

**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, nweurope.eu/fcrbe, futureuse.co.uk).

Non-exhaustive directories of dealers in reclaimed building materials are available on www.opalis.eu and www.salvoweb.com.

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.

Unless explicitly stated otherwise, the content of these sheets is credited in the Creative Commons Attribution NonCommercial – Share Alike format (CCBY-NC-SA).



Unless explicitly stated, the images used in this document belong to © Rotor vzw/asbl or © Opalis. Any other image has been the subject of a systematic request for authorisation from their authors or rightful owners. When this request has not been answered, we assumed that there were no objections to the use of the image. If you feel that this interpretation is unreasonable, please let us know.



Material description

Natural stone elements are often used to cover the tops of walls (acroterion, gable, partition walls) to protect them from rain and humidity. Like other natural stone materials, wall copings and capings (also called covering stones) are suitable for reclamation: they are resistant, have beautiful finishes and lend themselves well to various transformations. They are commonly found on the reclamation market, in a multitude of models which often reflect historical regional specificities (blue stone in Belgium, Burgundy stone in central France, sandstone in the United Kingdom).

Several criteria make it possible to distinguish them:

→ *Geological nature.* Many types of rocks were used in the manufacture of coping stones. Among the most common on the reclamation market, we find granite, sandstone, limestone (blue stone or white stone) or slate, in all their local variations.

→ *Formats and dimensions.* Most often, reclaimed coping stones have widths between 25 and 60 cm, thicknesses between 4 and 20 cm and variable lengths. The maximum length of new coping stones is generally 155 cm. Besides the linear elements, there are also specific parts for angles, ends, etc.

→ *Profiles.* Different coping stone profiles can meet. Their main function being to ensure the flow of rainwater, they are generally (but not always!) inclined. Their slope can be unilateral or bilateral depending on the desired direction of flow. Generally, natural stone coping extends beyond the thickness of the wall (≈ 5 cm on both sides) and include a drip groove to keep runoff water away (Figure 1).

→ *Fixing.* Coping stones are generally installed on a full bed of mortar (with or without the addition of additives) without interlocking or overlapping.

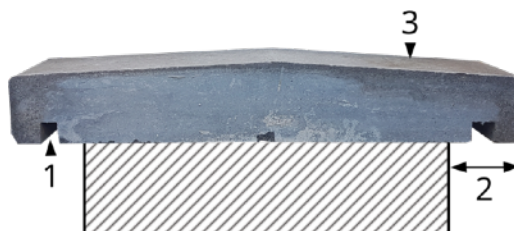


Figure 1. Profile of a standardised natural stone wall coping.

1. Drip groove
2. Overhang
3. Inclined upper face

Did you know ?

A *coping* is a construction element that lays on top of a wall and comes down the sides of it, encasing the wall and providing weather protection. However, a *caping* sits on the wall with its edges flush to the width of the wall.



Flat wall coping
© Architectural salvage



Sloped surface coping
© Willmow Reclamation & salvage



Double inclined surface coping
© Rotor DC



Cap coping
© Olde School architectural antiques



Half round in yellow Brionnaise stone
© Antic-Mat



Coping stone
© Willmow Reclamation & salvage



Natural stone wall copings

→ **Appearance.** The diversity of rocks is reflected in a wide range of colours, including within the same family: grey, beige, ochre, brown, pink, bronze, etc. A specific vocabulary is used to designate the stone inlays: veins, grains, strata, flames, stains, etc.

In addition to the original appearance of the rock, the coping stones can bear the marks of their cutting method (cleavage, sawing) and of their original finish (grinding, sanding, softening, chiselling, bush hammering, flaming, etc.). Over time, their appearance also varies according to the stresses of use: softening, polishing of the visible face, traces of paint, mortar, development of organisms (mosses, lichens.), etc.

When a re-machining of the reclaimed coping stones is envisaged (sawing, squaring, milling, etc.), this will generally modify the appearance of the visible faces.



Reclaimed red sandstone coping stones
© [Willmow Reclamation & salvage](#)



Reclaimed granite coping stones
© [salvoweb.com](#)



Reclaimed blue stone (limestone) coping stones
© [Het arduinen hoekje](#)



Reclaimed white stone (limestone) coping stones
© [BCA Matériaux Anciens](#)



Reclaimed slate coping stones
© [salvageandstone.co.uk](#)



Inspiration. Flat coping stones cut from reclaimed Villebois blocks © [Antic-Mat](#)



Material reclamation

Natural stone coping is a good candidate for reuse, either on-site or through the professional channels of material resellers. These suppliers can also ensure the supply of batches of coping stones ready for installation. They are able to ensure the smooth running of the following operations:

→ *Disassembly test (or expert opinion).* Makes it possible to ensure the feasibility and profitability of a removal. An “expert eye” generally makes it possible to estimate the interest of a batch based on photos or by an on-site visit. The focal points for coping stones will be among others:

- the general condition of the batch and the laying method: condition of the stone, formats and dimensions, nature of the laying bed, characteristics of the joints, etc.
- commercial interest, depending on the period, style, stone, condition, quantity in place, etc.
- logistics arrangements: especially in terms of deadline, working time, handling, transport, etc.

In order to more confidently determine the salvage potential of coping stones, a dismantling and cleaning test is usually performed on a sample.

→ *Removal.* The careful dismantling of coping stones must ensure the safety of the workers and the integrity of the recovered elements. The coping stones are first detached from the wall using mechanical or manual tools (hammer, jackhammer, pneumatic chisel, crowbar, etc.). Coping stones can be heavy due to their size and the density of the stone (> 2.5 t/m³). They can also be fragile, especially if they are thin (4-6cm) or if there are white grooves or veins on the surface of the stone. In the event of cracking or breakage, they lose a lot of their value. It is therefore advisable to equip oneself with specific means or call in a professional.

→ *Cleaning and sorting.* The salvaged coping stones will then be sorted by qualities, colours and dimensions. Cleaning with a brush and water as well as scraping with a suitable blade is generally sufficient to remove the residues of the laying layer, the jointing products, the residues of sealants and tar and the other elements which could adhere to them. However, mortars can bond tightly

and it is not always easy to remove them. Methods for repairing small cracks and breaks can be considered to restore damaged elements.

→ *Operations.* While some coping stones can be reused as is after a rough cleaning, others may require additional operations such as:

- *Sawing:* the ends of the coping stones can be sawn to obtain flat and vertical side faces, in order to standardize their dimensions.
- *Cutting and machining:* the profiles and edges of the coping stones can be re-worked.
- *Thorough cleaning:* the visible face of some more porous stones may be stained or have changed colour during use due to atmospheric pollution or the growth of mosses. Their restoration to original condition is not always possible. It depends on the depth of encrustation, which varies according to the type of pollution and the type of stone. It is advisable to contact a professional to know the compatible products and the appropriate treatment methods. Several techniques are possible (on site or in a workshop): water polishing, use of chemicals (oxalic acid, polishing chemicals, polishers), mechanical cleaning (sanding, polishing) or even, in very specific cases, use of laser, latex or poultices.

The choice of a suitable cleaning technique will depend essentially on the following aspects: nature and hardness of the stone, fineness of its grain and other surface aspects, presence of alterations, type and degree of soiling, desired result.

- *Finishing:* to meet the desired requirements (uniform appearance, rough or smooth appearance, etc.) several techniques are possible depending on the nature of the stone and the expected performance: bush hammering, sanding, flaming, shot blasting, pitting, etc. A specific vocabulary determines the type of finish depending on the type of rock concerned.

These various operations can be carried out by specialised resellers within their facilities. They can also be considered on site, provided that the site logistics allow it.



Sealant and tar residues © [auctelia](#)



Development of organisms © [Willmow Reclamation & salvage](#)

→ *Storage and packaging.* Coping stones are generally stored outside, packaged and strapped on pallets. They are arranged horizontally. Ideally, they are separated by wedging elements in order to limit the risk of damage. The wedges/separation wood must not be treated, be very dry and not contain tannins which could stain the stones. Metal straps should be avoided as there is a risk of staining the stone (rust). The packaging must take into account the large mass of the elements. Appropriate means of transport and lifting are also required.

Reclaimed natural coping stones are generally sold by the linear metre or by the piece. Most suppliers are able to provide a technical sheet showing their main characteristics: type of rock, nominal dimensions and tolerances, finish, intended applications and, in certain cases, their origin.



Applications and installation

Reclaimed coping stones can be re-used in their original function or reused for other applications: door and window sills, exterior flooring, stair treads, benches, etc.

For identical use, the main points of attention related to the installation of reclaimed coping stones do not differ from those linked to new coping stones - in particular, and in a non-exhaustive way: type and dimensions of the elements, type of laying layer, type of jointing, coping stone profile and incline, presence of drip groove, expansion joint, anchor, etc.

It is up to the specifiers to rely on the regulations in force in this field, on the rules of the art and on the European and national standards relating to the stone products. Furthermore, adequate installation requirements must be specified to cover the wide variety of possible applications of reclaimed coping stones.

In general, finding a batch with very specific characteristics can be complicated. It is often preferable to identify a batch of raw reclaimed coping stones and to consider additional processing operations. The expertise of professionals can be invaluable in this regard.

The following characteristics can be described and specified when drafting the technical requirements related to the delivery of a batch of reclaimed coping stones:

→ **Batch composition.** The batch consists of reclaimed coping stones of the same type (same profile), the same geological nature or even the same origin of use (area subject to frost, etc.). However, mixed coping stone batches may be suitable for less demanding applications.

→ **Format.** The identified batch must correspond to the specificities of the project. In general, the dimensions must be uniform in thickness and width greater than that of the wall to be covered. Depending on the design, the batch can be split into sub-batches of different dimensions. To limit costs and facilitate the identification of recovered coping stone batches, it is preferable to be flexible enough on the dimensions by opting for a free-length installation, by defining only a minimum length (for example, min. 40 cm) or by setting a fairly wide gap (for example, length between 80 and 120 cm). If necessary,

it is also possible to insist on more precise dimensional characteristics (as well as tighter dimensional tolerances). This may result in a heavier transformation of the material (sawing, re-machining).

→ **Profile.** If necessary, the profile (flat, unilateral or bilateral slope, etc.), the condition of each edge (straight sawn, chamfer, rounded, without requirement, etc.), the degree of inclination and the dimensions of the drip edge should be specified. These characteristics may be given approximately (for example, thickness > 5 cm, height difference > 5%, etc.) or defined more precisely.

→ **Texture and finish.** Depending on the requirements (functional and aesthetic) and the type of rock, the appearance of the visible faces (sawn, ground, bush hammered, flamed, scabbled, shot peened, etc.), non-visible faces and ends (sawn, cleaved) should be specified.

→ **Hue.** By nature, natural stones have a wide variety of colours and appearances. Depending on usage requirements (for example, in the context of heritage renovation), it is possible to specify this characteristic by referring to a general hue or to a specific colour.

→ **Condition.** In addition to traces of mortar and paint residues, reclaimed coping stones may show minor alterations such as signs of surface wear, chips, light cracks, craters, light flaking, stains, leftover moss, earth, etc.

These deteriorations can influence the technical and aesthetic performance of the coping stones, as well as their re-installation, but do not constitute a major obstacle to reclamation (see "Characteristics and fitness for use"). Depending on the nature of the rock, other aspects can be considered as major imperfections. For example, certain limestone rocks (i.e. blue stone) may have stylolitic joints liable to weaken the stone. To a large extent, the existing technical documentation makes it possible to assess these various aspects on a case-by-case basis. Professionals can also be consulted. It is up to the specifier to define the degree of imperfection tolerated, according to the defined use and the installation conditions, by specifying the degree of acceptable alterations (for example: chips, cracks and flaking < x cm² tolerated on visible sides, broken corners and edges tolerated on invisible parts, etc.).

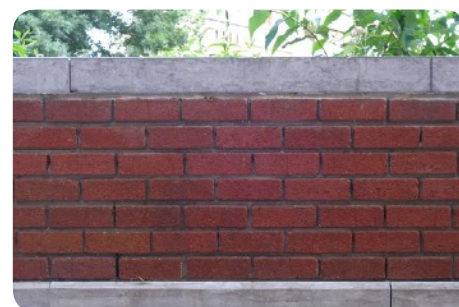
Most professional suppliers are able to ensure that delivered batches meet these requirements. A control test procedure

based on a contractual sample and sampling upon receipt can be set up.

Most of the reclaimed building materials are sold as is. The conditions of sale may however contain special guarantees specific to the material. Some suppliers are able to indicate the origin of the material and/or provide documentation on the product purchased (for more information, see the Introductory sheet).



Coping stone (with overhang)



Coping stone (without overhang)

Design tip!

It is better to order a quantity expressed in linear metres rather than in number of pieces, given the irregular lengths of the reclaimed coping stones.



Characteristics and fitness for use

By knowing the family or the type of stone present, it is generally possible to find its general characteristics. These indications are invaluable for studying the compatibility of the reclaimed stone for the intended use.

See for example: www.febenat.be ; www.stonenaturelle.fr ; www.pierreetsol.com ; www.cstc.be ; etc.

As an indication, the following table (*Table 1*) shows some of the known performances of some types of rock constituting coping stones which are frequently reclaimed. It is important to point out that each stone has its own characteristics and that two batches of coping stones of the same rock can however have quite different performances.

There is no harmonized standard specific to coping stones, but several standards and test methods make it possible to determine the properties relating to natural stones (EN 12407 - Petrographic examination, EN 1936 - Determination of real density and apparent density, and of total and open porosity, EN 12371 - Determination of frost resistance, etc.). Although they relate to new materials, these documents can be useful in characterizing reclaimed coping stones (*Table 2*).

Table 1 : Technical characteristics of the most common stones used in coping stones

	Bulk density (kg/m³)	Porosity	Wear resistance
Sandstone	2000 - 2700	little porous (0.5 to 10%)	good to very good
Soft limestone (e.g. white stone)	< 2500	porous (5 to 50%)	good
Compact limestone (e.g. bluestone)	> 2500	little porous (0.2 to 5%)	good
Granite	2500 - 3000	very little porous (0.2 to 2%)	very good
Slate	2600 - 3000	very little porous (< 3%)	/

Table 2 : Characteristics to be evaluated in order to determine the fitness for use of reclaimed natural stone wall copings

Characteristics	Comments
Geological origin and petrographic description	The reclaimed coping stones come from works that may have been made from batches of multiple origins. If it is possible to visually identify the type of rock present, it is however more difficult to affirm with certainty that their geological origin is identical, unless there are records that allow it to be attested (for example: a certificate of origin, archival documents, etc.). This is all the more true for the batches made up of elements of various origins.
Geographical origin	As with the geological provenance, information on the original geographic provenance of a batch of reclaimed coping stones is difficult to certify with any certainty. On the other hand, we can deduce certain characteristics if we know where the coping stones were removed. Thus, in the absence of information on the original quarry, it may be useful to have information on the original use or the area where the elements come from.
Geometric characteristics	These characteristics can be found out by taking simple measurements. They are closely linked to the degree of sorting and cleaning of the reclaimed coping stones as well as to the transformation operations undertaken on the material. In the case of coping stones intended to be re-machined or re-cut, it is advisable to define with the supplier the dimensional tolerances applicable to each of the dimensions (width, thickness, length, etc.) the type of stone and the functionality of the works. The requirements in terms of flatness, straightness, dimensions of the drip edge and the desired degree of slope should also be detailed.
Bulk density and open porosity	<p>These characteristics are specific to each stone. The density [kg/m³] gives an indication of the degree of compactness of the stone. In general, the more compact a rock, the less porous it is.</p> <p>The open porosity of a stone [% by volume] corresponds to the proportion of pores connected to each other and accessible to water. This characteristic influences in particular the degree of resistance to stains and soiling. It does not directly affect its freezing (it is rather its capacity to return the absorbed water that matters at this level).</p> <p>This information can be estimated based on technical documentation relating to natural stones (<i>see Table 1</i>). If necessary, these characteristics can be measured more precisely by an identity test as defined by the test EN 1936).</p>



Characteristics	Comments
Resistance to freezing/thawing (and de-icing salts)	For an exterior application, the natural stone elements must be able to withstand freezing/thawing without their appearance or their mechanical characteristics being affected. The source and condition of a batch of reclaimed coping stones can provide a useful guide to determining their resistance to freezing/thawing. Many old coping stones are in fact likely to have withstood, during their first use, more freeze/thaw cycles than what is recommended by the test standard which allows this performance to be assessed (EN 12371). It is therefore important to find out about the geographical origin of the batch to ensure the original climatic conditions (for example, a batch coming from a continental climate in northern Europe will probably be suitable for an application in the Mediterranean climate of the South of France). Generally, less resistant coping stones that have suffered frost damage will probably have been discarded during the sorting and cleaning steps.
Reaction to fire	In accordance with Commission Decision 96/603/EC, natural stones are considered to belong to class A1 of reaction to fire (see EN 12 058 for exceptions). However, be careful with the use of filler sealants, which can affect this performance.
Susceptibility to staining	<p>To assess this characteristic, we differentiate between internal staining caused by the reaction of certain constituents of the stone (metallic minerals or organic materials present in the stone), from accidental staining caused by contact with a staining product.</p> <p>Internal staining is first and foremost an aesthetic concern for the material and it is therefore appropriate for the project developer to define the acceptable characteristics with regard to the intended use.</p> <p>The sensitivity to staining is also directly related to the porosity value of the stone. The higher the porosity, the more easily the stone absorbs liquids and pollution, the more sensitive it is to staining. A porosity of less than 4% is generally satisfactory in order to limit the risks of soiling. It is also possible to visually identify the degree of soiling of the reclaimed wall copings by observing the visible face of the unprocessed (sawn) elements. Where appropriate, there are surface treatments to improve this performance by slowing the infiltration of greasy substances into the stone's pores.</p>
Resistance to impact	The impact resistance of a hard body depends on the characteristics of the stone but also on its installation method and its substrate. The test described in standard EN 14158: 2004 consists in dropping a steel ball on the element installed in its actual conditions of use. For reclaimed coping stones, we can also rely on the condition of the elements still installed. If many coping stones subjected to similar loads are broken, it can be assumed that even intact coping stones are liable to break in turn. These coping stones alone should not be removed without minding all the information on the condition of the batch.
Thermal deformation	Natural stone is subject to dimensional variations under the effect of temperature. This deformation is expressed in [mm/mK] by the coefficient of thermal expansion. In the case of coping stones subjected to large temperature variations, it may be relevant to determine its extent (EN 14581: 2005). In certain marbles and, to a lesser extent, certain granites, the anisotropic thermal expansion of the stone causes granular decohesion resulting in significant deformation of the blocks.



Blue stone exterior coping stones reused for the creation of a terrace, Brussels (BE) © VLA architecture
<https://www.guidibatimentdurable.brussels/fr/reemploi.html?DC=10994>



Availability

Professional suppliers of reclaimed stone materials generally have batches of varying quantities of coping stones. The quantities found can range from a few metres (<10 m) to a hundred linear metres. For larger quantities, stock should be checked with suppliers well in advance.

Indicative prices (Excl. tax):

A non-exhaustive sampling of the reclamation market in North West Europe (Belgium, France, Great Britain and the Netherlands) made it possible to extract some indicative prices. The price of a coping stone (expressed in linear meter) varies depending on the availability of the size and type of stone, as well as the degree of sorting and cleaning requested.

- Thin coping stone (<10 cm): ~ 30-50 €/lm
- Thick coping stone (> 10 cm): ~ 60-200 €/lm
- Cutting: ~ 40 €/h for cutting the stone

Find specialised businesses



salvoweb.com

opalis.eu



Reusing old coping stones for window sills © Sophie Boone

Did you know?

Some suppliers of reclaimed stone items also offer new product lines, some of which are artificially aged to give them the appearance of a used product. If in doubt, find out where the materials are coming from, in order to be sure of their reclaimed origin.