

**Disclaimer**

This sheet is intended for designers, specifiers and other members of construction project teams wishing to reuse this building material or product. It is part of a collection of sheets aimed at bringing together the available information to date that is likely to facilitate the reuse of building materials and products.

This sheet has been produced by Rotor vzw/asbl within the framework of the Interreg FCRBE project - Facilitating the Circulation of Reclaimed Building Elements, supported by the entire project partnership. Sources of information include the experience of reclamation dealers and involved project partners, lessons learned from exemplary projects, available technical documentation, etc.

The sheets have been produced between 2019 and 2021. As the reclamation sector is evolving, some information, notably regarding pricing and availability, may change over the time. When the text refers to European standards, it is up to the project team to refer, if necessary, to their national implementations and local specificities.

It is important to note that the information presented here is not exhaustive or intended to replace the expertise of professionals. Specific questions are always project related and should be treated as such.

The complete collection of sheets (including the introductory sheet) is freely available from different reference websites (a.o. [opalis.eu](http://opalis.eu), [nweurope.eu/fcrbe](http://nweurope.eu/fcrbe), [futureuse.co.uk](http://futureuse.co.uk)).

Non-exhaustive directories of dealers in reclaimed building materials are available on [www.opalis.eu](http://www.opalis.eu) and [www.salvoweb.com](http://www.salvoweb.com).

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Interreg FCRBE partnership: Bellastock (FR), the Belgian Building Research Institute / BBRI (BE), Brussels Environment (BE), the Scientific and Technical Center of Building / CSTB (FR), Confederation of Construction (BE), Rotor (BE), Salvo (UK) and University of Brighton (UK).

The information contained in this document does not necessarily reflect the position of all the FCRBE project partners nor that of the funding authorities.

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**1. Introduction: why these sheets?**

**The reclamation of construction materials is a practice that has many environmental, socio-economical and cultural advantages. This is a priority approach in the perspective of a transition of the construction sector towards circular practices.**

Despite these incentives, designer/specifier who wish to use reclaimed construction materials in their projects are generally faced with questions that they struggle to answer:

- What building materials are suitable for reclamation?
- Where can these materials be found?
- What are the performance characteristics of these products and how can they be evaluated?
- How can these materials be integrated into the prescriptive documents, in particular the specifications?

This collection of sheets intends to bring together as much information as is available on common and relatively recent materials to help purchasing advisers overcome these various obstacles. The aim is to encourage the reclamation of construction materials through a better knowledge of the possibilities and practical ways and means.

To do this, we called on various sources: technical documentation, harmonised standards, available documentary resources as well as interviews with professional suppliers of materials and feedback from example projects.

This introductory sheet brings together cross-cutting information that is applicable to all materials. It also details certain systematic choices made in putting together these sheets.



*Panel door specialised dealer*



*Neatly organized reclaimed carpet tiles*



*Sanitary component cleaning tests*



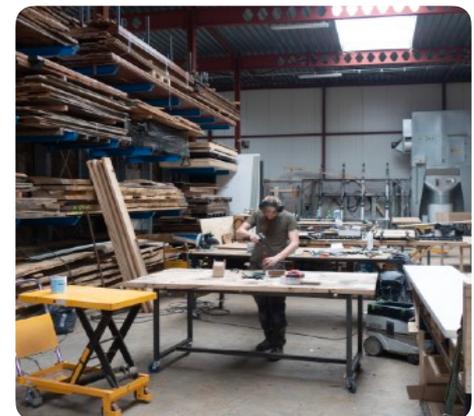
*Reclaimed brick sorting heap*



*Stone reconditioning*



*Reclaimed wood structural beams*



*Reclaimed wood workshop*



## 2. How are the reclamation sheets structured?

Each sheet is dedicated to a specific reclaimed material. It is arranged into several sections, addressing the main issues raised by reclamation operations.

### 2.1. Description

This section summarises the main characteristics of the reclaimed materials concerned: how are they produced, where are they commonly found and in what form? How can they be recognised?

It is supplemented by practical information on the most common formats, colours and textures, the composition of materials, etc.

### 2.2. Salvage

This section details the focal points related to careful disassembly for the reuse of the targeted materials: what should you watch out for and what are the necessary steps?

In general, it is recommended to use companies specialising in the dismantling and salvage of materials. These can intervene in the context of a full-fledged mission or as sub-contractors of general contractors engaged in a project.

Regarding the realisation of an inventory of reclaimed materials in an existing building, we refer to the work carried out on this question within the framework of the [FCRBE](#) project <sup>1</sup>.

Regarding the establishment of a market for dismantling for reuse in the context of



Stone cutting section

public procurement, please refer to the [handbook for off-site reuse](#) <sup>2</sup>.

### 2.3. Applications and implementation

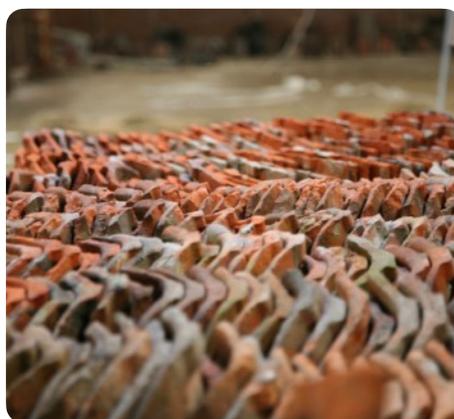
The aim here is to describe what are the most common applications of the reclaimed materials covered by the sheet.

This section is supplemented by information specific to the implementation of reclaimed materials:

Salvage by professional operators. The materials put back on sale by professional operators are, for the most part, cleaned, sorted or even slightly adapted. At the end of these operations, they are generally ready for installation. In this sense, their use does not differ from that of a new equivalent material. Readers should therefore refer to the state of the art (or implementation standards) and to the good practices in force.

Specificities of reclamation. In some cases, the fact that it is a reclaimed material can influence certain installation techniques. Specific features such as the presence of mortar remains, the treatment undergone during the first phase of use, certain forms of wear, etc. can influence material laying techniques. Only these focal points are discussed in the sheets.

In general, designers are encouraged to opt for installation techniques that facilitate the integration of reclaimed materials and maximise the value of the material batches. Tolerating dimensional variations or accepting traces of aesthetic wear is often an effective way to limit waste.



Color variety of terra cotta roof tiles

Some reclaimed building materials are suitable for a wide variety of uses while others cover more limited applications. For example, tiles will be suitable both for a floor covering and for a wall cladding while another kind of tile, because of its thickness, will only be suitable as a floor covering. These indications are detailed in the content of the sheets. Obviously, designers always have the possibility of considering more substantial forms of change of use than those covered by the sheets. In this case, it is up to them to establish the appropriate framework for these operations.

### 2.4. Characteristics and fitness for use

See also the detailed chapter on proof of fitness for use below.

The suitability for use depends essentially on the intended use. In order to meet this requirement, the material must achieve a certain level of performance in terms of some of its intrinsic characteristics.



Careful dismantling of marble wall panels



Blue limestone reclamation operation

<sup>1</sup> FCRBE, *A guide for identifying the reuse potential of construction products*, 2020.

<sup>2</sup> Rotor (S. SEYS, L. BILLIET). *Vade-mecum pour le réemploi hors-site. Comment extraire les matériaux réutilisables de bâtiments publics*, Brussels, 2015.



In all cases, it is the responsibility of the designers/specifiers to ensure that the materials chosen actually meet the requirements arising from this use. In other words, if a regulation imposes a level of performance on a product or material, the designer/specifier or contractor must ensure that it complies with it. In the absence of specific regulations, they will freely choose their product or material on the basis of the adequacy of the level of performance for the intended use.

The way of establishing and measuring the performance of materials may be approached differently when working with reclaimed materials. In contrast to mass-produced new materials, whose technical characteristics are measured and declared by the producer when they are placed on the market, reclaimed materials are not always the subject of such documentation. Other approaches are then necessary to measure and establish their performances.

Designers/specifiers will find in each sheet a list of characteristics that they are likely to need depending on the intended use. To determine these characteristics, we use the corresponding headings in the European technical standards (or product standards)<sup>3</sup> as a basis. Although these standards do not generally include the case of reuse in their purpose, the specific considerations to the intended uses are enlightening here. We have supplemented this information with the available information on reclaimed materials.

However, some performances cannot generally be established. For these, specific measures are to be provided for. Finally, it should be noted that certain materials are not covered by any technical standards (e.g.



Reused glue lam beams

'steenschotten' or scaffolding panels, which are not originally construction products).

## 2.5. Reclamation indicators

This section gives indications on three aspects:

1. **Availability of materials from professional suppliers.** Most of the materials described in these sheets are available from specialist suppliers. Their availability depends on the quantities required. In each sheet, we indicate an order of magnitude of the quantities currently available.
2. **Indicative price.** This reflects the prices found on the reclamation market (specialist resellers, marketplaces, etc.). These indications are however likely to vary according to the geographical area, the heritage character of the materials and their quality.
3. **Environmental impact.** Reusing building materials is generally beneficial from an environmental point of view. This makes it possible to extend the life of existing materials and thus avoid the environmental impacts caused by the production of new elements.

Concerning point 3, we are limiting ourselves here to an assessment based on the potential to mitigate the global warming by focusing on avoided greenhouse gas emissions (kg CO<sub>2</sub> equivalent). Other environmental impacts could also be considered such as the emission of fine particles, toxicity, eutrophication of water, depletion of resources, etc.

We rely on data relating to the impacts of production of new equivalent materials as established in environmental product declaration sheets (database of EPDs and alike formats in the different countries). We count the emissions relating to the production phase (A1-A3), which gives a general idea of the environmental 'carbon gain' linked to strategies for the reclamation of these materials.

This principle is therefore based on a logic consisting in estimating avoided impacts – that is to say, impacts that did not take place thanks to a specific action (in this case,

reusing an existing material rather than making a new one).

Such logic is applied in different contexts. We find it for example:

→ In certain green building certification and rating systems, in particular the French BBCA label. This considers that the impact on production can, for reclaimed materials, be negligent in the overall calculation of emissions during the building's life cycle.

→ In decision-support tools, in particular the Belgian Totem tool.

→ In the formula proposed by the European Commission to assess the environmental footprint of a product (which takes into account, among other aspects, the impacts avoided thanks to the logic of substituting virgin resources).<sup>4</sup>

It should however be noted that this logic is not equivalent to the steps consisting in establishing a detailed profile of the environmental impact of a product. The approach proposed here is not a substitute for an environmental statement. It is not based on detailed life cycle analyses of the operations necessary for the reclamation of the products studied. In some cases, the reclamation process is far from negligible in terms of environmental impacts.

This approach does not take into account the phases which follow production (transport, installation, maintenance, end of life). The few life cycle analyses that have been carried out on reclaimed materials show that, in most cases, it is not during these phases that the gains linked to reclamation strategies (compared with new equivalents) are the most important.

Likewise, the impact of transport can potentially affect the environmental balance – although, again, this should be compared with the distance travelled by a new equivalent.

Finally, we rely as much as possible on several sources. These sometimes show significant variations.

The information provided in the data sheets should under no circumstances be considered as absolute values. These are orders of magnitude making it possible to help in the decision.

<sup>3</sup> Many European product standards are said to be 'harmonised' when the technical specifications covering the product are common to the Member States. If the product is not covered by a harmonised standard, it is generally covered by a European standard transposed in accordance with provisions specific to each Member State. In this case, significant differences may arise (for example on the test method for determining performance). In these sheets, we have mainly drawn inspiration from Belgian standards. Please note that the standards are constantly evolving and that it is advisable to refer to their latest version.

*Reclaimed wood flooring*

### **Special case of the reuse of wood-based materials (and other organic products)**

Assessing the climate change impact of wood-based building products is quite complex. Beyond the classical parameters used for Life Cycle Assessment, the reasoning here integrates the notion of biogenic carbon. Plants metabolise CO<sub>2</sub> present in the atmosphere through photosynthesis in order to ensure their growth. Trees thus constitute an important carbon reservoir and continue to play this role even when they are cut down and transformed into consumer products. This explains why many LCAs of wood-based products have negative values for the production phase. This negative value refers to the amount of carbon captured and sequestered by the plant (biogenic carbon). However, this reasoning is only valid under two conditions:

1. The wood used must come from sustainably managed forests. A new tree must actually be planted in place of the original to justify this benefit. Forest management must also respect the renewal rate of the resource. However, despite local efforts in responsible forest management, the global trend is towards deforestation and the replacement of forests by urban or agricultural land.
2. Wood-based products should not release the biogenic carbon they contain too quickly. This means that wood-based products should be kept in circulation as long as possible in order to preserve their carbon storage function and to prevent them from releasing

greenhouse gases (in the form of CO<sub>2</sub> and/or methane).

As such, the reuse of wood products plays an important role in maintaining the long-term carbon stock in the built environment. Reuse is a good alternative to incineration and methanisation of wood.

However, the assessment of the overall environmental impact of a reused wooden construction element must also take transport into account. Some batches of reclaimed wood available in North-Western Europe are imported from North America (e.g. for 'barnwood') or South-East Asia. These long journeys have an impact on the overall balance sheet. In some cases, it may be more attractive to use local supply chains that are committed to responsible management than to import reclaimed wood from the other side of the world.

The heritage value of wooden components and the fact that the reclaim market can be considered as a local source of wood that is not available locally (e.g. azobe wood from naval applications) should also be highlighted. The latter elements are difficult to quantify and go somewhat beyond the question of carbon balance.

To sum up, it can be considered that in the majority of cases, the reuse of wood elements is a strategy that extends the lifetime of existing materials and preserves the biogenic carbon stock represented by wood-based construction elements. It is also a strategy that helps to reduce the current pressure on forests.

<sup>4</sup> Commission Recommendation of 9 April 2013 on the use of common methods to measure and communicate the life cycle environmental performance of products and organisations (2013/179/EU)



### 3. Demonstrate the fitness for the use of reclaimed materials

Fitness for use refers to the ability of a building material or product to meet the requirements of a given use. These requirements can be of two types<sup>5</sup>:

1. **Regulatory.** These are non-negotiable requirements set by the legislator (e.g. basic requirements at European level, town planning prescriptions at regional level, etc.). They relate to principles such as the safety and health of persons, the stability of structures, fire resistance, limitation of the emission of toxic substance, accessibility for people with reduced mobility, thermal and acoustic insulation, durability, etc. Some of these requirements are expressed by referencing technical standards (e.g. Eurocodes).
1. **Contractual.** These are requirements set by the designer/specifier in the context of a specific project. These may be requirements on dimensions, appearance, colour of materials, etc. It is common for designers/specifiers to refer to technical standards to express these requirements.

The regulatory requirements related to uses are set by the legislative and normative frameworks specific to each Member State (national provisions) as well as by the rules of practice of the construction sector. These usage requirements are the same for reclaimed materials as for new materials. In both cases, designers must be careful *to choose materials whose characteristics meet the specific requirements of a given use*. Knowing all the regulatory provisions remains the responsibility of each designer/specifier and/or project owner.



Refurbished radiator valves

The technical documentation (Declaration of Performance, European Technical Assessment, CE marking, etc.) attached to new products makes it fairly easy to check their fitness for use<sup>6</sup>. The same is not always the case for reclaimed materials.

For them, it is a question of having information on:

→ the original characteristics and performances.

→ any alterations that the material may have undergone during its initial use: wear, gradual deposits of material, physical and chemical transformations, etc.

Depending on their nature and degree, these alterations are liable to affect the performance of the material and reduce the possible applications. In some cases, they can completely jeopardise their reuse.

It would be wrong to consider reclaimed materials as being of inferior quality compared to new equivalents. In some cases, on the contrary, they have quite interesting technical characteristics.

On the other hand, they generally do not have a technical sheet or a performance declaration establishing precisely all their characteristics and performances.

How, then, can their fitness for use be ensured? Several courses of action are possible, depending on the nature of the materials and the requirements to be met. These courses are obviously complementary. The exact procedure will depend on the specificities of each project and the requirements set by insurers and technical inspection services.



Counted reclaimed carpet tiles

### 3.1. Guarantees provided by professional suppliers

Professional sellers of reclaimed materials are an essential link in the chain of operations leading to the reuse of a material. Not only do they take care of the storage and marketing of materials, but they also carry out a series of operations on the materials they salvage: cleaning, sorting, material description, etc.

Salespeople are committed to what they advertise. Most suppliers can thereby guarantee aspects such as the uniformity of a batch from the point of view of material composition or dimensions, the quality of the cleaning performed or the completeness of the batches.

Some go further and offer trade guarantees on certain characteristics of the products sold. For example, certain suppliers of cast iron radiators carry out pressure tests and thereby guarantee the water tightness of refurbished radiators. Suppliers of salvaged steel profiles carry out tests so that they can describe the strength of the elements. Resellers of raised access floor tiles declare performance certified by approved organizations. Brick suppliers are able to declare the compressive strength and porosity of some common types of brick. Sellers of pavers draw up detailed technical data sheets for their products.

It is rare, however, for suppliers to give precise details of all the characteristics of all their materials which they sell. The reason is that they often work with rather disparate batches and in much smaller quantities than in the industrial production of new materials. In this context, it is not tenable to carry out systematic tests.

<sup>5</sup> Florence Poncelet, Morgane Deweerdt, Jeroen Vrijder, 'Réemploi des matériaux: comment justifier leurs performances techniques ?' in CSTC Contact, 2020/1, p. 23-26.

<sup>6</sup> Since the introduction of the Construction Product Regulation (CPR) and the harmonisation of product standards, the technical specifications for many construction products are no longer transposed and adapted by each Member State. The essential characteristics of the products covered by a harmonised standard and the way to determine their performances are common for each European country.



### 3.2. Thorough examination

For some characteristics, simple measures can be performed by dealers, contractors or stock takers. For example, establishing dimensions, shades, colours, thickness, mass, etc.

Many common alterations (minor or major) can also be detected visually: presence of deposits, efflorescence, signs of wear, chips, scratches, development of fungi, cracks, discolourations, etc. However, some alterations remain invisible to the naked eye (micro-cracks, metal fatigue, etc.).

Other types of summary checks may be performed when a visual examination is not sufficient. For example, roofers are accustomed to knocking the tiles together to detect the presence of internal cracks through the sound they produce.

Finally, some technical characteristics can be correlated from data that are relatively easy to measure. Thus, the modulus of elasticity of a steel element can be deduced from the hardness of the steel. Such approaches can be of interest when the tests in question prove to be simpler and cheaper to perform.

### 3.3. Original use

This is an approach that works particularly well when it is possible to see the batches before they are taken apart. It is then a question of collecting all the useful information on the material: has it been correctly implemented, in what context, to what stresses has it been subjected, has it been correctly maintained, what were the original climatic or hygrometric conditions, etc.?

All of this information can be useful in carrying out a fitness-for-use assessment. Carrying out an inventory of the potential for reuse (or *diagnostic resources*) is a good opportunity to collect this data.

This work can be accompanied by documentary research in the *as-built* sheets, the original technical sheets, the maintenance and upkeep plans, the historical archives (specialized press articles, photo reports, etc.).

### 3.4. Tests

Certain material characteristics cannot be established with sufficient certainty and precision by the three methods described above. In this case, it will be necessary for approved bodies to carry out laboratory tests.

The cost of these tests varies depending on the measures to be taken and the sampling required.

In the case of a batch of material supplied by a professional seller, it is recommended to carry out the test in the presence of both the buyer and the seller. Where possible, samples are taken from different places in order to obtain an average sample size. In most cases, these certified testing organisations will assist in setting the appropriate sampling method.



Quality controlled bricks



Backside of a reclaimed cement based floor tile

### 3.5. Precautions against hazardous substances

Some reclaimed construction products may be contaminated with hazardous substances. For example, wood impregnation products containing arsenic or PCP (pentachlorophenol), lead- or cadmium-based paints, materials made of asbestos, floors laid with tar adhesive, etc.

Since the end of the 20th century, new regulations have set a stricter framework that restricts or bans the use of many toxic substances. However, existing buildings still contain materials that predate the application of these regulations and may therefore present a toxicity risk. The forms of contamination are variable and multiple. We will, as best as possible, outline the most frequent cases in each of the sheets.

Here are some general principles to flag this question:

→ **Compliance with current legislation:** for example, materials made of asbestos must be inventoried prior to demolition/renovation and are obligatorily considered as hazardous waste when they are evacuated. Dismantling is generally carried out by approved companies, according to a binding work protocol. Their re-use is therefore prohibited.

→ **Risk analysis:** in case of doubt, it is advisable to rely on an expert assessment to determine the level of risk and to deduce the measures to be taken. This assessment is generally based on laboratory tests carried out on samples.

→ **Decontamination:** Certain forms of contamination can be remedied to extend the life of a material. This is particularly the case for forms of surface contamination, such as the application of heavy metal paints or tar adhesives. Stripping these layers can result in a healthy material that is ready for reuse. These reconditioning operations must, however, be carried out in accordance with the environmental and health regulations in force. Many professionals in the sector are able to carry out such operations.



→ **Restriction of use:** certain substances may present a risk when associated with certain uses (indoors, in direct contact with the skin, etc.) but do not present a risk when associated with other applications (outdoors, out of reach of users, etc.). It is therefore advisable to limit the use of the materials concerned to applications in which they do not present a risk. For example, a batch of PCP (pentachlorophenol) emitting boards may be suitable for outdoor cladding applications, provided that the risk of contact with skin and food is limited.

→ **Protection of workers:** the removal of risk elements requires that adequate provisions be made to limit the risk of worker exposure.

→ **Implementation:** as a general rule, it is recommended to avoid contaminating the recovered material with substances potentially harmful to the environment or human health. This criterion also facilitates subsequent reuse. For example: re-painting cast iron radiators using eco-friendly paints with low VOC (Volatile Organic Compounds) content is preferable to polyurethane-based paints.



Sanitary components cleaning station



Residue on the side of a reclaimed marble tile

### 3.6. Alternative design strategies

*Last but not least*, if there is no information or a doubt about the performance of the material, it is also possible to adapt design strategies that give pride of place to “cascading” principles : one logic that has proved its worth is to consider reusing a material for less demanding uses than the original ones.

Any doubts about the porosity of a batch of slate? Perhaps these can be reused in a part of the building that is not exposed to the elements. No way of measuring all the performance of a steel beam? Maybe it can still be used for non-structural purposes for interior designs. A batch of particularly chipped tiles? Maybe these can still be used for spaces well-suited to these imperfections. Any doubt on the fire-resistance of a door? Why not reserve it for spaces that are not concerned by this requirement?

We can also cite the principles of redundancy and oversizing.

In general, establishing a rapid link with the engineering and control offices helps to control costs and assess the ecological and economic advantage of the operation.



Reclaimed fire retardant door



#### Read more!

*Technical framework for reused materials: How to justify the technical performance of reclaimed materials? Le Bâti Bruxellois : Source de nouveaux Matériaux (BBSM). May 2021. (Document in French)*

<https://www.bbsm.brussels/wp-content/uploads/2021/06/annexe-16-WP6-cadre-technique-des-matériaux-de-reemploi.pdf>



#### 4. Advice

In principle, the information mentioned in the sheets (possibly supplemented by specific procedures) should allow designers/specifiers to formulate reuse operations in their specifications.

Here are some general considerations in this regard, considering several scenarios.

Please note, these suggestions are not standard clauses that can be copied as in a specification. It is important that each designer/specifier adapts them to the terms of his project.



Careful dismantling of tile floor



Repackaged reclaimed ceramic tiles



Reclaimed timber formwork steenschotten panels

#### 4.1. Specify the removal of a batch of material for its reuse

Whether for reuse on-site or via professional take-back channels, it is a matter of specifying *careful dismantling of the affected batches*.

Depending on site organisation, this will take place during demolitions or during construction. In all cases, it is important to specify the objective of the operation (i.e. the future reuse of the elements).

If this has not been done beforehand, a dismantling test can be requested from the contractor in order to ensure the feasibility of the operation and to know the loss rate.

##### Example:

'Batch [XYZ] will be carefully dismantled for future reuse.'

The service provider will ensure that the batch is stored in conditions which make it possible to preserve its qualities [possibly specify the conditions: protected from frost / bad weather / dry conditions / protected from dust...].

The batch will be packaged [specify the applicable packaging requirements: on pallet / in boxes / strapped in packages of X pieces / in bulk...].

The batch will be sorted according to [specify the applicable criteria: shapes / colours / dimensions / quality...].'

At this stage, it is recommended to work in Presumed Quantities.

##### Example:

'Only the surface areas actually salvaged will be paid by the Client'



Wall tiles and sinks before dismantling

#### 4.2. Specify a removal and reuse operation on-site

In an on-site reuse scenario, it is important to clearly define the distribution of tasks.

##### Example of distribution:

*Dismantling + Storage* = responsibility of the demolition company.

*Cleaning + relaying* = responsibility of the construction company.

It is advisable to leave the possibility for general contractors to call on specialised service providers for operations linked to reclamation (i.e. dismantling companies).

In certain cases, it will be necessary to provide for the possibility that these operations are carried out off-site if the site conditions do not allow working correctly or storing the materials in good conditions.

It is also useful to refer to the removal station in the clause provided for installation.

##### Example:

'The batch [XYZ] to be installed comes from a careful dismantling operation with a view to this reuse carried out in a previous contract/item [specify which].

The batch has the following characteristics [specify format, colours, any associated elements...].

The salvaged [XYZ] items are in good condition. The contractor can inspect the batches/samples on-site.

The elements must be [specify expectations: cleaned/stripped/sandblasted/coated/treated against certain stresses/cut/made to certain dimensions...] before being installed.

Operations [specify which] are/are not included in this job.

A surplus of [specify percentage or absolute quantity] is expected for future repairs.

Presumed quantity (PQ) in [specify: m<sup>2</sup>, pieces, m<sup>3</sup>, tonne...] – net surface area – installation price only (excluding material purchase, already on-site).'



Finally, it may be counter-productive to oblige a contractor to reuse a batch dismantled on the same site, in particular if the dismantling has not been studied beforehand. It is then up to the contractor to assume the risks if the dismantling proves to be disappointing.

To overcome this scenario, it is useful to separate the two actions:

→ Subject the contractor to a *duty to take reasonable* care in recovering a maximum of such a batch with a view to its reuse (either on-site, or via professional or other reuse channels).

→ Indicate to the contractor that the materials to be re-implemented must come from reclamation.

In this case, if conditions allow, the contractor will be encouraged to reuse on-site. However, it will not be blocked if conditions do not allow it; the dismantled materials will always have the possibility of finding a new use elsewhere, while reclamation channels will be properly activated for the supply of new elements.



Green reclaimed ceramic wall tile

#### 4.3. Specify the implementation of a reclaimed batch

In this case, the batch comes from an external source. The company can obtain supplies from a professional dealer or even suggest materials from another work in progress.

##### Example:

*'This job concerns the installation of a batch of reclaimed [XYZ]. These elements are to be supplied by the contractor via a professional supplier/via another demolition site/other [specify]. The contractor will indicate to the client the origin of the material in order to ensure that it is not an imitation reclamation.'*

The designer/specifier then describes his requirements:

- Description of the material: composition, variety, etc.
- Dimensions and dimensional tolerance.
- Aspects: colour, texture, shade, etc.
- Expected degree of cleaning.
- Tolerance to cosmetic imperfections.
- Forms of (un)tolerated alteration
- Other required performance.

##### Example for reclaimed wall tiles:

*'The set of reused ceramic wall tiles contains the following elements: plain tiles/frieze elements/edge elements. The tiles are in a format of  $X \times X \times X$  cm, with a dimensional tolerance of  $\pm XX$  mm. They are plain/decorative... in appearance and uniform in colour [to be specified] or of a shade [to be specified]. Cracked glaze is/is not accepted [possibly specify the reservations: only if the cracked glaze is original]. The delivered batch is uniform: it only contains ceramic wall tiles. The tiles are delivered in good condition and completely cleaned of mortar residue on the front side/on the edges/on the front side and on the edges. Chips on the edges do not exceed  $XX \text{ mm}^2$  per tile [provide a drawing if necessary].*

*Surface preparation (plaster and repairs), grouting and finishing are included in this item.*

*Presumed quantity (PQ) in  $\text{m}^2$  - net area.'*



Ceramic wall tiles

The designer/specifier can draw the attention of the person carrying out the work to the existence of professional sales channels of reclaimed construction materials, by providing them with the reference to sectoral directories such as [opalis.eu](http://opalis.eu) or [salvoweb.com](http://salvoweb.com).

The order for removal/installation must be aligned with the administrative clauses of the specifications. If necessary, these must be adapted to set guidelines for reuse operations.

Do not forget to indicate the jobs involved in the reuse in the quantity survey and on the executive plans.



Blue reclaimed ceramic wall tile edge