

Benelux Circular Economy Business Forum

4 & 5 octobre 2022



Digital Deconstruction

Thematic workshops 2 : Sustainable construction in the Benelux



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& ASSOCIÉS**

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AND TECHNOLOGY









Construction & demolition waste

35%

*of all waste
produced in the
EU*

Construction & demolition waste

50%

*of this amount is
recycled in most
of the EU
countries*

Construction & demolition waste

Less than **3%**
*considered for
reuse & upcycling
in NW EU*



Opportunity for circular economy & innovation

IN THE PAST



Brussels, 1928, Demolition of the Palais
Granvelle, Building from 1550
KIK-IRP, cliché A105361

From Rotor, Brussels



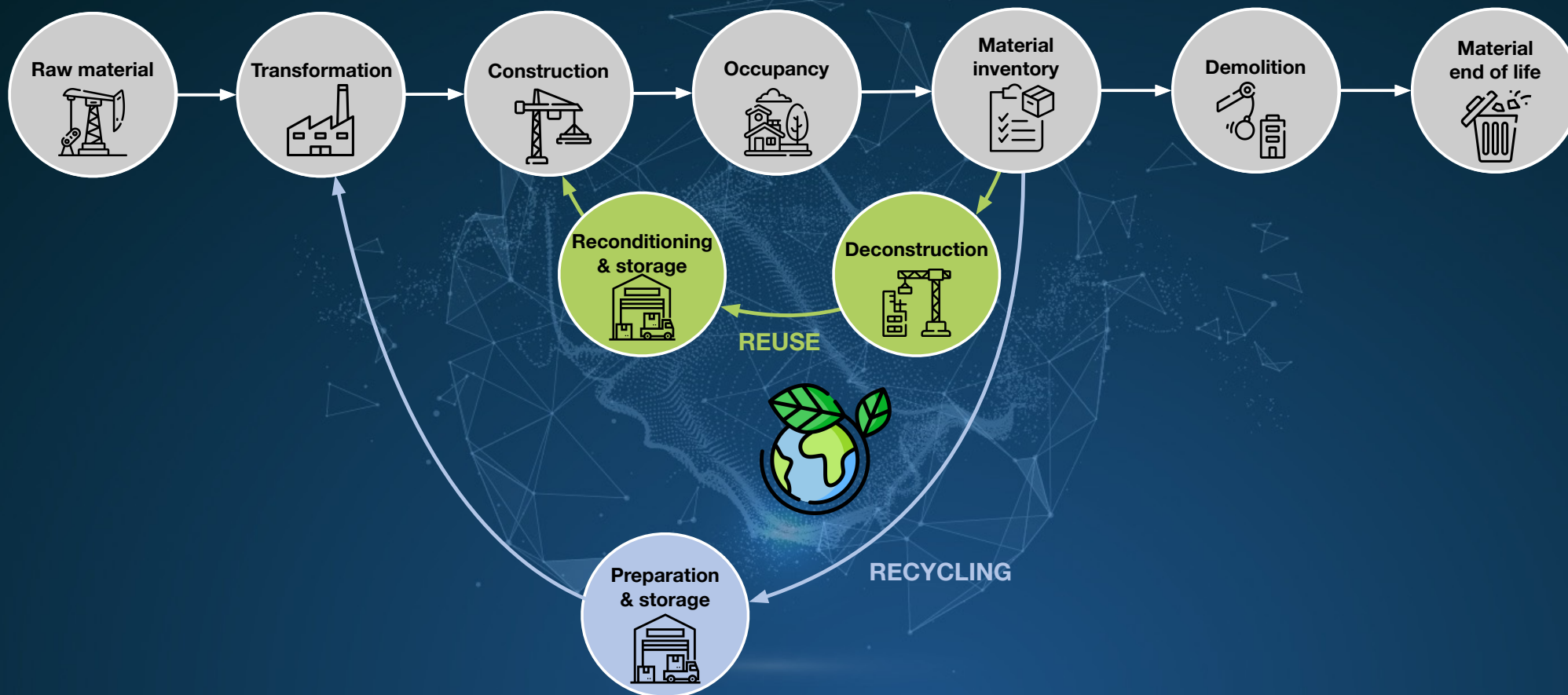
TODAY

Material inventory 

Low reuse level 

High quantity of wastes 





Icon Flaticon

DIGITAL DECONSTRUCTION PROJECT



provincie limburg



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Digitalization is key to improve the reuse strategy



Decision support system



+ Environmental criteria



+ Economic criteria





M1

3D SCAN & SCREENING



M2

REVERSIBLE BIM



BLOCK MATERIALS

M3

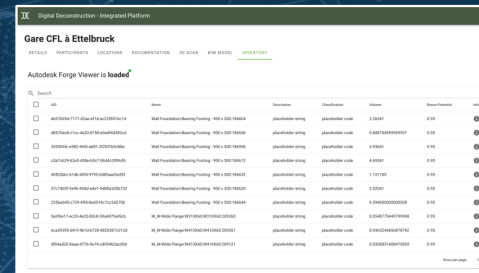
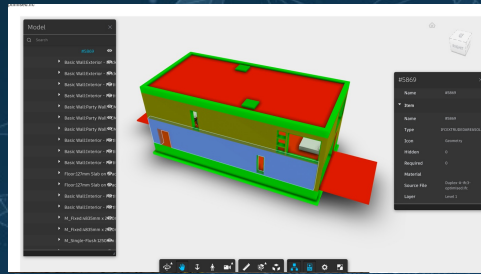
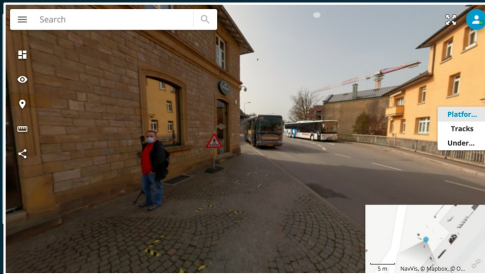
MATERIALS INVENTORY



**BLOCK
MATERIALS**

M4

MATERIAL PASSPORT / BLOCKCHAIN



DigitalDeConstruction Platform

Decision support interface for deconstruction & reuse strategies

- BIM visualization
- Economic indicators
- Material data
- Sustainable indicators
- Material passport
- Scenarios analysis

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LIST 



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LIST 

2/16/23

DDC PLATFORM END USERS

PUBLIC OR PRIVATE OWNER



Owner

DECONSTRUCTION EXPERT



RBIM expert

3D SCAN EXPERT



Scan

ARCHITECT, ENGINEER
INVENTORY EXPERT



Inventory

BUYERS



Buyer

CONSTRUCTION FIRMS



Construction firm



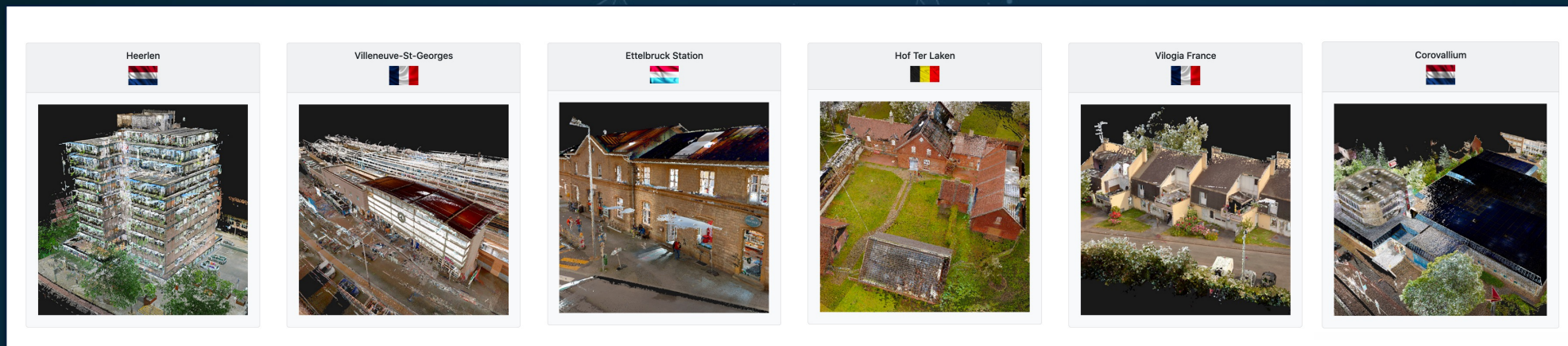
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SEVERAL PILOTS



Picture BIM-Y

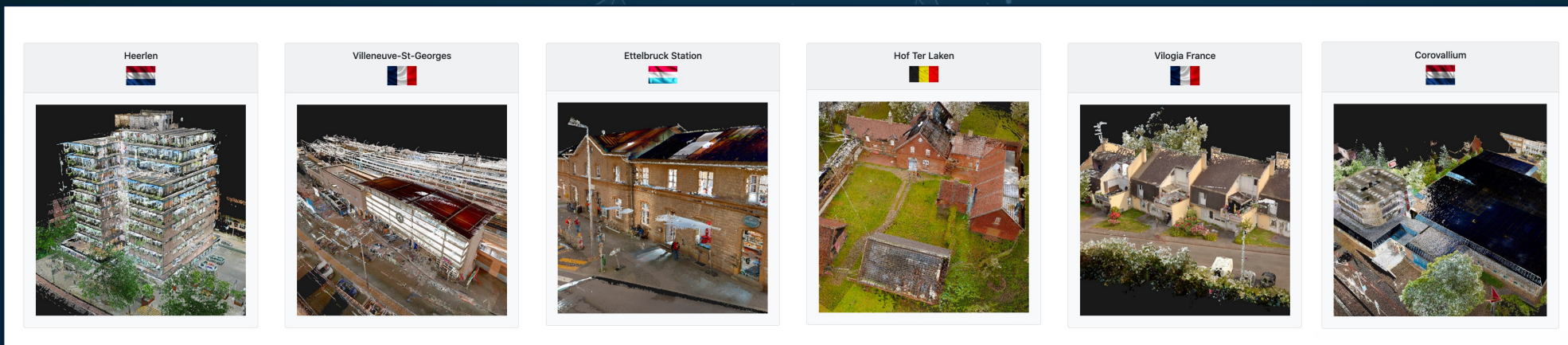
Test of technologies

User feedback

Cost/benefit analysis

16-02-2023

3D SCANNING



Picture BIM-Y

	Hof Ter Laken (BE)	Heerlen (NL)	Ettelbruck (LU)
Duration	1 h 13 min	12 h 30 min	46 min
# picture	1.073	5.063	522
Ratio	1.342 m2/hour	1412 m2 /hour	3.353 m2/hour



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SCREENING



Picture BIM-Y

Main features

- Virtual tour
- Geolocated inventory data
- Automatic 2D map
- Measurement tools
- Crop and download point cloud

16-02-2023

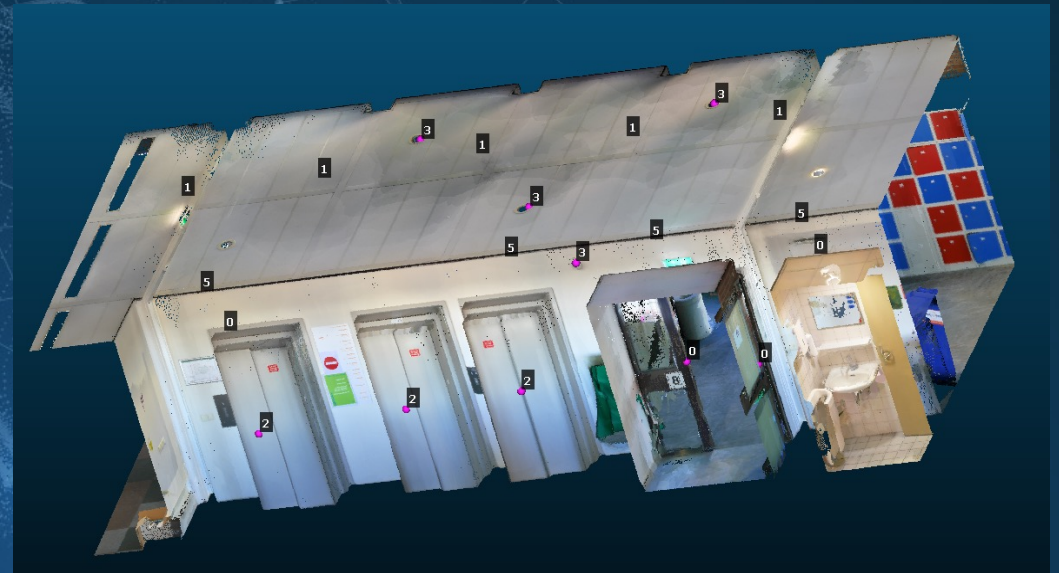
INVENTORY

Asset detection



Pictures BIM-Y

Geolocation



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Ettelbruck train station

ETTELBRÜCK TRAIN STATION

📍 In the North of Luxembourg

Building owner **CFL**

Building from 1873



ETTELBRÜCK TRAIN STATION

Manual inventory of building components

manuel ②

Pas idem: voir référence sur photo

2.1 1x Radiateur → ~~idem~~ ① → ~~plastique~~ ETS 400

2.2 1x Porte idem ① à recouvrement

2.3 Bâses idem ①

1x simple

1x double

1x triple

2.4 1x Prise antenne TV idem ①

2.5 1x bouton lumière idem ①

2.6 1x Thermostat idem ①

2.7 1x luminaires métallique oré



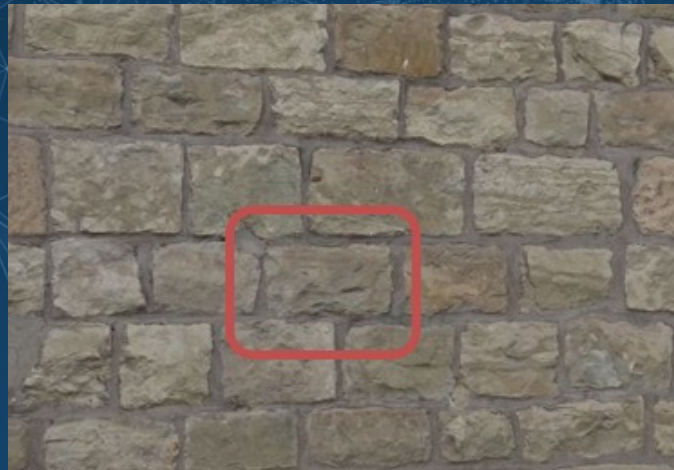
Déconstruction du Bâtiment Voyageurs en gare d'Ettebrück

2. Inventaire - Type et quantité des matériaux survenant lors du démantèlement

Désignation et code du matériau	Description du matériau (par ex. indications précises concernant le composant)	Type de matériau (inerte, non dangereux, dangereux)	Qualité du matériau	Position dans le bâtiment (par ex. étages inférieurs, étages supérieurs, toit)	Dimensions	Quantité (en tonnes) = estimation	Contamination du matériau avec des polluants (cf. aussi liste de contrôle relative à l'étude sur les polluants)	Le matériau est-il collecté séparément sur le chantier ?	Comment le matériau va-t-il être traité ? (par ex. réutilisation, recyclage, valorisation énergétique, élimination et/ou autre)	Notices, remarques, liens vers les photos
17 01 béton, briques, tuiles et céramiques										
17 01 01	béton armé	Fondations	inerte		Fondations au sous-sol	non connues. Estimation : 100m ³ à 0,40m ³ /ml = 40 m ³	40 m ³ * 2,5 t/m ³ = 100 t			Partiellement démolies dans ce marché (voir plan)
17 01 01	béton armé	Dalle	inerte		Dalle sur sous-sol	530 m ² * 0,25 m = 132,5 m ³	132,5 m ³ * 2,5 t/m ³ = 331,25 t			
17 01 01	béton armé	Voiles	inerte		Murs extérieurs sous - sol	(70m * 0,3 * 2,5 m) + (40m * 0,3 * 1,5m) = 70,5 m ³	70,5 m ³ * 2,5 t/m ³ = 176,25 t			Partiellement démolis dans ce marché (voir plan)
17 01 01	béton armé	voiles extérieurs	inerte		voiles extérieurs locaux WC	17,60m ² * 0,2 * 3 m = 10,56m ³	10,56 m ³ * 2,5 t/m ³ = 26,4 t			isolant extérieur
17 01 01	béton	Dalle	inerte		Dalle de fond au sous-sol : à priori non armée	400 m ² * 0,25 m = 100 m ³	100 m ³ * 2,5 t/m ³ = 250 t			Partiellement démolie dans ce marché (voir plan)
17 01 02	briques	Murs extérieurs en pierres de pays	inerte		4 façades du BV	(2 * 88,5m * 2 * 330m ²) * 0,50 = 418,5 m ³	418,5 m ³ * 2 t/m ³ = 837 t	oui : voir colonne "Notices"	réutilisation	Pierres brutes pour AC Ettebrück Pierres taillées (tours de fenêtres, corniches) pour récupération CFL

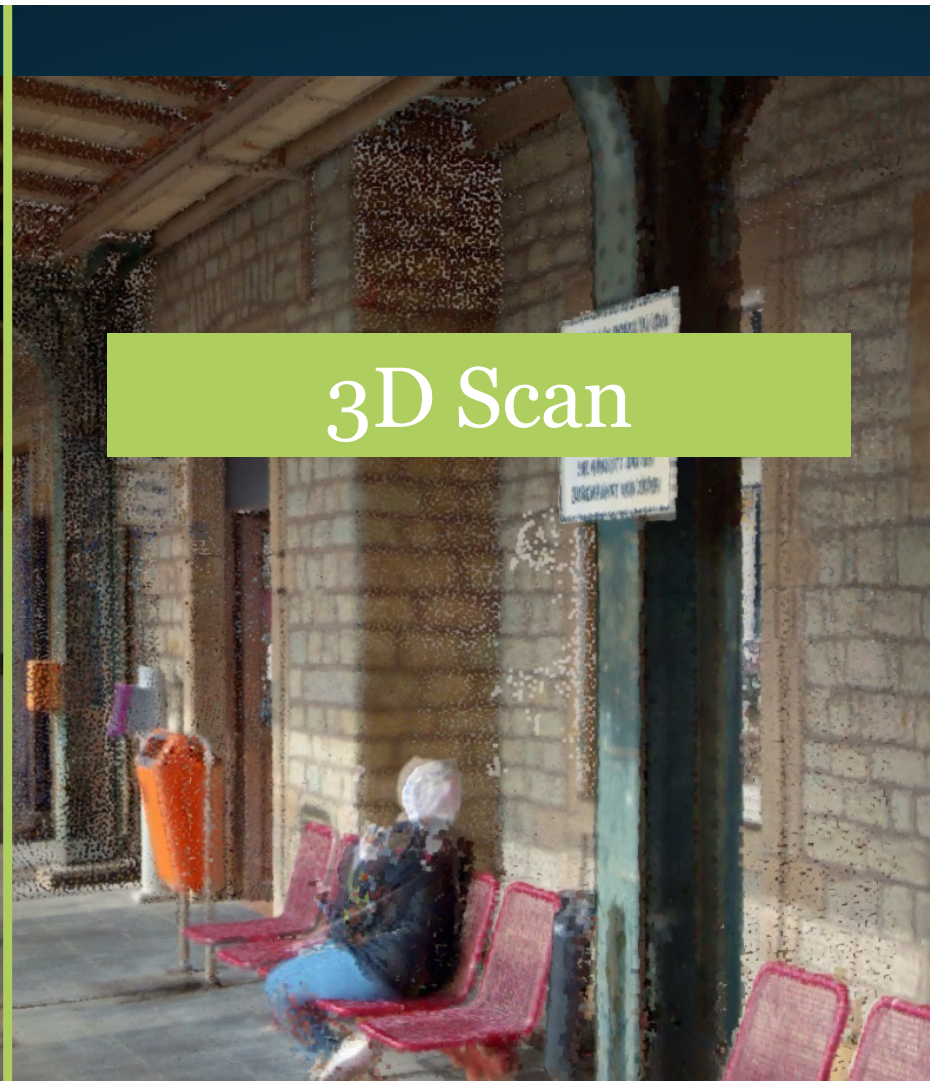
ETTELBRÜCK TRAIN STATION

Manual identification of reuse potential





Reality



3D Scan

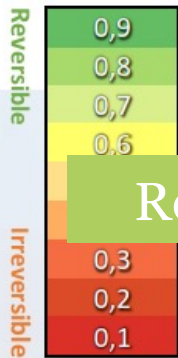


Reality

Picture from BIM-Y



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Reversible BIM

ETTELBRUCK- Luxembourg



M2

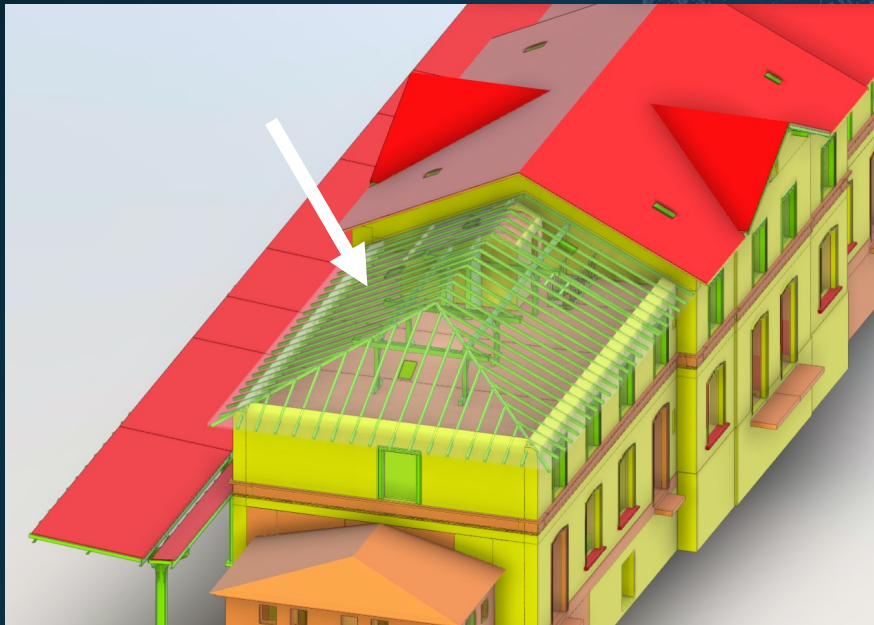
Dr. Elma
Durmisevic,
developer of
Reversible Building
model



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ETTELBRÜCK TRAIN STATION

Total : 14 % of reused elements



Dr. Elma Durmisevic, developer of Reversible Building model

Reused beams



DDC Platform

https://itt-ddc.private.list.lu/#/en/project

DownloadPrintShare

EN

Digital Deconstruction - Integrated Platform

Ettelbruck Luxembourg

< BACK TO LIST

DETAILSPARTICIPANTSLocationsDOCUMENTATION3D SCANREVERSIBLE BIMINVENTORYANALYSIS

NavVis Indoor Viewer

Search

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1

0

-1

5 m

NavVis, © Mapbox, © OpenStreetMap contributors



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Website

<https://www.nweurope.eu/digitaldeconstruction/>

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