Using reclaimed materials in construction projects

Is it more expensive?

Aline Vergauwen – Project Leader Sustainable and Circular Solutions
Based on two research projects with pilots
Pilot Case – Tuighuisstraat

<table>
<thead>
<tr>
<th>Location</th>
<th>Kortrijk Neighbourhood Tuighuisstraat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Year of construction</td>
<td>1924</td>
</tr>
<tr>
<td>Typology</td>
<td>18 small family houses in brickwork, semi-detached or terraced houses</td>
</tr>
<tr>
<td>Size of the project</td>
<td>+ 2750 m2</td>
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</tbody>
</table>

Reuse of bricks and roof tiles

Wonen Regio Kortrijk
MAKER architecten
Objective

• Maximal reuse of bricks and roof tiles for reuse in the construction of the new houses and in gabions for the gardens.

• In the future houses they will use a different type of mortar: lime mortar in stead of cement mortar.

• In the tender, the reuse of the bricks and roof tiles was described in the project specifications. The tests that needed to be done are described as well.
Pilot Case – Tuighuisstraat

Operational process
Pilot Case – Tuighuisstraat

Results

Estimation of the architects
• 50% bricks
  • Of which 35% for reuse as bricks
  • Of which 15% for reuse in gabions
• 50% reuse of roof tiles

Actual recovery:
• Bricks for reuse in facade: 22 %
• Bricks for reuse in gabions: 10 %
• Roof tiles: 60 %
## Pilot Case – Tuighuisstraat - 2021

<table>
<thead>
<tr>
<th></th>
<th>Cost of dismanteling by specialised contractor</th>
<th>Cost of dismanteling by contractor with no experience</th>
<th>Unit price new bricks or roof tiles (similar type) 2021</th>
<th>Unit price new bricks or roof tiles in 2023</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bricks</td>
<td>30 EUR/m²</td>
<td>43 EUR/m²</td>
<td>55 EUR/m²</td>
<td>70 EUR/m²</td>
</tr>
<tr>
<td>Roof tiles</td>
<td>10 EUR/m²</td>
<td>25 EUR/m²</td>
<td>15 EUR/m²</td>
<td>20 EUR/m²</td>
</tr>
</tbody>
</table>

**SAVINGS DURING THE DEMOLITION PHASE?**

On a total collected area of 1580 m² the savings on waste evacuation: 1.55 EUR/m²

- **Roof tiles** => challenging to be break-even
- **Bricks** => with specialised contractor: break-even or beneficial
4. The use of primary raw material in the construction of the building is minimised through the use of secondary raw materials. The operator of the activity ensures that the **three heaviest material categories used to construct the building**, measured by mass in kilogrammes, comply with the following maximum total amounts of primary raw material used:

   a. for the combined total of brick, tile, ceramic, a maximum of 70% of the material come from primary raw material;

   In order to respect the Waste Hierarchy and thereby favour re-use over recycling, **re-used construction products**, including those containing non-waste materials reprocessed on site, are to be counted as comprising zero primary raw material.
Mundo Lab – Louvain-La-Neuve - Belgium

- Project 2300 m²
- 1350 m² offices
- Used reclaimed beams for the entire structure
- Used lots of other reuse materials: acoustic panels, sanitary appliances, raised floors, lighting fixtures, ceramic tiles,…

https://www.circubuild.be/fr/actualite/etude-de-cas-mundo-lnn-louvain-la-neuve/
Reuse of steel beams


https://www.circubuild.be/fr/actualite/etude-de-cas-mundo-lin-louvain-la-neuve/
Reuse of steel beams

https://tools.agoria.be/nl/marktprijzen-van-materialen-overzichtstabellen

1800 EUR/ton (incl. testing, preparation,...)

Min. 800 EUR/ton second hand price
Reuse of steel beams

Halve the additional cost => 1300 EUR/ton
Little variation in price

https://tools.agoria.be/nl/marktprijzen-van-materialen-overzichtstabellen
<table>
<thead>
<tr>
<th>COSTS</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Specialised) labour</td>
<td>Company image valorization</td>
</tr>
<tr>
<td>Adaptation of processes and practices</td>
<td>Reduction of waste management costs</td>
</tr>
<tr>
<td>Additional logistics</td>
<td>Sale of reclaimed materials</td>
</tr>
<tr>
<td>Justification of the technical quality of materials</td>
<td>No or lower purchase costs</td>
</tr>
<tr>
<td>Traceability requirements</td>
<td>Reduction of transport costs</td>
</tr>
<tr>
<td>Sorting and preparation for reuse</td>
<td></td>
</tr>
<tr>
<td>Adjustments and adaptations to integrate them</td>
<td></td>
</tr>
<tr>
<td>Insurance and liability</td>
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</table>
Conclusion

• We need specialised contractors to reduce and stabilise the “harvest price”

• We need standardised protocols for the implementation of the reclaimed materials in construction projects to keep the “additional costs” under control

• Shortage of raw materials and rising energy prices push up the unit price of new materials

• Indirect financial benefits: EU – Taxonomy will stimulate the use of reclaimed materials in projects
Questions?