

STONEPLACING

STONE PLACING COURSE CURRICULUM

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O. INTRODUCTION

Objectives

The Stone placing course will be a common tool for students in initial training and workers in continuous training of each partner country. It will be implemented by the schools where stone related specialities are taught, and also by the European companies associations, in the continuous training courses are continuously implementing.

The curriculum must include the main stone work:

- Placing ashlars and pavers/cubes.
- Placing natural stone elements and stone blocks
- Assembling ventilated facades
- Placing pavements
- Prepare mortars, adhesives and concrete.

Finally, the curriculum will have 9 competence units. The report 1.4 was the basis to elaborate this curriculum, and it coincides with chapter 2.

The specific content will be introduced in this document, decided and improved by consortium under the project. Once it has been approved, it will be translated into the participant languages.

I. COMPONENTS OF THE CERTIFICATE OF PROFESSIONAL COMPETENCE

Name of the certificate of professional competence

Placing of natural stone

Competence units of the certificate of professional competence

- UNIT 1. Basic risk prevention in the worksite for the stone placing
- UNIT 2. Preparing of cements, mortar, adhesives and concrete
- UNIT 3. Placing of pavement and stairs
- UNIT 4. Placing of masonry, ashlar and blockwork
- UNIT 5. Placing of cladding with mortar or adhesive
- UNIT 6. Assembling of ventilated facades
- UNIT 7. Placing of individual elements of stone
- UNIT 8. Monitoring and good practice for environmental protection standards
- FINAL MODULE. Professional internship module for placing of natural stone

Qualification level

Competence Units will be level 3 according to European criteria, except the *Unit 2 Making cements, mortar, adhesives and concrete* and *Unit 3 Selection of Stone*, which will be level 1 (according to curricula from Europe).

General competence

Placing various building element of natural stone such as pavement, stairs, masonry, ashlar, blockwork, mortar or adhesive cladding, ventilated facades and individual stone elements (for example, countertops for bathroom, kitchen or furniture, bathroom tops, tables, fireplaces, balusters, columns, sculptures, fountains, gargoyles, shields, figures, logos, prints, murals, mosaics, puzzles cutting, street furniture: benches, bollards, planters; funerary art: gravestones, chapels and mausoleums), which these elements must be placed according to guidelines of project technical documentation and the requirements about quality safety and environment and also must be kept in mind other materials and work units of a project and, finally, the finishing tasks.

Professional environment

Professional field:

Professional activity as a freelancer or as an employed person within small, medium or large companies using natural stone for building. Workers, who are specialised on placing stone, develop technical duties, fulfil orders and achieve technical objectives that are set by high-level technicians.

Productive sectors:

Stone industry
Construction

Occupations or related jobs:

Masonry worker
Building marble cutter or Monumental mason
Building stonemason

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Assembly operator for ventilated facades
Placing operator for pavement covering and wall facing

Duration

UNIT 1. Basic risk prevention in the worksite for the stone placing	60 h Theory: 40 h Training: 20 h
UNIT 2. Preparing of cements, mortar, adhesives and concrete	30 h Theory: 10 h Training: 20 h
UNIT 3. Selection of stone	30 h Theory: 20 h Training: 10 h
UNIT 4. Placing of pavement and stairs	160 h Theory: 60 h Training: 100 h
UNIT 5. Placing of masonry, ashlar and blockwork	120 h Theory: 40 h Training: 80 h
UNIT 6. Placing of cladding with mortar or adhesive	120 h Theory: 40 h Training: 80 h
UNIT 7. Assembling of ventilated facades	200 h Theory: 50 h Training: 150 h
UNIT 8. Placing of individual stone elements	120 h Theory: 40 h Training: 80 h
UNIT 9. Monitoring and good practice for environmental protection standards	60 h Theory: 40 h Training: 20 h
FINAL MODULE. Professional internship module for placing of natural stone	80 h
<u>TOTAL HOURS: 980 h</u>	

Teaching modules and units

UNIT 1. Basic risk prevention in the worksite for the stone placing	60 h Theory: 40 h Training: 20 h
UNIT 2. Preparing of cements, mortar, adhesives and concrete	30 h Theory: 10 h Training: 20 h

UNIT 3. Selection of stone	30 h
	Theory: 10 h Training: 20 h
UNIT 4. Placing of pavement and stairs	160 h
TEACHING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE FOR PAVEMENT AND STAIRS	50 h
	Theory: 20 h Training: 30 h
TEACHING UNIT 2. PLACING, ATTACHMENT AND FINISHING TOUCHES ON SITE FOR PAVEMENT AND STAIRS CONSTRUCTION	110 h
	Theory: 40 h Training: 70 h
UNIT 5. Placing of masonry, ashlar and blockwork	120 h
TEACHING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE FOR MASONRY, ASHLARS AND BLOCKWORK	30 h
	Theory: 10 h Training: 20 h
TEACHING UNIT 2. CONNECTION AND PLACING OF MASONRY, ASHLARS AND BLOCKWORK ON SITE CONSTRUCTION	60 h
	Theory: 20 h Training: 40 h
TEACHING UNIT 3. FINISHING TOUCHES FOR MASONRY, ASHLARS AND BLOCKWORK DURING ON SITE CONSTRUCTION	30 h
	Theory: 10 h Training: 20 h
UNIT 6. Placing of cladding with mortar or adhesive	120 h
TEACHING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE FOR NATURAL STONE CLADDING WITH MORTAR OR ADHESIVE	30 h
	Theory: 10 h Training: 20 h
TEACHING UNIT 2. PLACING, ATTACHMENT AND FINISHING TOUCHES DURING ON SITE CONSTRUCTION FOR NATURAL STONE CLADDING WITH MORTAR OR ADHESIVE	90 h
	Theory: 30 h Training: 60 h
UNIT 7. Assembling of ventilated facades	200 h
TEACHING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE FOR VENTILATED FACADES	40 h
	Theory: 20 h Training: 20 h
TEACHING UNIT 2. CONNECTION AND PLACING OF ANCHORAGES AND SUB-STRUCTURE FOR VENTILATED FACADES	60 h
	Theory: 10 h Training: 50 h
TEACHING UNIT 3. CONNECTION CLADDING FOR VENTILATED FACADES	40 h
	Theory: 10 h Training: 30 h
TEACHING UNIT 4. INDIVIDUAL TASKS AND FINISHING TOUCHES FOR VENTILATED FACADES	60 h
	Theory: 10 h Training: 50 h
UNIT 8. Placing of individual stone elements	120 h

TEACHING UNIT 1. PREPARATION TASKS AND CONSTRUCTION SURVEYING ON SITE FOR
INDIVIDUAL ELEMENTS OF NATURAL STONE 30 h

Theory: 10 h
Training: 20 h

TEACHING UNIT 2. PLACING INDIVIDUAL ELEMENTS OF NATURAL STONE DURING ON SITE
CONSTRUCTION 60 h

Theory: 20 h
Training: 40 h

TEACHING UNIT 3. FINISHING TOUCHES FOR INDIVIDUAL ELEMENTS OF NATURAL STONE
DURING ON SITE CONSTRUCTION 30 h

Theory: 10 h
Training: 20 h

UNIT 9. Monitoring and good practice for environmental protection standards 60 h

Theory: 40 h
Training: 20 h

FINAL MODULE. Professional internship module for placing of natural stone 80 h

TOTAL HOURS: 980 h

2. PROFILE OF THE CERTIFICATE OF PROFESSIONAL COMPETENCE

Competence Unit 1. Basic risk prevention on the worksite for stone placing

TOTAL 60 h
Theory: 40 h
Training: 20 h

Competence Unit will be level 3 according to European criteria, and level 2 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF 1: Detecting risks in the workplace or related to assigned job, facilities, conditions, etc. and carrying out correct checks with the aim of promoting and controlling safe progress of all works, in accordance with Health and Safety Plan and specific regulations for construction sites.

FC1.1. It is necessary for information about work conditions and to design collective protection means the following:

- Identifying person/s in charge, manager/s, supervisors, team leaders, and safety resources for each task or tasks related to among these.
- Seeking out information from these persons in charge and if needed, consulting Plan of Security and Healthy or evaluation of each workplace hazards.

FC1.2. Worksite environment and transit areas are checked visually and / or confirmation is requested at the beginning and during tasks to be carried out according to orders and Plan of Security and Healthy and checking the following:

- Worksite must be clean and free of obstacles (such as stored products, debris or other unrelated to the work done).
- In the case of terrain or neighbouring buildings these must be propped up or stabilised.
- Surface, on which task will be carried out, must be stable and firm
- Worksite are lit and ventilated adequately.
- Areas for storage of materials must be adequate and secure, and storage area must be checked to ensure that it does not exceed the load-bearing capacity for the area, and does not interfere with the movement of workers and equipment.

FC1.3. Electrical supply facilities are checked visually and / or confirmation is requested at the beginning and during tasks to be carried out according to orders and Health and Safety requirements, and checking the following:

- RCD functioning correctly.
- The electrical connections are made by approved connections
- The power lines are insulated, in good condition and, as far as possible, are well supported without risk of collapse, especially in damp areas.

FC1.4. Jobs are suspended under adverse weather conditions, first ensuring that materials and equipment are secured, especially those at a height.

FC1.5. Is checked in accordance with the instructions, both at the start of work and periodically during the progress of the work, that the signs on the site give information to reduce the areas of potential risk, and are clearly visible, even at night.

FC1.6. Aids installed by foreign companies are checked in accordance with the instructions, and visually for confirmation, verifying that:

- Correspond in type and location with those under the Health and Safety Plan of the work.
- Feature the maintenance instructions and prescriptive.

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- They have in case of inspections and mandatory permits.

FC1.7. Collective means of protection installed by foreign companies are checked in accordance with the instructions, and visually for confirmation, verifying that:

- They are prepared well in advance of the implementation of the work.
- Installation is performed following the instructions of the manufacturer or installer.
- all items have CE marking.
- Meets the specifications of the Health and Safety Plan of the work.

FC1.8. the temporary facilities for workers must correspond to those provided in the Health and Safety Plan of the work.

FC1.9. Kind of tool -pulley or sheave- or machine -forklifts and others- for lifting loads and their respective accessories -hooks, ropes, slings, slings and others-. All tools and machines used for lifting loads must have clear instructions saying what loads can be safely lifted.

FC1.10. Problems that are detected on the site must be quickly resolved so as to avoid the extension of risk.

PF 2: Carrying out the basic monitoring and control during the implementation of the assigned job(s) with the aim of promoting and controlling the safe progress of the job, in accordance with the site health and safety plan and with the specific regulations for construction sites, checking the correct use of the equipment and the working practices.

FC2.1. Workers directly in charge, should show balanced behaviour in accordance with established guidelines, with no anomalous behaviour at any time of during the work.

- They should have received specific training and protection, or have a professional qualification tailored to the tasks to be performed.

FC2.2. Occupational hazards associated with activities in excavated areas, holes in the ground

-Those in charge are assigned to :

- Consul with those responsible for the work and services to prevent risk in accordance with the health and safety plan of the work.
- For jobs that do not require safety and health plan, identifying the risks of the hole in which the work is being done, which combine the usual risks in this type of work involving sites, pit equipment and specific agents.

FC2.3. Situations of increased risk of work interference with other planned activities are detected and collaborating with decision makers and risk prevention services, ensuring protection to third parties within the work itself and party walls or the street.

FC2.4. It is found that the operators and crews directly in charge have been instructed on work at the bottom of the hole, on their specific risks and preventive measures to be taken in the same, which must be taught clearly and concisely.

FC2.5. Good practices are fostered by checking that operators develop their work:

- Looking out for incorrect postures , correcting them and instructing them on the proper posture to prevent injury.
- Avoiding unsafe acts, correcting them otherwise.

FC2.6. Personal protective equipment, should meet the following requirements:

- They are certified.
- Match the Plan specified in the safety and health of the work.
- They are in good condition and within the useful life period, asking for immediate replacement.

If not in good condition.

- Workers carry them and operate them correctly, instructing them in handling otherwise.

FC2.7. Aids and collective protection should

- Respond to the needs of the business, allowing their implementation according to the instructions of manufacturer or installer and the safety and health plan of the work.
- Are used, preserved and maintained according to manufacturer's instructions or installer.
- Workers respect the integrity and functionality of them, and seeking permission to proceed with the transformation or removal of any item.
- Are checked after intensive use.

FC2.8. Vehicles and machines:

- They correspond to those under the Health and Safety Plan of the work.
- Are used and stored according to manufacturer's instructions.
- They are in good condition according to regulations.
- They are used by authorised and trained operators for this purpose.
- Used only in tasks for which they were designed.
- Machines are properly installed and maintained, keeping guards and protective covers to the operator.
- Vehicles using the road and park in provided spaces for this purpose.

FC2.9. Waste generated in the excavated area is shown to be dumped in the spaces designated for this purpose in accordance with the criteria of safety and environmental protection established.

FC2.10. Contingencies identified in the excavated area are resolved, and are communicated as quickly as necessary to enable monitoring and resolution, avoiding the extension of risk.

PF 3: In the case of accidents or injuries, act in a manner to minimise damage and to give first aid to the injured in an efficient, speedy and safe manner, communicating and coordinating with supervisors and the emergency services to control and manage the situation effectively.

FC3.1. Information channels for emergency actions and first aid, are identified in advance, determining the means of contact with those responsible for the work, institutions or health professionals and law enforcement, or any others that might be relevant.

FC3.2. Emergency medical-kit, evacuation, fire and others are identified in advance, determining their position and checking that are specified-in number, type and location, and that are in good working order.

FC3.3. Alarm was given in accordance with the provisions, to be satisfied of the emergency or incident, warning people at risk.

FC3.4. Actions of the agent causing the risk in emergencies are limited to their signage as directed set, unless it is considered necessary to intervene to avoid greater evils.

FC3.5. The worker defines the scope of their duties during the emergency or incident, depending on the situation, acting promptly and applying basic measures established, particularly making contact with those responsible for the work, and if necessary with medical officials or civil protection.

FC3.6. Responsible orders are obeyed and executed during the emergency or incident.

FC3.7. Risks arising from the emergency or incident, when failed contact the heads-of the work, medical or civil protection as appropriate, are identified, assessing their severity and establishing both the actions to be developed in the field of its obligations as the priority thereof.

FC3.8. In case of injuries, when they have not able to receive instructions, identifying the damage to them by the type of accident, and proceeds along the following principles:

- Avoiding situations of nervousness or disorder that could aggravate the consequences of the incident.
- Avoiding the displacement of the wounded except as necessary to prevent greater evils.
- Avoiding position changes for the wounded.
- Avoiding the removal of the elements embedded in deep wounds.

- Avoiding the separation of skin clothing hurt if severe burn.
- Solving the electrocutions by power disconnection.

Professional context

Means of production

Media of detection and extinction of fires: Hardware of detection and alarm. Means of extinction manuals (Extinguishers, mouths of fire equipped). Media of extinction. Media of evacuation: outputs, doors, signalling, lighting of emergency. Means for action and first aid: Personal protective equipment for emergency situations; closet or kit of first aid portable devices to deliver oxygen, eyewash, showers.

Products and results

Checking the condition of the working environment. Checking the use and maintenance of: Personal and collective protective equipment, auxiliary equipment, site facilities, machinery and plant vehicles. Respond to instructions in the case of accidents or emergencies and first aid. Monitoring and enforcement of the site health and safety plan.

Used or created information

Regulations and documentation of risk prevention. Health and safety regulations in the workplace. Standards and industrial safety regulations in different fields. Reference documents (standards, guides different organisms). Documentation related with the prevention of the company. Documentation related with the hardware and facilities existing in the company. Documentation related with the activities and processes made. Related Documentation with the produce or substances used. Documentation related to notification and log of damage to health. Plan of security and health in the job. Risk assessments in the workplace. Verbal and written instructions to those responsible. Technical recommendations of manufacturers and machine operating manuals supplied by manufacturers.

IN CROATIAN AND SPANISH CASE: This modulus is main condition to continuing the course.

Competence Unit 2. Preparing of cements, mortar, adhesives and concrete

TOTAL 30 h
Theory: 10 h
Training: 20 h

Competence Unit will be level 1 according to European criteria, and level 1 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF1: Operate with the materials and work equipment (machines, tools, supplies and personal protective equipment) necessary to achieve the required performance and quality, observing established safety measures.

FC1.1. Machines, tools, supplies and personal protective equipment are selected are appropriate for the activity.

FC1.2. Safety measures and environmental protection are adopted following orders received verbally and / or written.

FC1.3. Maintenance operations daily for the various work equipment used.

FC1.4. waste is dumped or stored in the spaces designated for this purpose, respecting the criteria of safety and environmental protection established.

PF2: Prepare plaster mortar and grout, cement and lime, both manual and mechanical means, to perform masonry and siding, following the composition and dosage set and meeting deadlines and volumes required.

FC2.1. Components used are set in terms of types, sizes and shapes of aggregate, binder type and class of additives.

FC2.2. Dosage of components and the volume of water reported are those specified to achieve the required consistency and resistance.

FC2.3. Machine mixes projection by dose based on the nature of it and the environmental conditions.

FC2.4. Specifications regarding mixing, at times adjustability and environmental conditions are respected.

FC2.5. Mixture is prepared, has the proper homogeneity and responds to the quantity demanded.

FC2.6. Mixture is delivered within the specified time range respecting workability period.

PF3: Develop concrete with both manual and mechanical means to carry out construction works, following the composition and dosage set and meeting deadlines and volumes required.

FC3.1. Components used are set in terms of types, sizes and shapes of aggregate, binder type and class of additives.

FC3.2. Dosage of components and the volume of water reported are those specified for conditions required consistency and resistance.

FC3.3. Specifications regarding mixing, at times adjustability and environmental conditions are respected.

FC3.4. Preparing the mixture has the proper homogeneity and responds to the quantity demanded.

FC3.5. Mixture is delivered within the specified time frame respecting the period of workability.

PF4: Prepare dosage mortars, both manual and mechanical means, to perform masonry and siding, observing the manufacturer's recommendations, indicated quality conditions and standards established safety and environmental protection.

FC4.1. Products used, their quantities and their conservation status are appropriate for the features set, and storage and handling is done in the safety and health conditions indicated or recommended by the manufacturer.

FC4.2. Mortar and grout for machine-dosed projection based on the nature of it and the environmental conditions.

FC4.3. Specifications regarding mixing, wait times before mortar re-kneading, adjustability to time and environmental conditions are respected.

FC4.4. Mixture is prepared and has the response due to the volume homogeneity required

FC4.5. Mixture is delivered within the specified time frame respecting the period of workability.

PF5: Prepare adhesives and grouts to perform coating work, using mechanical means, following the dosage and instructions established by the manufacturer and meeting the deadlines and volumes required.

FC5.1. Products used, their quantities and their conservation status must be appropriate for the features set, and storage and handling is done in the safety and health conditions indicated or recommended by the manufacturer.

FC5.2. Cement based adhesives are mixed with the water volume set, subject to the following conditions:

- Water used must be drinking or, alternatively, with no organic matter or other foreign material.
- Dried product was poured on water always.
- Volume of water respects the ratio (litres per bag or kilograms) specified by the manufacturer.
- In case of partial or total replacement of water emulsions, respecting the replacement ratio specified by the manufacturer.
- Compliance to the manufacturer in terms of time to maturity and lifespan.

FC5.3. Adhesives and grouts reaction resins are obtained by mixing the components and using the entire contents of the respective containers.

FC5.4. Adhesives dispersion resins, sold ready for use, are used after a short mechanical stirring before use must be kept intact on the packaging closed at the end of the day to allow its use later on.

FC5.5. Specifications regarding mixing (useful, speed, stirring time and waiting time before mortar re-kneading) and environmental conditions are respected, obtaining the required consistency and wettability.

FC5.6. Prepared mixture homogeneous with complete absence of lumps and air bubbles in the mixture, responding to the quantity demanded.

FC5.7. Mixture is delivered with due observance of the maturation period in the life of the product, established by the manufacturer depending on the environmental conditions.

Professional context

Means of production

Concrete, mixers and mixers. Pallets, shovels wheelbarrows, drawers, baskets, buckets, hod carriers, kneading-troughs, hod for plaster. Binders: lime, plaster and cement. Gravel. Sand. Water. Additives. Mixtures pre-dosed. Individual protection means.

Products and results

Plaster, mortars, adhesives, materials of grouting and concretes with application: factories, coatings, sealed reinforcement bonding, waterproofing, grouting, filling, levelling, anchoring and / or injections

Used or created information

Working parties, parties of incidents, parts ordering and receiving materials. Technical recommendations of manufacturers. Verbal and written instructions of the team leader. Machine operating manuals supplied by manufacturers.

Competence Unit 3. Selection of stone

TOTAL 30 h
Theory: 20 h
Training: 10 h

Competence Unit will be level 1 according to European criteria, and level 1 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF 1: Studying about main stone deposit and overview about formation, quarrying and processing natural stone.

FC1.1. Formation, chemical composition and classification.

FC1.2. Physical and chemical terminologies.

FC1.3. Stone formations during geologic history.

FC1.4. Earth's composition. Formation of stone.

FC1.5. Differences between igneous, sedimentary and metamorphic rocks.

PF 2: Studying about possibilities for the use according to the type and characteristic of stone.

FC2.1. Products and their use

FC2.2. Selection of natural stones for their required processing

FC2.3. Structure, colour, textures and drawing

FC2.4. Density and bulk density water absorption under atmospheric pressure and by capillarity, compression strength, bending strength, abrasion resistance, thermal conductivity and dilation

FC2.5. Weathering of stone: Differences between chemical, biological and physical weathering, measures to avoid weathering.

PF 3: Technical characteristics of the most important natural stones to use them in the right way

FC3.1. Natural stone characteristics: hardness, resistance to weathering, structure and colour.

PF 4: Reasons of building defects and damages on natural stone

FC4.1. Building damage caused by frost, temperature, earthquake, wind, rust, acid corrosion and plant growth.

Professional context

Means of production

Several types of stone (granite, marble, limestone, etc.) with different characteristics (resistance, absorption, freezing, etc.). Several types of surface finish quality.

Products and results

Checking characteristics of stone in construction site and condition of working environment where stone is to be placed. Combination of natural stone with other materials. Checking use and maintenance of natural stone for any cases. Responding to instructions of person in charge related to characteristics of natural stone.

Used or created information

Technical recommendations of manufacturers. Verbal and written instructions of the team leader. Machine operating manuals supplied by manufacturers. Combining materials correctly.

Competence Unit 4. Placing of pavement and stairs

TOTAL 160 h

Theory: 60 h

Training: 100 h

Competence Unit will be level 3 according to European criteria, and level 2 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF 1: Verifying condition of workspaces, materials and equipment needed, within their sphere of competence, to achieve the required performance and quality in the work floor and stairs, meeting the established Health and Safety standards.

FC1.1. Machines, tools and supplies available, checking that these are appropriate to the activities to be undertaken during the construction of pavements and staircases, selecting where appropriate the necessary criteria of quality, safety and health, and performance optimisation.

FC1.2. Personal protective equipment to implement implementation of flooring and stairs, selected according to the indications of higher risk or responsibility and concrete work, checking that have CE marking, to suit the needs of the activity and that are in good condition and within the period of life, if not asking for replacement.

FC1.3. Health and safety measures for the implementation of pavements and staircases, which are collected and confirmed, requesting instructions-verbal and written-and confirming your understanding, if necessary at the manufacturer's equipment and products.

FC1.4. Auxiliary and collective protection installed by others, necessary for the implementation of pavements and staircases means checks that are available in the necessary locations to fulfil their role and are operating, detecting defects in installation and maintenance, and avoiding changes without permission.

FC1.5. Contingencies identified in the work are resolved within the scope of competence, and where appropriate, communicate to the senior or responsible person as quickly as necessary to enable monitoring and resolution, especially those that endanger the safety and health of the worker himself or others, particularly in the case of horizontal or vertical gaps without collective protection installed.

FC1.6. Waste disposal is effected by depositing the waste in containers suitable for each type of waste.

FC1.7. Maintenance of that day to apply assigned to different work equipment used, following the instructions received and the manufacturer's instructions.

PF 2: Perform pre-flight holder to proceed with the implementation of pavements with the requisite quality, checking the status, physical characteristics and geometry of both the support and the adjacent building elements-elements that stand, equipment, carpentry and other-.

FC2.1. Conditions achieved in the prior-stability, cleanliness, sanitised, cohesion, and texture-regularisation achieved in previous treatments, treatments checks or confirmation that are sufficient to run the pavement calls.

FC2.2. Protecting media installations, carpentry or other elements of stand-and environment-cloths-adjacent elements and equipment, it is found that allows the development of work without affect.

FC2.3. Protective layering is undertaken covered Noting that were previously installed protection layers of the waterproofing membrane to avoid damage during work.

FC2.4. Geometric control support is made on all its breadth, considering the following aspects:

- Length and width of the rectangular soil, detecting different dimensions on opposite sides, meetings with non-parallel walls and other building elements together or if offset from the horizontal.
- Perpendicularity of encounters with pavement construction elements that stand, especially walls.
- Flatness and level of supports, sensing the need to correct by screed.
- Delivery of the final coat of pavement, sensing that the available height to accommodate the total thickness of the bonding material and parts is insufficient.

FC2.5. Geometric control of accompanying support elements is carried out considering the following aspects:

- Implementation and location of pre-installations detecting absence of pre-run pre-installation the pavement or executed off-site or protruding surface.
- Location and levels of equipment and furniture, especially fixed shower trays, baths and saunas and hydromassage cabins-detecting the need to reinstall.
- Alignment of the existing structural movement joints.
- Existence of motion perimeter seals and, where appropriate, intermediate in screeds executed.

FC2.6. Structural movement joints, cleaning them and filling them treated along its length and width with the specified or compressible materials specified placing prefabricated boards.

FC2.7. Perimeter joints and intermediate movement are located, confirming its position as the top or responsible, or detected and installed in the previous screed treatments and materialise if setting the background compressible material or prefabricated joint seals that have specified.

FC2.8. Environmental conditions and the surface temperature, existing at the time of implementation of the pavement or during the subsequent drying, need to be suitable, especially outdoors.

PF 3: Perform pre-flight mixtures applied-mortars, adhesives and grout-, parts replaced and labour conditions to proceed with the implementation of pavements with the requisite quality, checking the status and physical characteristics and geometry tiles and slabs.

FC3.1. Composition of the mixtures were checked or confirmation that are provided and, if necessary, appropriate and compatible with the flooring to run calls.

FC3.2. Dosage of the mixtures and in particular, the water / binder checks or asked for confirmation that is suitable for placement in thick mortar-positioning "on-decoupled-screed" mode and "with trowel tip outline" mode - to stand on which already apply the environmental conditions of humidity and temperature.

FC3.3. Mortars, adhesives and grouting materials prepared, should exhibit the characteristics required fresh, homogeneous appearance, volume is sufficient and delivered within the specified time frame without exceeding the maximum usage time or life.

FC3.4. Correspondence of models defendants served with checks, reading codes entered packaging depending on the quality of the material-series model, commercial quality, tone, format manufacture and, where appropriate, size, verifying that stockpiles are correct in number, with extreme control to special parts.

FC3.5. Quality, integrity and consistency of parts is checked by composing panels dry with samples taken from batches collected, controlling:

- Appearance of the parts-colour shades, textures, and other decorative motifs-detecting inhomogeneities and appreciating the need to mix the pieces before placement.
- Directionality of textures and decorations, assessing the need for placement as a certain direction.

- Surface quality compared to commercial quality marked by detecting the actual quality of the parts is indicating its code.
- Dimensional characteristics of the parts, detecting deviations-perpendicularity, length, width, straightness and flatness-edge above tolerances, particularly with certain types of rigs, assessing the need for replacement or treatment workshop.

PF 4: Construction surveying of tile installation to proceed with the placement, in line with the forecasts of the project and the conditions of the supports.

FC4.1. Construction surveying of fits plans and drawings or the instructions received, adjusting the spaces provided and taking into account the areas occupied by equipment or fixed furniture, and other coatings-treated by woods, laminates and others.

FC4.2. Criteria wonder stake and if necessary fixing, if seeking approval of the proposals by the client, specifying:

- Direction of laying the tiles.
- Placement direction of the long and short sides of rectangular pieces.
- Tackle placement, considering not only the forms but also the decorative effects of the parts-stripes, patterns, colours, textures, and other parts of the same design.
- Combination of pieces of different-in design chess, spikes or other.
- Treatment of meetings, change-up, delivery to other construction elements, frames and other materials.
- Custom Parts: skirting and scotia, kicks, and others.
- Position of the cuts, placing them in less visible places, which are hidden by furniture or other causes preset locations.

FC4.3. Criteria are adapted if possible to achieve the following purposes:

- Optimisation of material, avoiding having to make cuts of narrow step tops, or getting a bevel, small triangles.
- Performance optimisation in placement, preferably opting for solutions that minimise distributions and cutting operations.
- Adaptation to the geometry of the support, avoiding rigging evidencing defects of squareness and alignment thereof or in encounters with the components, equipment and fixed furniture.
- Hiding cuts, trying to locate where they have less visibility or will be covered later, or other kitchen furniture.
- Symmetrical configurations.

FC4.4. Necessary cuts spans, contours of fixed furniture and equipment or for other reasons, is getting rims determine the shape of the projected-fringes decorative effects and others and material optimisation.

FC4.5. Holes are determined necessary, especially considering the position and size of outlets, toilets, pipes and other reasons.

FC4.6. Stakeout specific marking required cuts and holes in parts to serve as a template for the implementation thereof.

PF 5: Carrying out natural stone paving techniques by placing thick coatings ("on-decoupled-screed" mode and "with trowel tip outline" mode) using as material grip cement mortar or cement mixed and lime to get the project under pavements, meeting quality measures and established safety and health.

FC5.1. Works are undertaken having confirmed the validity of the media, parts, mixtures and techniques used, particularly in the placement to "with trowel tip outline" mode that the dosage of

mortars is adequate to minimise shrinkage in the curing process avoiding the formation of eyebrows and flatness defects.

FC5.2. Tiles having high absorption of water wetted to prevent mortar from absorbing water.

FC5.3. Anticipated final level pavement respected, checking if the available height to accommodate the total thickness of the mortar and parts is sufficient, and adjusting the mixture to have thickness and placement by teachers.

FC5.4. Work is undertaken in a logical order placement.

- After the tiles and / or on the final level of the same.
- Extending the expected decoupling layer-based loose aggregate or consolidated as poor cement mortar, or other.
- In the case of the "on-decoupled-screed" mode, performing a levelling layer with special attention to the fresh properties, and proceeding on levelling layer fresh applying a bridge between the level slab and tiles, based a cement sprinkled with subsequent wetting.
- In the case of the "with trowel tip outline" mode and "with trowel tip outline" mode parts are placed one by one by arranging a mortar bed on the laying surface with enough material so that after pressing the back is completely covered Specimen and reach the expected level.
- Addressing the broader contours and cloths in the first place, unless otherwise stated, and in the case of horizontal holes or busy to be paved, marking and fitting to reference lines and spaces surrounding them avoiding proceed.
- Optimising performance.

FC5.5. Construction surveying previously established respected in all their predictions during placement, both of the blanks as special.

FC5.6. Boards provided respect the separation between parts, using prefabricated separators when you reach the required quality, and if present righteousness orthogonal parts, parallelism and levelling required.

FC5.7. Structural joints, perimeter and intermediate movement, if any, are properly sealed, ensuring uniformity of thickness and adhesion of the sealant to the edges of the tiles.

FC5.8. Final surfaces have the properties of flatness and absence of eyebrows respecting the tolerances, and cleaning of the joints between parts and the surface of the tiles are secured and protected against traffic before curing of mixtures of grip.

FC5.9. Health and safety measures for the implementation of pavements, which are met in accordance with established criteria for risk prevention and specific instructions for the work being executed.

PF 6: Run paving stone tiles fixed with adhesive or thin-layer media, to get the project under pavements, meeting quality measures and established safety and health.

FC6.1. Works are undertaken having confirmed the validity of the media, parts, adhesives and in particular, the environmental conditions for thin layer techniques or media.

FC6.2. Adhesive is uniformly disposed on the support with the intended thickness, and avoiding using toothed apply flat spot or gobs.

FC6.3. Pieces are placed by pressing and rubbing until the crushing grooves gluing, using the technique of double bonding unless otherwise indicated in the following circumstances:

- Large format pieces.
- Demanding Applications-facades, waterproofing, high chemical resistance and other.

FC6.4. Work is undertaken in a logical order placement unless indicated otherwise:

- After the clad and / or on the final level of the same.

- Addressing the broader contours and cloths in the first place, unless otherwise stated, and in the case of horizontal holes or busy to be paved, marking and fitting to reference lines and spaces surrounding them avoiding proceed.
- Optimising performance.

FC6.5. Construction surveying of previously established respected in all their predictions during placement, both of the blanks as special.

FC6.6. Gaskets are obtained, provided respect the separation between parts, using prefabricated separators when you reach the required quality, and in particular:

- Orthogonal joints presented pieces righteousness, parallelism and levelling required.
- Joints between panels preassembled mosaic will look the same as the joints between the tiles, avoiding mark the outline of the pieces.

FC6.7. Structural joints, perimeter and intermediate movement, if any, are properly sealed, ensuring uniformity of thickness and adhesion of the sealant to the edges of the tiles.

FC6.8. Final surfaces are obtained, exhibiting the properties of flatness and absence of eyebrows, respecting the tolerances, cleaning the joints between parts and the surface of the tiles are secured and protected against traffic before curing of the adhesive.

FC6.9. Health and safety measures for the implementation of pavements, which are met in accordance with established criteria for risk prevention and specific instructions for the work being executed.

PF 7: Coat stairs and baseboards place using mortars, pastes and adhesives for flooring and complete the planned coatings, provided quality measures and established safety and health.

FC7.1. Works are undertaken noting that the ladder is supplied with the dimensional specifications defined in the project, and is old enough to consider it stable.

FC7.2. Adequacy of the tiles and special pieces available to the intended rigging is checked by staking the ladder, and if not, it informs the senior or responsible person as quickly as necessary to enable monitoring and resolution.

FC7.3. Long dimension of the piece that will be the baseboard is found that matches the size of the tile flooring that is delivered to the baseboard, observing the correct modulation for orthogonal placement or work.

FC7.4. Work is undertaken in a logical order placement unless otherwise indicated:

- After the claddings and, if necessary, on the final level of the same.
- Addressing the stairs from top to bottom, placing the risers / riser after the trace from the bottom step and, where appropriate, the nosing.
- Once completed and hardened the lining of the steps, the skirting is placed.
- Optimising performance.

FC7.5. Gaskets are obtained, provided respect the separation between parts, using prefabricated separators when you reach the required quality, plus:

- Orthogonal joints presented pieces righteousness, parallelism and levelling required.
- Joints in skirting pieces coincide with the joints between the floor tiles.

FC7.6. Baseboard is always placed above the perimeter joint movement without contacting the filler material or with parts of the pavement, leaving enough space to introduce the sealant, and baseboards are located so as not to interrupt or overlap Edge board movement.

FC7.7. Baseboard has been done, has the properties of flatness and perpendicularity relative to the pavement, observing the tolerances, and cleaning of the joints between parts and the surface of the baseboard and the floor is secured before curing of adhesives and bonding mortars.

FC7.8. Stairs are obtained, present the expected coating properties with their steps flatness and absence of eyebrows, respecting the tolerances, cleaning the joints between parts and the surface of the tiles are secured and protected before the transit before tightening grip mixtures.

FC7.9. Health and safety measures for the implementation of steps are accomplished in accordance with established criteria for risk prevention and specific instructions for the work being executed.

PF 8: Contents flooring adhesive secured directly to medium to fine-layer special coatings on low compressibility insulation in interiors supports previously waterproofed liquid waterproofing sheets and on electric resistances and in the case of high mechanical strength pavements and / or chemical-, meeting quality measures and established safety and health.

FC8.1. Work on applications on low compressibility isolates or waterproofing treatments using sheets or liquid-in waterproofing including bathrooms and showers-are undertaken having confirmed the compatibility of the surfaces constituting the bracket-floor insulation and waterproofing materials-with adhesive material.

FC8.2. Jobs for high strength pavements are undertaken having confirmed the strength capacity of the surfaces constituting the bracket pavement.

FC8.3. Works are undertaken having confirmed the validity of the pieces, mixtures and environmental conditions for the thin layer technique or medium, and if pavement high mechanical strength and / or chemical that tiles, adhesives and grouts have the necessary properties for the intended use.

FC8.4. Work on acoustic insulation applications on low compressibility are undertaken having confirmed the complete coverage of the support by the insulation and proper sealing of joints, resulting in a continuous area of insulation without acoustic bridges.

FC8.5. Paving work on waterproofing treatments by liquid waterproofing sheets or having checked are undertaken waterproofing implementation by skilled operators, or waterproofing undertaking this way similar to that followed when executed for tiling.

FC8.6. Insulating materials are arranged on the support when necessary and not executed placing skilled operators, similar to that followed in the implementation of special floating screeds mode thereon.

FC8.7. Electric resistances that constitute the floor heating are arranged and fixed directly on the laying surface with a compatible adhesive, normally a high deformability, making sure there are electric sockets before the implementation of the pavement.

FC8.8. Pavement on having electric heating is undertaken by confirming that the authorised installer has revised system operation.

FC8.9. Implementation of high strength pavements and / or chemistry is performed using the technique of double glue and open joints, respecting the minimum separation.

FC8.10. Stake in the case of chemical resistant flooring is done, opting for a rig whose joints are aligned with lines sloping sinks to facilitate the evacuation of liquids, and before implementation is found that movement joints have been treated chemically resistant waterproofing.

FC8.11. Pavement is executed and delivered as normal pavements, final surfaces have the properties of flatness and absence of eyebrows respecting the tolerances, and cleaning of the joints between parts and the surface of the tiles is ensured by adhesive curing.

FC8.12. Health and safety measures for the implementation of pavements, are met in accordance with established criteria for risk prevention and specific instructions for the work being executed.

Professional context

Means of production

Measuring tapes, tape measures, plumb bobs, levels of hand, water and laser. Rules / view, brackets, wire for tautening and to mark. Trowels, plain or toothed combs, trowels, flat brush, pointing trowel. Drawers, baskets, buckets, hod carrier, troughs. Rubber mallets, pincers tiler. Suction. Spreaders and separating wedges for tiles. Standoffs Natural or artificial stone. Different types of ceramic tiles and other materials, glass-ceramic, resin agglomerates, metallic, composite and other rigid materials. Preassembled and vitreous ceramic tile. Tiles and slabs of natural and artificial stone, whether or not agglomerated with resins. Functional and decorative trims, ceramic nature glass or other materials-wood, stainless steel, aluminium and others.

Special parts for stairs and baseboards. Cement, lime, aggregates and gypsum. Fine gravel and agglomerates of clays. Prefabricated layers of separation and decoupling. Mortars. Cementitious and reaction resin adhesives. Grouts and borated for flooring natural and artificial stone. Liquid waterproofing, plumbing pre-installations cuffs and bands plane change. Fibreglass mesh, galvanised steel mesh and stainless steel mesh high chemical resistance. Prefabricated movement joints, corners and fixed equipment deliveries. Products for joints from moving. Putty silicone, polyurethane and polyurethane / tar. Tape. Personal protective equipment, collective protection means, aids, temporary facilities.

Products and results

Flooring laid with cement mortar / adhesive lime and even preassembled, ceramic and natural or artificial stone mosaics. Specialty Flooring: acoustic insulation on low compressibility and waterproofing treatments, electrical heating systems, high mechanical strength and / or chemistry. Waterproofing mounts indoors. Stair covering and skirting. Compliance with measures of risk prevention and quality specifications.

Used or created information

Plans and drawings of work related linings. Data sheets and product safety. Working parts, parts of incidents, parts ordering and receiving materials. Manuals and commercial catalogues of materials and products. Operation manuals and maintenance of machines and equipment. Manual placement of modular rigid coverings. Verbal and written instructions of the head of upper or responsible. Plan safety and health at work. Risk assessments in the workplace. Signalling work.

Competence Unit 5. Placing of masonry, ashlar and blockwork

TOTAL 120 h

Theory: 40 h

Training: 80 h

Competence Unit will be level 3 according to European criteria, and level 2 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF1: Determine the scope and organisation of the work to proceed with its implementation on schedule and with the required quality from the interpretation of drawings and other technical documentation, and / or seek information or responsible superior.

FC1.1. Project documents: exploded views and / or assembly and other technical documentation available is sorted and analysed, identifying omissions and errors in the information necessary for the complete definition:

- Characteristics of the pieces to be placed: geometry, volume, weight, appearance.
- Characteristics of the support: materials - brick, concrete or other -, geometry - levelling, surface - flatness and regularity, stability and condition.
- Singular points, auctions and meetings.
- Anchoring system: characteristics and attachment.
- Suitable conditions for preparation of the mixture and curing of adhesive.
- Specifications of placing.

FC1.2. Defining a set of place is obtained from the various parts or elements, indicating which are serially and which are unique for a previous overall composition.

FC1.3. Representations and measures or possible mismatched uncertainties that may exist, are identified and communicated to the responsible line manager for clarification and justification.

FC1.4. Parts or areas in appropriate cases, require a detailed interpretation, are studied by means of drawings, proposing solutions to the technician.

FC1.5. Documentation for anchorages and joints, is checked in relation to information on the geometric position, depth, material and implementation order.

FC1.6. Surface finishes and capping operations that require to be performed "in situ" fully defined, indicating the field of performance, system, intensity and any other parameters necessary for its definitive fulfilment in work.

FC1.7. Organisation of material and human resources are determined from the implementation orders, trying to optimise the quality and performance in regard to:

- Organisation of the work.
- Placement staff.
- Relationship with other trades.
- Medical aids are available: cranes, scaffolding and others.
- Collection, storage and distribution of the pieces to be placed.
- Distribution and sequencing of tasks in time.
- Establishment of control points: checking contents, check the benchmarks, check your work, check adjustment deadline.

PF2: Preparing the equipment and materials necessary work - machines, tools, supplies, personal protective equipment and collective aids, natural stone pieces, to achieve the required performance and quality, observing established safety measures, from the interpretation of graphical information, and written and considering the technical requirements laid.

FC2.1. Machines, tools, supplies, personal protective equipment and collective aids that are selected are appropriate for the activity to develop.

FC2.2. Security measures are taken, according to the plan specified order according to verbal and / or written.

FC2.3. Maintenance operations and day to properly apply the different teams, following instructions and in accordance with specific instructions manuals.

FC2.4. Work spaces are kept clean and free of obstacles, to ensure safety and quality in the work.

FC2.5. Leftover stone, auxiliary materials, pallets and packaging are removed and deposited in areas or containers provided for this purpose.

FC2.6. Amount and characteristics - shape, thickness and finishes, from natural stone elements received at work was found to correspond with the requirements of the technical documentation,

verifying, prior to receipt at store or work placement, in perfect and communicating it to the person responsible.

FC2.7. Pieces are identified, both in the work and in the delivery notes, checking compliance with the criteria established production or using summary reports or similar measurements.

FC2.8. Delivery of the stone elements is done without interrupting other trades, ensuring that the material rests on strong enough areas for the collection.

PF3: Construction surveying of the necessary references and place the fences to guide the placement of the stone elements, reproducing the geometry defined in the plans, respecting the accepted tolerance.

FC3.1. Staking plan conforms to the geometry and tolerance defined in the project plan or sketch of the work, checking on the clean surface, with a stroke easily identifiable and sufficiently stable.

FC3.2. References and order are placed where they come from, in sufficient number, properly positioned, received, their faces chipping squared and compared to baseline.

FC3.3. Reference view or bars are positioned so that the levels are properly located sills and lintels of the voids, to ensure the proper placement of subsequent courses of stone.

FC3.4. Strings are laid between brands of view corresponding to the same row, and have the required flatness in the project or the quality plan.

FC3.5. Special pieces - mouldings, sills, lintels, jambs, and others - whose placement precedes the lifting of the blocks are located properly, and are plumb, level and braced.

PF4: Set to work natural stone items received to achieve parts with features and finishes required, using manual and mechanical means, respecting the technical specifications and safety standards and environmental protection.

FC4.1. Pre-cuts designed to protect the blockwork for transport work are eliminated by mallets and chisels to get completely flat surfaces and edges without chipping.

FC4.2. Pieces are trimmed on site, until the flat faces seat with their cut edges in perfect condition.

FC4.3. Dimensional adjustment problems are solved in the work pre-placement, reviewing or compensating those areas or pieces of stone needed.

FC4.4. Tillage operations required in the walls and corners meetings are held, to achieve consistency with the rest of the work.

FC4.5. Right pieces to coat the edges of the slabs are chosen, to achieve an even finish with the rest of the facing.

FC4.6. Cuts and drills necessary to accommodate the metallic elements - stiffening rods and anchorages, are performed in the stone pieces that need it, so as to allow the accommodation of the metallic elements in a safe and durable.

FC4.7. Waste generated in the work setting are managed in accordance with procedures established by the company and current legislation.

PF5: Raise stone masonry factories, received dry or with mortar, walls for enclosures or resistant according to the provisions of the project and compliance with quality and safety measures established.

FC5.1. Ordinary masonry blocks rise so that they present the largest masonry regularly in the corners and jambs of the openings being in alignment and plumb, coining and filling the gaps between masonry rubble, with the lock and keys necessary.

FC5.2. Masonry blocks concerted and facing (only in one side) occur that presents all the faces of masonry veneer and worked together, being seated on flat and parallel faces.

FC5.3. Rough ashlar factories or irregular masonry spun with rough stones rise of substantially prismatic, and so that no more than three edges coincide in a single vertex and the distance between the vertical joints of two successive rows, lest lower than the specified length.

FC5.4. Duplex blocks that meet defined quality control are performed, so that the latch and present necessary keys and finish required on each face.

FC5.5. Waste generated in the work setting are managed in accordance with procedures established by the company and current legislation.

PF6: Contents placing masonry and blockwork, for the formation of load-bearing structural elements, cladding, and unique items and auction, using dry bonding systems, with anchorages and / or mortar or other adhesives, respecting the technical specifications and safety standards and environmental protection.

FC6.1. Transverse reference necessary to start the wall are placed at set distances, level and plumb, properly, to ensure an adequate basis for the remaining elements.

FC6.2. Stone pieces are placed respecting the criteria of alignment, flatness and levelness.

FC6.3. Pieces are placed with the latch and the rigging set, ensuring stability and aesthetic finish either bone, mortar and / or anchorages.

FC6.4. Window and door openings are joined by right constructive solutions, as well as those made on the other parts of work already built or going to be executed, such as partitions or slabs.

FC6.5 essential unforeseen anchorages practiced manufacturing on site, as a solution to specific problems of placement, using resins and corresponding metal elements.

FC6.6. Provisional elements of lift and support the stone pieces are removed without altering the layout of the built.

FC6.7. Elements drainage and ventilation of the chamber are arranged, if necessary, set in places, to guarantee the absence of humidity in the interior of the building.

FC6.8. Waste generated in the work setting are managed in accordance with procedures established by the company and current legislation.

PF7: Contents arches, lintels, cornices, columns and other masonry unique shots for voids, cloths and trim of the front defined in the project while ensuring the quality and safety set.

FC7.1. Trusses are made respecting the manner set out in the plan or sketch of work and with sufficient strength to support the weight of the item.

FC7.2. Formwork and construction girders of the arches and adequately support lintels, hollow inside, and the height indicated.

FC7.3. Stone arch segments are properly aligned along the axis of his song with the help of cintrel.

FC7.4. Voussoired lintel having an odd number of pieces of stone, is properly aligned according to the axis of the opening and seals spacing specified.

FC7.5. Imposts, mouldings and cornices are made respecting the geometry defined in the plane or the sketch of the work.

FC7.6. Sills, copings and steps are performed brickwork so reproducing the arrangement and inclination of the parts specified in the plan or sketch of the work and present a correct finish sores.

FC7.7. Waste generated in the work setting are managed in accordance with procedures established by the company and current legislation.

PF8: Contents arches, lintels, cornices, columns and other unique auctions in masonry and blockwork for the holes, and trim panels of the facade defined in the project while ensuring the quality and safety set.

FC8.1. Joint drills between pieces of natural stone and the work performed at the points provided by project.

FC8.2. Stiffening metal elements are placed in the holes, applying resins or corresponding threaded elements to ensure the stability of the posterior parts.

FC8.3. Parts are placed in a way that are completely vertical, flat and stable.

FC8.4. Necessary temporary reinforcement are made depending on the parts and the environment in which they are found.

FC8.5. Union joints are finished within the stated tolerances, to avoid discontinuities.

PF9: Topping the work by assistants work together treatments, adjustments and additional work in general, for a complete finish work, ensuring functional and aesthetic requirements.

FC9.1. Grouting products and mastic -pasta - are prepared and applied, as stated in the technical specifications.

FC9.2. Functional and decorative elements, such as vents, or ornaments tether anchorages are placed with enough security and with a shot to the boundary line thereof.

FC9.3. Cleaning required for the delivery of the work under the conditions, are carried out, as indicated.

FC9.4. Finish of the work is checked by visual inspection that matches specified in the project, communicating any relevant responsible anomaly.

FC9.5. Waste generated in the work setting are managed in accordance with procedures established by the company and environmental regulations.

Professional context

Means of production

Elements of drawing. Tools, tools and measuring instruments directly for stakeout. Pallets, levels, plumb bobs, squares and tape measures. Twine and look, trusses courses and material for templates. Masonry tools: chisels, pointers, axes, pots, maces, hammers various stonework, wedges, crowbars. Spatulas and elements of grouting: pointing trowel, tool for grout, jonquils and gauges calibrated. Formwork and girders. Cutting machines: grinding, cutting wheels, polishing. Cutting tables. Lift and transport media. Aid: scaffolding, pulleys, mounting wedges. Personal and collective protective equipment. Stone wool, gravel, masonry and rough ashlar. Ashlar. Blockwork.

Products and results

Construction surveying of work. Resistant elements and enclosures of masonry brickwork. Resistant elements and enclosures of masonry brickwork and blockwork. Grouting and completion of the work.

Used or created information

Drawings, sketches, technical requirements, summary reports measurements. Health and Safety Study. Quality of work plan. Technical instructions of the manufacturers of the chemicals. Exploded diagrams (arches, voussoired lintels and panels and finials singular). Verbal and written instructions of the team leader. Sketch of final state. Working parties, parties of incidents, parts ordering and receiving materials.

Competence Unit 6. Placing of cladding with mortar or adhesive

TOTAL 120 h
Theory: 40 h
Training: 80 h

Competence Unit will be level 3 according to European criteria, and level 2 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF 1: Checking and conditioning work spaces, materials and equipment required, within their sphere of competence, to achieve the required performance and quality tiling and cladding works, complying with health and safety measures in place.

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FC1.1. Machines, tools and supplies available checks that are appropriate to the activities to be undertaken during the implementation of tiled and clad, selecting those from the necessary criteria of quality, safety and health, and performance optimisation.

FC1.2. Personal protective equipment for the implementation of tiled and clad, are selected according to the indications of higher risk or responsibility and concrete pit, checking that have CE marking, to suit the needs of the business and that is are in good condition and within the period of life, asking if his replacement.

FC1.3. Health and safety measures for the implementation of tiled and clad, are collected and confirmed, requesting instructions-verbal and written-and confirming your understanding if necessary consult the manufacturer's documentation and equipment safety sheets products.

FC1.4. Aids and collective protection, installed by others, necessary for conducting paint decorative finishes, it checks that are available in the necessary locations to fulfil their role and are operating, detecting defects in installation and maintenance, and avoiding modify without authorisation.

FC1.5. Contingencies identified in the pit are resolved within its purview, and communicate with the person responsible as quickly as necessary to enable monitoring and resolution, especially those that compromise the health and safety of himself or others worked, particularly in the case of horizontal or vertical holes without collective protection installed.

FC1.6. Ladders are used check that the support points are stable, resistant and non-slip, setting the locking mechanisms to avoid opening or moving parts, and avoiding both heavy loads / bulky and difficult tasks that support and decrease the stability of the worker.

FC1.7. Scaffolds and work towers with reduced height are installed in compliance with established security conditions in width, stability, immobilisation of the base, separation wall which work is been working and need for perimeter, meeting in any case regulatory requirements for work equipment for temporary work at height.

FC1.8. Waste disposal is effected by depositing the waste in containers suitable for each type of waste.

FC1.9. Maintenance operations to be assigned day that apply to the various work equipment used, following the instructions received and the manufacturer's instructions.

PF 2: Perform preflight support to proceed with the implementation of tiled and clad with the required quality checking the status, physical characteristics and geometry of both the support and of the adjacent elements, equipment, and other woodwork.

FC2.1. Conditions reached in the previous treatments, stability, cleanliness, sanitised, cohesiveness, texture adjustment and media-checks or for confirmation of which are sufficient for the coating run, and in particular the uprights have the mechanical strength sufficient to withstand the weight of natural stone tiles.

FC2.2. Medium's capacity to withstand the weight of the parts of the coating is checked for confirmation or, especially in the case of veneers, without making excessive deformations.

FC2.3. Supports protection installations, carpentry or other stand-and environment-cloths, adjacent-elements and equipment, it is found that allows the development of the work without affecting them.

FC2.4. Absorption capacity / suction holder are evaluated by water jetting, observing the disappearance of the glow time and ending the need to treat wet-support, sealing surface.

FC2.5. Substrate temperature is proven to be adequate, and the humidity of the positioning surface in the case of thin-layer technique or media hygrometer is checked by ensuring that adhesives can be used.

FC2.6. Stand Geometric control is performed on all its breadth, considering the following aspects:

- Length and width of the rectangular cloths, detecting different sizes on opposite sides, not mutually parallel edges or possibly diverted from the horizontal or vertical.
- Perpendicularity of intersections among surfaces, detecting when it's necessary to square by screeds.
- Flatness and plumb vertical construction elements, detecting the need to fix by screed according to the bonding materials and techniques applied.

FC2.7. Geometric control accompanying the support elements is performed considering the following aspects:

- Implementation and location of pre-installations, detecting the absence of pre-implementation pre-installations coating or executed off-site or protruding surface.
- Uniformity and width of woodworking supplies and its plumb, level and perpendicular, sensing the need to relocate the supplies.
- The location, level and plumb if fixed equipment and furniture-Especially showers, tubs and tubs or saunas cabins-, sensing the need to reinstall.
- The alignment of the existing structural movement joints.

FC2.8. Structural movement joints treated by cleaning and filling them across its length and width with the specified compressible materials or placing prefabricated joints that have been specified.

FC2.9. Movement joints are located perimeter and intermediate, confirming his superior position or responsibility, or detected and installed the screed prior treatments, and if fixing materialise compressible material or backer boards are prefabricated been specified.

FC2.10. Environmental conditions and the temperature of the support, existing at the time of implementation of the coating during drying or later, they are found suitable, especially outdoors.

PF 3: Perform pre-flight mixtures applied-pastes, mortars, adhesives and grouting-material, parts replaced and the pit conditions to proceed with the implementation of tiled and clad with the required quality checking the state and the physical characteristics and geometry tiles and slabs.

FC3.1. The composition of the mixtures were checked or asked for confirmation that is provided, and where appropriate, consistent and appropriate coatings to execute.

FC3.2. The dosage of mixtures and in particular the water / binder is checked or asked for confirmation that is appropriate to the type of coating to be executed, the support on which it is applied and environmental conditions of humidity and temperature.

FC3.3. The mortar and grout, adhesives and grouts prepared, it is found that exhibit the characteristics required fresh, cohesive look, respond to defendant and delivered volume within the specified timeframe without exceeded the maximum time of use or life.

FC3.4. Correspondence of models defendants served with checks, reading codes on packages forth depending on the quality of the material-series, model, commercial quality, tone, and format appropriate manufacturing-calibre, making sure the stockpiles are correct in number, making every special parts control.

FC3.5. Quality, integrity and uniformity of the tiles and plates were checked, preparing dry panels with samples from batches collected, controlling:

- Appearance of the pieces-colour tones, textures, and other decorative motifs-detecting inhomogeneities and assessing the need to mix the pieces before placement.
- Directionality of textures and decorations, assessing the need for placement as a certain direction.
- Surface quality regarding marked commercial quality, by detecting that the actual quality of the parts is less than that indicated by its code.

- Dimensional characteristics of the pieces, detecting deviations-Perpendicularity, length, width, straightness and flatness-edge above tolerances, particularly for a certain type of gear, assessing the need for replacement, or in the case of natural stone treatment in workshop.

PF 4: Construction surveying of the placement of the parts to proceed to its placement, adjusting to the design expectations and conditions of the supports.

FC4.1. Construction surveying of fits plans and drawings or as instructed, adjusting the spaces provided and taking into account the areas occupied by equipment or fixed furniture, and other coatings treated by-Paints, laminates and others.

FC4.2. Consider the site and if necessary seek the approval of the proposals by the client, specifying:

- Address of placement of the pieces, and set direction rectangular pieces of long and short sides.
- Rig placement, considering not only the forms but also the decorative effects of the pieces-stripes, patterns, colours, textures, and other pieces of equal-in design.
- Combination of different-design pieces in chess, spikes or other.
- Treatment of encounters-frames, baseboards, friezes, borders, mouldings, and other treatment, and changes in plane-corners, edges, and others.
- Position of the cuts.

FC4.3. Stakeout criteria fit as possible to achieve the following purposes:

- Optimisation of the material, avoiding having to make cuts of narrow step tops, or in the bevel placement of small triangles.
- Performance optimisation in the placement, preferably opting to minimise distributions and gear cutting operations.
- Adaptation to the geometry of the support, avoiding gear defects evidencing squareness and plumb alignment thereof or in encounters with the components, equipment and fixed furniture.
- Hiding cuts, trying to locate where they have less visibility or will be covered later, or other kitchen furniture.
- Symmetrical configurations.

FC4.4. Necessary cuts are determined-in corners, edges of openings, contours of fixed furniture or equipment and for other reasons, seeking:

- Continuity corners decorative effects.
- Avoid narrow step tops in standard and special parts.
- The optimisation of the material.

FC4.5. Holes needed are determined, especially considering the position and size of outlets, toilets, pipes and other reasons.

FC4.6. Position of the holes required on the horizontal edges of the plates of natural stone veneers is determined, considering how to place the hooks on the side edges in encounters with floors and ceilings and the back plate corners.

FC4.7. Specific marking staking cuts and drills necessary parts to serve as template for the implementation thereof.

PF 5: Placing stone on walls, and generally non-trafficable construction elements with stone tiles and adhesive material using as cement or cement and lime mixed, to get the project under coatings, meeting quality measures and security established health.

FC5.1. Tile presenting high water absorption wetted to prevent absorbing water from mortar.

FC5.2. Anticipated final level of the facing is respected by adjusting the thickness of mixing and placement available through ruler to serve as references.

FC5.3. The pieces are placed arranging a mortar bed on the back of the piece with the material after pressing enough that it is completely covered.

FC5.4. Work is undertaken in a logical order placement unless otherwise specified:

- Before placing the flooring and / or the final level of the same.
- Addressing the contours first unless otherwise indicated, conforming to the lines on the vertical gaps frames, avoiding encircling procedures.
- Advancing in horizontal courses.
- Optimising performance.

FC5.5. Previously established Construction surveying of all respected in their assessments for placement of both parts of the base and special.

FC5.6. Separation of the joints between pieces provided is respected using prefabricated separators when so required, and if present joints orthogonal parts righteousness, parallelism, levelling and plumbing required.

FC5.7. Profiles and trims for corners-in case-matching, fixed and plumb while the cloth comes in that corner.

FC5.8. Structural movement joints, perimeter and if intermediate, sealed properly, ensuring the thickness uniformity and adherence of the sealant to the sides of the pieces.

FC5.9. Final cloths exhibit the properties of flatness and absence of eyebrows respecting tolerances and ensures the cleaning of the joints between the parts and the surface of the tiles before the hardening of mixtures of grip.

FC5.10. Health and safety measures for the implementation of tiling and cladding, are met in accordance with the criteria established for the prevention of occupational hazards and specific instructions for the work that is carrying out.

PF 6: tiling walls and, in general, non-walkable constructive elements, with stones tiles, and thin-layer using adhesives and a half, to obtain the coatings under project, fulfilling the quality measures, and established health and safety.

FC6.1. Adhesive is placed uniformly on the substrate with the thickness schedule, and avoiding using notched trowels apply spot or gobs.

FC6.2. Pieces are placed pressing and rubbing until crushing gluing grooves, using the double-spread technique unless otherwise indicated in the following circumstances:

- Large format pieces.
- Demanding-facades, swimming pools, waterproofing, high chemical resistance and others.

FC6.3. Work is undertaken in a logical order placement unless otherwise specified:

- Before placing the flooring and / or the final level of the same.
- Addressing the contours first unless otherwise indicated, conforming to the lines on the vertical gaps frames, avoiding encircling proceed.
- Advancing in horizontal courses.
- Optimising performance.

FC6.4. Previously established Construction surveying of all respected in their assessments for placement of both parts of the base and special.

FC6.5. Respect the separation joints between pieces planned, using prefabricated separators when so required, and in particular:

- Orthogonal joints present rectitude parts, parallelism, levelling and plumbing required.

FC6.6. Profiles and trims for corners-in case-matching, fixed and plumb while the cloth comes in that corner.

FC6.7. Structural movement joints, perimeter and if intermediate, sealed properly, ensuring the thickness uniformity and adherence of the sealant to the sidewalls.

FC6.8. Final cloths having the properties of flatness and absence of eyebrows respecting tolerances, ensures the cleaning of the joints between the parts and the surface of the tiles before the hardening of the adhesive.

FC6.9. Health and safety measures for the implementation of tiled and clad, are met in accordance with the criteria established for the prevention of occupational hazards and specific instructions for the work that is carrying out.

PF 7: Making tiled areas with all types of tile adhesive attached directly or thin-average special coatings on substrates or isolates prefabricated average compressibility interior supports on previously waterproofed waterproofing sheets and liquid-compliance measures quality and established safety and health.

FC7.1. The applications work on prefabricated supports, insulation or waterproofing treatments using sheets or liquid waterproofing, are undertaken having confirmed the compatibility of the surfaces are tiled bracket adhesive material, assessing the need for treatment adherence placing a first contact layer incorporating fiber mesh.

FC7.2. Work on applications are undertaken on isolates having confirmed the complete coverage of the support by the insulating material, including elements associated or interposed as pipes or pillars, and proper sealing of joints, resulting in a continuous insulation surface without thermal bridges or acoustic.

FC7.3. Treatments work on waterproofing applications using sheets or liquid waterproofing-in particular-baths and showers, are undertaken having checked the performance of waterproofing for skilled workers, or undertaking that waterproofing.

FC7.4. Carrying out sheet waterproofing by using adhesives compatible with both the support material as the sheets, following the instructions of the manufacturer of waterproofing sheets and safety data sheets and adhesives, coating the entire support and seal the joint blade.

FC7.5. Liquid waterproofing run on substrates without cracks or fissures, using materials compatible with both the substrate and the adhesive tiling, respecting the technical and security of the waterproofing, and coating the entire performance and support with the recommended dilutions.

FC7.6. Changes flat deliveries pre-installations placing bands are treated and elastic sleeves, in the case of liquid waterproofing banding and sleeves is performed after the first layer being covered and protected by the side of the second layer waterproofing.

FC7.7. Tiling is executed and delivered as normal on the tiles walkable elements, the panels exhibit the properties of final flatness and absence of eyebrows respecting the stated tolerances, and ensures the cleanliness of the joints between parts and the surface of the tiles before curing the adhesive.

FC7.8. Insulating materials are arranged and fixed to the wall bracket, when necessary and are place by specialised operators, similar to that followed in the implementation of special floating screeds.

FC7.9. Health and safety measures for the implementation of tiled and clad areas, are met in accordance with the criteria established for the prevention of occupational hazards and specific instructions for the work that is carrying out.

PF 8: Investing walls and generally constructive elements with non-walkable pieces of natural stone, using traditional plating techniques using mixed-grip holding more anchor-liners for planned, meeting quality measures and health and safety established.

FC8.1. Anchoring system is specified or selected project:

- Prefabricated stainless steel anchors.
- Non-corrosive wires shaped to form staple.
- Thickness of the plates sufficient to support attachment holes.
- Clamping profiles overhangs edging non-corrosive material.

FC8.2. Plates presenting high water absorption wetted to prevent mortar absorbing water, sprinkle cement (it depends of the case).

FC8.3. Final level of the facing is provided by adjusting the thickness respects mixture disposed in the substructure of the plates.

FC8.4. Anchorages on construction surveying of the block, respecting the previously established stake in all its provisions, and drilling the bracket with the shape and depth to allow the accommodation of the belt anchorages and received mixtures of grip.

FC8.5. Work is undertaken in a logical order placement.

- Before placing the flooring and / or the final level of the same.
- Setting a first guide batten and supporting the first course on it.
- Advancing horizontal rows supported on the lower course where resistant, ensuring the time required for tightening the clamping or adhesive mixture.

FC8.6. Forming operations covering parts-cutting, drilling, grooving, chamfering, textured-checked and order for workshop is preferably carried out under controlled conditions, reserving the site work to final adjustment specific details.

FC8.7. Joints between orthogonal films have been obtained, present rightness, parallelism, levelling and plumbing required.

FC8.8. Structural movement of joints if any, properly sealed, ensuring uniformity of thickness of the sealant and its adhesion to the sides of the tiles.

FC8.9. Final checks cloths having the properties of flatness and absence of eyebrows respecting the established tolerances.

FC8.10. Health and safety measures for the implementation of tiled and clad, are met in accordance with the criteria established for the prevention of occupational hazards and specific instructions for the work that is carrying out.

Professional context

Means of production

Measuring tapes, tape measures, plumb bobs, hand levels, water and lasers, rulers / view and view brackets, shims, brackets, wire for tightening and boot dial. Trowels, notched trowels or combs, trowels, flat brush, pointing trowel. Drawers, baskets, buckets, kneading-trough, troughs. Rubber mallets, pliers. Cups. Crosses and wedges for tile separation. Standoffs natural stone. Different types of stone tiles and other materials. Tiles and slabs of natural stone, whether or not agglomerated with resins. Mortars. Cementitious adhesives, dispersed resin and reactive resin. Grouts and borated to clad. Waterproofing liquid preparations are sleeves for plumbing and plane change bands. Fibreglass mesh. Prefabricated movement joints, corners and fixed equipment deliveries. Products for movement joint filler. Putty silicone, polyurethane and polyurethane / tar. Tape. Personal protective equipment, collective protection means, auxiliary, temporary facilities.

Products and results

Tiles placed with cement mortar / lime. Tiles adhesive placed even flashed and natural stone. Tiling on supports prefabricated insulation and waterproofing treatments average compressibility. Clad placed by

traditional methods mixed (more anchor adhesion). Media Waterproofing indoors. Compliance measures occupational safety and quality specifications.

Used or created information

Plans and drawings of work related linings. Safety data sheets and product. Working parties, parties of incidents, parts ordering and receiving materials. Manuals and commercial catalogues of materials and products. Operation manuals and maintenance of machines and equipment. Tile Installation Manuals modular rigid. Verbal and written instructions from the team leader or charge higher. Safety and health plan at work. Risk assessments in the workplace. Signalling work.

Competence Unit 7. Assembling of ventilated facades

TOTAL 200 h
Theory: 50 h
Training: 150 h

Competence Unit will be level 3 according to European criteria, and level 2 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF1: Determine the scope of the work to proceed with its implementation on schedule and with the required quality, interpreting blueprints, drawings cutting / modulation and assembly, work plans and other technical documentation generated on site, or seek information superior or responsible, identifying the elements of the façade system ventilated-bracket-anchorage-coating-and specifications laid, and checking the characteristics of the support.

FC1.1. Project documents and / or drawings of plant / modulation and mounting available, are ordered and reviewed, detecting omissions and errors in the information necessary for their work is fully defined, and / or deriving it from the top or responsible:

- Geometry of the facade.
- Singular points, auctions and meetings: start, hollow crown, facilities.
- Coating materials.
- Type and anchorage subsystem elements: point-anchoring systems or non-adjustable point and grid-fixing systems to the structure or the inner enclosure, brackets, vertical elements and horizontal if the substructure, joints / couplings, special parts.
- Registrability or coating.
- Insulation Materials: type, attachment to the support.
- Conditions suitable for the preparation of the mixture and curing of adhesives.
- Specifications of placing substructure and anchorages-point adjustable and non-adjustable, joining pieces, implementing singular elements, insulation placement.

FC1.2. Characteristics and properties of the support are identified based on the drawings and / or specifications and other technical documentation applicable, or possibly doing a spot examination, specifying:

- Support Elements: Forged edges, bearing walls, metal or others.
- Nature of the materials, plants, concrete, metal or other.
- Stability.
- Geometry-forged alignment, levelling, surface evenness and regularity.
- Compatibility anchorage subsystem with the support.

FC1.3. Geometric characteristics of the facade, support, insulation, voids, facilities, anchoring subsystem elements, pieces of siding and decorative motifs are identified from the project drawings, exploded views and assembly and other applicable technical documentation.

FC1.4. Qualities of the anchorage subsystem elements, and parts coating-material aspect and others-are determined from the plans, contract technical requirements of the project and other applicable technical documentation.

FC1.5. Organisation of material and human resources are determined from the implementation orders, trying to optimise the quality and performance in regard to:

- The organisation of work-faces to be coated, order placement and other parts.
- Staff placement.
- Relationship with other trades.
- Aids available: cranes, scaffolding and others.
- The collection, storage and distribution subsystem elements and spare anchorage and insulation coating.
- Distribution and sequencing of tasks in time.
- Establishment of control points: checking contents, check the benchmarks, checking the work performed, check the schedule adjustment.

FC1.6. Yields, terms and interactions with other trades are specified for each unit of work, to inform from person responsible.

PF2: Operate correctly with necessary working equipment-machinery, tools, supplies, personal protective equipment and collective-aids to achieve the required performance and quality, observing established safety measures while undertaking day weekend.

FC2.1. Machines, tools, supplies, personal protective equipment and aids selected are appropriate for the activity to develop.

FC2.2. Security measures are indicated in the manufacturer's documentation for the machines, tools, supplies, personal protective equipment and aids, as well as orders received through verbal and / or written.

FC2.3. Maintenance operations and to use time properly apply different working equipment and machines used.

FC2.4. Evacuation of waste-plastic step tops, house waste-is made by depositing the waste in appropriate containers for each type of waste.

PF3: Condition the gashes on ventilated facades assembly to improve performance and prevent risks, points to areas of collection and Optimising routes.

FC3.1. Workspace is shown to be clean and free of obstacles.

FC3.2. Collective protection measures is shown to be arranged with the advance of the implementation of work, allow development and meet the specifications of the security plan.

FC3.3. The cuts is shown to be adequately lit and arranged in the vicinity of material storage areas appropriate, safe and easy supply.

FC3.4. Signage on the block is found that narrows the areas of potential risk, the time remaining operational and being sufficiently visible, even at night.

FC3.5. Poor environmental conditions for the implementation of safe-mount exposure to wind, rain, lightning and other-are detected, suggesting stop work in risk areas and alerting the upper or responsible.

FC3.6. Contingencies detected or transmitted on the chopping block are resolved, or communicate to superiors or responsible as quickly as necessary to enable monitoring and resolution, especially jeopardising the safety of workers, and the stability and safety of the scaffolding or formwork: -ties

defective, loose or improperly assembled parts, lack of parts, heavy machinery manoeuvres near the scaffold or shoring, jobs near power lines, work at higher levels and others.

PF4: Construction surveying of references for subsequent positioning subsystem elements anchorage-fasteners, anchorages point and / or substructure of the coating, and the singular elements of the facade, window openings, mouldings, sills, eaves and other-, based on previous references set by the competent technician and in line with the graphic documentation and indications of physicians.

FC4.1. The starting point or origin of measures for placing anchorage subsystem identifies the facade to rethink successive elements, from the drawings and / or verbal instructions given in works by technician.

FC4.2. The main lines of reference-level-lead and are positioned with the final depth from the starting point, considering the deviations between the front plane and the plane of the support and the tolerances so that serve to redefine the various elements mounting system.

FC4.3. Construction lines for measuring drag and position of the various subsystem elements of the facade anchorage are positioned perpendicular to the plane defined by facade main lines, performing the necessary physical marks on the support, and compensating for errors resulting from drag measurement.

FC4.4. The parking spot laser markers, and other references to anchorage stake subsystem is positioned and fixed relative to its origin and axes, and are checked periodically, ensuring that no position has been altered to prevent errors drag.

FC4.5. Proper alignment of the location points is checked after construction surveying, according to the established design, with special attention in the case of subsystems unions anchorage / clip viewed.

FC4.6. Respects construction surveying of support structural joints and coating themselves, saying the board or by providing a solution that allows movement.

FC4.7. Complementary elements for the constructive solution of singular points-together, bibs, finials, sockets and others are staked in accordance with the plans, the work done and superior specifications or responsible.

PF5: Fixing and installing sub-substructure and anchorages adjustable and non-adjustable point-to-factory support, concrete or the like to proceed with the placement of the pieces of the coating, ensuring stability and strength, respecting previous stakeout and fulfilling the security and quality requirements.

FC5.1. Elements of anchoring subsystem checks that meet the provisions of the project and that any amendment is always approved by the competent technical and system manufacturer.

FC5.2. Adequacy of the support-brick, concrete, metal or other-for the type of anchorage to use subsystem is verified by checking its flatness, resistance and current status.

FC5.3. Fasteners anchorage subsystem support directly receive either the structure or the walls, taking into account avoiding references redesigned and measure the depth directly to the support, following the techniques of system instructions.

FC5.4. Fixing the factory anchorage point anchorages is properly built, meeting the mechanical condition and position, checking explicitly.

FC5.5. Anchorages are checked regularly seen are resting, depending on the design set.

FC5.6. Strength and quality of fixations made to support heavy coatings for ensuring that it is within the minimum / maximum limits required by torque wrenches or the like in the previously defined control points.

FC5.7. Cutting the anchoring elements, the sub-profiles, is performed, when necessary, ensuring maximum utilisation of the material.

FC5.8. Installation of the substructure on the brackets already placed, perform, plumbing and levelling the elements according to the nature and order of the system, following the instructions techniques of the system, and in particular respecting the measures to absorb expansion of the grid.

FC5.9. Assembly of the substructure is found to have been carried out correctly and that the knots are resistant prior to placement of the coating.

PF6: Place and secure the insulation panels to complete the thermal resistance of the enclosure, ensuring the absence of thermal bridges and camera functionality and meeting the security and quality requirements.

FC6.1. Insulation panels put these prove the type provided in material, thickness, bonding system at the edges and other specifications.

FC6.2. Stand conditions and environmental conditions, it is checked or asked for confirmation to competent technicians that are appropriate for placement of insulation for moisture, stability and others.

FC6.3. Insulation panels are fixed to the mill stand, concrete or the like, according to design specifications, to ensure stability and minimise the existence of thermal bridges, preventing the deterioration of the panels and filling the perforations undergone.

FC6.4. The panels are placed so that they are linked together, with continuity and without warping, and in the case of dovetail joints or grand, properly attached, and where appropriate, sealed by system.

FC6.5. Insulation boards are protected from moisture before, during and after installation, to prevent spoilage by storing them in appropriate locations before placement and by covering with waterproof materials subsequent to their placement.

FC6.6. Cuts are protected against moisture during the interruptions by covering with impermeable materials.

FC6.7. Waste generated during placement of insulation, are managed in accordance with procedures established by the company and environmental regulations.

PR7: Linking / attaching parts coating to sub-substructure anchorage and anchoring point-adjustable and non-adjustable, to complete the facade, adjusting its position until the intended design in the project and meeting the safety and quality measures established .

FC7.1. Useful section of the air-chamber between the insulation and the extrados of the lining-it is found that is specified by verifying that the projected insulation is cured and is the final level.

FC7.2. Coating parts are visually inspected, ensuring that there are no defects in the material that discourage its use in construction, and that the product range is placed according to the project specifications.

FC7.3. The correspondence of the models served with the defendants is found in products labelled, reading consigned packaging codes depending on the quality of the material-series, model, commercial quality, tone, format and if manufacturing gauge-, verifying that the stockpiles are correct in number, and with extreme control trims.

FC7.4. Coating the pieces is checked containing sufficient holes or slots for positioning directly or indirectly through a coupling piece connecting elements / hook, in accordance with the anchoring system, and gaps that allow movements absorb expansions or without subjecting the parts to any unforeseen effort.

FC7.5. Trim pieces are placed following a sequential order, as the plane of the facade and the anchoring system, left to right or from bottom to top or others buying that flatness defects.

FC7.6. Proportions of components and the setting times for chemical bonding of the anchorages are observed, following the manufacturer's instructions, thus avoiding loading the components until.

FC7.7 Anchorages are resistant. Coating the pieces are placed so that are supported independently of the other supports, each piece no other or others, is supported by and spaced around the perimeter of adjacent components and / or various other structural elements of the anchorage, using if withdrawing prefabricated separators once placed the piece.

FC7.8. Pieces are arranged with the necessary clearances for regarding the own expansion joints / hooks, having plastic caps or fillers into latches needed to prevent ingress of water and to avoid contact between the coating material and the anchorage.

FC7.9. The joints of the pieces of the coating to anchorage subsystem checks that have been carried out correctly and are resistant.

FC7.10. Dimensional deviations of the parts-orthogonality, length, width, flatness and edge state-machined or to invalidate the positioning of the workpiece are detected, evaluating the need for replacement, or in the case of natural or artificial stone treatment in workshop.

PF8: Make singular elements to resolve the discontinuities of the façade -Holes, baseboards, edges and others, ensuring the functionality of the façade Camera-ventilation, absence of thermal bridges, waterproofing, and fulfilling the security and quality requirements.

FC8.1. Singular elements to place in meetings, auctions and / or expect from windows, doors, arches and columns are identified in the plane and checked on site, noting its position on the front and required application, as applicable corner, baseboard, trim , framing, finishing checking-singing prescribed pilaster, miter, straight edge, round, pigeon breast for each.

FC8.2. Various elements are received singular place on serving anchorage subsystem included in project specifications.

FC8.3. Parts are placed so that they are fully stable in the plane-vertical, horizontal, or slant-, as established in the project.

FC8.4. The joints between materials of different physical-mechanical-natural stone, ceramics, metal, glass, wood, plastic and others are resolved by using the solution prescribed in the project, materials, methods and systems, together, discontinuities, fillings, break of bridges.

FC8.5. Elements that ensure tightness against ingress of water, and, if specified to prevent the spread of fire, are identified, checked for installation on site.

FC8.6. Complementary elements for the constructive solution of singular points-together, bibs, finials, sockets and others are placed where appropriate and in accordance with the specifications of the superior responsible.

PF9: Form coating parts-cutting, drilling, grooving, chamfering and others, for integration into the facade, getting the dimensions and finishes required and complying with safety and quality measures established.

FC9.1. Machining that in exceptional cases be required to work, are conducted under the authorisation and supervision by the competent technician.

FC9.2. Coating parts are identified form on the plane and in work, checking its quality, consistency, size and texture, to ensure project solution.

FC9.3. Taking action and making templates or models is made contrasting planes and real space work to ensure correctness in the works in terms of measures.

FC9.4. Sites or holes to accommodate the connections / couplings in the coating are determined, taking the dimensions of the anchoring elements such as diameter, length, thickness of an inter alia for incorporation in machining and eventually achieve the correct behaviour between and anchoring the liner part.

FC9.5. Forming operations covering parts-cutting, drilling, grooving, chamfering, textured-are performed using machines and tools tailored to the peculiarities of the material-stone, ceramic,

composites, wood derivatives, cement and others, and compliance with established security measures.

FC9.6. Pre-installation elements necessary to apply coating parts are positioned correctly in their flatness,-vertical, horizontal and tilt-, noting the pressure applied mechanically or by the use of chemicals in their quotas.

FC9.7. Waste generated during placement of insulation, are managed in accordance with procedures established by the company and environmental regulations.

PF10: Perform additional work-cleaning, sealants, gaskets and other treatment-for a complete finishing of the work, ensuring functional and aesthetic requirements.

FC10.1. Parts or areas to be treated are identified on the plane and in the work, relating to the various treatments prescribed for each.

FC10.2. Cleaning products are prepared using as contained in the technical requirements and apply at the right intensity or predetermined.

FC10.3. Sealing cords are found to have the necessary throat depth and to ensure functionality and durability.

FC10.4. Application of the products is carried out using established security measures, both individual and collective character.

FC10.5. Functional and decorative elements (such as vents, tether anchorages or ornaments) are positioned and with adequate security and with a shot according to the environment thereof.

FC10.6. Top section of the facade crowning the top and bottom joints checked enabling natural circulation of the air flow inside the camera.

FC10.7. Final check of the work is done in an orderly and systematic way, verifying that there are no points or areas without established trim level.

FC10.8. Waste generated during placement of insulation, are managed in accordance with procedures established by the company and environmental regulations.

PF11: Run disassembly and / or reassembly, to carry out necessary repairs or modifications, ensuring the integrity of parts and preventing the collapse of which are damaged, fulfilling the security and quality requirements.

FC11.1. Parts to be replaced previously identified and work plans, as well as the anchoring system with which they have been placed, checking the degree of conservation, possible cracks and flaws that could affect removal.

FC11.2. Possible damage not covered "a priori", reported to relevant responsible for making appropriate decisions.

FC11.3. Parts to be replaced are handled and removed according to their weight, eccentricity, state or fragility, using the means of support, lifting and transportation provided, so as not to affect your state and in any case not to produce new lesions-chipped, mismatches, in the same or adjoining elements.

FC11.4. Parts are stacked safely for both transportation and for storage, and where applicable, are corresponding landfilled.

FC11.5. New parts are placed keeping the flatness and the plumbing necessary, considering the space between joints and their mechanical safety.

FC11.6. Measures necessary for the individual pieces are collected unanticipated, considering all the features required to manufacture anchorage-area, meeting space, and other surface appearance.

Professional context

Means of production

Tools, tools and measuring instruments directly for stakeout. Levels, plumb bobs, squares, tapes, cords and view. Laser Equipment stakeout. Items marked. Tools, Masonry: blades, picks, trowels, flat brush and others. Tools and masonry tools: chisels, pointers, picks, crowbars, pots, hammers, rubber hammers, hammers diverse, wedges, toothed stone chisel, bush-hammer. Forming equipment: grinders, cutting discs, grinding, drilling, grooving. Cordless drills. -Metal, bits. Flat and pipe wrenches. Torque wrenches. Specific elements anchoring subsystem: fasteners, brackets, metal profiles, screws, self drilling screws, anchorages point adjustable or not joins / hooks, plastic caps. Mortars and anchoring adhesives. Sealants seal guns and chemical anchorage. Spatulas, pointing trowel, shims, spacers and shims. Cups. Pieces of natural stone cladding, ceramic, wood derivatives, metal and other materials. Insulation panels. Auction items: corner, grids, bibs and more. Means of support, lifting and transport. Pallet truck manuals. Aids. Temporary facilities. Personal protective equipment and collective.

Products and results

Developments ventilated resetting the facade. Insulation panels placed. Anchorage System-coating placed on site. Items placed shot. Grouting and completion of the work.

Used or created information

Project Technical Documentation: Drawings, specifications, and measurements related parties ventilated facades. Technical Documentation facade system. Book Building. Technical documentation generated during the work: drawings and assembly drawings, exploded views / modulation, prescriptions and other technical documentation, summary reports measurements. Sketch and / or final status report. Health and Safety Plan and Quality Plan work: ventilated facades related parties. Technical Instructions subsystem manufacturer anchorages. Verbal and written instructions for the project management, team leader and foremen. Working parties, parties of incidents, parts ordering and receiving materials.

Competence Unit 8. Placing of stone singular elements

TOTAL 120 h
Theory: 40 h
Training: 80 h

Competence Unit will be level 3 according to European criteria, and level 2 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF 1: Determine the scope and organisation of the work to proceed with its implementation on schedule and with the required quality from the interpretation of drawings and other technical documentation, and / or seek information from the person in charge or supervisor.

FC1.1. Project documents: exploded views and / or assembly and other technical documentation available is sorted and analysed, identifying omissions and errors in the information necessary for the complete definition:

- Characteristics of pieces to be placed: geometry, volume, weight, appearance.

- Characteristics of support: materials (brick, concrete or other), geometry (levelling, surface, flatness and regularity), stability and state of preservation.
- Singular points, finishing and intersections.
- Anchorage system: characteristics and method of attachment.
- Suitable conditions for preparation of mixture and hardening of adhesive.
- Specifications for placing.

FC1.2. Define the set of elements to be placed, it is obtained from various parts or elements, and indicating which one are mass-produced or singular to achieve a previous and overall composition.

FC1.3. Non in agreement representations and measures or lack of definition are identified and communicated to the person in charge for clarification and justification.

FC1.4. Parts or areas, that in appropriate cases require a detailed interpretation, are studied by means of drawings which will propose solutions for technician/s.

FC1.5. Documentation for anchorages and joints, it is checked in relation to information on geometric position, depth, material and implementation order.

FC1.6. Surface finishes and capping operations that require perform "in situ" are defined fully, indicating the field of performance, system, intensity and any other parameters necessary for its definitive fulfilment in work.

FC1.7. Organisation of material and human resources are determined from the implementation orders, trying to optimise quality and performance in regard to:

- Organisation of the work.
- Staff for placement of stone.
- Relationship with other professions.
- Auxiliary equipment used: cranes, scaffolding and others.
- Stockpile, arrangement and storage of the pieces to be placed.
- Distribution and sequencing of tasks over time.
- Establishment of control points: checking products, benchmarks, made work and deadline.

PF 2: Prepare necessary working equipment, machines, tools, equipment, individual and collective protection equipment and auxiliary equipment to achieve required efficiency and quality, and carrying out established standards of safety measures.

FC2.1. Selected machines, tools, equipment, individual protection equipment and auxiliary equipment are appropriated for the activity to do, and to ensure completion of work effectively and safely.

FC2.2. Security measures are indicated in the manufacturer's documentation for machines, tools, equipment, individual protection equipment and auxiliary equipment as well as received through spoken and / or written order given, to ensure the completion of work safely.

FC2.3. Collective protection measures are provided in sufficient time to carrying out work, and comply with specifications of the security plan, to ensure the completion of work safely.

FC2.4. Work places are kept clean and free of obstacles, to ensure the completion of work effectively and safely.

FC2.5. Waste are dumped or accumulated in places or containers for this purpose, in accordance with the criteria of safety and established environmental protection.

PF 3: Make stockpile and move of parts and sets of natural stone, to achieve required performance and quality, carrying out established standards of safety measures.

FC3.1. Load capacity and hoisting of machines used are checked if they are enough resistance to transport work-pieces (entire, parts or assembly).

FC3.2. Slings, clamps and all necessary equipment on anchorages for handling of natural stone pieces are checked if they are enough resistance to transport work-pieces (entire, parts or assembly).

FC3.3. Load capacity calculation of area where storage is performed, it is checked if it can support weight of the pieces to stock-pile.

FC3.4. Stockpile is made respecting original packaging as far as possible, and it must be located as close as possible to area of use and obey occupational risk prevention standards, in order to carry out tasks effectively and safely.

FC3.5. Move work-pieces without original packaging it is done by taking all necessary precautions to ensure stability and immobility of load in means of transport.

FC3.6. In the case of placing pieces without original packaging, protection elements for the pieces are arranged at support points to avoid breaking of edges and corners.

FC3.7. Polished materials without original packaging must be placed among polished faces or serrated faces, so these must never be placed among different kinds of surfaces.

PF 4: Surveying various elements or areas for further placement, based on previous references set by a qualified technician and following project specifications.

FC4.1. Reference lines for deep, level and alignment must fit in the reference origin of construction surveying.

FC4.2. Placement points of different elements are pinpointed and must be check if these points are a problem with the rest of work site.

FC4.3. Verification of reference lines are made to ensure that location is the same, to avoid measurement errors.

FC4.4. Measures are checked when pieces are placed and also before definitive attachment, among all pieces and compared to the reference lines.

FC4.5. Break lines or slope change are surveyed and drawing in the work site –level, plumb line, alignment, location, etc.–.

FC4.6. External references to elements or natural stone compositions are pinpointed properly and are stable to avoid alteration.

FC4.7. When pieces are being placed, location of surveying marks is checking and in agreement with final composition and functionality.

FC4.8. Possible deviations between site work and detailed project are corrected or shared out to be appreciated as little as possible at the time for placing the pieces.

FP 5: Perform cuts at the specified size, machining and shaping, to obtain singular elements that must achieve the necessary requirements for placing on site, and using machines, tools and suitable equipment and, on the other hand following the technical specifications and / or construction surveying and complying with safety standards and standards for environmental protection.

FC5.1. Singular elements to be machined (such as countertops, turning parts, carvings, engravings, mosaics, etc.) and tasks to be identified (such as cuts, drill holes, grooving, milling, polishing, honing, sanding, texturing, antique, casting), these are established according to the technical specifications and / or construction surveying.

FC5.2. Machines and / or tools to be used (such as cutting machines, cutting wire, hydro-cutting, pantographs, lathes, table shears, laser, sandblasting, bevelling, edge polishing, drill, etc.) are established based on work for cutting or shaping (carving, drilling, sandblasting, engraving, turning, etc.).

FC5.3. Specific tools for machining (such as bits, cutters, discs, wire, shot, hand-tools) are selected according to task to do, are checked status tools periodically and are replaced if necessary.

FC5.4. Certain pieces will be cut at a specified size to fit and to change the direction for solid pieces (such as balustrades, stairs, etc.), and according to specified characteristics in the project (colour, shape, size, texture and materials).

FC5.5. Tasks to be carried out are plotting or survey on the stone, and using natural scales templates in order to fit at work site.

FC5.6. Layouts using templates, laser, measurement and testing tools, are adjust in the implementation planes or sketches, so these draws will be in accordance with reality of work site.

FC5.7. Elements to be installed (such as sinks, toilets, faucets, letters, lighting elements, ornaments, etc.) are checked in accordance with specified adjustment measures.

FC5.8. Arrangement of decorative elements (for instance, curvature, angles, sizes, shapes) is fitted as specified by technical and graphic documentation.

FC5.9. Environmental protection measures are looked after, in particularly on the areas of dust emission and noise production, water discharges and cooling.

FP 6: Placing pieces by means of adherents and / or metal anchorages to achieve the requested global solution, based on the technical information provided or orders of person in charge, and resolving intersections with other construction elements.

FC6.1. Anchorages, adhesives and other materials, which used to make connections between all parts, are specified in the construction's technical documentation.

FC6.2. Placement areas on other stone pieces (for example, drill holes, grooves or slots or similar...) are checked that size and position fit in according to plan and depending on the joint system.

FC6.3. Support is checked that comply with specifications for resistance, flatness and state of preservation, communicating any deficiencies that may exist.

FC6.4. Pieces are covered before placing during the entire construction, because of impacts or adverse weather conditions.

FC6.5. Adherents are prepared and applied in accordance with setting time, as indicated in the manufacturer technical documentation for each product, to ensure correct and safe placement of singular elements of natural stone.

FC6.6. If it is necessary to place anchorages according to technical documentation, so these anchorages will be attached to support and other stone pieces, paying attention to technical instructions of its anchorage system and to guarantee a correct and safe placement of singular elements of natural stone.

FC6.7. Joints for union are cleaned and, where relevant, are concealed by colours and textures similar to stone pieces, and in case it if necessary to waterproof them, it should check continuity of this waterproof coating.

FC6.8. Intersection areas among other materials and/or implement of construction unit will be carried out according to person in charge or technical documentation, and special care should be taken on joint for union and finishing of these intersection areas.

FC6.9. Mechanical stability of elements or groups of elements are checked upon joint tasks are brought to completion.

FP 7: Prepare and implement finishing tasks of singular elements to complete the construction, ensuring functional and aesthetic requirements, according to the instructions and the current rules of occupational safety and environmental protection in force.

FC7.1. Finishing tasks for each singular element (such as adjustment of pieces, calibration, assembly, grouting, sealing works, stained, varnished, polished, texturing tops, cleaning, chemical treatment on surface application for stone products, etc.) are carried out according to technical specifications of project or received instructions.

FC7.2. Materials are used for finishing (for example, silicones, resins, mortars for grout, colouring, glues, decorative items, cleaning products, etc.), as well as application and dosage, are specified in technical specifications to make construction with the required quality.

FC7.3. Security measures implemented in singular elements (for instance, fastening of elements, voids, anti-slip, etc.) are carried out according to construction documents.

FC7.4. Finishing quality is defined by detailed inspection, using quality control tools (such as tracer, glossmeter / lux meter, colorimeter, calliper, gauge, etc.).

FC7.5. Used packaging and other waste products are deposited in appropriate containers to recycle or to transport controlled dumping site or recycled.

FC7.6. Singular elements are delivered without debris or residue from bonding materials, as well as marks or indications for placement, labels, etc.

Professional context

Means of production

Elements for drawing.

Equipment, tools and measuring instruments for surveys: levels, plumb bobs, set-squares, measuring tapes, cords and sights.

Cutting machines, drills, manual lathes, sectioning machines.

Polishing, chamfering, edge polishing, sandblasters, bench grinders.

Tools for stonework and carving (pneumatic and manual).

Cutting plotters, vinyl, abrasive.

Resins, colouring, chemical products.

Tray for immersion of chemical dissolutions.

Lifting, handling and transport equipment.

Suckers, lifting clamps.

Compressors. Vacuum Equipment.

Auxiliary equipment: scaffolding, tackles, assembly wedges.

Temporary facilities. Personal protective equipment and collective.

Products and results

Singular elements (countertops for bathroom, kitchen or furniture, bathroom tops, tables, fireplaces, balusters, solid stone stairs, columns, sculptures, fountains, gargoyles, shields, figures, logos, prints, murals, mosaics, puzzles cutting, street furniture: benches, bollards, planters; funerary art: gravestones, chapels and mausoleums) are placed in worksite with the required finishing level.

Used or created information

Plans, drawings and other technical documentation. Templates. Work instructions oral or written. Technical instruction manuals for equipment and machinery. Product catalogs. Standards of occupational risk prevention. Quality standards of products. Delivery notes. Job order and incident form.

Competence Unit 9. Monitoring and good practice for environmental protection standards

TOTAL 60 h
Theory: 40 h

Competence Unit will be level 3 according to European criteria, and level 2 according to curricula from Spain.

Professional fulfilment (PF) and fulfilment criteria (FC)

PF 1: Understand how a sustainable building is orientated and designed.

FC1.1. Given detailed plans and /or model:

- Analyse if a project can be labelled as “environmentally sustainable”.
- Propose some improvements to an imperfect or flawed design.

FC1.2. Building materials are identified. Their advantages and drawbacks can be explained to a non-trained professional or client.

FC1.3. Insulating products are identified. Their advantages and drawbacks can be explained to a non-trained professional or client.

PF 2: Calculate the thermal performance of a small building / house.

FC2.1. The vocabulary and coefficients used in thermal performance calculation are known and used accordingly.

FC2.2. The flaws of an existing building or project are identified, the improvements suggested are relevant.

FC2.3. The diagnosis software is used efficiently, additional improvements are added or removed to attain the desired result.

PF 3: Implement an insulation system on a stone wall.

FC3.1. A relevant system is chosen for the type of support and the nature of the stone available.

FC3.2. The system is placed accordingly to technical documentations or good practices.

FC3.3. Safety gear or collective measures are used accordingly.

3. TEACHING MODULES OF THE PROFESSIONALISM CERTIFICATE

TEACHING MODULE 1. Designation: BASIC RISK PREVENTION IN THE WORKSITE FOR STONE PLACING

Methodological guidance

TEACHING MODULE 1	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
	40	20	60

Criteria of access for students

Level 3 according to European criteria.

Duration. Theory and Training

Total: 60 h

Theory: 40 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to all PF of competence unit 1.

Assessment ability and criteria

A1: Identifying the activities of safety and health at work the basic legal framework that regulates the construction sector, assessing the importance within them have technical measures and risk prevention and protection, and as the need for preventive management.

AC1.1. Explaining the meaning of the concept of health in areas of work, identifying the components it encompasses.

AC1.2. Defining the meaning of occupational risk, differentiating this concept with danger, describing the scales with that value.

AC1.3. Listing differences between occupational accidents and occupational diseases.

AC1.4. Identifying the differences between work accidents and incidents, specifying each type has implications in the field of prevention.

AC1.5. Clarifying the differences between security techniques and techniques of Health (Industrial Hygiene, Ergonomics, Occupational medicine, training and information), distinguishing the meaning of prevention and protection in the area and comparing the first importance.

AC1.6. Mentioning the functions and / or obligations of legally defined responsible following: Promoter, Coordinator safety and health during the implementation of the work, Project Manager, Contractor, Subcontractor and Self-Employed.

AC1.7. Summarising functions of the Prevention Services, specifying who applied the mandatory presence of preventive resources and construction works such presence when needed.

AC1.8. Defining what is the management of risk prevention, identifying internal management bodies of the company and external to it.

AC1.9. Identifying the rights of workers in safety and health, the exact content protection rights, information, training in prevention, consultation and participation.

AC1.10. Identifying duties of workers safety and health.

A2: Defining the general occupational hazards in work environments and prevention systems, specifying the roles of occupational risk control and monitoring of worker health.

AC2.1. Mentioning what is meant by environment and working conditions and the relationship they have with workplace hazards.

AC2.2. Describing what is meant by work environment, listing:

- Its components (physical, chemical and biological).
- The main variables that determine the physical work environment (temperature, humidity, ventilation, noise, lighting, vibration, radiation, etc.) and the main risks associated with each.
- The main pollutant types that can appear in the chemical environment of work (solid, liquid and gas) and the main risks associated with each.
- The types of organisms that can contaminate the biological environment of work and the major risks.

AC2.3. Describing what is meant by mental and physical burden of work, specifying the risks associated with excess thereof.

AC2.4. Indicating what is meant by occupational risk control, specifying when they should be used for that purpose and collective protective equipment in what circumstances and conditions should be chosen personal protective equipment.

A3: Differentiating the principles and criteria for action in the first interventions to be undertaken before construction emergencies and first aid, assessing their importance and consequences.

AC3.1. Explaining what are the plans, identifying:

- Common causes of emergencies.
- Firefighting appliances.
- Signalling emergency routes and exits.
- Information material and human resources (media contacts, addresses, maps, etc.) necessary in emergencies.
- The importance of early interventions.

AC3.2. Specifying guidelines for action in emergencies and first aid, explaining the consequences arising therefrom.

AC3.3. In a case properly characterised as an emergency with injuries which require first aid:

- Indicating principles and performance criteria.
- Determining the scope of action.
- Propose actions to minimise risk and treat the injured.

A4: Identifying workplace hazards in construction, arguing the reasons for its frequency and severity of its consequences, prevention specifying basic criteria and associated protective equipment.

AC4.1. Understanding frequency rates, severity and incidence of workplace accidents particular the construction sector, comparing absolute and relative values of the statistics of construction with the total number of sectors.

AC4.2. Arguing the importance and frequency of accidents in the construction sector by way of cause, and ordered from highest to lowest severity forms of fatal accidents and serious occurred during the last period according to statistics.

AC4.3. Specifying common occupational hazards in construction, involving the prevention and protection measures related to them.

AC4.4. Identifying workplace hazards characteristic of a given pit, indicating other cuts with which it can be related (pre, post and simultaneous) and assessing the effect on risk can have that relationship, especially concurrency.

AC4.5. Identifying workplace hazards characteristic of different types of machines given.

AC4.6. Identifying occupational hazards associated with certain chemicals common in construction.

AC4.7. Identifying unsafe conditions and practices from images, video and / or written reports on the development of actual construction.

AC4.8. Identifying and describing the function of the elements (perimeter fence, temporary facilities and other) works to get into the implementation phase.

AC4.9. Identifying and correctly understanding signalling works and machines, specifying where it should be positioned in accordance with health and safety plans.

A5: Identifying the requirements of health and safety plan of a work for different types of cuts, understanding the measures to be applied from health and safety plans and site plans.

AC5.1. Describing the purpose and content of a safety and health plan, stating:

- Who is required to develop a safety and health plan.
- Who has the right to consult.
- On what grounds can be changed.

AC5.2. In different practical cases of cuts, specifying and measure required orders to be transmitted based workers as contemplated by the Health and Safety Plan.

AC5.3. Determining temporary facilities, signage, auxiliary and collective means of protection required for the implementation of a block in terms of a safety and health plan.

AC5.4. Describing purpose and content of the Book of Trouble.

A6: Assess the importance and necessity of the use and maintenance of personal protective equipment (PPE), in different situations, depending on which workers operate properly with them, according to specific criteria.

AC6.1. Selecting and use the correct personal protective equipment required for a particular activity according to specific criteria.

AC6.2. Describing and / or implementing storage operations, maintenance and storage of personal protective equipment in accordance with established criteria.

AC6.3. Assess whether a given personal protective equipment is fit for use, according to the established criteria.

AC6.4. Explaining the importance of workers' obligations regarding the use, care, storage and reporting any defect, failure or damage appreciated in personal protective equipment.

AC6.5. Discriminating unsafe practices relating to personal protective equipment from images, video and / or written reports on the development of actual construction.

A7: Rating the importance and necessity of site, installation and maintenance of collective protective equipment, depending on whether they are suitable for the work to develop.

AC7.1. In a case study of a pit properly characterised or a work placing propose collective protection equipment.

AC7.2. Describing and applying if storage operations, maintenance and collective protection equipment.

AC7.3. Assess whether a given collective protection equipment is suitable for use in accordance with established criteria.

AC7.4. Listing the duties of workers regarding the use, care, storage and reporting any defect, failure or damage appreciated collective protective equipment.

AC7.5. Discriminating unsafe conditions and practices in relation to collective protective equipment from images, video and / or written reports on the development of actual construction.

A8: Defining the importance and necessity of the use, location, installation and maintenance of aids, assessing their suitability to work with workers to develop and operate properly with them.

AC8.1. Specifying the conditions required to be involved in both the direction and implementation of installation, removal or substantial modification of scaffolds.

AC8.2. Describing the conditions of installation and use must submit a scaffold to ensure stability and prevent the fall of people and objects from it.

AC8.3. Quote conditions of installation and use must submit a ladder to ensure stability and prevent the fall of people and objects from it.

AC8.4. Describing conditions of installation and use of an auxiliary admissible given.

AC8.5. Listing the duties of workers regarding the use, care, storage and reporting any defect, failure or damage appreciated as an auxiliary means.

AC8.6. Discriminating unsafe conditions and practices concerning aids from images, video and / or written reports on the development of actual construction.

Content of training module

1. Safety and health at work. General risks and prevention.

- Work and health: definition and components of health, occupational hazards, risk factors.
 - Damage from working: industrial accidents and occupational diseases, incidents, other pathologies arising from the work.
 - Security techniques: prevention and protection.
 - Health Techniques: Industrial Hygiene, Ergonomics, Occupational medicine, training and information.
 - Basic legal framework for the prevention of occupational hazards. Rights (protection, information, training in prevention, consultation and participation) and basic duties in this area.
 - General risks and prevention: risks related to security conditions, risks associated with the middle-working environment, workload and fatigue; elementary systems of risk control, collective and individual protection.
 - Emergency and evacuation plans.
 - Monitoring the health of workers.
 - Basic elements of management of risk prevention: public organisations related to health and safety at work, employee representation, rights and obligations. Organisation of preventive work: basic routines.
- Documentation: collection, processing and archiving.
- First aid: basic action criteria.

2. Construction Safety.

- Basic legal framework for construction safety: responsible for safety on construction sites and functions (Promoter, Coordinator safety and health during the implementation of the work, Project Manager, Contractor, Subcontractor and Self-employed).
- Organisation and integration of prevention in the workplace: prevention services.
- Risks common in the construction industry: forms of accident prevention and protection measures associated.
- Prevention of risks in building pits (job description, and machinery used aids, stages of development, previous cuts, post and simultaneous, singular risks and protective measures) in: auxiliary pits, demolition, earthworks, foundations; concrete structures, steel structures, cladding and partitions, roofs, finishes, carpentry, locksmith and glazing; facilities.
- Risk prevention in pits of urbanisation: earthworks, drainage, firm, pedestrian areas, walls and defensive works, bridges and walkways, urban service networks, signing and lighting.
- Prevention of risks of underground works, hydraulic and maritime.
- Terms and unsafe features in the construction sector.
- The importance of implementing preventive works: perimeter fencing, entry and exit doors and routes of movement of vehicles and people, location and range of cranes; rush and distribution networks; services affected, local sanitary toilet, temporary facilities; workshops, stores of work, signalling works and machines.
- Personal protective equipment: placing, uses and obligations; maintenance.
- Collective Protection Equipment: placing, uses and obligations; maintenance.
- Aid: placing, uses and obligations; maintenance.

TEACHING MODULE 2. Designation: PREPARING OF CEMENTS, MORTAR, ADHESIVES AND CONCRETE

Methodological guidance

TEACHING MODULE 2	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
	10	20	30

Criteria of access for students

Level 1 according to European criteria.

Duration. Theory and Training

Total: 30 h

Theory: 10 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to all PF of competence unit 2.

Assessment ability and criteria

A1: Describing the process of making pastes, mortars and concretes, identifying the components, relating the different types of applications, and specifying work methods.

AC1.1. Describing the scope of a given mixture.

AC1.2. Correctly understanding the meaning of technical terms used in work to develop pastes, mortars and concretes.

AC1.3. Recognising the type of a mixture presented, identifying the components that comprise it and describing its process.

AC1.4. Describing the materials and innovative techniques in developing pastes, mortars and concretes, assessing their impact on the associated competency unit training module.

A2: Operating equipment, personal protective equipment, tools and machines, in accordance with instructions received regarding work methods, safety and end of day operations.

AC2.1. Identifying machines, tools and equipment necessary for a particular activity.

AC2.2. Operating machinery, tools and supplies with the skill and precision required in a particular activity.

AC2.3. Identifying labour and environmental risks in making pastes, mortars and concretes, assessing severity and assigning the preventive and protective measures related to them.

AC2.4. Selecting and correctly use the clothing and personal protective equipment required for a given activity.

AC2.5. Describing and applying storage operations, maintenance and upkeep of tools, supplies and personal protective equipment used.

A3: Preparing concrete, mortar and grout according to the instructions of preparing and observing the consistency and resistance conditions indicated.

AC3.1. Setting composition and dosage of a mixture determined by the conditions of strength, consistency, adherence and / or workability following tables and nomograms indicated.

AC3.2. Specifying kneading conditions, mortar re-kneading, adjustability and maturation time, and life of a given mixture.

AC3.3. Describing the effect of environmental conditions on the preparation and properties of the blends.

AC3.4. In a practical case properly characterised, preparing mixtures homogeneity conditions required, and adjusted the volume and deadline.

A4: Preparing adhesives and grouts processing following the instructions and observing the consistency and resistance conditions indicated.

AC4.1. Establishing correction dosing a mixture of cementitious adhesive for partial or total replacing of water through a given emulsion.

AC4.2. Specifying kneading conditions, mortar re-kneading, ripening time and life of a given mixture.

AC4.3. In a practical case properly characterised, develop adhesives required homogeneity conditions, and adjusted the volume and the deadline.

Content of training module

1. Mortars, concretes and pastes in masonry and coatings.

- Mortar and pastries from the pit.
- Mortar and pastes pre-dosed.
- Concrete: design, components, classes, applications.

- Components: binders, additives, sand and water.
- Dosing, consistency, plasticity and strength. Applications.
- Regulations and essays.
- CE marking of construction materials.
- Marks and seals of existing building materials.

2. Adhesives and grouts.

- Cementitious adhesives.
- Dispersion resins adhesives.
- Adhesives and grouts reaction resin.
- Components:
 - Binders.
 - Additives.
 - Arenas.
 - Water and emulsions.
- Dosing, consistency and plasticity.
- Applications.
- Regulations and essays.
- CE marking of construction materials.
- Marks and seals of existing building materials.

3. Manufacture of mortars, pastes, concrete, adhesives and grouts.

- Processes and conditions developing pastes and mortars:
 - Identification and control components.
 - Dosing in weight and volume dose corrections.
 - Mixing manual and mechanical means.
 - Water supply.
 - Filling of shipping containers.
 - Environmental conditions for the production of mortar and grout.
- Processes and producing concrete conditions:
 - Identification and control components.
 - Dosing in weight and volume dose corrections.
 - Mixing manual and mechanical means.
 - Water supply.
 - Filling of shipping containers.
 - Environmental conditions for the production of concrete.
- Processes and conditions developing adhesives and grouts:
 - Identification and control components.
 - Dosage adjustments.
 - Mixing manual and mechanical means.
 - Filling of shipping containers.
 - Environmental conditions for the production of adhesives and grouts.
- Equipment:
 - Types and functions (selection, testing and handling).
- Protective equipment:
 - Individual.
 - Collective.

- Labour and environmental risks, preventive measures.
- Materials, techniques and innovative equipment recently introduced.

TEACHING MODULE 3. Designation: SELECTION OF STONE

Methodological guidance

TEACHING MODULE 3	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
	20	10	30

Criteria of access for students

Level 1 according to European criteria.

Duration. Theory and Training

Total: 30 h

Theory: 20 h

Training: 10 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to all PF of competence unit 3.

Assessment ability and criteria

A1: Petrology

AC1.1. Main stone deposits

- Formation, chemical composition and classification
- Physical and chemical terminologies
- Stone formations during geologic history
- Differences between igneous rock, sedimentary rock, metamorphic rock

AC1.2. Overview about formation, quarrying and processing natural stone.

- Earth's composition - formation of stone: igneous rock, sediments, metamorphic rock

AC1.3. Possibilities for the use according to the type and characteristic of stone

- Products and their use
- Selection of natural stones for their required processing
- Structure, colour, textures of natural stones
- Density and bulk density water absorption under atmospheric pressure and by capillarity, compression strength, bending strength, abrasion resistance, thermal conductivity and dilation

AC1.4. Weathering of stone

- Differences between chemical, biological and physical weathering, measures to avoid weathering

AC1.5. Technical characteristics of the most important natural stones to use them in the right way

- Natural stone characteristics: hardness, resistance to weathering, structure, colour,

AC1.6. Reasons of building defects and damages on natural stone

- Building damages caused by frost, temperature, rust, acid corrosion, plant growth

A2: Building physics stonemasons

AC2.1. Bases of physics

AC2.2. Physical qualities of rocks

- Density and apparent density
- Mechanical qualities
- Thermal qualities and influences of temperature
- Sound absorption
- Porosity

AC2.3. Hydric qualities – natural stone and water

- Water
- Water absorption mechanisms
- Water delivery/drying
- Steam diffusion
- Bowing and shrinking

AC2.4. Structural damages and weathering - physical causes

AC2.5. EN standards

A3: Stone extraction and stone processing

AC3.1. Extraction and quarries

- Quarries
- Basic principles for the stone extraction

AC3.2. Criteria for workable rocks

- Fault in the rock
- Drilling ability and cleavability

AC3.3. Work stone processing

- Work stone processing as specified
- Free work stone processing
- Stonemason sign
- Historical stone processing

AC3.4. Manual stone processing techniques

Content of training module

The course participant exercise:

1. Naming the most important rock deposits.
3. Recognising of unusual features using rock samples.
2. Recognising and Examination of technical qualities.
4. Recognising of rock ways (Cracks, pores, veins).
5. Judgments of the suitability and possibilities for their use.
6. Recognising surface finish quality.

TEACHING MODULE 4. Designation: PLACING OF PAVEMENT AND STAIRS

Methodological guidance

TRAINING UNITS OF TEACHING MODULE 4	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
Training unit 1	20	30	50
Training unit 2	40	70	110
	60	100	160

Sequence: Training units of this teaching module can be programmed independently.

Criteria of access for students

Level 3 according to European criteria.

TRAINING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE FOR PAVEMENT AND STAIRS

Duration. Theory and Training

Total: 50 h

Theory: 20 h

Training: 30 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF1, PF2 and PF3.

Assessment ability and criteria

A1: Identify pavement works with all types of modular rigid materials sorting implementation modalities and their respective fields of application, and relating the characteristics and properties of the coating materials.

AC1.1. Sorting the pavement with rigid parts depending on the coating materials and grip and fields of application-location support and functional requirements.

AC1.2. Describing the differences between parts and continuous pavements and floors between floors and stairs and flooring with other parts, wood, or other synthetic-associating the scope of each type of coating, and describe the safety requirements of using front risk of falls provided by the Technical Building Code, explaining how they affect the choice of materials for pavement.

AC1.3. Recognising and list the rooms and building components eligible for a pavement, assessing the evolution of the aesthetic demands of the user.

AC1.4. Describing the generic sequence in-carrying out floors and stairs, identifying pre-and post pits and needs coordination needs.

AC1.5. Recognising the types, materials and samples of natural stone and others, relating their characteristics and basic properties and fields of application, identifying whether they correspond to tiling, flooring, or both.

CE1.6. In a practical case properly characterised as identifying properties of the coating material: Interpreting the packing code for the type of waste-series tiles, pattern, tone, size and commercial-quality and its CE marking, checking correspondence with the parts presented. Identify the cutting, drilling or mitred, appropriate to the material being handled.

CE1.7. Listing the characteristics related to the appearance of the pieces in terms of uniformity of tone colour, texture, and directionality of textures and decorations, describing their influence on the final appearance of the coated surface.

CE1.8. Identifying common occupational and environmental hazards in work floors and stairs, assessing their severity and Recognising teams and individual protection measures.

CE1.9. Relating causes of defects and real faults in the work floor and stairs, assessing the possible impact and needs solutions in each case.

CE1.10. Describe the factors of technological and organisational innovation in the work of pavements and staircases, assessing their impact on performance in the implementation as well as the quality, durability and functionality delivered coating.

A2: Contrasting state supports and positioning surfaces, confirming their suitability to materials and technical implementation under the floors and stairs, or proposed treatment screeds that enable for the intended placement.

CE2.1. List and recognise samples submitted from the various support materials for floors and stairs, including insulating and waterproofing materials compatible with performance of pavements.

CE2.2. Describe the fundamental characteristics and properties must meet different kinds of media and surfaces for each placement technique of flooring and stairs, especially the stability of concrete slabs-maturity-and Forged-maturity, yield-active and arrows.

CE2.3. Identify common defects and malfunctions in brackets, intermediate layers, screeds and positioning surfaces that prevent, the implementation condition of pavements, or reduce the quality and durability of them.

CE2.4. Describe the routine to perform on pavement surfaces delivered for testing, pre-installations and fixed equipment, specifying the measures that can be taken in the event of defects in them.

CE2.5. Relate environmental conditions and substrate-temperature and humidity-that allow placement for different types of materials and playing techniques, describing any changes or interventions that can be performed.

CE2.6. Describe the types of expansion joints, the delivery terms of the structural, and the location and characteristics of perimeter and intermediate.

CE2.7. In a case properly characterised verification of a real mount, forged-with or without upper-layers or straight:

- Check or verify the stability and strength of support depending on their degree of maturity, and in the case of a floor, depending on the light.
- Check if the maturity of the screed and the compressibility of the intermediate layers respectively.
- Check cohesion, texture and surface cleaning placement.
- Perform the dimensional control over space-length, width, and final dimension perpendicular to walls and partitions, and surfaces to receive floor-flatness and level.
- Perform dimensional inspection of fixed equipment, especially the location, level and plumb.
- Check the location and proper implementation of the pre-installations.
- Make incident report and propose, if necessary, corrective actions, depending on the material and technique intended placement.
- Suggest materials and performance techniques that fit the diagnostic support.

A3: Rethinking tile installation based on the geometric characteristics of the supports and the design expectations of pavements and staircases, selecting as appropriate the type of gear and the width of the grout, and determining the needs of forming parts-cutting, drilling, mitring, or due to their appearance.

CE3.1. Identifying the different types of gear and describe the advantages and disadvantages associated with them depending on substrate conditions and parts, indicating the influence of the dimensional tolerances of the housings and parts.

CE3.2. Calculate the amount of coating material in practical cases well characterised for different formats and gear parts, putting together the corresponding sketch.

CE3.3. Determine the needs of handling rigid parts in the following cases:

- Cutting operations depending on the stakeout on a real space.
- Parts Drilling Operations interpreting scale drawings and dimension drawings related to flooring and in particular strand representations of facilities and equipment.

CE3.4. Describe the aspect checks and dimensional tolerances in receiving the tile, linking action to take.

CE3.5. In a practical case properly characterised stakeout of a real room, bathroom and kitchen with defects parallel edges that produce a slightly trapezoidal surface, and a pillar coated with non-identical pieces with textures or variable motifs, including the baseboard, under the following conditions:

- Checking the dimensional tolerances of the parts for the intended rig.
- Compiling a panel dry with extracted samples collected lots, proposing a placement criterion that considers the uniqueness of the pieces.
- Making a Stand bounded sketches, including the presence of fixed equipment and pre-installations.
- Making and expressing a complete sketch by staking mode indicated rigging, placing cuts and fixed equipment deliveries and other construction materials or elements.
- Determining the geometry of the parts to be cut, including its number.
- Determining drilling parts according to pre-installations.
- Calculating the stockpiles required for performance of the pavement, with a sufficient degree of approximation and taking into account losses.

CE3.6. In a practical case properly characterised by a plane or dimension drawing and I represent an area of over 40 m² with pillars presence of at least one structural joint movement and some fixed equipment:

- Determining the location of intermediate movement joints, signalling on the plane or dimension drawing.
- Describing the width and materials involved in the movement and perimeter joints in the intermediate previews.
- Calculating the stockpiles necessary for the implementation of all movement joints with a sufficient degree of approximation.

CE3.7. In a practical case properly characterised as a ladder to be coated by standard parts and special-skirting, trims or nosing-tread:

- Contents and express a complete sketch by staking, placing the cuts.
- Determining geometry of the parts to be cut, including its number.
- Calculating the stockpiles required for covering stairs with a sufficient degree of approximation.

Content of training unit

1. Work floors and stairs

Types of flooring and stairs: flooring installed by direct adhesion (in thick and thin or average), mosaic floors (tiles of ceramic, natural stone and glass), on special flooring screeds (soundproof low compressibility or waterproofing), special flooring (sealing and chemical resistance, radiant cooling, conductive, raised).

Other types of flooring: no rigid modular flooring (wood and derivatives, synthetic), floating floors, pavements continuous clusters (in situ terrazzo, concrete and mortar layers), no pavements continuous clusters (bituminous pavements, pavements and other resins), flexible floor coverings (carpet, linoleum, metal and synthetic materials).

Fields of application: according to use of the building, according to functional requirements, depending on the type of supports: concrete floors, slabs or unidirectional lattice, wooden platform on existing pavement, covered passable, depending on trends in architecture, interior design and decoration. Technical Building Code: use security against the risk of falls.

Materials for Solar: commercial types and product groups according to European and international standards (ceramic tiles, prefabricated mosaic, natural stone tiles, tile agglomerates of inorganic materials, conglomerates tile natural stone, composite tile, ceramic laminates, metal tiles, pavement systems for stairs, skirting and trims delivery, prefabricated joints movement); formats; properties; encoding according to CE marking, information on labels and labelled packaging.

Working arrangements: relationships with other elements and force cuts in both delivery stage finishes such as post jobs pavement; phases floors and stairs.

Defects and dysfunctions of pavements and staircases: defect classes, according to their importance and impact severity, causes and solutions depending on the type of defect. Equipment carrying out floors and stairs: types and functions (selection, testing and handling).

Risk prevention in the work of pavements and staircases: occupational risk specific preventive techniques, personal protective equipment and means of collective protection (installation, usage and obligations, maintenance), aids; interference between activities (simultaneous or successive activities).

Environmental risks.

Factors technological and organisational innovation in the flooring and stairs: materials, techniques and innovative equipment recently introduced; trends in the use of modular rigid finishes on walkable supports; innovative systems in the context of sustainable building.

2. Stands for floors and stairs

Support Structure: sturdy support base, intermediate layers (layers of mortar, special screeds over layers of acoustic insulation and / or heat, waterproofing layers, heating by water cooling) and positioning surfaces. Positioning surfaces: concrete, mortar (cement and mixed), acoustic insulation sheets and plates, sheets and liquid waterproofing waterproofing, stone surfaces (existing pavements), terrazzo, wood surfaces or wood particleboard and laminates, metal surfaces, anhydrite floors.

Media types: concrete floors, slabs (concrete and reticular unidirectional, metal, wood), compacted soil.

Types of acoustic insulation: low compressibility, sheet and plate. Types of waterproofing indoors: You liquids and sheets.

Conditions of the substrate: the resilient support base (stability, mechanical strength) of the screed layers (maturity) of the insulation layers (low compressibility) adhesion placement surface (sanitation, cleaning, cohesion, regularity, chemical compatibility with the bonding material, insensitivity to water and humidity, cleanliness) of the laying surface (level and final dimension, flatness); between geometric surfaces (perpendicular) stand, the support of associated elements (location, level, and other conditions of perpendicularity installations, carpentry, equipment, fixed furniture).

Diagnosis of supports: support for bonding materials and techniques proposed placement, media adaptation treatments, corrective measures. Stand Movement Joints: types (structural, intermediate, perimeter); functions and features, fillers and sealing joints, together with special features (chemical resistance and sealing).

3. Stakeout for floors and stairs

Selecting gear: gear types, current trends in interior design and decoration; influence of the dimensional tolerances of the parts.

Definition of coordinate delivery level pavement: Primary and secondary benchmark levels.

Treatment of meetings, baseboards and stairs: special pieces; systems for stair (treads, risers, nosings and step tops) criteria position cuts.

Processing equipment and facilities: drilling needs, treatment records, location of parts piercing.

Plans for modular rigid pavements: plans and sketches related to pavements; drawings, installations and equipment.

TRAINING UNIT 2. PLACING, ATTACHMENT AND FINISHING TOUCH ON SITE FOR PAVEMENT AND STAIRS

Duration. Theory and Training

Total: 110 h

Theory: 40 h

Training: 70 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF4, PF5, PF6, PF7 and PF8.

Assessment ability and criteria

A1: Apply techniques of flooring and stairs in thick layer in the forms of "on-decoupled-screed" mode and "with trowel tip outline" mode, both closed and open meeting, meeting quality measures and specific safety and health.

CE1.1. Identify environmental conditions, types of rigid parts, media types and those requirements that discourage use of the technique in screeds.

CE1.2. Specify the method and sequence of work in implementing pavement thick mortar, including an initial implementation of the decoupling layer and final grouting operations, cleaning and, if necessary, protection of flooring.

CE1.3. Describe the variations in performance technique in thick, including placement alternatives- "on-decoupled-screed" mode and "with trowel tip outline" mode.

CE1.4. Identify the causes of defects and specific dysfunctions of work in thick layer of pavement.

CE1.5. In a practical case properly characterised as proposed or other similar difficulty-performing pavement "on-decoupled-screed" mode on a minimum preferably not parallel area of 3 x 3 m with simulated deliveries walls or partitions between them, preferably with tiles square ceramic exceeding 30 x 30 cm and singularities of texture or decoration in your face view format, placed to line and open joint (3 mm), carrying a box with centre-border-with or without a bevel gear and performing an intermediate gasket on the central axis of the surface parallel to the sides, under the following conditions:

- Noting that the environmental conditions and the stability of the support are compatible "on-decoupled-screed" mode.
- Carrying out a stakeout on the solar surface that results in a sketch bounded indicating: rigging, the dimensions of the central carpet, perimeter arrangement and dimensions / geometry of the tiles cut deliveries to walls or partitions.
- Checking the quality and dimensional tolerances of tiles available and if special pieces that form the border, verifying that correspond to the previews, and specifying the need for preservative treatment of eye surface before placement.
- Compiling a dry panel, checking the quality and surface smoothness and, if necessary, by selecting and arranging the pieces according to their uniqueness.
- Establishing references perimeter and intermediate level delivery.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course. Checking moisture and aggregate gradation or coarse aggregate served for decoupling layer and, if approved, carrying out it on the stand supplied with a minimum thickness of 20 mm.
- Checking the suitability and workability of mortar served in making any necessary corrections.
- Carrying out the pavement "on-decoupled-screed" mode, allowing the progress of the work that would ensure optimal control of flatness and floor level, and making cleaning the tile and grout placement before grouting operation.
- Carrying out board intermediate horizontal movement from installation of the filler material to the sealing and cleaning.
- Applying to day operations of the equipment used.

CE1.6. In a practical case properly characterised as proposed or other similar difficulty-performing pavement wing tip on a minimum area of 2.5 x 2.5 m, including a pillar or column and simulation traps or boxes, preferably square format tiles 30 x 30 cm line and open joint (minimum 5 mm), under the following conditions:

- Checking conditions-environmental and stand-replacing parts and support materials and technical implementation of the pavement, providing corrections or support interventions if applicable.
- Carrying out a spatially and on the support that results in a dimensioned drawing with rigging and deliveries to the pillar / column and horizontal surfaces stake.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course.

A2: Apply insulation and waterproofing techniques of supports for floor adhesive or thin-layer media, laying low compressibility acoustic insulation and waterproofing sheets or liquid waterproofing, and meeting quality measures and specific safety and health.

CE2.1. Sort the insulating and waterproofing materials that can be used as a surface plot, according to their nature and functions.

CE2.2. Specify the method and sequence of work in placing acoustic insulation supports walkable low compressibility.

CE2.3. Specify the method and sequence of work placement sheet waterproofing and application of liquid media trafficable waterproofing in describing treatments deliveries sinks and construction elements that stand in the case of heavy duty pavements and chemical sealing.

CE2.4. Describe common defects in the insulation and waterproofing placement and inner media, specifying which appear and how the thermal or sound bridges and leakage are avoided.

CE2.5. In a practical case properly characterised as proposed or other similar difficulty-place prior isolation pavement with adhesive thin layer on a minimum area of 3 x 3 m in its centre a pillar and includes simulation siphons and manholes, under the following conditions:

- Noting that the environmental conditions-and support-allow placement-by adhesive or mechanical attachment.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course.
- Fixing the panels to the carrier by adhesives, protecting the joints to prevent sound bridges and panels properly delivering the building blocks that stand with sound insulating bands also avoid these sound bridges.
- Performing the final inspection of flatness for thin pavement layer.
- Applying to day operations of the equipment used.

CE2.6. In a practical case properly characterised as proposed or other similar difficulty, perform a waterproofing prior to its pavement thin layer on a constructive component simulating a shower stall in its bottom sheets with a surface minimum placement of 1.4 x 1.4 m, with outstanding "four waters" of 2% and central drain and walls 0.5 m high in three of its four sides, under the following conditions:

- Checking conditions-environmental and stand-support materials and waterproofing through technical sheets.
- Checking the quality of the films available, and delivery hoses and belts, verifying that correspond to the previews.
- Selecting the equipment, tools and equipment necessary for the implementation, and applying operations to day.
- Setting the sheets to the carrier by adhesives, even applying these sheets on the walls up to 50 cm in height, making the overlaps between sheets, and installing sleeves bands and steps in the meetings and facilities.
- Carrying out a board of intermediate horizontal movement, using a special chemical waterproofing treatment.

CE2.7. Identify patterns, characteristics and performance conditions from the ground floor heated by electric resistance coils, Recognising the type of adhesives used in the installation of the coils.

A3: Apply pavement placement techniques thin layer or adhesive media, both closed and open meeting, meeting quality measures and specific safety and health.

CE3.1. Identify environmental and Delivery Payment -flatness/level surface placement, cohesion, humidity and cleaning, as well as the stability of the support, the type of rigid-format piece, water absorption, dimensional sensitivity to water and moisture and, where appropriate, linear thermal expansion coefficient, which determine the selection of adhesives and application variants placement technique or thin layer medium.

CE3.2. Mechanically identify functional resistance, resistance to loss of appearance resulting from stains, scratches and abrasion, chemical resistance, resistance to freeze / thaw, or other special-placed a thin layer pavement or media, associating the location requirements , the type and intensity of traffic, and the latter with the type of adhesive and the variants of the insertion technique.

CE3.3. Specify the method and sequence of tasks during pavement thin layer or adhesive media, including grouting operations, cleaning and, if necessary, protection of flooring.

CE3.4 describe the variants in implementation technique thin layer or media, including thin-layer placement with reaction resin adhesives, single or double gluing and placing a closed or open joints, and clarify the specificities placing pre-assembled mosaic.

CE3.5. Identify the causes of defects and specific dysfunctions of the work of pavement thin layer or medium, relating to environmental conditions, preparation and application of the adhesive, the type of tiles used, the dimensional stability of the supports and the characteristics and delivery terms of positioning surfaces, particularising for cases of immature screeds and levelling floors with medium or high demands on mechanical strength.

CE3.6. Identify the specific equipment for pavement placement technique thin layer, especially equipment for the preparation of adhesives by plain type and serrated type associated with the adhesive, the format of the tile and conditions of flatness / level delivered the laying surface.

CE3.7. In a practical case properly characterised as proposed or other similar difficulty-, make the pavement thin layer on the surface resulting from the completion of the evaluation criteria CE1.5-surface at least 3 x 3 m floored with tiles ceramics and making an intermediate board on the central axis of the surface parallel to its sides make a pavement-thin-layer and double-spread preferably ceramic tiles 30 x 60 cm format and placement closed ring (1.5 mm), to latching 1/3 and oblique to the joint central movement, under the following conditions:

- Noting that the surface-handed if the floor tiles result of the implementation of the conditions presented CE1.5-flatness / level and cleaning for the new pavement on the technique of thin layer placement, and environmental conditions are compatible with thin layer technique.
- Checking the dimensional tolerances of ceramic tiles, especially the lateral curvature of the large format 30 x 60 cm in avoiding eyebrows and shoulders, and the surface quality and uniformity of textures and decorative effects making panels dry.
- Performing a rethink on the laying surface, through the preparation of a figure where the dimension drawing board intermediate movement and deliveries.
- Calculating the collection of materials and the geometry and number of cut in a locking positioning, with a sufficient degree of approximation pieces.
- Selecting the equipment, tools and equipment necessary for the implementation, and then by applying the operations end of day.
- Selecting the type of compatible adhesive surface placement and type of tile, and checking the homogeneity and adhesive characteristics served fresh.
- Performing the pavement including periodic inspections of flatness / level, wettability and adhesive open time.
- Carrying out the intermediate joint motion from the base of the floor above, including the filler and sealant, as well as cleaning after the operation.

CE3.8. In a practical case properly characterised as proposed or other similar difficulty-, make the pavement thin layer on the surface resulting from the completion of the evaluation criteria CE2.6-constructive element that simulates a shower stall in his bottom, waterproofed using sheets with an area of 1.4 x 1.4 placing m, sloping hipped 2% and central drain and walls 0.5 m high in three of its four sides -, preferably ceramic mosaic tesserae or glass panels pre-mounted in at least 30 x 30 cm, under the following conditions:

- Noting that the waterproofing is installed correctly and there are delivery terms flatness / level for installing pre-assembled mosaic under the thin layer technique with adhesive, and that environmental conditions are compatible with thin-layer placement.
- Checking the type and characteristics of the mesh, the adhesion of the tiles and the width of joint between them, as well as correspondence with the model laid mosaic.

- Selecting the type of adhesive compatible with sheet waterproofing and type of mosaic, and checking the characteristics of the adhesive served fresh.
- Noting that the joints between tiles are empty adhesive and performing a first cleaning before hardening.
- Selecting the grouting material support to the type of tile.
- Performing the operation and cleaning grout over the entire surface of building components.

CE3.9. In a practical case properly characterised as proposed or other similar difficulty-performing thin layer pavement on the floor covered in the evaluation criteria CE1.6-surface minimum of 2.5 x 2.5 m, which includes a pillar or column and simulation siphons or pavement "with trowel tip outline" mode -preferably terracotta ceramic tiles or natural stone tiles measure approximately 20 x 20 cm, standing with open joints of 10 mm and grouting contrasting colour to the surface of the tiles, a bevel arrangement and including a baseboard, in the following conditions:

- Checking conditions for delivery of the solar surface, in planarity / level and cleanliness, quality and tolerance of the parts to drop and that environmental conditions are suitable for installation in thin layer.
- Performing a complete redesign of the solar surface, resulting in a dimension drawing bearing the rig and cut parts deliveries, all set to board placement.
- Selecting the equipment, tools and equipment necessary for the implementation, and then by applying the operations end of day.
- Selecting the protective undercoating material applied on the view of the tiles before the positioning based on the surface characteristics of the same surface, and selecting a suitable adhesive depending on the laying surface and the type delivered rigid piece.
- Performing the pavement wetting the back of the tiles and the absence of adhesive joints between tiles.
- Selecting the grouting material suitable to the type of rigid parts and the width of the planned meeting, overseeing cool features grout served.
- Performing grouting material with contrasting colour to the surface of the tiles.
- Making the final cleaning and, behind her, removing the protective primer.

A4: Apply coating techniques stairs with rigid parts and skirting implementation, both board closed and open, and thick as a thin layer, meeting quality measures and specific safety and health.

CE4.1. Identify environmental conditions and delivery-surface-supported placement with placement technique thick and thin, in the implementation of skirting and siding stairs.

CE4.2. Specify the method of work in implementing skirts, extended to the selection of bonding materials and grouting depending on the type of part and the laying surface on which the baseboard is installed.

CE4.3. Specify the treatment given perimeter joints in implementing the baseboard.

CE4.4. Describe the most common types of ladders, characteristics and conditions of supply to phase finishes.

CE4.5. Describe coating systems stairs treads, nosings or parts incorporating fingerprint-nosing and skirting and process layout a staircase lined with rigid parts.

CE4.6. Identify the causes of defects and specific dysfunctions of work lining stairs and baseboards conducting rigid parts, relating to environmental conditions, preparation and application of grouting and bonding materials, the type of parts used and the characteristics Payment and delivery of positioning surfaces.

CE4.7. In a practical case properly characterised as proposed or other similar difficulty-skirting make provisions implementing the evaluation criteria CE3.9-surface at least 2.5 x 2.5 m-, placing the

baseboard on the perimeter of the pavement and controlling the alignment, flatness and plumbing parts as well as proper delivery above the perimeter joint movement.

AC4.8. In a practical case properly characterised as proposed or other similar difficulty-, coated with rigid parts a ladder on a case study that adequately reflect the complexity of real cuts, as proposed case of a straight section of at least three steps, delivered to a surface in a footprint that includes the riser and skirting boards to the left or right, under the following conditions:

- Checking the geometrical, dimensional and delivery conditions of the flight of stairs that allow the selection of technical and material placement.
- Checking the surface quality and tolerances of parts total, and the sufficiency of stockpiles of treads, risers, skirting and nosings in your case.
- Performing a rethinking of the flight of stairs Give two dimensional drawings, plan and elevation, with the modulation of the treads and risers respectively, calculated with sufficient approximation the need for stockpiles of treads, risers, skirting and nosings in your case.
- Selecting the technique of placing the bonding material and depending on the terms of delivery of the flight of stairs and the type of rigid parts, and checking the characteristics of the material fresh gripping served.
- Doing the coating controlling the stairs and the absence of bonding material between tiles, skirting placing in correspondence with the profile of the tread, riser and, where appropriate, the nosing.
- Performing the grouting operation and cleaning.

Content of training unit

1. Flooring in thick

Method: "on-decoupled-screed" mode and "with trowel tip outline" mode. Checks and previous stake holder and associated elements.

Material selection and dosage gripping and grouting: environmental conditions, support features and parts. Mix workability.

Checking parts: dimensional control, selection of tackle and the width of the grout.

Thumbnail decoupling layer: moisture control and grading of aggregates and other materials, extension of the layer with a uniform thickness.

Placing "on-decoupled-screed" mode: laying of rules and piece of plaster to fix, preparation and implementation of the bridge bonding parts placement, direction of travel, own joints, sealing movement joints, pre-hardened cleaning placement if baseboard, grouting and cleaning.

Placement "with trowel tip outline" mode: dosage and preparation of cement and lime mortar, consistency control and workability, placement rules and piece of plaster to fix, parts placement, forward direction, sealing movement joints, hardened prior to cleaning themselves together, placement if baseboard, grouting and cleaning. End Quality: flatness, plumb, alignment of joints, cleaning.

Application defects, causes and effects.

2. Flooring thin layer and media

Pre-treatments checks and placement surface and associated elements.

Selection of the adhesive and grout: environmental conditions, support features and parts, functional requirements. Features fresh adhesives: consistency, open time and wetting capacity, thixotropy.

Checking parts: dimensional control, selection of tackle and the width of the grout.

Drawing the solar surface depending on the geometrical characteristics and the presence of fixed equipment, the dimensional quality of the parts and the selected gear.

Placing the pieces: sense of progress, checking the wetting capacity, sealing movement joints, if installation of baseboard, and hardened after cleaning, control of materials and the process of grouting own boards.

Grouting tile and flooring preassembled with special requirements for strength and chemical sealing.

End Quality: flatness, levels, alignment of joints, cleaning.

Quality pre-assembled mosaics: flatness, levels, alignment of joints, uniformity of parts and joints between tiles, cleaning. Tangential test light.

Application defects, causes and effects.

3. Special floorings. Stairs and baseboards

Types of special pavements: acoustic insulation on low compressibility of liquid or sheet waterproofing, electric radiant heater, other (sealing and chemical resistance, conductive, raised).

Layer soundproofing materials (plates, sheets or plates, sound absorbing sealing step tops or delivery) conditions (own boards, meetings and attachment to surfaces delivered); common implementation defects (causes and effects, sound bridges).

Waterproofing interior elements for pavement: types of items (toilets, showers, saunas, whirlpool, cold storage and others); waterproofing materials (plates, liquid waterproofing, bands and sleeves); waterproofing conditions (mode of application and number layers to be applied in liquid waterproofing, fixing the floor and lift on the vertical surfaces, overlapping sheets, meetings and deliveries waterproofing plumbing, waterproofing implementation of movement joints); common implementation defects (causes and effects, filtration).

Processes and pavement condition of stairs: types of stairs, the coating materials themselves stairs; ante controls (flatness, level and plumb the rungs delivered surface placement of the system parts ladder); process implementation (staking, materials selection and placement technique, control features fresh grip materials and grouting; embodiment of the treads and risers, skirting installation, grouting process control) implementation defects usual: causes and effects.

Processes and conditions for implementation of electric radiant heating: ante controls (surface placement of the pieces); implementation process (adhesive selection for placement of the coils, control characteristics served fresh adhesive, installation coils, staking, control features fresh adhesive and installation of parts, material control and grouting process, appropriate placement of baseboard, cleaning control); common implementation defects: causes and effects.

Processes and conditions of pavements tightness and chemical resistance and / or conductive flooring: pre-flight (bracket, special materials used, parts); process implementation (staking, location intermediate joints and perimeter motion selection grip materials and grouting, control features fresh adhesive, placing the pieces in thin layer and double bonding, waterproofing implementation of high chemical resistance to movement joints, sealing movement joints, control features fresh and application of grouting material, arrangement of copper step tops within the adhesive during the installation process in conductive floor tiles, placing the pieces, control the characteristics of fresh grout and its implementation, as well as cleaning before hardening, completion of grouting floors high strength and chemical sealing and conductive flooring) final quality (level, flatness, alignment of joints, deliveries to building and fixed equipment, supplies to sinks and movement joints, cleaning); common implementation defects: causes and effects.

TEACHING MODULE 5. Designation: PLACING OF MASONRY, ASHLARS AND BLOCKWORK

Methodological guidance

TRAINING UNITS OF TEACHING MODULE 5	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
Training unit 1	10	20	30
Training unit 2	20	40	60
Training unit 3	10	20	30
	40	80	120

Sequence: Training units of this teaching module can be programmed independently.

Criteria of access for students

Level 3 according to European criteria.

TRAINING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE FOR MASONRY, ASHLARS AND BLOCKWORK

Duration. Theory and Training

Total: 30 h

Theory: 10 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF1, PF2 and PF3.

Assessment ability and criteria

A1: Describing the process of placing masonry, masonry and blockwork, identifying types and describing materials, working methods and risks, and relating them to the overall process of a construction site.

AC1.1. Defining and related schematically, a total process of working on a construction site that also includes the sequence of all tasks.

AC1.2. Identifying the general risks and safety measures and protection exist in construction.

AC1.3. Listing the types of natural stone blocks as components, types and functions.

AC1.4. Identifying the different natural stone construction elements involved in construction, describing the main features of each.

AC1.5. Recognising quality conditions to be met by various elements of natural stone.

AC1.6. Describing the processes of transport, handling and storage of natural stone pieces.

AC1.7. Identifying the different methods (mortars, adherent to bone, anchorages, and others) work placing in thick pieces of natural stone thicknesses, describing the applications, operating characteristics and the process for each one of them.

AC1.8. Describing components, grip and seat blends suitable for a particular job placing of natural stone pieces, describing the interlocking, keys, auctions, meetings and singular points.

AC1.9. Identifying the specific health risks of the placing of natural stone elements, linking with established safety standards: personal protective equipment and collective.

AC1.10. From a detailed work plan:

- Specifying the sequence of work required to lift a given natural stone brickwork.

A2: Understanding graphic and written information concerning the placing of masonry, masonry and blockwork.

AC2.1. Recognising different representation systems (dihedral and perspectives) used in the preparation of plans and sketches.

AC2.2. In a construction in which the documentation is delivered to the work itself:

- Identifying in memories, special conditions and additional documentation, information regarding placing and final processing of natural stone building elements.
- Carrying out simple sketches and representations at different scales using the drawing tools.
- Successfully carrying out stone factories templates from specifications detailed plans or sketches.
- Successfully carrying out shoring and bracing for the placing of the stone pieces from specifications detailed plans or sketches.
- Applying measurement techniques, alignment, levelling and lead to rethink the parts and the work to be performed.
- Relating the written documentation to the graph, identifying the different parts and features of the parts, to a complete interpretation of the research.
- Contrast the information received with the actual characteristics of the work by analysing all the elements within it.
- Proposing, with sketches and explanations necessary, the necessary adjustments to the elaboration of the pieces tailored to the characteristics of the work.

A3: Selecting and preparing the machines, tools, supplies and personal protective equipment and collective, as well as the auxiliary means, observing established safety conditions, achieving specified performance and carrying out maintenance and end of day.

AC3.1. Identifying machines, tools and equipment necessary for the installation of singular natural stone elements, relating to the various jobs and processes to carry out.

AC3.2. Operating machinery, tools and supplies with the skill and precision required in a particular activity.

AC3.3. Describing and applying storage operations, maintenance and repair of machines, tools and helpful employees.

AC3.4. Selecting, use and maintain properly the clothing and personal protective equipment required for each activity.

AC3.5. Identifying function, composition and use (installation, testing, maintenance and removal) of the collective means of protection required in a particular activity.

AC3.6. Identifying function, composition and use (installation, testing, maintenance, removal and storage) of the auxiliary means required in a particular activity.

AC3.7. Identifying general environmental risks generated by these works (noise, dust, waste) relating them to adopt protective measures.

A4: Rethinking the various elements and sets of natural stone, as well as areas that are to be placed, following the geometry indicated in plan and established tolerances.

AC4.1. Selecting the instruments and tools required for stakeout.

AC4.2. Extracting information, based on geometry and tolerances of a particular project or work plan, developing a simple sketch with accurate stakeout references and describing how to transfer these references to the support.

AC4.3. In a practical case properly characterised:

- Construction surveying on a specific media references on stroke clean and stable surface, respecting the geometry and tolerance indicated in sketch or plan.
- Locating the correct order placing points (corners, meetings and at intervals which meet certain maximum distance).
- Placing a view to meet the requirements of poise, stability, alignment of their faces, chipping compared to baseline levels and marking sill and lintel.
- Receiving fences, or other auxiliary pre-frames whose placing precedes the lifting of factories meet location requirements, poise, levelling, bracing and beams cut to the height defined.

Content of training unit

1. Masonry, stonework and blockwork: types, characteristics and placing techniques.

- Stone wool, gravel, masonry and ashlar.
- Masonry: ordinary concert, of irregular ashlar courses.
- Ashlar, blockwork.
- Factories on one or both sides.
- Board with mortar, slat stone, metal and others.
- Processes and implementation conditions. Supply. Placing. Storage.
- Stone materials used. Types. Features.
- Building components in natural stone. Types. Main features.
- Types of stone factories.
- Overall process of placing masonry, masonry and blockwork.

Main activities. Sequence.

- Systems thick parts placing thicknesses:
 - Placing bone / / Dry.
 - Systems for adherence: Mortars and resins.
 - Anchoring systems. Typology, arrangement and placing.
- Components, grip and mixtures seat.
- Grasp, keys, meetings, singular points, auctions.
- Machinery, equipment, and tools specific to the placing of stone and materials:
 - Selection.
 - Preparation.
 - Handling.
 - Maintenance operations. Instruction Manuals.
 - Cleaning operations.
 - Storage.
- End of day operations.
- Stone materials received on site:

- Identification.
- Checks.
- Handling.
- Transport.
- Storage on site.
- Using aids in stone factories:
 - Lifting and suspension systems: cranes, slings, wedges, etc.
 - Scaffolds.
 - Shoring, provisional architectural bracing.
- Processes and safety conditions in factories of natural stone:
 - Safety in the placing of masonry, masonry and blockwork.
 - Major occupational hazards.
 - Prevention and protection measures.
- Personal protective equipment and collective stone factories:
 - Selection.
 - Preparation.
 - Utilisation.
 - Maintenance.
- Process and environmental protection conditions in factories of stone:
 - Rules.
 - Main environmental risks.
 - Prevention and protection measures.
 - Waste management: selection, collection, removal.
- Processes and conditions for quality natural stone factories:
 - Checks.
 - Major defects and irregularities.
 - Causes.
 - Possible Solutions.

2. Interpretation of graphic and written placing applied to masonry, masonry and blockwork.

- Projects: documentation.
- Representation systems: dihedral and perspectives.
- Scales.
- Interpretation of sketches and drawings of cutting, assembly, etc.
- Interpretation of written technical documentation.
- Interpretation of rules and special requirements specifications.
- Identification of:
 - Characteristics of the stone pieces.
 - Stand Features.
 - Features mortars, adhesives and / or anchoring systems.
 - Singular points, auctions and meetings.
 - Material resources.
 - Human Resources.
- Identification of possible omissions, uncertainties, errors, mismatched measures, etc.
- Proposed solutions.
- Making sketch.
- Making templates.

- Management tools for drawing.

3. Staking systems applied to the placing of masonry, masonry and blockwork.

- Stakeout planimetric and altimetry (plan and elevation).
- Instruments and tools for staking. Selection. Management.
- Interpretation of the plane: geometry and tolerances.
- References for staking.
- Marking the support.
- Location of view. Intervals. Corners, meetings.
- Measure. Alignment. Levelling / Chipping. Lead.
- Rig. Flatness. Crash. Horizontality of layers.
- Reference bars. Levels sills and lintels of the gaps.
- Location of auction: mouldings, sills, lintels, jambs, etc.
- Fences, pre-frames and other ancillary items.

TRAINING UNIT 2. CONNECTION AND PLACING MASONRY, ASHLARS AND BLOCKWORK ON SITE CONSTRUCTION

Duration. Theory and Training

Total: 60 h

Theory: 20 h

Training: 40 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF4, PF5 and PF6.

Assessment ability and criteria

A1: Fitting the pieces of masonry work, masonry and blockwork, using the proper tools and implements.

AC1.1. Describing the processes to be followed to stabilise a piece of stone before working on it.

AC1.2. Skilfully and accurately handle the tools and equipment necessary to carry out the operations of a stone shot.

AC1.3. Describing the operations required for that given two sides of the seat opposite, may be parallel to each other and perpendicular to the discharge line of efforts, showing step by step tools to use.

AC1.4. In a case study properly characterised:

- Distributing dimensional errors between several pieces, trying to fit together or proposing the implementation of new parts fewest possible.
- Indicating the procedure to be followed for a bulkhead in a facing for the placing of a square grid of ventilation.
- Describing and carrying out the process to achieve a flat seal face, perpendicular to the seat, indicating how the stone mark.
- Given two breeze blocks in the same row and between which there is a given spacing, specifying the operations to get the piece that goes between them considering the various boards.
- Describing and carrying out preliminary operations on each piece trimmed to obtain a homogeneous end facing and aligned, once positioned.

A2: Build factories natural stone masonry, from a given layout and technical documentation respecting safety standards and ensuring the quality of work.

AC2.1. Describing the conditions of implementation of ordinary masonry factories, concerted, of regular ashlar courses, focusing on quality and safety requirements.

AC2.2. Operating machinery, tools and supplies with the skill and precision required in a particular activity.

AC2.3. In a factory construction masonry:

- Preparing masonry from rough stone, responding to the characteristics required for the type of masonry, specified and reserving those larger and regularly to hollow corners and finials.
- Raising stone factories dimensions and thicknesses determined by observing the conditions and tolerances specified in planarity and plumb.
- Conducting meetings between getting the interlocking elements specified.
- Placing landings, or parts prefabricated mono-block, respecting the requirements.
- Sequencing and correctly carrying out the work required to obtain a hollow singular plane defined set, and carrying out properly identifying each of the stages.
- Managing waste generated in accordance with environmental protection regulations.

A3: Applying various positioning systems and blockwork masonry, respecting the layout and technical documentation, in safety and respecting the quality criteria.

AC3.1. Describing the conditions of implementation of stonework and blockwork, focusing on quality and safety requirements.

AC3.2. Listing the steps to follow to carry out the various wall construction types, depending on its dimensions and tolerances to the conditions specified in an implementation project.

AC3.3. Operating machinery, tools and supplies with the skill and precision required in a particular activity.

AC3.4. In a work placing or blockwork masonry:

- Conducting meetings between getting the interlocking elements specified.
- Carefully cleaning the walls obtained by removing traces of mortar.
- Sequencing and correctly carrying out the work required to obtain a hollow singular plane defined set, and carrying out properly identifying each of the process steps: preparation of parts, manufacturing and assembly of auxiliary frame construction, removal subframe.
- Specifying the process for placing of anchorages between transverse.
- Applying the anchorages in established areas.
- Managing waste generated in accordance with environmental protection regulations.

Content of training unit

1. Setting to work the pieces of masonry, masonry and blockwork.

- Preparation of masonry from rough stone.
- Selection and preparation of corners and holes for masonry.
- Preparation of the blocks and blockwork.
- Tools, manual and mechanical adjustment. Utilisation.
- Elimination of transportation blockwork pre-cuts.
- Open or stone pieces to make flat stone.
- Cut by manual and mechanical.
- Tapping.
- Challenged

- Trimmed.
- Getting flat faces and edges seen.
- Edge of floor covering.
- Machined from work: cutting, drilling and mortising.
- Adjust dimensional. Cast dimensional errors between pieces of stone.
- Making grids ports for placing.

2. Placing of masonry.

- Construction of masonry factories.
 - Implementation conditions. Sequence work. Operating process.
 - Length and thickness.
 - Alignment and levelling. Flatness and plumb. Tolerances.
- Mortar and adherents: preparation and application.
- Using of anchorages rough stone placing.
- Connection among arch ribs, gear and games. Lock and keys.
- Fill with gravel.
- Corners.
- Hollow. Windows and doors.
- Union with walls and floors.
- Resolution of encounters: with other materials, other construction elements and other types of construction.

3. Placing of masonry and blockwork

- Construction of stone factories:
 - Implementation conditions. Sequence work. Operating process.
 - Length and thickness.
 - Alignment and levelling. Flatness and plumb. Tolerances.
- Mortar and adherents: preparation and application.
- Using anchorages in placing blocks and breeze blocks.
- Connection among arch ribs, gear and games. Lock and keys.
- Corners.
- Hollow. Windows and doors.
- Union with walls and floors.
- Resolution of encounters: with other materials, other construction elements and other types of construction.

TRAINING UNIT 3. FINISHING TOUCHES OF MASONRY, ASHLARS AND BLOCKWORK ON SITE CONSTRUCTION

Duration. Theory and Training

Total: 30 h

Theory: 10 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF7, PF8 and PF9.

Assessment ability and criteria

A1: Applying the procedures for lintels, arches, cornices, columns, and other singular auctions in brickwork, masonry and blockwork, meeting quality standards and safety regulations.

AC1.1. Describing the process and implementation conditions necessary for installing and removing ancillary components for masonry construction, masonry and blockwork:

- Temporary bracing.
- Shoring.
- Formwork, and girders.
- Templates, detail drawings to assembly pieces, fences, frames, landings and other ancillary items.

AC1.2. Describing the process and implementation conditions necessary to build lintels and arches.

AC1.3. Describing the process and implementation conditions necessary for building cornices, mouldings and imposts.

AC1.3. Describing the process and implementation conditions necessary to build sills, copings and steps brickwork.

AC1.4. Describing the process and implementation conditions necessary to place columns, stairs, balustrades, handrails and other singular construction elements.

AC1.5. In a practical course placing properly characterised masonry or blockwork:

- Sequence and successfully carrying out the work required to obtain a singular shot defined in assembly drawing, and carrying out correctly identifying each of the stages.
- Placing landings, or parts prefabricated mono-block, respecting the requirements.

A2: Carrying out factory auction in stone work, including joint treatment, adjustments and additional work in general, respecting safety and environmental regulations.

AC2.1. Identifying the various auxiliary and complementary (racks, sinks, metal spikes and other) as well as shots required for insertion into the stone elements.

AC2.2. Identifying and implement joint treatment and end caps.

AC2.3. Identifying and implement systems cleaning and finishing of the work.

AC2.4. Describing the major defects that may occur, relating to possible causes and solutions.

AC2.5. In a practical case properly characterised capping a factory in stone:

- Carrying out the actions necessary for the delivery of work, cleaning items placed and the setting and collecting all the waste generated during the process.

Content of training unit

1. Placing items in natural stone singular.

- Placing singular elements. Operational processes and procedures:

- Arches, lintels.
- Columns.
- Eaves, imposts, copings, sills.
- Stairs.
- balusters, handrails and other structural elements.
- Other auctions and singular mouldings.

2. Positioning aids.

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- Temporary bracing.
- Shoring.
- Auxiliaries:
 - Formwork, and girders.
 - Templates, detail drawings for assembly pieces.
 - Fences, frames, landings.
- Placing of landings, or parts prefabricated mono-block.

3. Additional work, finials and finishes.

- Positioning of auxiliary and complementary gratings, drains, and other metal finials.
 - Protection against moisture: barriers in fits and surface finishes.
 - Thickness, filling and finishing of joints. Treatment of joints and surfaces.
- Sealants.
- Auction singular.
 - Cleaning the stone factories and work area.
 - Techniques for cleaning, finishing and appearance.

TEACHING MODULE 6. Designation: PLACING OF STONE CLADDING WITH MORTAR OR CLADDING

Methodological guidance

TRAINING UNITS OF TEACHING MODULE 6	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
Training unit 1	10	20	30
Training unit 2	30	60	90
	40	80	120

Sequence: Training units of this teaching module can be programmed independently.

Criteria of access for students

Level 3 according to European criteria.

TRAINING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE CONSTRUCTION FOR NATURAL STONE CLADDING WITH MORTAR OR ADHESIVE

Duration. Theory and Training

Total: 30 h

Theory: 10 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to the PF1, PF2, PF3, PF4, PF5

Assessment ability and criteria

A1: Identify the tiling work and clad with all kinds of natural stone materials sorting implementation modalities and their respective fields of application, and relating the characteristics and properties of the coating materials.

AC1.1. Sort the tiles and depending on the clad coating materials and gripping and the fields of application-location support and functional requirements.

AC1.2. Describe the differences between tiled and clad, and tiled with mixed adhesion between coatings and mechanical fixing, involving the scope of each type of coating.

AC1.3. Recognise and list the rooms and building components eligible for a tiled or clad, assessing the evolution of the aesthetic demands of the user.

AC1.4. Describe the generic sequence work in executing tiled clad, identifying pre-and post pits and needs coordination needs.

AC1.5. Recognise the types and materials of natural stone tiles on samples submitted, relating their characteristics and basic properties and fields of application.

AC1.6. In a practical case duly characterised by identifying the properties of the coating material:

- Interpret the packing code for the type of waste-series tiles, pattern, tone, size and quality trade-and its CE marking, checking correspondence with the pieces presented.
- Identify the cutting, drilling or mitring, appropriate for the material being handled.

AC1.7. List the characteristics related to the appearance of the pieces in terms of uniformity of tone colour, texture, and directionality of textures and decorations, describing their influence on the final appearance of the coated surface.

AC1.8. Relate causes of defects and malfunctions in the usual tiling work and plating, assessing the possible impact and needs solutions in each case.

AC1.9. Describe the factors of technological and organisational innovation in the work of tiling and cladding, assessing their impact on performance in the implementation as well as the quality, durability and functionality delivered coating.

A2: Apply techniques of installing the usual aids and collective protection executing tiled clad, working in the same facility and correcting deficiencies in that is already installed, provided security measures and specific health .

AC2.1. Identify common labour and environmental risks and plating tiling work, assessing their severity and recognising teams and individual protection measures.

AC2.2. In a practical case properly characterised a particular pit tiling or veneering Identify labour and environmental risks and associated prevention measures and collective protection necessary, by drawing a sketch of the location thereof.

AC2.3. Identify function, composition and use, installation, testing, removal, and storage of different types of scaffolds or platforms and protective devices for work at height tiling or cladding.

AC2.4. In a practical course run properly characterised a tiled height:

- Install, test and disassemble scaffolding.
- Install, test and disassemble a tubular scaffold height.
- Installing and removing collective means of protection needed, communicating with identified gaps and the results obtained.

A3: Contrasting state supports and placing surfaces confirming their suitability to materials and technical implementation under tiles and veneers, and proposing treatment screeds that enable for the intended placement.

AC3.1. List and recognise samples submitted from the various support materials for tiles and veneers, including insulating and waterproofing materials compatible with the tiling work.

AC3.2. Describe the fundamental characteristics and properties must meet the different types of media and positioning surfaces for each placement technique for tiled and clad with mixed grip.

AC3.3. Identify common defects and malfunctions in brackets, intermediate layers, screeds and surfaces that preclude placement, condition the implementation of tiled and clad, or reduce the quality and durability of them.

AC3.4. Describe the usual to make the surfaces tiled or clad delivered for testing, carpentry, pre-installations and fixed equipment needs measures that can be taken in the event of defects in them.

AC3.5. Relate environmental conditions and substrate-temperature and humidity-that allow placement for different types of materials and playing techniques, describing any changes or interventions that can be performed.

AC3.6. Describe the types of expansion joints, the delivery terms of the structural, and the location and characteristics of perimeter and intermediate.

AC3.7. In a practical case properly characterised verification of a real, preferably three-dimensional support:

- Check or verify the stability and strength of brackets depending on their maturity.
- Check if the maturity of the screed and the compressibility of the intermediate layers respectively.
- Check cohesion, texture, absorption / water suction, moisture and cleaning surfaces placement.
- Perform the dimensional control over space-length, width, height and perpendicularity in meetings-and the surfaces which are to receive laminated tiled-flatness and plumb.
- Carry out dimensional control of the woodwork and fixed equipment, especially the location, level and plumb of the latter and the uniformity and ease of woodworking.
- Check the location and proper implementation of the pre-installations.
- Make incident report and propose, if necessary, corrective actions, depending on the material and technique intended placement.
- Suggest materials and performance techniques that fit the diagnostic support.

A4: Select and dose-grip materials pastes, mortars and adhesives, and grouting, and check their properties for cool, considering the nature and possible media conditions and environmental conditions.

AC4.1. Associate the type of hold-paste, mortar or adhesive, or grout used with tiled or clad type to run and support materials compatible.

AC4.2. Interpret the contents of labelling and marking of binders and adhesives presented.

AC4.3. Compare the properties in fresh-consistency and / or workability-two mortar of the same composition and different doses, using the reference tables and nomograms.

AC4.4. Describe features fresh and after hardening of the different types of adhesives and grouts used in placing thin layer or media.

AC4.5. Identify the types of grout and its characteristics, associating them with the tiles, environmental conditions and the requirements of use chemical-resistance, resistance to freeze / thaw, water resistance, resistance to mould growth.

AC4.6. In a practical case properly characterised, known environmental conditions, you specify time adjustability and lifetime of a given bonding material or grout, or open time for the case of adhesives and resin grout.

AC4.7. In a practical case properly characterised different fresh samples of various bonding materials and grouting:

- Assess its workability and estimate their suitability for a particular type of tiling.
- Check colour consistency and no lumps of grout.
- Propose measures for correction or amendment.

AC4.8. In a practical case properly characterised, known environmental conditions and support, as technical specifications of grouting and bonding materials, and given you the art of performance:

- Recognise the type of samples submitted arid, select and evaluate appropriate moisture content.
- Select appropriate dosing and the bonding material and grouting, depending on the mode of application.
- Calculate the total volume of material necessary grip and grouting.
- Calculating the lifetime of the mixture and adjust the mixture to production capacity placing.

A5: Rethinking tile installation based on the geometric characteristics of the supports and the design expectations tiling or veneering selecting as appropriate the type of gear and the width of the grout, and determining the needs of forming parts-cutting, drilling, mitring, or due to their appearance.

AC5.1. Describe the aesthetic possibilities associated with the modularity of rigid coatings, especially the combination of parts of different format, look and material.

AC5.2. Identifying the different types of gear and describe the advantages and disadvantages associated with them depending on substrate conditions and parts, indicating the influence of the dimensional tolerances of the housings and parts.

AC5.3. In a practical course characterised properly calculate the amount of coating material needed for different gear and parts formats, tailoring the corresponding sketch.

AC5.4. Determine the needs of drilling parts and interpreting scale drawings dimension drawings related tiled clad, and in particular Chapter representations of facilities and equipment.

AC5.5. Describe the aspect checks and dimensional tolerances in receiving the tile, linking action to take.

AC5.6. In a practical case properly characterised stakeout of a real room, bathroom and kitchen, three dimensional parallelism flawless edges and openings, coated with non-identical pieces with textures and motifs variables, under the following conditions:

- Checking the dimensional tolerances of the parts for the intended rig.
- Compiling a panel dry with extracted samples collected lots, proposing a placement criterion that considers the uniqueness of the pieces.
- Making Stand bounded sketches, including the presence of fixed equipment, carpentry and pre-installations.
- Making and expressing a complete sketch by staking mode indicated rigging, placing cuts, deliveries to woodworking, construction equipment and other fixed or tangible assets.
- Determining the geometry of the parts to be cut, including its number.
- Determining drilling parts according to pre-installations.
- Calculating the stockpiles necessary for the implementation of tiled or clad with a sufficient degree of approximation and taking into account losses.

Content of training unit

1. Construction systems for enclosures.

- Building Basics:
 - Structure.

- Enclosure.
- Isolation.
- Coatings.
- Facilities facade.
- Supports:
 - Main types: forged edges, walls and other.
 - Materials: brick, concrete, metal, and others.
 - Pillars, beams, etc.
 - Features.
 - Geometry: Alignment, levelling, flatness, roughness.
 - Requirements. Stability.

2. Claddings, components, features.

- Construction system: characteristics, properties.
- Lining: Main types and materials. Features:
 - Natural stone, ceramics, wood, metal, glass and others.
 - Panels, boards, plates and platelets. Standards.
 - Thicknesses, weights, finishes, mechanical properties.
- Placing systems. Classification. Features:
 - Specific systems.
 - Citations and hidden.
 - Retaining and lift.
- Products of union. Types, features, incompatibilities.
- Joints. Types, characteristics. Functionality and performance.
- Solicitations and actions that affect construction system.
- Main construction defects and pathologies among support and coating system. Causes. Effects.
- Factors of technological and organisational innovation in the work of cladding materials, systems, techniques and innovative equipment recently introduced.

3. Interpretation of technical documentation applied to mortar or adhesive cladding.

- Documentation. Project: Report specifications, drawings and measurements. Plan work. Quality plan. Safety Plan.
- Sketch, sketches, drawings and plans.
- Types of drawings: site plans, general plans, detail drawings.
Plans, elevations, sections, perspectives.
- Scales. Graphics and coding. Labelling. Dimension. Orientation.
- Quartered drawing.
- Additional information. Technical Instructions of manufacturers.
- Identification of:
 - Coating characteristics.
 - Stand Features.
 - Characteristics of adhesives and mortars.
 - Singular points, auctions and meetings.
 - Isolation.
 - Material resources.
 - Human Resources.
- Identification of omissions, uncertainties, errors, etc.

- Proposed solutions.
 - Making sketch.
 - Making templates
 - Management tools for drawing.
4. Prep work: work equipment and safety measures.
- Equipment, tools and supplies for installation cladding:
 - Types: main features.
 - Selection.
 - Checking.
 - Handling.
 - Maintenance.
 - Storage.
 - Facilities and work areas. Using spaces.
 - Aids and temporary facilities. Utilisation.
 - Cleaning of equipment and facilities.
 - End of day operations.
 - Labour and environmental risks. Prevention measures.
 - Means of individual and collective protection: selection, preparation, use, maintenance and storage.
 - Waste: Selection, collection and removal.
5. Surveying.
- Instruments and useful. Selection. Management.
 - Interpretation of the plane: geometry and tolerances.
 - Set starting references.
 - Setting of the reference lines:
 - Main lines: lines plumb, level and depth.
 - Auxiliary lines.
 - Placing of teachers and view.
 - Fixing holes and other singular points.
 - Regular checks. Deviations. Tolerance. Settings and error compensation.

TRAINING UNIT 2. PLACING, ATTACHMENT AND FINISHING TOUCH ON SITE CONSTRUCTION FOR NATURAL STONE CLADDING WITH MORTAR OR ADHESIVE

Duration. Theory and Training

Total: 90 h

Theory: 30 h

Training: 60 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to the PF6, PF7, PF8.

Assessment ability and criteria

A1: Apply placement techniques tiling thick with cement mortar or cement and lime mixed, both closed and open meeting, meeting quality measures and specific safety and health.

AC1.1. Identify environmental conditions and usage requirements that discourage the technique in screeds.

AC1.2. Specify the method and sequence work in executing tiled in thick mortar, including grouting operations, final cleaning and, where appropriate, protection tiles.

AC1.3. Describe the variations in performance technique thick layer, in particular variants of placement and placement closed joint open joint.

AC1.4. Identify the causes of defects and specific dysfunctions of tiling work in thick layer.

AC1.5. In a practical case properly characterised as proposed or other similar difficulty-perform tiling thick layer of a structural element, with two or three walls found in Angle-with minimum dimensions for each facing 1.5 m wide and 2.3 m high-, including gaps and facilities, preferably in different window and door facings and simulation hydrants and switch-boxes, including border at half height and different gear bevel and-a-line, and square tile format-preferably comprised between 20 x 20 and 30 x 30 cm, and with singularities or decorative texture-, under the following conditions:

- Noting that the environmental conditions and substrate moisture and the surface characteristics of placement, support materials and technical implementation of tiled, providing corrections or support interventions if applicable.
- Performing stakeout, taking into account both the rig and the supply dips and changes of plane.
- Checking the quality of the tiles and trims available, verifying that correspond to the previews.
- Compiling a dry panel, checking the quality and surface smoothness and, if necessary, by selecting and arranging the pieces according to their uniqueness.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course.
- Checking the suitability and workability of mortar served in making any necessary corrections.
- Carrying out a board of intermediate vertical movement on one of the walls, from the installation of the filling material to the sealing and cleaning.
- Checking the cleanliness of installation joints before grouting operation.
- Applying to day operations of the equipment used.

A2: Apply insulation and waterproofing techniques for media tiled with adhesives or thin-layer media, placing thermal and acoustic insulation medium compressibility and waterproofing sheets or liquid waterproofing, and meeting quality measures and specific health and safety.

AC2.1. Identify the insulating and waterproofing materials that can be used as a surface to be tiled according to their nature and functions, linking the building blocks where isolation or pre-coated waterproofing is necessary or desirable.

AC2.2. Specify the method and sequence of work in placing thermal insulation and / or acoustic medium compressibility non walkable supports.

AC2.3. Specify the method and sequence of work placement lamellar liquid waterproofing and application of non-trafficable waterproofing supports.

AC2.4. Describe common defects in the insulation and waterproofing placement and inner media, specifying which appear and how the thermal or sound bridges and leakage are avoided.

AC2.5. In a practical case properly characterised as proposed or other similar difficulty-place insulation prior to tiling on a facing with minimum dimensions of 3 m width and 2.3 m in height, to

include in its hollow centre a door and facilities-preferably hydrants and electric-power boxes, under the following conditions:

- Checking conditions-environmental and stand-support materials and placement technique-by adhesive or mechanical attachment.
- Checking the quality of the insulation panels available, verifying that correspond with those expected.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course.
- Fixing the panels to the carrier by adhesives or mechanical fasteners not constituting thermal bridges, and trying the joints between panels and steps and records facilities.
- Performing final inspection and plumbing flatness of the surface obtained for thin layer or tiled average.
- Applying to day operations of the equipment used.

AC2.6. In a practical case properly characterised as proposed or other similar difficulty-, two walls for waterproofing tiled thin layer or medium with minimum dimensions of 1.5 m wide and 2.3 m high-including outlets, plumbing, under the following conditions:

- Check that the environmental and substrate conditions are compatible with the materials and waterproofing technology-using sheets or liquid waterproofing.
- Check that the geometry allows for support after waterproofing, a suitable surface for tiling thin layer or media.
- Check the quality of the sheets or liquid waterproofing available, verifying that correspond to the previews.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course.
- Fix the sheets to the carrier by adhesives or by applying liquid waterproofing, making the overlaps between sheets, and installing sleeves bands and steps in the meetings and facilities.
- Applying to day operations of the equipment used.

A3: Apply placement techniques tiled thin layer or adhesive media, both closed and open meeting, meeting quality measures and specific safety and health.

AC3.1. Identify environmental and Delivery Payment placing surface-moisture, cohesion, cleaning and technical support placement thin layer or half flatness/plumbed-, specifying measures that enable its implementation.

AC3.2. Identify the functional requirements-waterproof, chemical resistance and / or freeze / thaw or other a tiled-placed thin layer or media, linking them to the type of adhesive and variants of the application technique.

AC3.3. Specify the method and sequence of tasks during thin layer of tile adhesive or medium, including grouting operations, cleaning and, if necessary, protection tiles.

AC3.4. Describe the variations in performance technique thin layer or media, including single or double sizing and placement to open or closed meeting.

AC3.5. Identify the causes of defects and specific dysfunctions of work tiling thin layer or medium, relating to environmental conditions, preparation and application of the adhesive, the type of tiles used and the characteristics and conditions of supply of surfaces placement.

AC3.6. In a practical case properly characterised as proposed or other similar difficulty-tiled perform thin layer of support resulting from the implementation of the evaluation criteria CE7.5, preferably

with minimum-rectangular tile format 20 x 40 cm-placed to open joint (3-5 mm) and lock background (1/2), including a border at half height, under the following conditions:

- Performing the necessary checks prior to the support, parts availability and environmental conditions, verifying compatibility with thin-layer technique.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course.
- Selecting the type of compatible adhesive surface placement.
- Applying a first contact layer reinforced with fibreglass mat on the entire surface to be tiled.
- Performing the space surrounding the placement-and respecting pre-installations once the contact layer hardened by double glue technique, and previously checking the features served fresh adhesive.
- Applying to day operations of the equipment used.

AC3.7. In a practical case properly characterised as proposed or other similar difficulty-tiled perform thin layer of support resulting from the implementation of the evaluation criteria CE7.6, a closed joint (1.5 mm) and line including a border at half height, under the following conditions:

- Noting that the environmental and substrate conditions are compatible with thin-layer placement.
- Identify the type and characteristics of the mesh, the adhesion of the tiles and the width of joint between them, checking if they correspond to the model provided.
- Checking the suitability and workability of adhesives and grout served.
- Performing steps respecting the placement of facilities.
- Checking and cleaning the joints between tiles prior to grouting operation and proper alignment and width of the joints between pieces flatness and uniformity.
- Performing grouting and cleaning.
- Applying to day operations of the equipment used.

AC3.8. In a practical case properly characterised as proposed or other similar difficulty-performing thin layer tiling two walls of plasterboard found in Angle-with minimum dimensions of 1.5 m wide and 2 3-m high, preferably including border at half height and different gear separated by a border tiles 30x30 cm from the ground and background work (sixth) and tile rectified 20 x 60 cm up to the ceiling, a closed ring (1.5 mm), under the following conditions:

- Noting that the environmental conditions are compatible with the materials and technique of thin-layer implementation and the appropriateness and workability of adhesives served.
- Checking the quality and dimensional tolerances of the tiles and special pieces total, with special attention to the lateral curvature of the large rectangular format rectified verifying that correspond to expected patterns.
- Performing both placement and grouting and cleaning.
- Applying to day operations of the equipment used.

A4: Apply traditional plating techniques using mixed-grip over-anchor fastening, meeting quality measures and specific safety and health.

AC4.1. Identify environmental conditions and requirements that discourage use of compatible technical clad with mixed support.

AC4.2. Specify the method and sequence of work in implementing mixed-clad clamping operations including grouting, cleaning and, if necessary, clad protection.

AC4.3. Describe the variations in performance technique with mixed subject, in particular variants of placement and placement closed joint open joint.

AC4.4. Identify the causes of defects and malfunctions specific jobs clad with mixed support.

AC4.5. In a practical case properly characterised as proposed or other similar difficulty-clad perform a subject with mixed outer-facing with 1.8 m minimum width from the pavement to 2.1-m high, in the centre a door opens and includes a junction box, placing minimal plates 40 x 60 cm format and online at the following conditions:

- Checking that the environmental conditions, temperature and humidity of the surface are compatible with the materials and technique of plating mixed support.
- Checking the quality and tolerance of natural stone tile available, verifying that correspond to planned and incorporate drills in singing required for anchorage, stating the need for preservative treatment of eye surface before placement.
- Checking the suitability and workability of gypsum plaster or mortar served, making the necessary corrections.
- Selecting the machines, tools and supplies needed for the job, as well as personal protective equipment required, following the established security measures and health during the implementation of the course.
- Performing surrounding the hole placement, adjusting the vertical frame and respecting the case record.
- Applying to day operations of the equipment used.

Content of training unit

1. Tiling work and plating

- Tile types: direct adhered installed tiles (thick layer and thin layer or average), tiled on special screed (with insulation and / or waterproofing), special tiles (for insulation and waterproofing, on prefabricated supports, high strength and / or chemical resistant to freeze / thaw, bactericides and resistant to mould growth, and other self-cleaning) impermeability.
 - Fields of application: according to use of the building, according to functional requirements, by type of media (not walkable: partitions, cladding, roofing not walkable, walls and others) based on the trends in architecture, interior design and decoration. Materials for tiling: commercial and product groups types according to European and international standards; formats; properties; encoding according to CE marking information on labels and labelled packaging.
 - Veneers Materials: types, formats, properties.
 - Organisation pit: relationships with other elements and force cuts in both delivery stage finishes such as post jobs tiled and clad and phases.
- Defects and malfunctions and tiled clad: defect classes, according to their importance and impact severity, causes and solutions depending on the type of defect. Equipment and implementation of tiled clad: types and functions (selection, testing and handling).
- Risk prevention in the work of tiling and plating: occupational risk specific preventive techniques, personal protective equipment and means of collective protection (installation, usage and obligations, maintenance), aids; interference between activities (simultaneous or successive activities). Environmental risks.
 - Factors technological and organisational innovation in modular hard covering materials, techniques and innovative equipment recently introduced; trends in the use of modular rigid supports finishes on non-trafficable; innovative systems in the context of sustainable building.

2. Supports tiled plating.

- Support Structure: sturdy support base, intermediate layers (screeds and pastries, special screeds on insulation layers, layers of insulation, waterproofing layers), a bridge (primers, reinforcing meshes).
- Positioning surfaces: ceramic, concrete, plaster and mortar (cement and mixed), plasterboard, insulation panels, sheet and liquid waterproofing waterproofing, wood surfaces or pellets and wood laminates, metal surfaces.
- Types of insulation: medium and low compressibility.
- Types of waterproofing indoors: You liquids and sheets.
- Conditions of the substrate: the resilient support base (stability, mechanical strength) of the screed layers (maturity) of the insulation layers (low or medium compressibility) adhesion placement surface (sanitation, cleaning, cohesion, regularity, texture, porosity / suction surface moisture, temperature, chemical compatibility with the bonding material, insensitivity to water and humidity, cleanliness) of the placing surface (level and final dimension, flatness and plumb) between geometric surfaces placement (parallel, perpendicular) of elements associated with the bracket (location, level, plumb, squareness and other conditions of installations, carpentry, equipment, fixed furniture).
- Diagnosis of supports: support for bonding materials and techniques proposed placement, media adaptation treatments, corrective measures. Stand Movement Joints: types (structural, intermediate, perimeter); functions and features, fillers and sealing joints, together with special features (chemical resistance and sealing).

3. Bonding materials and grouting for tiles and clad

- Bonding materials: types (gypsum plaster, cement and cement and lime mixed, cementitious adhesives, reaction resin adhesive resin dispersion) component types (types and grading of aggregates, types of binders, adhesive types, coding and CE marking of components).
- Grouting materials: types of grouting materials, coding and features. Terms of mixtures: composition, dosage, consistency, durability, uniformity, adhesion to the substrate, adhesion with insulation and waterproofing, mechanical and chemical resistance.
- Selection and dosing of gripping and grouting materials depending on the substrate and coating, environmental conditions and other factors.
- Adhesive selection function of time in the open and the slip resistance for placement thin layer or medium.

4. Stakeout in tiled and clad

- Modularity and combinability rigid modular cladding.
- Selecting gear: gear types, current trends in interior design and decoration; influence of the dimensional tolerances of the parts; appropriate substrate conditions; optimising material.
- Treatment of meetings and changes of plane: special pieces; criteria position cuts, mitring, treatment starts, changes top and flat on mixed clad by subject.
- Processing equipment and facilities: drilling needs, treatment records, location of parts piercing. Plans for tiling and plating: plans and sketches related tiled clad, floor plans and equipment.

5. Tiling thick layer

- Checks and pretreatments bracket and associated elements.
- Material selection and dosage gripping and grouting: environmental conditions, support features and parts. Mix workability.

- Checking parts. Stakeout. Thumbnail rules and piece of plaster to fix. Thumbnail pieces: sense of progress. Own boards. Sealing movement joints. Preliminary cleaning hardened.
- End Quality: flatness, plumb, alignment of joints, cleaning.
- Application defects, causes and effects.

6. Tiling thin layer and media

- Checks and pretreatments bracket and associated elements.
- Selection of the adhesive and grout: environmental conditions, support features and parts. Workability (open and pick up time) of the adhesive. Checking parts. Stakeout. Thumbnail pieces: sense of progress.
- Own boards. Sealing movement joints. Hardened prior to cleaning.
- End Quality: flatness, plumb, alignment of joints, cleaning.
- Application defects, causes and effects.

7. Special tiles

- Type: on thermal insulation and / or acoustic, on stands prefabricated waterproofing sheet on or liquid, other (high strength and / or chemical waterproof, resistant to freeze / thaw, bactericides and resistant to mould growth, self-cleaning others).
- Insulation layers: functions, insulation materials (sheets, plates, step tops and sealing gaskets, reinforcement mesh) Payment isolates (type and thickness, own boards, meetings, fixing to vertical faces); common implementation defects (causes and effects, thermal and acoustical bridges).
- Waterproofing tiled interior elements: types of items (toilets, showers, saunas, hydromassage cabins, kitchens, etc.); waterproofing materials (plates, liquid waterproofing, bands and sleeves); condition waterproofing (mode of application and thickness liquid waterproofing, fixing vertical walls and overlaps of sheets, meetings and deliveries waterproofing plumbing; common implementation defects (causes and effects; leaks).
- Prefabricated brackets: types of products (materials, features and mounting systems) requirements (stability, delivery and technical support materials and placement).
- Checks and pre-treatments bracket and associated elements. Testing of insulating or waterproofing materials. Thumbnail insulators. Treatment of joints between panels.
- Checking prefabricated supports: stability, plumb, flatness, encounters between panels, guard bands. Criteria for selection of treatments on these supports and the selection of materials for grip and grouting of tiles.
- Checking waterproofing materials. Positioning and fixing of sheets, application of liquid waterproofing. Treatment delivery and plane changes. Selection of the adhesive and grout: environmental conditions, support features and parts. Workability of the product.
- Checking parts. Stakeout. Thumbnail pieces: sense of progress. Own boards. Sealing movement joints. Preliminary cleaning hardened.
- End Quality: flatness, plumb, alignment of joints, cleaning.
- Application defects, causes and effects.

8. Clad with mixed subject

- Types and elements point anchor.
- Checks and pre-treatments bracket and associated elements.
- Material selection and dosage gripping and grouting: environmental conditions, support features and parts. Mix workability. Checking anchors. Checking parts.

- Stakeout. Thumbnail rules and piece of plaster to fix. Perforation of the support, setting anchors (if it is necessary). Thumbnail pieces: sense of progress. Own boards. Sealing movement joints. Cleaning before hardening.
- End Quality: flatness, plumb, alignment of joints, cleaning.
- Application defects, causes and effects.

TEACHING MODULE 7. Designation: ASSEMBLING OF VENTILATED FACADES

Methodological guidance

TRAINING UNITS OF TEACHING MODULE 7	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
Training unit 1	20	20	40
Training unit 2	10	50	60
Training unit 3	10	30	40
Training unit 4	10	50	60
	50	150	200

Sequence: Training units of this teaching module can be programmed independently.

Criteria of access for students

Level 3 according to European criteria.

TRAINING UNIT 1. PREPARATION OF TASKS AND CONSTRUCTION SURVEYING ON SITE FOR VENTILATED FACADES

Duration. Theory and Training

Total: 40 h

Theory: 20 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF1, PF2, PF3 and PF4.

Assessment ability and criteria

A1: Defining the characteristics and conditions of the facades ventilated, identifying the different types of components (supports, anchorages or anchorages and coating subsystems) and identifying the actions and incompatibilities that exist between them.

AC1.1. Describing the ventilated facade construction system giving its main characteristics and properties.

AC1.2. Recognising the different types of support (continuous: brick factories and blocks of concrete and reinforced concrete, discontinuous: columns, beams and slab fronts, and mixed), indicating their capacity in different anchoring systems.

AC1.3. Recognising the different types and coating materials, identifying the main characteristics of each.

- Types: Panels, boards, plates or platelets. Thicknesses and weights standards, minimum and maximum.
- Stone: Main classes (granite, marble, slate, etc.) and main characteristics: weight, mechanical properties, different finishes, surface aspect ratio.
- Ceramic materials. Main features: weight, mechanical properties, different finishes, surface aspect ratio.
- Other materials: wood, metal, glass and others. Main features: weight, mechanical properties, different finishes, surface aspect ratio.

AC1.4. Classifying the subsystems of anchorage (anchorage point and non-point, adjustable and non-adjustable, seen and hidden, retention and support / retention, and others) listing the main characteristics of each type and relating to different types of fasteners, brackets, substructure, unions / clip and trims.

AC1.5. Recognising the different types of shaping boards, noting its functionality and behaviour.

AC1.6. Identifying the different materials anchorages (aluminium alloy, stainless steel or other) as well as different products for fixing and binding and liner support (mortars, resins and other), noting the properties and applications of each, and interaction and possible incompatibilities between the different materials (anchorage coating and support).

AC1.7. Indicating the calls and actions affecting the facades ventilated (gravitational, thermal, rheological, humidity, proximity to the sea, ice, wind, earthquakes, fire, possible impacts, pollution, degradation and other) indicating the precautions to be observed in placing of the system to prevent warping and ensure durability.

AC1.8. Relating the usual defects in the assembly of ventilated facades with their causes and effects, distinguishing between problems and diseases that are specific to the system or placing of which are specific to the work and project due to defects or improper implementation .

AC1.9. Identifying on various assumptions given, incompatibility or improper choice of materials (for a default project or the reality of the work), detailing the problems that can arise and how to minimise or avoid them, and if not, its possible treatment.

AC1.10. Describing the factors of technological innovation and organisational ventilated facades work in the construction sector, assessing its impact on the associated competency unit training module.

A2: Analysing project documentation and related work plans with the placing of facades ventilated, identifying the criteria and conditions for performance, quality and safety and making simple sketches.

AC2.1. Distinguish types of technical documents themselves a masonry (basic design, project implementation, project modified work plan, sketch complementary work etc.) and their stages of development.

AC2.2. In a practical case properly characterised masonry which delivers the proper documentation of the work:

- Removing the information contained in the documents received: project work plan: report, plans, specifications, measurements and study of health and safety.

- Relating assembly drawings with detail, and the various views and projections of the same element.
- Drawing simple sketches of cutting and staking for the completion of construction elements.

A3: Preparing the machines, tools, supplies and personal protective equipment associated with assembly work ventilated facades, in accordance with its operating instructions and safety regulations.

AC3.1. Identifying machines, tools and equipment necessary for mounting ventilated facades.

AC3.2. Identifying occupational hazards associated with the handling of the equipment, tools and supplies used for mounting ventilated facades, assessing their severity and relating them to the appropriate personal protective equipment for each case.

AC3.3. Describing the main operations of preparation, storage, maintenance and upkeep of tools, supplies and personal protective equipment used in the assembly of ventilated facades.

AC3.4. In a practical case properly characterised mounting a front ventilated:

- Preparing the machines, tools and supplies suitable for mounting on the front, according to the instructions received.
- Selecting and preparing correctly the clothing and personal protective equipment required for safe operations.
- Carrying out maintenance operations, maintenance and storage of tools, supplies and personal protective equipment used.

A4: Recognising and applying collective protection measures more frequent in the pits of ventilated facades, respecting safety and environmental regulations.

AC4.1. Identifying general labour and environmental risks associated with the installation of ventilated facades, assessing severity and assigning the preventive and protective measures associated with them collectively.

AC4.2. Identifying the role, composition and use (installation, testing, maintenance, removal and storage) of the collective means of protection required for the assembly of a facade ventilated.

AC4.3. Describing the cleaning, storage and maintenance of the means used.

AC4.4. In a practical case properly characterised mounting a front ventilated:

- Selecting and applying the appropriate collective protection measures for safe implementation.
- Applying environmental protection measures appropriate in accordance with environmental regulations.
- Carrying out the cleaning, maintenance and storage of the media used.

A5: Applying measurement techniques, alignment, levelling and lead to stakeout mounting works ventilated facades, understanding drawings and other technical documentation of this work itself and respecting siting criteria, verticality and levelling.

AC5.1. Identifying the main techniques for stake in ventilated façade work.

AC5.2. In a case study characterised properly mount a facade work ventilated:

- Selecting and understanding information necessary for its stake.
- Selecting and use expertly and useful instruments required for stakeout.
- Recognising the references starting or origin of measures, placing them in their correct spatial position.
- Placing the reference lines from the original, respecting the characteristics of received position.
- Positioning the holes (pre-frames, fences and other ancillary items) meeting the requirements of location, verticality and levelling.

- Checking for proper construction surveying of the anchoring elements by measuring it from the source reference lines.
- Using plotters and laser levelling, Recognising the parking errors.
- Contrasting the information received with the actual characteristics of the work by analysing all the elements that compose it, to identify possible deviations from that projected.
- Proposing, using the sketches and explanations necessary, the necessary adjustments to compensate for any deviations detected.
- Identifying the correct situation points stakeout references.
- Comparing the instructions provided with the features, properties and limitations of the anchorages.

Content of training unit

1. Construction systems for enclosures.

- Building Basics:
 - Structure.
 - Enclosure.
 - Isolation.
 - Coatings.
 - Facilities facade.
 - Mechanical load.
- Supports:
 - Main types: forged edges, bearing walls, steel structures and other.
 - Materials: brick, concrete, metal, and others.
 - Pillars, beams, etc.
 - Features.
 - Geometry: Alignment, levelling flatness, roughness.
 - Requirements. Stability.

2. Facades ventilated, components, features.

- Ventilated facade construction system: characteristics, properties.
 - Lining: Main types and materials. Features:
 - Natural stone, ceramics, wood, metal, glass and others.
 - Panels, boards, plates and platelets. Standards.
 - Thicknesses, weights, finishes, mechanical properties.
 - Anchoring systems. Classification. Features:
 - Specific systems.
 - Systems with profiles.
 - Adjustable and non-adjustable anchorages.
 - Citations and hidden.
 - Retaining and lift.
 - System components: fasteners, brackets, substructure, joints / couplings, special pieces.
 - Types of anchorages: materials, features and incompatibilities.
 - Fastening and bonding products. Types, features, incompatibilities.
 - Gaskets. Types, characteristics. Functionality and behaviour.
 - Solicitations and actions that affect ventilated façade system.
 - Major defects and pathologies-anchorage support system-coating.
- Causes. Effects.

- Factors of technological and organisational innovation in the work of facades: materials, systems, techniques and innovative equipment recently introduced.

3. Interpretation of technical documentation applied to ventilated facades.

- Documentation: Project: report, specifications, drawings and measurements. Plan work. Quality plan. Safety Plan.
- Sketch, sketches, drawings and plans.
- Types of drawings: site plans, general plans, detail drawings. Plans, elevations, sections, perspectives.
- Scales. Graphics and coding. Labelling. Dimension. Orientation.
- Quartered drawing.
- Additional information. Technical Instructions anchorages manufacturers.
- Identification of:
 - Coating characteristics.
 - Stand Features.
 - Characteristics of anchoring systems.
 - Singular points, auctions and meetings.
 - Isolation.
 - Mortars and adhesives.
 - Material resources.
 - Human Resources.
- Identification of omissions, uncertainties, errors, etc.
- Proposed solutions.
- Making sketch.
- Making templates
- Management tools for drawing.

4. Prep work: cut equipment and safety measures.

- Equipment, tools and supplies for installation of facades ventilated:
 - Types: main features.
 - Selection.
 - Checking.
 - Handling.
 - Maintenance.
 - Storage.
- Facilities and work areas. Using spaces.
- Aids and temporary facilities. Utilisation.
- Cleaning of equipment and facilities.
- End of day operations.
- Labour and environmental risks. Prevention measures.
- Means of individual and collective protection: selection, preparation, use, maintenance and storage.
- Waste: Selection, collection and removal.

5. Staking ventilated facades.

- Instruments and useful. Selection. Management.
- Interpretation of the plane: geometry and tolerances.

- Set starting references.
- Setting of the reference lines:
 - Main lines: lines plumb, level and depth.
 - Auxiliary lines.
- Placing of teachers and view.
- Fixing holes and other singular points.
- Regular checks. Deviations. Tolerance. Settings and error compensation.

TRAINING UNIT 2. CONNECTION AND PLACING ANCHORAGES AND SUB-STRUCTURE FOR VENTILATED FACADES

Duration. Theory and Training

Total: 60 h

Theory: 10 h

Training: 50 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF5.

Assessment ability and criteria

A1: Setting the anchorages for mounting bracket ventilated facades, following the manufacturer's technical instructions anchorages and understanding technical documentation.

AC1.1. Recognising the characteristics required in a subsystem support anchorage about geometry (levelling, flatness and roughness), strength, capacity and condition, to achieve adequate fixation anchoring subsystem.

AC1.2. Describing the procedures for installing the bracket fasteners, Recognising the quality and safety criteria, as well as the main problems and defects that can occur in its placing, its causes and effects.

AC1.3. Applying safety measures and environmental protection while carrying out assembly work of the anchorages.

AC1.4. In a practical case mounting properly characterised ventilated façade and redesigned, and based on force planes and technical instructions of the manufacturer of anchorages:

- Checking the anchorages.
- Checking the support.
- Placing the fasteners in the following references support the stakeout.
- Use personal protective equipment and collective protection measures.
- Respect the environment protection measures.

A2: Installing anchoring subsystem assembly ventilated facades, following the manufacturer's technical instructions anchorages and understanding technical documentation.

AC2.1. Describing the methods of assembling main substructures or existing anchorage body, distinguishing the quality and safety criteria, as well as the main problems and defects that can occur in its placing, its causes and effects.

AC2.2. Recognising the different torques depending on the fasteners.

AC2.3. Quoting mechanical key used for fixing and for cutting profiles and their criteria for support and safety measures to be taken.

AC2.4. Applying safety measures and environmental protection while carrying out assembly work anchoring subsystem.

AC2.5. In a practical case mounting properly characterised ventilated façade and redesigned, and based on force planes and technical instructions of the manufacturer of anchorages:

- Checking the anchorages.
- Checking the support.
- Placing the fasteners in the following references support the stakeout.
- Placing the anchorage body subsystem or on the fasteners.
- Checking the strength and quality of fixations made.
- Using personal protective equipment and collective protection measures.
- Respecting the environment protection measures.

Content of training unit

1. Subsystem fixing anchorage bracket.

- Installing the bracket fasteners: punctual and would outline systems.
- Operational process:
 - Checking the anchorages.
 - Checking the stand.
 - Reception of the fastening element to the support.
 - Securing the anchorage bracket.
 - Checking the work: position, mechanical condition, resistance.
- Equipment, tools and materials. Utilisation.
- Safety standards. Checks. Use of personal protective equipment and collective.
- Quality criteria. Installation Problems and defects: causes and effects.

2. Mounting the substructure.

- Operational process:
 - Cut section member of the substructure.
 - Installing the substructure on the anchorages.
 - Leaded, level. Space for expansion.
 - Checking the work: position, mechanical condition, resistance.

3. Using the equipment, tools and materials.

- Equipment, tools and materials. Utilisation.
- Safety standards. Checks. Use of personal protective equipment and collective.
- Quality criteria. Installation Problems and defects: causes and effects.

TRAINING UNIT 3. CONNECTION CLADDING FOR VENTILATED FACADES

Duration. Theory and Training

Total: 40 h

Theory: 10 h

Training: 30 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF6, PF7 and PF9.

Assessment ability and criteria

A1: Placing insulation panels in facades ventilated, for waterproofing of the work, resolving potential interference points insulator with the other elements of the facade.

AC1.1. Identifying the different types of insulation panels, Recognising their specific uses.

AC1.2. Describing the procedures for the placing and bonding of the insulation to the substrate, indicating the conditions for successful implementation.

AC1.3. Recognising fixing errors insulation panels, indicating its causes and consequences.

AC1.4. Identifying thermal bridges, indicating its causes and consequences.

AC1.5. Recognising the correct connection between panels to ensure joint tightness.

AC1.6. Identifying points insulating interference with other facade elements, indicating the right way to solve them.

AC1.7. Identifying the main waste generated during placing operations isolation and environmental protection measures to be adopted.

CE1.8 In a case of study properly characterised assembly and given a front ventilated force planes in the manufacturer's technical instructions isolation, making the placing of the insulation panels maintain the tightness of the work and resolving potential interference points insulation with the remaining facade elements.

A2: Operating machines and tools used in work to form the cladding elements and applying various surface treatments (cutting, drilling, sandblasting, bush hammering, polishing, compressor and others), according to safety regulations and environmental protection.

AC2.1. Identifying the main work consists in assembling ventilated facades, Recognising the quality criteria.

AC2.2. Recognising norms risk prevention relating to the use of machinery, equipment and materials required for forming a facade elements ventilated.

AC2.3. Identifying the different products commonly used for surface treatment chemical type coating parts ventilated facades, relating them to different application methods.

AC2.4. Identifying the main environmental risks associated with the use of products for natural stone finish.

AC2.5. In a practical case mounting properly characterised ventilated façade and executed and based on planes of work:

- Identifying the planes from the covering pieces to be shaped.
- Identifying places or situation to accommodate the anchorages in the coating.
- Drilling the holes with the characteristics required to achieve the correct anchorage housing lining piece.
- Making the necessary machining work, operating machines and tools according to the peculiarities of the material.
- Organising and coordinate the tasks corresponding to the correct operation of machinery.
- Applying the rules of occupational safety especially regarding the proper use of machinery, and auxiliary facilities.
- Applying environmental protection standards.

A3: Applying appropriate techniques to link and / or engage the trim pieces to anchoring subsystem, following the manufacturer's technical instructions anchorages and understanding technical documentation work.

AC3.1. Recognising defects that prevent the use of different pieces of siding.

AC3.2. Recognising the flaws and defects in the anchorage points that prevent their use.

AC3.3. Describing the main procedures binding / coupling parts or substructures coating anchorage body, Recognising the main criteria of quality and safety, as well as the main problems and defects that can occur in its placing, its causes and effects.

AC3.4. Recognising the conditions for preparing the mixture and curing of adhesives.

AC3.5. Describing the use of mechanical means used for coating placing, relating to security measures taken especially the use of personal protective equipment and collective.

AC3.6. In a practical case mounting properly characterised ventilated façade in which the subsystem is executed based anchorage and some working drawings and technical instructions of the manufacturer of anchorages:

- Checking the lining pieces.
- Checking the anchorage points.
- Preparing chemicals binding according to manufacturer's instructions.
- Putting the pieces of the coating to anchoring subsystem.
- Checking the strength and quality of connections made.
- Applying safety standards.

Content of training unit

1. Placing insulation panels

- Types of insulation panels.
- Placing insulation panels. Operational process:
 - Checking: material, thickness, bonding system specifications.
 - Checking the stand.
 - Environmental conditions. Moisture protection.
 - Securing the support.
 - Connection between panels.
 - Resolution of encounters with other construction elements.
 - Removal of waste.
 - Checking the work: stability, tightness, thermal bridges.
- Equipment, tools and materials. Utilisation.
- Safety standards. Use of personal protective equipment and collective.
- Quality checks, placing problems and defects: causes and effects.

2. Forming work of trim parts.

- Forming Operations site. Types.
- Measurements.
- Use of templates.
- Setting of parts. Manual and mechanical cutting.
- Machining: drilling, grooving, chamfering, and other
- Surface treatment: polished, bush hammered, sandblasted and others.
- Equipment and Tools. Utilisation.
- Surface treatment chemicals. Safety. Waste removal.
- Placing items pre-installation. Fixing: mechanical and chemical.
- Safety standards. Use of personal protective equipment and collective.
- Environmental protection standards. Collection and removal of waste.

3. Bonding / coupling subsystem anchorage coating.

- Pieces of coating:

- Checking the coating: identification, status, machining. Pathologies. Reasons for failure of parts.
- Collection, handling, transit and storage.
- Union coating. Operational process:
 - Checking the anchorage points
 - Checking the air
 - Placing of the coating. Order of the pieces.
 - Binding anchoring system: preparation and application of the elements and binding products.
 - Checking the work: separation between parts, conditions for expansion, bond strength.
- Equipment, tools and materials. Utilisation.
- Mortars and adhesives: types, preparation and curing. Specifications.
- Auxiliaries: use for lifting and handling of coated parts.
- Safety standards.
- Periodic checks stakeout. Deviations. Range-looking surface. Tolerances. Settings and error compensation.
- Quality criteria. Checks. Problems and defects of attachment: causes and effects.
- Joint Clamp.

TRAINING UNIT 4. SINGULAR TASKS AND FINISH TOUCH OF VENTILATED FACADES

Duration. Theory and Training

Total: 60 h

Theory: 10 h

Training: 50 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF8, PF10 and PF11.

Assessment ability and criteria

A1: Using proper techniques for placing various singular elements (meetings, auctions, expect) used in a front ventilated discontinuities (voids, baseboards, edges, etc.), to ensure the functionality of the facades (ventilation, lack of bridges thermal, waterproofing), under conditions of occupational and environmental safety and their quality standards.

AC1.1. Recognising the major elements existing facades ventilated singular.

AC1.2. Describing the process of placing the main elements singular ventilated existing facades, Recognising the main criteria of quality and safety, as well as the main problems and defects that can occur in its placing, its causes and effects.

AC1.3. Describing the use of the main means used to place the various singular elements, relating to safety standards to adopt, adopt, especially the use of personal protective equipment and collective.

AC1.4. In a practical case properly characterised a front mounting and starting ventilated force planes:

- Recognition at the singular elements, understanding and identifying their position in the front and finish requirements.
- Making the placing of the singular elements of the subsystem anchorage according to the specifications of the project.

- Checking the location of parts for total stability, as set out in the project.
- Applying the various systems and products for bonding different materials according to their physical and mechanical characteristics.
- Applying safety standards.
- Identifying the elements that ensure tightness against water ingress into the facade.

A2: Carrying out sealing operations, cleaning tack and the various elements that constitute the ventilated façade system, to its final and complete auction.

AC2.1. Sorting the various sealing and cleaning products based on their application, detailing the risks and safety measures to be taken into account both in its application and in its handling and storage.

AC2.2. Describing the process for receiving and sealing on the façade system ventilated complementarities and auction, such as vents, fasteners, functional elements and / or aesthetic, or similar, either temporarily or permanently integrate pass.

AC2.3. Describing an action plan, which included, sequenced manner, all the steps and products, machines, tools and equipment necessary to carry out additional work and tacks.

AC2.4. State the acceptance criteria of the major interventions (sealing joints and other).

AC2.5. In a practical case properly characterised, from planes and technical instructions, and whose purpose is to carry out the sealing, flushing, joint treatment and other finish treatments of work:

- Differentiating in the plane and pictures of the work, points and critical areas of potential concern, noting their corresponding pathology.
- Developing an action plan indicating the order in which the various interventions made.
- Preparing and operating the tools, equipment and products used for each job.
- Identifying the risks inherent to working in the work and the implementation of the various products.
- Conducting joint treatment indicated.
- Placing grids or other singular elements to the finish specified.
- Cleaning the facade.
- Checking the level of finish of all jobs.

A3: Carrying out disassembly ventilated system for storage or transfer, properly handling the various parts and elements in it.

AC3.1. Quoting safety criteria (physical-mechanical deterioration) that determine the need to replace parts of coating and / or anchorage metal elements in a system already built.

AC3.2. Describing and applying the procedure for the safe conduct of the work of removal and replacing of parts.

AC3.3. Enumerating machines, tools, supplies and materials required for both the dismantling and subsequent handling and assembly of the various fasteners and anchorage coating.

AC3.4. Identifying the risks that exist in every part of the process, indicating the precautions to be taken into account to minimise them.

AC3.5. Describing how to carry out the manipulation of pieces that have to intervene more than one operator.

AC3.6. Citing handling and storage criteria to be contemplating, both for the anchoring elements, and for coating parts (eccentricity, weight, fragility).

AC3.7. In a practical case properly characterised ventilated facade:

- Distinguish the error: existing holding, inadequate coating some parts (unlike colour, appearance, texture, and other), flatness defects and plumbing and space between boards.

- Remove the trim pieces to be determined, according to the instructions and procedures for handling, transport and storage.

Content of training unit

1. Additional work placing singular elements and finishing shots.
 - Singular elements. Types. Features.
 - Placing: operational process:
 - Checking the singular elements: position, applications, finishes.
 - Reception on anchoring subsystem.
 - Locating parts: stability in the horizontal, vertical, and inclined.
 - Connection between different materials. Techniques and products.
 - Application of safety standards.
 - Checking the work: position, stability, tightness.
 - Capping complementary elements: Types. Features. Placing: operational process.
 - Shots against other building systems.
 - Placing vents.
2. Operations auction and ventilated facade finish.
 - Sealing and joint treatment:
 - Products.
 - Application.
 - Checks.
 - Shooting:
 - Types: functional and decorative elements.
 - Placing.
 - Checks.
 - Cleaning systems:
 - Products. Technical Specifications
 - Development and implementation.
 - Equipment, tools, materials and products. Handling and storage.
 - Safety standards.
 - Finishing. Final checks.
 - Waste: recall, withdrawal.
3. Replacing ventilated facade elements.
 - Parts to be replaced. Pathologies: non-acceptance criteria.
 - Aids handling, lifting and transport.
 - Disassembly process: process, equipment and tools, safety standards. Removal of the parts.
 - Definition of replacing parts. Processing orders.
 - Selection, collection and storage of new parts.
 - Assembly process new parts: placing procedure, equipment and tools, safety standards.
 - Partial and final checks.

TEACHING MODULE 8. Designation: PLACING OF SINGULAR ELEMENTS OF STONE

Methodological guidance

TRAINING UNITS OF TEACHING MODULE 8	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
Training unit 1	10	20	30
Training unit 2	20	40	60
Training unit 3	10	20	30
	40	80	120

Sequence: Training units of this teaching module can be programmed independently.

Criteria of access for students

Level 3 according to European criteria.

TRAINING UNIT 1. PREPARATION OF TASKS AND SURVEYING FOR SINGULAR ELEMENTS OF NATURAL STONE ON SITE CONSTRUCTION

Duration. Theory and Training

Total: 30 h

Theory: 10 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF1, PF2 and PF4.

Assessment ability and criteria

A1: Characterisation of the different types of singular elements of natural stone, and showing the process and conditions to place.

AC1.1. Sorting the various natural stone materials, and knowing the main characteristics of each.

AC1.2. Sorting the different types of singular elements of natural stone, and indicating the characteristics of each:

- Constructive / decorative elements: countertops, fireplaces, shields, gargoyles, balustrades, balconies, solid stone stairs, figures or statues.
- Urban furniture: fountains, benches, pedestals, planters, bollards.
- Funerary art: gravestones, chapels and mausoleums.
- Special pieces: mosaics, puzzles cutting.

AC1.3. Examining quality conditions that singular elements of natural stone must comply, as well as examining defects that may determine to acceptance or to rejection some pieces.

AC1.4. Explaining the process for placing various singular elements of stone, indicating the main work or operations to be performed and sequence to carry out.

AC1.5. Separating tasks, that will be done, into simple activities to get required material (equipment, tools, materials, auxiliary elevation and handling means) and humans resources (workers for placing, and where necessary, relative to other professions) for each separated task.

AC1.6. Sorting the various materials and products used for placing of singular elements (mortars, adhesives, metal anchorages), and indicating incompatibility with each other and when they cannot be used.

AC1.7. Identifying different kinds of supports, and indicating defects and common pathologies.

A2: Understanding technical documentation relating to works for placing singular elements of natural stone, and that technical documentation will be corroborated with workplace to have a complete definition of the work done.

AC2.1. Listing documents of an implementation project, and corroborating the written with the graph documents.

AC2.2. Examining different representation systems (dihedral and perspectives) that usually are used for plans and sketches.

AC2.3. Identifying information relating to placing final processing of singular elements of natural stone for building projects and civil works, special conditions and additional documentation and detecting potential weaknesses or errors in the information provided.

AC2.4. Drawing sketches and simple representations at different scales and using drawing tools.

AC2.5. Performing properly templates of stone singular elements from draws or sketches that normally are in technical documentation of a project, which has been corroborating with worksite previously.

AC2.6. In an instructive example with technical documentation about a fictitious building construction and corresponding verbal clarifications:

- To associate information that has been received with characteristics and peculiarities of construction work, or where appropriate, a theoretical construction work which it will be provided all the necessary documentation.
- Identifying and associating different elements and pieces of a set to get an ordered list of them and to identify any item or part.
- Indicate each material and trades that are involved on the worksite.
- Getting a full definition of each piece (dimensions, finishing, etc.).
- Grouping pieces and tasks to obtain a completed estimation of all materials and human resources.
- Making up a logical sequence of tasks.
- Establishing collective and personal protective equipment for the tasks.
- Establishing estimation on auxiliary means.
- Identifying potential control points.
- Proposing, through sketches and sufficient explanations, necessary adjustments for elaboration of pieces according to characteristics of construction work.
- Proposing a waste management plan.

A3: Identifying, selecting and preparing equipment, tools, machines and collective and personal protective equipment, as well as auxiliary means, and observing standard safety conditions to achieve adequate performance and carrying out maintenance work and end of working day.

AC3.1. Identifying machines, tools and equipment necessary for placing singular elements of natural stone, relating to other tasks and processes to carrying out.

AC3.2. Describing storage operations, maintenance works and repairing machinery, as well as tools and equipment.

AC3.3. Identifying clothing and personal protective equipment for each activity.

AC3.4. Identifying function, composition and use of means of collective protection for each activity.

AC3.5. Identifying function, composition and use of auxiliary means for each activity.

AC3.6. Identifying overall environmental risks that are caused by these tasks (noise, dust, waste) to adopt protective measures.

AC3.7. In an example of adequately characterised case study thanks to suitable technical documentation and verbal clarifications:

- Applying operations of preparation, storage, maintenance and repair of machines, tools and equipment.
- Selecting, using and maintaining properly clothing and personal protective equipment that are used for an activity.
- Installing, testing, maintaining and removing means of collective protection that are used for an activity.
- Installing, testing, maintaining, removing and storing auxiliary means that are used for an activity.

A4: Complying with standard procedures to carry out storage, handling and transportation of parts and sets made of natural stone, and observing established safety conditions.

AC4.1. Identifying tools (slings, clamps) that are used for handling, lifting and transferring of natural stone pieces, and selecting the most appropriate in each case.

AC4.2. Describing standard procedures to carry out on the worksite stockpiles of parts and sets made of natural stone, and indicating the safety measures to be taken to avoid damage to parts, equipment and facilities, or in people.

AC4.3. Describing standard procedures to carry out the transfer of parts and assemblies, and indicating the security measures taken to avoid damage to parts, equipment and facilities, or in people.

AC4.4. On an adequately characterised case study thanks to suitable technical documentation and verbal clarifications, it will be carried out collecting, moving and storing pieces safely and following established procedures.

A5: Surveying various elements and sets made of natural stone, as well as areas where these elements will be placed, and following established geometry in plan and established tolerances in technical documentation.

AC5.1. Describing surveying process for placing singular elements of natural stone, and focusing on critical issues and common problems in these operations.

AC5.2. In an example of adequately characterised case study thanks to suitable technical documentation and verbal clarifications:

- Selecting required instruments and tools for topographic surveying.
- Deducing information on geometry and tolerances.
- Developing simple sketch with topographic surveying references and describing how to transfer these references to a support.
- Surveying on a support with a clean and stable surface, and respecting geometry and tolerance that is indicated in sketch or plan.
- Locating placement points of levelling staffs to survey correctly (on corners, intersections and obeying maximum distance interval of these points).

- Placing levelling staffs according to the requirements of plumbing, stability, alignment of their faces, chipping compared to baseline levels and marks of sill and lintel.
- Receiving casing, pre-frames or other auxiliary elements, of which these elements are placed before singular elements of natural stone, it must comply with requirements of location, plumbing, levelling, bracing and cutting out crossbeams to the defined level.

Content of training unit

1. Singular elements of natural stone: types, characteristics and placing techniques.

- Types of natural stone: Properties and applications.
- Types singular elements:
 - Countertops.
 - Fireplaces.
 - Columns, lintels.
 - Shields, gargoyles.
 - Balustrades, balconies.
 - Sculptures.
 - Urban furniture: fountains, benches, pedestals, planters.
 - Funerary art: gravestones, chapels and mausoleums.
 - Special pieces: mosaics, puzzles cutting.
- Quality requirements for natural stone elements. Main defects.
 - Rejection pieces: how to proceed.
- Compatibility among stone materials and other materials of the worksite.
- Placing techniques for singular elements:
 - Mortars and adherents.
 - Anchorages.
- Overall process of placing singular elements:
 - Stages and processes.
 - Main activities.
 - Sequence of tasks.
 - Material resources.
 - Human Resources.
- Identification of the characteristics of worksite from technical documentation:
 - Characteristics of stone pieces (dimensions, finishes, etc.).
 - Characteristics of a support.
 - Characteristics of mortars, adhesives and / or anchoring systems.
 - Singular points, finishing and intersections.
- Identification of omissions, uncertainties, errors, etc.
- Proposing solutions.
- Drawing sketch.
- Making templates.
- Support: types, materials, characteristics, geometry, resistance. Pathologies and common mistakes.
- Singular elements to be placed in worksite:
 - Identification.
 - Checks.
 - Protection elements. Containers and packaging.

- Handling.
- Storage in worksite.
- Using auxiliary measures for handling and transfer of singular elements:
 - Lifting and suspension systems: cranes, slings, hooks, etc.
 - Scaffolds.
- Equipment, tools and machines that are used for placing of singular elements:
 - Selection.
 - Preparation.
 - Handling.
 - Maintenance operations. Instruction Manuals.
 - Cleaning operations.
 - Storage.
- Management tools for drawing.
- Safety standards for the placement of stone singular elements.
- Specific risks in placing singular elements of natural stone.
- Prevention and protection measures.
- Personal protective equipment and collective:
 - Selection.
 - Preparation.
 - Utilisation.
 - Maintenance.
- Environmental standards for placing singular elements of stone.
- Specific environmental risks in placing singular elements of natural stone: noise, dust, waste.
- Measures for environmental protection.
- Waste management: Classification. Collection. Withdrawal.
- Processes and quality conditions in placing singular elements of stone.
- Points for quality control.
- Quality of materials and products.
- Quality process.
- Quality result.
- Placing defects.
- Causes.
- Possible solutions.

2. Analysis of graphic and written documentation for placing singular elements of stone.

- Projects: documentation.
- Representation systems: dihedral and perspectives.
- Scales.
- Analysis of sketches and drawings: general, detailed, quartered drawing, etc.
- Drawing sketches.
- Comprehension of written technical documentation.
- Comprehension of rules and special requirements specifications.
- Identification of:
 - Characteristics of stone pieces.
 - Characteristics of support.
 - Characteristics of mortars, adhesives and / or anchoring systems.
 - Singular points, auctions and meetings.

- Material resources.
 - Human Resources.
 - Identification of omissions, uncertainties, errors, etc.
 - Proposed solutions.
 - Making templates.
 - Handling tools for drawing.
3. Topographic surveying for placing singular elements.
- Planimetric and altimetry surveying (in plan and elevations).
 - Tools for topographic surveying. Selection. Handling.
 - Comprehension of graphic documentation: geometry and tolerances.
 - References to origin points of surveying and reference lines.
 - Marking a support.
 - Measurement. Alignment. Levelling / Chipping. Weight (plumbing).
 - Checks. Identification of deviations. Correction of dimensional errors.
 - Bonding. Flatness. Out of plumb.
 - Stakeout applied to the placement of singular elements:
 - Countertops.
 - Fireplaces.
 - Balustrades and balconies.
 - Funerary art.
 - Urban furniture.
 - Sculptures, fountains and other decorative items, art and craftsmanship.
 - Other singular elements of construction and civil works.

TRAINING UNIT 2. PLACING SINGULAR ELEMENTS OF NATURAL STONE ON SITE CONSTRUCTION

Duration. Theory and Training

Total: 60 h

Theory: 20 h

Training: 40 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to the PF6.

Assessment ability and criteria

A1: Applying process for placing singular elements by adherents and / or anchorages, relating various materials and systems that will be used in a construction work and placement process and solving intersections between other elements of a worksite to achieve the expected solution.

AC1.1. Identifying different bonding or connection systems (adherents and / or anchorages) that are used for placing singular elements, indicating the most common applications, function of each of its parts and its advantages and disadvantages.

AC1.2. Distinguishing blending components for adhesion systems, function, handling, use, dosage and setting times and conditions.

AC1.3. Analysing connection system compared to mechanical stress that it has to transmit.

- AC1.4. Identifying, according to anchoring system, area and geometry to be accommodated into a stone.
- AC1.5. Knowing common errors, pathologies and basic requirements must be a support to place various stone elements.
- AC1.6. Describing construction process for placing various elements: surveying, lifting and suspension preparation of mortars, placing anchorages, etc. and knowing auxiliary measures and adequate staffing.
- AC1.7. Operating machinery, tools and equipment with skill and precision that it is required for each activity.
- AC1.8. Identifying the most common health risks that it may occur in each operation, and indicating security measures to make, as much material as workers.
- AC1.9. Relating pieces, which will be placed, to worksite, and indicating necessary systems and operations to placed, as much visually as functionally.
- AC1.10. Locating points and areas which will have treatment, indicating process for application.
- AC1.11. Knowing quality criteria that it defines the proper implementation of tasks for each part of worksite.
- AC1.12. Knowing waste management procedures that will be used.
- AC1.13. In a practical case properly defined, through technical documentation and / or work instructions, knowing how to place singular element.

Content of training unit

1. Placing singular elements of natural stone by adherence systems.
 - Adherence systems: Mortars and resins:
 - Types, characteristics, applications. Capabilities and limitations.
 - Interpretation of manufacturer's technical documentation.
 - Composition.
 - Preparation: dosage, handling.
 - Application: setting times and conditions.
 - Implementation processes and conditions.
 - Equipment, tools and materials. Utilisation.
 - Checking mechanical stability of joints.
 - Resolution of intersections:
 - Among other materials.
 - Among other construction elements.
 - And other types of construction.
 - Jointing material: preparation, cleaning, treatments.
2. Placing singular elements of natural stone by anchoring systems.
 - Anchoring systems:
 - Types, characteristics, applications. Capabilities and limitations.
 - Interpretation of technical documentation of the anchorages.
 - How it is placed on support or / and stone (position and size).
 - Placing.
 - Implementation processes and conditions:
 - Fixing to support.
 - Fixing to stone.
 - Equipment, tools and materials. Utilisation.

- Checking mechanical stability of joints.
- Resolution of intersections:
 - Among other materials.
 - Among other construction elements.
 - And other types of construction.

TRAINING UNIT 3. ATTACHMENT AND FINISHING TOUCH FOR SINGULAR ELEMENTS OF NATURAL STONE ON SITE CONSTRUCTION

Duration. Theory and Training

Total: 30 h

Theory: 10 h

Training: 20 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to the PF5 and PF7.

Assessment ability and criteria

A1: Applying operations cutting to size, machining and moulding singular elements, using and operating machines, appropriate tools and equipment, relating all of them to technical specifications and / or construction surveying.

AC1.1. Explaining operations cutting to size, machining and moulding (drilling, grooving, milling, polishing, honing, sandblasting, texturing, distressing, hollowing out and other) of singular elements, connecting steps of process to operations and means of implementing.

AC1.2. In a practical case properly defined:

- Operating machines or tools according to tasks to be carried out, complying security measures for handling each machine.
- Selecting and applying specific tools for machining (bits, milling cutters, cutter discs, wire cutting, steel abrasive, hand tools) based on placed materials and work done.
- Carrying out marks of surveying by templates, measuring and testing tools, laser level and others, understanding plans and drawings.
- Checking and carrying out various types of fitted to inserts elements (inner, outer, upper, lower and mixed).
- Applying occupational risk prevention standards safety and environmental risks, with special attention to corrective action of dust emission, noise, waste and sludge.

AC1.3. In a practical case properly defined about cutting to size to attachments, assemblies, change of direction of solid pieces, recognising and measuring a complete solid.

A2: Applying necessary procedures to carry out tasks of finishing for singular elements and distinguishing among functional and aesthetic finishing, according to working instructions.

AC2.1. Identifying various finishing operations to be for singular elements (pointing, polishing, texturing, cleaning, sealing, tinting, glossy, surface treatments), relating to equipment, tools and materials to use, as well as occupational risk prevention standards to be considered for each case.

AC2.2. In a practical case properly defined, through technical documentation and / or work instructions to carry out finishing touch tasks with the required level of quality:

- Applying finishing products in the dosage and timing required by the technical specifications.

- Applying safety measures needed in each singular item, adjusted to project implementation.
- Determining quality of finishing that must be established in project through tools and checking fixtures.

Content of training unit

1. Adjusting on site construction of singular elements of natural stone.

- Complete solid. Selection.
- Marking pieces.
- Using templates.
- Cutting to size.
- Machining: drilling, grooving, milling, polishing, honing, sandblasting, texturing, distressing, hollowing out.
- Equipment and Tools: Use:
 - Cutting machines.
 - Polishing machine.
 - Sandblasting machine.
 - Beveling machine.
 - Edge polishing tool.
 - Grinders.
 - Drilling.
- Tools for machining: selection, placing, checks, replacement.
- Checking size and characteristics of singular elements.
- Safety measures for cutting and machining.
- Personal protective equipment.
- Collective protective equipment.
- Measures for environmental protection: noise, dust, debris.

2. Finishing works of singular elements of natural stone.

- Finishing.
- Treatment of joints. Sealants.
- Surface treatment:
 - Mildew and anti-graffiti chemicals products.
 - Tinting, glossy.
 - Polish, textures.
- Protection against moisture: anti-humidity barriers in critical areas and surface finishes.
- Placing accessory elements.
- Operations and cleaning products.
- Quality of finishing:
 - Quality control: tools.
 - Main defects and irregularities.
 - Causes and possible solutions.
 - Process and quality conditions.
- Safety measures.
- Waste management.

TEACHING MODULE 9. Designation: MONITORING AND GOOD PRACTICE FOR ENVIRONMENTAL PROTECTION STANDARDS

Methodological guidance

TRAINING UNITS OF TEACHING MODULE 9	Theory (h) No. of hours maximum for distance learning	Training (h)	Total duration of the training units in hours (h)
Training unit 1	20	10	30
Training unit 2	20	10	30
	40	20	60

Sequence: Training units of this teaching module can be programmed independently.

Criteria of access for students

Level 3 according to European criteria.

TRAINING UNIT 1. IDENTIFY KEY PRACTICES OF SUSTAINABLE BUILDING

Duration. Theory and Training

Total: 30 h

Theory: 20 h

Training: 10 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to PF1 and PF2

Assessment ability and criteria

AA1: Understanding the basics of sustainable building orientation and design.

AC1.1. Placing and orienting a building on a plot to gain optimal benefits from the sun according to the climate.

AC1.2. Placing and orienting a building on a plot to gain optimal benefits from the natural terrain and vegetation.

AC1.3. Placing and orienting a building on a plot to minimise the effects of neighbouring buildings.

AC1.4. Understanding the impacts of a roof shape.

AC1.5. Understanding the impacts of a building shape.

AC1.6. Understanding the impacts of thermal bridges.

AC1.7. Placing rooms and buffer spaces on a floor plan according to the orientation of a building.

AC1.8. Placing openings according to the orientation of a building.

AA2: Identifying the different building materials and their properties.

AC2.1. Identifying stones and their thermal properties.

AC2.2. Identifying bricks and their thermal properties.

AC2.3. Identifying cement-based materials and their thermal properties.

AC2.4. Identifying wood-based materials and their thermal properties.

AA3: Identifying the different insulating materials and their properties.

AC3.1. Identifying insulating wools and their thermal properties.

AC3.2. Identifying insulating panels and their thermal properties.

AC3.3. Identifying insulating loose-fill materials and their thermal properties.

AA4: Identifying the different opening systems.

AC4.1. Identifying the types of door frames and their benefits and drawbacks.

AC4.2. Identifying the types of window frames and their benefits and drawbacks.

AA5: Identifying the heat regulation systems

AC5.1. Identifying heating systems and their benefits and drawbacks.

AC5.2. Identifying cooling systems and their benefits and drawbacks.

AC5.3. Identifying ventilation systems and their benefits and drawbacks.

AA6: Determining the thermal performance of a building.

AC6.1. Identifying the factors that have an impact on the performance of a building.

AC6.2. Understanding how to use the coefficients given by the materials' manufacturers.

Content of training unit

1. Building orientation and design

- Sustainable building orientation.

- Taking advantages of the surroundings of the plot
- Taking advantages of the natural shape of terrain
- Taking advantages of the sun

- Advantages and drawbacks of building shape (spherical, cubic, L-shaped, U-shaped...).

- Advantages and drawbacks of roof shape (gable, gambrel, flat, round...).

- Advantages and drawbacks of other architectural details (bow window, balcony, verandas...)

- Design and technical solutions to avoid thermal bridges

- Type of rooms in a building (office, kitchen, sleeping room, living room) and the factors to take into account (noise, light...)

- Placing the different rooms on a floor plan

2. Building materials and their thermal properties:

- Stones: Sandstones, granites, soapstones...

- Bricks: traditional, insulating...

- Cement based: concrete, concrete blocks, cellular concrete blocks...

- Wood based: timber, sandwich panels...

3. Insulating materials and their thermal properties:

- Insulating wools: glass, rock...

- Insulating panels: wood, polystyrene...

- Insulating fill-in materials: cellulose, wool...

4. Opening systems

- Door and window types: sliding, swinging, hollow, filled...

- Door and window frames: PVC, aluminium, wood...

- Types of glass and gazes used in window frames
5. Heat regulation systems
- Types of cooling and heating systems: central, geothermic, radiators, walls, floor...
 - Types of ventilation systems: Vents, Heat recovery ventilation, Energy recovery ventilation ...
6. Thermal performance of a building.
- Signification and use of coefficients for the types of materials: conductivity, resistance
 - Surveying a building and assess its thermal performance.

TRAINING UNIT 2. PLACING INSULATION ON A STONE BUILDING

Duration. Theory and Training

Total: 30 h

Theory: 20 h

Training: 10 h

Reference to the competences (Professional Fulfilment)

This training unit corresponds to the PF3.

Assessment ability and criteria

AA1: Understanding the process for placing interior insulating products.

AC1.1. Identifying which products can be used for interior insulation.

AC1.2. Identifying different systems that are used for placing interior insulating products.

AC1.2. Identifying the advantages and drawbacks of each systems.

AC1.3. Placing the most common systems for installing interior insulating products.

AA2: Understanding the process for placing exterior insulating products.

AC2.1. Identifying which products can be used for exterior insulation.

AC2.2. Identifying different systems that are used for placing exterior insulating products.

AC2.3. Identifying the advantages and drawbacks of each systems.

AC2.4. Placing the most common systems for installing exterior insulating products.

Content of training unit

1. Placing interior insulating products on a stone building.

- Selection of material:
 - Criteria of choice (climate, expected results, aspects...)
 - Costs and efficiency of different products
 - Advantages and drawbacks of each products
- Placing systems:
 - Types, characteristics.
 - Advantages and drawbacks of each systems
 - Interpretation of technical documentation for a stone wall.
 - Equipment, tools and safety products for each system.

2. Placing exterior insulating products on a stone building.

- Selection of material:
 - Criteria of choice (climate, expected results, aspects...)
 - Costs and efficiency of different products
 - Advantages and drawbacks of each products
- Placing systems:
 - Types, characteristics.
 - Advantages and drawbacks of each systems
 - Interpretation of technical documentation for a stone wall.
 - Equipment, tools and safety products for each system.

FINAL MODULE. Designation: PROFESSIONAL INTERNSHIP MODULE FOR PLACING OF NATURAL STONE

Duration. Theory and Training

FINAL MODULE	Professional internship (h)
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80

The professional internship is non-remunerated works to develop all the capabilities that students need to apply their learnt theory knowledge in previous 9 modules.

Assessment ability and criteria

A1: Conducting construction surveying elements and construction sets from the interpretation of drawings and other technical documentation, under the supervision of the head.

AC1.1. Selecting and understanding technical documentation of projects and construction plans, identifying the criteria and conditions for performance, quality and safety.

AC1.2. Selecting and use tools and instruments required for stakeout.

AC1.3. Recognising starting references or origin of measures, placing them in their correct spatial position.

AC1.4. Proposing, using the sketches and explanations necessary, the necessary adjustments to compensate for any deviations detected.

AC1.5. Locating the reference lines from the original, respecting the characteristics of received position.

AC1.6. Being mandatory using templates and / or measuring tools.

AC1.7. Checking for proper construction surveying of the anchoring elements by measuring it from the source reference lines.

A2: Build factories natural stone masonry, from a given layout and technical documentation in safety and respecting the quality standards under the supervision of the head.

AC2.1. Carrying out the operations of collection, handling and transportation of natural stone pieces under safety conditions and procedures.

AC2.2. Preparing masonry from rough stone, responding to the characteristics required for the specified type of masonry and reserving those larger and regular auctions for corners and holes.

AC2.3. Keeping the dimensions and thicknesses determined by observing the conditions and tolerances in planarity and plumb.

AC2.4. Conducting meetings between getting the interlocking elements specified.

AC2.5. Placing landings, prefabricated parts or mono-block, under supervision.

AC2.6. Carrying out the work required to obtain a singular space defined in assembly drawing, carrying out each of the phases of the process: cutting sketch drawing, layout, preparation of parts, clothing and subframe assembly, construction, removal of secondary structure and cleaning.

A3: Implementing various positioning systems and blockwork masonry, respecting the layout and technical documentation, in safety and respecting the quality standards under the supervision of the head.

AC3.1. Carrying out the operations of collection, handling and transportation of natural stone pieces under safety conditions and procedures.

AC3.2. Keeping the dimensions and thicknesses determined by observing the conditions and tolerances in planarity and plumb.

AC3.3. Conducting meetings between getting the interlocking elements specified.

AC3.4. Applying metallic elements between transverse clamping in established areas.

AC3.5. Placing landings, or parts prefabricated mono-block, under supervision.

CE3.6. Carrying out the work required to obtain a singular space defined in assembly drawing, carrying out each of the phases of the process: cutting sketch drawing, layout, preparation of parts, clothing and subframe assembly, construction, removal of secondary structure and cleaning.

A4: Carrying out the placing of singular elements from a given layout and technical documentation in safety and respecting the quality standards under the supervision of the head.

AC4.1. Carrying out the operations of collection, handling and transportation of natural stone pieces under safety conditions and procedures.

AC4.2. Carrying out placing operations by adherence systems mortars and resins.

AC4.3. Carrying out placing operations with anchoring systems.

AC4.4. Solving encounters with various materials, the systems involved in the placing process and the rest of the work, to achieve the required overall solution.

A5: Setting anchoring subsystem assembly ventilated facades, following the manufacturer's technical instructions and understanding technical documentation, in safety and respecting the quality standards under the supervision of the head.

AC5.1. Placing fasteners on the media stakeout following the references.

AC5.2. Placing the anchorage body subsystem or on the fastening elements according to the technical documentation.

AC5.3. Checking the strength and quality of the fasteners made.

A6: Joining and / or engage the trim pieces to anchoring subsystem assembly ventilated facades, following the manufacturer's technical instructions anchorages and understanding technical documentation work in safety and quality compliance criteria under responsible supervision.

AC6.1. Carrying out the operations of collection, handling and transportation of natural stone pieces under safety conditions and procedures.

AC6.2. Placing insulation panels ventilated facades, for waterproofing of the work, resolving potential interference points insulator with the other elements of the facade under responsible supervision.

AC6.3. Preparing and implementing bonding chemicals according to manufacturer's instructions.

AC6.4. Putting the pieces of the coating to anchoring subsystem following the technical specifications.

AC6.5. Checking the strength and quality of connections made.

AC6.6. Carrying out positioning of the individual elements on the anchorage sub, according to project specifications, verifying the location and stability.

AC6.7. Applying the various systems and products for bonding different materials according to manufacturer's specifications.

AC6.8. Identifying and resolve errors in work: retaining existing, inadequate coating some parts-unlike colour, appearance, texture, and other-flatness defects and plumbing and space between boards.

AC6.9. Detaching and remove the trim pieces to be determined, according to the instructions and procedures for handling, transport and storage.

A7: Carrying out the operations of fit, finish and shot on site using and operating the machines, tools and appropriate under the supervision of the head.

AC7.1. Adjusting natural stone pieces safely operate machines or cutting and machining tools.

AC7.2. Carrying out cutting and machining selecting and using the specific tools-drills, discs, hand tools.

AC7.3. Carrying out finishing operations established work, using the dosage and times prescribed in the technical specifications of products.

AC7.4. Placing singular construction elements (arches, lintels, cornices, columns, etc.). Defined in assembly drawing, and carrying out correctly identifying each of the phases of the process: developing cutting sketches, layout, parts preparation, construction and cleaning.

AC7.5. Carrying out flat tops definite singular set, and carrying out correctly identifying each of the phases of the process: developing cutting sketches, layout, parts preparation, construction and cleaning.

AC7.6. Carrying out the indicated joint treatment.

AC7.7. Cleaning the work placing was performed, removing any traces of mortar or other foreign materials to the construction.

A8: Participating in the working processes of the company, following the rules and instructions in the workplace.

AC8.1. Behaving responsibly both in relationships and in the work done.

AC8.2. Respecting the rules and procedures of the workplace.

AC8.3. Undertaking tasks diligently as instructed, trying to suit the pace of work of the company.

AC8.4. Integrated into the production processes of the workplace.

AC8.5. Using established communication channels.

AC8.6. Always respect the risk prevention, occupational health and environmental protection.

Content of training module

1. Staking various elements of natural stone.

- Interpretation of technical information.
- Selection and use of instruments and tools for staking.
- Location starting references.
- Status of the reference lines.
- Making simple sketch.

- Use of templates.
- Location of the holes for windows and doors.
- Checks.
- Identification of deviations.
- Adjustment and compensation of deviations.

2. Making masonry factories.

- Storage, handling and transfer of masonry.
- Preparation of masonry.
- Conducting meetings and work.
- Realisation of singular holes.
- Levelling, plumbing and alignment.
- Waste treatment.

3. Making masonry and blockwork factories.

- Storage, handling and transportation of the blocks and blockwork.
- Develop and transverse blocks.
- Holding meetings and work.
- Realisation of singular holes.
- Levelling, plumb and alignment.
- Waste treatment.

4. Placing natural stone singular elements.

- Storage, handling and transportation of the singular elements.
- Placing by adhesively systems.
- Placing by anchoring systems.
- Resolution of meetings.

5. Mounting ventilated facades. Anchoring of the substructure.

- Placing fasteners.
- Placing anchoring subsystem.
- Checks.

6. Mounting ventilated facades. Union and hitch parts coating.

- Storage, handling and transportation of the singular elements.
- Placing insulation panels.
- Checking of anchorage points.
- Preparation and implementation of binding chemicals.
- Anchorage of the lining pieces to the substructure.
- Checking the placing of the pieces.
- Identification of errors.
- Making adjustments.
- Removing ventilated facade elements.

7. Fit, finish and finials siting of natural stone.

- Operations on site cutting and shaping natural stone elements.
- Use of machinery, tools and supplies.

- Cast dimensional errors between pieces of natural stone.
- Conducting on-site machining.
- Operations finish of natural stone elements.
- Application of physical surface treatment: polished.
- Application of chemical surface treatments.
- Control the quality of finish.
- Placing of building elements of natural stone singular.
- Placing of gates and other singular auctions.
- Union of different materials.
- Sealing and joint treatment.
- Cleaning operations and final shot.

8. Integration and communication in the workplace.

- Responsible behaviour in the workplace.
- Respect the procedures and rules of the workplace.
- Interpretation and implementation diligently instructed.
- Recognition of the productive process of the organisation.
- Use established communication channels in the workplace.
- Matching the pace of work of the company.
- Monitoring of risk prevention regulations, occupational health and environmental protection.

IV. REQUIREMENTS FOR TRAINERS

ACCREDITATION REQUIRED	PROFESSIONAL EXPERIENCE REQUIRED IN THE FIELD OF THE UNIT OF COMPETENCY	
	If it is accredited	If no accredited
<p>FOR TEACHING MODULE 1. BASIC RISK PREVENTION ON THE WORKSITE</p> <ul style="list-style-type: none"> • Licensed Engineer, Architect or the title of degree corresponding u or other titles or equivalent. • Diploma, Engineer Technical, Technical Architect or el the title de of degree corresponding or other securities or equivalent. • Technical Top of the Extractive Industries sector professional. • Technical Top of the Professional Building sector and Civil Works. • Master of BASIC RISK prevention on construction 	1 year	It is essential to the certification requirement in Occupational Health and Safety
<p>FOR TEACHING MODULE 2 to 9</p> <ul style="list-style-type: none"> • Licensed Engineer, Architect or the title of degree corresponding u or other titles or equivalent. • Diploma, Engineer Technical, Technical Architect or el the title de of degree corresponding or other securities or equivalent. • Technical Higher of the Extractive Industries sector professional. • Technical Higher of the Professional Building sector and Civil Works. 	1 year	3 years

V. SPACES MINIMUM FACILITIES AND EQUIPMENT

TRAINING AREA	AREA (M ²) and NUMBER OF TRAINERS	
	15 Student	25 Student
Classroom (theory hours)	45 m ² 1 trainer	60 m ² 1 trainer
Workshop (training hours)	100 m ² 1 trainer	150 m ² 2 trainers

TRAINING AREA	EQUIPMENT
Classroom (theory hours)	<ul style="list-style-type: none"> - Blackboard to write with felt-tip pen or chalk, - Flip-chart - Material classroom - Table and chair for trainer/s - Tables and chairs for students - Audiovisual Equipment - Networked PCs installed, projector and internet - Specific software needed for the course

Workshop (training hours)

- Elements of drawing. Measuring Tools for surveying.
- Tools for stonework and masonry.
- Machines and cutting tools. Moulding equipment: knife grinders, cutting discs, polishing machines, drilling, grooving machines, etc.
- Chemicals. Equipment and application tools.
- Plaster, mortars, adhesives, grouts, pointing and concretes
- Lifting, handling and transport equipment. Auxiliary means: scaffolding, pulleys, mounting wedges. Temporary facilities.
- Personal and collective protective equipment.
- Specific elements for anchoring subsystem: fasteners, brackets, metal profiles, screws, self drilling screws, anchors point adjustable or not joins / hooks, plastic caps. Mortars and adhesives for anchoring. Sealants and chemical anchoring. Spatulas, pointing trowel, shims, spacers and wedge.
- Insulation panels.
- Elements of finishing: corners, grilles, parapet elements, rubble, rough stone and rough ashlar. Ashlar. Blockwork.
- Singular elements.
- Cladding pieces of natural stone, ceramic and wood derivatives, metal derivatives or other materials derivatives.

It is not necessary that training area be separated or identified clearly, but only a class simultaneously in that case.

The facilities and equipment must comply with industry regulations and hygienic-sanitary measures for and respond to universal accessibility and safety of the participants.

The number of equipment, machines and tools specified in the equipment of the training area, it will be sufficient for a minimum of 15 students and should be increased, if necessary, to meet higher number (up a maximum of 25).

In the event that training also participate persons with disabilities, it will be made by means of adaptations and reasonable accommodations to ensure their equal participation.

