



FINISHING  
PROCESS  
TOUCH

REUSE TOOLKIT  
**PROCUREMENT  
STRATEGIES**

**INTEGRATING REUSE IN LARGE-SCALE PROJECTS AND  
PUBLIC PROCUREMENTS**

# CONTENTS

---

|  |           |
|--|-----------|
| <b>ACKNOWLEDGMENTS</b>   | <b>4</b>  |
| <b>INTRODUCTION</b>  | <b>8</b>  |
| <b>SECTION 1: DEFINING A REUSE OBJECTIVE</b>   | <b>13</b> |
| 1.1 Getting to know the context  | 15        |
| 1.2 Formulating the reuse objective  | 18        |
| 1.3 Incorporating the objective into the contract documents  | 19        |
| 1.4 Reuse assistance   | 23        |
| <b>SECTION 2: IMPLEMENTING THE OBJECTIVE STEP BY STEP</b>  | <b>25</b> |
| 2.1 Overview of proposed approaches  | 28        |
| 2.2 Step-by-step approaches  | 30        |
| <b>SECTION 3: THEMATIC FACTSHEETS</b>  | <b>53</b> |
| factsheet 1: The benefits of reuse   | 55        |
| factsheet 2: Linking reuse with other aspects of the circular economy  | 59        |
| factsheet 3: Exploring the different sources of reclaimed materials  | 63        |
| factsheet 4: Finding out what is available from professional salvage dealers   | 75        |
| factsheet 5: Setting a performance target in reuse objectives  | 77        |
| factsheet 6: Contracting additional services: reclamation audit, additional studies, project management assistance, etc. | 87        |
| factsheet 7: Identifying relevant materials for your project   | 91        |
| factsheet 8: Conducting a prior market consultation  | 97        |
| factsheet 9: Assessing the economics of reuse in the project   | 101       |
| factsheet 10: Asking for a reuse alternative in the offer: variants and options  | 105       |

|  |            |
|--|------------|
| factsheet 11: Insuring reused materials  | 113        |
| factsheet 12: Writing technical specifications for reusing materials                         | 117        |
| factsheet 13: Opting for a procurement procedure that allows for negotiation                 | 129        |
| factsheet 14: Defining selection criteria  | 133        |
| factsheet 15: Assessing offers including reuse: documents to be requested and award criteria | 135        |
| factsheet 16: Incorporate specific performance clauses for reuse                             | 145        |
| factsheet 17: Adapting the contract documents to reuse objectives: checklist                 | 149        |
| factsheet 18: Making a reuse report: possible indicators                                     | 157        |
| <b>Corpus</b>  | <b>160</b> |
| <b>Photos credits</b>  | <b>168</b> |

*This document reflects the authors' views only. The authors and the funding authorities of the FCRBE project are not liable for any use that may be made of the information contained therein.*

This guide has been produced as part of the project Interreg NWE 739: Facilitating the Circulation of Reclaimed Building Elements (FCRBE), October 2018 - January 2022. It corresponds to Deliverable 1.2 of the Work Package 3 (WP T3 D.1.2).

The WP T3 aims to provide tools to building commissioners in order to facilitate the integration of reclaimed building materials into their construction and refurbishment projects. It targets especially commissioners of large scale projects and public projects.

<http://www.nweurope.eu/fcrbe>

## Authors

For Rotor: Gaspard Geerts, Michaël Ghyoot, Susie Naval ; Béatrice Godon for the layout.

For Bellastock: Hugo Topalov ; with the contribution of Mathilde Billet and Fanny Thibault ; Vincent Vanel for the layout.

## In collaboration with

- Brussels Environment: Corinne Bernair, Marilyn Mertens.
- Construction Confederation: Jonathan Boulvain, Lara Perez Dueñas, Petra Ronda.
- Belgian Building Research Institute: Morgane Deweerdt, Ambroise Romnée, Tijl Smeyers, Jeroen Vrijders.
- Le Centre Scientifique et Technique du Bâtiment (France): Frédéric Bougrain.

An intermediate version of this document has been carefully reviewed by Maxime Vanderstraeten, a lawyer specialising in public procurement, who made a lot of precious inputs concerning the organisation of public procurement. Some parts of the factsheets have benefited from the expert advice of Marc Serieis from Albert & Compagnie. We thank them for their contribution.

The authors also wish to thank:

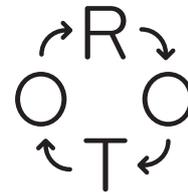
- All the project owners and architects who contributed to the pilot operations carried out within the framework of the FCRBE project and who, thanks to their valuable feedback from the field, helped improve the approaches proposed here: David Kohn Architects, Immobilière 3F, ITAR, Plaine Commune, City of Paris, Grand Huit, Seine-Saint-Denis Habitat, Aka, SAS l'Autre Soie Est Métropole Habitat, Brussels Environment, City of Koekelberg, V+, Citydev, Manchester City Council, Landlease, Paris Habitat, Camille Salomon & Valentin Cordebar architects, Louise Morin, QUBO (Quimper Bretagne Occidentale), Ter, Cuesta, City of Fourmies, Atelier 9.81, Samoa, Jacqueline Osty & associates, La Fabrique des Quartiers, Nicolas Pereira Architects, SERS, La Générale, Matthieu Buisson Architects, Studio Bark, Grosvenor, Arup, Orms, Elliott Wood, HETA, ReLondon.
- All organisations that participated in one of the working sessions in which these prescription methods were presented, discussed, confronted with current practices and projects and finally improved: Brussels Environment (architecture team), CPAS of the City of Brussels, Community Land Trust of Brussels, Centr'Habitat, Habitations Sociales du Roman Païs, Bin'Hôme, City of Watermael-Boitsfort, Logis-Floréal, SISP EBDS, Zinneke asbl, Confluences asbl and the City of Utrecht.
- All the people and organisations who have agreed to have their images and projects used in this guide as examples and illustrations.
- All the associated partners of the FCRBE project, who have been available to participate in working meetings, provide references or simply answer specific questions.
- All the partners of the FCRBE project who, in one way or another, have contributed to the content of this document.
- Finally, we would like to thank all the colleagues in the organisations involved who have contributed to the smooth running of this work through their advice, their ad hoc contributions or their support.

This document also benefited from the support of the European Regional Development Fund through the Interreg NWE programme, and the Brussels-Capital Region through the PREC programme.

*Contact person: Michaël Ghyoot (Rotor), [michaelghyoot@rotordb.org](mailto:michaelghyoot@rotordb.org)*



The FCRBE project is a partnership between Bellastock (France), the Belgian Building Research Institute (Belgium), Brussels Environment (Belgium), the Centre Scientifique et Technique du Bâtiment (France), the Construction Confederation (Belgium), Rotor (Belgium), Salvo (United Kingdom) and the University of Brighton (United Kingdom).



*Unless explicitly stated otherwise, the content of this document is credited under the Creative Common Attribution - Non Commercial - Share Alike format (CCBY-NC-SA).*

# INTRODUCTION —

Reuse involves taking reclaimed building materials and components that have been carefully dismantled from a building undergoing demolition for use in a new construction.

Reusing materials has many benefits: environmental, social, economic and cultural.



Throughout history, reuse practices have been commonplace. However, they declined during the twentieth century under the combined effect of the mechanisation of demolition sites, the gradual increase in labour costs, the need for speed (particularly in urban contexts) and the growing attraction of new types of industrial materials that are less obvious to reclaim.

However, in the last few decades, there has been a growing interest in reuse practices. This is motivated by concerns such as preserving the existing built environment, mitigating the impacts on the environment, reducing waste and working with quality materials bearing a history.

Today, reusing building materials features prominently in many local, regional, national and European public policies aimed at reducing the environmental impacts of the construction sector and managing material resources in a more sustainable way. This principle is also being promoted through the adoption of circular economy principles - understood as a context in which the production of added-value would derive from extending the lifespan of existing goods by keeping them in circulation as opposed to a 'classic' model based on a production-consumption-discard logic.

By encouraging the reuse of building materials and components in construction or renovation projects, project owners can contribute to these efforts and significantly reduce the environmental impact of the building industry.



Illustration of the general principles of reuse through the case of a tiled floor: careful dismantling, transport, cleaning, packaging and reuse.

# 1. Objectives of the guide

This guide is a tool aimed primarily at building owners. It presents several routes to integrate the principles of reusing building materials in construction and renovation projects.

The proposed strategies are adapted to the development of public building projects. They are in line with public procurement regulations. However, the general principles described here are also applicable to private contexts and to smaller scale projects, which are generally less constrained in terms of procedures. The main principles can also be transposed to other types of work such as public space developments, landscape infrastructure, etc.

The guide is structured around 3 sections:

1. The first section establishes different ways of formulating a reuse objective - an important and preliminary step whatever the subsequent route.
2. The second section offers a step-by-step presentation of different routes. These correspond to different cases and strategies, with each step being detailed.
3. The guide is completed by a collection of appendices where some questions and concepts are explained more thoroughly. This third section cross-references concepts from sections 1 and 2. □ These are indicated in the margin by a pointing index.

This guide is one of the outcomes delivered by the partners of the Interreg NWE project Facilitating the Circulation of Reclaimed Building Elements (FCRBE). Other deliverables of this project cover in detail some aspects also addressed in this guide. Where this is the case, an annotation in the margin indicates which document to consult (□).



# DEFINING A REUSE OBJECTIVE —

## SECTION 1



A reuse objective provides precision to the ambition to be sustainable/ environmentally friendly. Translating this general ambition into a clear objective has several advantages:

- Clear expression of what is expected from the external providers who will be involved in the project at different stages (architects, study offices, contractors, etc.).
- Articulating the ambition to reuse building materials alongside other environmental and circularity ambitions, equally relevant to the project.

There are several valid ways to formulate a reuse objective. These largely depend on the context in which the project is developed.



## 1.1 Getting to know the context

Getting a good understanding of the general context helps to formulate an appropriate objective - ambitious and inspiring but also adapted to the capacities of the market. To that end, it is useful to get an overview of three complementary aspects: actors, sources of materials and local dynamics.

### Actors

The aim here is to identify external providers who are active in the area and likely to contribute to the implementation of reuse strategies. This consists in particular of:

- Getting to know the professional reclamation dealers active in the area: with what materials do these companies commonly deal and what allied services do they offer ?
- Investigating the network of local organisations and social economy enterprises which, in some regions, can be active in salvaging building materials.
- Identifying architects, design offices and construction companies with experience in this field.



A network of mature actors will facilitate ambitious objectives. Conversely, if the identified actors are newer to reuse aspects, a lighter objective will have the virtue of initiating a learning curve and progressively increasing all the actor's competences.



## Potential sources of materials

The materials to be reused can come from different sources and follow different routes. Each has its own strengths and weaknesses. All are, of course, largely complementary but they can impact on how the reuse objective will be formulated and which actors to involve. Sources may include:

- Professional reclamation dealers active in the regions
- The original building
- A concurrent building site
- Internal stocks (owned by the client or contractors)
- ...



At this stage, it is not yet a question of identifying a precise source or deciding definitively which batches of materials are to be reused - these steps will come later in the process. It is, however, a matter of being aware of the contextual possibilities in order to formulate an appropriate reuse objective.

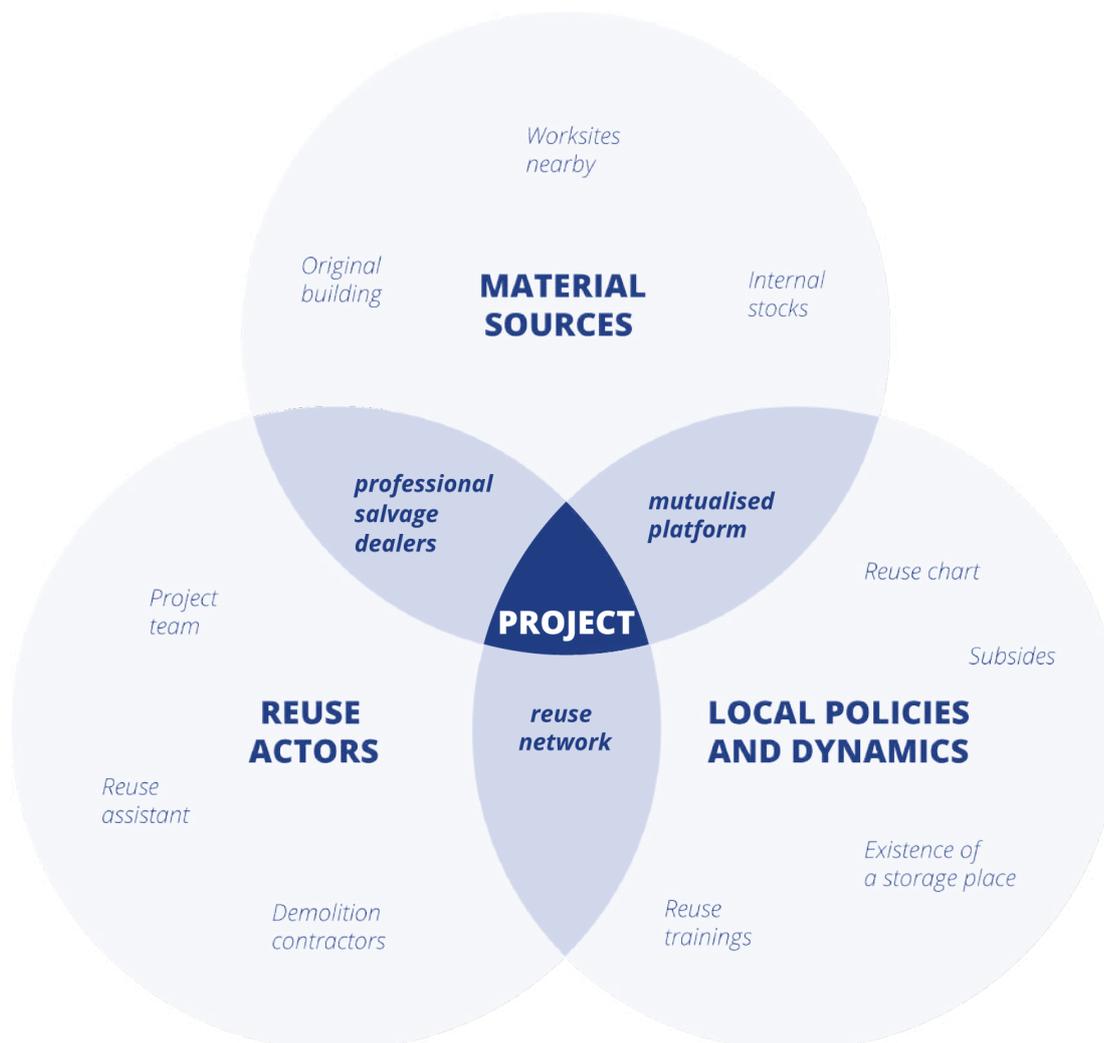
## Local dynamics and policies

Today, more and more local authorities want to stimulate the development of a more circular economy on their territory. These ambitions are translated into policies aimed at supporting emerging initiatives in this field: subsidies, organisation of facilitation services, creation of exchange platforms (online or physical), etc.

Thus, a construction project integrating reuse can be supported by local, regional, national and even European public schemes. An overview of existing programmes can help to find resources for the project and adapt the objectives accordingly: aim for a form of exemplarity, explore innovative practices, set particularly ambitious objectives, etc.

If there is no applicable programme for a given project, this should not prevent the formulation of a reuse objective: indeed, many forms of reuse do not imply particularly innovative dimensions or additional complexity.

Synergies can also be sought from companies, both public and private, that are developing their own internal circular economy strategy. A project



that has the opportunity to build on such dynamics will be able to aim for more ambitious objectives.

### To sum it up

At the end of this first analysis, the project commissioner should have a better insight into the resources that can influence the degree of ambition of its reuse objective. Well-established supply chains, experienced external providers, multiple supply opportunities, and a favourable political context are all the ingredients to achieve ambitious results !

None of the above ? Don't panic! The formulation of a reuse objective in the project can be the first milestone of a positive dynamic that will gradually develop from project to project.

In any case, it is now time to give shape to this objective.

## 1.2 Formulating the reuse objective

In this guide, we focus on one particular type of objective: to integrate reclaimed materials in the context of construction and renovation works.

This objective can be linked to other environmental ambitions related to the choice of materials, such as favouring materials with low environmental impact, and anticipating maintenance, repair and dismantling needs.

Expressing this objective in the contract documents is an important step. It will help establish a clear line and, in some cases, will be used as a basis for comparing tenders.

This reuse objective can be formulated in various ways. First of all, it can be expressed in either qualitative or quantitative terms:

- Qualitative: the tenderers are invited to take up the issue of reuse and to integrate it into the project, but they are not expected to provide precise quantities.
- Quantitative: this involves setting a reuse rate for the project, expressing a quantity that the tenderers must reach or exceed. This can be referred to as a 'reuse performance'.

Secondly, the reuse objective can also be expressed in either an open or specific way:

- Open: the commissioner leaves some leeway to the contractors to meet the expectations (e.g. by letting the contractors choose the parts of the project and the materials that will be concerned by reuse).
- Specific: the commissioner requires the contractors to take a certain approach to meet the expectations (e.g. by asking the contractors to integrate a specific batch of reclaimed materials in a specific part of the project).

These two approaches can be combined. They are illustrated as follows:



| Objective    | Specific  | Open   |
|--------------|---|--|
| Qualitative  | 'Integrate this or that reclaimed material for this or that part of the project.'                 | 'Favour reusing building materials wherever possible.' |
| Quantitative | 'Integrate at least X % of this or that reclaimed material for this or that part of the project.' | 'Integrate at least X % of reclaimed materials.'       |

If the objective is quantitative, it will be necessary to define the unit of measurement and, where appropriate, the expected performance target.

Both the context analysis and this internal reflection are useful to the contracting authority in balancing its ambitions and drafting a reuse objective adapted to its project. This objective can then be incorporated into the contract documents (see next section), and justify the development of an award criterion on reuse.



### 1.3 Incorporating the objective into the contract documents

The reuse objective is usually detailed in a section on the environmental performance of the project (depending on the case, it may also be in the generalities, or in a separate section, etc.). This clause will be of strategic importance as it will be cross-referenced in several places in the contract documents. It should therefore clearly express the commissioner's vision.

The description of the reuse objective can also be an opportune place to draw the tenderers' attention to particular challenges that may arise (depending on the material source chosen). By extension, this can help to provide a clear and solid basis for the award criterion that may be used to assess how well the offers address these issues.



In describing the objective, care should be taken to respect the definition of reuse, its place in the waste hierarchy and the articulation of the objective with other circular economy measures.

## EXAMPLES OF REUSE OBJECTIVES IN DESIGN SERVICE CONTRACTS

### Service contract for the design of an urban site

'The issue of circular economy is brought forward with two required approaches: the adaptability of the project (which is evaluated within the criterion «Habitability») and the choice of materials.

Choice of materials: with the aim of reducing the use of natural resources and limiting the environmental impact of construction, the tenderer will prefer, when choosing new incoming materials (other than materials from on-site reuse):

- materials and construction elements from the local reclamation sector instead of new construction materials and products from raw materials.
- materials, building products and construction techniques that have the potential to be reused for a similar function, or that can be recovered through recycling.
- materials, construction products and construction techniques whose composition includes a percentage of recycled material.
- materials, construction products and construction techniques with a high potential for recycling at the end of their life [...].

There is a commitment to foster a circular economy project where the amount of construction waste is reduced to a minimum, and where selective dismantling and reuse (same-site or off-site) are encouraged. In addition, the materials must be healthy, non-polluting and have the lowest possible environmental and health impact. [...]'

### Service contract for the design of a housing building

'The project has significant potential to foster the reuse of construction materials. [...] As part of this contract, the contracting authority aims to promote a project based on a circular economy approach. [...] The project will prioritise, in the following order: 1.

the conservation of materials in place, 2. the reuse of materials on site, 3. the supply of reclaimed materials and the reclamation of dismantled materials through the local reclamation sector.'

## EXAMPLES OF OBJECTIVES IN WORKS CONTRACTS

### Works contract for road improvements

'It is the contracting authority's intention to extend its commitment to a broader circular economy approach, by allowing the integration of reclaimed materials acquired outside the site into its developments. The sources of considered reclaimed materials are therefore (a) the site itself, as well as the contracting authority's pre-existing stocks, and (b) the market for reclaimed building materials [...]. For this second source, priority is given to the acquisition of materials from suppliers specialised in the reclamation, preparation for reuse and resale of building materials. Indeed, the contracting authority wishes to ensure the most reliable and stable supply possible for its works throughout the execution of the framework agreement and, at the same time, to foster the development of the professional reclamation sector.'

### Works contract for the renovation of a university building

'The contracting authority intends to manage this project in an exemplary way in accordance with the above-mentioned waste hierarchy, by requiring the use of reclaimed materials and the reuse of production and construction waste. This allows the contracting authority to reduce the overall environmental impact of the project by avoiding the production of new products. At the same time, it supports the development of the reclamation market and the practices of reusing production and construction waste. The reuse clauses applied in this contract have been carefully researched in a preliminary technical study.'

As mentioned above, the objective can be very open (leaving a lot of interpretation to tenderers), or, on the contrary, more specific (describing a very precise expectation). Depending on the form, these objectives are translated differently in the contract documents:

- A precise and limited objective briefly stated in the introduction to the contract, and then referred to in the form of contractual technical specifications. This is an interesting form when it is possible to describe



precisely the types of batches sought for reuse, which do not raise any particular difficulties in terms of supply and installation.

- A more open-ended objective will instead require formulating a clear ambition in the introduction to the contract, accompanied by an award criterion dedicated to this aspect. The way in which the objective will lead to tangible results will become clearer as the project develops.

## **PARC EN MOUVEMENT PROJECT, FCRBE PILOT OPERATION**

*Contracting authority: Communauté d'agglomération Quimper Bretagne Occidentale*

*Design: Agence TER*

*Quimper (France), 2020-2025*

The project concerns the redevelopment of the Quimper station square. From the very outset, the architects (Agence TER) planned to reuse on site the original paving stones. However, other possibilities emerged through the dialogue with a consultant specialising in reuse:

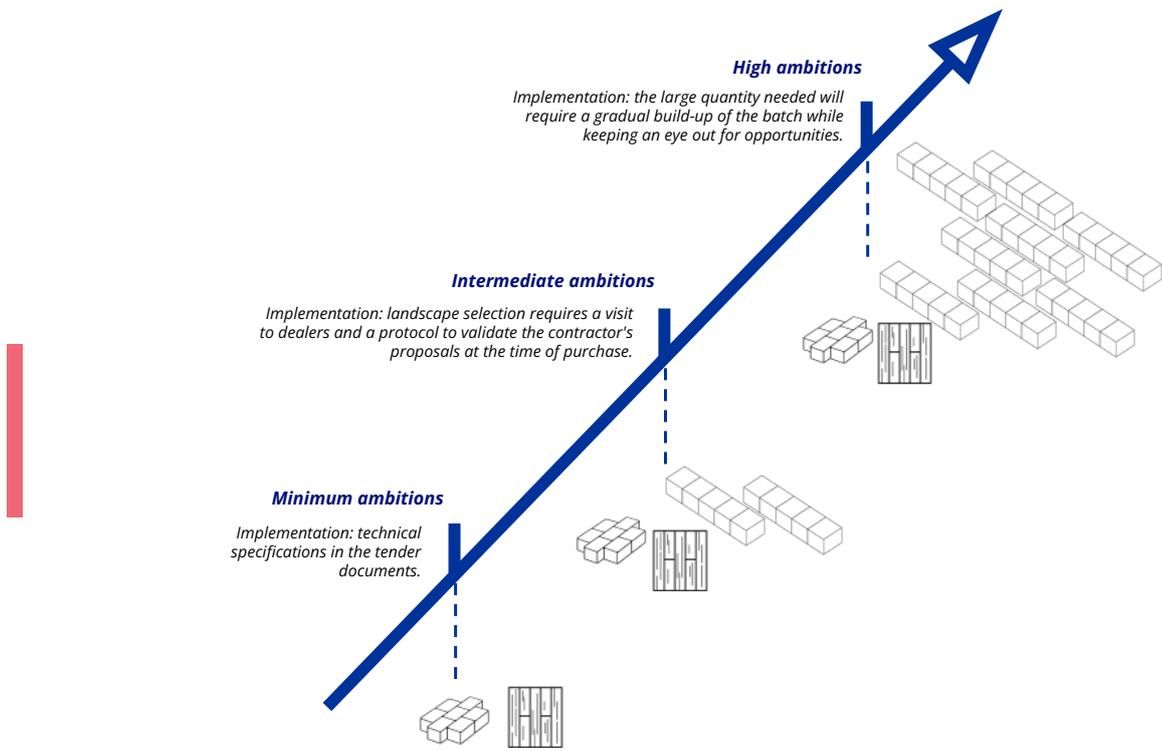
### 1. Study of the architects' plans.

It appears that other lots of the project could integrate reclaimed materials, in particular: floor surfaces (setts, concrete and granite tiles), specific coverings (timber decking), certain construction details (kerbs, stone steps) and street furniture (stone blocks).

### 2. Sourcing from professionals dealers in reclaimed materials.

This crucial stage allows certain hypotheses to be confirmed but also leads to others being ruled out, notably because of costs, availability of stocks (certain materials prove to be in short supply) and economic and logistical aspects (notably transport). However, this sourcing also reveals other opportunities: notably large stocks of granite lintels. This typical element was used as door and window framing in traditional houses in the region and is abundant. It inspires architects to design the public benches.

Finally, adjusting reclaimed materials locally available to the needs of the project led to the selection of the following elements: paving stones, kerbstones, stone lintels and timber decking. For these four families, reuse proves to be an interesting option from a technical, logistical and economic perspective.



Reuse strategy presented to the contracting authority, with three levels of ambition. The materials selected in the end correspond to an intermediate level of ambition.

## 1.4 Reuse assistance

A contracting authority may opt to be assisted by a service provider to help define its ambitions in terms of materials reuse and to translate these into the contract documents. Depending on the needs of the project, this assistance can also include other aspects, such as making an inventory of reusable materials in an existing building (i.e. reclamation audit), helping to identify batches suitable to reuse, defining a circular strategy, etc.

Alternatively, a contracting authority may ask tenderers to include in their team partners or subcontractors who are capable of carrying out this type of task. In this case, the reuse objective can be formulated in a rather open way, while emphasising the skills expected of the designated team.

see factsheet 6  
contracting  
additional  
services

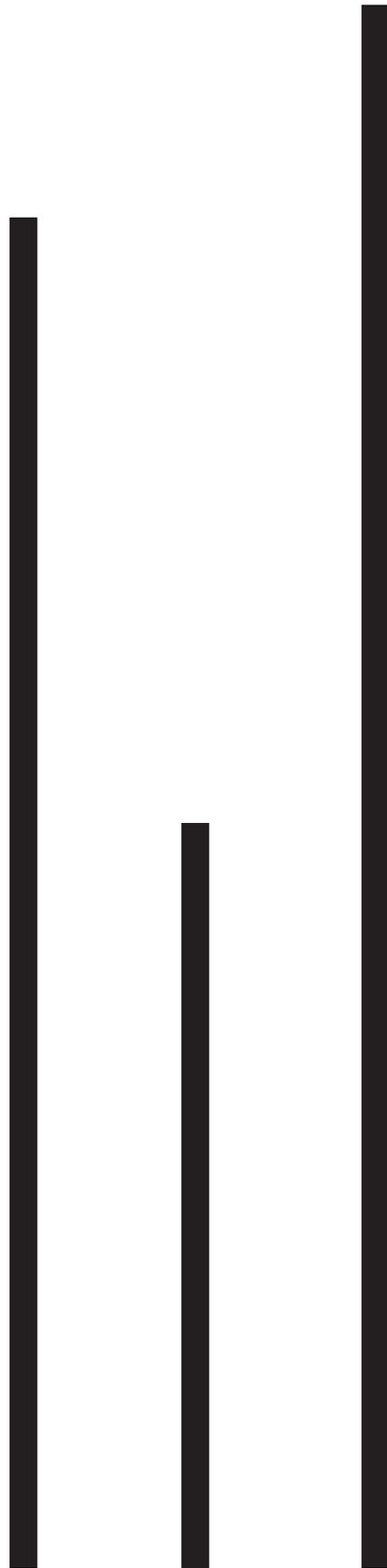
see factsheet 14  
selection  
criteria



## **SECTION 2**

# **IMPLEMENTING THE OBJECTIVE STEP BY STEP —**

## Implementing the objective step by step



In this section, we present several ways of integrating a reuse objective into a public procurement procedure - and of ensuring that it leads to tangible results !

We start by detailing two approaches to two procurement formats for architecture and building projects:

(A) Procurement of two separate contracts: service contract + works contract.

(B) Procurement of a single Design & Build contract.

The choice of one format over another depends primarily on the habits and preferences of the contracting authority. The ambition to reuse materials should not in itself determine the choice of one or another of these major types of procurement. However, each of them has specific features that can be leveraged and which can therefore influence how the reuse objective is formulated and achieved.

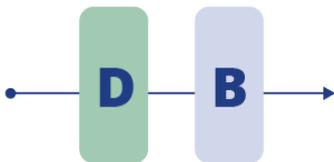
The approaches presented here are intended above all to mark out potential paths. It is, of course, possible to adapt or even cross-reference these different approaches according to each project needs. The examples illustrate how general principles can take shape once they are applied in a practical situation.

Besides these two main approaches, we also present three complementary approaches. These are based on other mechanisms that can be combined with the two main routes. Depending on the case, these complementary approaches can be used to seize opportunities, to overcome possible difficulties, or even to innovate and increase ambition.

- Procurement of a supply contract for the acquisition of batches of materials.
- Implementing a framework agreement for works that includes reuse aspects.
- Setting up a 'reuse lot' in a works contract.

## 2.1 Overview of proposed approaches

### A. Progressive approach: procurement in 2 separate contracts



In the case of a two-stage procurement (service contract for design + works contract for construction), we suggest that the reuse objective be implemented in two stages and in two different ways:

- During the design phase, the objective is formulated in a very open way. It simply specifies the context and the key challenges. The design team is therefore invited to take up this topic and incorporate it into their project. The sketch submitted as part of their offers can already include some indication of what is going to be reused, and how (alternatively, a supported description of a working methodology can also do the trick). As the project is still likely to evolve, the options indicated at this stage are also likely to change: some proposals may turn out to be more complicated than expected, while others may emerge as a result of further study.
- At the end of this study phase, however, the major reuse options for the project should be laid down. This enables the next phase to be carried out: the execution of the works. At this point, the reuse options established upstream have been studied in greater detail. They have become precise enough to be translated into technical specifications in the works contract.

### B. Quantitative approach: Design and Build (D&B) contract

This approach draws on the fact that the works contract (Build) includes Design aspects. The contractor in charge of the works is therefore immediately involved in the development of the architectural project. This makes it possible to quickly check the feasibility of certain solutions (particularly from technical or financial points of view), or even to start collecting batches of material in parallel with the design work.

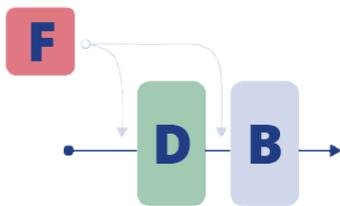
In this case, we suggest that the contracting authority set a quantitative target from the outset. This will give the bidders a clear signal to keep in mind throughout the project and give them some leeway to propose

solutions they feel comfortable with.

When submitting their offers, tenderers therefore commit themselves to an ambitious but realistic performance target for their project. This target becomes contractual once the contract has been awarded.

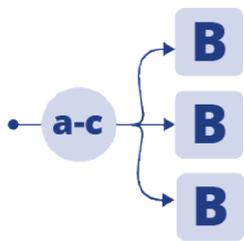
### C. Additional approaches

#### Purchasing of material batches by the contracting authority



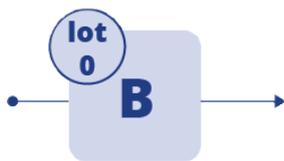
The acquisition of batches of reclaimed materials via a supply contract can be envisaged by the contracting authority. This is then a parallel process to the service and works contracts. It makes it possible to build up a stock of materials that will have to be integrated into the project. This strategy is not intended to be systematic, but in certain cases it can facilitate the achievement of a reuse objective. It is therefore a tool that can be combined with approach A.

#### Framework agreement for reuse-oriented works



The framework agreement is a format commonly used by certain contracting authorities for carrying out ordinary works in their assets. In terms of reuse, this approach entails some specific recommendations. Because of their systematic and recurrent nature, framework agreements are likely to be an interesting instrument for expanding reuse practices. This approach is therefore an alternative to the second part of approach A.

#### The 'Lot 0' approach



The general principle of Lot 0 is to foresee, within the works contract, a lot specifically dedicated to the finding and supply of reuse materials for the construction companies. The contractor in charge of this lot will act as a platform for collecting reclaimed materials and supplying them to the contractors in charge of the works. Lot 0 is likely to contain the following tasks:

- Identifying sources of materials of interest to the

project

- Collecting and transporting materials to the site
- Preparing the materials (cleaning, sorting, etc.)
- Storing and guarding the materials until they are laid
- Liaising with the other parties involved in the project, in particular the contractors in charge of the works and the control office
- Following formal procedures (traceability, compliance, insurance plan, etc.).

The scheme must be carried out by a contractor (or group of contractors) with strong skills in the field of reuse. It allows for a scaling up of both Approach A and Approach B.

## 2.2 Step-by-step approaches

See figures on the next pages.



# A

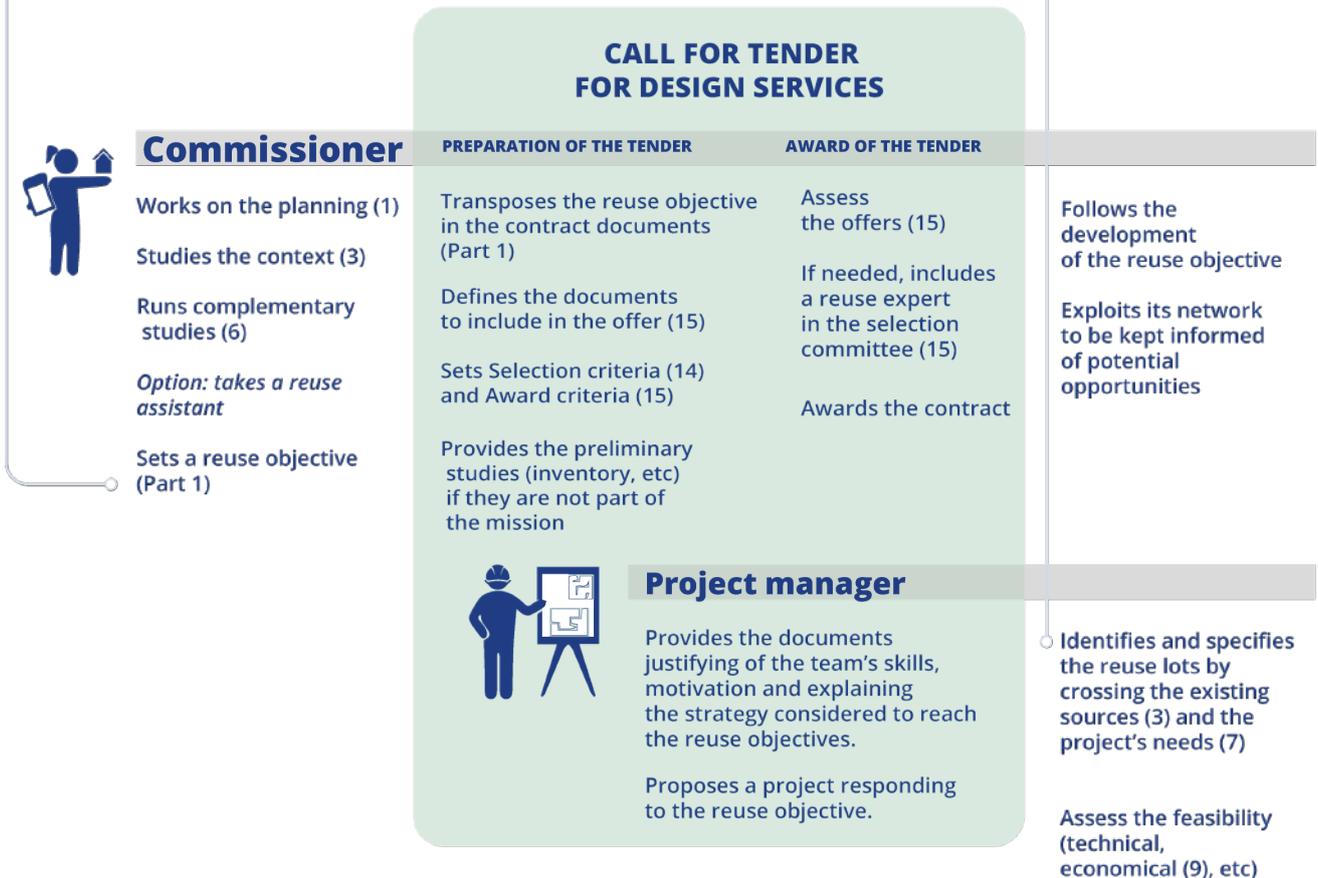
## SERVICES PROCUREMENTS WORKS PROCUREMENTS

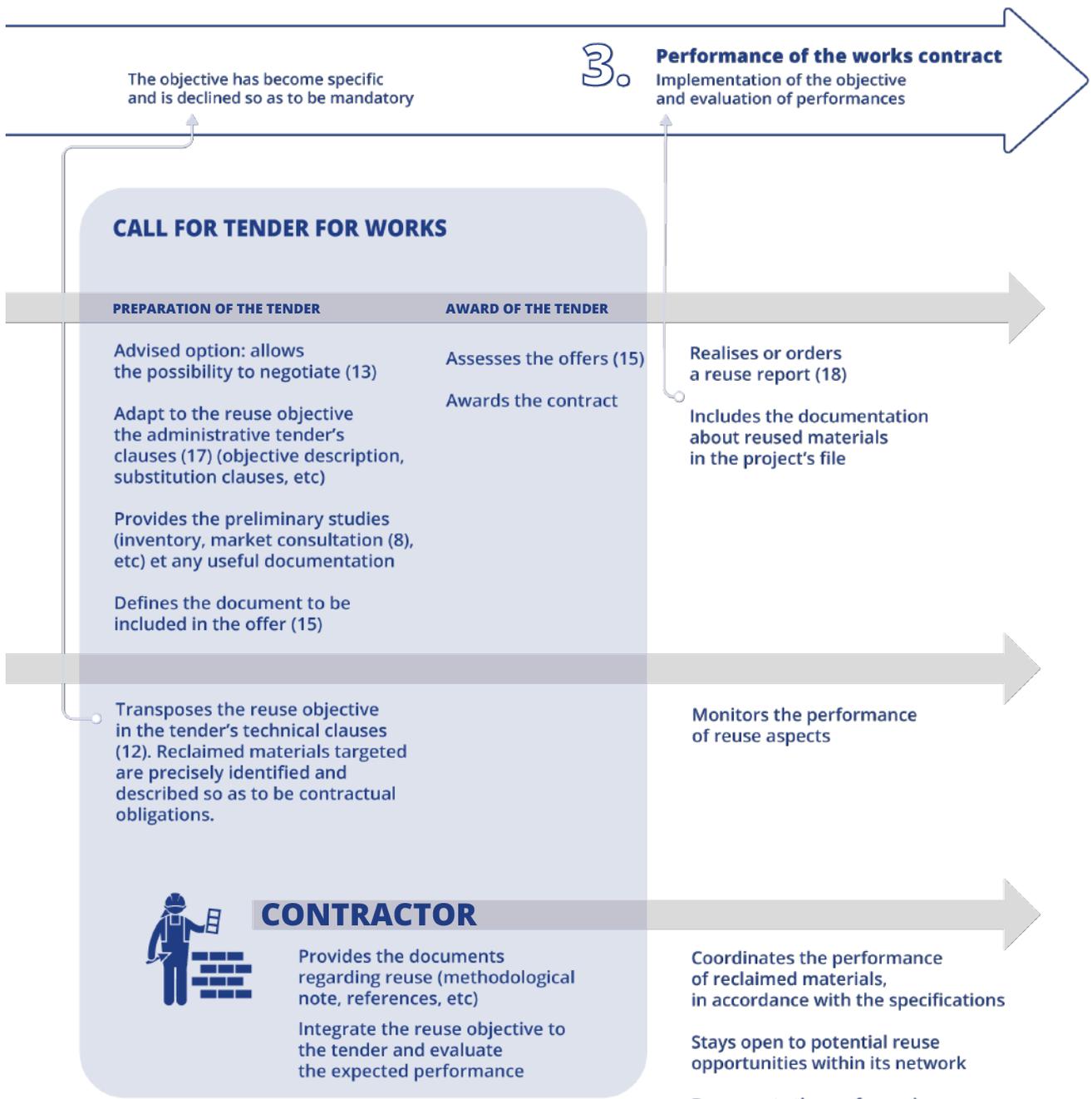


### REUSE OBJECTIVE

**1. Planning development**  
Definition of a reuse objective open and qualitative, to be developed along the design process

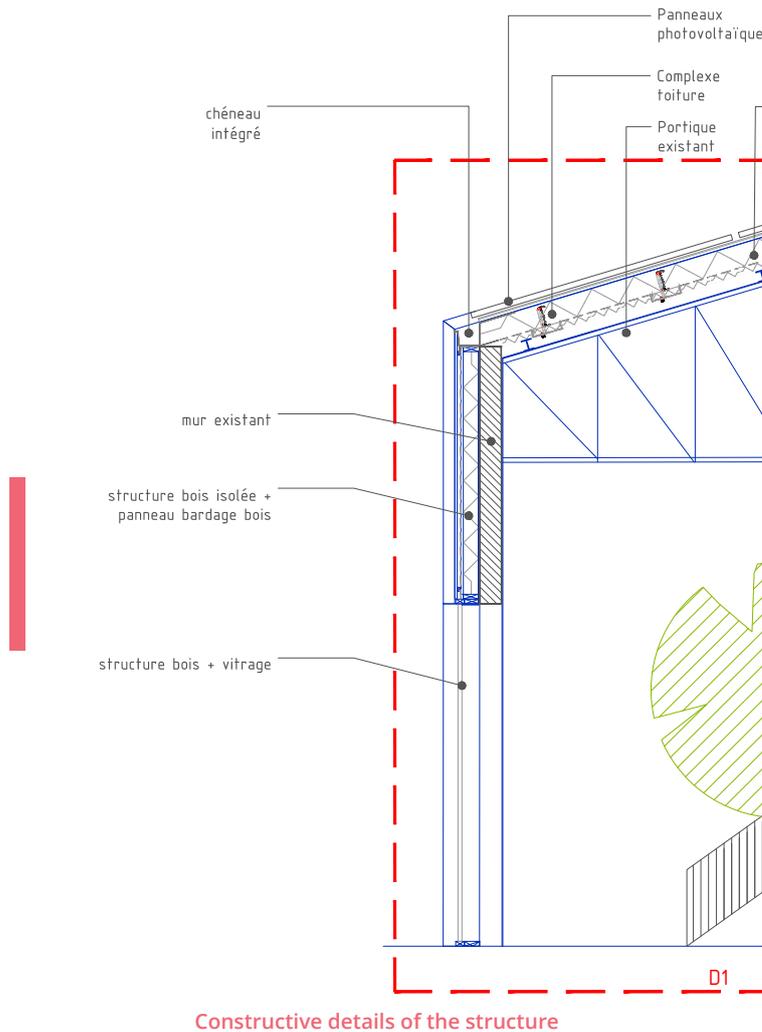
**2. Project development**  
Specification of the objective, integration of salvaged or identified reuse lots, evaluation of performances





## TRANSFORMATION OF A FORMER SUPERMARKET STORE IN FOURMIES

Contracting authority: Mairie de Fourmies  
 Design: Atelier 9.81  
 Fourmies (France), 2020 -



2020's situation above, foreseen situation below

The town council of Fourmies wishes to transform a former supermarket whilst at the same time supporting the circular economy. Maximum conservation of the existing building is favoured. The possibility of reuse is considered for each of the materials needed for the new development and on this basis some reclaimed materials are specified in the contract documents: prefabricated concrete slabs, stone paving and stone seatings.

**Matériau neuf prévu par le CCTP:**

Le CCTP prévoit pour ce lot des dalles d'extérieur en grès cérame monolithique (60 x 60 cm x 20 mm, surface antidérapante, teinte selon le choix de l'architecte) à poser sur des plots à vérins en polypropylène.

**Informations sur les alternatives en réemploi**

Il existe de nombreux produits de réemploi qui pourraient être substitués aux dalles de grès cérame prévues, comme par exemple:

- Des panneaux de bois "steenschotten": il s'agit de panneaux en bois de réemploi qui trouvent leur première application dans l'industrie du béton et qui sont un véritable classique sur le marché de la réutilisation. La plupart du temps, ils sont utilisés comme revêtement de terrasse et ils s'adaptent très bien à une pose sur plots à vérins. De plus ces sont des produits vraiment bon marché, probablement meilleur marché que les dalles en grès cérame prévues.
- Des dalles de béton de réemploi
- Des dalles en pierre de réemploi

**Liste indicative d'acteurs de la filière réemploi qui vendent ces produits**

**Van Elsen**

Rue Saint Jean-Baptiste, 29 7712 Herseaux Belgique  
+32(0) 470 07 48 17 (Be) +33(0) 7 89 26 37 89 (Fr)  
+33(0) 6 43 03 53 42 (Fr) <https://vanelsen-wood.com/>

Spécialisé dans les panneaux de bois "steenschotten"

**Leontine Van Leeuwen**

Rue Fontaine Saint Pierre 1 5330 Assesse , WNA Belgique  
Chaussée de Huy 306 1325 Chaumont-Gistoux , WBR  
Belgique  
Tél 0032 477 563 800  
[info@leontinevanleeuwen.be](mailto:info@leontinevanleeuwen.be)  
<http://www.leontinevanleeuwen.be/>

LA grande spécialiste des Steenschotten!

**Scierie des carrières de Maffle**

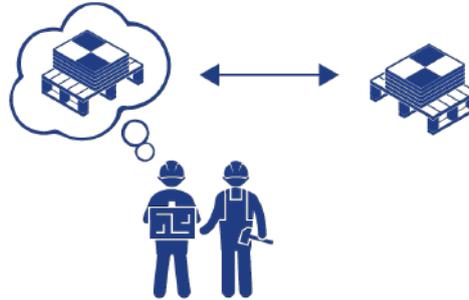
12 rue Joseph Wauters 7810 Maffle Belgique  
tel +32 (0)68 28 20 49 [Info@scieriemaffle.be](mailto:Info@scieriemaffle.be)  
<http://www.scieriemaffle.be>

Spécialisé dans la pierre, neuve et de réemploi.

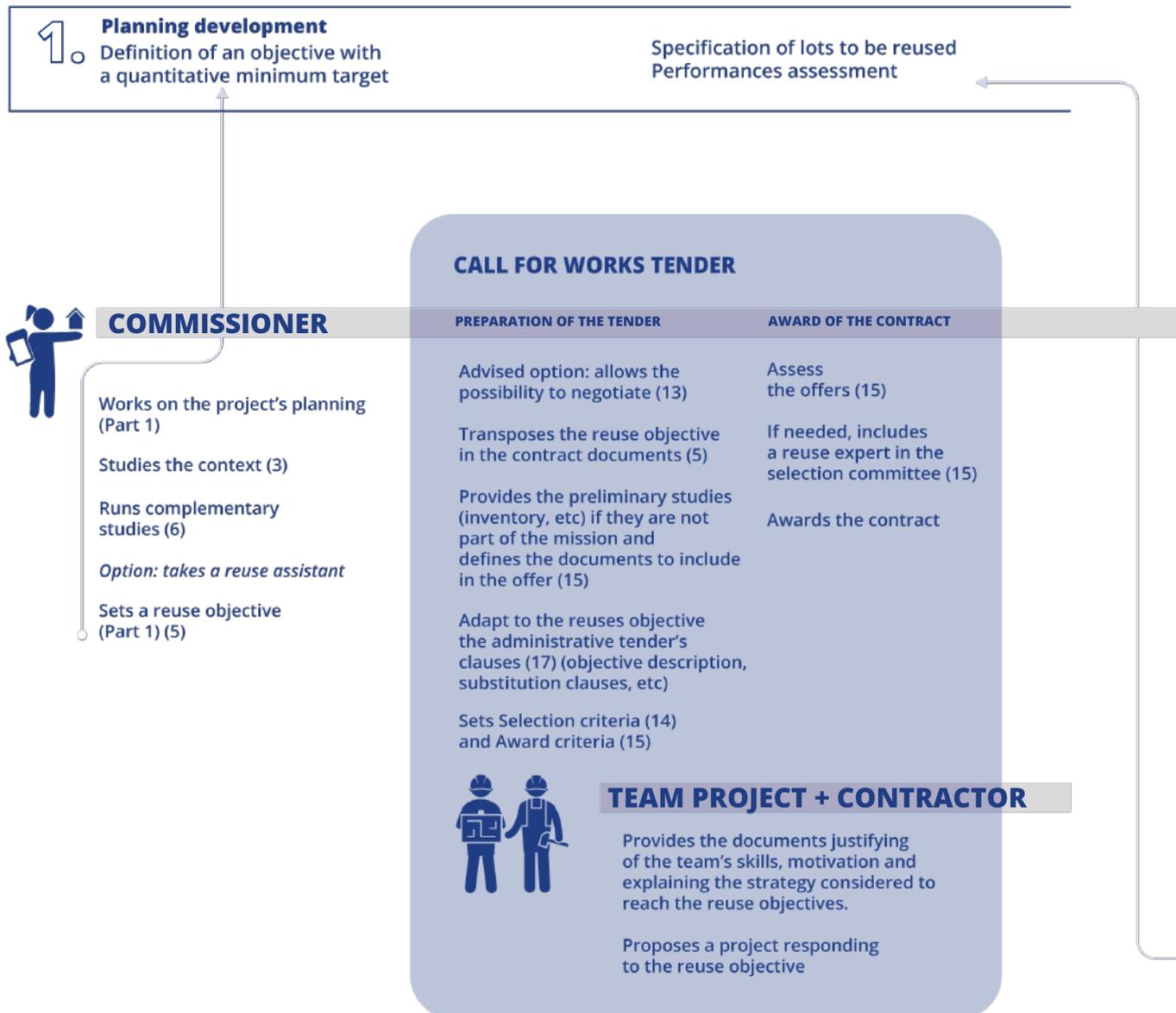
But the desire is also to go further by maintaining a certain flexibility in order to be able to seize reuse opportunities during the works. To this end, the contractor is left with the possibility of substituting new elements with reclaimed ones. Product information and a list of potential dealers are provided for each of these lots.

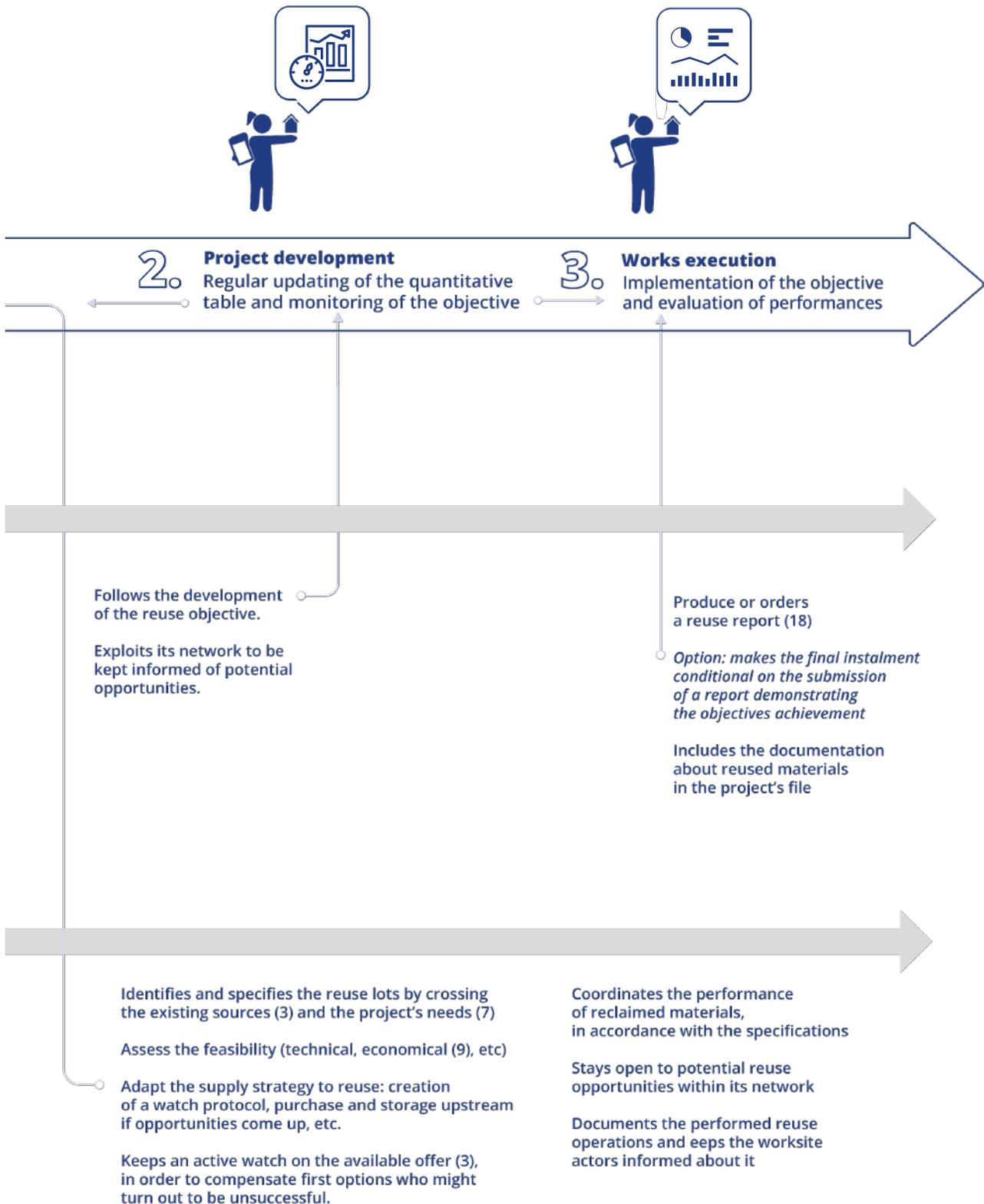
# B

## DESIGN & BUILD



### REUSE OBJECTIVE





## SEE U PROJECT - DESIGN AND BUILD CONTRACT FOR THE CONSTRUCTION OF A STUDENT ACCOMMODATION BUILDING

*Contracting authority: Société d'Aménagement Urbain (SAU)*

*Reuse assistance: Rotor*

*Brussels (Belgium), 2020 - 2025*



Aerial view of the former Ixelles barracks undergoing rehabilitation

In June 2021, the SAU published a contract for the design and construction of a student accommodation building. This project is part of a larger operation to transform a former barracks into a new district, with very high ambitions in terms of circularity.

An initial inventory phase has provided a comprehensive overview of the buildings and materials potential. On this basis, minimum targets were set (in % of the material mass) for:

- The building retention rate
- The outgoing re-use rate (i.e. materials extracted during the demolition phase for re-use on or off site)

- The outgoing recycling rate
- The rate of inbound re-use (i.e. re-used materials incorporated into the new project)
- The rate of recycled materials and bio/geo-sourced materials integrated into the new project.

A monitoring table allows the monitoring of these objectives, in relation to the initial expectations. Tenderers will have to integrate it in their offer and can gain points by exceeding the minimum quantities of reused materials required. Indeed, the initial targets leave room for much more ambitious approaches by bidders.

Tenderers will be encouraged to make strong commitments to reuse and will be able to use the flexibility offered by the Design & Build framework to specify these during the design phase. As the specifications do not provide for detailed metrics, the choice is left open to candidates as to which lots they are willing to offer for reuse. They must also attach a methodological note in order to check the feasibility of the quantities they propose, as well as their understanding of reuse issues.

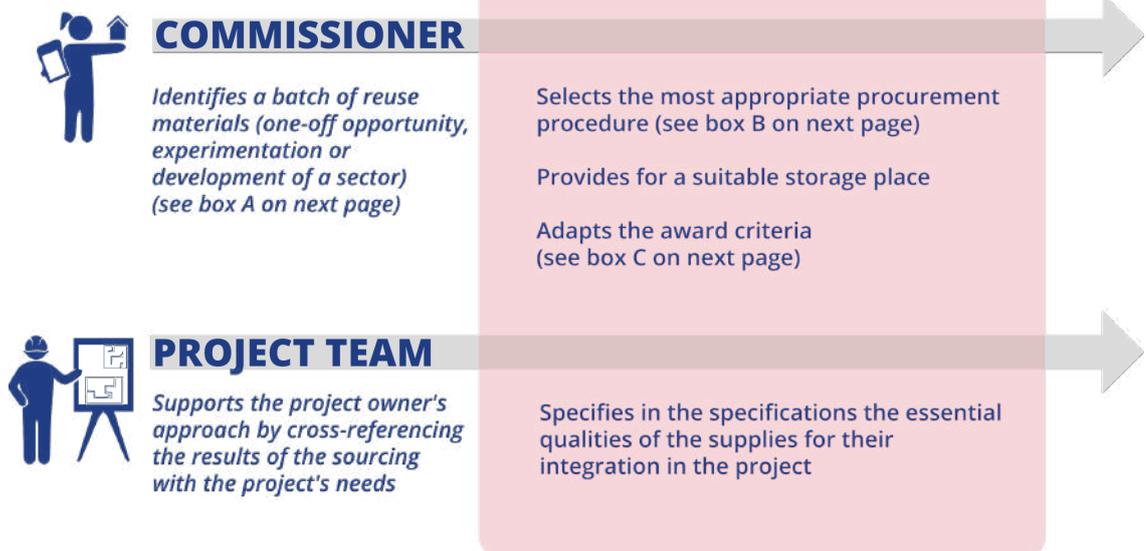
## + Supply procurement

It is rare for a contracting authority to purchase building components itself. This strategy is not an approach intended to be sustained by a contracting authority. Rather, it is a tool to initiate or support a broader objective.

In most cases, it is preferable to let the contractor acquire the reused materials on his own. This is because contractors have more flexibility in dealing with professional suppliers of reuse materials. Moreover, the dissociation of their mission, which in fact removes them from the choice of materials with which they will work, can create tensions on the insurance issue which must be anticipated.

### REUSE OBJECTIVE

Consideration of the lot in the overall objective OR development of the overall objective around an ambitious approach aiming to acquire a large lot



### A. Examples of cases

Case 1: The client identifies a batch of reuse materials available only in the very short term.

Case 2: In an experimental approach, the Owner wants to acquire a batch directly in order to control the choice of materials.

Case 3: The Owner wants to stimulate the development of reuse channels by placing a large order over the long term, after a sourcing phase (this can be the subject of a framework agreement).

### B. Adapted procurement procedure

The main advantage of a supply contract stands in the fact that procurement procedure with fewer advertising requirements can be used, depending of the contract's price. If the value of the lot is below the regulatory thresholds (13), as will often be the case for small and medium-sized lots of reused materials, a less formal procedure can be used.

If the client represents a public utility sector (water, energy, transport and postal services), the exception of opportunity purchase can be used. This exception allows to purchase reused building components only if their price is considerably lower than the usual price of equivalent components on the market.

For more details on these procedures and their variation by country, see the factsheet on procedures allowing negotiation (13).

### C. Award criteria

In the case of non-new supplies, it is recommended to include, in addition to the price criterion, a qualitative criterion in order to be able to assess the condition of the supplies.

The technical and aesthetic qualities can be assessed on the basis of a photograph and/or a sample attached to the tender, and/or on the basis of a direct examination by the contracting authority with the supplier.

#### + in project development phase



Immediately contacts the control office and the insurer to facilitate the resolution of insurance issues (11)



Integrates the acquired supplies into the project, documenting the implementation precautions

#### + at the call for tender for works stage



Plans a visit including the presentation to the contractors of the materials already procured

*Case 3 (see box A) : in the case of an order spread over a certain period of time, requests a methodological note on the logistic coordination for this supply on the worksite*



For materials already purchased, requests only the installation price

Specifies the particular methods of implementation, as well as the methods of packaging, transport and storage on site to preserve the material



Submits a price offer for the implementation service

*Case 3: in the case of an order spread over a certain period, provides for the methodology of reception and storage*

## ACQUISITION OF A BATCH OF RECLAIMED CLADDING TIMBER

*Contracting authority: La Fabrique des Quartiers  
Design: N Architecture (Nicolas Pereira Architectes)  
Control office: Alpes Contrôle  
Timber frame company: Combat Ossature Bois  
Roubaix (France), 2021*



3 alternative layouts designed by the project architect

*La Fabrique des Quartiers* is a public development company based in Lille. Since 2020, it has been developing reuse approaches for all of its projects. Most of its operations concern the rehabilitation of working class houses. These are buildings of a fairly modest scale, but which have a repetitive character and similar typologies. The practices tested in one project therefore have a high potential for systematisation.

To begin with, the team experimented with the integration of materials reclaimed from one of their own sites, or acquired from a professional dealer. To go even further, they recently experimented with other strategies for the acquisition of local reclaimed cladding wood. The most well-established providers are indeed too far away for the modest size of the required batch.

The team thus contacts a local company that produces firewood from recovered wood. They agree that this company would collect the necessary batch of wood reusable as cladding. To facilitate this process, the batch is purchased by mutual agreement, since its price is well below the €40 000 limit for contracts without prior consultation and advertising.

The clauses of the contract stipulate that the construction company will only be in charge of the installation. A control office, involved upstream, indicates the essential characteristics of the wood for this batch to be validated. The architect foresees different visuals, enabling them to adapt to the still unknown dimensions of the elements composing the batch. Finally, a timber frame contractor, invited as a consultant, gives several recommendations on the installation techniques to use according to the lot supplied.



## ANDERLECHT'S CONTAINER PARK: ACQUIRING A RECLAIMED GLUED LAMINATED TIMBER STRUCTURE DURING THE DESIGN PHASE

Contracting authority: Bruxelles Propreté

Design: 51N4E

Reuse assistance: Rotor

Anderlecht (Belgium), ongoing since 2016

In the architectural contest for the construction of a new 'Recypark' (a waste collection facility) in Brussels, the architects came up with an ambitious reuse solution: salvaging the entire structure of a warehouse to build part of the facility. Four structures scheduled to be demolished in the near future, and therefore potentially available, were considered in four project scenarios. All these proposals proved that the strategy proposed by the architects was feasible and they were appointed to carry out the project.



Spatial planning scenarios showing how the possible structures would look like. Images: 51N4E.



The design itself started with a first exploration to identify suitable structures (in terms of availability, timing, adequate dimensions, reasonable price, etc.). Indeed, the project had to be designed around this element. The contracting authority therefore had to acquire it before the works contract. In the end, the choice settled on a shed that had incidentally already been identified at the competition stage, and was still available. The stability engineers performed a thorough analysis of the existing structure before giving a go-ahead to carefully dismantle the glulam arches and store them until the start of construction.

## + Framework agreement for works

The award of a framework agreement for works by purchase orders brings certain constraints. The prices given in the offer will not be able to change or will change only slightly, whereas the reuse offer may be subject to more variability than new materials. It is difficult to anticipate the available quantity of materials sought, as well as their physical characteristics. However, some reclaimed material channels are sufficiently developed to guarantee a fair stability.

This strategy describes their integration into the project. It therefore comes into play after the service contract has been awarded (see Path A)

### Call for tender



In the award criteria, value the sourcing methodology for reclaimed materials. The aim is to ensure reliable and stable sources over time



In the technical specifications, provide for a reuse version (with more flexible specifications (12)) and an alternative new version (more detailed specifications) for the targeted materials



Proposes a methodology crossing very reliable sources (4), but also possibly other sources according to its network and expertise

### + project development



Identifies as a priority stable materials on the reuse market (4), whose quantity and prices will be little subject to variation

### + exécution du projet



Informs the company as far in advance as possible of future needs for reused materials in order to assess the feasibility of the order



Maintains a watch on the state of stocks with professional salvage dealers (4) and other potential sources



## + Reuse lot

### A. Example of cases

Case 1: in an experimental approach, the client wants to make reuse activities visible in his project. It is then decided to install a reuse workshop on site, open to the public during the construction period. The holder of the reuse lot, in charge of the management, fulfils the missions of both reuse technical coordinator and animator of the space.

Case 2: as part of the neighbourhood development, it is decided to set up an inter-building reuse lot. Its holder constitutes a mutualised stock of reclaimed materials which ensures several operations

### + at the call for tender for works stage



Reserves a specific reuse lot in its works contract.

The basic contract for contractors (other than for reuse lot) contains :

- the supply and installation of new materials
- authorises the substitution of new materials by reclaimed materials supplied by the reuse lot.

In this way, if it turned out that no reclaimed materials could be incorporated, the contractors could nevertheless complete their work with new materials, and the client could accept them.

Adapt the project's costing (9): the contractors are asked to calculate the lesser value for materials supplied by the reuse lot and the possible greater value for the installation of reclaimed materials.

The contract authorises the installation contractors to purchase reclaimed materials themselves if they find them.



Specifies in the specifications the essential supplies' characteristics for their integration in the project.

Defines and describes the reuse lot:

- the skills needed
- the tasks to carry out
- the limits of services with other companies



#### Entreprise du lot réemploi

Justifies the expected skills (knowledge of the reuse approaches and ecosystem, experience of reuse worksites)

Describes the methodology envisaged for identifying and supplying the materials



Commits to installing the reclaimed materials proposed by the holder of reuse lot during the performance of the works

Distinguishes between supply and installation in its costing.

**+ in works phase**



Examines the relevance of the reuse materials identified by the reuse lot as the works go on, and guides the initial choices.

Participates in the adaptation of the worksite methodology proposed by the reuse lot for each material.

Seeks out reclaimed materials (3), informs the architect of opportunities during the construction period



Collects materials and transports them to the site

Coordinates the adaptation of the construction methods with the architect and the contractor

Ensures the stock's guarding, is responsible for the materials until their transmission to the contractors for its installation



Possibly takes charge of the materials transformation (cleaning, repairing, sizing, adding complementary components...)

Records information on reclaimed materials and manages formal procedures (traceability, compliance, insurance plan, etc.)



**Reuse lot contractor**



Receives and installs the reclaimed materials

Applies the reclaimed material installation services such as described in the contract

## LA GRANDE HALLE DE COLOMBELLES<sup>1</sup>

*Contracting authority: EPF Normandie Aménagement*

*Design: Encore Heureux*

*Technical controller: Albert et Compagnie*

*Contracted provider for 'Lot 0': Le WIP*

*Colombelles (France), 2014 - 2019*



Left: original building. Right: interior of the hall after the works.

This project refurbished an industrial hall creating a vast array of opportunities for experimentation in reuse practices.

One of the schemes put in place on this occasion consisted of devoting a lot of detail within the works contract with respect to the reuse aspect. The providers of this lot were tasked with continuously prospecting for materials that could be integrated into the project (without increasing costs).

Such an arrangement requires a great deal of flexibility on the part of the different project stakeholders.

The design of the project is never entirely fixed. It evolves according

1 - This example is a synthesis of an in-depth analysis published by the Centre Scientifique et Technique du Bâtiment (France) : F. Bougrain, *Etude de cas: le réemploi lors de la réhabilitation de la Grande Halle à Colombelles (Calvados)*, DAEE-CSTB, 4 décembre 2020.

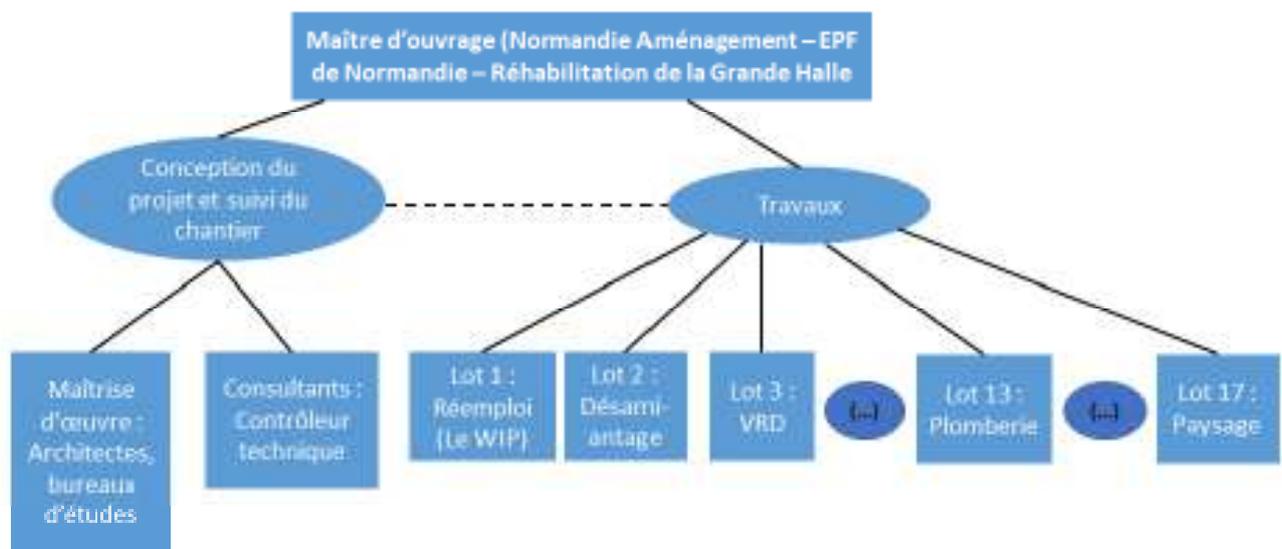
to the arising opportunities. This requires flexibility on the part of the architectural firm, which must be prepared to adapt the project continuously.

For the contracting authority, it is also a matter of searching for materials that can be integrated into the project. In this case, they used their close relationships with other contracting authorities to give the Lot 0 contractors a valuable insight into many ongoing works.

Finally, the contractors in charge of the other lots of the works also had to adapt their habits. It turned out that some of them had probably underestimated the extent of the reuse ambition, which led them to ask to renegotiate their prices in light of the quantity of materials actually involved. At the project debriefing, it was mentioned that 'the situation often proved to be paradoxical for the contractors. On the one hand, they saw their know-how being valued since they were working directly on products and materials that would be integrated into the new project. However, designing a new building with already used materials clashed with their vision of a building project. The interest of this approach was not always understood, whereas new, certified and suitable materials were available on the market, often at a cheaper price.'

A key factor in the success of this project was the active communication that was maintained with and between the work teams by the Lot 0 contractor. Finally, of the approximately €4.9M project budget, 3% was allocated to reuse the following materials:

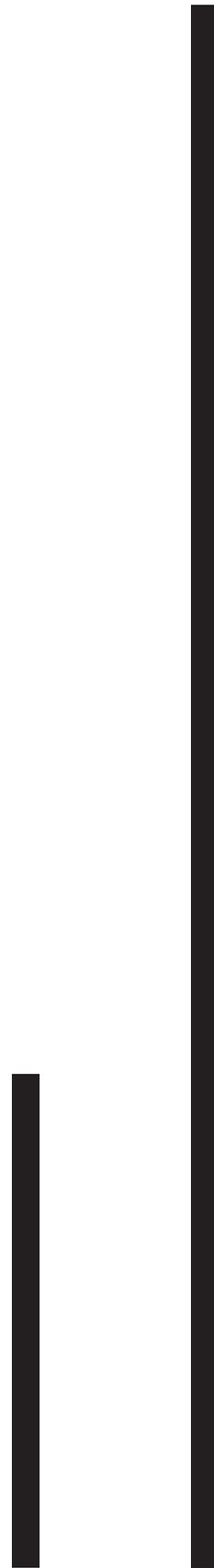
- 430m<sup>2</sup> of insulation in very good condition
- 29 cast iron radiators
- 30 steel radiators
- 21 pieces of wood for balcony railings
- 45 pieces of wood for a staircase
- 20 pieces of sanitary equipment
- 50 solid wood doors, including two fire doors.



**Figure 1 : Les relations entre acteurs du projet de réhabilitation**

## **SECTION 3**

# **THEMATIC FACTSHEETS —**



# 1. THE BENEFITS OF REUSE —

There are a number of aspects as to why reusing building materials is positive:

- To reduce waste. In Europe, more than 385 million tonnes of waste are produced annually by the construction industry. Reuse is considered by legislation as a waste prevention strategy<sup>2</sup>. As such, it should be at the forefront of approaches to saving existing assets and resources.
- To reduce pressure on resources. Half of the raw materials extracted and transported to Europe are used by the construction industry<sup>3</sup>. The extraction of natural resources also has environmental impacts, which reuse can help to reduce.
- To reduce greenhouse gases emissions. Materials account for 10-20% of a building's carbon footprint over its entire life cycle. For buildings that meet energy standards, it is the extraction, production and waste treatment phases that have the greatest impact in terms of GHG emissions. These phases are directly linked to the choice of building materials<sup>4</sup>. Life cycle analyses comparing the environmental impact of a new material against the equivalent reclaimed show that the latter has a much lower impact.



---

2 - Waste Framework Directive 2008/98/EC [1] - Art 4.1

3 - Level(s), taking action on the TOTAL impact of the construction sector. European Commission, 2019.

4 - Ibid.

## SOME TOOLS TO INFORM AND RAISE AWARENESS

A short video clip<sup>5</sup> made as part of the FCRBE project puts together a number of powerful arguments in favour of reuse. A good way to convince yourself - and your partners - of this practice's many benefits!



The standard note on reuse available in Factsheet 15 translates these arguments into a format suitable for public procurement. It is freely adaptable and can be attached as an annex to a contract, as a way to draw the attention of tenderers to this issue and give them some guidelines.

- To promote positive socio-economic impacts. The construction industry is identified as one of the most promising sectors for job creation linked to a circular economy<sup>6</sup>. Most suppliers of reclaimed materials are SMEs that sustain local employment. The reuse economy is largely based on manual labour, which can replace the use of fossil fuels and primary natural resources.

5 - Full link: <https://www.youtube.com/watch?v=4SQVbxxQ4mM>

6 - Anders Wijkman and Kristian Skånberg, The Circular Economy and Benefits for Society Jobs and Climate Clear Winners in an Economy Based on Renewable Energy and Resource Efficiency, Club of Rome, March 2020. <https://clubofrome.org/wp-content/uploads/2020/03/The-Circular-Economy-and-Benefits-for-Society.pdf>

## PULSE PROJECT

*Private client*

*Design: BFV Architects*

*Paris (France), 2019*

The construction of an office building in Saint Denis, in the region of Paris, triggered a demand for a significant amount of reclaimed raised floors systems (21,000 m<sup>2</sup>). A local company seized on this opportunity to start up a business based on the reclamation of this material. Today, the company has developed its own logistical and technical processes, managing its own stock and supplying several sites per year.



- To preserve cultural heritage. When it is absolutely impossible to retain an existing building, keeping its components in circulation is a way to preserve its memory. Specialist reclaimers preserve craft, skills and a knowledge of materials and construction techniques that hark back to valuable and shared heritage.

These different motivations can be used to justify specific reuse approaches in a project. It is interesting to refer to the regulatory frameworks and political orientations in place in order to do so.



From top to bottom: façade of the showroom of the Queen of the South, a company specialising in antique materials (Genk, Belgium). Transformation of the storage racks from a very large retailer into habitable furniture for the Agronaute, Fichtre, 'Quand même', 2019. Dismantling the solid oak woodworks of the Antwerp City Hall (Belgium), 2018.

## 2. LINKING REUSE WITH OTHER ASPECTS OF THE CIRCULAR ECONOMY ---

Reusing building materials is one facet of moving towards reducing the environmental impacts of construction and adopting circular economy principles. As such, reuse should be linked to other efforts such as reducing energy consumption, water management and environmental protection, etc.

For a contracting authority, it is ideal to establish the major ambitions of its project as early as possible, for example during the programming phase. Setting the major objectives of the project at this point allows all the stakeholders to set a clear target. However, this implies clearly articulated ambitions and no confusion between different (although complementary) strategies:

### **Waste management (outflow) and material choice (inflow).**

A construction project, especially when it is carried out on existing buildings, generally involves the materials movements in two directions. Some materials are removed from existing buildings, others are brought to the site to carry out the work. Reuse is a strategy that addresses the responsible management of these two flows: the in-flow and the out-flow. This should result in distinct objectives:

- Outflow: to maximise the proportion of materials being reclaimed for reuse.
- Incoming flow: to maximise the proportion of reclaimed materials being integrated into the new construction.

### **Reuse and the preservation of existing buildings.**

In the circular economy the preservation of existing resources is a priority and is the most meaningful approach to reduce environmental impacts.

A project intervening on existing buildings should always first consider retaining buildings in situ (as opposed to demolition then reconstruction strategies). Reuse comes second and is a strategy for extending the useful life of the elements that will be extracted from the building during the works.

### **Reuse and recycling.**

Reuse largely preserves existing elements in their original form. Recycling on the other hand, involves a profound transformation of the materials back into raw materials. In the case of demolition, waste management regulations require that prevention strategies, including reuse, be considered a priority. The recycling of construction and demolition waste is therefore a strategy to be used only when it has been demonstrated that the materials cannot be retained in place or reused.

### **Design of buildings to facilitate future reuse.**

Some guidelines about circular construction deal with principles such as enhancing the versatility of spaces, using durable and healthy materials, managing information on the installed materials and devising constructive details in order to facilitate maintenance, replacement of failing parts and easy dismantling for future reuse. All these principles are geared towards the objective environmental impact reduction over the building lifecycle. This perspective mostly focuses on the use phase and the end of life of buildings and their components. Ideally, these approaches should be combined with the integration of reclaimed materials. This latter strategy allows the reduction of environmental impacts resulting from the materials production phase, which represents a significant part of the overall impact of a construction project.

### **Reuse of other resources than building materials.**

In addition to building materials, reuse can be considered for other resources: water, excavated soil, vegetation, and even household waste produced during the use phase. It is recommended these different approaches are clearly distinguished in the initial objectives, as they involve different actions and actors.

### **Reduction of environmental impacts related to the production of materials.**

Also known as 'grey energy', this concern complements approaches that

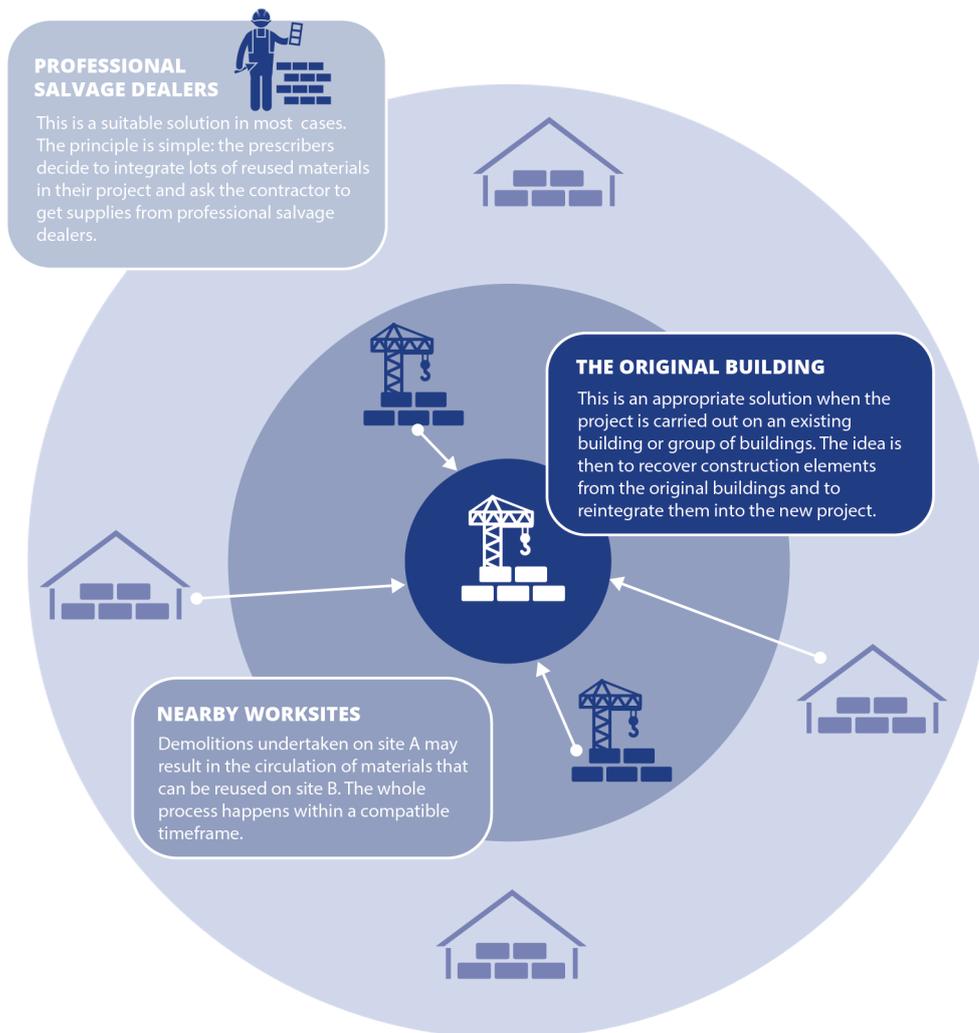
seek to limit the environmental impacts associated with the use-phase of a building (HVAC, lighting, etc.), also taking into account the impacts caused by the production of materials before they arrive on site. Reusing building materials is an extremely effective strategy in this context. There are other approaches that are also beneficial such as geosourced materials (raw earth, etc.), biosourced materials (wood, straw, hemp, etc.), and local and eco-responsible materials. These different approaches should be viewed as compatible and complementary in achieving significant reductions in the environmental impact of construction projects.



# 3. EXPLORING THE DIFFERENT SOURCES OF RECLAIMED MATERIALS

---

There are several ways to acquire reclaimed materials in the context of a construction or renovation project. All of these paths can of course be combined within the same project.



see factsheet 4

what is available from professional dealers

## A - Professional reclamation dealers

This is a path that is suitable in most cases. The principle is very simple: the specifiers decide to integrate batches of reclaimed materials in their project and ask the contractors to buy them from professional suppliers.

In practice, this means:

(A) having a good knowledge of the range of available materials.

(B) adapting non-essential aspirations to increase the chances of finding a suitable batch of materials at the time of the works (see clauses for the specifications of the work).

Note that some companies operate beyond the regional and even national boundaries. As the environmental impact of these materials is usually very low, it can be interesting to widen the search area for these materials. Often the impact of transport can be more than compensated for, as new materials are imported from even further away.

### Reclaimed building materials from professional dealers



*Overview of the stock of a dealer in reclaimed bricks. This company has a permanent stock of almost one million bricks (De Leyn Bouwmaterialen, Moerkerke, Belgium, image Opalis.eu).*

## B - The original building

This is a suitable path to take when the project is carried out on an existing building (or set of buildings). The idea is to reclaim building elements from the original building and reintegrate them into the new project. This path requires formulating two distinct objectives:

1. Encouraging the careful reclamation of reusable materials.
2. Encouraging the integration of reclaimed materials into new development.

It is often worthwhile to decouple these two objectives. This prevents the contractor from being required to reuse a material which may be unsuitable for the new project.

In practice, this approach first entails identifying batches with reuse potential, ie. conducting a reclamation audit.

This path also requires project managers to ensure the smooth implementation of the following operations: careful dismantling, temporary storage and any necessary operations for reuse. Where appropriate, some of these steps may involve external providers (e.g. companies specialising in the cleaning of certain materials). It is important that each stakeholder knows exactly what is expected of them. For example: careful dismantling and organisation of storage is carried out by the contractor in charge of the demolition work, while cleaning and installation would be the task of the general contractor.



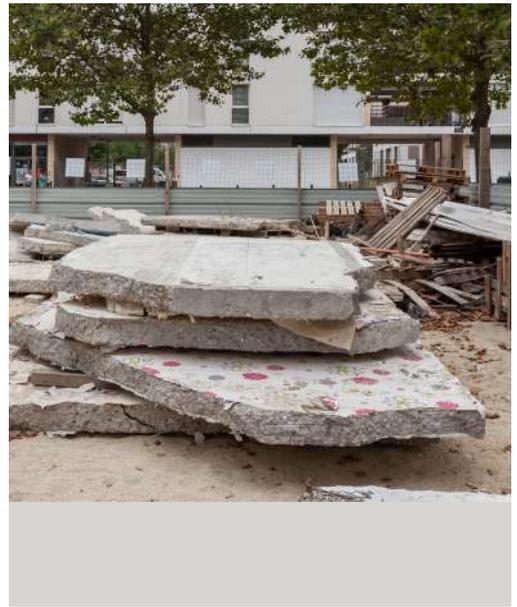
### ON-SITE REUSE OF CONCRETE SHELLS, STAINS, FRANCE

*Contracting authority: Seine-Saint-Denis Habitat*

*Design: Bellastock*

*Stains (France), 2017*

When demolishing a housing complex in Stains, some of the concrete walls were reused on site. The concrete shells were sawn on site and reused as non-load-bearing walls for a bicycle shed. The floors of the exterior spaces were also paved with raw concrete blocks.



## STANDAERTSITE PROJECT: ON-SITE REUSE OF GLULAM BEAMS

*Contracting authority: Sogent*

*Design: Carton123, AE architecten, Murmuur, Arne Deruyter, H110 architecten en ingenieurs Gand (Belgium), 2018*



*From top to bottom: (1) Original situation. (2) Storage of the beams on site after dismantling. (3) Reuse in the new project.*

## C - Concurrent worksites

Sometimes demolitions undertaken on site A release materials that can be reused on site B, which is being carried out at the same time. In practice, these opportunities can be identified and seized by different actors:

- Project owners who carry out several projects at the same time and find synergies between them (with the advantage that the materials then remain the property of the same entity). It is then a matter of orchestrating the transactions, in dialogue with the designers and contractors concerned.
- Building contractors who are running multiple sites at the same time may also be able to take advantage of site-to-site reuse opportunities. Designers can also identify such opportunities.

There are digital platforms that give visibility to reusable material batches present in buildings scheduled for demolition. They can be a useful source for identifying opportunities.

More broadly, this approach requires a good overview of the planned demolition work. This can be achieved through specific prospecting work (or internal coordination), entrusted to specialised actors.

## REUSE OF WINDOWS FROM ONE BUILDING SITE TO ANOTHER FOR AN URBAN FARM

*Private client*

*Design: Frédéric Denise Architecte*

*Reuse assistance: Bellastock*

*Stains (France), 2019*

In 2019, the Novaedia cooperative committed to the construction of an urban farm in Stains with strong reuse ambitions.

A few kilometres away from this site, the renovation of a housing complex includes the replacement of a large number of single-glazed wooden windows. The architect, with the assistance of a reuse expert, proposed to reuse these windows for the façade of the urban farm. The bioclimatic design of the farmhouse easily accommodates single glazing.

An agreement was quickly reached to proceed with the careful dismantling and transport of the materials. After the company was selected, a prototype was made in the workshop, then all the collected window leaves were cleaned, assembled and put back into use.

This operation required good logistical coordination in return taking advantage of a good local opportunity.



## REUSE OF A STEEL STRUCTURE, CONCRETE SLABS AND OTHER ELEMENTS BETWEEN TWO CONSTRUCTION SITES OF THE SEGRO COMPANY

*Private client*

*Conception: Langley Hall Associates (architecte), John Tooke & Partners (stability engineers)*

*Construction: Francis Construction*

*Slough (United-Kingdom), 2013*

In 2013, Segro decided to build a new industrial building in Slough. At the same time, it was planning to demolish a 3,320 m<sup>2</sup> building constructed 13 years earlier a few kilometres away. The contractor was therefore asked to reuse as many elements as possible from the old building into the new building. The steel structure, concrete slabs, false floors, stairs, curtain walls and windows were successfully reused<sup>7</sup>.

In total, 70% (by mass) of the original building was reused, cutting CO<sub>2</sub> emissions by 40% and construction costs for the new project by 25%.



Note that the same teams of architects and engineers worked on both projects. This facilitated access to the as-built plans and original drawings.

---

7 - Report EU-Progress (Provisions for Greater Steel Reuse), 2017-2020 research project., 'Factsheet No.2: SEGRO Warehouse, Slough, UK' <https://www.vtt.fi/sites/progress/Documents/FS02%20Segro%20warehouse%20Slough.pdf>



## D - Internal stocks

Some entities such as municipalities or public works departments may have their own internal stock of reusable materials.

When actively managed, they are a fairly obvious source of available materials for various types of building work. This is a solution that can be relevant to organisations managing a large estate although the management of such a space is not to be underestimated. In practice, having a temporary storage space makes it possible to considerably widen the window of opportunity for reusing batches dismantled during demolition. This is often a logical consequence for organisations that systematise reuse from site to site.

Internal stocks may also exist but lack visibility. This could be because they are either managed relatively informally (or by a completely different department within a large organisation) or they are no longer managed at all or no one knows exactly what they hold. For those looking for materials, identifying and visiting such stocks often leads to good opportunities.

## THE CITY OF PARIS' ROADWORKS MATERIALS PLATFORM: AN EXAMPLE OF INTERNAL CONSOLIDATION PLATFORM

*Bonneuil sur Marne, France*



*Consolidation platform for roadworks materials of the City of Paris. When carrying out roadworks, contractors procure paving stones, kerbs and other roadworks elements from this stock belonging to the city.*

## DORMANT STOCK IN A THEATRE: AN UNEXPECTED SOURCE OF MATERIALS

*Private client*

*Design and production: Rotor*

*Brussels (Belgium), 2010*

In 2010, the KFDA, a performing arts festival, took up residence in the Royal Flemish Theatre in Brussels. The construction of the street furniture, the greenhouse and the other temporary facilities was based almost exclusively on unused decors sets. These are kept by the theatre in a large warehouse, sometimes for decades. In fact, many of these sets were never used again.





# 4. FINDING OUT WHAT IS AVAILABLE FROM PROFESSIONAL SALVAGE DEALERS

---

There are hundreds of companies active in the reclamation, preparation and resale of building materials in North West Europe. These professionals have a detailed knowledge of materials, sometimes accumulated over several generations. From the design phase onwards, contact with these traders can provide useful information on the condition and stability of their stock, thus facilitating positive material choices.

In addition to the commercialisation of materials, most of these businesses offer related services to supply batches of 'ready-to-use' materials:

- Cleaned
- Sorted according to size, quality, colour...
- Cut to size
- Reconditioned
- Restored
- Documented
- Stored
- Delivered



Some companies also offer careful dismantling, design assistance and re-installation services. They can also be contacted to reclaim materials

from demolition work.

At present, specialised dealers offer a wide range of building materials (from structural elements to decorative elements, interior fittings and technical equipment) that cover a broad spectrum of time (from centuries-old materials to very recent building elements). Although some types of building elements are significantly less frequent on the reclamation market the supply is evolving and adapting to new demands.

These practitioners remains the best way to gradually develop the supply of reclaimed building elements.

### TOOL: HOW TO FIND SPECIALIST DEALERS?

Online directories (which were extensively updated during the Interreg FCRBE project) allow to find specialised suppliers of reclaimed building materials.

Salvoweb.com

Since 1994, this online directory has been listing professional dealers worldwide, with a particular focus on the UK and Ireland. The site also features a section allowing dealers to advertise material batches online, and a 'demolition alerts' section, which advertises batches of material for dismantling.



Opalis.eu



Since 2011, this directory has been listing dealers in Belgium, the Netherlands and France. Each company is described in detail with an indication of the services offered.



# 5. SETTING A PERFORMANCE TARGET IN REUSE OBJECTIVES

When the client requires a reuse performance to be achieved (i.e. an objective expressed in quantitative terms), it must ensure that two aspects are specified: the unit of measurement and, where appropriate the level of the expected performance.

## A - What shall we measure?

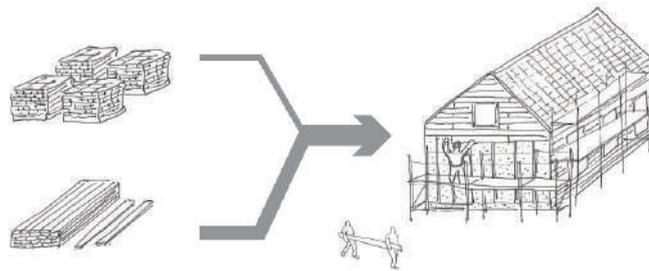
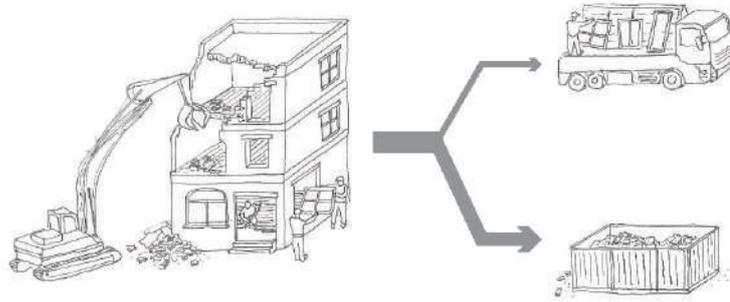
In a project aiming to promote reuse by setting a numerical target, several aspects can be measured. For example:

- The target can be the number of jobs involving the reuse of materials. Such a target is a way to stimulate diversified approaches and promote awareness. It is a fine complement to a purely qualitative approach since it gives a clear line to designers without requiring too much monitoring work.
- The objective can also relate to the quantity of materials reused. This approach is definitely compatible with the one presented above. This objective relates to the principle of maximising reuse and can therefore be referred to as reuse performance.

In the second approach, the measure of reuse performance is usually expressed as a proportion of a total quantity. For example, as a fraction of the materials flows used in the works (or, in the materials extraction phase, as a fraction of the flow of materials extracted during demolition).

Thus, an expression such as '10% of inflowing reuse' indicates that, out of all the materials used on a construction site, 10% were indeed reused. In the same way, an expression such as '65% of the outflowing materials were reclaimed' indicates that, of the totality of the materials evacuated from the building site, 65% could be reclaimed for reuse.





Reuse performance can also be expressed as an absolute value. In this case, it is simply a question of expressing the quantity of reused materials. For example: 'in this building, 10 tonnes of bricks are reused' or 'this project includes 1,000 m<sup>2</sup> of reused flooring'.

In a call for tenders, if the aim is to compare the tenderers' reuse efforts, it is better to use relative value (in flows and/or out flows).

## B- Choosing the right unit

The intention is to express the quantity of reused materials (possibly as a fraction of a global flow). For consistency it is important to specify early the metric to be used. The following table presents several possible approaches. In the context of this guide, they relate primarily to the integration of reclaimed materials, but some can also be considered valid for quantifying the reclamation efforts during demolition work.

| Metric                        | Pros and cons   |
|-------------------------------|---|
| <b>Mass (kg or t)</b>         | <p>It is the most common unit for measuring the quantity of reused materials. It allows for objective comparisons of a wide variety of material flows.</p> <p>However it is important to understand that an exclusive focus on mass can create a bias in favour of reusing heavier elements (stones, bricks, concrete...) to the detriment of lighter components (which may still have a significant environmental impact).</p> <p>Similarly, the mass of materials is not always explicitly stated in the bills of quantities used by specifiers. A conversion from the usual units (surface, volume...) is therefore necessary.</p> |
| <b>Volume (m<sup>3</sup>)</b> | <p>Volume is a commonly used unit for certain types of components (masonry, concrete, etc.). It can therefore also be used to measure a reuse volume.</p> <p>Using volume as a unit may bias the data towards more voluminous items. For items that are not usually expressed in volume, a conversion will also be necessary.</p>   |

| Metric  | Pros and cons   |
|---|---|
| <p><b>Other units used in bills of quantities</b></p> | <p>The bills of quantities used by specifiers generally mix several units depending on the items concerned: linear metre (m<sup>1</sup>), square metre (m<sup>2</sup>), cubic metre (m<sup>3</sup>), per piece (pc), in mass (kg)... As such, all these units of measurement can be used to measure reuse performance.</p> <p>However it is important to remember the diversity of units does not allow for a direct expression of the overall quantity of material involved - which is necessary if one wishes to refer to a fraction of the total flow (in or out). Conversions to a common quantity, such as mass, are then necessary.</p> <p>The use of standard units has the advantage of being easy to put into practice since it is based on available data and is often used for specific purposes such as at the level of a batch or well-defined field of use.</p> |
| <p><b>Cost (€)</b></p>                                | <p>In some cases monetary value can be a useful metric for measuring quantities of matter. It establishes a form of equivalence between potentially very different elements, making it convenient for measuring things that are otherwise different in nature.</p> <p>For example, it is possible to express a reuse objective as a percentage of the total value of the works. For example: '5% of reuse by value' indicates that a quantity of materials corresponding to 5% of the works budget must be of a reclaimed origin.</p> <p>This metric should not be confused with the measurement of an offer's economic performance (based on the 'best value for money' principle). Here, it is used to quantify a material flow<sup>8</sup>.</p>  |

8 - This is an approach proposed in particular in the 'recycled content' method, which quantifies efforts to integrate recycled and/or reclaimed materials on the basis of the economic volume of the various batches of materials concerned within a project.

## MEASURING REUSE EFFORTS: IMPACT OF UNITS

*Contracting authority: Municipality of Dilbeek*

*Design: Rotor*

*Dilbeek (Belgium), 2019*

Following the construction of a sanitary block for a youth movement, a survey of the reuse efforts was carried out. This is presented as follows:

|   | Volume - m3 (%) | Mass - kg (%) | Cost - € (%) |
|---|-----------------|---------------|--------------|
| <b>New materials</b>                      | 20 %            | 30 %          | 25 %         |
| <b>Reused materials</b>                   | 25 %            | 25 %          | 50 %         |
| <b>End-of-stock and surplus materials</b> | 55 %            | 45 %          | 30 %         |

This table prompts the following remarks:

- The initial objective was formulated in an open and qualitative way. The data presented here is the result of an assessment carried out when the project was over. It was not set as an objective from the outset.

- The choice of units shows some interesting variations. For example, insulation panels were purchased from a supplier specialising in end-of-stock items (so this is not strictly speaking reuse, as these panels had never been used before). These appear clearly in the volume balance, while they are comparatively less represented in the mass balance.

- A 25% mass reuse target is already a good result! The relatively simple nature of the programme, the small size of the building and the efforts made by the contractors explain this result.



### C - Fix the target's value

see method  
○  
guide for  
inventory  
developed  
from FCRBE —

As with all performance requirements, setting a reuse target requires a pre-study to ensure that the demand is realistic.

The target can be based on various elements, including:

- Quantities listed in a reclamation audit. These can be increased by incoming opportunities to reuse materials from other sources.
- Targets achieved by similar projects. In this respect, resources documenting projects already carried out are useful to get an idea of what can be achieved (FCRBE pilot operations, projects documented on Opalis.eu, etc.).
- A general average. It is now considered that, globally, reused materials represent 1% of the materials consumed by construction (in mass) in North West Europe. In this sense, aiming for 2% in a project means doing twice as well as the average!
- Performance levels based on a contextual analysis of project-specific opportunities, needs, local market, etc.

see section 1.1  
●  
getting to  
know the  
context —

The performance targets are dependent on the type of project considered.

Typically, urban development (paving stones, clinkers, kerbs...), the

interior finishings of a dwelling (parquet floors, joinery, flooring...), and interior fittings (shops, restaurants, cafés...) are contexts that lend themselves fairly well to reuse. At the other end of the spectrum, structural and shell work is more challenging and is likely to require stronger support.

A second element to consider is the context in which the client operates.

For a first experience in reuse and in a context where there is little flexibility, it is better to aim for modest targets (or even to rely only on qualitative objectives). These can gradually increase from one project to another as the stakeholders gain expertise.

A project that seeks to be exemplary could aim for higher targets. In some contexts, innovation efforts can lead to specific support (e.g. fundings). They can also lead to obtaining recognition marks (e.g. labels).

## D - Reuse performance and environmental performances

In some projects clients are led to set requirements in terms of environmental performance, including the impact of the choice of materials. This requires the use of harmonised methods<sup>9</sup> or tools that allow the impacts of construction choices to be modelled (e.g. the Totem tool in Belgium or Elodie in France).

Some of these tools take into account reuse principles. It is then possible to indicate whether the chosen materials are new or reused. The reuse of materials generally results in a significant reduction of environmental impacts and therefore an improvement in the overall score.

In theory a client setting a performance target in this way may not need to specify a separate reuse objective as it might be assumed that reuses strategies will naturally find their place to get good scores.

In practice, however this is not the case, it is still useful to make reuse an explicit objective on its own. This will encourage tenderers to take this approach into account. To avoid making the modeling process too cumbersome, the reuse objective can be expressed in qualitative terms if the client also sets a performance objective for the project's general environmental targets.



9 - For example, the method proposed by the French label *Bâtiment Bas Carbone*.

## TOOLS: ENVIRONMENTAL IMPACT ASSESSMENT SYSTEMS?

Grey energy and environmental impacts related to the production of building elements are to become increasingly important in the construction sector. There are already frameworks that focus on these aspects and thus foster reuse strategies.

This is the case with the French BBCA (Bâtiment Bas Carbone) label.

The label measures greenhouse gas emissions (kgCO<sub>2</sub>e) in all phases of a building's life cycle, from the production of its components to the energy required for its operation to its end of life. The label provides harmonised calculation methods to compare results and award the appropriate label level.

Aware of the difficulty in obtaining life cycle assessment data for reclaimed building components, the label has developed a rather elegant alternative solution: when calculating the impact related to the production phase of building components, it simply proposes to count the impact of reused components as zero!

A comparable approach is implemented by the Tool to Optimise the Total Environmental impact of Materials (Totem), developed by the Belgian public authorities.

This tool relies on the modelling of different construction solutions and proposes, for each of them, an estimate of their overall environmental impact (17 aggregated impacts), throughout the life cycle of the building. For each component, three options are possible: new, reused or kept in place. The software is based on data from environmental declaration Factsheets for new construction products. When the user chooses a reuse option, the software does not impute the impacts related to the production phase. This usually significantly reduces the overall impact.







# 6. CONTRACTING ADDITIONAL SERVICES: RECLAMATION AUDIT, ADDITIONAL STUDIES, PROJECT MANAGEMENT ASSISTANCE, ETC. \_\_\_\_\_

In order to carry out reuse practices, the client may choose to call on additional skills. To do this, he will have to contract other services. The need for this assistance will depend both on the client experience and autonomy regarding reuse, and on the context of the project (complexity, ambitions, etc.).

An overview (not exhaustive) of the possible complementary missions is presented below. These tasks can also be integrated into the service and or works contracts.

## A - Assessments

- Conducting a reclamation audit, i.e. an inventory of all the reusable materials (in an existing building).
- Analysis of project needs (programme diagnosis).
- Analysis of the context: identification of the actors and the range of materials and services available.

## B - Assistance to the contracting authority on the reuse aspect

- Assistance in defining the reuse strategy and objectives.
- Assistance in drafting and awarding contracts.
- Monitoring the implementation of contracts.

see method  
○  
guide for  
inventory  
developed  
from FCRBE —

see factsheet  
●  
identifying  
materials for  
your project —

### C - Comprehensive assistance mission

- Finding reusable materials.
- Reuse feasibility study (technical, economic, logistical, etc.).
- Legal assistance. Example: public procurement, transaction management in case of acquisition of materials from another contracting authority.

### D - Feasibility studies

- Analyses and tests to assess the performance of materials for reuse (if relevant).
- Dismantling tests to assess technical and economic feasibility of reclamation. Some tests can be carried out prior to starting the work.
- It is also possible to perform additional tests to assess how reclaimed materials can be cleaned, prepared and even implemented (e.g. through prototyping).

### E - Training / raising awareness

- Training of project actors (project owner, designers, contractors...).
- Training of the project owner's internal teams, with a view to replicating reuse strategies on other projects for instance.
- Raising awareness among local actors (local authorities, local associations and inhabitants, future users, other territorial partners, etc.).

## RECLAMATION AUDITS

Any on-site reuse operation - and more broadly, any operation involving the demolition of all or part of a building - should start with an inventory of reusable elements. Such an audit aims at identifying batches of materials that present a reuse potential before demolition begins.

Such an audit can then play several roles:

- To decide who will dismantle the batches, and when (demolition company, specialist contractors...).
- To notify the architect of the future project of the batches that could be reused on site.
- To investigate solutions for the reclamation of these batches by specialists (including professional dealers).

The Interreg NWE FCRBE project has developed a method to assist conducting reclamation audits: <http://www.nweurope.eu/fcrbe>.





# 7. IDENTIFYING RELEVANT MATERIALS FOR YOUR PROJECT

Choosing materials in an architectural project is a decision that generally involves many criteria. These could include things like the resources available for the project such as budget and timing, architectural design issues such as aesthetics, ergonomics and comfort of use, as well as performance-based technical requirements such as energy use and lighting. These different facets are generally studied and balanced by the designers during the planning phase, and this would also be in dialogue with the contractors if they are involved at this stage of the process.

Choosing reclaimed materials does not differ much from these principles, except that they can add a small amount of uncertainty to the equation. This is linked, among other things, to the fact that the supply of second-hand materials may present more fluctuations. For on-site reuse it may come from the unknowns related to the actual reuse potential of the materials (when these still have to be dismantled). Several other aspects can also accompany this process.

## A - Available sources

As mentioned above, different sources can provide access to different materials. On-site reuse strategies, for example, can provide access to materials that are not yet, or only to a limited extent, salvaged by professional businesses. Studying the wider context of a project can therefore lead to identifying useful batches of materials.



## B - Analysis of the needs

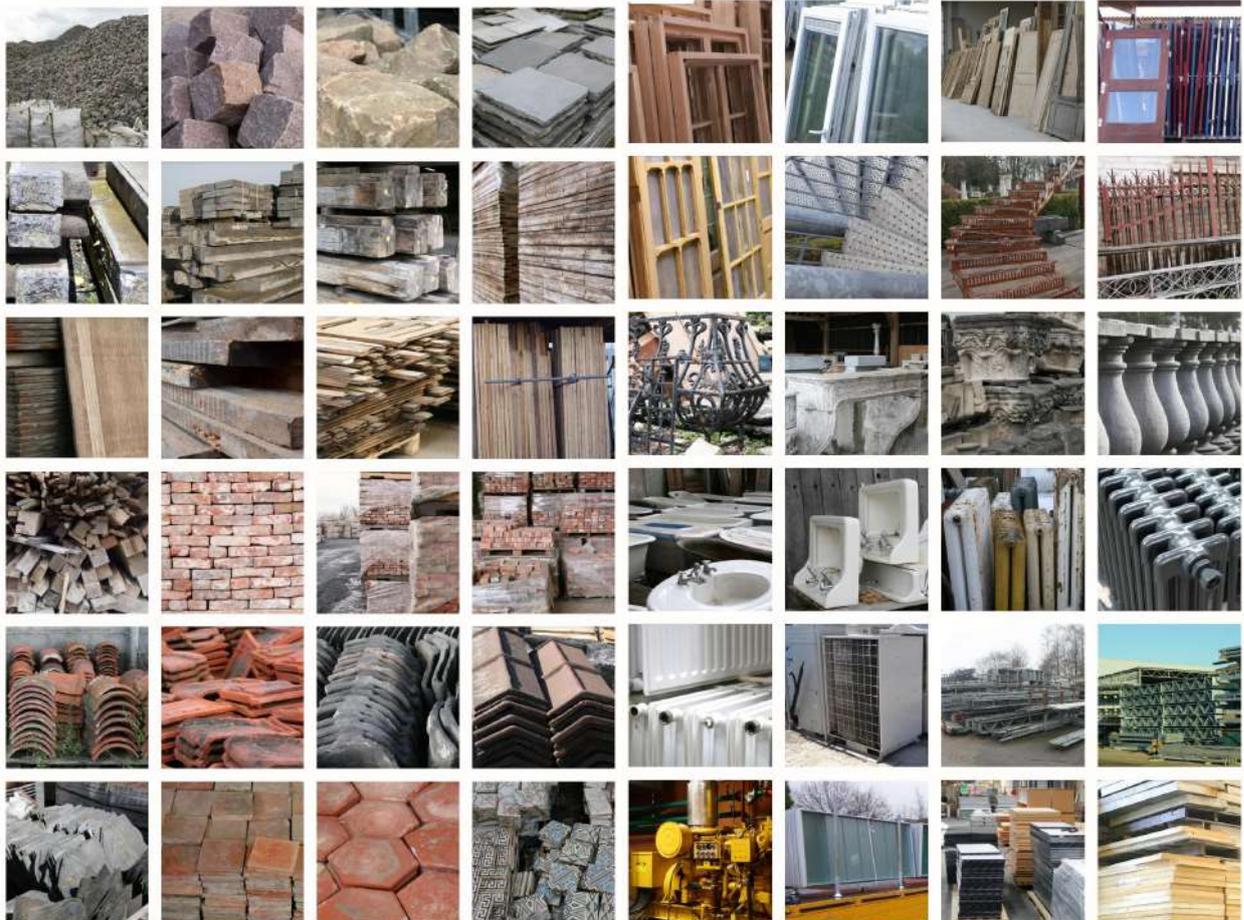
Conversely, understanding available sources can also be cross-referenced with the needs of the project. One way of doing this is to identify the most important batches within an operation so as to guide the search through the different reuse pathways. This approach, which focuses on the demand, can, in certain cases, have a positive effect on the development of the supply chain. For example, a project that makes its needs known in advance can enable potential suppliers to prepare themselves to meet this demand.

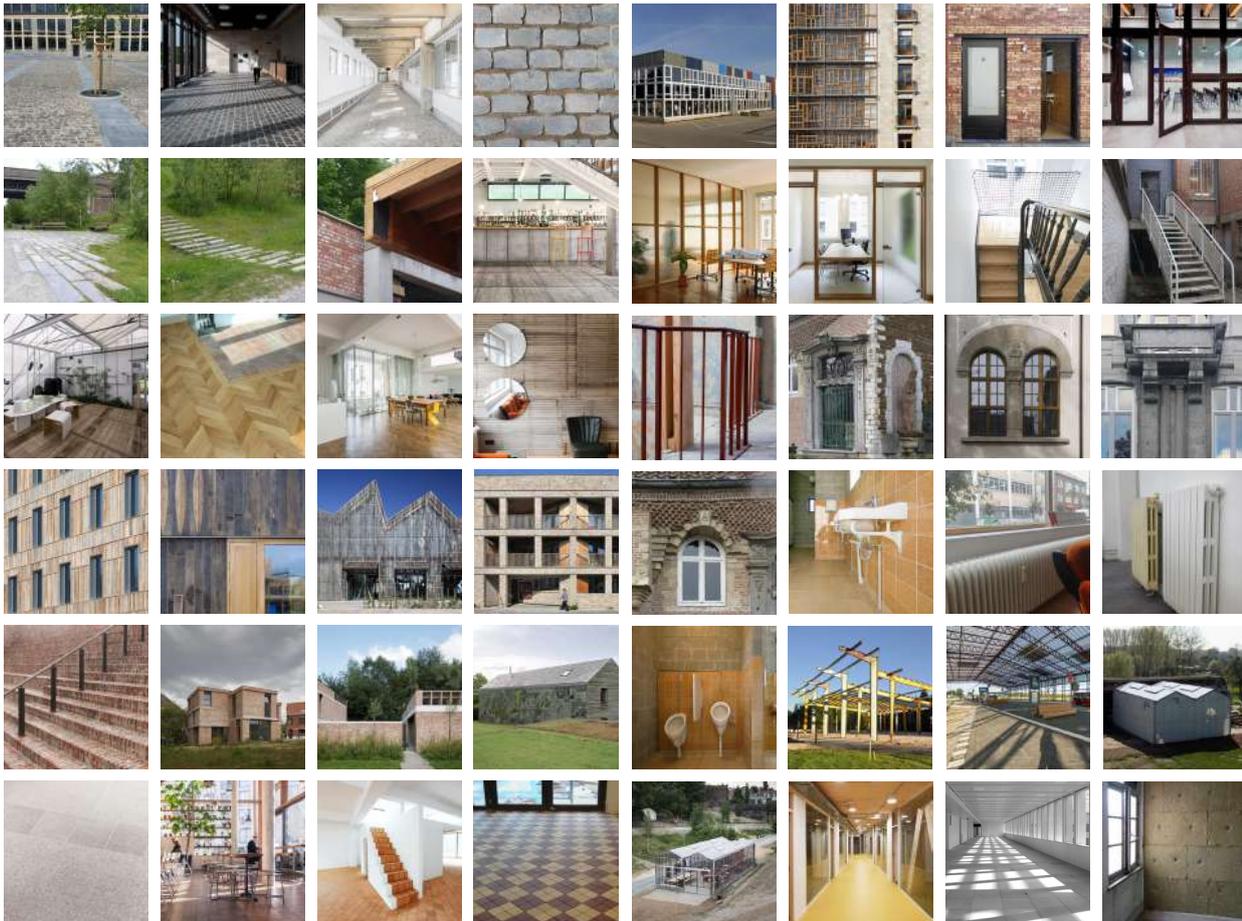




## C - Commonly reclaimed materials

It is also possible to draw on a range of materials that are relatively stable on the reclamation market. Here is an illustrated overview:





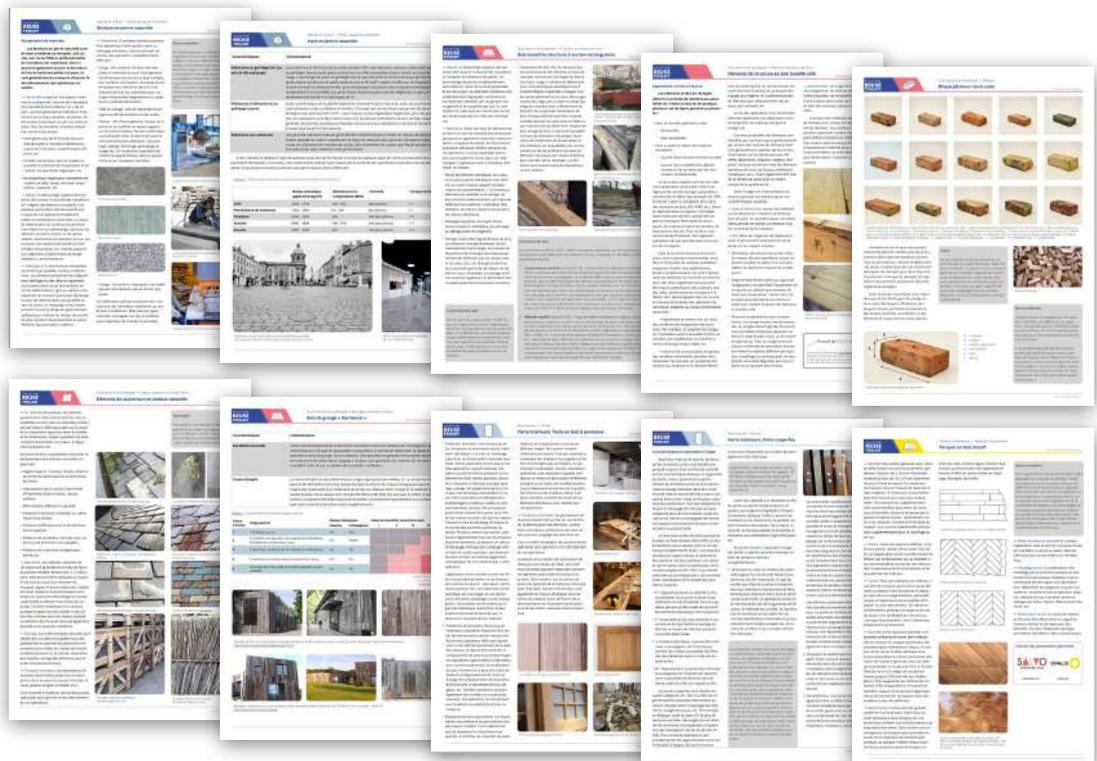
Sources. For the pictures in the left column: Opalis.eu. For the photos in the right column (from left to right and from top to bottom): 6a architects (14), AAC architecture (29), Atelier Passe Partout (10), Stijn Bollaert (18-19), Laurent Brandajs (31), Carrière de la Hazotte (1), CIRCL (28), CONIX RDBM Architects (2), François de Ribaucourt (23), Samuel Defourny (13), Filip Dujardin (16), David Grandorge (20), Michael Heinrich (35), K2 architectes (11), Séverin Malaud (33), MAMOUT architectes (3), Mecanoo architecten (15), Mobius (47), Luis Monteiro (43), Monteyne Architecture Works Inc. (42), Nu-architectuuratelier (8), Quentin Olbrechts (26), Rotor (4-7, 9, 12, 17, 22, 24, 27, 32, 34, 36-41, 44, 46, 48), Frédéric Uyttenhove (21, 30), Ruta Valiunaite (45), Fernando Van Teijlingen (25).

## TOOLS: MATERIAL SHEETS

As part of the FCRBE project, 40 sheets have been produced to document commonly reclaimed materials. They gather information on:

- characteristics
- precautions to be taken for their careful dismantling
- specifics of their reinstallation
- known performances
- availability on the market
- environmental benefits of their reuse

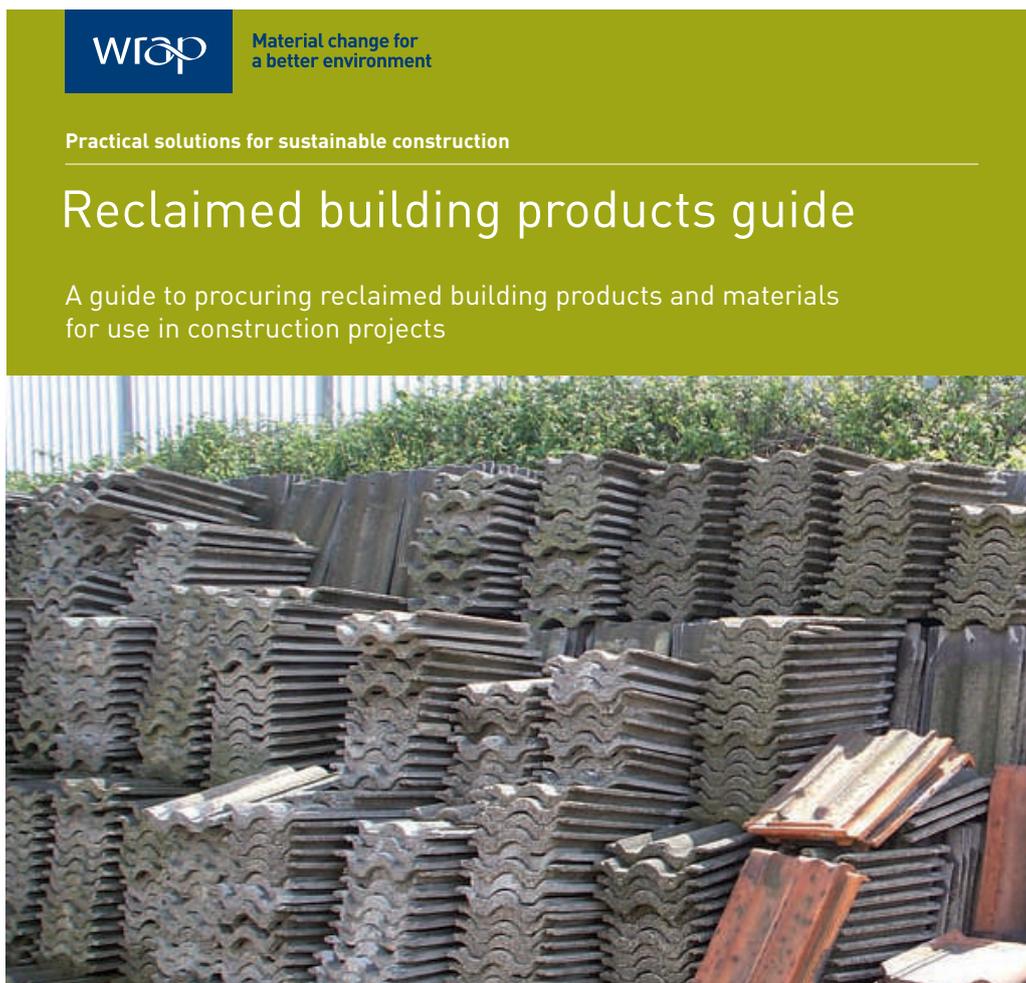
Link [1](#) and link [2](#)



## MATERIALS

Detailed description of 33 common reclaimed building products in Bioregional, Reclaimed building products guide. A guide to procuring reclaimed building products and materials for use in construction projects. Waste & Resources Action Programme (WRAP), 2008. Available online: <http://www.wrap.org.uk/sites/files/wrap/Reclaimed%20building%20products%20guide.pdf>.

Description of the main families of reclaimed products frequently found on Opalis, in the materials section (regularly updated). Common products, services offered by suppliers, links to dealers and to examples of realisations: <https://opalis.eu/en/materials>.





# 8. CONDUCTING A PRIOR MARKET CONSULTATION<sup>10</sup>

## A - Prior market consultation with the direct stakeholders.

Pre-market consultation (sometimes called 'sourcing' in common parlance) is encouraged by law in the context of public procurement<sup>11</sup>. In the case of reuse, it is a nearly indispensable step, to both adapt your project to existing possibilities and to ensure a dialogue between the different key players.

see section 1.1  
getting to know the context

The aim of a market consultation is to present your idea to the market to check if it is feasible (existence of a supply, stability of the supply, etc.) and to keep abreast of innovations and developments in products and techniques. At the end of the exchange, the contracting authority should have a better view of what the market can offer. This will allow the initial project to be compared with the realities of the market and to evolve accordingly. As for the companies contacted, they must have identified and understood the needs of the contracting authority (and possibly the reuse solutions available). This study should be carried out before the contract is launched. It will consist, for example, of approaching technical design offices and construction companies to ask them about their interest in reuse practices.

see factsheet 7  
identifying materials for your project

Here are some possible ways to start a discussion with the reuse market. Note that all information obtained during the exchanges between the market and the public authority must be available to all economic operators.

10 - This factsheet is based on the Market engagement section of the deliverable 'Public Procurement Innovation implementation strategy in MED countries' (WP4 - Act 4.3.1), written by the Centre Scientifique et Technique du Bâtiment (CSTB, France) in the framework of the Interreg project Prominent Med, Oct 2020.

11 - Public Procurement Directive 2014/24/EU, Art 40: 'Before launching a procurement procedure, contracting authorities may conduct market consultations with a view to preparing the procurement and informing economic operators of their procurement plans and requirements. For this purpose, contracting authorities may for example seek or accept advice from independent experts or authorities or from market participants. That advice may be used in the planning and conduct of the procurement procedure, provided that such advice does not have the effect of distorting competition and does not result in a violation of the principles of non-discrimination and transparency.'

### - Prior information notice

A prior information notice can be published on a standard public procurement platform, between 35 days and 12 months before the official launch of the consultation (through the publication of the contract notice). In the case of reuse, it can be used to raise awareness among companies by indicating the reuse ambition and informing them of the solutions already identified. It is ideal to complement this notice with a site visit or a thematic workshop, in order to further initiate a conversation with the market.

### - Publication of an RFI (request for information)

The RFI is not a contract notice as such, but a publication by which the contracting authority informs of its intention to launch a new contract. This can be an effective way of requesting information (conditions of performance, prices, deadlines, etc.) from economic operators.

### - Site visits

The organisation of a preliminary visit earlier in the project can provide valuable indications of the market's interest in certain materials. This is the time to draw attention to materials that can be reintegrated on site, or on a neighbouring building site and is already common in the consultation phase of a project.

### - Market consultation workshops

A project's presentation workshop can be organised around the needs of the project with construction companies, and why not with operators in the reuse sector. This will be an opportunity to present the materials targeted for reuse at an early stage, to answer questions, and allow exchanges between companies and their potential suppliers.



## B - General market survey of indirect stakeholders

In addition to the direct actors of the project (companies, design offices, architectural agencies, etc) reuse requires a number of other indirect actors. These are the professional suppliers of reused materials. It is the case that companies are still not used to working with the reuse sector and may underestimate (or overestimate) the capacity of suppliers as well as their differing technical challenges. Acquiring an overview could be

done, for example, through a study of the supplier market, prior to the selection of construction companies will make it possible to prepare the dialogue with these direct players during the award and execution phases.

A market survey of suppliers may consist of contacting a number of them in order to ask them about their stock and their opinion on the reuse objective<sup>12</sup>. The information obtained can be used to adjust the requirements of the contract and form an informative annex to the consultation documents sent to the companies. Of course this does not prevent them from proposing other suppliers, but will help to reinforce the importance of the reuse objective in the contract and demonstrate the existence of a bid that makes it possible to achieve it. The example of the framework agreement for works launched by SAMOA, in part 2, provides a good illustration.



---

12 - These suppliers can be identified in the first instance through the directories [www.opalis.eu](http://www.opalis.eu) and [www.salvoweb.uk](http://www.salvoweb.uk).



# 9. ASSESSING THE ECONOMICS OF REUSE ---

Is reusing materials a source of savings or, on the contrary, of additional costs? It is difficult to give a clear-cut answer to this frequently asked question as it varies according to the project and the materials considered. However, there are a few elements that can help clarify the discussion.

Firstly, it is worth recalling that the reuse benefits are mainly environmental and social. Reuse cannot therefore be used for the sole purpose of saving money (although this may be the case in some circumstances).



A reasonable starting point is to aim for a neutral cost in comparison with a conventional project (i.e. without reusing materials). However, at equal cost, reusing materials fosters the development of a promising economic sector that is usually locally based and associated with very low environmental impact. In other words the economical benefits of reuse go beyond the project itself.

## A - The costs of reuse

In general, the prices of materials available on the reclamation market are comparable to, and even competitive with, their new equivalents (although for some old materials, new equivalents may no longer exist). However, care must be taken to compare comparable things. For example, for the same performance, a reclaimed solid oak floor will generally cost less than a good quality, eco-certified new solid oak floor, but more than a new laminated floor.

In the reclamation market, prices depend largely on the operations carried out on the products. An uncleaned batch of tiles will cost less to buy than a fully sorted and cleaned one. However it is likely that sorting and cleaning of tiles will have to be planned downstream. Therefore overall, these costs are not avoided: they are simply passed on elsewhere. In this regard, specialist suppliers are generally well equipped to carry out such operations and optimise costs. In this sense, buying ready-to-use reclaimed materials is often an interesting option to avoid extra costs later on.

For on-site reuse, the economic assessment requires more care. While the materials available on site are virtually free (in the sense that they do not have to be purchased like a conventional new product or a reclaimed batch provided by a specialist dealer), they may require a succession of specific operations such as:

- Careful dismantling (labour costs)
- Temporary storage (labour costs and, depending on the case, transport and off-site space rental costs)
- Sorting, cleaning, conditioning (labour costs, usually the most substantial expenditure)
- Demonstration of fitness for purpose (cost of service providers, cost of sampling and testing, etc.)
- ...

It is possible to estimate the cost of these operations according to the batches considered and their quantity (large batches can indeed lead to economies of scale). A comparison with the cost of supplying an equivalent new material can then provide an initial indication of the economic relevance of the operation (without prejudging its interest in other respects, particularly environmental).

To provide a more comprehensive view, this comparison can also incorporate considerations of more complex but nuanced aspects:

- Potential to be replicated in the future: learning from a first operation can be seen as an investment that will pay off in future projects.
- Environmental gains: some actuarial models focus on monetising the cost of environmental damage. In principle, therefore, reuse could be credited for preventing damage.
- Intellectual services (reuse assistance, adaptation of the architectural project, search for materials, etc.) or insurance services can also be included in the financial statement.

## CASE STUDY ON A PROJECT

## 1. Case of an urban development project including the supply and installation of reclaimed roadworks materials

The analysis of the submitted offers shows that systematically opting for reclaimed granite elements would cost on average 57% more than new materials. On the scale of the project, this represents a difference of approximately €80,000, or barely 0.8% of the total project budget.

In effect, the impact of reuse remains minimal in proportion to the total value of the offers. In this case, the selected offer had the lowest total value while not being the cheapest in terms of reuse.

| MATERIAU                 | PRIX UNITAIRE (€) |            |            | MOYENNE    |
|--------------------------|-------------------|------------|------------|------------|
| TOTAL REEMPLOI EXT (DQE) | 314,348.00        | 264,067.00 | 259,749.50 | 279,388.17 |
| TOTAL NEUF (DQE)         | 233,001.75        | 205,579.25 | 155,547.00 | 198,042.67 |
| DIFFERENCE (€)           | 81,346.25         | 58,487.75  | 104,202.50 | 81,345.50  |
| Augmentation réemploi    | 65.09%            | 71.55%     | 33.01%     | 56.55%     |

## 2. Case of on-site reuse of bricks to be dismantled, prepared and conditioned

In a demolition contract, bidders are invited to complete a mandatory variant for the careful dismantling and provision of bricks for the construction contractor. The information provided here allows a comparison of two scenarios:

1. Demolition of 50 m<sup>3</sup> of masonry + removal of rubble + purchase of 50 m<sup>3</sup> of new bricks.
2. Careful removal + preparation and packaging + laying 50 m<sup>3</sup> of reused bricks.

| 3-5                   | Travaux relatifs aux matériaux destinés au réemploi  | Unité | Quantité | PU €HT   | Montant € HT |
|-----------------------|--|-------|----------|----------|--------------|
| Brique de terre cuite | Collecte : dépose manuelle et/ou mécanique soignée après nettoyage du sol au droit des ouvrages  | m3    | 50       | 189,98 € | 9 499,00 €   |
|                       | Préparation : Nettoyage (purge et retrait des résidus de mortier, peinture et tout autre matériaux résiduels), Tri par calibre (brique intégrée et fragmentée) et Contrôle de l'état des matériaux | m3    | 50       | 79,58 €  | 3 979,00 €   |
|                       | Conditionnement : fournitures annexes et conditionnement conforme aux CCTP   | m3    | 50       | 17,25 €  | 862,50 €     |

The integration of reuse in a project may require adapting the usual way of costing the amount of the works. The general principle here is to respect the overall price allocated to the works while allowing a certain amount of flexibility, in order to favour the integration of batches of reused materials. To do this, and depending on the conditions of the contract in question, several approaches can be considered which can be used also in combination.

- The first approach consists of asking the works company to separate the price of installation and supply in its costing for each material targeted for reuse. This makes it possible to study in greater detail the impact of replacing a new batch with a reused batch (if this has been provided for in the contract).
- Another approach is to set aside an amount for possible actions related to reuse that may arise during the course of the project. For example, this may involve having characterisation tests carried out on reuse materials, providing elements to compensate for an unforeseen loss during removal, etc. A sum that may be used if the expected cause is proven and justified by evidence.
- Other approaches are detailed in Factsheet 10, which involve using devices such as technical options or price lists to accommodate the flexibility inherent in re-use. These approaches can have an impact on the economics of the project.

# 10. ASKING FOR A REUSE ALTERNATIVE IN THE OFFER: VARIANTS AND OPTIONS

---

The project stakeholders need to stay open to reuse opportunities, while ensuring smooth project execution. However there is no question of endangering the project if a reused material cannot be found or is too damaged, nor of having to accept inferior new alternatives as a last resort. In the context of public procurement, there are a number of mechanisms that can provide some flexibility in the face of possible changes along the way.

## A - Technical options

Technical options are a mechanism that allows additional or alternative services to be included in a tender that are 'ancillary and not strictly necessary to the performance of the contract'. This feature can be made explicitly compulsory by the contracting authority or left open as a possibility for tenderers<sup>13</sup>. If this possible service is validated at the time of the award, it will be included in the tender but does not necessarily have to be activated during the performance of the contract.

This provision may be useful in anticipating certain situations relating to reuse (breakage during dismantling, unavailability of the lot on the market at the required time, etc.). Having provided for a technical option prescribing a new material that meets the requirements makes it possible to get back on track. In this form it is even possible to provide another reuse alternative, or another type of material with high environmental performance (bio-sourced, high rate of recycled materials, etc).

---

13 - In Belgium, when the law automatically allows this possibility, it is called a 'free option'. In other countries, it must be explicitly provided for by the contracting authority, and is called an 'authorised option'.

The advantage of this system is that it is possible to detail the expected requirements separately, depending on whether the material is sought for reuse (with potential unknowns, for example as regards its visual appearance or dimensions) or for new construction. In this way the objective of reuse is not hampered by unsuitable requirements and the fallback solution for new construction does not compromise on quality.

However it is worth noting that the use of the technical option can be a double-edged sword, as the bidder's greater familiarity with new materials may be felt in both scenarios proposed in the bid. It also requires a precise alternative solution for each material targeted for reuse. This solution is therefore especially relevant in the case where the materials targeted for reuse are precisely identified. Finally if the option has not been made compulsory, there is a risk that companies will not respond to it, unless they are encouraged to do so by other means (e.g. through the award criteria).

## B - Schedule of unit prices

On first glance, price lists are not perceived as a favourable solution to great flexibility. But when the objective of reuse is to target specific materials that are common on the reuse market, they offer an interesting compromise between flexibility and security.

The contracting authority can ask bidders to submit both a price for each material targeted for reuse, and a price for the new equivalent of the same material. As with the technical options, this enables the details of the requirements to be adapted according to whether the material is reused or new. The difference is that both prices will be included in the base bid from the outset. During the execution of the project, the client will be able to compose his orders by favouring reused materials, or by falling back on new materials when market capacity is not guaranteed.

This technique has been tested in the pilot operation with SAMOA, presented in Part 2 - Framework agreement for reuse-oriented works (the project is currently being implemented).

## C - Review clauses

The administrative specifications may include a review clause that sets out the conditions for substitution between new and reused materials. The replacement of a new lot by a reused lot (or vice versa) will in the vast majority of cases be authorised because of the low value of this change (both below the European thresholds and less than 15% of the initial value of



the works contract<sup>14</sup>). The challenge for the contracting authority is above all to supervise the substitution process in order to avoid abandoning the objective of reuse and to have a look at the materials chosen in the end (see next box).

If the contracting authority prefers to introduce it directly into the technical specifications, it is better to speak of a 'substitution clause'.

This mechanism is complementary to the previously mentioned ones, as it provides additional security that can be used during the performance of the contract.

### EXAMPLE OF A REVIEW CLAUSE REGARDING REUSE IN A WORKS CONTRACT

#### '(1) Impossibility for the contractor to obtain certain reused supplies

Conditions for the application of the review clause:

- With regard to an item for which the contractor must in principle acquire reused supplies itself, the contractor has offered in its tender a price (excluding installation) which is within the price range estimated by the contracting authority; and
- The contractor demonstrates, in the course of performance of the contract, that it is ultimately not possible to obtain the reused supplies concerned, or that they can be obtained only at a price higher than the maximum price of the range announced. The contractor shall provide such proof by demonstrating that it has contacted and requested quotes from several reused suppliers and after having obtained the recommendations of the materials reuse adviser. Then the contracting authority will have the choice between the following two options:
  - 1 - either it will enable the contractor to carry out the work concerned using new supplies, at a price (purchase and installation) to be agreed between the contracting authority and the contractor;
  - 2 - Or it will invite the contractor to carry out the work concerned

---

14 - Article 72(2) of Directive 2014/24/EU.

using the reused supplies available, at a price (for purchase and installation) to be agreed between the contracting authority and the contractor.

## (2) Other replacements of reused supplies with new supplies

Without prejudice to Article 1, the contractor must use reused supplies to carry out the work concerned and may not therefore substitute new supplies for those reused supplies.

As an exception, the contractor will nevertheless place new supplies in place of reused supplies:

- either, at the request of the contracting authority, and whatever the reason for this substitution: in this case, the parties shall agree on an appropriate price for the item concerned (purchase and installation price);

- or, at the request of the contractor, in the event that a reused supply deteriorates at the time of installation, or if a defect is discovered after installation, requiring the dismantling of the defective supply, its removal, and the reassembly of another equivalent supply. In this case, the parties shall agree on an appropriate price for the item concerned (purchase and installation price). Nevertheless, if the deterioration or disappearance of the reused supply is attributable to the contractor, the latter shall ensure, at its own expense, the replacement of the supply by a reused or new equivalent supply in accordance with the specifications;

- or, at the request of the contractor, for any other justified reason, if this request is accepted by the contracting authority, and against a purchase and installation price to be agreed by the parties, it being understood that the total price (purchase + installation) paid by the contracting authority may in this case not exceed that initially agreed for the purchase and installation of the reused supply.

## (3) Replacement of new supplies with reused supplies

The contractor shall place reused supplies in place of new supplies:

- either, at the request of the contracting authority, and whatever

the reason for this substitution: in this case, the parties shall agree on an appropriate price for the item concerned (purchase and installation price). Such a situation could arise in particular if, in the course of performance of the contract, the contracting authority sees an opportunity to acquire reused supplies which can be used under this contract;

- or at the request of the contractor, if this request is accepted by the contracting authority, and against a purchase and installation price to be agreed by the parties.'

### D - Variants

When possible according to the regulation, contracting authorities may allow or even require tenderers to submit variants. In both cases they must clearly indicate their minimum requirements in the contract documents. This ensures that the established award criteria can be applied to both variants and the basic tender. If the variant is successful, it will replace the original tender.

In the context of a design service contract, and even if it complicates the award process somewhat, it may be useful for contracting authorities to allow tenderers to submit variants in addition to the basic tender. This may allow bidders to submit both a basic bid with little or no reuse and another with higher reuse ambitions.

In the context of a works contract, variants can also be used, for example to require tenderers to quote a basic price for the supply and installation of new material, and a variant price for the supply and installation of reused material.

### REQUIRING THE INCLUSION OF A VARIANT FOR CERTAIN WORK ITEMS

**Variante obligatoire 04.2 :**

**Isolation intérieure des cloisons ditributives et séparatives**

En plus ou moins value

isolation en panneau de laine de roche semi-rigide non revêtu (Masse volumique : 70kg/m3) ; en réemploi (25% de la surface)

Panneaux epaisseur totale 40mm (25% surface)

**Sous total en plus ou moins value VO 4.2**

| unité   | prix unitaire | quantité | prix total |
|---|---------------|----------|------------|
| m2  |               |          |            |
| m2  |               |          |            |
| <b>Sous total en plus ou moins value VO 4.2</b> |               |          |            |

alternatives (here called variants) for which the bidders must submit prices. The company is required to break down the supply and installation. In other words, they must present a first unit price for the basic work (excluding reuse) and second unit price for installation excluding supply in their offer. The price of the supply is known during the construction phase, when the batches of reused materials are identified. It is then possible to choose whether or not to install the reused materials. When drafting the contract, the project team ensures that the total of potential alternatives does not exceed the threshold set by law, below which modifications are possible without formalities.<sup>15</sup>

Extract from the specifications:

'The company is asked to complete the quantity and to commit to a unit price. This means that the 'installation' unit price of the company's variant is guaranteed up to a maximum reduction of the quantity indicated by the MOE in the schedule.

It should be noted that we remain within the framework of a global and lump-sum contract, which means that the company will carry out, upon release by the project owner of the variant after agreement of the MOE, the service regarding reused materials, for the subtotal presented in its commitment act and will complete it with the services provided for in its basic contract. The companies are informed that the offer will remain a lump sum in all cases and that, to this extent, they must in all cases complete the work as described in the contract file, whatever the actual quantity of reused material in question.'

## E - Amount reserved

Refer to Sheet 9, section B.

---

15 - This threshold is 15% in France and Belgium for works contracts (Article 72(2) of Directive 2014/24/EU).





# 11. INSURING REUSED MATERIALS

---

As the interest in reuse evolves, so does the issue of insurance for reused materials. A thorough description of the various insurance strategies in this field could be the subject of a guide of its own!

Nonetheless, the following recommendations are relevant to most projects including reuse ambitions and may help to prevent unpleasant surprises.

## A- Communicating with stakeholders

Insurers are not opposed in principle to the reuse of materials. Most are actually willing to consider alternatives to the usual protocols for new materials. When a control office is involved in the operation monitoring, the insurers will generally take its opinion into account. However, not everyone is equally sensitive to these issues and some will be more willing to play the game. It is therefore advisable, first of all, to secure the support of these actors in order to be well surrounded. It is also important to keep them informed as soon as the reclaimed materials are identified. This will enable them to share their requirements and reservations (if any) during the design phase. This can also guide the choice of materials and anticipate questions from the contractors.

## B - Seeking evidence by experience

New materials are subject to standards and certifications attesting to their performances. These standards establish a normalised framework to facilitate the demonstration of the fitness-for-use of a material.

Reclaimed materials generally cannot prove compliance with this framework and therefore have to demonstrate their performance in other ways. Technical control offices develop tailor-made assessment protocols for this purpose. The requirements depend on the intended application.



FutuREuse:  
Evaluating  
the technical  
performance  
of reclaimed  
materials



C - commonly  
reclaimed  
materials

Depending on the application, several modes of demonstration are possible, ranging from a careful visual examination to check the good condition of the material, to laboratory tests, to research on the life of the material during its initial use. For commonly reused materials, it is rare to have to carry out tests at significant extra cost.

## C - Reassuring the contractor

The question of insurance can be a source of concern for contractors, since they are liable for the materials they install. Here again the involvement of the insurer and (if applicable) the control office will be the best way to reassure them. In most cases the favourable opinion of the control office for the reuse of materials will enable the contractor to engage their liability. Finally, it is recommended to involve the contractor in the development of the reuse methodologies, so as to reinforce its support and confidence in the process. The active participation of the contractor can also lead to better technical and economic solutions. Where appropriate, an independent control office can also advise on a protocol to deal with these issues.

If the materials are already the property of the client, an adapted solution can be envisaged where the contractor is liable only for the installation. In the event of a subsequent loss affecting the structure, it will be necessary to determine whether the loss was due to a defect in the product or to its application.

### EXAMPLE OF AN INSURANCE CLAUSE FOR THE ADMINISTRATIVE SPECIFICATIONS

#### Assurance décennale, cas des matériaux réemployés non neufs

The contractor must obtain information from his insurer on the conditions regarding the installation of reused materials and must inform the project owner and the project manager as soon as possible of the answers provided by the insurer on this point.

In particular, he should ask his insurance company about the definition and scope of non-routine techniques. He can indicate in his offer the amount of any additional premium associated with this type of implementation.





# 12. WRITING TECHNICAL SPECIFICATIONS FOR REUSING MATERIALS

---

Most of the clauses found in standard specifications have not been written specifically with reuse in mind. Tailor-made wording may therefore be necessary to adapt to the specificities of reclaimed materials.

This is not specific to reuse. In essence technical specifications are the place where the expectations of a particular project, a particular application and in some cases, a particular material are formulated. In this respect, the care and attention needed to write these specifications is not particular to reuse. But reuse requires some specific points of attention, detailed in this factsheet.

In addition it is important to keep in mind that the technical specifications are not the only aspects of the contract that require adaptation. For example, the administrative specifications will provide a fallback mechanism in case of unforeseen circumstances or difficulties. Writing a technical specification suitable for reuse does not therefore represent a risk to the proper execution of the contract, even when the materials involved are less certain or less precisely known than new materials. On the contrary, it allows the research to be marked out while maximising its chances of success.

## A - Leaving some room for manoeuvre...

In a world where building materials are tailor-made for a project, there might be a tendency to design and define their characteristics down to the smallest detail. In contrast, when you design from what is already there, you have to learn to deal with materials that have a higher degree of variability.

This can have different implications:

- As to the choices of installation and laying. Certain types of assembly,

see factsheet 17  
●  
adapting  
the contract  
documents —

see factsheet 10  
●  
including  
alternatives  
in the offer —

fittings and composition are better suited to materials with some variability. For example, free-length installation makes it easy to work with elements of varying dimensions..

- As to the definition of the expected characteristics of the materials. Some characteristics can be expressed in a more open way. For example: increasing the tolerance margins on the nominal dimensions or defining an interval rather than a fixed dimension (in compatibility with the chosen installation), accepting traces of patina and cosmetic wear, allowing a certain variation in shades and colours (rather than requiring a specific colour)...

## B - ...but not just anywhere!

Of course, the choice of installation and the definition of the expected characteristics of the materials must always meet the requirements of the intended use.

These requirements can be:

- regulatory, i.e. they may relate to performances set by the legislator, for example, in terms of stability, health and safety, fire resistance, etc. These are non-negotiable.
- contractual, i.e. established by the specifier as part of their project. These can potentially be substantially adapted.

By extension, how to demonstrate fitness for use may also vary from what is applied to new materials. In the case of reclaimed materials, and depending on the material and its intended use, the methods may range from careful visual examination to laboratory tests.

## C - For a known batch: outline the operations to be carried out

In the case of a batch that is already known (e.g. because it has been or will be dismantled on site), the technical specifications should describe the operations expected from the contractor in charge of their installation. Depending on the materials and their intended use, this may cover aspects such as:

- Cleaning
- Cutting to dimension



- Applying various treatments
- Repairing
  - Combining a reclaimed component with new parts (e.g. reclaimed sinks with new tapware)
- Testing to determine technical characteristics
- Etc.

These specifications must be sufficiently precise to enable the contractor to draw up their tender in a knowledgeable manner and on a clear basis. It should also ease the comparison of tenders for the contracting authority.

## EXAMPLE OF TECHNICAL SPECIFICATIONS FOR THE ON-SITE REUSE OF MODERN WINDOW FRAMES

### Background and approach

An architect is asked to renovate a building that has just changed its function. The building has undergone recent renovation work and contains a lot of modern, high-quality equipment. This includes a dozen high-insulating windows. The architect decided to reuse them in the new project. However, it involves changing the location and size of some of the windows.

The specifications are used to describe, window by window, exactly what is expected (moving windows, cutting them to dimension, replacing certain parts, etc.).

Contractors quote their prices according to these instructions and the awarded contractor performs the work according to the technical specifications.

### Extract from the technical specifications

#### X.X EXISTING STEEL WINDOW FRAMES

The following items include useful adaptations and re-installation of steel window frames.

##### X.X.X Window frames C04, C05, C06

Tilt-and-turn window to be installed in new masonry as shown in the

plan.  
Glazing unchanged.  
Handle unchanged.  
Paintwork unchanged.  
Measurement: by the piece.  
Approximate dimensions: 1.00 □ 2.00 m  
Concerns: room XYZ  
Flat rate quantity, 3 pieces.

X.X.Y Window frames C31, C32, C33  
Tilt and turn window, original dimensions: ~1.00 □ 2.40 m  
The article includes:  
- removal of glazing and hardware ;  
- any cuts, fixings or welds to size (approx. 1.00 □ 2.00) ;  
- repainting of the frame (identical colour);  
- spare parts as required;  
- supply and fitting of new V1 type glazing;  
- interior sash in smooth white melamine MDF assembled with mitre joints.  
Concerns: room ABC  
Measurement: by the piece  
Flat rate quantity, 3 pieces.

(...)

## D - For a batch not yet known: express the expected results

Where the batch of reclaimed materials is to be supplied by the contractor, the technical specifications may be formulated in terms of performance or functional requirements. In this case, it is important to ensure that the parameters are sufficiently precise to enable (1) tenderers to prepare their offers and (2) contracting authorities to award the contract<sup>16</sup>.

As mentioned above, the use of reclaimed materials may imply leaving some leeway on certain characteristics (depending on the case, technical, economic or performance parameters). It is therefore advisable to define the extent of this leeway, for example, by specifying minimum thresholds, permissible ranges, etc. This allows the tenderer to respond to the need and the contracting authority to assess whether the requirements have

---

16 - Directive 2014/24/EU of the European Parliament and of the Council of 26 February 2014 on public procurement, Art. 42, §3.a.

been met.

## EXAMPLE OF A SPECIFICATION FOR REUSING RECLAIMED PORPHYRY SLABS FOR INTERIOR DESIGN

### Background and approach

In the context of a public tender, the architects choose to use reclaimed slabs for the interior flooring of a public building. They describe their expectations in the specifications for the works. The contractor then buys the slabs from a specialist dealer and lays them.

### Extract from the technical specifications

(XX)YY PAVING STONES

(XX)YYY RESAWN PORPHYRY SETTS

1° MATERIAL

Belgian reclaimed slabs in porphyre, obtained from the dismantling of roadways, and suited for a normally loaded paving.

Square format 13 X 13 X 13 cm.

3 colours (mosaic laying): green colour, pink colour and grey colour.

Top side 'sawn top'.

(...)

### Comment

Unless there is a good reason to stipulate specific dimensions, it would have been possible to leave this criterion more open. For example: specify a square format with dimensions between 10 and 20 cm. In this way, there is a better chance of meeting the supply available from dealers.

In this case, the laying requirements are identical to those for new paving. The specifier can simply refer to the relevant standard clauses.



## E - Useful resources

### TOOL: INTRODUCTORY TOOLKIT SHEET (2021)

One of the outcomes of the FCRBE project is a collection of 40 material sheets. The introductory sheet contains suggestions for technical specifications (for installation and reclamation). These standard formulations are to be completed with the information provided in each material sheet.

Link [here](#)

**REUSE TOOLKIT** Fiche réemploi Fiche introductive - Introduction générale Suggestions de prescription

**4. Suggestions de prescription**

En principe, les informations mentionnées dans les fiches (éventuellement complétées par des démarches spécifiques), doivent permettre aux auteurs de projets de formuler des opérations de réemploi dans leurs cahiers des charges.

Voici quelques considérations générales à ce propos, considérant plusieurs cas de figure.

Attention, ces suggestions ne sont pas des clauses-type pouvant être copies-telles-quelles dans un cahier des charges. Il est important que chaque prescripteur les adapte aux modalités de son projet.

**4.1. Prescrire la dépose d'un lot de matériaux en vue de son réemploi**

Que ce soit en vue d'un réemploi sur site ou via les filières de reprises professionnelles, il s'agit de prescrire un démontage soigneux des lots vifs.

Selon l'organisation du chantier, ceci interviendra lors des démontages ou en cours de travaux. Dans tous les cas, il est important de préciser l'objectif de l'opération (i.e. le réemploi futur des éléments).

Si cela n'a pas été fait au préalable, un test de démontage peut être demandé à l'exécutant afin de s'assurer de la faisabilité de l'opération et connaître le taux de perte.

À ce stade, il est recommandé de travailler en Quartier Présumés.

**Exemple :**

« Le lot (XYZ) sera démonté soigneusement en vue de son réemploi futur.

Le prestataire veillera à stocker le lot dans des conditions qui permettent de préserver ses qualités, spécifier éventuellement les conditions : à l'abri du gel / des intempéries / conditions sèches / protégé de la pollution... »

Le lot sera conditionnel à l'application des exigences de conditionnement applicables : sur palette / en ballot / empilé par paquets de 3 pièces / en vrac... »

Le lot sera trié selon l'application des critères opérationnels (forme / couleur / dimensions / qualité... ) »

**Exemple :**

« seuls les surfaces effectivement réemployées seront payées par le Maître d'ouvrage. »

**4.2. Prescrire une opération de dépose et de réemploi sur site**

Dans un scénario de réemploi sur site, il est important de bien définir la répartition des tâches.

Il est conseillé de laisser la possibilité aux entreprises générales de faire appel à des prestataires spécialisés pour les opérations liées au réemploi (par exemple, entreprises de déconstruction, etc.).

**Exemple de répartition :**

Démontage + Entassement : responsabilité de l'entrepreneur en démontage.

Nettoyage + reprise : responsabilité de l'entrepreneur en construction.

Dans certains cas, il faudra prévoir l'éventualité que ces opérations soient réalisées hors site si les conditions du chantier ne permettent pas de travailler correctement ou de stocker les matériaux dans de bonnes conditions.

Il est également utile de se référer au poste de dépose dans la clause prévue pour la reprise.

Enfin, il peut être contre-productif d'obliger un entrepreneur à remettre en œuvre sur le même site un lot démonté sur place, en particulier si le démontage n'a pas été étudié au préalable. C'est alors à l'entrepreneur d'évaluer les risques si le démontage s'avère décevant.

Pour pallier à ce cas de figure, il est utile de déléguer les deux actions :

1. Soumettre l'entrepreneur à une obligation de moyen de récupérer un maximum de tel lot en vue de son réemploi (soit sur site, soit via des filières de réemploi professionnelles ou autres).
2. Indiquer à l'entrepreneur que les matériaux à remettre en œuvre doivent être issus du réemploi.

Dans ce cas, si les conditions ne le permettent, l'entrepreneur sera incité à effectuer du réemploi sur site. Il ne sera toutefois pas bloqué si les conditions ne le permettent pas. Les matériaux démontés auront toujours la possibilité de trouver un nouvel usage par ailleurs tandis que des filières de réemploi seront bel et bien activées pour la fourniture des nouveaux éléments.

**Exemple :**

« Le lot (XYZ) à installer provient d'une opération de démontage soignée en vue de cette réutilisation opérée dans un matériel en poste précédent (préciser l'usage).

Le lot présente les caractéristiques suivantes (préciser le format, les couleurs, les éventuels éléments associés...) »

Les éléments (XYZ) réceptionnés sont en bon état. L'évaluateur peut prendre connaissance des lots / des échantillons sur chantier.

Les éléments doivent être préservés les éléments : nettoyés / découpés / lavés / enduits / traités contre certaines contraintes / dégraissés / mis à certaines dimensions... (soit en offre pays).

Les opérations (spécifier lesquelles) sont / ne sont pas incluses dans ce poste.

Un surplus de générer un pourcentage ou une quantité (abstrait) est prévu pour les futures réparations.

Quantité en démonté (XYZ) en (préciser : mis pièces, en tonnes...) sur pied (soit : prix de pose uniquement pour achat matériel, déjà sur place) »

**Démontage de plancher technique**

**Démontage éléments en pierre**

**Démontage de carreau en céramique**

© 10-01-2021, 28 p/30

## TOOL: BBSM PROJECT MATERIAL SHEETS (2021)

As part of an ERDF Brussels research project, the BBRI has developed a report on the implementation of a technical framework for justifying the technical performances of reclaimed materials: <https://www.bbsm.brussels/wp-content/uploads/2021/06/annexe-16-WP6-cadre-technique-des-materiaux-de-reemploi.pdf>



Cadre technique des matériaux de réemploi :  
Comment justifier les performances techniques  
des matériaux de réemploi ?

Mai 2021

The general method proposed here has been applied to the following materials:

- Reclaimed clay bricks intended for reuse as cladding
- Reclaimed manufactured mineral wool products for reuse as insulating material
- Reclaimed structural steel elements for reuse in structural applications
- Reclaimed solid wood flooring for reuse in indoor flooring
- Reclaimed technical installations.

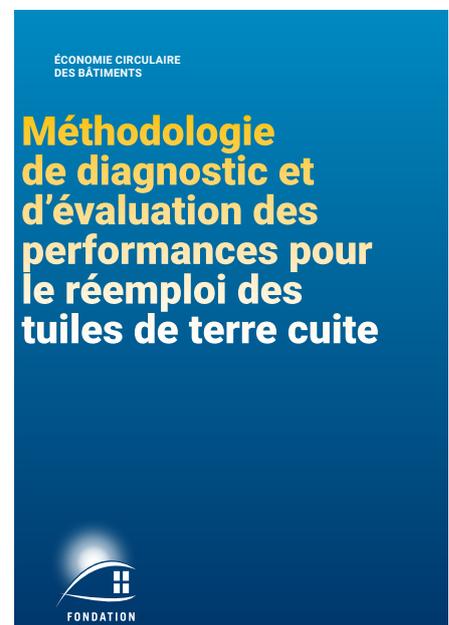


## TOOL: MATERIAL SHEETS FONDATION BÂTIMENT ÉNERGIE (2021)

The CSTB has developed a method of diagnosis and assessment of performance for the reuse of the following materials:

- Tiles
- Ceilings
- Parquet floors
- Framework
- Joinery
- Facade
- Carpentry
- Bricks

- <http://www.batiment-energie.org/index.php?p=70>



## EXAMPLE OF SPECIFICATIONS FOR THE INSTALLATION OF A FAÇADE CLADDING MADE OF RECLAIMED WOOD

### Background and approach

In the context of the energetic refurbishment of a university building from the 1960s, the client wanted a wooden cladding for the 2,600 m<sup>2</sup> façade. They opted for reclaimed barnwood.

Due to the large quantity involved, a small feasibility study is commissioned beforehand.

A mock-up is also produced to test the feasibility of the operation.

This batch is described in detail in the technical specifications used for tendering the works.

### Extract from the technical specifications

#### X.X.X NATURE AND CHARACTERISTICS OF RECLAIMED TIMBER

This article describes the general characteristics of reclaimed timber to be delivered to the site. Article X.X.Y and sub-articles complete this description by specifying the additional operations or requirements made necessary for the specific use in cladding as foreseen in the project.

### BACKGROUND

#### Nature of the wood

- Reclaimed softwood, such as 'barnwood' or equivalent, obtained from the dismantling of the outer shell of old barns, warehouses or equivalent buildings.
- The reclaimed wood has not undergone any prior treatment (painting, etc.) and has a natural surface.
- The material has been exposed to outdoor conditions for at least 100 years, which gives it the necessary strength to be reused as exterior cladding without the need for special treatment.
- The batch consists of a mixture of wood species (softwood).

- The wood has an FSC label or equivalent.
- Durability: at least class 3.
- The wood has been dried and has a moisture content of less than 15%.

The wood is certified as to its origin and former use.

#### Nature of the wood for outdoor use - Protection

The contractor shall check the compatibility of the specified wood, with or without treatment, with the requirements of the biological attack risk class GK No. 3 in accordance with DIN 68800-3. The specified wood does not, at first sight, require any protection due to its age and drying conditions. The contractor checks this. If, however, treatment is necessary, this is included in the price (general price for cladding) in accordance with the specifications below. No price supplement is accepted during the course of the work for any change in this respect. (...)

Comment



The rest of the specifications also describe the acceptance criteria (cleaned, cut, planed, and stored properly), the treatment procedures to ensure fire resistance and the installation procedures in accordance with the architects' design.

For example, the specifications do not specify a particular type of wood. It does, however, clearly indicate the constraints that the cladding must meet (resistance to insects, mould, etc.). This makes it possible, if necessary, to refuse an unsuitable batch while opening up to various potential solutions.

Collecting such a large quantity was complicated for the supplier, which sometimes undermined traceability requirements. The preparation of the planks and their installation was very labour intensive. This was a complicated job for the contractor. In the end, however, both the contractor and the contracting authority were very satisfied with the result and the lessons learned.





# 13. OPTING FOR A PROCUREMENT PROCEDURE THAT ALLOWS FOR NEGOTIATION

---

## A - Why negotiate?

Tenderers are not always familiar with reuse practices, which are still considered as innovative today. This might lead them to misjudge the cost of certain operations, or to overestimate the risks. Negotiated procedures<sup>17</sup> are not a prerequisite for reuse, but they do present the advantage of allowing dialogue before the award of the contract. This can be useful when negotiating with the contractor on a specific point or adjusting price estimations.

## B - When to negotiate?

Negotiation is generally allowed in call for service tenders. It is less so for supply or work calls. However, it can be useful when prices have to be quoted for reclaimed materials or to anticipate methodological difficulties.

In the case of supply procurements, the value of small and medium-sized batches of reclaimed will generally remain below the thresholds above which very restrictive advertising and consultation measures must be implemented. These procedures thus make it possible to seize certain opportunities (see optional method for supply contracts).

It is worth remembering that the use of a negotiated procedure does not oblige the contracting authority to negotiate. It is simply an available opportunity.

---

17 - This generic term covers different procedures:

Throughout the EU: the competitive procedure with negotiation.

Only in Belgium: the negotiated procedure without prior publication and the direct negotiated procedure with prior publication.

Only in France: the procedure without prior publication nor competition and adapted procedure contracts.

In the United Kingdom: the competitive procedure with negotiation.

### C - How to enable negotiation?

Negotiation is generally allowed in contracts up to a certain threshold (see table below). Above these thresholds, negotiation is possible in certain cases provided for in the 2014 EU Directive on public procurements. Reuse may justify the use of one of those exceptions.

|   | UK | FR   | BE   |
|---|----|--|--|
| Below the European thresholds <sup>18</sup> | /  | <p>Procedure without prior publication nor competition for contracts with a value of less than €40,000<sup>19</sup> (also exempt from setting up a competitive tendering system).</p> <p>Adapted procedure for contracts below the European thresholds<sup>20</sup>.</p> | <p>Procedure with accepted invoice for contracts with a value of less than €30,000<sup>21</sup>.</p> <p>Negotiated procedure without prior publication for contracts of a value lower than<sup>22</sup>:</p> <ul style="list-style-type: none"> <li>- the European thresholds for supplies and services.</li> <li>- the amount set by Royal Decree for the works.</li> </ul> <p>Direct negotiated procedure with prior publication for contracts below the European thresholds<sup>23</sup>.</p> |

18 - EU thresholds are updated every two years (next update planned for January 2022). There is a threshold for service and supply contracts and a threshold for works contracts. The threshold for service and supply contracts may also be different depending on the type of legal entity (e.g. contracting authority or contracting entity). Below these thresholds, national public procurement legislation applies. Above these thresholds, national legislation transposing the 2014 Public Procurement Directive applies. To check which framework you fall under, consult a legal adviser in your organisation.

19 - Art. R. 2122-8 of the Public Procurement Code (France). Please note that this amount is subject to revision.

20 - Art. R. 2123-1 of the Public Procurement Code (France).

21 - Article 92 of the Law of 17 June 2016 on public procurement and Article 124 of the Royal Decree of 18 April 2017 on public procurement in the classical sectors.

22 - Article 42 of the Law of 17 June 2016 on public procurement and Article 90 of the Royal Decree of 18 April 2017 on public procurement in the classical sectors.

23 - Article 38 of the Law of 17 June 2016 on public procurement and Article 91 of the Royal Decree of 18 April 2017 on public procurement in the classical sectors.

|  | UK   | FR | BE |
|--|--|----|----|
| Regardless of the thresholds, according to specific criteria | <p>The competitive procedure with negotiation can be used when the project meets one of the conditions set out in the law. A project with a reuse objective can generally meet at least one of these conditions<sup>24</sup>:</p> <ul style="list-style-type: none"> <li>- When the subject-matter of the contract includes design services or an innovative solution<sup>25</sup>. As reuse is considered an innovative practice, design service contracts and Design &amp; Build contracts allow for negotiation on two counts.</li> <li>- When the contracting authority is unable to define the technical specifications with sufficient precision by reference to a standard, a European Technical Assessment, a common technical specification or a technical reference system<sup>26</sup>. This condition may be invoked to justify the use of negotiation in a works or supply contract with a reuse objective.</li> <li>- In the so-called 'utility' sectors<sup>27</sup> (water, energy, transport and postal services), it is possible to take advantage of purchasing opportunities that are available within a very short period of time and at a price considerably lower than normal market prices<sup>28</sup>, without the need for prior publication<sup>29</sup>. Reclaimed materials can therefore only meet these criteria when their price is considerably lower than equivalent new materials. However, this exception for 'opportunity purchases' does not apply to the traditional sectors.</li> </ul> |    |    |

24 - These conditions are provided for in the 2014 Public Procurement Directive, and have been transposed into the respective laws, decrees or royal decrees of the Member States:

- Art 38 of the Law of 17 June 2016 on public procurement (Belgium).
- Art R. 2124-3 of the Public Procurement Code (France).
- Art. 26 (4) of The Public Contracts Regulation (UK).

25 - Article 26(4)(a)(ii) of Directive 2014/24/EU.

26 - Article 26(4)(a)(iv) of Directive 2014/24/EU.

27 - Also referred to as 'special sectors' in Belgian law and 'network operators' in French law, as well as by the term 'entité adjudicatrice' in both states. Public procurement in these sectors is covered by Directive 2014/25/EU (the 'sister' to the Public Procurement Directive 2014/24/EU for the classical sectors). The possibility of opportunity buying is provided for in:

- Art. R. 2122-11, 2° of the Public Procurement Code (France).
- Art. 124, §1, 10° of the law of 17 June 2016 on public procurement (Belgium).

28 - Article 50(h) of Directive 2014/25/EU, transposed in Article R. 2122-11 of the Public Procurement Code (France) and in Article 124, §10° of the Law of 17 June 2016 on public procurement (Belgium).

29 - That is, by a negotiated procedure without prior publication in Belgium and a procedure without prior publication nor competition in France.

## EXAMPLE OF A JUSTIFICATION FOR USING A NEGOTIATED PROCEDURE IN A WORKS CONTRACT

'This contract presents an innovative feature due to the ambitions of the contracting authority in terms of reusing materials and technical equipment. It is a pilot project integrating large-scale reuse requirements, which implies unusual constraints for the contractor:

- The obligation to install certain reuse supplies that will either (i) be acquired by the contracting authority, and have characteristics that are not yet precisely known at the contracting stage; or (ii) come from the renovated buildings, will be dismantled and reused on site;
- The obligation for the contractor to acquire and install certain reclaimed supplies.

As a result of these constraints, the contracting authority expects that tenderers will face difficulties in estimating their quotes for acquiring and/or installing certain reclaimed elements. Negotiations may be necessary to correct any over- or underestimates by tenderers.'

# 14. DEFINING SELECTION CRITERIA

---

## A - In a service contract

The first phase of the procurement process is to select candidates capable of carrying out the task, even before asking them to submit an offer.

This is assessed on the basis of selection criteria announced in advance in the contract notice and is an important step. It is common to ask candidates to prove one or more similar experiences<sup>30</sup>. As reuse is still a relatively new subject for the construction sector, many do not (yet) have this prior experience, despite their competence and motivation to explore this subject. Making it a criterion can therefore hinder the development of reuse practices.

However, as reuse is still a relatively new topic for the construction sector, many actors do not (yet) have this prior experience, despite their competence and motivation to explore this topic. Requiring prior experience could therefore hinder the development of reuse practices.

Fortunately, there are other criteria to ensure that candidates are capable of meeting reuse challenges:

- Past experience, not restricted to reuse, which shows an ability to be creative and adapt to circumstances
- Sensitivity to environmental issues
- General architectural quality of previous work
- Participation in specific training, workshops or research projects on this subject
- A balanced team composition with a diversity of skills

---

30 - Article 58(4) of Directive 2014/24/EU according to which the contracting authority may require that candidates have a sufficient level of experience, demonstrated by adequate references from contracts previously performed.

- ...

These alternative criteria are equally demanding but incorporate the fact that the competence to design with reuse will have been built up through other experiences.

### **B - In a works contract**

In addition to the usual selection criteria required of contractors (turnover, etc.), the contracting authority may also require that a certain level of experience be demonstrated.

However, as with service contracts, care should be taken not to restrict participation in the tender to contractors with previous experience in reuse, as this may unduly restrict access to the tender. Contractors with no previous experience in reuse may be able to meet the reuse objectives, provided they have the necessary information.

### **C - In Design & Build contracts**

As with the selection of the design team alone, it is preferable not to restrict the selection to the experience of the applicants in reuse. The same criteria proposed above can be used in this case.

However, this type of contract, which will result in the selection of both design and implementation teams, may justify an increased attention to their interest in this particular issue.

It is possible to ask for a motivation statement in which the team explains its understanding of the reuse practice and the issues it typically involves. It may also be interesting to ask them to explain how the partners will organise the joint implementation of reuse strategies.

Another alternative is to request that the team designate a 'reuse referent' to ensure that the objective is monitored throughout the project.

# 15. ASSESSING OFFERS INCLUDING REUSE: DOCUMENTS TO BE REQUESTED AND AWARD CRITERIA

---

## A - Why an award criterion?

The paths in Section 2 show the balance to look for between technical specifications and award criteria. The more precise the reuse requirements are, the more they can be incorporated as technical clauses and thereby become a contractual obligation.



Thus, for operations of no particular complexity (small scale, very common reused materials, etc.), a lighter alternative to the award criterion may be to attach a framework note on the reuse objective. This will be signed by the tenderer and will form an integral part of his offer.

Similarly, if the prior market consultation did not raise any particular obstacles, the contracting authority may dispense with an award criterion specific to reuse. It is understood that if the technical specifications relating to reuse are not met, the tender will not be compliant anyway.



However, the innovative nature of reuse makes it difficult to rely entirely on the specifications to obtain an adequate offer. This practice inherently requires a certain flexibility, which is difficult to frame solely by technical specifications. It may also suffer from a lack of knowledge on the subject from the tenderers.

It is therefore still recommended that an award criterion be included in all types of contracts, in order to:

- Highlight the expectations and encourage tenderers to look carefully at the detailed requirements.
- Provide the opportunity to assess reuse as an overall quality ap-

proach, not just on a material-by-material basis.

- Possibly challenge the minimum requirements by encouraging tenderers to go further (either in the quantity of reuse targeted or in the quality of the approach proposed).
- Ultimately, find the 'best value for money' offer with regard to the purpose of the contract, to which the reuse objective is attached.

In order for the tenderer to make the reuse objective benefit from his expertise, he must be able to understand what is expected of him. The reuse strategy developed by the client will therefore be a key factor. In addition to a clear objective, this should be accompanied, if relevant, by a context analysis (inventory, sourcing, territorial diagnosis, etc.), a coherent description of the requirements throughout the specifications, etc. When the project concerns an existing building, a visit to the site to present the materials that are candidates for reuse can help the tenderers to prepare their offer.

In short, the definition of the award criterion should be adapted on a case-by-case basis. It can be done in many ways depending on the project. In all cases, the criterion should be consistent with the way the objective is formulated, and proportionate to its relative importance in the contract. The following are some suggestions for establishing appropriate award criteria.

## **B - Qualitative objective**

In the context of a design service contract, the evaluation of the reuse criterion (or sub-criterion) may be based on a methodological note added to the more traditional documents in the tender file (plans, illustrations, etc.).

This note should make it possible to assess the candidates' understanding of the objectives stipulated by the contracting authority. It must also explain the approach proposed by the team. In this respect, the tenderer may be asked to explain, for example:

- Its understanding of reuse practices. There is no need to revisit the theoretical fundamentals of the circular economy here. The key is to ensure that reuse is treated as a distinct topic - for example, separate from the principles of recycling and waste management.
- Its understanding of the different issues that need to be anticipated

to achieve the objective. A well-constructed note will warn of possible difficulties, and propose solutions to address them, for instance.

- The proposed protocol for finding and acquiring batches of reclaimed materials, storing them (if necessary), and then implementing them. A serious note will consider, for example, the possible sources, the storage and conditioning method, the potential alternatives if the constitution of a batch proves difficult, references to materials commonly available on the market...

- Etc.

In the context of a works contract, the necessity of establishing a criterion (or sub-criterion) specific to re-use is assessed on a case-by-case basis.

- If the design phase has given due consideration to the issue at an early stage, it is possible that reuse ambitions can be translated into technical specifications (this is the hypothesis of route A described in section 2).

- In some cases, reuse may have an impact on the logistical and temporal organisation of the site. The way in which bidders address this can, where appropriate, be assessed through an award criterion dedicated to these aspects.

- In the context of a Design & Build contract, the use of an award criterion will often be appropriate for the reasons given in point A above.



## AWARD CRITERIA OF A PROCUREMENT FOR THE DESIGN OF SOCIAL HOUSING (2021)

'[The team must present in a note its methodology to respond] to the particularities of the project, and particularly the strategy developed to favour the reuse of construction materials (maintenance, in situ reuse, ex situ) and the optimisation of the project in terms of circular economy, sustainability, energy performance and budget. [...]

[The note should also indicate] the aspects of the assignment that motivate or inspire the candidate in this project and the reasons why he believes he is able to develop with the contracting authority an adequate solution to the challenges posed.'

The sustainability criterion is weighted at 25%, with a sub-criterion

dedicated to 'Exemplary Materials Management'.

### **AWARD CRITERIA OF A CONTRACT FOR URBAN DEVELOPMENT WORKS (2021)**

Price = 40%.

Technical value = 60%, of which 10% for the reuse approach

Provisions implemented and methodology of the company in favour of the environment (extracts):

'- Description of the methodology for the use of the place made available for the storage, packaging and recovery of materials. (5 points)

- Description of the methodology for the supply of reused materials. The note must meet the objectives detailed in the CCAP (1.8 sustainable development objectives - 11.10.5) and identify stable and reliable sources of supply (both in terms of the quality of the material and the guarantee of its re-use origin). (5 points)'

### **AWARD CRITERIA OF A WORKS PROCUREMENT FOR A MAJOR BUILDING RENOVATION**

'Price = 80%

Site planning and methodology = 20%

The contracting authority will assess the relevance and credibility of the planning and methodology proposed by the tenderer in order to:

- Respect the execution deadlines
- Manage the storage of supplies, especially reuse supplies dismantled during the demolition works and which will have to be reused on the site
- Guarantee the occupation continuity of the building by the contracting authority.

The tenderer shall attach to its tender: a note of maximum 5 pages (recto, Arial, size 10) detailing its methodology; a detailed provisional schedule for the entire contract.'

### **AN ALTERNATIVE: WRITE THE EXPECTED**

## METHODOLOGICAL NOTE DIRECTLY

Sometimes, the contract's size or purpose makes a specific reuse criterion unnecessary. In such cases, asking bidders for a methodological note and in-depth work on this subject may seem a little disproportionate! The contracting authority La Fabrique des Quartiers opted for a more suitable alternative.

'Our operations are small scale but very similar and we often work with small operators, who cannot invest considerable time in writing their bids. These generally consist of a generic technical brief outlining the company's expertise and a specific detailed quotation. In order to implement new reuse objectives in the contract, we therefore considered it more relevant to describe in a short note (one page) our expectations regarding reuse: careful removal of certain elements, storage and packaging for reuse, acquisition of reuse materials from suppliers, etc. These requirements were also included in the specifications, but making them a separate annex helps to highlight this issue and show the importance we attach to it. By signing it and submitting it as part of its tender, the company attests to having acknowledged it and commits to it. This seemed to us like a fair compromise, because that would give us a basis to rely on during the dialogue with the selected service providers.'

### C - Quantitative objective

When the reuse objective is expressed in quantitative terms, its evaluation requires the ability to clearly identify the concerned lots and the quantities which the tenderers are committing to.

This information can be included in the detailed project quantity survey, or in a separate table. The table should be sufficiently organised, in order to avoid tenderers using too different approaches when filling it in, as this could jeopardise the comparison of tenders (e.g. if the units are not common or if the calculation methods are too different).

In addition to the tender, this table could also be used to monitor the development of the reuse objective. The selected service provider could be asked to update this table at the various key stages of the project (preliminary design, final design, application for a permit, execution file, etc.). This ensures that, despite any strategy changes, the overall objective is still achieved.

see section 2.2  
●  
example of  
the See U  
project \_\_\_\_\_

see factsheet 5  
●  
setting a  
performance  
target \_\_\_\_\_

see factsheet 16  
●  
execution  
clauses \_\_\_\_\_

It may be appropriate to ask for the table to come with a methodological note in which the tenderers detail their choices and method. For the project owner, this note can help to understand and evaluate in more detail what is being proposed by the tenderers and its feasibility.

### **EXAMPLE OF THE DOCUMENTS EXPECTED FROM THE COMPANY IN A DESIGN & BUILD CONTRACT**

In the context of assistance to the contracting authority, the Bellastock consultancy has drawn up a list of documents to be attached to the tender for a Design & Build contract.

The reuse objectives are set out in a table attached to the consultation file. The objectives are contractual and form an annex to the Commitment Deed.

The reuse methodology, i.e. the description of the means dedicated to achieving these objectives, is to be recorded in a table also attached to the consultation file. The reuse methodology is also contractual and annexed to the Commitment Deed. It then becomes the responsibility of the contractor to supply the products and therefore to dedicate all the necessary means to achieve the quality requirements.

In this sense, the methodology includes a part concerning the demonstration of the fitness for use of the reused construction products. This implies that the company takes the following measures:

- An engineering commitment to establish a reliable protocol
- An operational commitment to supply and install the reused products
- A commitment to technical expertise to ensure the demonstration of the technical performance of the products, if necessary (common sense is to be preferred).

Complementary measures are added to this:

- A principle of consultation on the reuse materials choices, involving good communication between all the stakeholders

(the companies, the insurers of the various parties involved, the inspection office(s), the administrative and legal departments of the stakeholders, the possible reuse consultant...).

- The establishment of a Quality Assurance Plan - prepared by the company in charge of installing the materials, during the site preparation phase. This plan summarises the respective commitments of the company supplying the reused materials and the company installing them. It also sets up the procedures and means implemented to achieve the quality requirements. At the very least, this plan establishes the execution and control procedures, as well as the documents necessary for monitoring the execution.

## D - The selection committee

Apart from the regulated procedure of the architectural competition, a client may set up a selection committee to evaluate the tenders. We have seen why experience in reuse should not be required (or at least not be a determining factor) from the candidates, as this would prevent motivated teams from specialising. By contrast, the presence of an experienced professional within the selection committee is highly relevant, if not essential.

Contracting authorities may fear being seduced by an attractive project that turns out to be impracticable. Inviting a reuse expert to take part in the committee can help to identify and avoid unrealistic offers, as well as to assess the methodological notes. An alternative to the selection committee would be to ask for an ad hoc expert advice when drawing up the specifications or when assessing the tenders.

As the example below shows, in many cases the reuse strategies proposed by the applicants can be assessed by knowledgeable construction professionals.

see factsheet 14  
 ●  
 selection  
 criteria —

## A LEARNING PROCESS

'A contracting authority asked us to assist with all the reuse aspects of a project. They wanted to encourage reuse and were looking for design teams that could meet this challenge. When it came to selecting the teams, they were concerned that they would not be able to sift through the offers. We then proceeded in two stages. Firstly, each party carried out its own assessment and gave a score. We then shared and compared our results. It turned out that the results were

almost identical: the client was perfectly capable of making a sound assessment. In fact, when it comes to reuse, you have to trust your common sense!

## **THE EXAMPLE OF ZINNEKE: AWARDING AN ARCHITECTURAL CONTRACT THROUGH A WORKSHOP FORMAT**

*Contracting authority: Zinneke asbl (ERDF public funding)*

*Design: Ovest Architecture*

*Reuse assistance: Rotor*

*Brussels (Belgium), 2019-2021*

As part of this pilot project to renovate its premises, the Brussels social and artistic organisation Zinneke organised the procedure for appointing architects in a way to assess, among other things, their motivation to push for the reuse of materials.

Zinneke opted for a procedure allowing negotiation. The selection took place in two phases. In the first phase, the candidates were assessed on the basis of:

- A presentation of the team's interest in and ability to work with reclaimed building materials.
- A letter of motivation including a reference project. This project did not have to be designed by the candidates themselves. It only had to be relevant to the present project.
- 2 references of projects carried out by the candidates.

On this basis, the client selected four candidates who were invited to participate in the second phase.



The second phase consisted of a 90-minute workshop in which the tenderers were invited to develop a project methodology covering different aspects such as the implementation of multidisciplinary co-design logics, working with the existing and the integration of reclaimed elements. The bidders had the opportunity to visit the building before the workshop, which allowed them to develop a first vision on how to adapt the programme to the existing spaces. They were also asked to present some architectural proposals for specific parts of the project.

These proposals were assessed by a committee of experts. This selection procedure, somewhat different from a more traditional competition, proved to be a good way of assessing the motivation of the candidates to meet the specific challenges of the project (e.g. reuse). Despite this unusual format, the contracting authority complied with all the requirements for public procedures (including the justification for the award).



# 16. INCORPORATE SPECIFIC PERFORMANCE CLAUSES FOR REUSE

---

## A - On the monitoring of the objective

During the design phase, a note on reuse (which may be based on the methodological note initially submitted) should be updated throughout the planning phases. It enables monitoring the progress of the objective until the work is undertaken.

Regarding the works phase, the terms of reference must specify the means by which the objective will be monitored, and according to which indicators. This may include regular monitoring at meetings, and the appointment of a reuse referent within the site team who will be responsible for this monitoring.



## EXAMPLE OF A EXECUTION CLAUSE IN A DESIGN AND BUILD CONTRACT

'In order to validate the material batches proposed for the achievement of the different objectives, several pieces of information must be provided:

- For the objective of preserving the existing building: the monitoring table must be filled in and the data validated with the architectural project documents (plans, sections...)
- For the objective of materials reclamation (flow out): an identity sheet per batch of materials must be filled in to indicate the destination of the batch. The same applies to on site reuse. The quantity mentioned on the sheet is the quantity after dismantling the batch.

For example: if 100 m<sup>2</sup> of tiles are dismantled and, in the end, 60 m<sup>2</sup> are effectively reclaimed (on or off site), only these 60 m<sup>2</sup> are

accounted for in this objective. It will therefore be indicated as 60 m<sup>2</sup> on the identity sheet.

If, for example, the remaining 40 m<sup>2</sup> of broken tiles are also effectively reused for a flooring laid in opus incertum, these 40 m<sup>2</sup> will also be included in the reuse objective (flow in)

- For the objective of materials reuse (flow in): evidence of purchase must be provided such as transfer vouchers, photos attesting to on site reuse (accompanied by the identity sheet) or any other document that can attest to the origin of the batch of materials.

- (...)"

## B - On traceability of materials

The truly reclaimed origin of the materials should be checked to ensure that they are indeed reclaimed from demolition work (as opposed to new materials artificially aged to look like reclaimed materials). More generally, it is important to keep an eye on the issue of traceability and to prevent the purchase of items from dubious sources (such as stolen materials) or from demolitions that may have had negative impacts on a local community and their heritage.

In order to enforce this requirement, the contracting authority may ask the contractor to provide documents attesting to the origin of the materials. The documents requested must correspond to the means and reality of the reclamation sector. To date, there is no chain of custody or any other formal system to guarantee the origin of reclaimed products. Nevertheless, most reclaimers can provide relatively accurate information on the origin of their products. At a minimum, they can be asked to provide a statement on oath that their products come from reliable sources and have been undergoing a genuine reclamation process.

- Invoices (if purchased via a dealer)
- Photos of the material in its original location (if reused on site or from site to site)
- Information on any reconditioning operations
- Information on any fitness-for-purpose tests conducted on the material.

The ongoing development of sectoral labels such as the 'Truly reclaimed'<sup>31</sup> label may help entrepreneurs to demonstrate that an item is indeed from the reclamation sector<sup>32</sup>.

---

31 - This label is developed as part of the FCRBE project, so that professional material dealers can guarantee that their materials have actually undergone a reclamation process.

32 - However, the use of labels in the context of public procurement is regulated. Labels must meet certain requirements (objectively verifiable, non-discriminatory, etc.).



# 17. ADAPTING THE CONTRACT DOCUMENTS TO REUSE OBJECTIVES: CHECKLIST ---

Generally speaking, to integrate reuse ambitions harmoniously into a service or works contract, it is recommended that the contracting authority involves its legal department, or any other body with expertise in this area.

First of all, it is important to ensure that all of the various parts of the contract are consistent. Reuse should not be treated as an afterthought. It is an integral part of the specifications and should be consistently applied wherever necessary.

Most contract documents in a public works contract may need to be adapted to reflect aspects specific to reuse. The nature and degree of these changes will of course depend on the strategy adopted and the context of the project.

The following checklist lists all the possible types of documents and clauses that may be affected by these adaptations, which are explained in the previous factsheets.

| Procurement documents            | Clauses likely to be influenced by the reuse objective   |
|----------------------------------|--|
| <p><b>Commitment deed</b></p>    | <p>- Indicates, if relevant, a list of documents to be submitted by the tenderer regarding the reuse requirements (methodological note, table for monitoring the objectives, etc.).</p> <p>Factsheet 15: Assessing offers including reuse: documents to be requested and award criteria</p>  |
| <p><b>Consultation rules</b></p> | <p>- Allowing for negotiation secures a moment to discuss unsatisfactory points about the inclusion of an innovative objective such as reuse in the offer.</p> <p>Factsheet 13: Opting for a procurement procedure that allows for negotiation</p> <p>- An award criterion (or sub-criterion) may be reserved regarding reuse.</p> <p>Factsheet 15: Assessing offers including reuse: documents to be requested and award criteria</p> <p>- Technical variants and options allow flexibility for substitution opportunities between new and reused materials.</p> <p>Factsheet 10: Asking for a reuse alternative in the offer: variants and options</p> |

| Procurement documents                       | Clauses likely to be influenced by the reuse objective  |
|---|---|
| <p><b>Administrative specifications</b></p> | <ul style="list-style-type: none"> <li>- The reuse objective can be included in 'General', 'Environmental objectives', a separate clause, etc. This objective will be the basis for a possible specific award criterion dedicated to reuse.</li> </ul> <p>1.3 - Incorporating the objective into the contract documents</p> <ul style="list-style-type: none"> <li>- An insurance clause on reuse can be added to the usual articles in this section (see example clause in Factsheet 11).</li> </ul> <p>Factsheet 11: Insuring reused materials</p> <ul style="list-style-type: none"> <li>- Specific performance clauses for achieving and monitoring the re-use objective will often be relevant.</li> </ul> <p>Factsheet 16: Incorporate specific performance clauses for reuse</p> <ul style="list-style-type: none"> <li>- A substitution clause can allow substitution between new and reused materials as long as it remains a non-substantial change for the contract.</li> </ul> <p>Factsheet 10: Asking for a reuse alternative in the offer: variants and options</p> |

| Procurement documents                  | Clauses likely to be influenced by the reuse objective   |
|--|--|
| <p><b>Technical specifications</b></p> | <ul style="list-style-type: none"> <li>- The clause governing the origin of the materials must specify the specific conditions for reclaimed materials (see box below).</li> <li>- A general clause on reuse can be added (see example in the box below), which recalls the objective if the latter is measurable (materials precisely identified in the technical specifications, quantitative monitoring, etc.).<br/>This clause will also detail the requirements in the implementation methodology (e.g. storage and transport conditions, possible provision of a site...).</li> </ul> <p>Factsheet 5: Setting a performance target in reuse objectives.</p> <ul style="list-style-type: none"> <li>- Flexibility for alternative solutions can be provided, including technical options, a substitution clause, or reference to the substitution clause.</li> </ul> <p>Factsheet 10: Asking for a reuse alternative in the offer: variants and options.</p> <ul style="list-style-type: none"> <li>- Technical specifications for reuse materials may need to be adapted. This also requires vigilance on the coherence of the whole: some requirements in terms of standards, certifications, CE marking, etc. are not always adapted to reuse materials and should explicitly be reserved for new materials.</li> </ul> <p>Factsheet 12: Drafting technical specifications for reusing materials</p> |

| Procurement documents                            | Clauses likely to be influenced by the reuse objective   |
|--|--|
| <p><b>Decomposition of the overall price</b></p> | <p>- The price offer to be submitted by the contractor can be structured in different ways to facilitate the integration of reuse and the comparison of offers.</p> <p>Factsheet 9: Assessing the economics of reuse in the project</p>  |
| <p><b>Possible appendices</b></p>                | <p>- Context analysis (pre-demolition inventory, market survey of reuse material suppliers, information on a batch already in stock, etc).</p> <p>Factsheet 3: Exploring the different sources of reclaimed materials.</p> <p>Factsheet 8: Conducting a preliminary market analysis</p> <p>- Background note on reuse (see box below).</p> |

## WHAT ABOUT PLANNING PERMISSION?

As we have seen, reclaimed materials may have variable characteristics. If some of these need to be assessed by the competent authority (e.g. dimensions, colours, etc.) it can lead to complications at the planning application stage and it is at this stage the main design choices are usually made. However, it is rare that the reclaimed materials are already precisely identified and procured (with the exception of batches reused on site), allowing their complete description in the specifications.

If the characteristics have to be precisely established in the permit application file (for example, establishing the exact dimensions of a window), they become a de facto determinant in the choice of materials. This might limit the opportunities available on the reuse market at the convenient time. It is therefore useful to have a fallback plan (e.g. to new materials).

An alternative approach is to describe the works to be carried out by demonstrating that they meet the various urban planning requirements, while indicating any possible margins of variation. For example, establishing that a window will have dimensions between a given minimum and maximum. This is, however, a rather innovative practice which, for the time being, is left to the discretion of the competent authorities.

## EXAMPLE OF A GENERAL CLAUSE ON THE ORIGIN OF MATERIALS

### 1. Specificities for the origin of materials

'[...]

- The origin of materials resulting from a reuse approach must be proven by identifying their origin (invoice from a supplier specialising in the recovery and resale of materials, storage sheet from the contracting authority's reuse shop, proof of direct origin from another site, etc.).

[...]'

### 2. Reuse materials acquired off-site

'The Contract holder will be required to use all necessary means to meet the demand for the integration of reused materials, in particular:

- By maintaining a regular dialogue with identified suppliers to keep abreast of their stocks.
- By anticipating a longer supply time than for new materials (contacting suppliers, sending a sample, etc.).
- By showing initiative when an interesting opportunity arises. It is brought to the attention of the contractor that a temporary storage space can be made available for this purpose.
- Furthermore, the contractor may also offer lots from other sources (e.g. another construction site), without this justifying an upward revaluation of the price submitted in the tender. If the stock situation of the identified suppliers or other difficulties prevent the contractor from fulfilling the order, the contractor must immediately inform the client and the project owner in writing, providing the necessary justification. The project owner reserves the right to request additional evidence. Verification by the contracting authority and the project owner that it is indeed impossible for the contractor to supply the materials prescribed for reuse may justify their replacement by new materials equivalent to the conditions defined in the tender.'

## TOOL: A FRAMEWORK NOTE ON REUSE

The contracting authority can attach a framework note on reuse to its contract documents. This will be useful for summarising the main ambitions and principles, especially in cases where the project does not justify a specific award criterion for reuse. This note, which the company will have to sign and integrate into its offer, will attest to its awareness of the expectations in this area. It can be constructed in the following way:

1. Definition of reuse. A short introductory paragraph aimed at establishing what is meant by the term reuse. This is particularly aimed at defusing possible confusion with recycling.

2. Justification of reuse. Presentation in a few paragraphs of the main arguments in favour of reuse: reducing waste production, reducing pressure on natural resources, reducing greenhouse gas emissions, favouring positive socio-economic spin-offs, preserving cultural heritage... It is useful to support these different facets by referring to regulatory frameworks, public policies and internal guidance notes.

3. Overview of the main approaches targeted by the project. Depending on the case: on-site reuse, use of professional channels, materials acquired by the project owner, other sources... For each, summarise the major challenges expected.

4. List of eventual pre-studies relating to the issue of re-use (inventory, sourcing, etc.).

5. Useful references enabling tenderers to go into more detail on certain aspects (directories of suppliers, practical guides, technical documentation, etc.).

# 18. MAKING A REUSE REPORT: POSSIBLE INDICATORS \_\_\_\_\_

At the end of the project (and even during), it is worth asking the service providers to carry out a review of the reuse operations, in particular to draw lessons from the operations and adjust the focus on future projects.

The review can include a quantified assessment of the impact of achieving the reuse objective in the project. The following table presents a non-exhaustive list of possible indicators for carrying out this assessment. It is of course possible to limit the assessment to only some of these indicators.

A point of attention: some tools are used at the design stage to monitor the environmental impact of the project. In this case, the final assessment should be included in the service contract from the outset. Indeed, extracting the data below may require full modelling of the project (including a comparison with its non-reuse equivalent).



| <b>Material flow indicators</b>  | <b>unit</b>          |
|--|----------------------|
| Inflow of reclaimed materials<br>(To be compared with the quantities of recycled and new materials entering the project)                       | t, m <sup>3</sup> .. |
| Outflow of reclaimed materials<br>(To be compared with the quantities of material retained in place and the materials extracted for recycling) | t, m <sup>3</sup> .. |
| <b>Environmental indicators</b>  |                      |
| GHG emissions avoided by reuse   | kgCO <sub>2</sub> e  |
| Waste prevented through reuse  | t                    |
| Abiotic resource depletion avoided through reuse   | gSbe                 |
| Primary non-renewable energy consumption prevented   | kWh                  |
| Avoided freshwater consumption   | l                    |
| <b>Economic indicators</b>   |                      |
| Deconstruction costs (if existing buildings):<br>- costs of careful dismantling<br>- avoided costs for waste disposal                          | €                    |
| Construction costs:<br>- material preparation costs<br>- avoided costs for purchasing new materials.<br>- costs of installing materials        | €                    |

| <b>Economic indicators</b>   | <b>unit</b>                                   |
|--|---|
| <b>Logistical costs:</b><br>- storage/immobilization<br>- transport  | €   |
| <b>Cost of intellectual services and external expertise:</b><br>- Support for reuse<br>- Characterisation of the materials (example: laboratory tests) | €, person.day                                 |
| <b>Social indicators</b>   |   |
| Local employment: additional labour generated by reuse operations  | Hours, amount of companies                    |
| Vocational integration   | Hours   |
| Training   | Amount of trained people, amount of companies |
| Events around reuse  | Amount  |

## 1. ON REUSE OPPORTUNITIES AND BARRIERS TO REUSE

B. ADDIS, *Building with Reclaimed Components and Materials. A Design Handbook for Reuse and Recycling*. London, Sterling, VA: Earthscan. United-Kingdom. 2006.

*Be Circular be.Brussels* <<http://www.circulareconomy.brussels>> [accessed 18 December 2019].

Bellastock (J. BENOIT, G. SAUREL, S. HALLAIS), *REPAR. Réemploi comme passerelle entre architecture et industrie. 2012-2014*. Report nr 12 06 C0069. ADEME. France. 2014.

Bellastock (J. BENOIT, G. SAUREL, M. BILLET), CSTB (S. LAURENCEAU, F. BOUGRAIN), *REPAR #2. Le réemploi passerelle entre architecture et industrie*. Report nr 1406C0043. ADEME. France. 2018.

Cabinet Nomadéis, *Batiflux 3 : Transformons nos bâtiments en réserves de matériaux - Pratiques, perceptions et attentes des architectes et des maîtres d'ouvrage en matière d'économie circulaire dans le bâtiment en région Provence-Alpes-Côte d'Azur*. France. June 2019.

CSTC (A. ROMNÉE, J. VRIJDERS), *Vers une économie circulaire dans la construction. Introduction aux principes de l'économie circulaire dans le secteur de la construction*. CSTC: Monography nr 28. Belgium. 2018.

A. DHEE, *Les Saprophytes. Urbanisme Vivant*. Lille: La Contre-Allée. France. 2017.

Reuse working group ('Alliance Emploi Environnement'), *Stratégie réemploi des matériaux de construction. Encourager le réemploi des matériaux de construction en Région de Brussels Capitale*. Brussels, Belgium. 2015.

P. HRADIL, *Barriers and opportunities of structural elements re-use*, Research report, Technical Research Center of Finland (VTT). Finland. 2014.

T. KAY and J. ESSEX, *Pushing reuse. Towards a low-carbon industry*, BioRegional. United-Kingdom. 2009.

E. LEONARD, *Bouwteam et Conception Presentation in the framework of Séminaires Bâtiments Durables*, Brussels Environnement. Brussels, Belgium. 2013.

Nobatek - Bazed Project, *Réaliser un projet réutilisant des matériaux issus de la déconstruction ?* Nobatek. France. 2015.

Orée, *Comment mieux déconstruire et valoriser les déchets du BTP ?* France. November 2018.

RDC Environment, éco BTP, I Care & Consult, *Identification des freins et des leviers au réemploi de produits de construction.* Report for ADEME. France. 2016.

*EU-Progress (Provisions for Greater Steel Reuse) 2017-2020 research project report, Factsheet No.2: SEGRO Warehouse, Slough, UK.* United-Kingdom. 2020.

Government Chief Scientific Adviser report, *From Waste to Resource Productivity.* London, United-Kingdom. 2016.

Rotor (S. SEYS, L. BILLIET), *Vade-mecum pour le réemploi hors-site. Comment extraire les matériaux réutilisables de bâtiments publics.* Belgium. 2015.

Rotor (M. GHYOOT), *Objectif réemploi. Pistes d'actions pour développer le secteur du réemploi en Région de Brussels-Capitale.* As part of the ERDF-research project 'Le Bâti bruxellois, source de nouveaux matériaux' (BBSM). Brussels, Belgium. 2017.

Rotor (M. GHYOOT, L. DEVLIEGER, L. BILLIET, A. WARNIER), *Déconstruction et réemploi. Comment faire circuler les éléments de construction.* Lausanne: Presses Polytechniques et Universitaires Romandes (PPUR). Belgium. 2018.

A. ROMNÉE, L. PÉREZ DUÑAS, C. BOYER, P. VAN GINDERDEUREN, *Le secteur de la construction à Brussels. Constat et perspectives: vers une économie circulaire.* Brussels Environment. Brussels, Belgium. 2018.

P. SASSI, *Strategies for Sustainable Architecture.* Oxon: Taylor and Francis. United-Kingdom 2006.

SCI (Steel Construction Institute), *Structural Steel Reuse - Assessment, Testing and Design Principles.* United-Kingdom. November 2019.

UK Green Building Council (UKGBC), *Circular economy guidance for construction clients. How to practically apply circular economy at the project brief stage.* United-Kingdom. April 2019.

Waste & Resources Action Programme (WRAP), *Reclaimed building products guide. A guide to procuring reclaimed building products and materials for use in construction projects.* Banbury, Oxon: Waste & Resources Action Programme. United-Kingdom. 7 May 2008.

## 2. ON PUBLIC TENDERS

J. ANDERSON and N. HOWARD, *The Green Guide to Housing Specification. An Environmental Profiling System for Building Materials and Components Used in Housing*. Garton, Watford: BRE Press. United-Kingdom. 2000.

D. BATSELÉ and al. *Les marchés publics à l'aube du XXIe siècle*. Brussels: Bruylant. Belgium. 2000.

A-S. CONDETTE-MARCAN, *Bâtir une généralité. Le droit des travaux publics dans la généralité d'Amiens au XVIIIe siècle*. Vincennes: 'Institut de la gestion publique et du développement économique'. France. 2001.

Bazed, *Réaliser un projet réutilisant des matériaux issus de la déconstruction ?* Intermediate report. Nobatek. France. 2015.

V. BIAU, *La dévolution des marchés publics de maîtrise d'œuvre en Europe (Allemagne, Belgique, Danemark, Espagne, France, Italie, Pays-Bas, Portugal, Royaume-Uni)*. 'Mission Interministérielle pour la Qualité des Constructions Publiques', 'Centre de la Recherche sur l'Habitat'. LOUEST. UMR nr 7544 du CNRS. France. 2002.

Architecture office of Wallonia-Brussels Federation, *Guide pratique des marchés d'architecture*. Belgium. <http://marchesdarchitecture.be/> [consulted several times between september 2019 and june 2021].

Crown Commercial Service, *The Public Contracts Regulation 2015 - Guidance on Social and Environmental Aspects*. United-Kingdom. 2015

A. DEBOUTIÈRE, E. ARVANITOPOULOU, G. BRUNAUD, *Focus. Vers une commande publique circulaire*. Paris: 'Observatoire des Achats Responsables, Institut de l'Économie Circulaire'. France. 2017.

Direction of Legal Affairs, Ministry of Economy, *Allotissement*. Paris: Ministry of Economy. France. 2017.

Direction of Legal Affairs, Ministry of Economy, *Vade-mecum des marchés publics*. France. 2015.

European Commission, *Public Procurement for a Circular Economy - Good Practice and Guidance*. 2017.

European Commission, *Public Procurement Guidance for Practitioners*. February 2018.

European Union, *Directive 2014/24/UE du Parlement Européen et du Conseil du 26 février*

*2014 sur la passation des marchés publics*. 2014.

P. FLAMME, O. BASTIN, *Vade Mecum des projets publics d'architecture*. Brussels: Bouw Meester Brussels - Maître Architecte Brussels. Belgium. 2014.

Government of the Netherlands, *MVI Criteria - Sustainable Public Procurement Webtool*. Pays-Bas. <https://www.mvicriteria.nl/en> [consulted in May 2020].

Groupe Ensemble 77, *Construire un appel à la concurrence avec des objectifs environnementaux*. Dammarie Les Lys: Groupe Ensemble 77. France. June 2014.

Imperial College of London, *Project Process Map*. United-Kingdom. <https://www.imperial.ac.uk/media/imperial-college/administration-and-support-services/es-tates-projects/public/project-process-map/project-process-map.html> [consulted in December 2019].

P. LEXELLENT, *Commande publique responsable : un levier insuffisamment exploité*. France. March 2018.

J-L. MESTRE, *Introduction historique au droit administratif français*. Paris: PUF. France. 1985.

L. PFISTER, entry *Marchés publics* in D. ALLAND, S. RIALS (eds.), *Dictionnaire de la culture juridique*. Paris: PUF. p. 993. France. 2003.

'Mission Interministérielle pour la Qualité des Constructions Publiques' (MIQCP), *Quelles procédures adaptées pour la passation des marchés de maîtrise d'oeuvre par les pouvoirs adjudicateurs, maîtres d'ouvrage, au-dessous des seuils européens ?* in *Médiations*, 25. France. 2017.

MORGAN and STEVENSON, *Design and Detailing for Deconstruction*. SEDA Design Guides for Scotland n.1. SEDA. United-Kingdom. 2005.

National Occupational Standards (NOS), *Manage Procurement of Design Services*. United-Kingdom. 2014.

'Ordre des Architectes' (BE), *Design & Build et le PPP : Recommandations*. Belgium. 2013.

'Ordre des Architectes' (FR), *La procédure adaptée dans le cadre des marchés de Maîtrise d'oeuvre*. Belgium. 2005.

'Ordre des Architectes' (FR), 'Mission Interministérielle pour la qualité des Constructions Publiques', and 'CAUE Fédération Nationale', *Le Mini-Guide pour bien*

*choisir l'architecte et son équipe*. France. May 2018.

Organisation for Economic Cooperation and Development (OECD), *La passation des marchés publics dans les Etats membres de l'UE. Réglementation applicable aux marchés dont le montant est inférieur aux seuils européens et relatifs à des secteurs non couverts par les règles détaillées des directives européennes*. January 1st 2010.

C. VAN OPPEN, C. GODARD and D. BIJL DE VROE, *Circular Procurement in 8 Steps*. Netherland. 2018.

Royal Institute of British Architects, *RIBA Plan of Work 2013*. United-Kingdom. 2013.

Royal Institution of Chartered Surveyors (RICS), *Tendering Strategies*. United-Kingdom. July 2014.

'Service Public de Wallonie', *Marchés publics responsables - Note de cadrage et de conseils juridiques pour l'intégration de clauses environnementales, sociales et éthiques dans les marchés publics*. Belgium. 2019.

P. THIEL, *Mémento des marchés publics et des PPP 2014*. Waterloo: Wolters Kluwer Belgium. Belgium. 2013.

'Union des Villes et des Communes de Wallonie asbl', 'Direction générale des pouvoirs locaux', *Focus sur la commune - 174 fiches pour une bonne gestion communale*. Belgium. 2018.

Waste & Resources Action Programme (WRAP), *Setting a requirement for recycled content in building projects. Guidance for clients, design teams and contractors*. Banbury, Oxon: Waste & Resources Action Programme. United-Kingdom. 2008.

Waste & Resources Action Programme (WRAP), *Reclaimed Building Products Guide - A Guide to Procuring Reclaimed Building Products and Materials for Use in Construction Projects*. United-Kingdom. 2008.

### **3. LEGAL REFERENCES AND POLICY FRAMEWORK**

#### **European Union**

*Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on Waste and Repealing Certain Directives*. 2008.

*Directive 2014/24/UE of the European Parliament and of the Council of 26 February 2014 on Public Procurement and Repealing Directive 2004/18/EC*. 2014.

European Council, *Council Conclusions on Circular Economy in the Construction Sector*. 2019.

European Union, *Treaty on the Functioning of the European Union (Articles 26, 34, 53 §1, 56, 57, 62 and 114 Related to Public Procurement Regulation)*.

European Commission, *Report from the Commission to the European Parliament, the Council, The European Economic and Social Committee and the Committee of the Regions on the Implementation of the Circular Economy Action Plan*. April 2019.

European Commission, *Evaluation of the implementation of environmental policies 2019 (Country reports - Belgium)*. 2019.

*Regulation (EU) nr 305/2011 of the European Parliament and of the Council Laying down Harmonised Conditions for the Marketing of Construction Products and Repealing Council Directive 89/106/EEC, Annex 1 (Basic Requirements for Construction Works)*. 2011.

## Belgium

Be Circular - Be.Brussels / Brussels Environnement, *'Feuille de route des acteurs de La Construction à Brussels - Vers Une Économie Circulaire'*. 2019.

Brussels-Capital Region (be Circular), *Programme régional en économie circulaire 2016-2020 (PREC)*. 2016.

*Circulaire pour l'intégration du développement durable, en ce compris les clauses sociales et les mesures favorisant les petites et moyennes entreprises, dans le cadre de marchés publics passés par les autorités adjudicatrices fédérales*. 2014.

*Loi du 20 février 1939 sur la protection du titre et de la profession d'architecte*. 1939.

Service Public Fédéral, chancellerie du Premier Ministre, *Loi relative aux marchés publics du 17 Juin 2016, [C – 2016/21053]*. 2016.

Wallonia Region, *Green Deal Achats Circulaires | Développement Durable*, <http://economiecirculaire.wallonie.be/green-deal>. 2019.

## France

*Code de La Commande Publique*. 2019.

*Décret nr 2016-811 Du 17 Juin 2016 Relatif Au Plan Régional de Prévention et de Gestion Des Déchets, 2016-811*. 2016.

*Feuille de route de l'économie circulaire - 50 Mesures pour une économie 100% circulaire.* 2018.

*Loi nr 2015-991 Du 7 Août 2015 portant nouvelle organisation territoriale de la république,* 2015-991. 2015.

*Loi nr 85-704 Du 12 Juillet 1985 relative à la maîtrise d'ouvrage publique et à ses rapports avec la maîtrise d'œuvre privée (Ex Loi MOP, aujourd'hui intégrée au Code de la Commande Publique).* 1985.

'Ministère de l'Ecologie, du Développement durable et de l'Energie', *Plan National d'Action pour les achats publics durables 2015-2020.* 2014.

'Ministère de l'Economie', *Moderniser la commande publique - Les 11 mesures du gouvernement pour la commande publique.* 2018.

*Ordonnance nr 2015-899 Du 23 Juillet 2015 relative aux marchés publics.* 2015.

*Ordonnance nr 2018-937 du 30 octobre 2018 visant à faciliter la réalisation de projets de construction et à favoriser l'innovation.* 2018.

## United-Kingdom

HM Government, *A Green Future: our 25 year plan to improve the environment.* 2018.

Infrastructures and Projects Authority, *Government Construction Strategy 2016-2020.* 2016.

*The Public Contracts Regulations.* 2015.



# PHOTOS CREDITS

---

Except from the list below, the entirety of the photographs and images have been produced by Rotor, including the front and the back covers.

Front page, right: © Guillaume Sokal

p.8/9 © Julien Hayard

p.36 © Atelier 9.81

p.40 Archive image - unknown source

p.44 © Nicolas Pereira Architectes

p.47 © 51N4E

p.50/51 Extracted image from the documents produced for the operation (Rotor)

p.52 © Encore Heureux

p.53 CTSB

p.58 Creative Commons, FCRBE

p.59 Bellastock

p.60 Middle: © Studio Ravages

p.66 Creative Commons, Opalis

p.68 Up: © Clément Guillaume, down: © Alexis Leclercq - pour Bellastock

p.69 Up: © Carton 123, down: © ae-architecten

p.71 Bellastock

p.72/73 © Simon Sturgis

p.74 Bellastock

p.75 © BePictures

p.77/94/95 Creative Commons, Opalis

p.96 Extract from the FCRBE factsheets

p.97 WRAP

p.112 Extract of Bellastock table

p.124 Left: © Mammouth, right: © Studio Fifty Fifty

p.125 BBSM

p.126 *Fondation Bâtiment Energie*

p.128 © Michel Prégardien

p.129 @ Samuel Defourny Moury

p.145 © Delphine Mathy

