"COLLABIM" – Topics

Methodological Guide for the preparation, development and evaluation of BIM Competitions between students

BIM GAME I.O. #6

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1 Background

This Guide is developed within the framework of the BIM GAME Erasmus + Project developed between 2016 and 2019 between several European universities and other educational and business institutions.
This document is linked with 4 events organized by the BIM GAME team in 4 countries in Europe:

- EVENT #1: "BIMTag" in Oldenburg (Germany – 02/2019)
- EVENT #2: "Sustainable" in Brussels (Belgium– 04/2019)
- EVENT #3: "EUBIM" in Valencia (Spain – 05/2019)
- EVENT #4: "BIM & Building materials from re-use" in Besançon (France – 06/2019)

Each event is welcoming speakers, workshops, … and a BIM GAME experimentation held on the same place in order to show to the participants what the project is and to give opportunities to the students. At the end of each competition, we used the open-badges system to give "BIM GAME awards" to the learners and this is a kind of "ceremony" with all the people of the event.

More information about the open-badges: I.O. #5 (Documents for trainers) and Annex C
More information about the events: Annex D

Its intention is to systematize in a simple way the procedures followed during our experience so that they are easily transferable to other initiatives that are intended to be carried out.
The scope of use of the same should be considered for use among students of last grades of secondary education and university students.

As a starting point it should be noted that the development of the activity requires:

- Collaborative spirit among students.
- Capacity for enthusiasm and motivation among teachers.
- Work dynamics not excessively hierarchized.
- Open provision for online digital communication methodologies.
- Receptive environment by the management cadres of the centers and / or companies, administrations or entities affected.

1.1 Purpose of the competitions

It is about encouraging the learning of the BIM methodology in the educational environments related to the AECO sector (Architecture, Engineering, Construction and Operation) in a collaborative way among students, professors, companies and administrations.

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Already from the object, we understand that these will be activities that require the active and collaborative participation of people and institutions. For this reason the procedure is considered to approximate the subsequent professional reality of the students.

In short, it is the creation of a "scenario" that comes to reproduce in a digital scenario a real and habitual problem in the sector. Hence the participation of the different skateholders of the same is required.

1.2 Participants

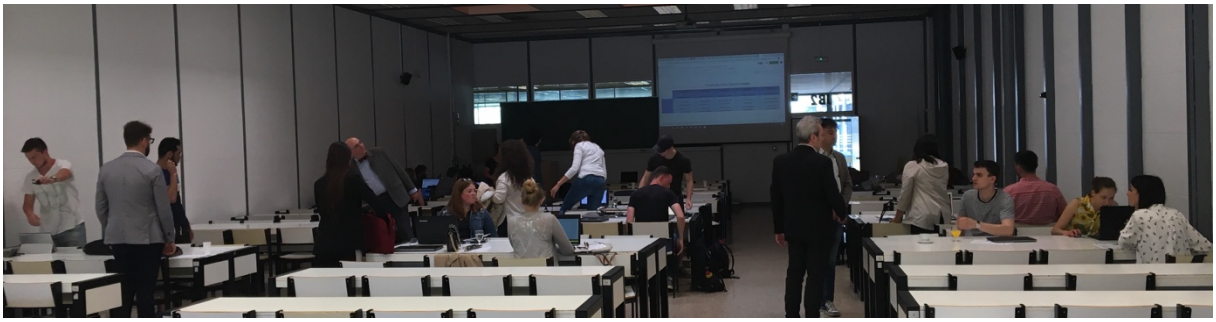
The development of the competitions requires the participation of most of the actors that participate in the construction process:

- Property
- Promoter
- BIM Manager
- BIM Coordinator
- Architect
- Engineers
- Builder
- Subconstructor
- User
- Maintenance company
- Financial entity.
- ...

All or part of them can participate, this will depend on the type of "scenario" that arises for its development.

1.2.1 Students role

Students should assume all the roles of each skateholder selected for the scenario. The student must feel willing to work in a team and have a collaborative attitude with their classmates. He must be able to assume the responsibilities entrusted to him and be honest with himself and with the rest of the team.



Picture 1"COLLABIM" Competition - Valencia - 22/005/2019

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1.2.2 Role teachers

The teachers are mere supervisors of doubts and coaching of the students during their work. They should guide the proposed activities and ensure the correct progress of the work done.
The teacher must have coaching skills and be sensitive to the possibilities, attitudes and aptitudes of each student. It is really difficult to make collaborative work work without a thorough knowledge of the human component of the team.

1.3 Academic Coordination

The preparation of BIM competitions or competitions between students can be integrated into the activities of one or several subjects of one or several centers. It is simply about adapting the usual evaluation systems of the subjects to the requirements and delivery conditions of the works that are finally presented at the end of the contest.

Obviously, the teachers responsible for these subjects should consider what content, skills and results they expect to obtain and evaluate during the development of the competition and coordinate them with the teacher responsible for the development of the competition. It is also particularly interesting the participation of the teacher himself during the development of the same to guide students in the approach and to analyze the results.

It is particularly interesting to emphasize that NO It is necessary that the teacher who contributes contents of his subject to the competition-competition has previous knowledge of BIM. In short, the visiting professor is a specialist in his subject, how the problem should be posed and what results he expects from it. BIM is only a methodology, it does not alter the way of building, nor the analytical basis of the usual checks in construction, therefore, participation can be open to ALL the teachers of the center.

In the same way it happens when it comes to several educational centers, even when they are of different levels (secondary, university, professional training, master's degree). Moreover, it is very interesting to note that the interaction between students of different levels is beneficial for all parties. It is understood that the main mission of CollaBIM * (BIM Competitions or Competitions) is to promote COLLABORATIVE work among students from different levels and areas of training so that it is reproduced in the classroom, the reality that they will then live professionally in the process constructive.

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Picture 2 BIM GAME Team – Oldenburg Competition - 02/2019

Picture 3 – Team at work- Oldenburg Competition - 02/2019

2 Description of Collabim Parameters

2.1 Competition-Competition System. Organization and Model chosen to work

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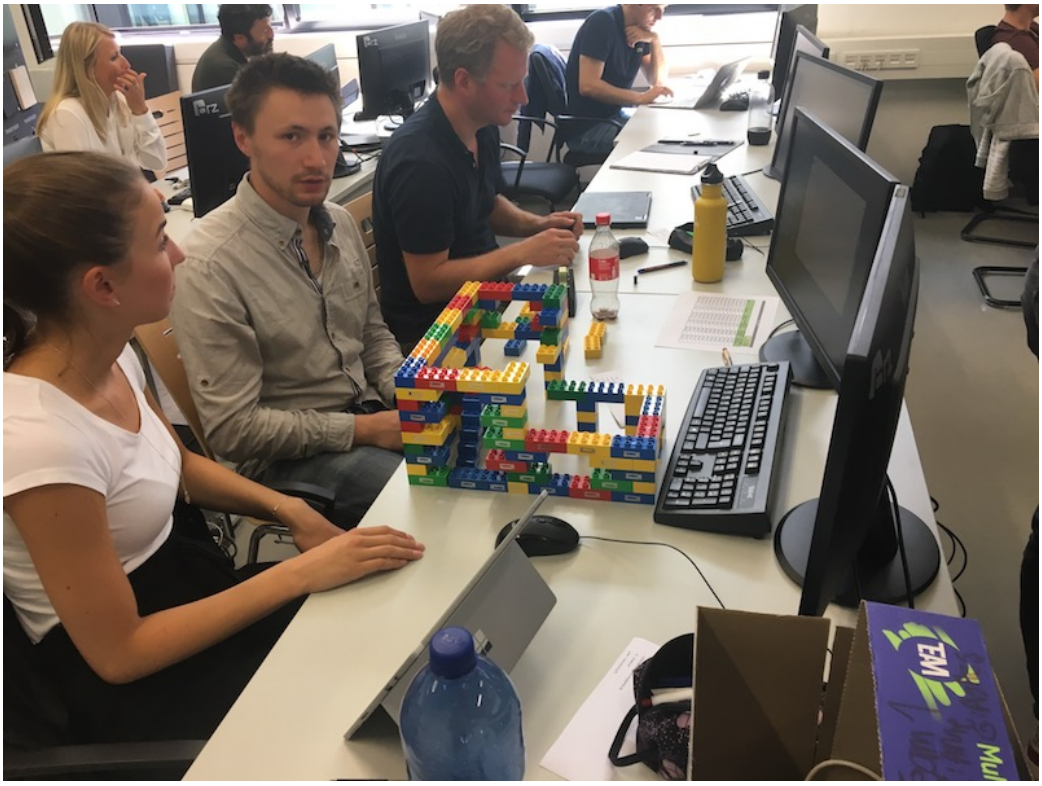
We have established three types of competition system possibilities depending on the origin of the team members, how to distribute them in teams and whether it is competition between them or joint work.

2.1.1 Competition between national teams with a common theme and several resulting projects.

• Teams: All students are of the same nationality, within each team. Each nationality can present more than one team.
• Specialty: The teams have students of different levels and specialties: Modelers, Builders, Quantifiers, Designers-Architects
• Teachers: Teachers of different nationality are involved as general advisors of all teams.
• Competition theme: Bases and objectives to be met (EIR) are provided.
• Evaluation: A winner is chosen based on the fact that he has achieved more and better results to the requirements used.
• Assessable parameters:
o Better design
o Modeling more faithful to the design
o Correspondence between digital model and real model.
o Quantification of materials (lego) used.
o BIM process followed.
o Election of the winner by the Role of Owner.



Picture 4 - Wuppertal Competition - 09/2018

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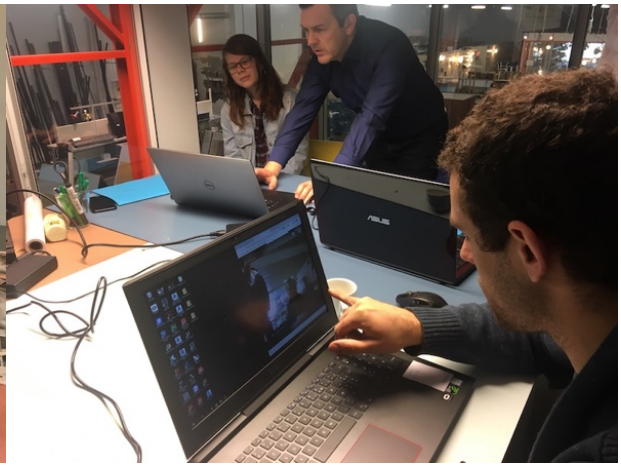
2.1.2 Team competition with international members and with a common theme

• Teams: Students are of different nationality, within each team. The roles within each team are previously distributed.
• Specialty: The teams have students of different levels and specialties: Modelers, Builders, Quantifiers, Designers-Architects
• Teachers: Teachers of different nationality are involved as general advisors to each of the teams.
• Competition theme: Bases and objectives to be met (EIR) are provided. Besançon: construction of a mobile module for educational dissemination. Brussels: Internal conditioning of a room from recycled building material.
• Evaluation: A winner is chosen based on the fact that he has achieved more and better results to the requirements used.
• Assessable parameters:
o Better design
o Modeling more faithful to the design
o Correspondence between digital model and real model.
o Quantification of materials (Lego in Besançon, Rotor in Brussels) used.
o BIM process followed.
o Election of winner by popular vote.

Picture 5 - Besançon Competition - 06/2019



Picture 6 - Brussels Competition - 04/2019

2.1.3 Common Collaborative Project developed by different thematic areas, attended by students of different nationalities and assisted by the teaching staff.

There is NO competition, it is a unique work among all.

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• Work areas: Students are of different nationalities, and are distributed by work areas: 3D ARC, 3D STR, 3D MEP, 4D, 5D, 6D The roles within each team are previously distributed.
• Specialty: The areas have students of different levels and specialties according to the specialty of each one.

• Teachers: Teachers of different nationality are involved as general advisors of each of the areas.

• Theme of the Common Collaborative Project: Bases and objectives to be met (EIR) are provided on a nearby building, if it can be the same on which the Stress Test (ST) is being developed Example Valencia CB4: Conditioning part of the roof of the Polytechnic School of Valencia, establishment of accessibility to it and conditioning of the courtyard of the building. It is intended that the data collection be as simple as possible and that the student take into account the real conditions to do the work.

• Evaluation: There is no winner, the achievements in each area are evaluated based on what was initially proposed. Acti is highly valued You collaborative between students in each area, between areas and with the aim of a single common project.

• Assessable parameters:
- Design appropriate to the EIR and the conditions
- Modeling more faithful to the design
- Correspondence between digital model and real building.
- Quantification of materials for an evaluation of energy efficiency of the same.
- BIM process followed.
- Self-evaluation of the results obtained.

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Picture 7 - Valencia Competition - 05/2019

2.2 OBJECTIVES, TIME AND AREAS INVOLVED.

2.2.1 Temporary Objective: Stress Test (ST)

By having the time limited to a few days we call each of the CollaBIM organized as: Stres Test (ST). We talk about Stress Test, because the TIME factor is important to achieve the objectives and because it is very similar to the real professional life where Time is a very important factor. We all know that having MORE time to do things does not always translate into a BETTER result.

The temporary objective as a limited resource, forces a much more thoughtful work organization, helps to select objectives, forces to choose the most effective people for each task, forces to think about a process programming that eliminates DEAD WAITING TIMES. And all this is part of the BIM process. Each team must think about what account, what objectives it has and how it will organize its work to arrive safely and guarantees delivery.

Within this temporary organization, the Definition Levels (LODs) acquire a fundamental importance. For the integrated development of the project (IPD), something absolutely inherent to the BIM methodology, it is necessary that all areas move forward jointly and with partial verification at the end of each LOD through meetings between areas, that the project progresses properly and fulfilling EIR requirements.

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2.2.2 Thematic Objective: Areas involved, the "Ds" of the BIM.

It would be a question of establishing a scope of the proposed work with logical delivery criteria that are acceptable to the average work team. The dimensions are many and you can propose scenarios in which a minimum of 3 areas and a maximum of 8 or more concur. Logically complexity increases with the number of areas involved. The decisions to be taken must take into account more parameters and the process of design and development of the proposal is complicated.

The size of the Scope of the ST will be directly related to the expertise, knowledge and skills of the participating students. In any case, regardless of the areas involved and the level of the participating students, any ST can give very satisfactory results for the participating students.

• 3D ARQ: In this section we include both the architectural project part and its modeling. It is usually the beginning of work but it must be done simultaneously to progress in other areas to take into account its conditions.

• 3D STR: Modeling and structural analysis, it does not have to appear, but for ST especially oriented to the calculation it is usually very interesting. Equally important to have a clear approach with low levels of definition (LODs).

• 3D MEP: Modeling and analysis of some of the facilities. Similarly to the previous one, it is very specific and is particularly important for cases in which there is to establish Clash Detection analysis between systems.

• 4D PRG: Programming the construction process: It is about thinking and organizing how the construction process is going to develop. Temporary programming of the work to be carried out is requested. Sometimes, the specific conditions of the location of the proposed work can generate programming parameters that affect the design and, of course, the budget.

• 5D MED: Measurements and budget: Quantify quantities of material, labor, execution time, cost. It is a fundamental chapter that can and should establish parameters from the first moment to the rest of the areas.

• 6D EES: Energy efficiency and sustainability: Fundamental parameter if we consider limited carbon footprint, energy consumption or the conditions of recycled materials used.

• 7D FM: Facility Management: The process does not end with the building executed, but with the building in operation. The analysis of the consequences that will have in maintenance the solutions that we propose in project and work are fundamental for its users. Decisions and requirements may also appear from the first moments of the design.

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• 8D HSF: Health and Safety: Analyze and program all auxiliary elements, scaffolding, aids, personal and collective protection systems, storage facilities, crane installation, truck and people maneuverability. Frequently, we forget that materials are not put ONLY in construction. The simulation of the process causes the student to consider his project as something to be executed, which It's real.

2.3 USE AND LEARNING SOFTWARE OBJECTIVE. BIM SKILLS

2.3.1 Recommendations before starting

• Experience: It is not necessary to have previous experience by the teaching staff or the students. The objective of collaborative practice at BIM is to learn by collaborating, not to demonstrate what one already knows. Obviously, all prior knowledge is welcome, but it is not about "giving a software cuse."

• Collaborative fitness: this is the main mission. It is not important the previous knowledge that is had, it is more, sometimes those that the student already has can be counterproductive, because they are intended to impose on the rest.

• The Software is NOT the important thing: The skills that one can achieve during the experience are always welcome and positive, but the important thing is the discovery of collaborative creation and the feeling of belonging to a team with specific responsibilities.

2.3.2 Basic BIM concepts

• EIR: Empoyer Information Requirements: It is the statement of the Stress Test. Description of the test requirements, objectives, concrete deliverables, parameters to be considered, their assessment and evaluation of the final proposal.

• BPMN: Business Process Model Notation: Flow chart that organizes the activity of the team members, establishes the tasks to be delivered, the relationships between them, the deliverables and the final objective. Be part of the BEP.

• BEP: BIM Execution Plan: General organization of work at BIM. Work delivery protocols, style book, responsibility matrix, etc. It can be more or less extensive, but it should be written and kept in mind, even if it is a very simple document. Establish the work plan to follow previously. Usually, it is not a strictly closed document, it must be open to modifications during the process itself.

It is a very appropriate document to establish subsequent evaluations of the execution.

• IPD: Integrated Project Delivery: The development of the project advancing at the same time in all areas (BIM Dimensions: "Ds") that will intervene. It is important to understand this

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from the beginning so that unnecessary waiting times do not occur in certain areas. The sequence would be as follows:

o General statement: EIR.
o First work session in each of the areas ("Ds").
o Conclusions and first conditions in each area.
o First Collaborative Work Meeting with presentation of each one of the requirements and verification of the correct progress of the project.
o Corrections if necessary under those requirements.
o Establishment of the next LOD (Level Of Definition) advance point.
o Repeat the cycle ...
o Second work session…

• LOD: Level of Definition, Development: Definition levels (LOD), or information levels (LOI) indicate the amount of progress in the definition and information contained in the project. It is very important to know what decisions are made when each LOD passes. That is to say, the decisions are general at the beginning, but very important since they are going to mark a path in the advancement of the digital model that should not be questioned again. For that reason it is important to define what should be defined at each level, before moving on to the next.

• IFC: Industrial Foundation Classes: Digital format for information exchange between different software. It is very important to define the conditions for editing IFC files in native modeling or calculation programs for later reading by IFC "viewers". It must be the delivery format always. That makes us independent of native software and different versions of them. In addition, with the viewers I can open and compare models from different native softwares simultaneously to perform clash detection between the building elements of each other.

• BCF: BIM Collaboration Format: Communication format between collaborators that is broadcast from native programs or from IFC viewers. It serves to have a historical record of messages and modifications that have been carried out on the model. It is very graphic, protocols and communication channels can be established by levels. It should be of use and evaluation of its use in a mandatory way in all the Stress Test that arise, since it is easily evaluable parameter.

• Communication Online System: Communication systems between members must always be established, even when they are all working on site. The presence of online communication is recorded, there is evidence of who has communicated what to whom, when he has done it, what files he had linked to and what, how and when he has had an answer. It serves to distribute tasks, assign them to members, comment on them, link them to the contents of the CDE, communicate that they are already done, follow up, etc ...

The tools are many in the market and are free It is in many cases: Trello, Nextcloud, Rocketchat, Slack, although it is usually differentiated between the communication channel

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(Rocketchat, Slack, NO Whataspp) and the organization of Tasks (Trello, Nextcloud). It is NOT good to use email because it does not leave traceability of its use to several members and does not have connection to the CDE.

• CDE: Common Data Enviroment. It is the system of centralization, classification, organization of files. It is very important to organize it and follow the protocols of the Style Book for the naming of files, generation of folders, naming of the same, etc ... It must be a system that allows common access to members, you should not be allowed to use files that are not in the CDE. The creation of collaborative files for the registration, work and verification of several members simultaneously or not should be favored. It is very convenient to have connection with the task organization system (Trello, Nexcloud) and with the communication systems (Slack, Roquetchat).

The market offers a large number of free systems: Google Drive, Dropbox, Onedrive, Nextcloud ... with different levels of tools and gadgets. It is important to use one of easy handling and learning.

2.3.3 Software typology and digital skills.

• No software is better than another: The battles between commercial companies usually generate "addicted" students and teachers, not to mention hooligans of certain brands and software programs. This is absolutely counterproductive and not very operational. The BIM methodology can be used with any type of software. While it is true, that if everything is done with the software of the same brand, interoperability is better, but, since it involves simulating situations similar to reality, it is preferable not to force certain software and work with what the student or teacher knows or is more friendly.

• Availability: Most software houses usually offer easy-access educational licenses or a cost substantially lower than the market. This allows to have a large amount of different software.

• Learning. It should be clear that it is NOT about teaching a certain software. The commercial houses that supply them have very good management manuals for the student to learn on their own. Logically, the teacher must be able to analyze the results obtained by the software. If you have any kind of software skills, much better.

• Principle of WHY ?: This principle must be kept in mind at all times during the Stress Test. That is, before choosing some digital tools or others, it is necessary to be clear about what we want them for, without or not being necessary. Complicated tools are not better, it is more important that the student get results soon, there will be time to complicate the software.

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• Software table: Some of the software we have used can be found in the Excel document that accompanies this guide. Obviously there are many more and can be expanded, but these are easily accessible and with free licenses.

• Appendix. : The rules for the use of a Dice Game that was generated during the development of the project are incorporated as an annex to this guide. The game randomly establishes the software to be used during the programmed Stress Test. It means that it is NOT necessary to use a specific software, but in real life the situations are very diverse and it is normal for software from different sources to live together.

3 CONCLUSIONS

• This guide is intended to be useful to any teacher and educational team that intends to introduce the BIM methodology among its students and subjects.

• Its contents are recommendations for use, obviously some parameters can be varied.

• The motivation of collaborative aptitude is the main mission of teachers and students.

• The work of both (teachers and students) in an open format and without hierarchies is the best procedure to progress.

• Software learning should not be a handicap for the application of the BIM methodology in any teaching program. This can be applied are basic, free and fast learning software.

• Participation in public BIM competitions together with students is an incentive for participation.

• The best way to discover the benefits is to put it into practice and optimize the process with practice.

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4 Annex A : BIM GAME DICE GAME

4.1 FOUNDATION AND RULES OF THE GAME

4.1.1 Game Basis

The BIM (Building Information Modeling) methodology consists of the integrated development of Building Construction or Civil Works projects, through the simultaneous and integrated use of different Software. The organization of the disciplines which are usually used in the realization of these Integrated Project Delivery (IPD) are Distributed in the following Areas:

- 3D ARQ Area: For the digital modeling of the building or civil works, with an important load of information linked to the geometric entity. It is actually an associated database to a geometry of the constructive elements represented.
- 3D STR Area: Aimed at the digital definition of the calculation of the structure and its integration into the digital model of Architecture above:
- 3D MEP Area: Aimed at the digital definition of the calculation of facilities and their integration in the rest of digital models of architecture or structure.
- Area 4D PRG: Intended for the definition of the temporary organization of the construction process of so that you can know when the integration of each of the elements will be done constructives of the digital model according to the real model.
- 5D QNT Area: Aimed at defining the measurements and budget of the work.
- Area 6D ECO: Intended to know the sustainability index of the model, its energy efficiency, carbon footprint, etc.

The types of construction have been specified in 5 typologies: Single-family residential, Residential, Multi-Family, Offices, Commercial-Tertiary, Industrial and Rehabilitation.

Made this introduction necessary to know the basis of the game we find that in the real life of the construction processes we can find different brands and types of software whose main mission are the objectives of these Areas. As it is easy to understand no there is a perfect combination of integrating one type of software from each area according to each work. This will depend on the software used by the concurrent companies at all times and that is totally random (hence the chance of the dice and the beaker). Also, hence use a dice to group on each side of it, the anagram of a software corresponding to that area.
It is also possible to play with less than 6 dice, if necessary, in the simulation that we are going to do, we know for certain that one of the areas will not intervene, for example the area of structure in minor works of interior conditioning.

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4.1.2 Faces of the dice

As indicated, each die corresponds to an Area of which the IPD is integrated. The anagram of a common software in that area has been arranged on five of the faces of a given area. The sixth face of the dice will correspond to the Anagram of the Building Smart. It is an international organization that watches over the IFC (Industrial Foundation Class) format that it pursues
interoperability between the different software that work with BIM. This face will be the one that works as COMODIN. (It is a good simile since it will be the one that will allow you to choose in the roll, that is, it is the symbol that encourages INTEROPERABILITY)

4.2 GAME RULES

4.2.1 Case A

Individual simulation: The player makes a roll with the number of dice that corresponds to the scenario he wants to represent and obtains a type of software for each area. That would simulate the set of software that you should use in your work. Some of the results may not satisfy you, you can repeat the roll with the dice corresponding to that area as long as you have an IFC face on a given die roll to roll together with the one you want to change. This way you can repeat the operation up to three times or until you run out of IFC (wild card) faces. The resulting final combination will give you a hypothetical combination of different software with which you should think and explain to the rest of the players how you would organize interoperability between the different sofware.

4.2.2 Case B

Group simulation: the dice could be distributed between a number between 2 and 6 players, so that each of them carried all the dice in the same area in their beaker. The game consists of placing a bet that is passed from player to player indicating the maximum number of type of software that will be desired if we add the equal results of all the players and add the number of wild cards. The bet must be passed from one player to another (the wild cards can be taken out to “intimidate” the next one that should, if you accept the bet, throw your beaker and increase the bet you have received for the next player, or not accept it and make that all raise their beakers, the options are counted and it is checked whether the bet is exceeded or not, if it is not exceeded, who made it, loses and if it is exceeded, who did not accept it, loses.

4.2.3 Case C

Simulation between two players to obtain with their roll better interoperability option between software than the opposite considering that you can change dice of your roll that are wildcard for those that are not the opposite and if you are interested. After an equal number of runs between the two, the game is cut and it is checked who has achieved the best interoperability and wins. The wild cards here are important if when you stop the

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game, those that you have modify them to the software that suits you best of that dice (area).

4.3 CONCLUSION

The game tries to simulate real situations of possible software combinations and, at the same time, it implies recognition and exploration of combinatorial possibilities of a complex reality in a game and competition environment.

Picture 8 - BIM GAME dices - Valencia - 05/2019

Picture 9 - BIM GAME dices - Valencia - 05/2019

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5 Annex B: Sheet of COLLABIM Competition

		EVENT COMPETITION			
		OLDENBURG	BESANÇON	BRUXELLES	VALENCIA
		févr-19	juin-19	mars-19	mai-19
COLLABORATIVE PARAMETER	DESCRIPTION - PARAMETER COLLABORATIVE TYPE				
SYSTEM	Competition x National Member each Teams				
	Competition x International Member each Team				
	Collaborative Project x International Member each Area.				
ORGANIZATION	Only Proposal x Several Projects				
	Several Proposal x Several Projects				
	Only Proposal x Only Project				
MODEL STATED TO WORK	Imaginary model - Digital model				
	Imaginary model - Digital model - Symbolic model				
	Imaginary model - Digital model - Scale real model				
	Existing building - Small size < 100m2				
	Existing building - Medium size < 500 m2				
	Existing building - Big size < 1000 m2				
	Urban project – Digital model				
Objectives - Areas Involved	Design + Mod 3D ARCH				
	Structural Analysis + Mod 3D STR				
	MEP Analysis + Mod 3D MEP.				
	Programming constructive process + 4D				
	Measurements and budget + 5D				
	Energy analysys and sustainability + 6D				
	Facility Management + 7D				
	Security and Safety + 8D				
BIM Skills	EIR: Empoyer Information Requirements				
	BPMN: Business Process Model Notation				
	BEP: BIM Execution Plan				
	IPD: Integrated Project Delivery.				
	LOD: Level of Definition, Development,				
	IFC: Industrial Foundation Classes				
	BCF: BIM Collaboration Format				
	Communication Online System				
	CDE: Common Data Enviroment.				
Software 3D ARCH	Revit				
	Archicad				
	Sketch Up				
	Edificius				
Software Visualization	BIM vision				
	Tekla Bimsight				
	Trimble Connect				
Software 3D STR	Cypecad				
	Cype 3D				
	Edificius Estruct				
	Cadwork				
Software 3D MEP	Cypecad MEP				
	Revit MEP				
	Archicad MEP				
Software 4D	Excel				
	MS Project				
	Synchro				
	Navisworks				
Software 5D	Excel				
	Arquimedes				
	Presto				

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6 Annex C: BIM GAME open-badges

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7 Annex D: 4 BIM GAME Events

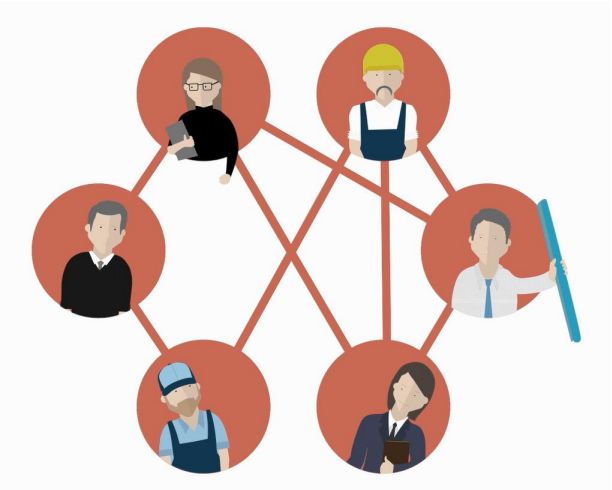
7.1 Event #1: Oldenburg

BIM Game

Oldenburger BIMTag, 28.02.2019

Another way to learn BIM

BIM GAME
// Ausgangslage



ARBEIT MIT BIM

- Erfordert Kollaboration
- Hohen Grad an Informationsaustausch

→ Wie wird das Personal darauf vorbereitet?

2

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DAS FORSCHUNGSPROJEKT
// Projektteam

JADE HOCHSCHULE Wilhelmshaven Oldenburg Elsfleth

LYCÉE DU BOIS

UCLM UNIVERSIDAD DE CASTILLA-LA MANCHA

Université de Liège

BERGISCHE UNIVERSITÄT WUPPERTAL

gip Formation Tout au Long de la Vie

datacomp

Pôle énergie Franche-Comté

4

DAS FORSCHUNGSPROJEKT

- Laufzeit: September 2016 – September 2019
- Förderung über Erasmus+
- Partner aus Frankreich, Belgien, Polen, Spanien und Deutschland

3

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DIGITALISIERUNG DER BAUWIRTSCHAFT
// Worauf kommt es an?

VERÄNDERUNG

// PROZESSE
// TECHNOLOGIE
// MENSCH

7

DIGITALISIERUNG DER BAUWIRTSCHAFT
// Worauf kommt es an?

Abschluss der digitalen Transformation

Vier von fünf Unternehmen sehen die digitale Transformation als kontinuierlichen Prozess, der über die nächsten zehn Jahre hinaus laufen wird.

Trendstudie von Tata Consultancy Services (TCS) und Bitkom Research

8

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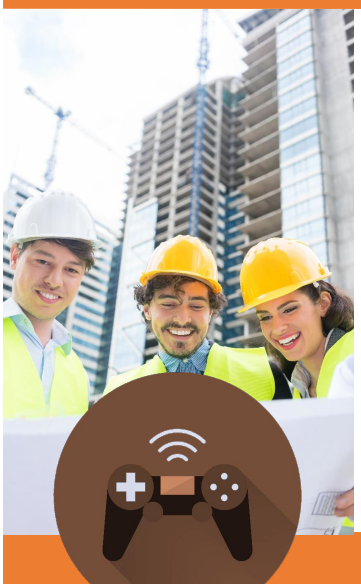
DIGITALISIERUNG DER BAUWIRTSCHAFT
// Worauf kommt es an?

TECHNOLOGIE

Funktioniert nicht ohne die Menschen

12

BIM GAME
// Was ist das?



GAMIFICATION

- ÜBERTRAGUNG VON **SPIELTYPISCHEN ELEMENTEN** IN **SPIELFREMDE ZUSAMMENHÄNGE**
- ZIEL: VERHALTENSÄNDERUNG UND **MOTIVATIONSSTEIGERUNG**
- BEWÄLTIGUNG VON AUFGABEN DURCH INDIVIDUELLE UND **KOLLABORATIVE** LEISTUNGEN.

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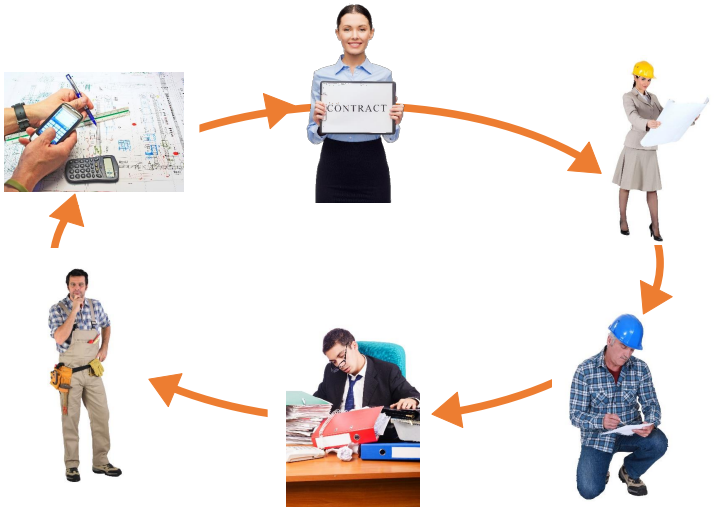
BIM GAME
// Zielgruppe

21

BIM GAME
// Zielgruppe



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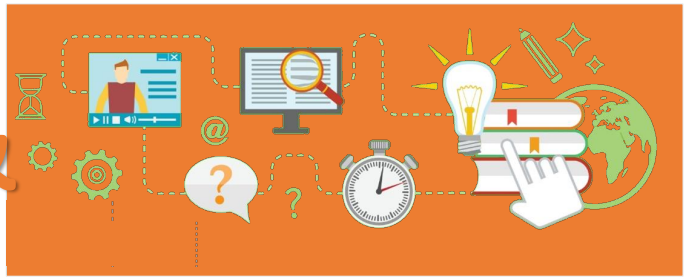
BIM GAME
// e-learning vs. klassisch vor Ort

&



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BIM GAME
// Szenarien

≙

23

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BIM GAME
// nextcloud (e-learning Plattform)

Creativity

Technologies

Collaboration

Flexibility

27

BIM GAME
// nextcloud (e-learning Plattform)

Chat

Mail

File deposit

28

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Figure 1- Event #1 – Oldenburg

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7.2 Event #2: Brussels

1 event, 2 days, 3 locations

10 minutes walk from Brussels Midi station !

24 th April

stress test : LIRL
rue de la Croix de Pierre 73 • 1060 Brussels

stress test : Rotor DC

Rue Prévinaire 58 • 1070 Brussels

25 th April

Congress BIM Game : La tricoterie
158, rue Théodore Verhaegen • 1060Brussels

EVENT BIM GAME

BIM & Sustainbility

24 & 25 th April 2019

Organization

Laboratoire de culture Numérique en Architecture LNA
Faculté d'architecture
Université de Liège
Boulevard de la Constitution 41
4020 Liège

www.lna.uliege.be

What is BIM Game ?

BIM Game: Playing to build the 21st century

The BIM Game is a **role-playing game** whose objective is to **learn to collaborate through the B.I.M.** (Building Information Modeling) process. The participants play the different roles involved in the building environment (project owner, architect, engineer, craftsman,...) around a scenario led by a trainer. Getting the right information to the right people at the right time is the challenge of learning the BIM Game. This is **a European issue** and each country has the same question about the best method to adopt to spread this new culture and especially to integrate it into professional practices. This project, **financed by Erasmus+ and supported by the Besançon GIP**, is based on numerous project follow-ups carried out in the partner countries. This pooling makes it possible to work not only on national scenarios, in relation to local regulations, but also on simulations of international architectural projects, which today correspond to the reality on the ground.

What is the stress test?

The BIM Game is a collaborative role-playing game and, as such, it requires a scenario through which learners will work. A BIM Game scenario will therefore include:

- A problem arising from a real case
- The pedagogical objectives targeted by the trainer
- The distribution of roles
- A welcome letter corresponding to each role
- All the resources and software necessary to solve the problem
- A BPMN diagram

Since the project is built using an agile method, the content of a scenario has evolved since the first tests.

www.bimgame.eu

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What is BIM ?

by Abdelkader Boutemadja, Charlotte Dautremont, Sylvie Jancart
LNA - ULiège

BIM is a collaborative process that has been revolutionizing the workflow of construction stakeholders for over a decade. Often translated as a Building Information Model (a digital model), BIM is also a modeling process and project management.

Through collaboration around the digital avatar, BIM provides better knowledge and anticipation at different stages of the building cycle: better design, planning, construction and project management.

With other methodologies such as Lean Management or the Materials Passport, BIM offers many pathway towards the sustainable development of the construction sector.

"Le processus BIM (Building Information Modeling) révolutionne le flux de travail des acteurs de la construction et particulièrement celui des architectes. Cette lente révolution contribue à de meilleures planification, conception, construction et gestion du projet (Lebegue et Segura, 2015). Malgré ces atouts, le BIM semble être un excellent terrain de promotion des fabricants, avec pour conséquence de transformer les projets d'architecture en catalogue de produits. Ce renouvellement constant va l'encontre du cadre normatif (Directive CE, 2008) sur les déchets et de l'engouement général croissant pour le « zéro déchets ». Si actuellement, nous recyclons beaucoup (+/- 44% de déchets municipaux sont recyclés en 2017) (Europa, 2018), nous réutilisons peu. Le BIM, et son lien direct et constant avec les plateformes de produits industriels, ne ferme-t-il pas la porte à une architecture circulaire ? "

extract from the article "BIM6D: un levier pour une architecture circulaire?" by Charlotte Dautremont, Charlélie Dagnelie, Sylvie Jancart, SCAN'18.

www.lna.uliege.be

PROGRAM of 25TH APRIL • Congress BIM Game

Most conferences will be in French with support in English

08.30 - 09.00	WELCOME COFFEE		
09.00 - 09.15	**WELCOMING SPEECH // Why sustainable BIM ?** by Charlotte Dautremont from LNA - ULiège		
09.15 - 09.30	**BIM GAME PROJECT PRESENTATION** : learning with BIM by Lionel Croissant from GIP BESANÇON		
09:30 - 10:00	**CONFERENCE #1 // RESEARCH :** The Brussels Building Stock as a source of new Materials (BBSM) by Emilie Gobbo from UCLOUVAIN		
10:30-11:00	**CONFERENCE #2 // BIM & circularity :** The contribution of the BIM digital model to the circular economy by Lionel Bousquet from BXLMRS		
11:00 - 11:30	COFFEE BREAK		
11:30 - 12:00	**CONFERENCE #3 // BIM & sustainable :** BIM processes as a tool for integrating sustainable development concepts into the construction world by Vincent Martin from BSolutions		
12:00 - 12:30	**Open discussion** by Abdelkader Boutemadja from LNA - ULiège		
12:30 - 13:30	LUNCH		
13:30 - 14:30	**BIM Game stress test presentation**		
14:30 - 15:00	COFFEE BREAK		
15:00 - 15:40	**WS#1** by Tanguy Pinxteren : **alternative pedagogy** from LIRL	**WS#2** by Henri-Jean Gless : **poker BIM** from CRAI, ENSA NANCY	**WS#3** by Renaud Haerlingen : **Circularity** from ROTOR
15:50 - 16:30	**WS#4** by Hervé Maillot : **Circularity Fiction** from GIP, BESANÇON	**WS#5** by Catherine Cornu : **BIM** from RESERVOIR A	**WS#6** by Claire Roumet : **Energy Cities** from ENERGY CITIES
16:30 - 17:00	Awards for BIM GAME stress test • CLOSING COMMENT		

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SPEAKERS

Emilie Gobbo

Postdoctoral Researcher at UCL,Graphic interpreter and Sketchnoting

The Brussels Building Stock as a source of new Materials (BBSM)

Lionel Bousquet

Architect, Expert BIM & circularity • BXLMRS

BIM & circularity : The contribution of the BIM digital model to the circular economy

Vincent Martin

Architect, Expert BIM • BSolutions

BIM & sustainable : BIM processes as a tool for integrating sustainable development concepts into the construction world

Emmanuel Mossay

Advisor to the Parliament of Wallonia, Visiting Professor, Author of books (Economic Transition)

How could a biocapacitic economy solve several ecosystem issues?

Emilie Gobbo

The FEDER funded **BBSM project** aims to demonstrate that end-of-life materials are resources and that their reintroduction into the cyclical process is positive for the sustainable development of the Brussels-Capital Region: it considers the region as an urban mine, where materials in buildings could maintain their value.The presentation focuses on one part of the project: the analysis of the impact of different energy retrofit scenarios on material stocks and flows. These scenarios can directly influence the nature and quantity of the materials used (inflows) and discarded (outflows) by upgrading or renewing the existing building stock. They can also lead to different environmental impacts and vary the embodied potential (through reuse or recycling) of resources. The overall objective is to inform, sensitize, and lead various stakeholders to responsible and conscious choices when retrofitting a building by adding concerns of resources efficiency while focusing on reducing energy demands.

Lionel Bousquet

BXLMRS is an office of architecture and town planning. Represented by Lionel Bousquet and Antoine Chaudemanche trained at INSA Strasbourg. The practice of the office is based on a logic of flows and networks. **DETHY's project** is a passive renovation of a mixed building in Brussels. It's based around 4 goals: Passive renovation, Eco-conception, Circularity and BIM.We make the assumption that the combination of these different processes makes it possible to achieve for each one an increased efficiency which would be less by applying in isolation one or the other field. It's this mutualisation that can bring intrinsic and coherent qualities (architectural, economic,environmental, flexibility, replicability). The presentation focuses on BIM and circular economy.

Vincent Martin

As an evolving digital prototype of the building, **the BIM models** offer the opportunity to optimize many problems of the world of construction in a controlled industrialized collaborative process during the entire life cycle of a building.

The technical applications for which BIM has the potential to bring environmental added value are multiple (technical simulations, prefabrication, asset management, monitoring, deconstruction, etc.) but this requires overcoming technical, social and legal constraints.

The presentation will aim to understand some of the difficulties and outline few possible solutions for the future.

Emmanuel Mossay

The ecosystem approach offers many opportunities, starting from the limits of biocapacity and other societal issues, to offer answers to public deficits, and the reduction of externalities (and their financing).

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We need you !

wooclap

We invite you to participate in the Stress Test BIM Game team election!

To do this, go to the internet with your smartphone on:

www.wooclap.com

Enter the code:

BIMGAMEULG

and vote !

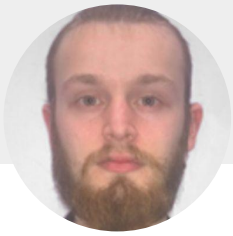
Thanks you for your participation ;-)

WORKSHOP'S LEADERS

Thomas Zech

LIRL teacher

Alternative pedagogy



Henri-Jean GLESS

Architect DE, Doctoral Teacher at CRAI, Nancy

Micro poker

Renaud Haerlingen

Architect, Rotor Member

Circularity

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Thomas Zech

The creation of the Lycée intégral Roger Lallemand (**LIRL**) in September 2017, is the meeting between enthusiasts of education (the association "The Pedagonauts") and the municipality of Saint-Gilles who both wanted to create a contemporary secondary school.

The educational project is inspired by the proposals of André Giordan (University of Geneva) and Jérôme Saltet (Editions Play Bac) who have supported and followed this initiative since its beginnings in 2010, and who make the bet to change the school by forming "Autonomous, responsible, enterprising and happy citizens!"

LIRL project with "Design with sense".

Henri-Jean GLESS

Micro poker is an agile practice to support meetings. It is a game composed of four cards that allows the different actors of a BIM project to exchange ideas about the BIM tasks to be done. The aim of the game is to estimate the complexity and duration of the tasks to be performed. For this purpose, each card offers several estimation scales: numerical, size, urgency or random. At the same time, the actors choose and play a card. This is followed by a phase of exchanges and debates to understand the choices of others and then rally them or try to convince them to join us. This practice then initiates so-called elicitation, refinement and evaluation activities of BIM design tasks between designers.

The objective of micro poker is to invite all participants in a meeting to participate in the creation of a common and accepted definition of a BIM design task.

Renaud Haerlingen

Rotor is a cooperative design practice that investigates the organisation of the material environment.

We develop critical positions through research and design. Besides projects in architecture and interior design, we also produce exhibitions, books, economic models and policy proposals.

Rotor was founded in 2005. Today, a core of about a dozen long-term collaborators sets the agenda of the group. The concrete realisation of our projects is tributary to a more extended network of ad hoc collaborators.

In 2016, the spin-off **Rotor Deconstruction**was founded as a separate entity. Its mission is to facilitate the reuse of building components.

WORKSHOP'S LEADERS

Hervé Maillot

Officer on standby at the French Ministry of Higher Education and Research

Circularity fiction

Catherine Cornu

Architect
MSc Adaptive Architecture and Computation - UCL London
Research / teaching assistant - UCL Louvain

BIM

Claire Roumet

Partnership and strategy
Energy cities

Energy cities

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Hervé Maillot

If there is another world, it is in this one".

Circularity Fiction.

STOP.

Post peaks scenario.

STOP.

40 minutes to glimpse an unknown world, ours in just 50 years.

STOP.

Let us not lack imagination, nor courage, nor wisdom.

Catherine Cornu

Insérez votre texte ici

Insérez votre texte ici

Insérez votre texte ici

Insérez votre texte ici

Insérez votre texte ici

Insérez votre texte ici

Insérez votre texte ici

Claire Roumet

Energy cities want a radical transformation of the energy systems and policies, giving our citizens the power to shape a decentralised and renewable energy future.

We believe that the energy transition is not just about clean energy or great technologies: it is about wise use of resources while strengthening local participation and well-being in a democratic Europe.

EVENT BIM GAME

BIM & Sustainbility

Organization

Laboratoire de culture Numérique en Architecture LNA
Faculté d'architecture
Université de Liège
Boulevard de la Constitution 41
4020 Liège

www.lna.uliege.be

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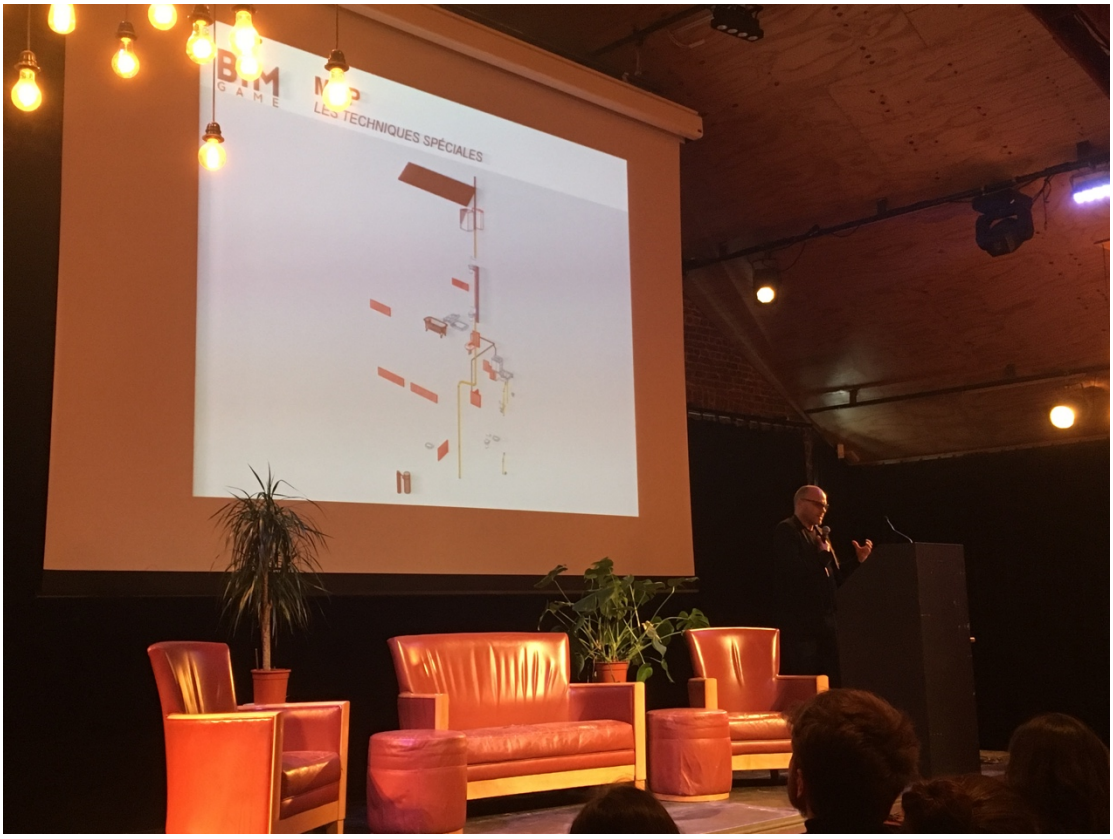

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Figure 2- BIM GAME Event #2 - La tricoterie (Brussels)

Figure 3- BIM GAME Event #2 - ROTOR (Brussels)

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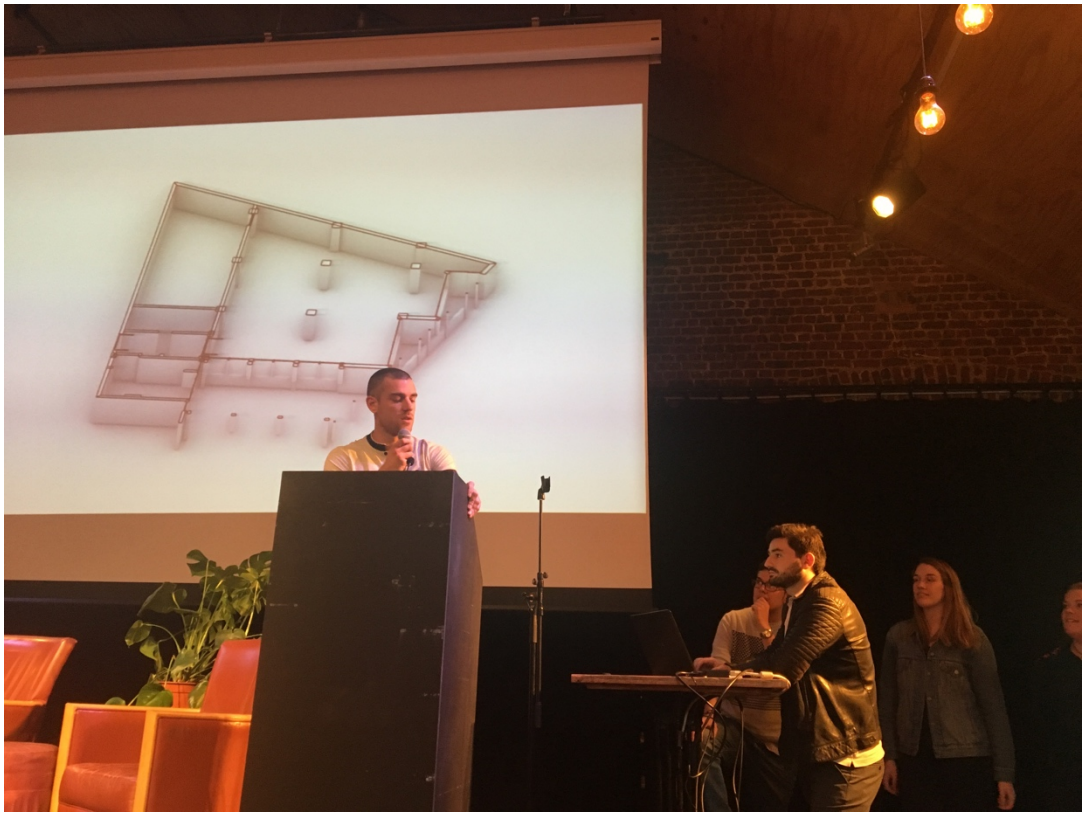

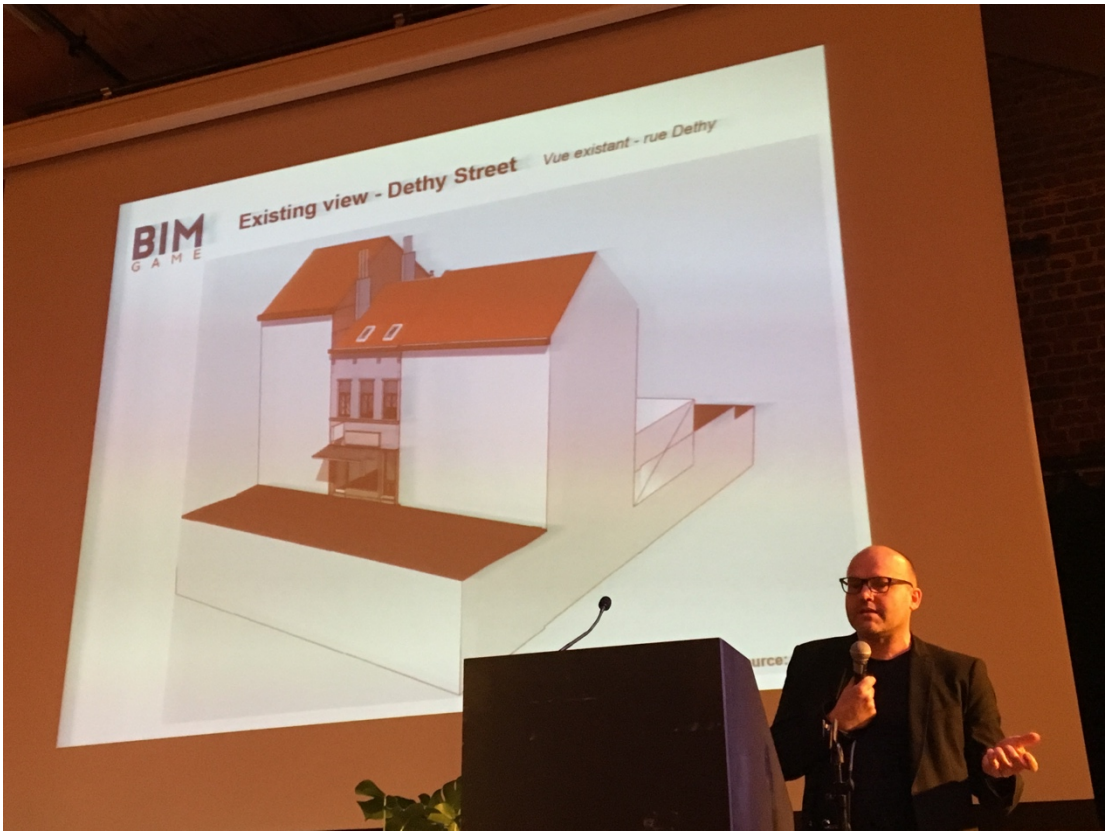

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7.3 Event #3: Valencia

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Figure 4 - BIM GAME Presentation - EUBIM 2017 – Valencia

Figure 5 - in BIM GAME stand - EUBIM 2019

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Figure 6 - BIM GAME Presentation - Valencia

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EUBIM 2019 - BIM International Conference / 8º Encuentro de Usuarios BIM
València, 23, 24 y 25 de mayo 2019
Escuela Técnica Superior de Ingeniería de Edificación
Universitat Politècnica de València

PRESENTACIÓN

EUBIM 2019: JUST DO BIM

Debemos superar la fase de la juguetería

Ya van ocho años, ocho ediciones de EUBIM. Aquella iniciativa que nació como una necesidad de reunirnos, de aprender unos de otros, de conocernos cuando éramos muy pocos, en medio del desértico interés por BIM durante el período prodigioso del 2000 al 2007 y tras la posterior debacle económica de nuestro sector, hoy es el congreso internacional sobre BIM de carácter científico y profesional veterano en España.

Y aunque ahora somos legión, nos da la sensación de que somos una legión deslavazada, sin una dirección y objetivos comunes (aunque sí con necesidades comunes), donde cada uno, cada una, está haciendo BIM a su manera, según puede, le dejan o cree que es la mejor aplicación de la metodología.

Asistimos al nacimiento de la Comisión es.BIM con mucha ilusión, dispuestos todos y todas a aportar de forma generosa, voluntaria, nuestro saber hacer, conocimiento y experiencia para marcar las directrices que debían definir la profunda transformación que nuestro sector requiere. Aquello quedó en un conjunto de documentos de carácter orientativo, de seguimiento voluntario, donde apenas se percibe la transformación que la adopción de BIM exige por parte de todos los agentes del sector.

Sabemos de la constitución de la Comisión BIM Interministerial gracias al BOE. Nada más sobre su trabajo, objetivos, hitos, avances, etc.

Las Administraciones Públicas están haciendo su transición particular (aquellas que lo están haciendo, claro) de forma independiente, particular, no coordinada, por pequeños grupos de técnicos con algo de presupuesto para formarse, pero sin capacidad para acometer la transformación digital necesaria que adoptar BIM exige. Da la sensación de que esto depende de la voluntad de unos funcionarios inquietos que intentan mantenerse al día, reciclarse, pero sin una apuesta decidida desde la parte política y gestora por promover la transparencia y certidumbre que BIM ofrece a la gestión del gasto público en infraestructuras y edificación pública.

En el sector privado, las promotoras que exigen el desarrollo de sus proyectos inmobiliarios en BIM parecen trituradoras consumiendo entregables, con el modelo completo, con interminables informes de interferencias, en un nivel de desarrollo casi, casi LOD 500 en la fase de definición…

Las constructoras, utilizando BIM para detectar incoherencias en los proyectos con el fin de preparar los contradictorios, modificados, reformados… intentando desesperadamente que BIM sea el que se adapte a su rancio método de beneficio económico-empresarial y sin apenas síntomas ni voluntad por invertir en la mejora de su gestión del proyecto más allá de la bajada de los precios de subcontratación frente a los de licitación. Para la mayoría, BIM es una nueva herramienta para seguir haciendo lo de siempre.

Y un montón de profesionales, arquitectos, arquitectos técnicos, ingenieros de caminos, ingenieros civiles, ingenieros industriales… intentando hacer BIM como pueden, les dejan, saben o creen saber, cada uno con su sistema de estandarización particular/ propio/ privado, guardando celosamente sus objetos BIM, deseando que IFC avance y sea de verdad Open BIM, sometidos a las actualizaciones de cada empresa fabricante de software BIM, más preocupadas por fidelizar usuarios a sus entornos BIM que de interoperar con otros sistemas y favorecer realmente el intercambio de información entre agentes intervinientes en el proceso constructivo.

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Eso sin hablar de la formación en BIM, campo abonado para advenedizos, iluminados y prometedores de aprendizaje rápido y fácil en apenas 6 horas de curso, o que dicen conceder títulos de máster con 150 horas de formación. Y no hablemos de los programas de formación reglada de grado en el ámbito de la Ingeniería y la Construcción. Ni rastro de una apuesta decidida por la implementación de su aprendizaje en las materias fundamentales de cualquiera de las titulaciones de los que van a dirigir los proyectos, la ejecución y el mantenimiento de los edificios e infraestructuras dentro de muy poco. Muchos proyectos de innovación docente, de innovación educativa, pero nada de actualizar los caducos programas de formación universitaria a la revolución 4.0 de la era digital y de la información. La mayoría de los actuales planes de estudio (los primeros fruto de la adaptación al Plan Bolonia) empiezan ahora su revisión y nueva acreditación por parte de la ANECA, pero no parece que haya, de momento, mucha intención de introducir las mejoras que preparen a lo futuros técnicos para los avances tecnológicos y metodológicos que se están produciendo y se van a encontrar a su llegada al mundo profesional.

Solo hay una buena noticia ante este panorama: los colegios profesionales, por fin, toman conciencia de la re-evolución que se está produciendo y apuestan por preparar, formar, informar a sus colegiados de las novedades y actualizaciones que aparecen. Esperemos que, como interlocutores de todos nosotros ante las Administraciones Públicas, empiecen a exigir un poco de coherencia y marcación de objetivos comunes a todo el sector.

Y así estamos. Parece que nos hayan abierto una nueva juguetería y ahora todos tenemos acceso a ella. Hay muchos juguetes, todos espectaculares, todos hacen cosas increíbles, nos tienen fascinados, absortos, entretenidos… Tal vez haya llegado el momento de dejar de jugar cada uno con su juguete favorito y empezar a jugar (hacer BIM) todos juntos, contribuyendo de una forma seria y organizada a la auténtica transformación del sector, a su desembarco en el s. XXI, en la era de la información.

BIM no es un cambio de herramienta de trabajo, es un cambio rotundo en la mentalidad y forma de entender el negocio de la construcción, donde la competencia se mida por la profesionalidad, capacidad tecnológica y valor añadido, y no por una mal entendida economía de medios que solo se basa en la transferencia del riesgo propio a un tercero.

Salgamos de la juguetería. Superemos la fase inicial del jardín de infancia y empecemos a construir un nuevo escenario de madurez BIM, de profesionalidad y avance del sector. Es nuestra oportunidad de rematar la re-evolución que empezamos hace 8 años, de abajo a arriba. Ha llegado el momento de tomar conciencia de nuestro papel más allá de “evangelizadores BIM” y alzar la voz para que nos oigan los *policiy-makers*. Ya nos estamos cansando de jugar. Ahora queremos directrices y objetivos serios que, de verdad, sitúen en la era actual a nuestro sector.

Hay otros congresos y encuentros BIM, pero ninguno son EUBIM. Aquí nos reunimos la legión de usuarios BIM para contarnos lo que aprendemos, para compartirlo, para sentar las bases de nuestra entrada en la madurez BIM. Aquí no hay políticos diciéndonos lo que van a hacer. Aquí hay profesionales demostrando lo que son capaces de hacer. EUBIM en la herramienta para organizarnos, para establecer dónde está el límite del conocimiento y madurez BIM en estos momentos en nuestro país, para invitarnos a ir más allá, avanzar e innovar. Y sí, durante tres días y medio, vamos a jugar, a divertirnos y a aprender jugando. Bienvenido, bienvenida a EUBIM.

El Comité Organizador de EUBIM 2019

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Universitat Politècnica de València

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7.4 Event #4: Besançon

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14h30 **WORKSHOP (to choose among 3)**

WORKSHOP # 1
A pilot project in our territory: to grow, train, organize collectively and create a sector around the circular economy
Julie BENOÎT (Bellastock - France)

WORKSHOP # 2
BIM & Facility Management
Ronan BELLIER (Pôle Fibres-Energivie - France)

WORKSHOP # 3
BIM as a decision support tool: deconstruction or demolition
(Université of Liège - Belgium)

15h30 **Feedbacks from workshops by the pupils of "Conseil Académique de la Vie Lycéenne"**
(CAVL - Besançon - Dijon)

16h00 **Speech by the Rector of the Bourgogne-Franche-Comté Educational District**
Jean-François CHANET

16h30 **Delivery of Open badges to the teams (BIM GAME contest)**

17h00 **Close of the seminar**
You are welcome at Hop Hop Hop café from 5 pm

REGISTRATION
Required registration **HERE**
Or call (+33) 7 70 12 77 00
Deadline : 20th of June 2019

HOW TO GET TO THE MSHE ?

Access by bus/tram (see the website www.ginko.voyage/) :
By tram: Chamars stop, lines 1 or 2
By bus: Chamars-Esplanade stop, lines L4, L6 or L10

Access by car :
To reach the Charles Nodier street, follow the direction "City Center", then "Parking Chamars"de la Mairie".

Tuesday 25th of june 2019 from 7pm to 1am
at the RODIA rue de Chardonnet - Besançon

FREE ACCESS

Come share a friendly time and exchange with European experts ...
- Welcome reception
- Presentation of student work following the "BIM GAME" contest
- Concert of the band "Nose to Foot"

With the participation of : mshc

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Figure 7 - BIM GAME Event #4 - Besançon

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8 Annex E: BIM and CIRCULAR ECONOMY (Brussels presentation by Lionel Bousquet)

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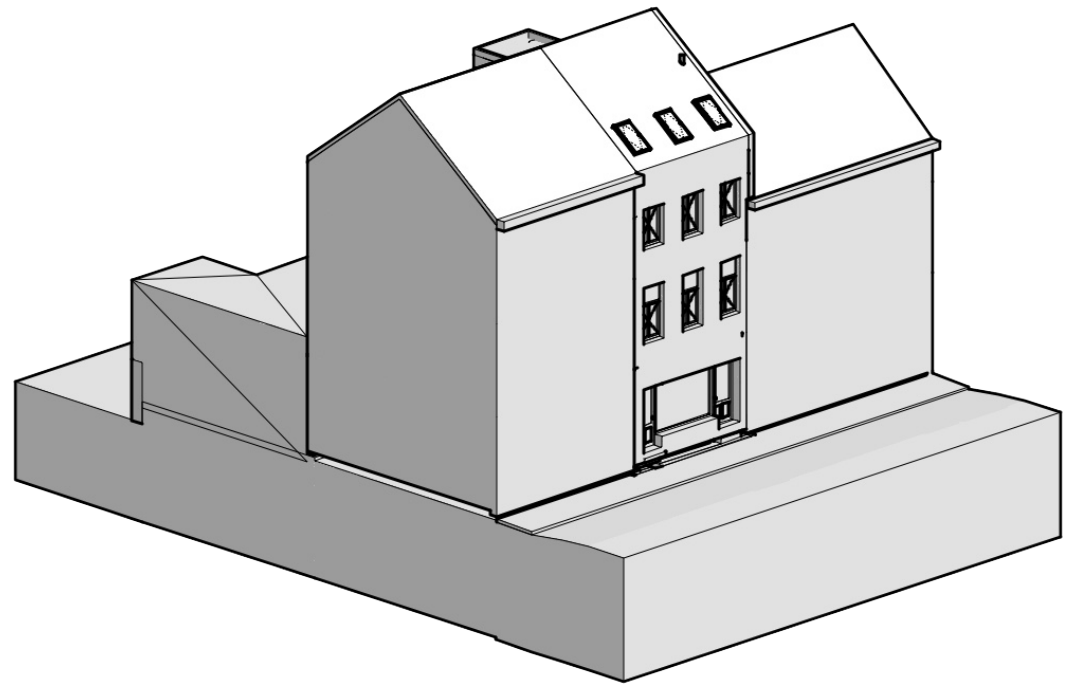
BIM
GAME



BIM AND CIRCULAR ECONOMY

BIM et économie circulaire

Wednesday, June 26, 2019

Mercredi 26 juin 2019

Lionel Bousquet
BXLMRS

AIMS OF THE PRESENTATION
BUTS DE LA PRÉSENTATION

- **Interests of BIM: application to a specific case.**
  Intérêts du BIM : application sur un cas concret.

- **How BIM can limit the environmental impact of the site.**
  Comment le BIM peut limiter l'impact sur l'environnement du chantier.

- **How to use BIM in a circular process.**
  Comment utiliser le BIM dans une démarche circulaire.

SUMMARY

PLAN DE L'EXPOSÉ

1. Knowledge of the building
   1. La connaissance du bâti
2. Using BIM and other process
   2. Utiliser le BIM et d'autres processus
3. Organizing building site
   3. La préparation du chantier
4. BIM continuum
   4. Le BIM continuum

1. KNOWLEDGE OF THE BUILDING

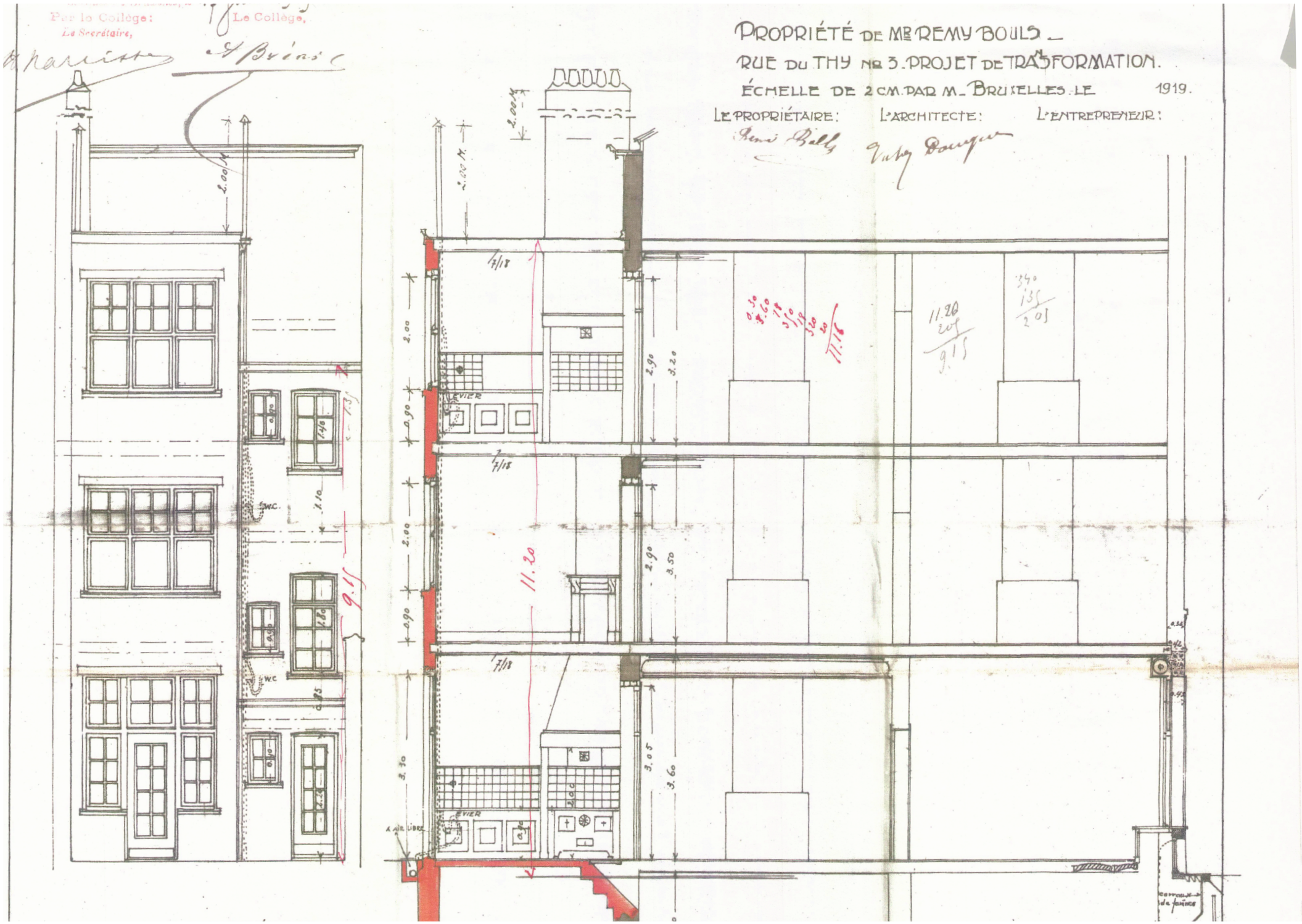
LA CONNAISSANCE DU BÂTI

rue Dethy 3 - Saint-Gilles
BRUXELLES - Belgium

source: BruGIS®

BIM GAME

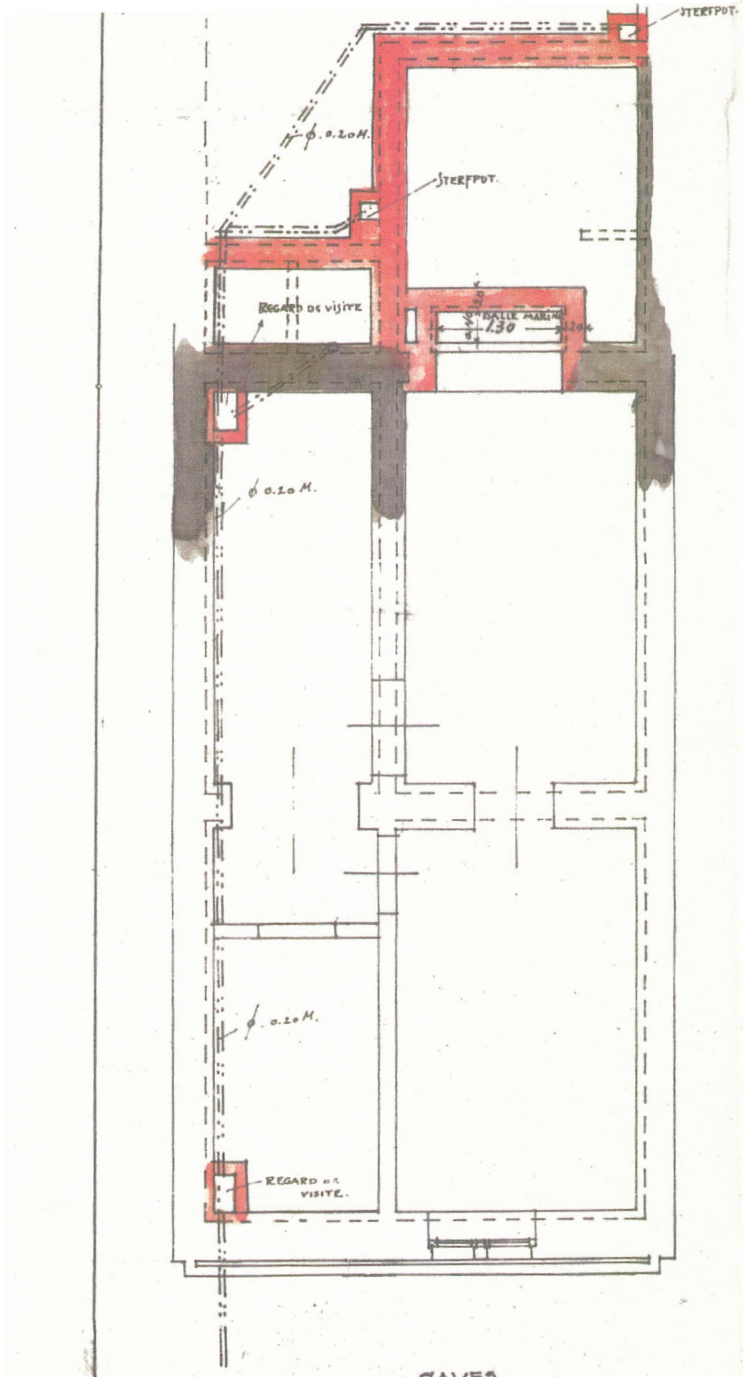
1919



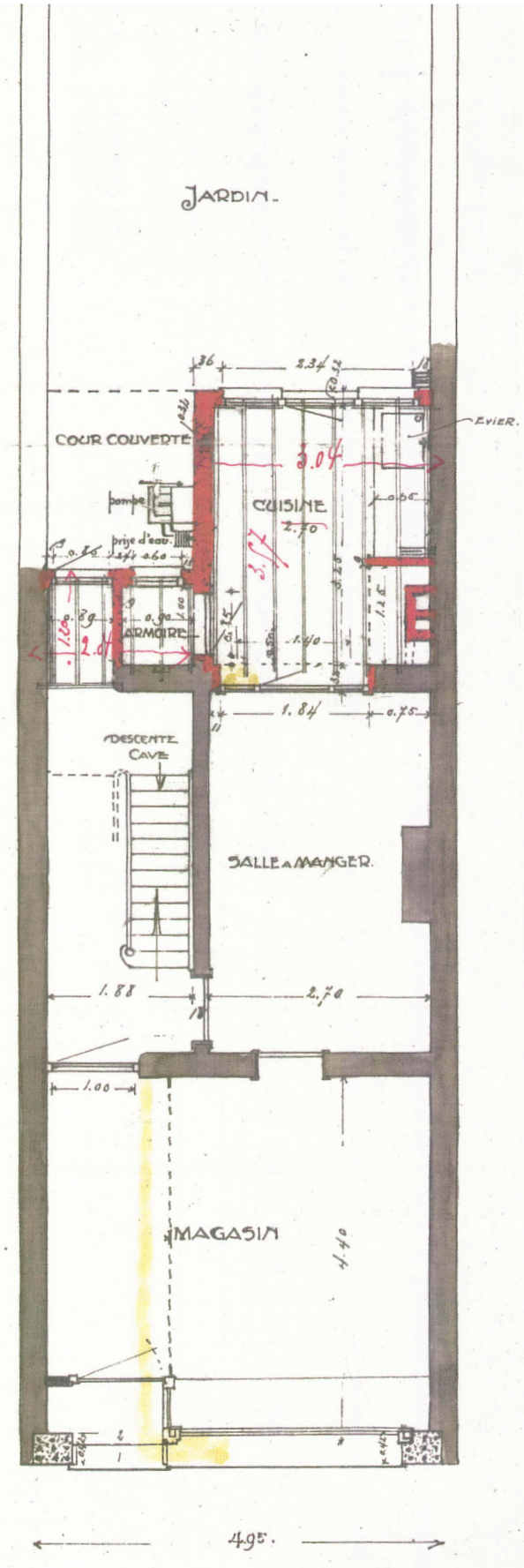
source: urbanisme Saint-Gilles

BIM GAME

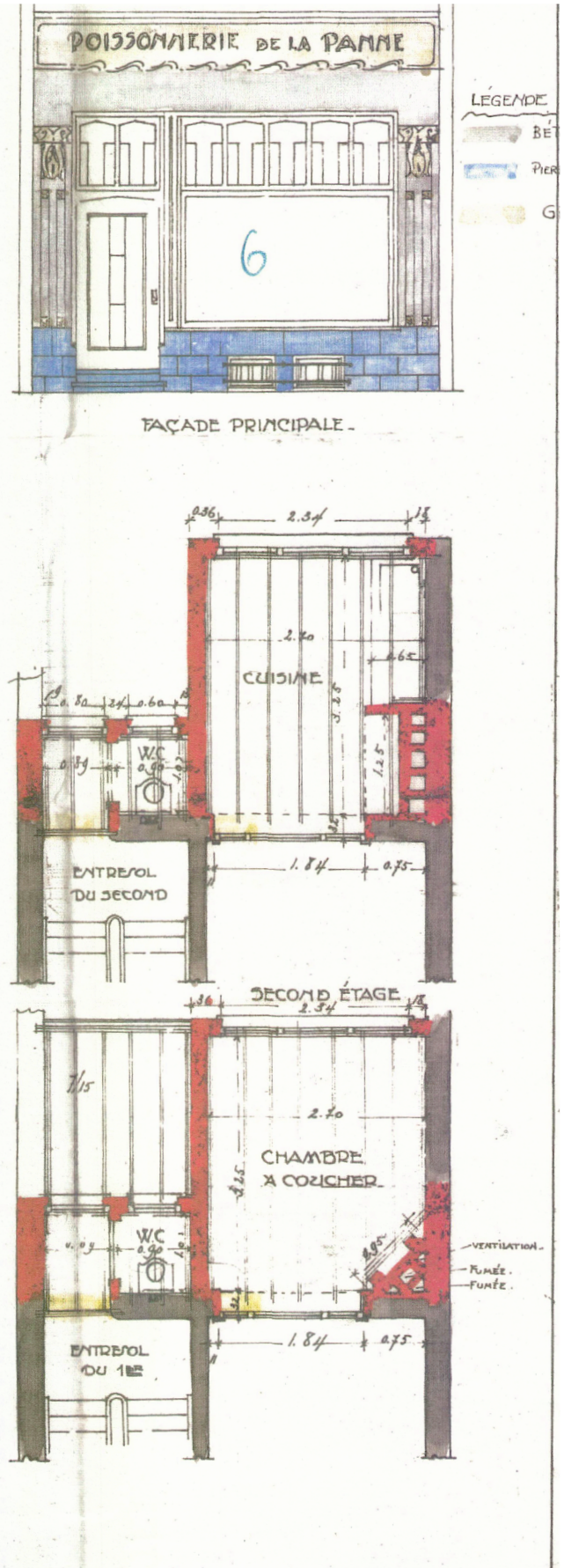
1919



CAVES
EGOUTS - FONDATIONS.



- REZ. DE CHAUSSÉE -

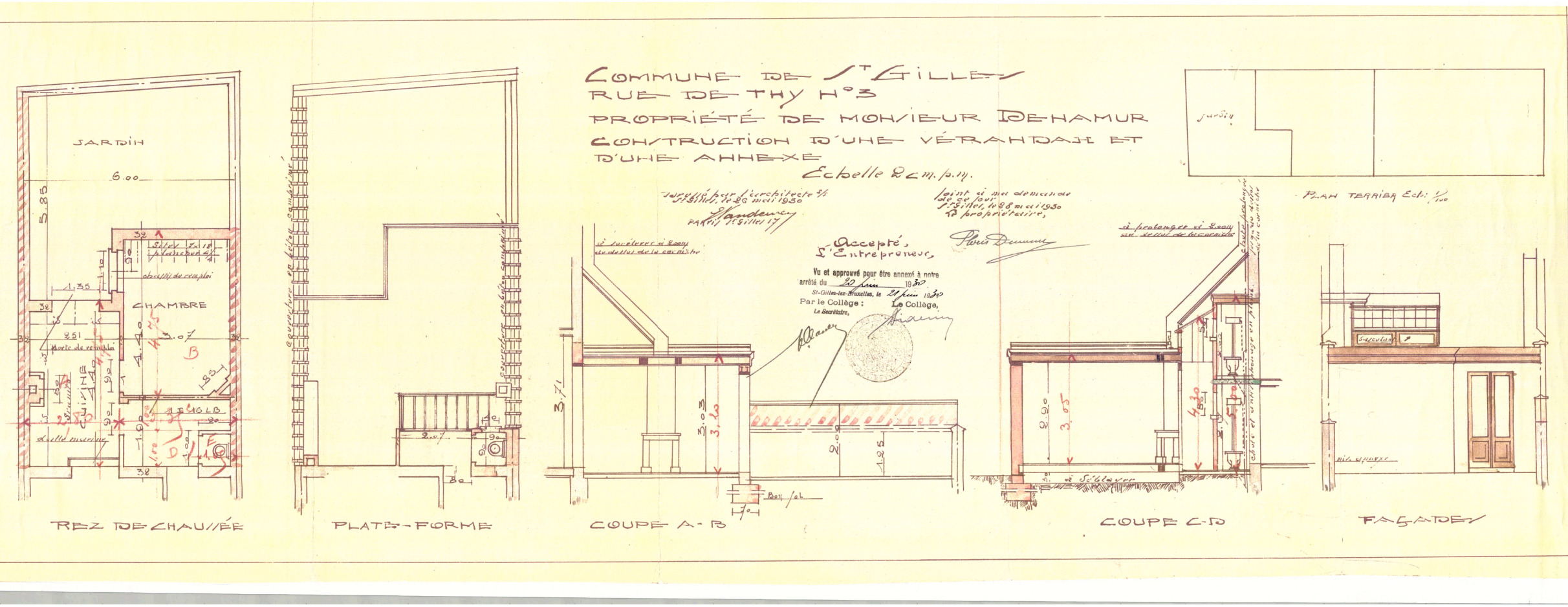


- 1ER ÉTAGE -

source: urbanisme Saint-Gilles

BIM GAME

1930



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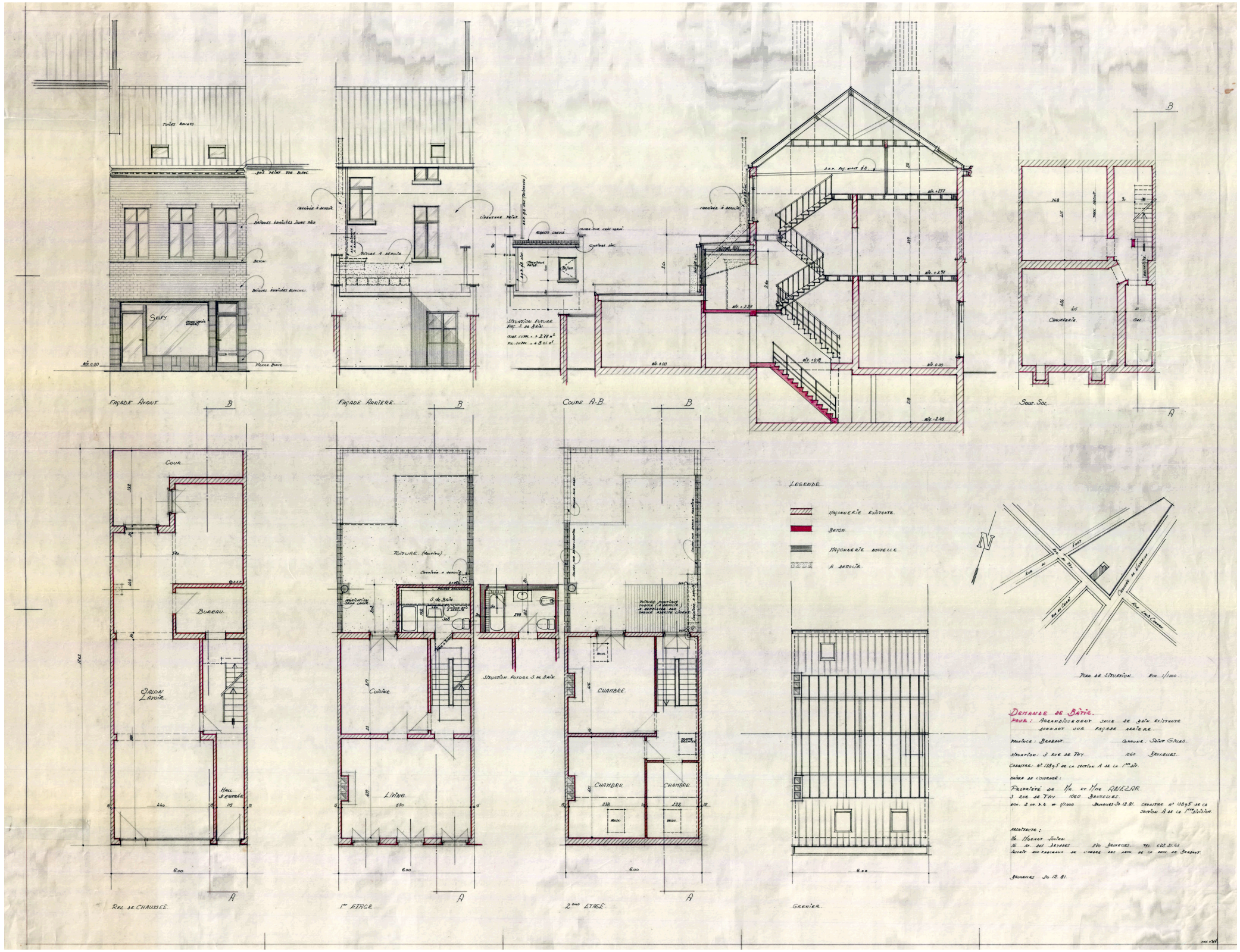
BIM GAME

1984



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BIM GAME

2017

source: BxlMrs©

BIM
GAME

2017

source: BxlMrs©

BIM GAME

2017

Vue façade intérieur d'ilôt - partie haute

Vue façade intérieur d'ilôt - partie basse

Vue mitoyen Ouest intérieur d'ilôt

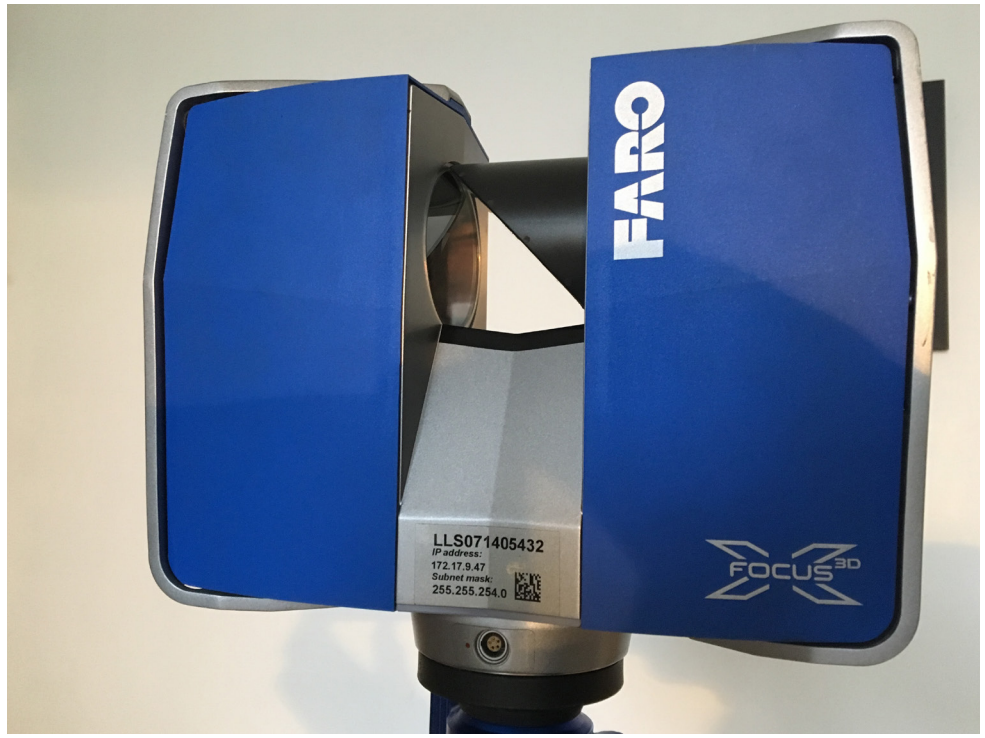
Vue mitoyen Est intérieur d'ilôt

source: BxlMrs©

BIM GAME

3D SCAN - POINTCLOUDS

Scan 3D - nuages de points



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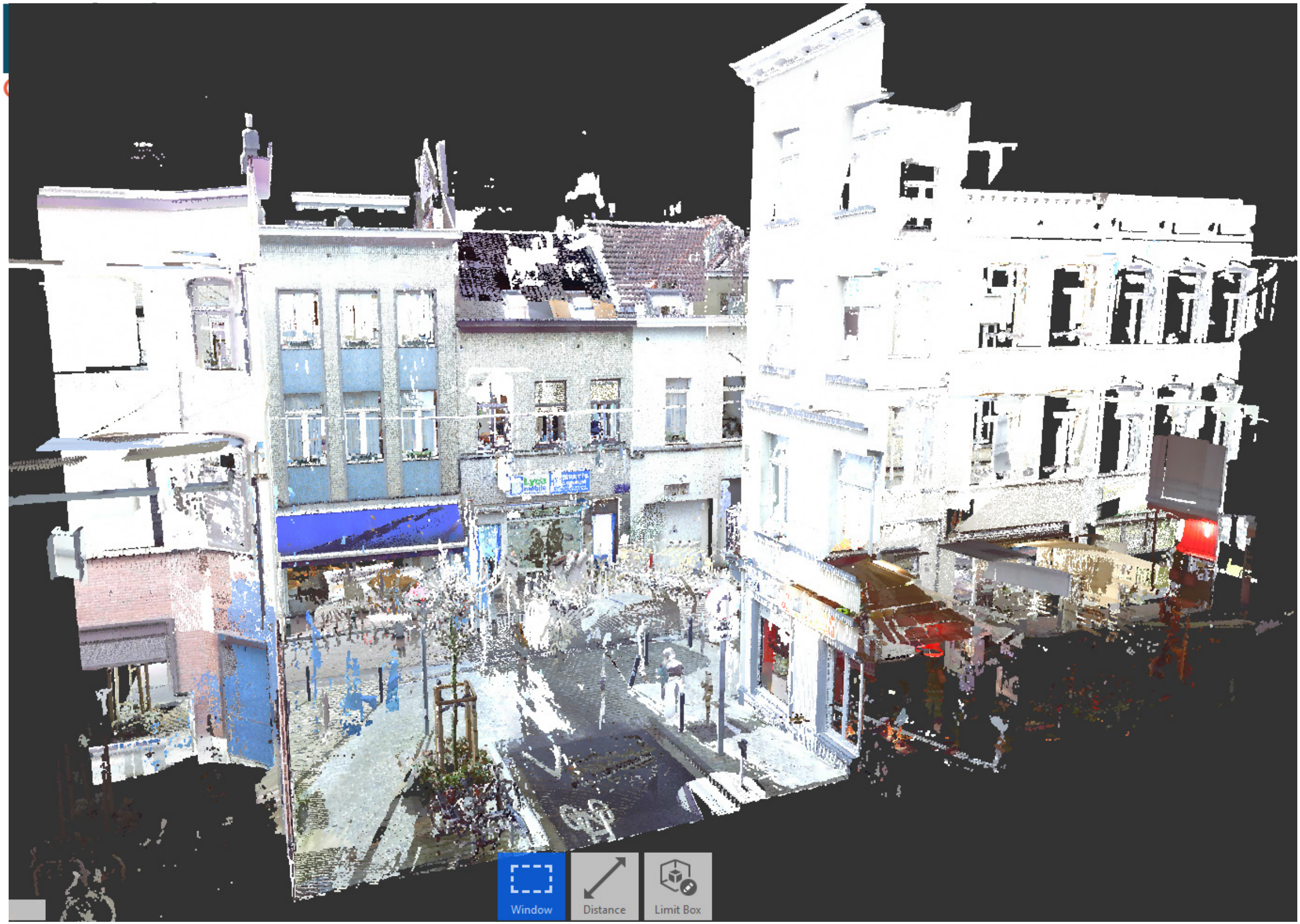

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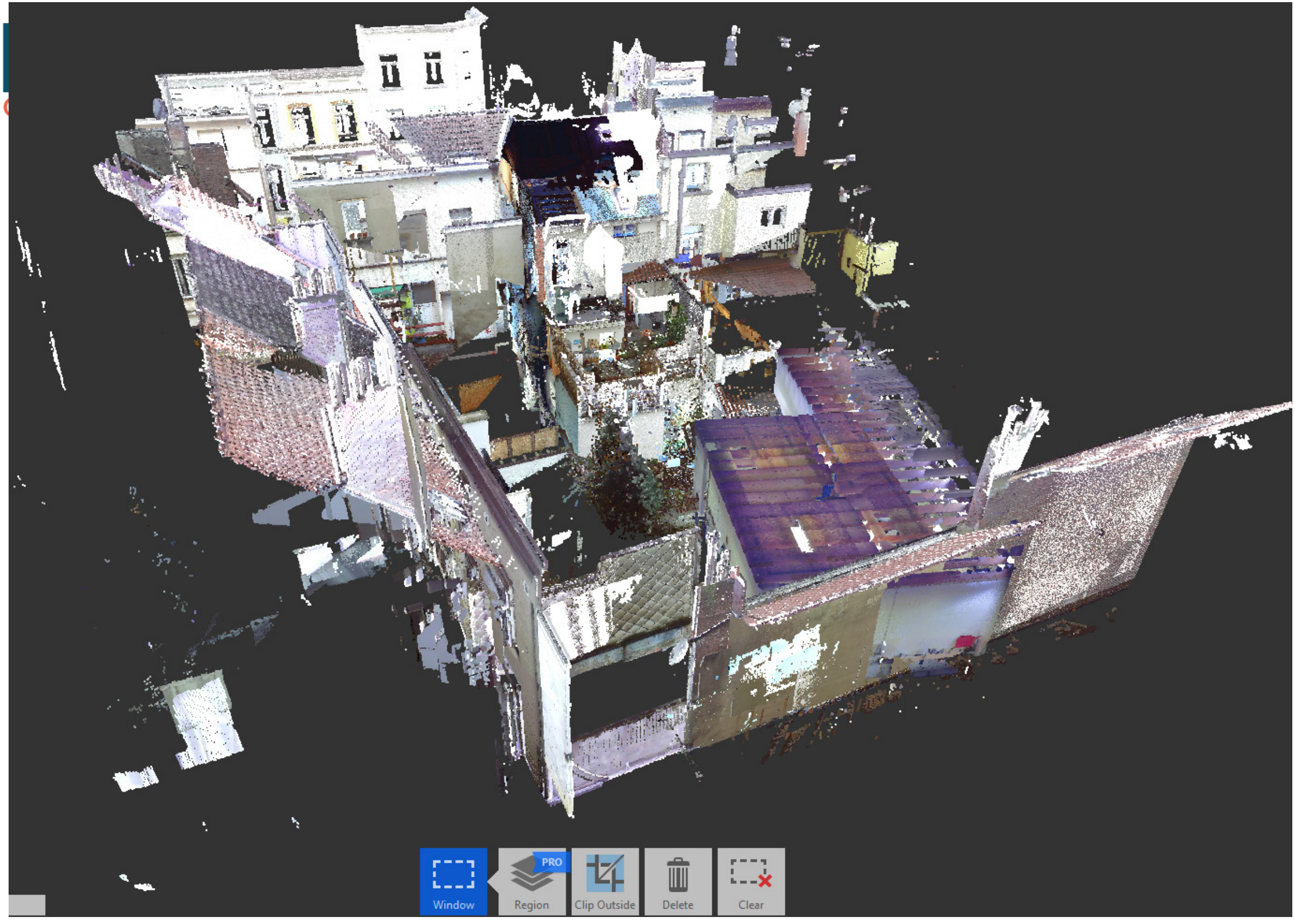

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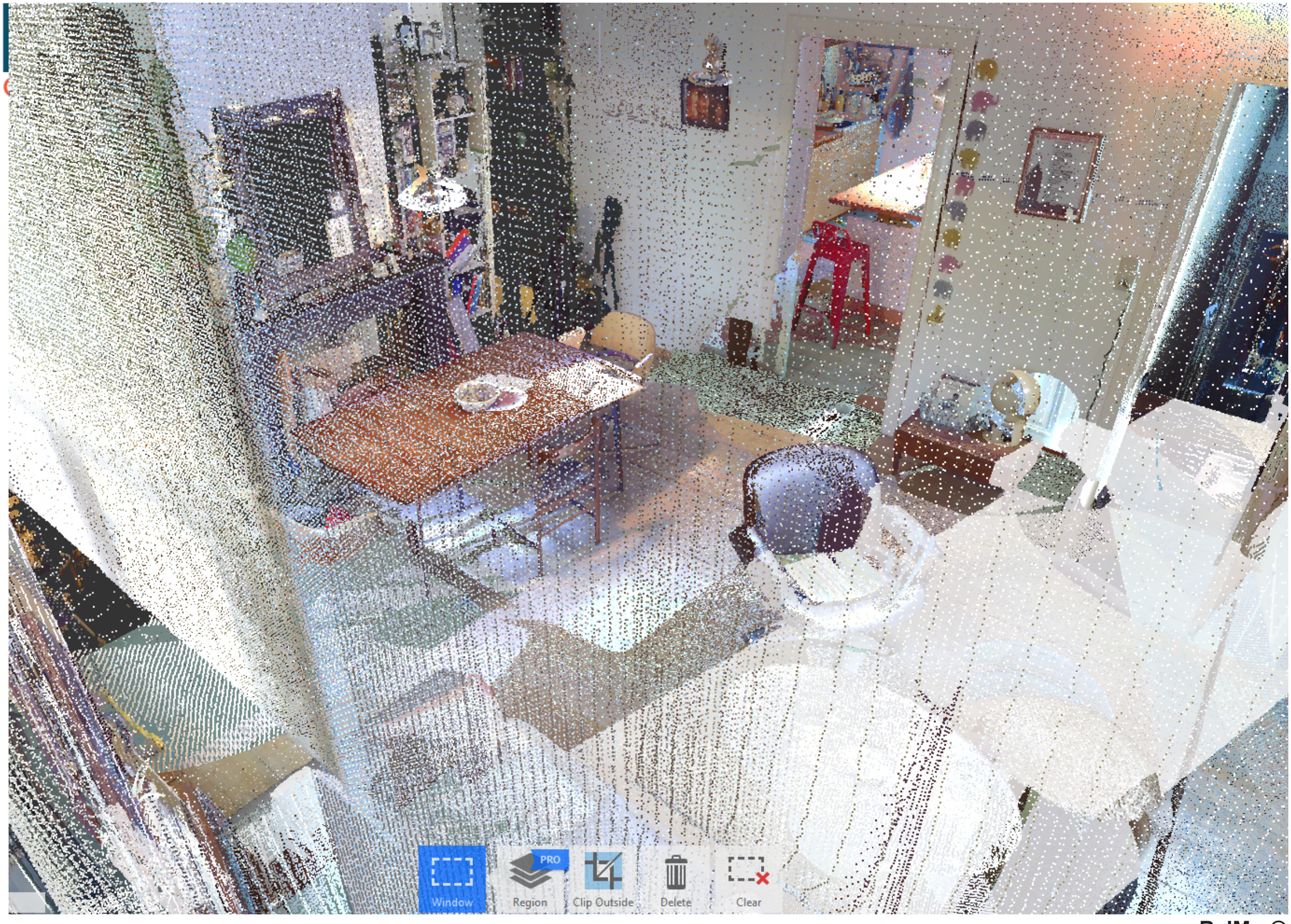

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BIM GAME

RDC

source: BxlMrs©

BIM GAME

R+1

source: BxlMrs©

BIM GAME

Section - *Coupe*

source: BxlMrs©

BIM GAME

Section - *Coupe*

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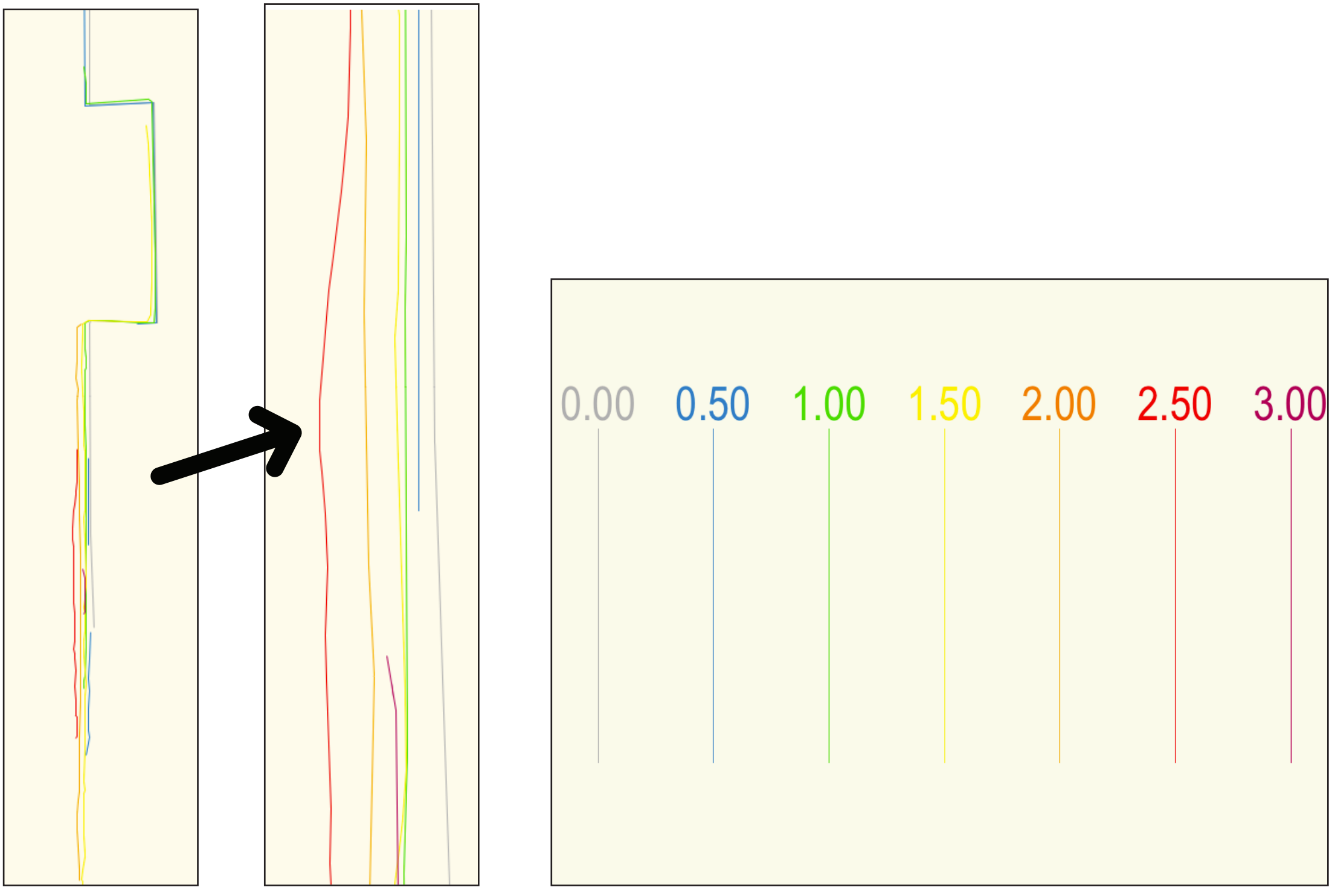
BIM GAME

South - *Sud*

North - *Nord*

Pointcloud ----> architectural drawing

Nuages de points ----> dessin architectural



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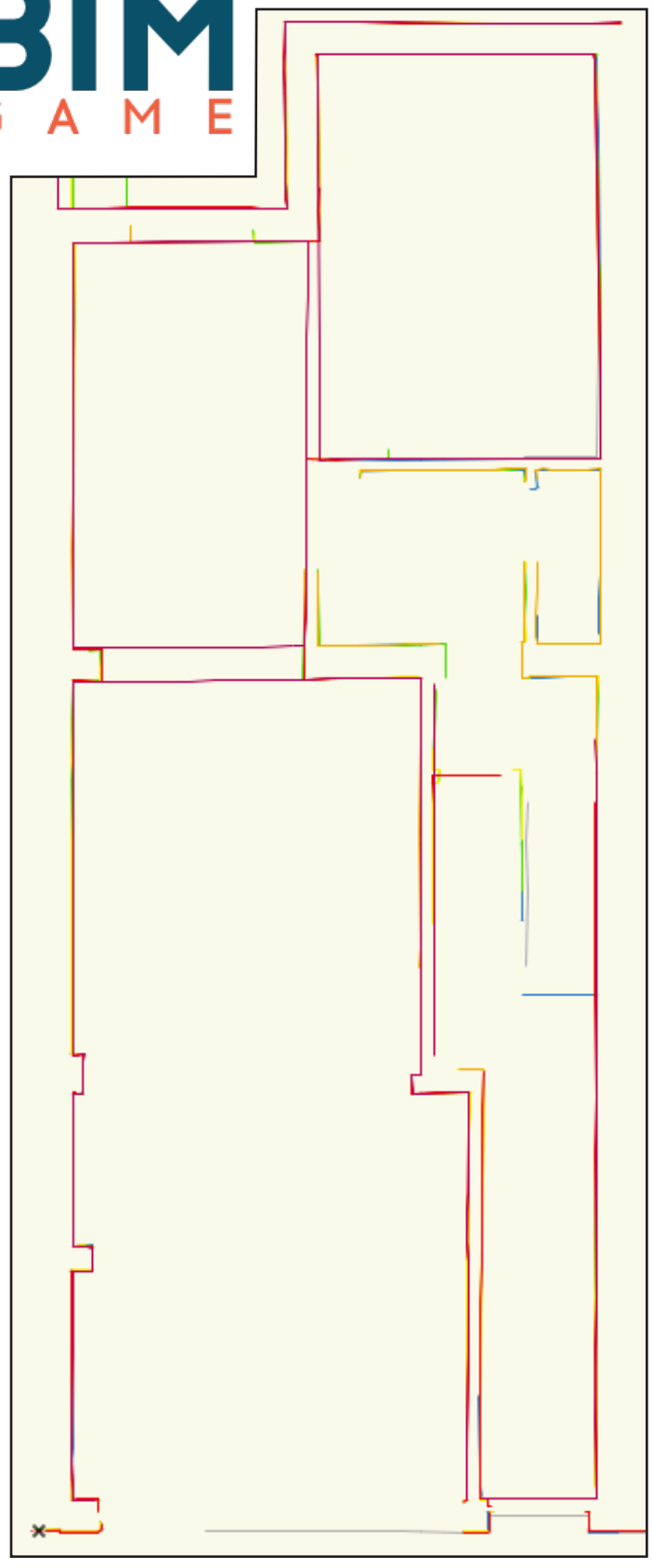
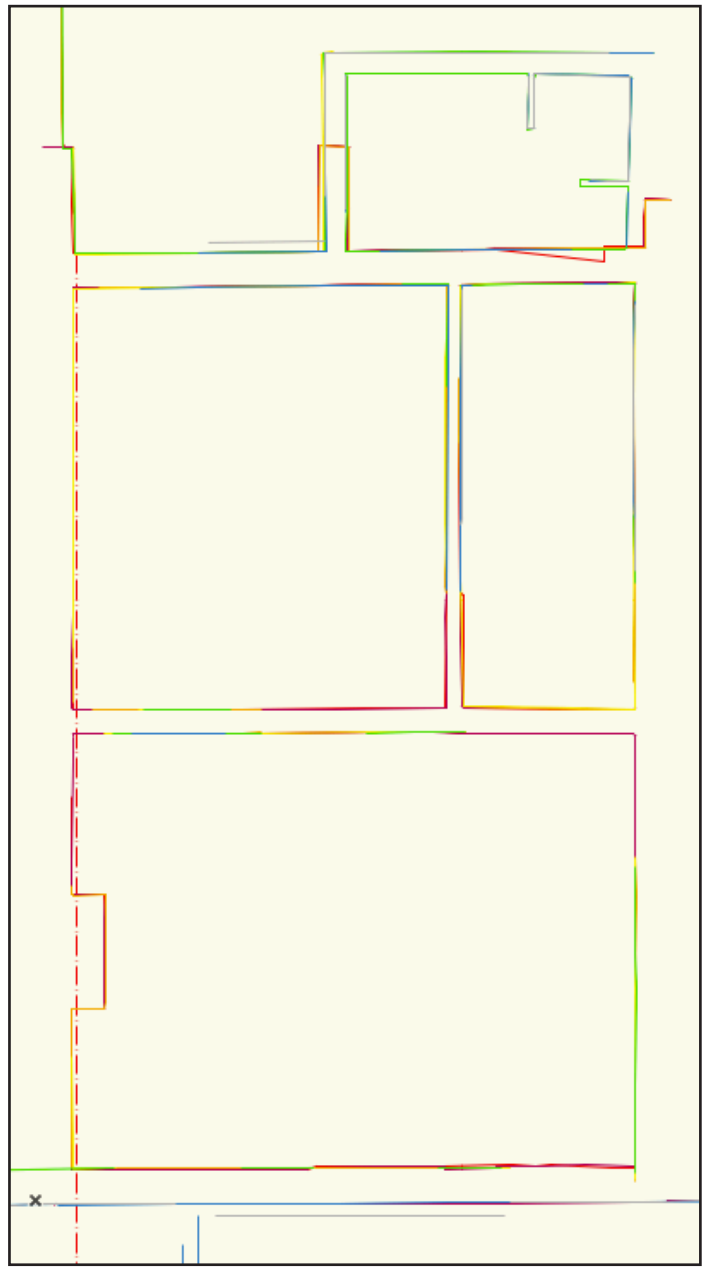
BIM GAME

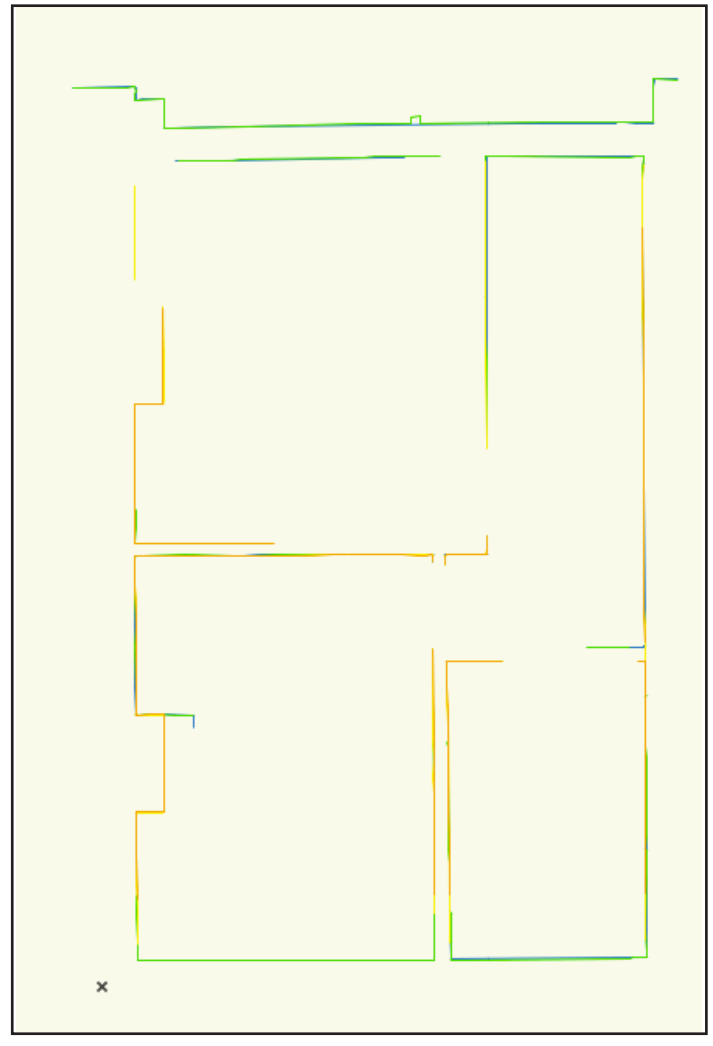
Rdc



R+1



R+2



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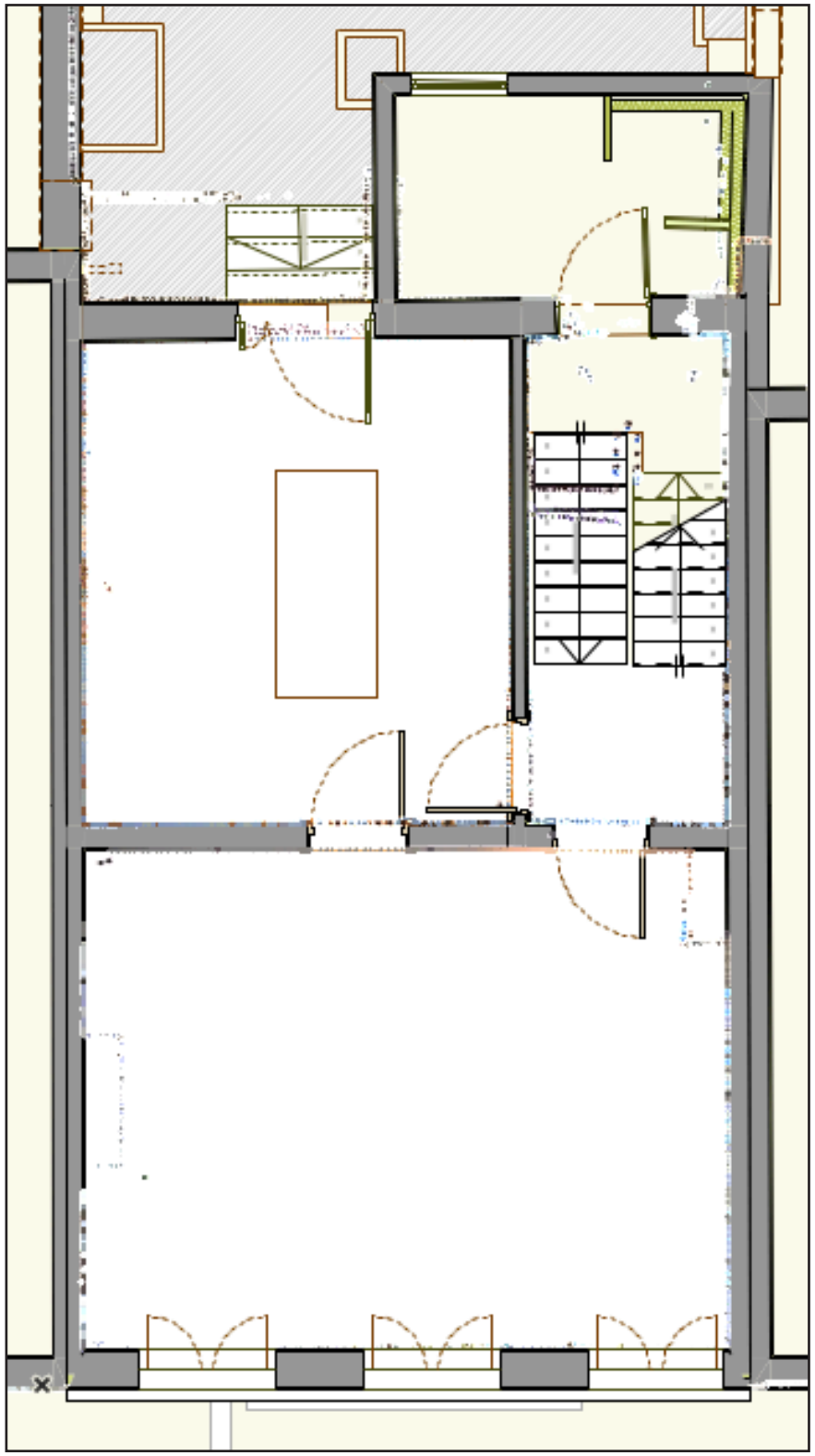
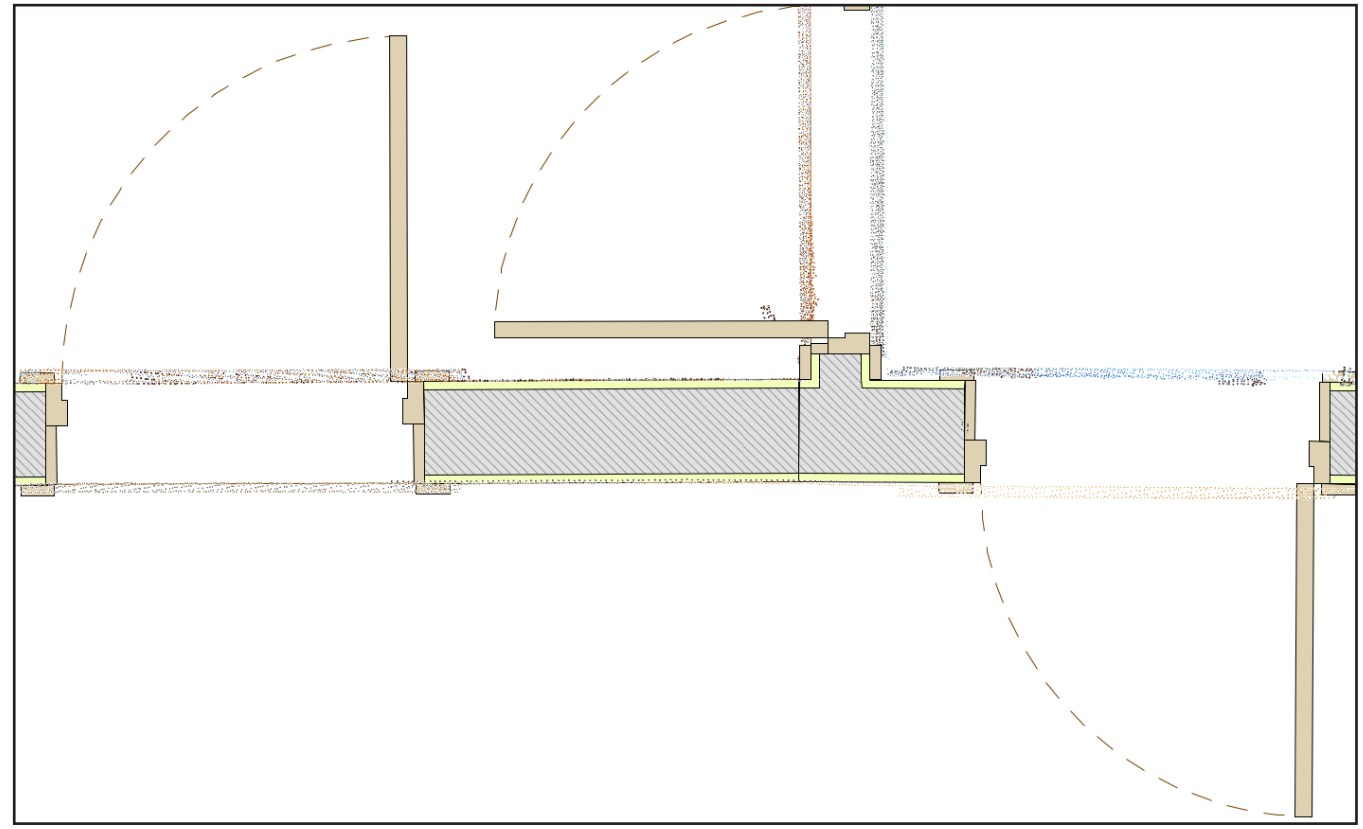
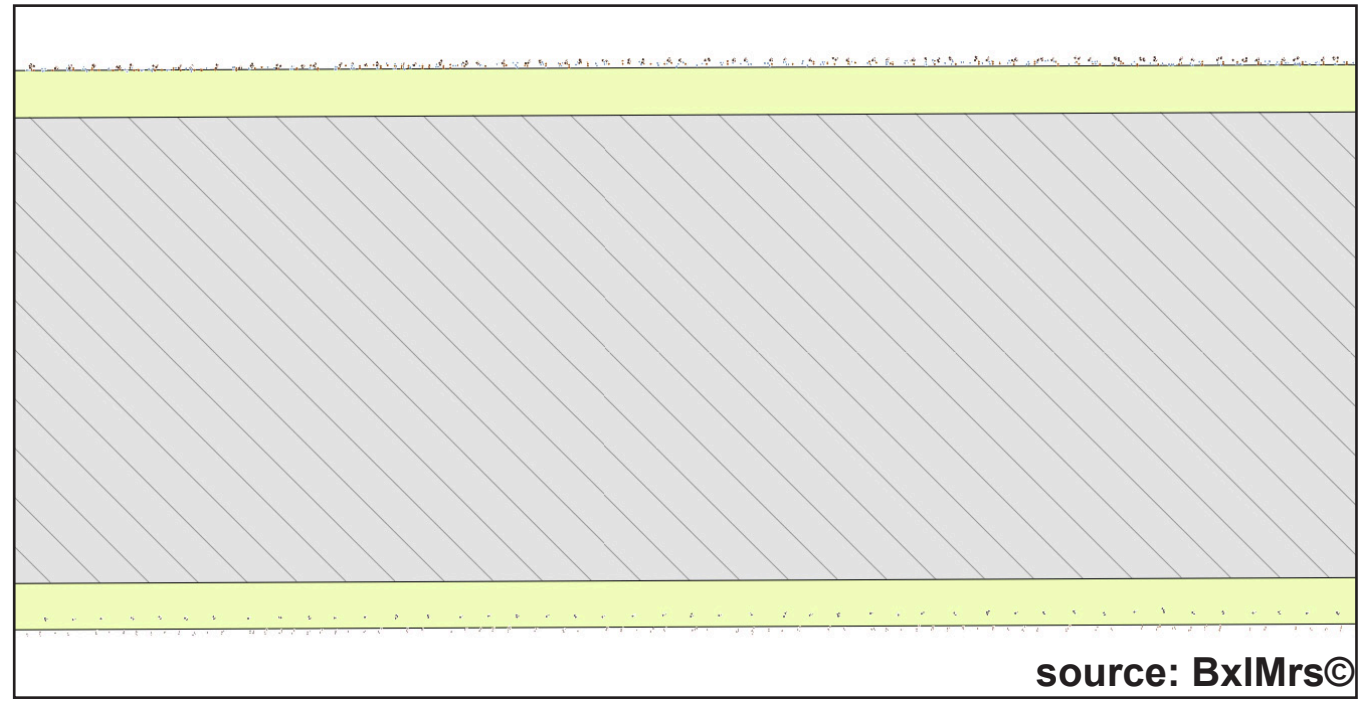
Pointcloud ----> architectural drawing

Nuages de points ----> dessin architectural



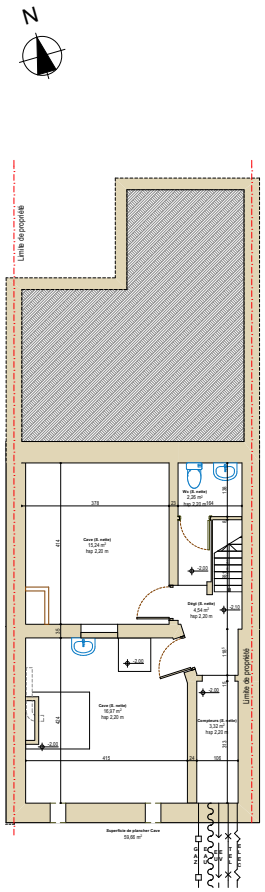


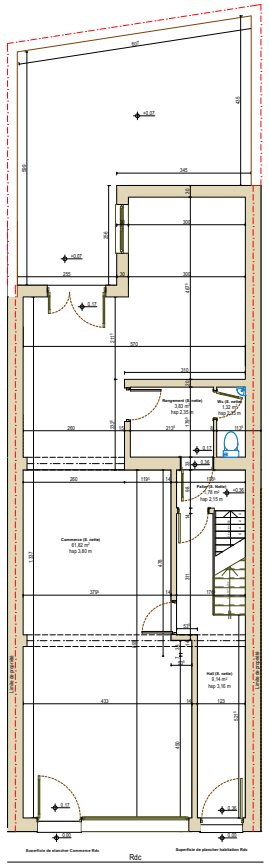


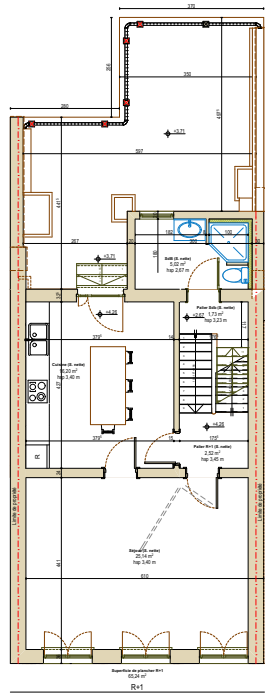
source: BxlMrs©

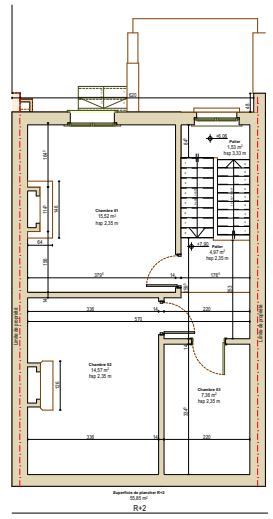
Existing plans - *Plans état des lieux*

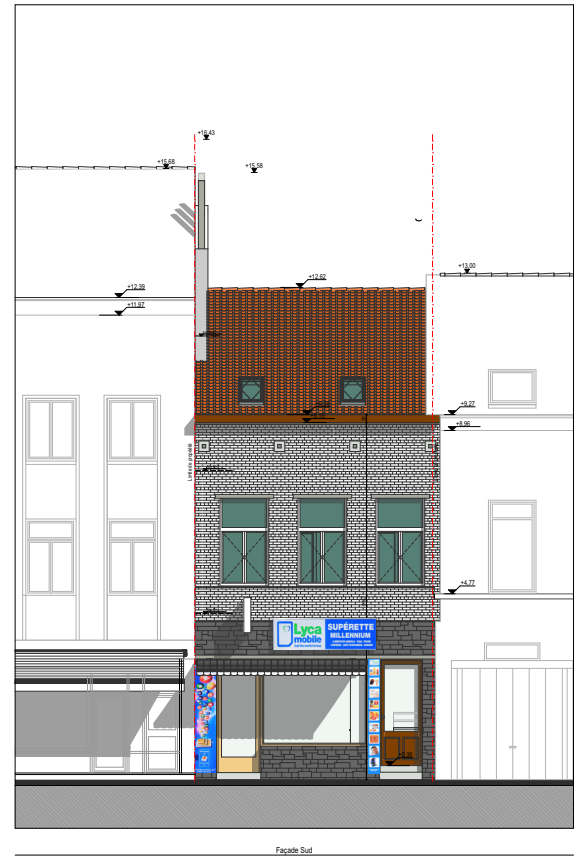
source: BxlMrs©

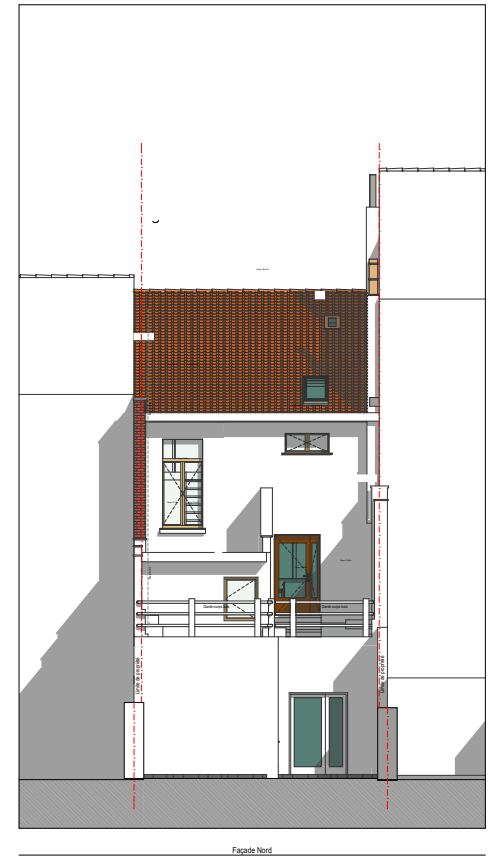


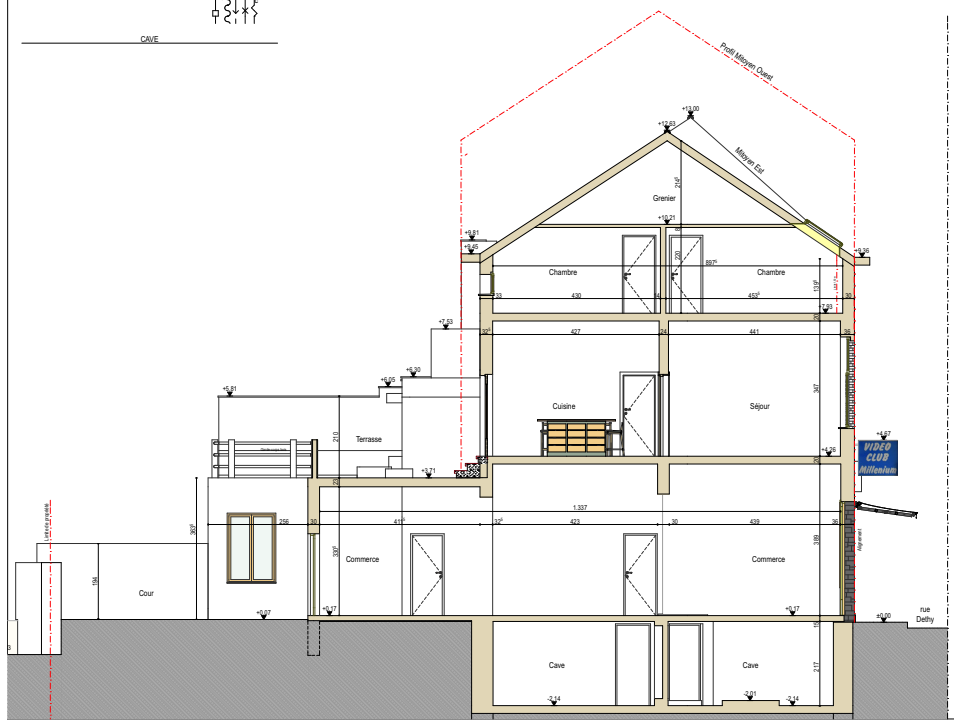


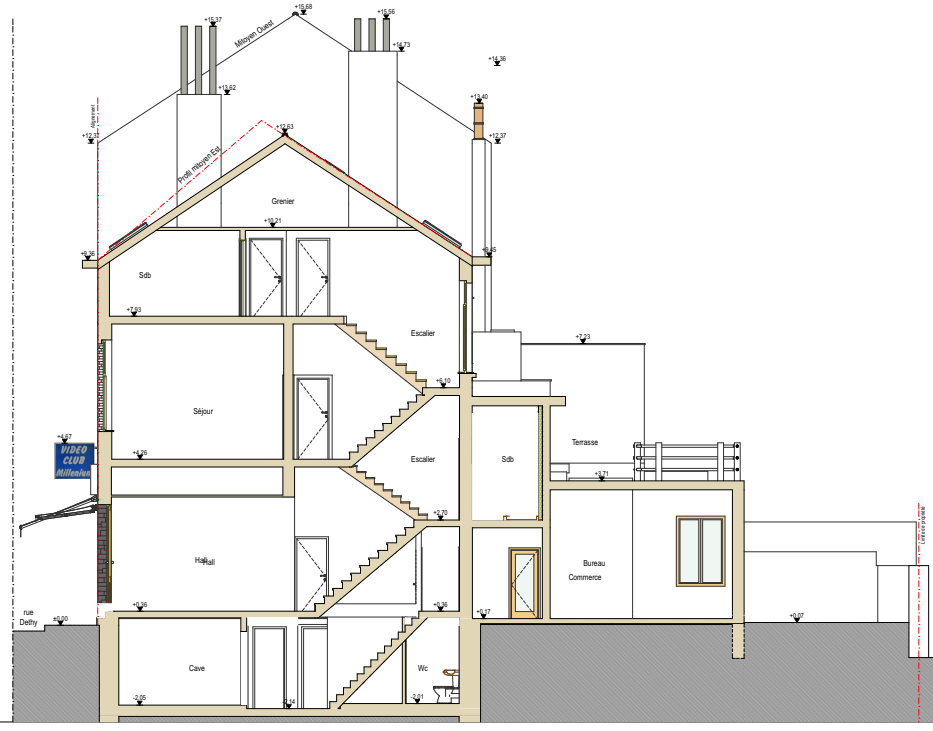












Projet

001_DETHY

rue Dethy, 3 BRUXELLES 1060 BELGIQUE

Maître d'ouvrage	-	Bureau de contrôle	-
	Marianne Sérandour Lionel BOUSQUET rue Dethy 3 1060 BRUXELLES		-
Architecte	BXLMRS	Bureau d'étude env.	ENESTA
	AGENCE BXLMRS 61, avenue Jean Volders 1060 BRUXELLES Lionel BOUSQUET Téléphone : 0 494 837 494 e-mail : lionel@bxlmrs.eu		ENESTA Centre d'entreprises Village Partenaire - rue Fernand Bernier 16 Séverine Ronsen Téléphone: 02 543.44.08 e-mail : info@enesta.be
Bureau d'étude structure	PFC Engineering	OPC	BXLMRS
	PFC ENGINEERING Bld Paepsemlaan 16 - 1070 Brussels Pierre-François Cistiache Téléphone: +32 2 345 71 56 Fax: +32 2 256 97 67 e-mail : info@pfc-engineering.eu		AGENCE BXLMRS 61, avenue Jean Volders 1060 BRUXELLES Lionel BOUSQUET Téléphone : 0 494 837 494 e-mail : lionel@bxlmrs.eu

Phase

Permis d'urbanisme

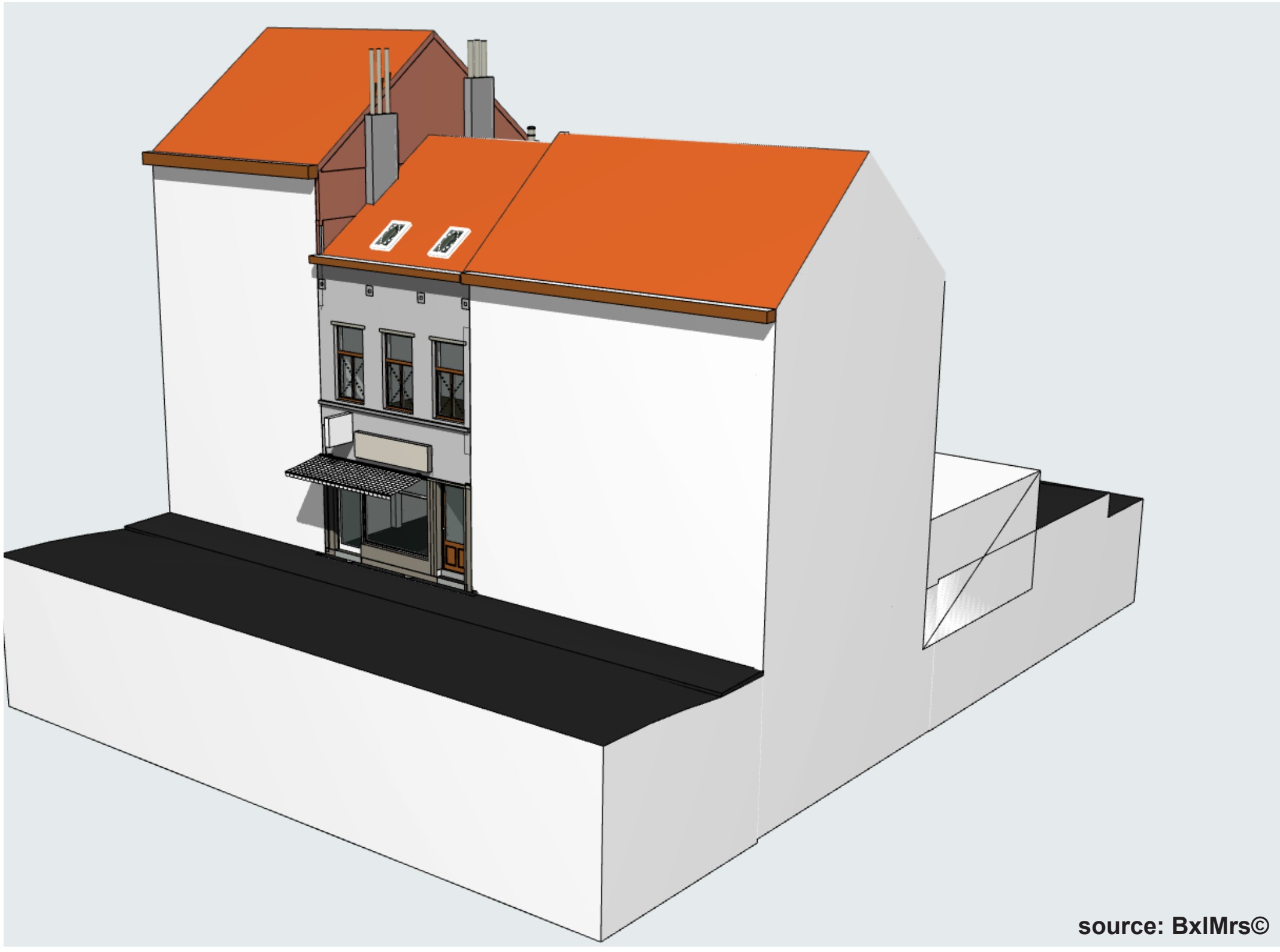
Document

Etat des lieux

Nom du fichier			Numéro 04
Dessiné par : LB Vérifié par: Sprl BXLMRS Architecten	Echelle 1:50	Indice A	Date 15/12/15

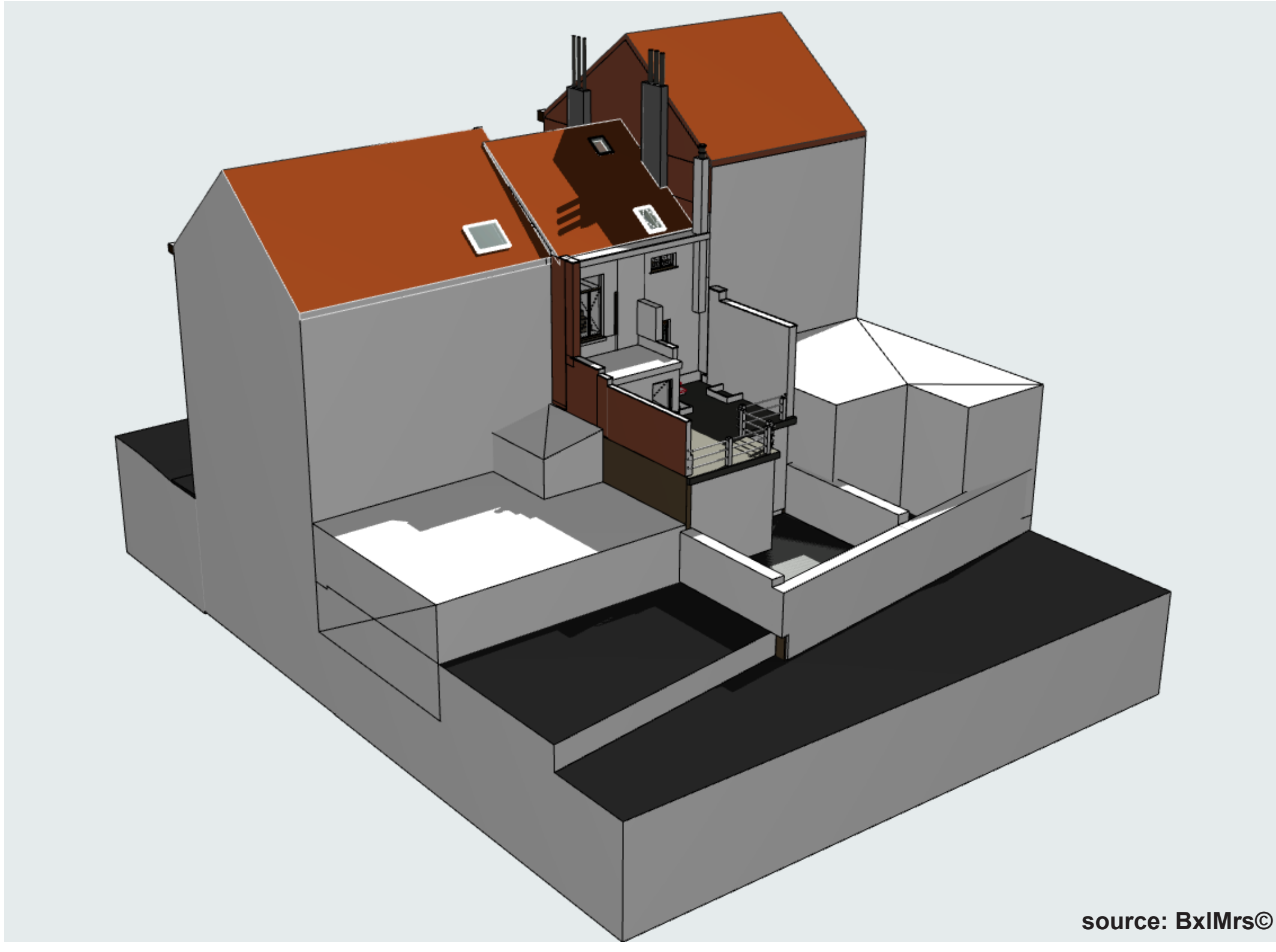
Existing view - Dethy Street

Vue existant - rue Dethy



source: BxlMrs©

Existing situation view - Heart block *Vue existant - Coeur d'îlot*

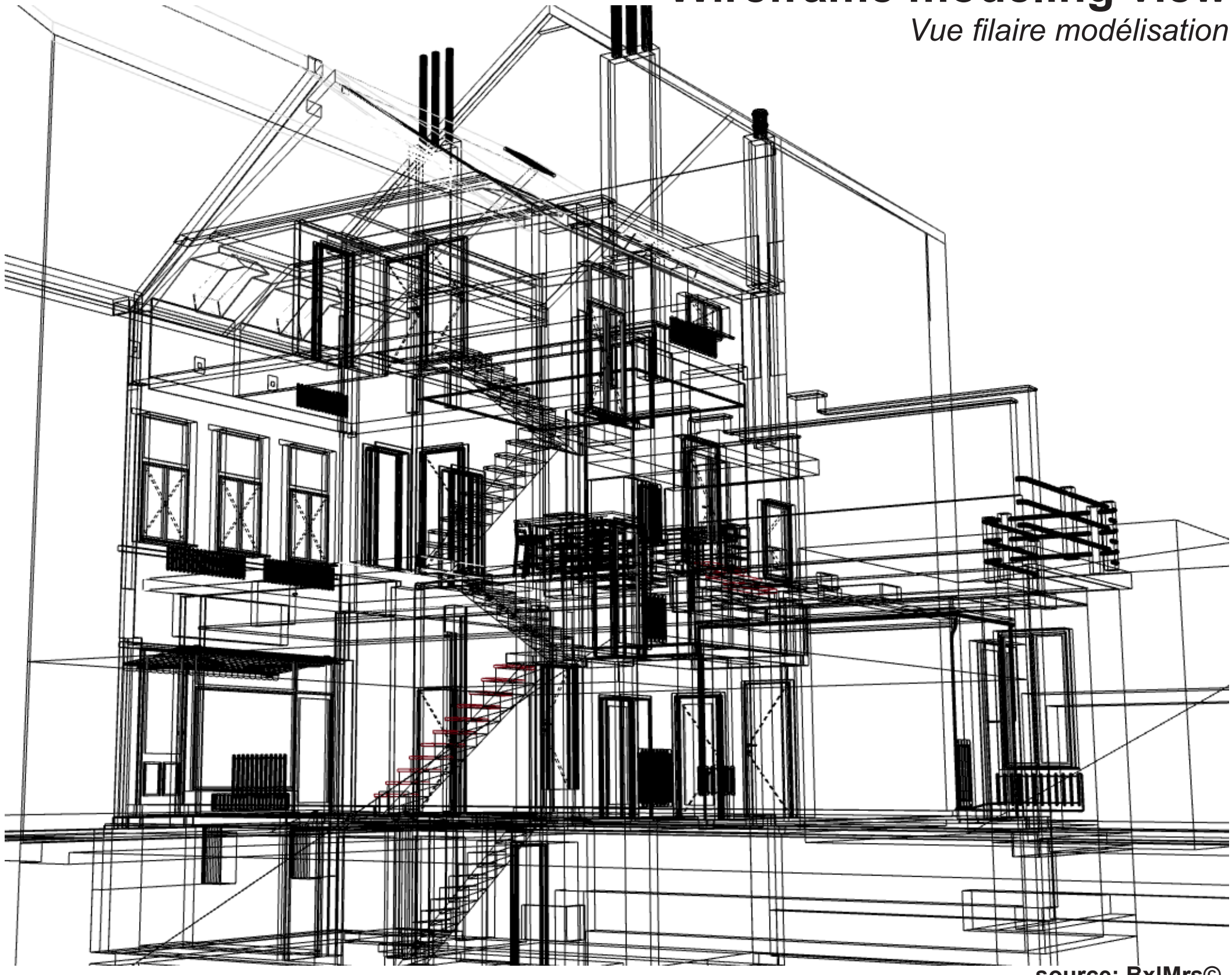


source: BxlMrs©

BIM GAME

Wireframe modeling view

Vue filaire modélisation



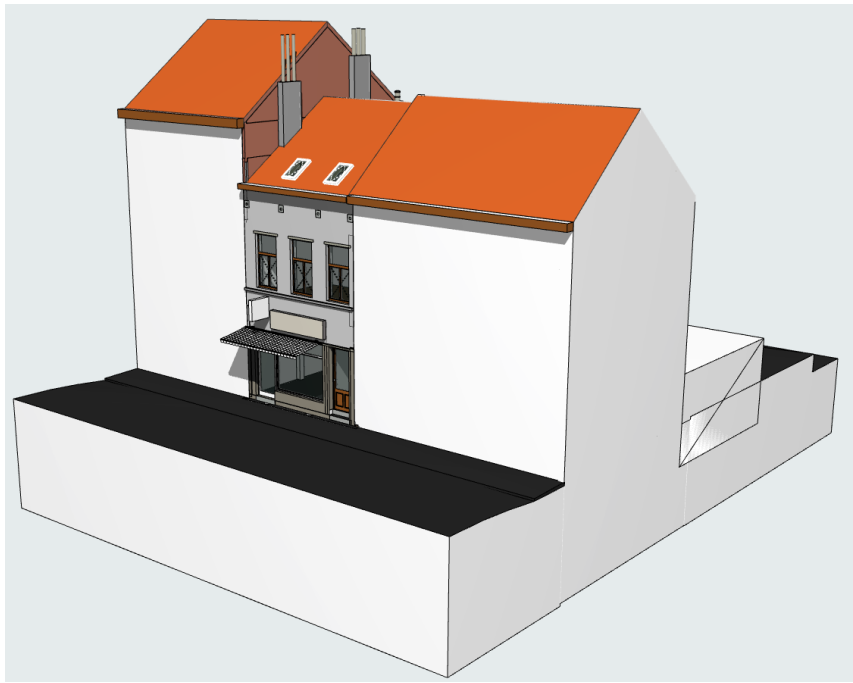
source: BxlMrs©

2.USING BIM AND OTHER PROCESS

Utiliser le BIM et d'autres processus

Program *Programme*

Family 4 people
Famille 4 personnes



Office groundfloor + Unit living
Bureaux Rdc + Habitation

Passive House Institute

Passiv renovation
Rénovation passive

Roof renovation
Rénovation toiture

1 additional floor
1 étage supplémentaire

Eco-construction
Éco-construction

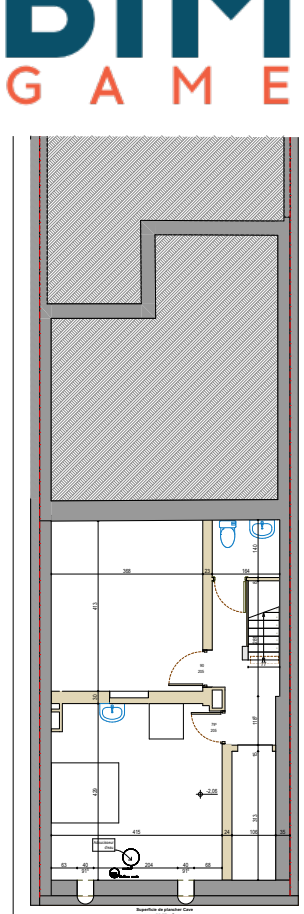
Building license - *Permis d'urbanisme*

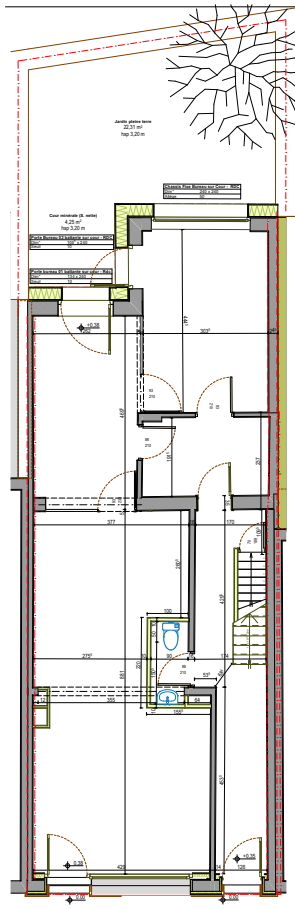
Interlude ..... 16 months...

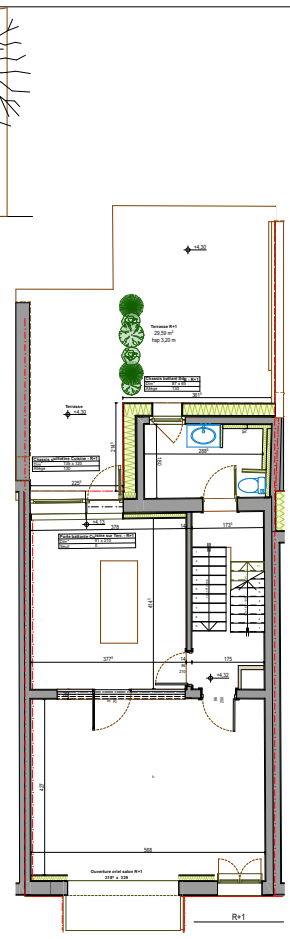
Interlude ..... de 16 mois...

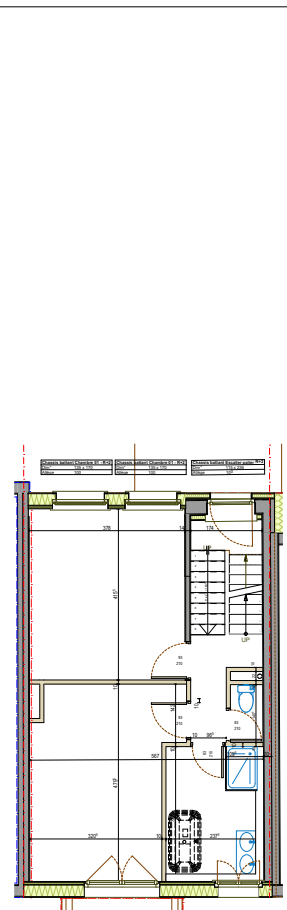
source: urbanisme Saint-Gilles

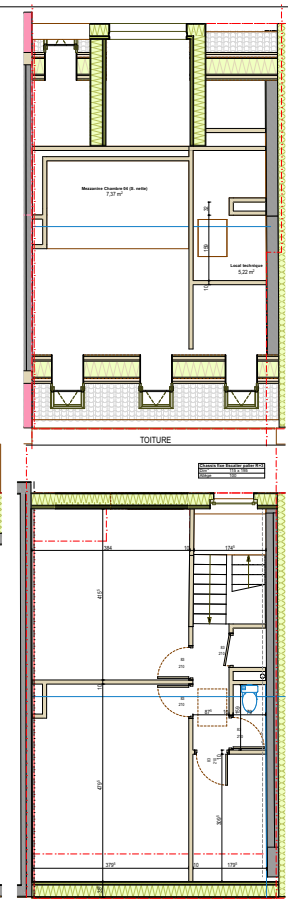
Project - *Projet*


Cave


RDC

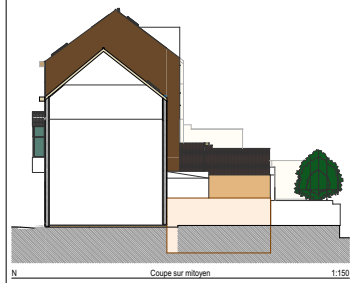

R+1


R+2


R+3

Façade Sud - rue Dethy

Façade Nord - intérieur îlot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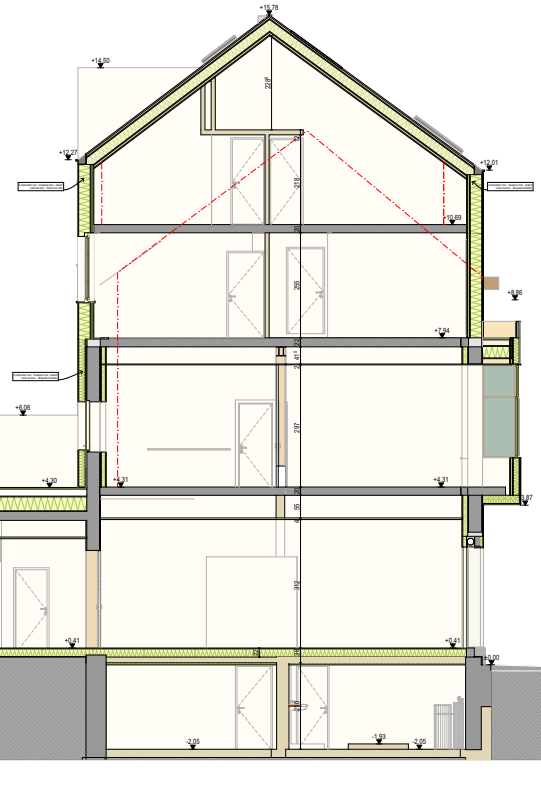
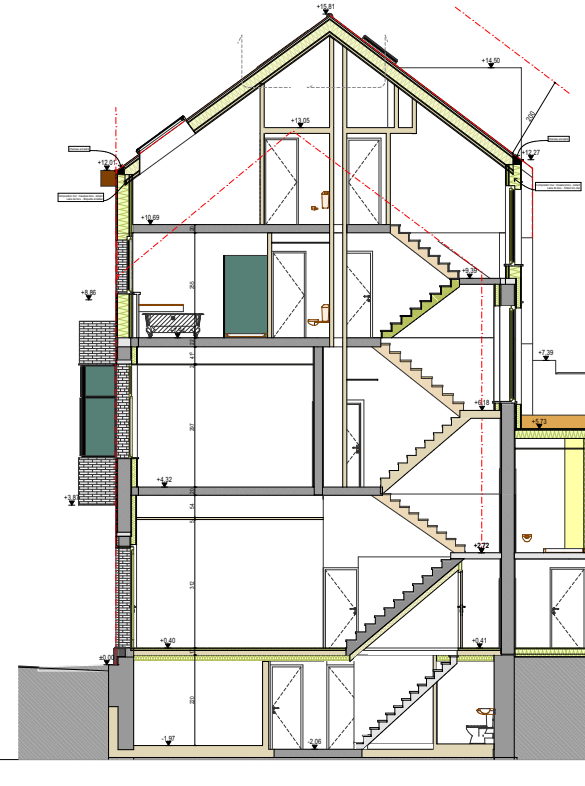
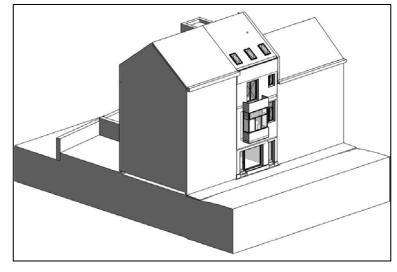
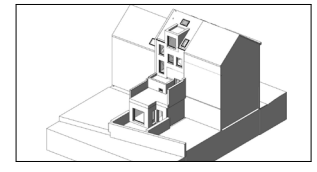








Projet

001_DETHY

rue Dethy, 3 BRUXELLES 1060 BELGIQUE

Maîtrise d'ouvrage	-	Bureau de contrôle	-
	Marianne Sérandour Lionel BOUSQUET - rue Dethy 3 1060 BRUXELLES		-
Architecte	BXLMRS	Bureau d'étude env.	ENESTA
BXL MRS	AGENCE BXLMRS 3, rue Dethy 1060 BRUXELLES Lionel BOUSQUET Téléphone : 0 494 837 494 e-mail : lionel@bxlmrs.eu	e.	ENESTA Centre d'entreprises Village Partenaire - rue Fernand Bernier 15 Séverine Roman Téléphone: 02 543.44.08 e-mail : info@enesta.be
Bureau d'étude structure	PFC Engineering	QPC	BXLMRS
PFC Engineering	PFC ENGINEERING Bld Paepsemlaan 16 - 1070 Brussels Pierre-François Cloteuche Téléphone: +32 2 343 71 58 Fax: +32 2 256 37 67 e-mail : info@pfc-engineering.eu		AGENCE BXLMRS 3, rue Dethy 1060 BRUXELLES Lionel BOUSQUET Téléphone : 0 494 837 494 e-mail : lionel@bxlmrs.eu

Phase

PERMIS D'URBANISME

Document

PROJET - Modificatif

Nom du fichier

Dessiné par : LB Vérifié par: Sprl BXLMRS Architecten	Echelle 1:50, 1:200	Indice B	Date 15/02/19

Numéro **08**

An evolutionary process - *Un processus évolutif*

OPEN BIM™
BUILDING INFORMATION MODELING

ECO CONSTRUCTION

PROCESSUS PROJET

Passive House Institute
CONCEPTION PASSIVE

RÉVERSIBILITÉ

FLEXIBILITÉ

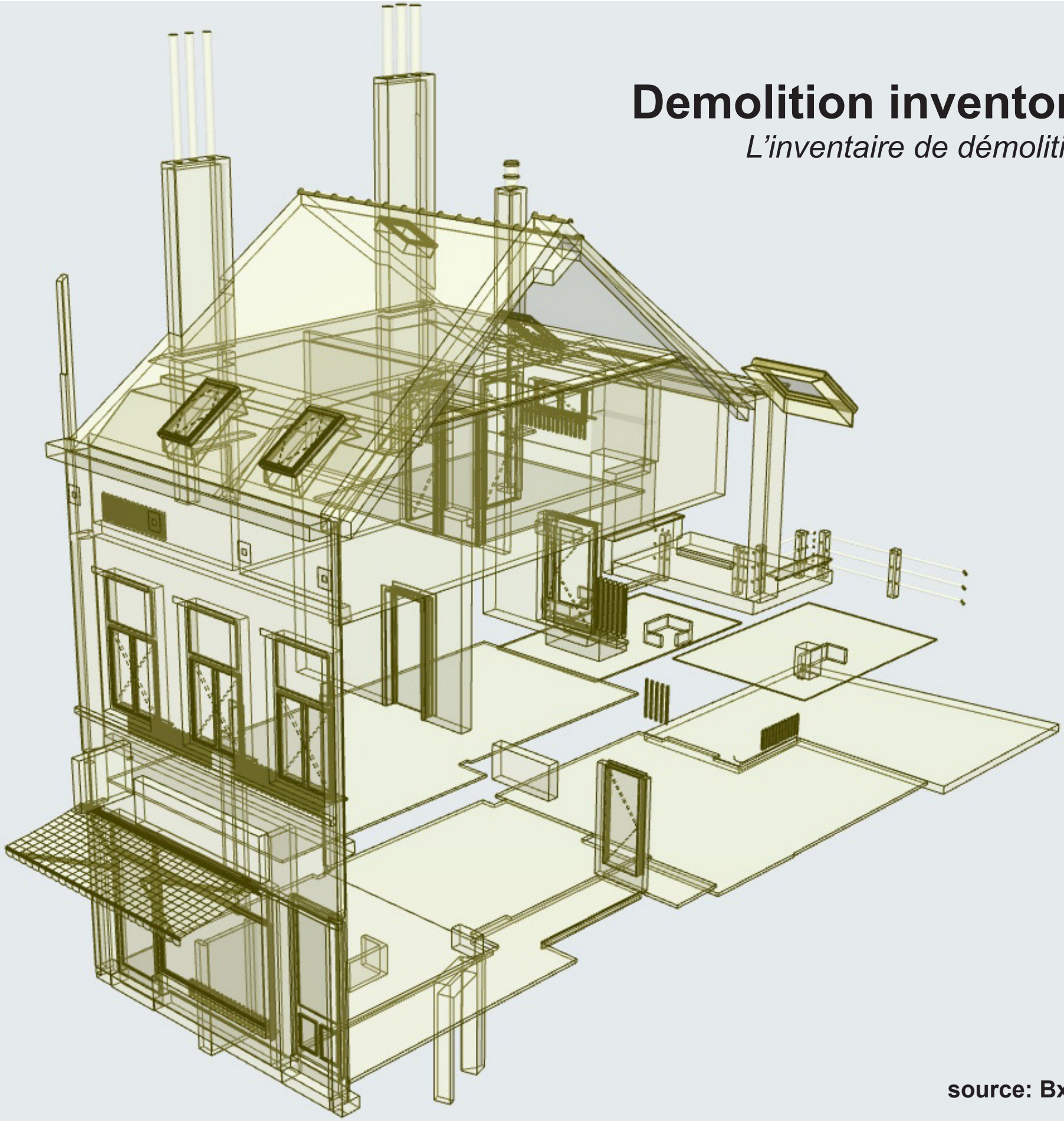
be circular be.brussels
ECONOMIE CIRCULAIRE

source: BxlMrs©

BIM GAME

Demolition inventory

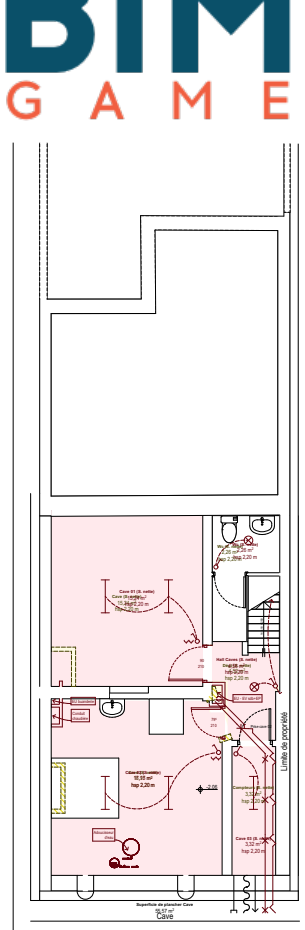
L'inventaire de démolition

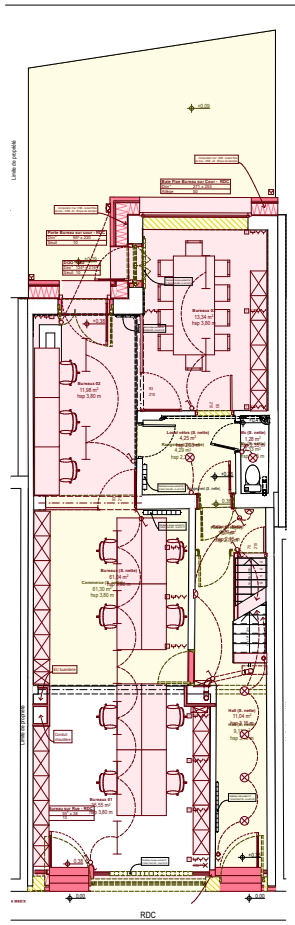


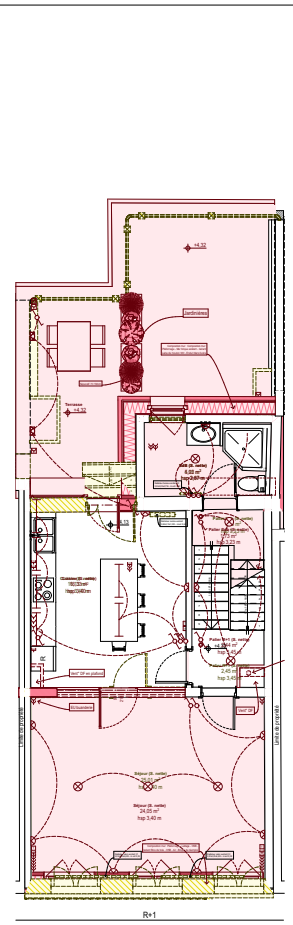
source: BxlMrs©

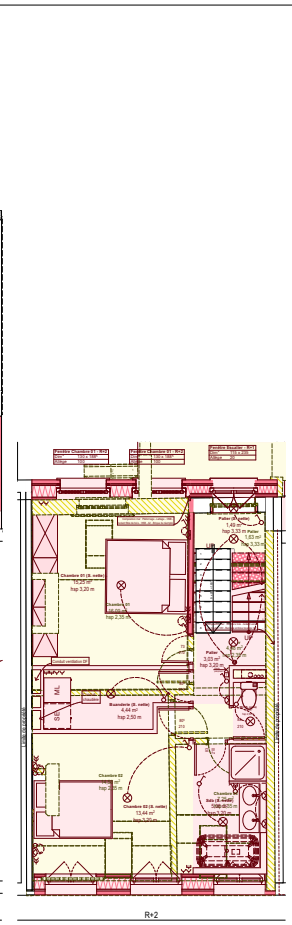
Overlay: demolition (yellow) - new (red)

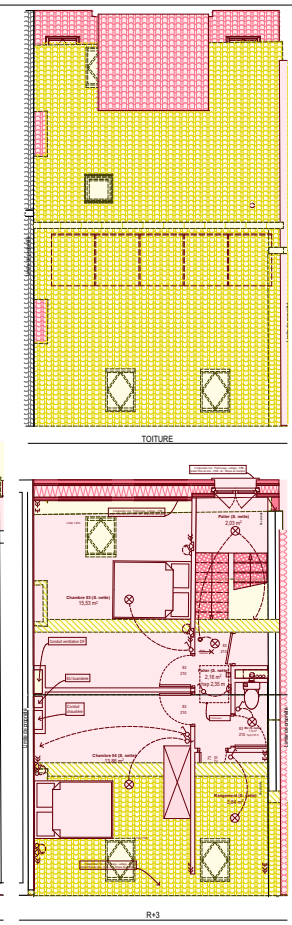
Synthèse : démolition (jaune) - neuf (rouge)

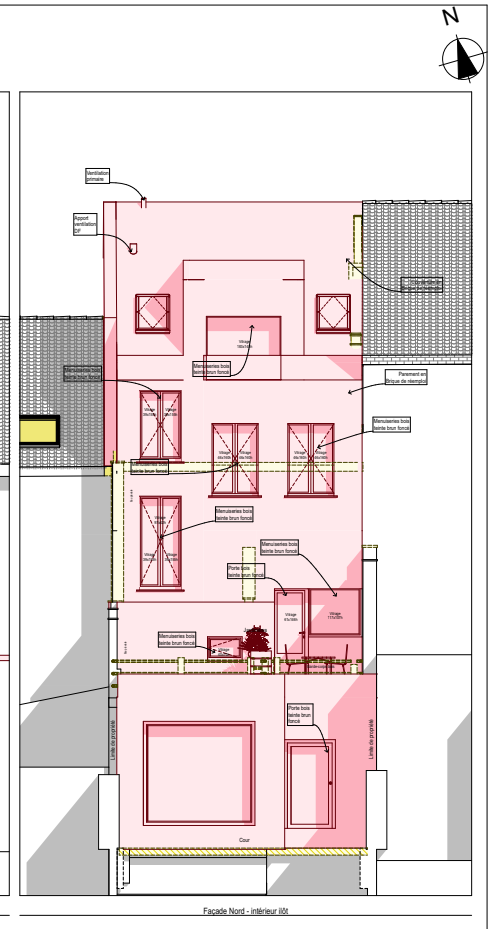


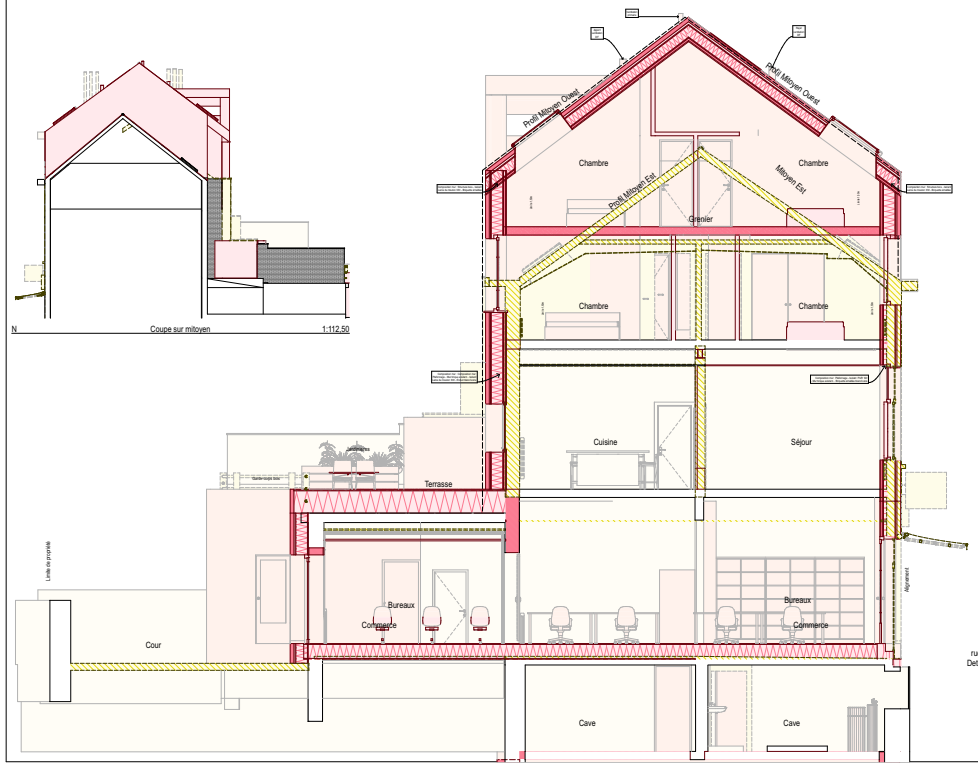


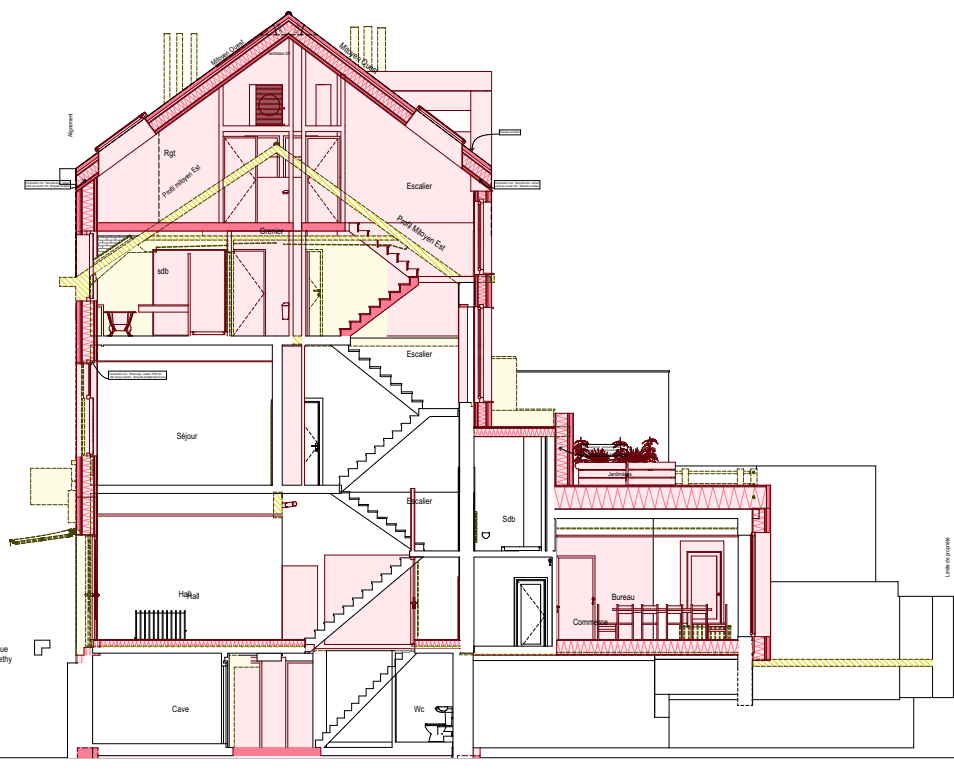












Projet

001_DETHY

rue Dethy, 3 BRUXELLES 1060 BELGIQUE

Maître d'ouvrage	-	Bureau de contrôle	-
	Marianne Sérandour **Lionel BOUSQUET** rue Dethy 3 1060 BRUXELLES		-
Architecte	**BXLMRS**	Bureau d'étude env.	**ENESTA**
	AGENCE BXLMRS 61, avenue Jean Volders 1060 BRUXELLES **Lionel BOUSQUET** Téléphone : 0 494 837 494 e-mail : lionel@bxlmrs.eu		**ENESTA** Centre d'entreprises Village Partenaire - rue Fernand Bernier 15 **Séverine Roman** Téléphone: 02 543.44.08 e-mail : info@enesta.be
Bureau d'étude structure	**PFC Engineering**	QPC	**BXLMRS**
	PFC ENGINEERING Bld Reyerslaan 16 - 1070 Brussels **Pierre-François Clotuche** Téléphone : +32 2 343 71 58 Fax: +32 2 256 97 87 e-mail : info@pfc-engineering.eu		**AGENCE BXLMRS** 61, avenue Jean Volders 1060 BRUXELLES **Lionel BOUSQUET** Téléphone : 0 494 837 494 e-mail : lionel@bxlmrs.eu

Phase

ÉXECUTION

Document

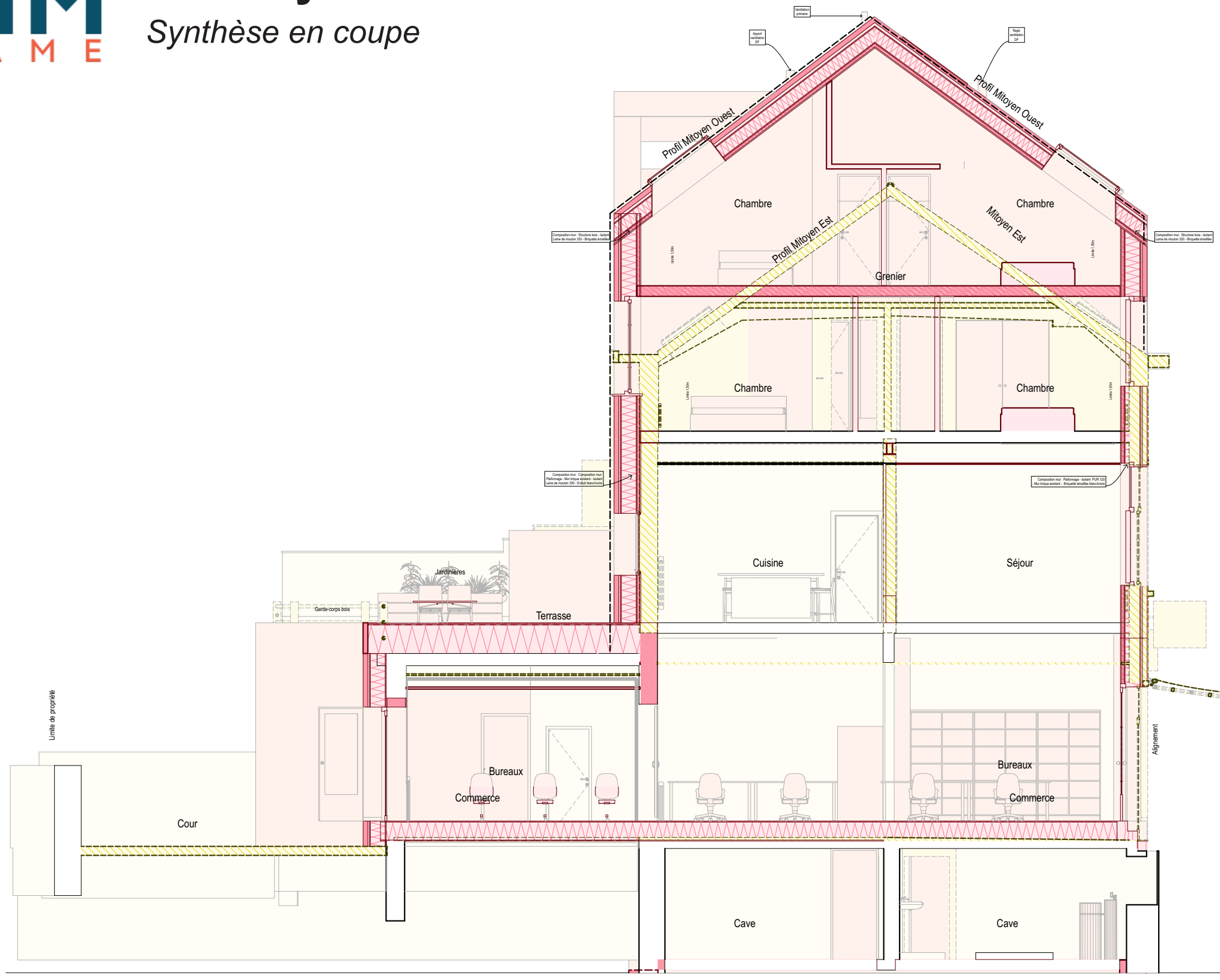
SYNTHESE

Nom du fichier			Numéro **03**
Dessiné par : **LB** Vérifié par: **Sprl BXLMRS Architecten**	Echelle **1:50, 1:150**	Indice **C**	Date **16/04/18**

source: BxlMrs©

Overlay - Section

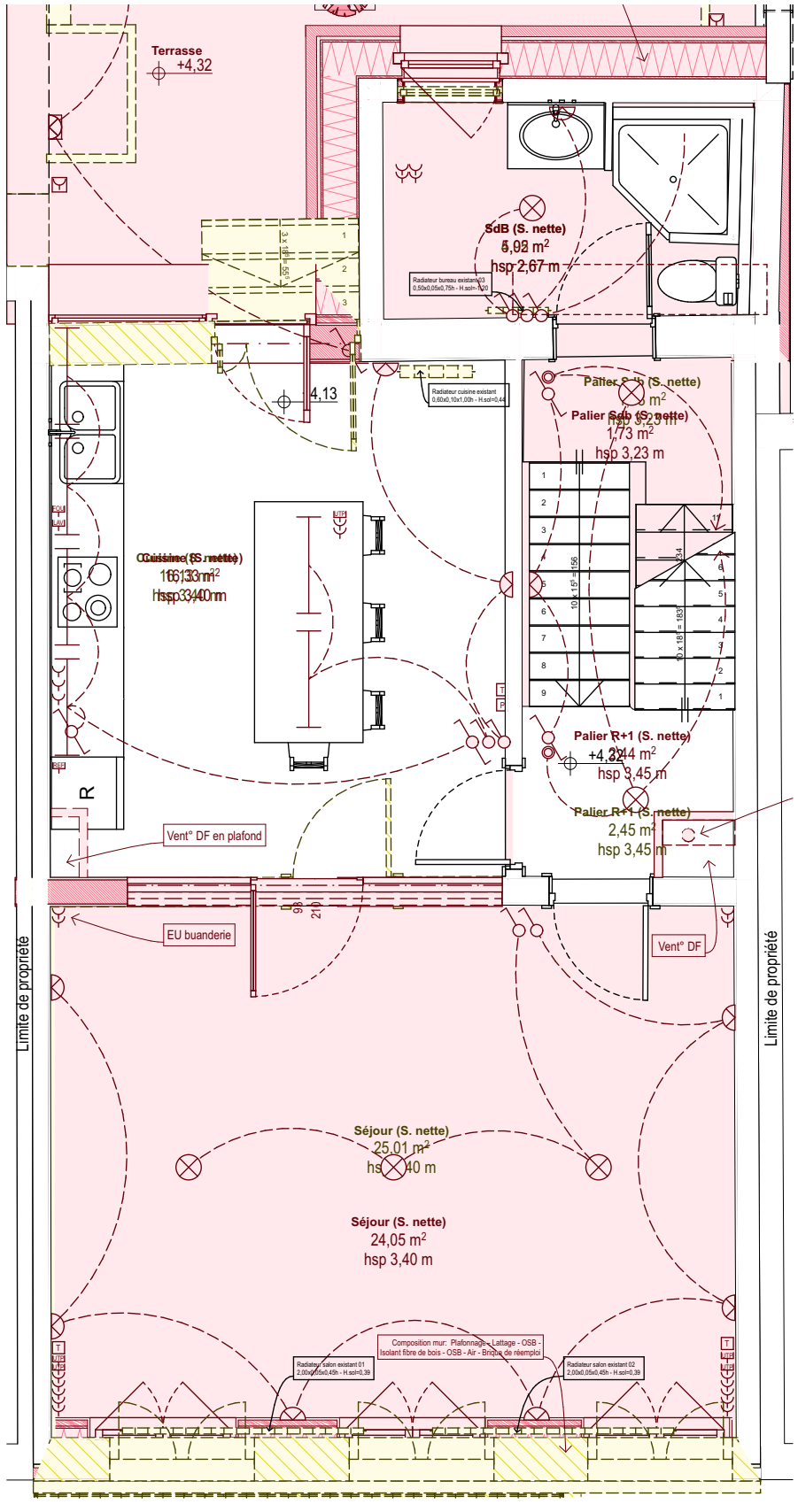
Synthèse en coupe



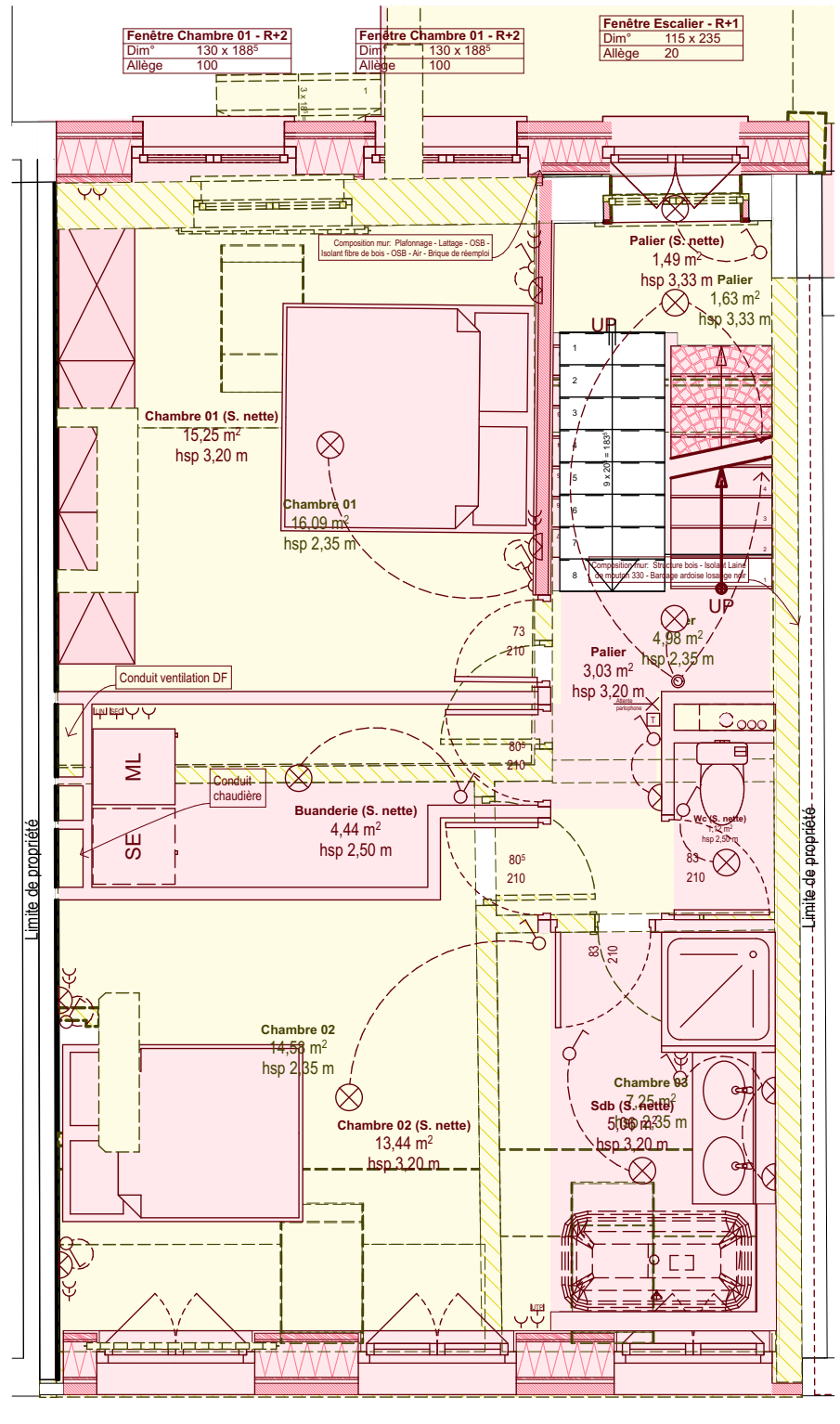
source: BxlMrs©

Overlay - Plans

Synthèse en plans



R+1



R+2

source: BxlMrs©

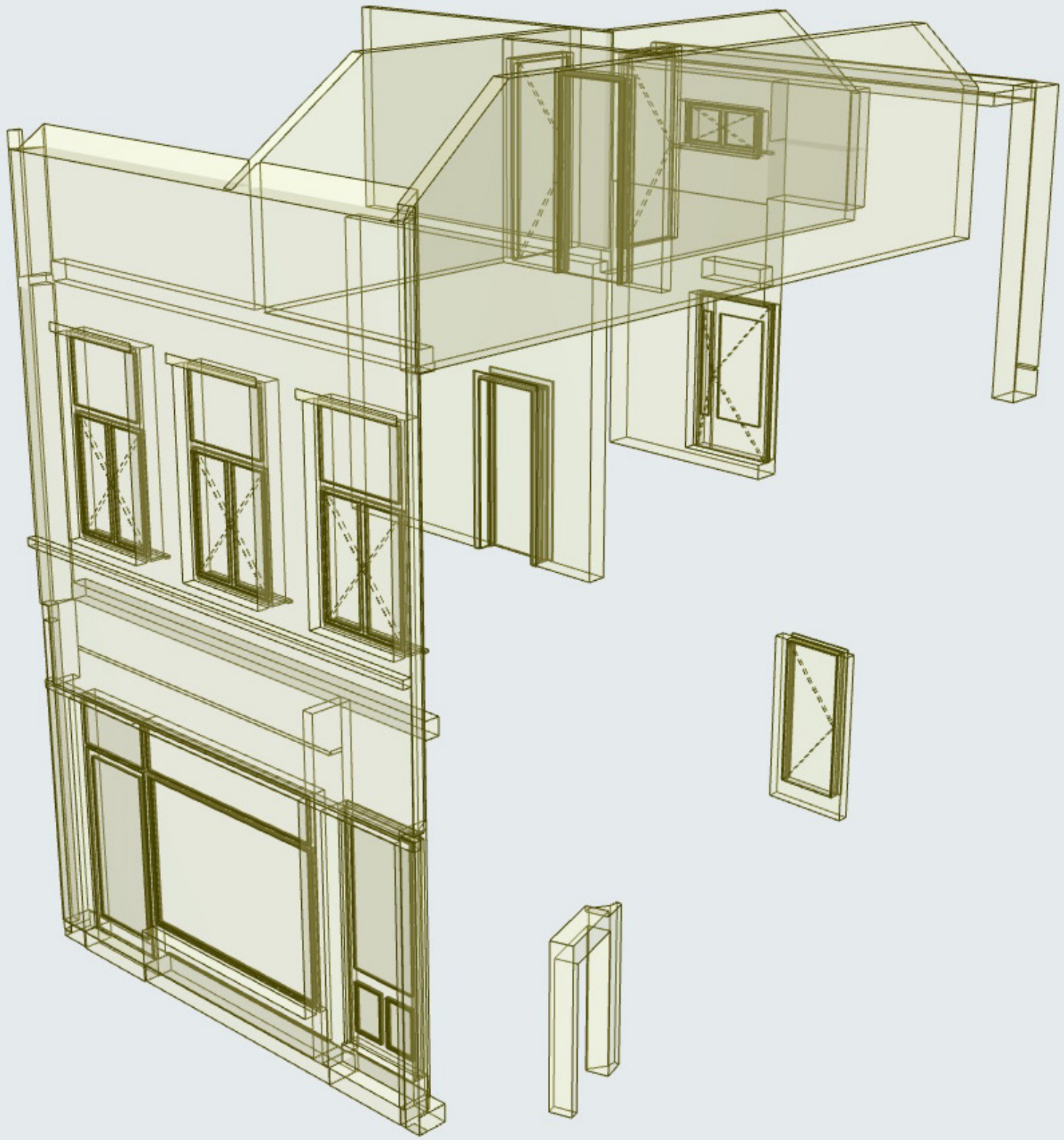
Exploratory work : brick

Sondage matériau : brique

source: BxlMrs©

Brick : BIM model correspondence

Brique: correspondance modèle BIM



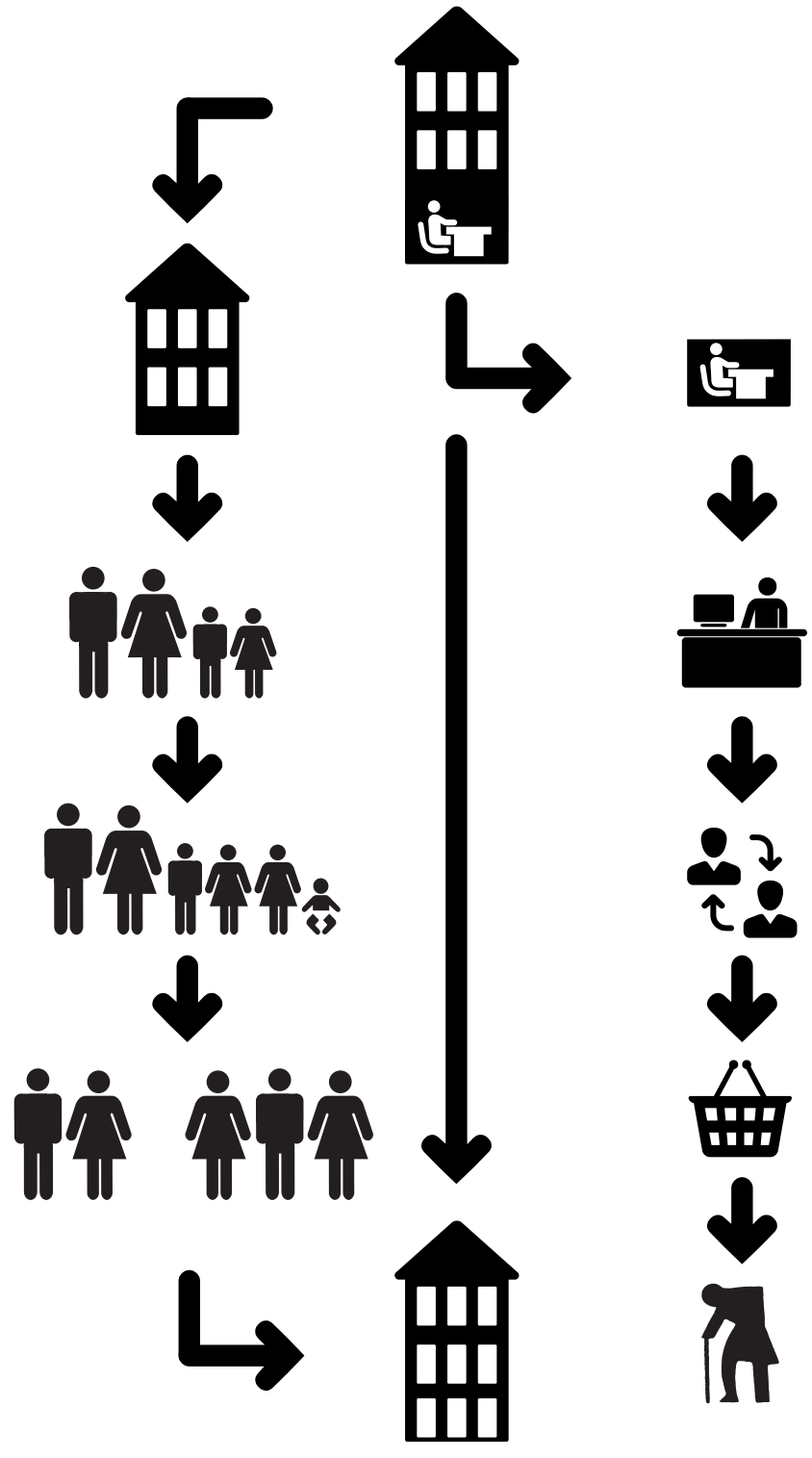
source: BxlMrs©

Program evolution(s)

Évolution(s) du programme

Living unit(s)

Habitation(s)

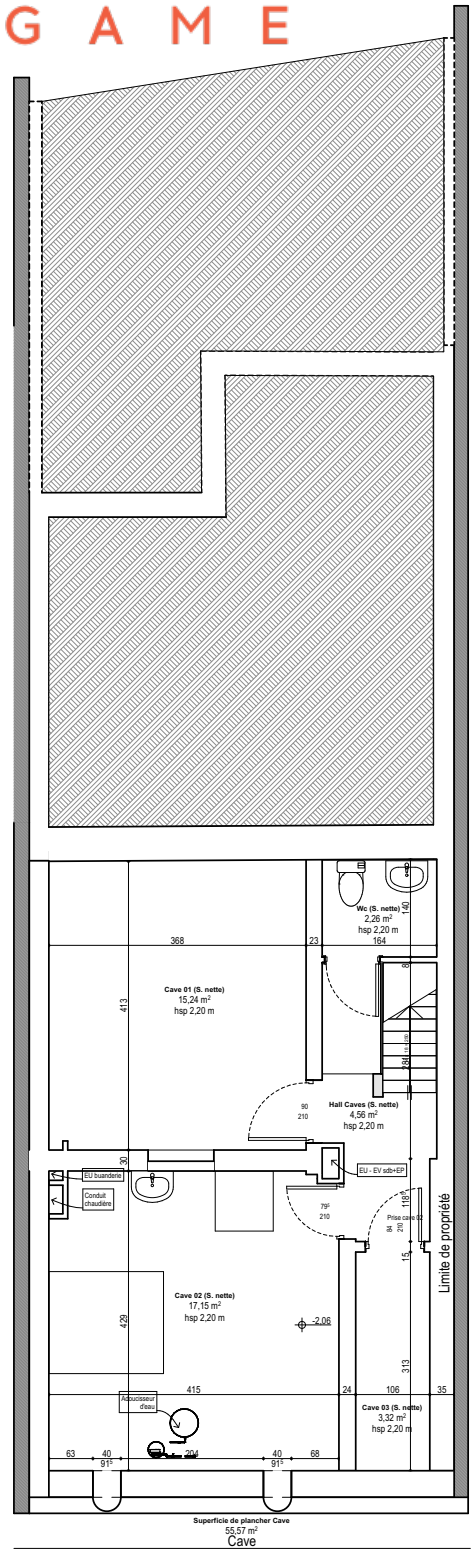


Groundfloor

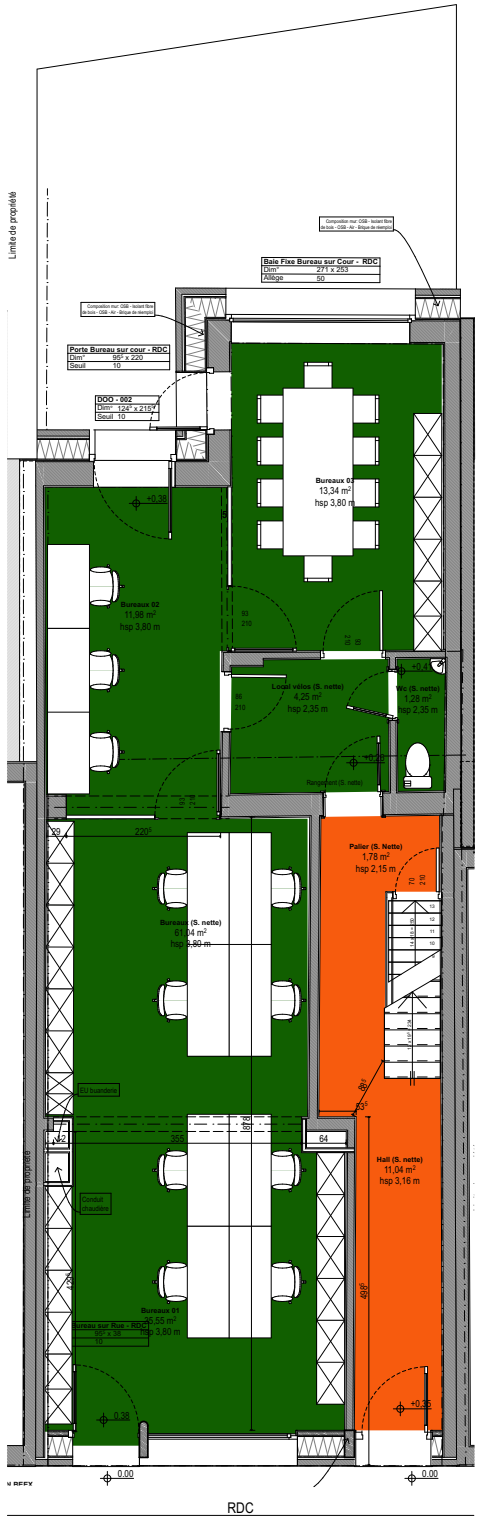
Rdc

Plans scenario 01

Plans scénario 01



Cave



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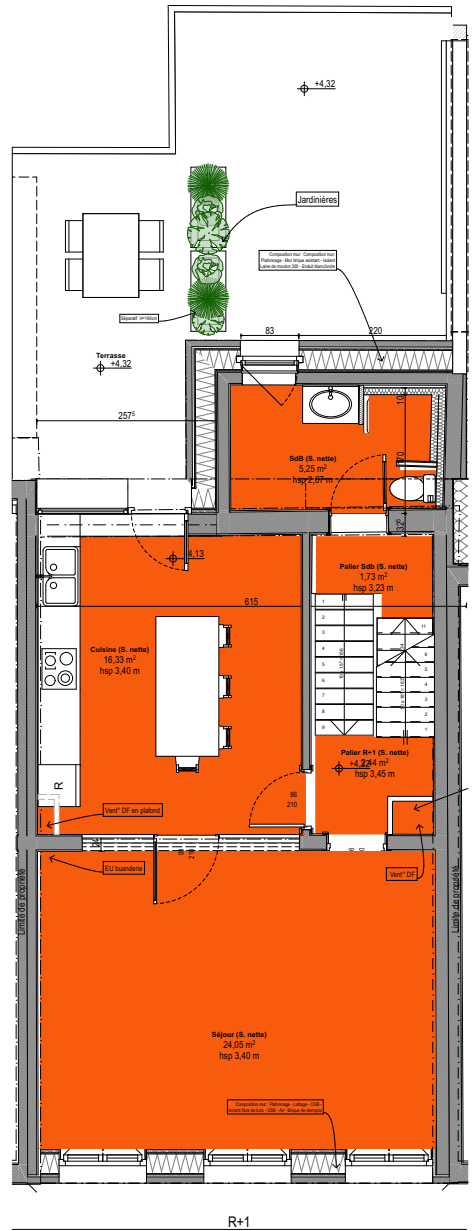
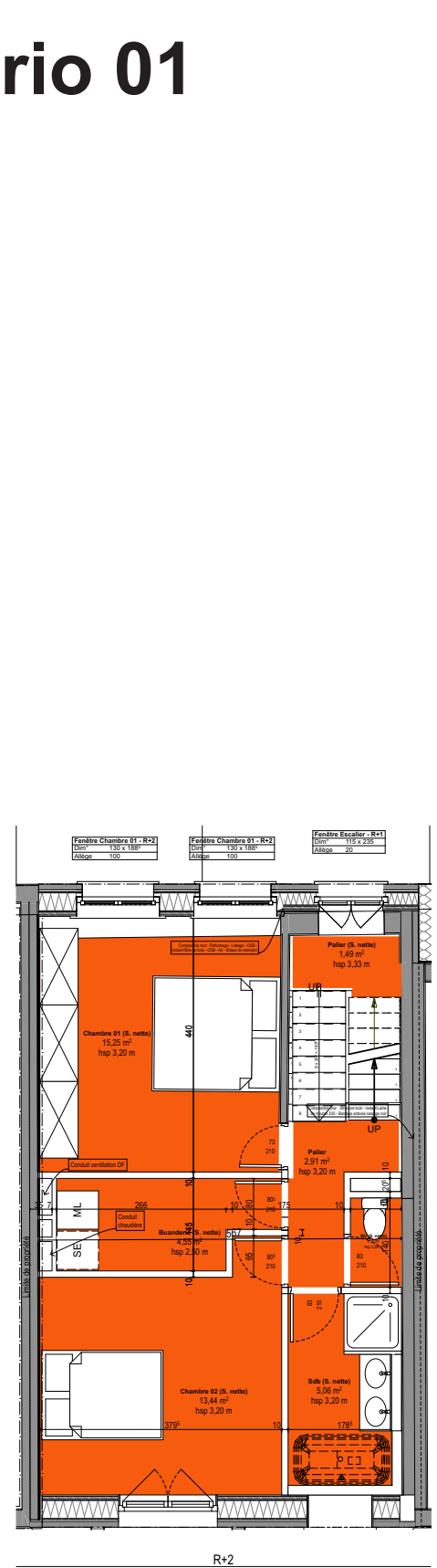
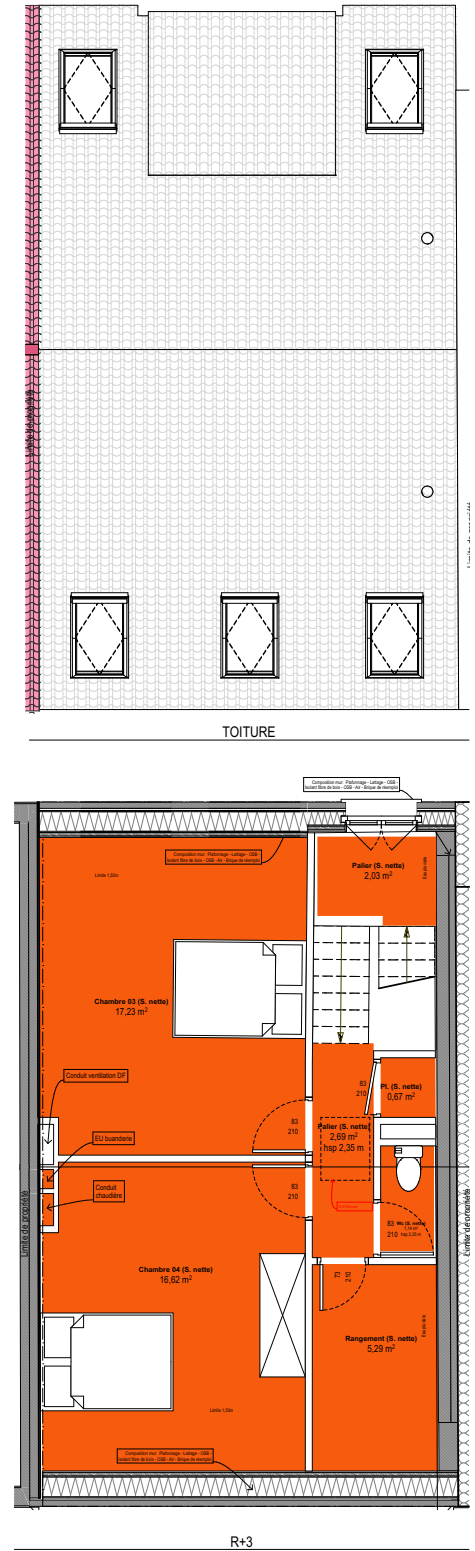


R+1



R+2

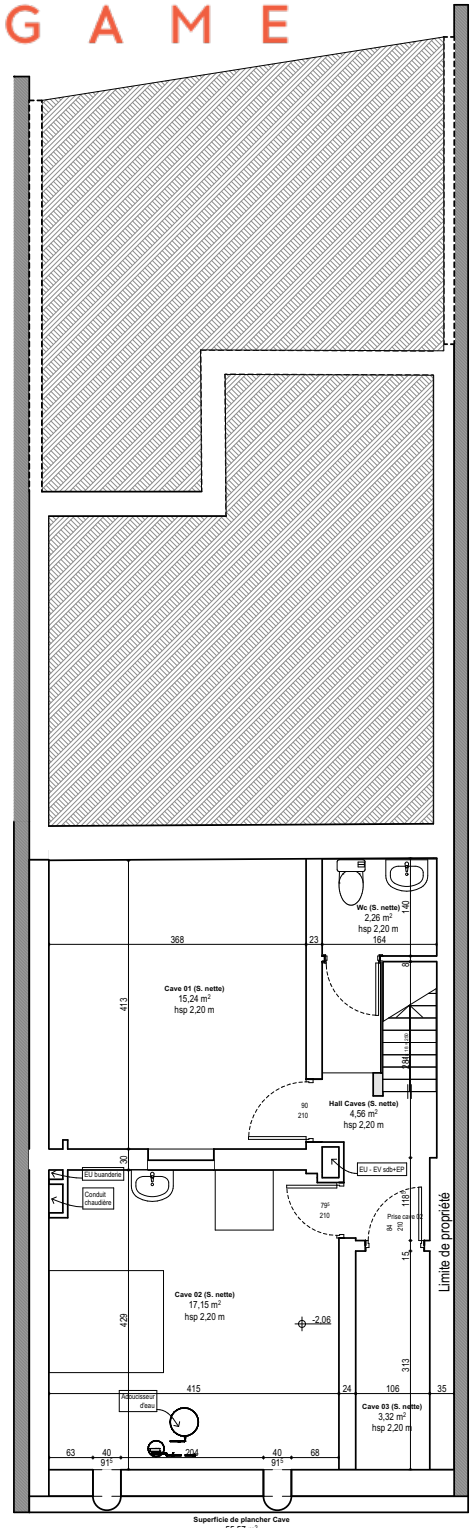


R+3

source: BxlMrs©

Plans scenario 02

Plans scénario 02



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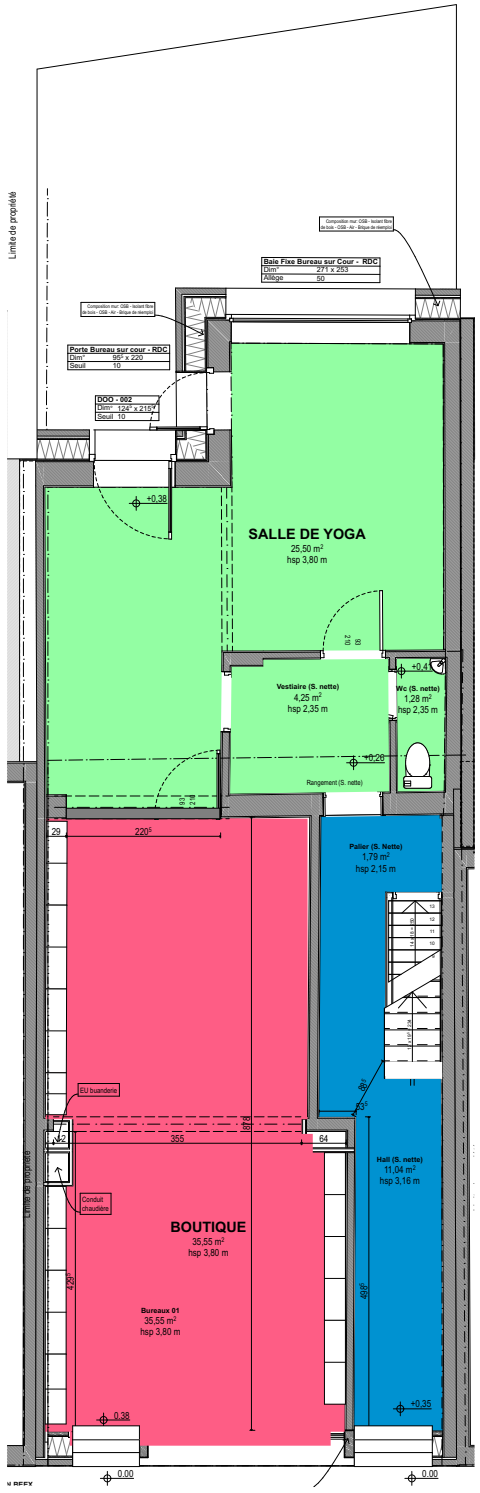
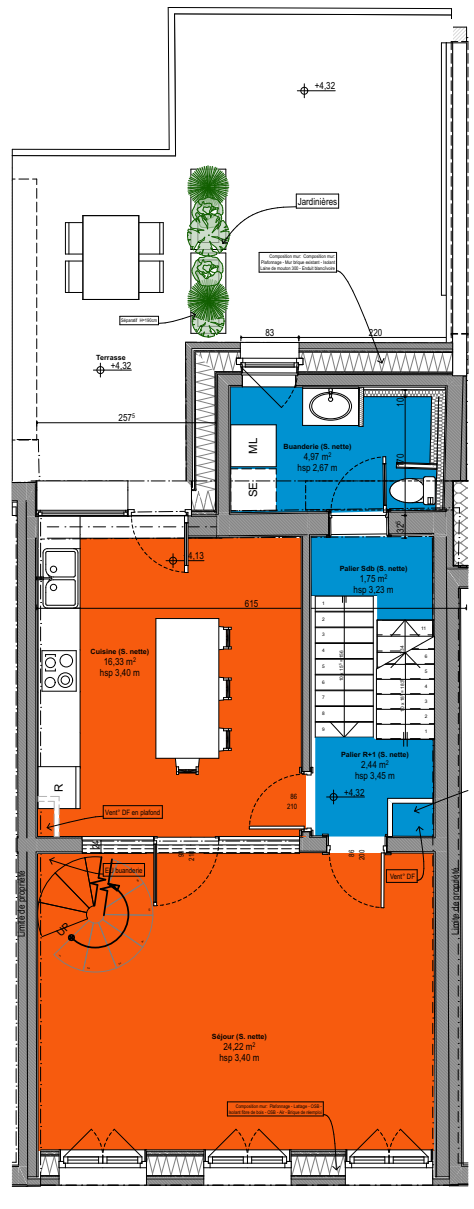
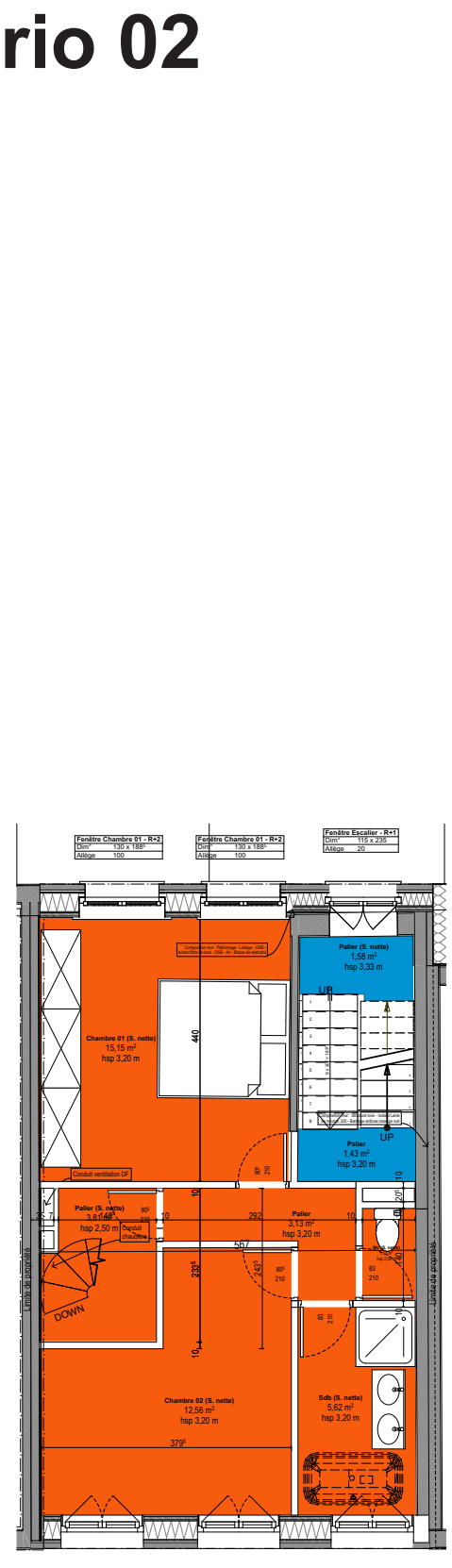


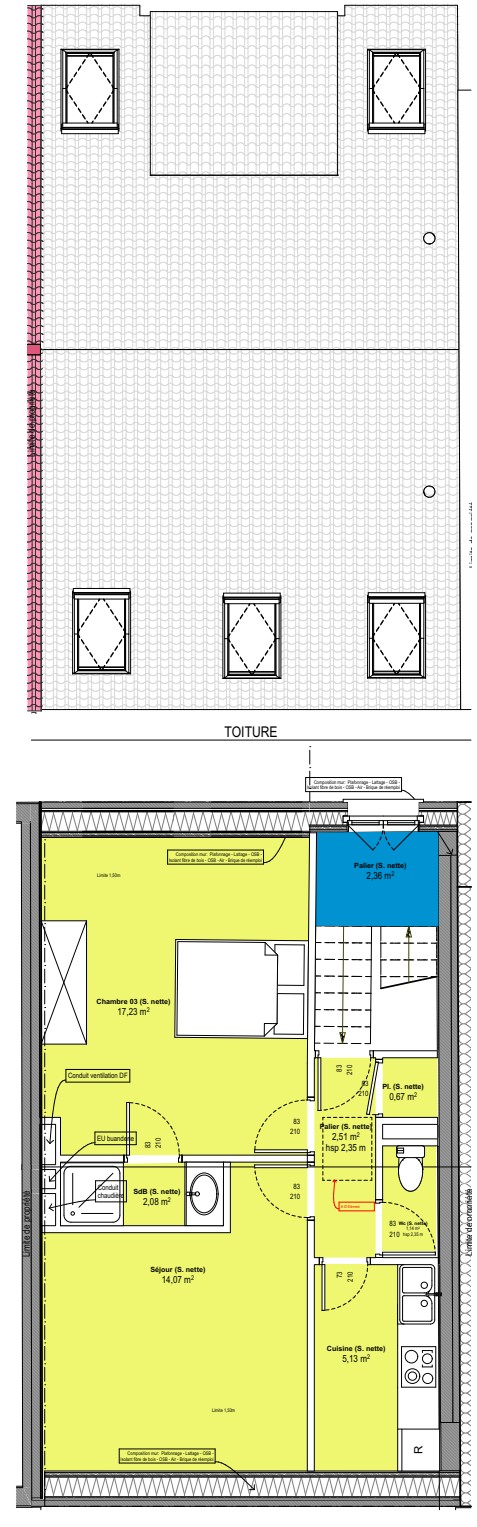
RDC



R+1



R+2

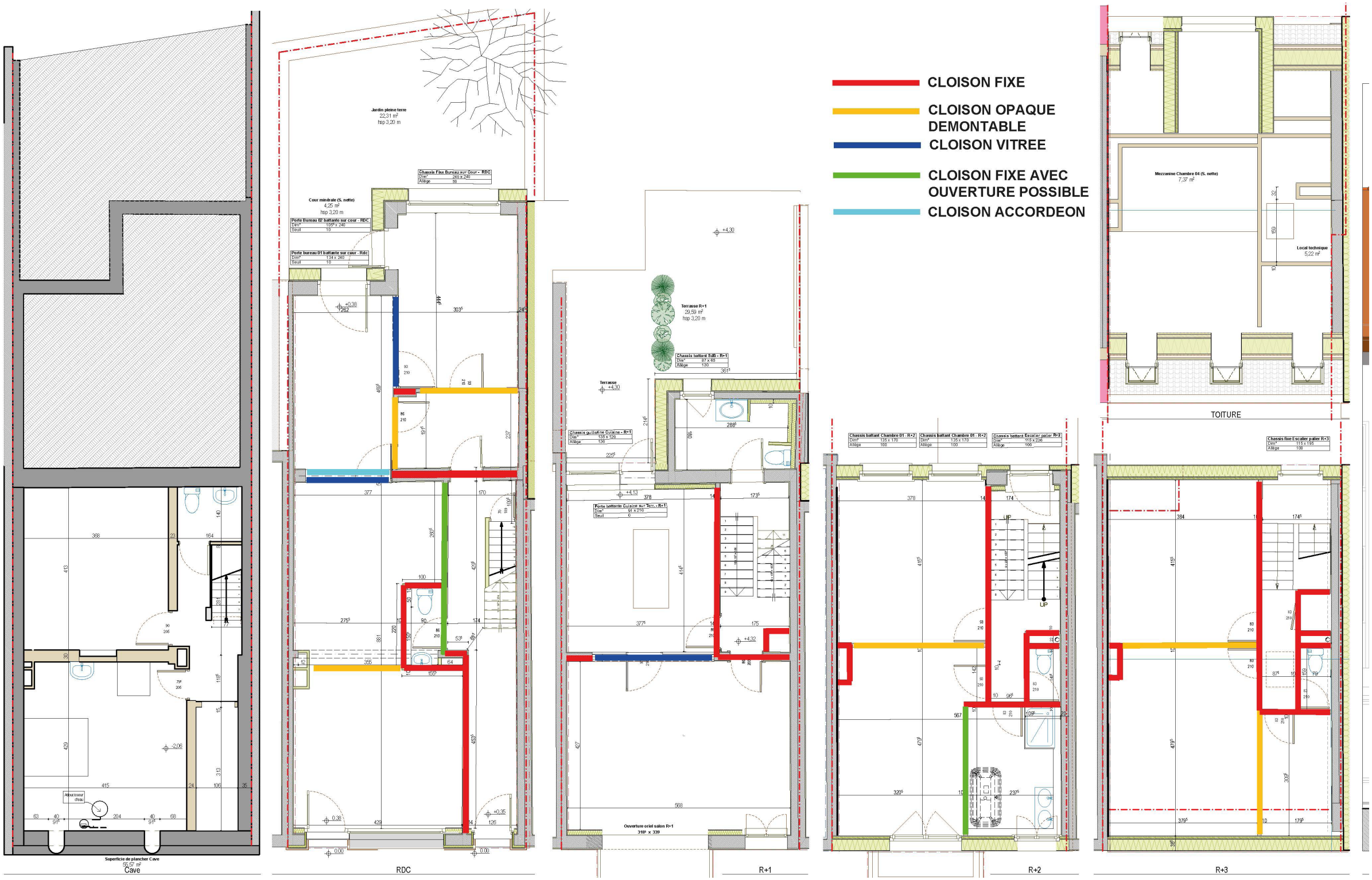


R+3

source: BxlMrs©

Collaboration VUB
Etude cloisonnements intérieurs

VRIJE UNIVERSITEIT BRUSSEL



source: BxlMrs©

BIM GAME

Collaborative work with BIM

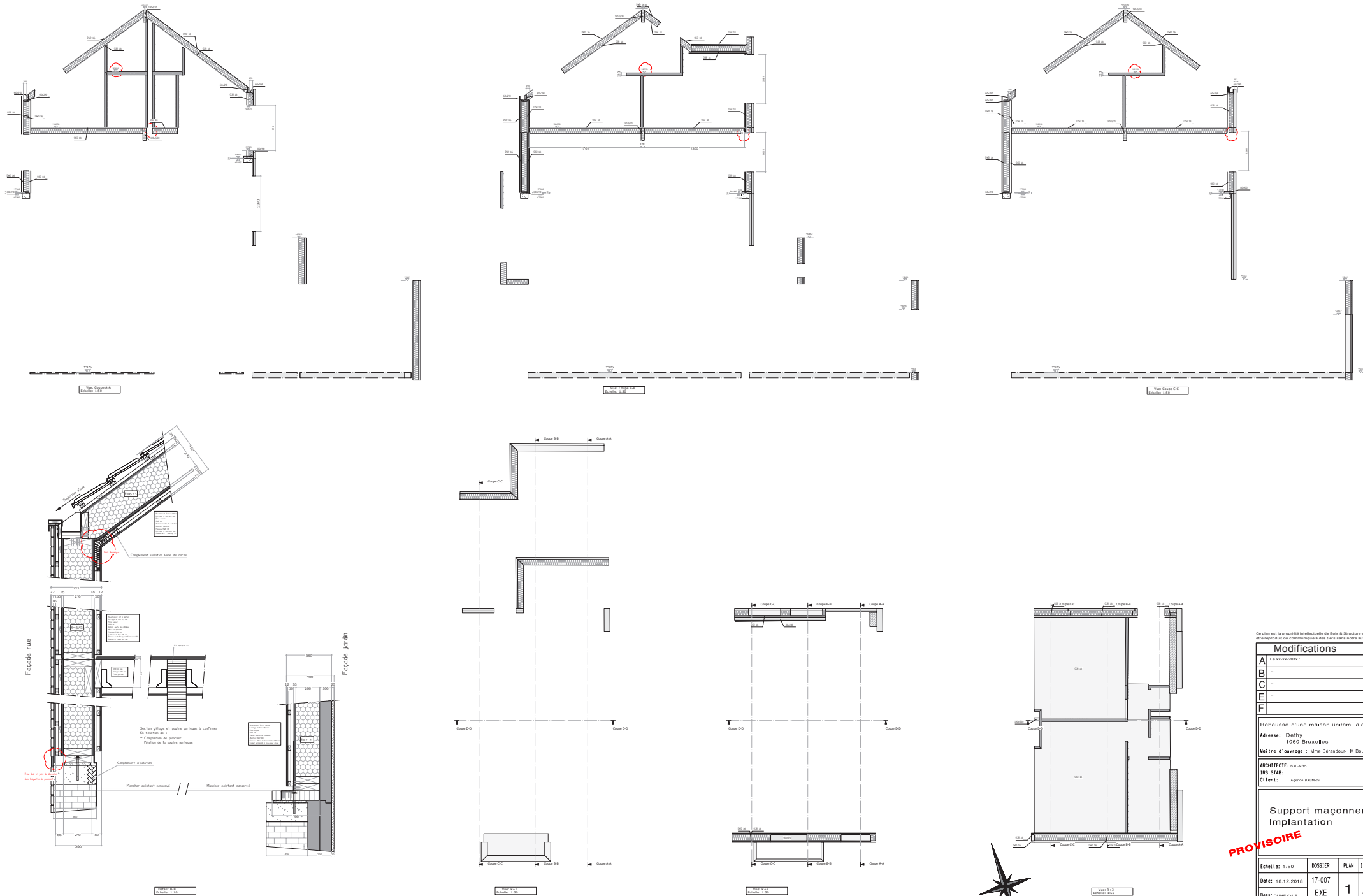
Le travail collaboratif à l'aide du BIM

IFC : Industry Foudation Classes

source: BuildingSMART™

IFC Model - wood structure

Maquette IFC structure bois



Ce plan est la propriété intellectuelle de Bois & Structure et ne peut être reproduit ou communiqué à des tiers sans notre autorisation

source: Bois&Structure©

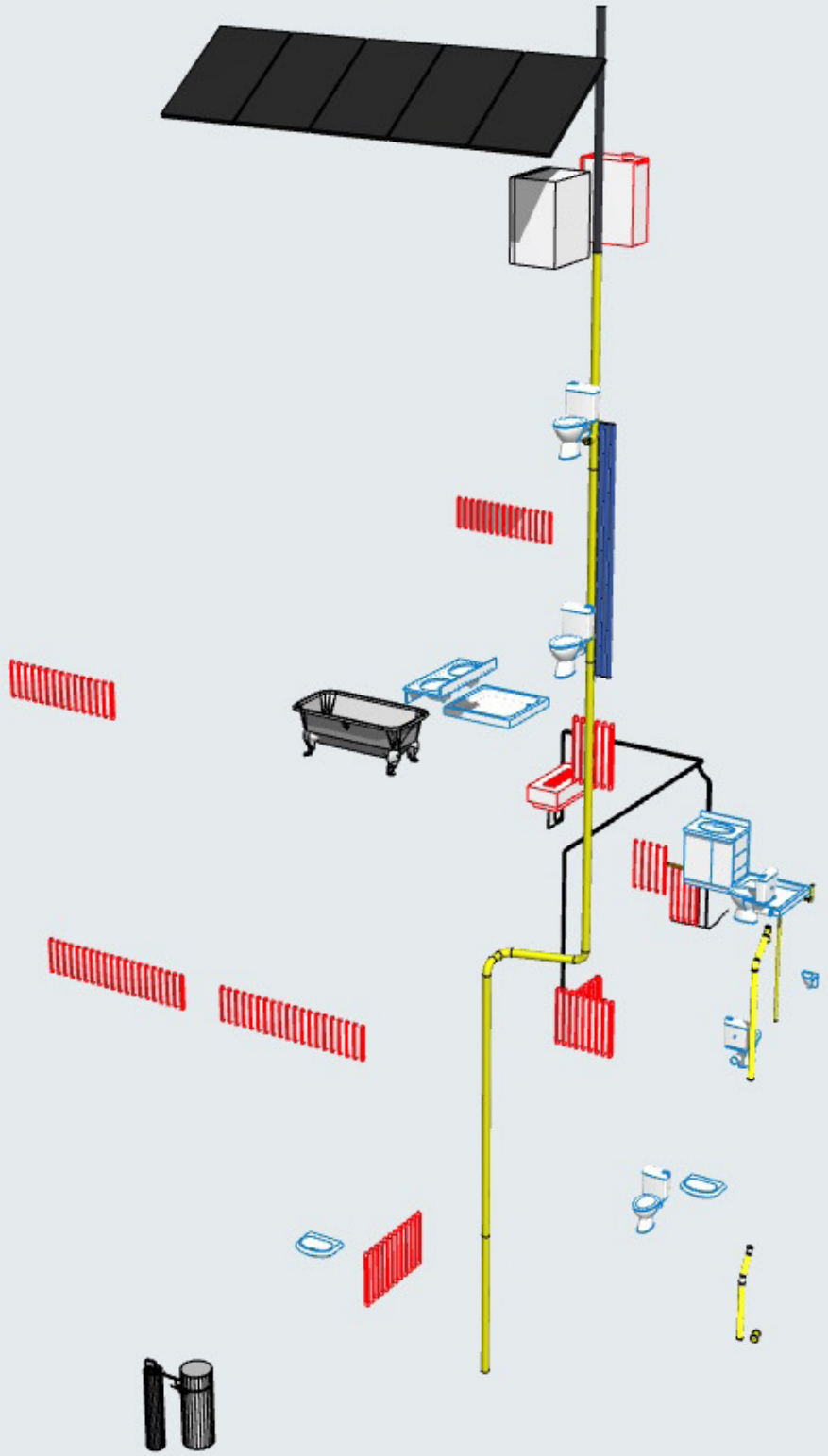
IFC exchange via online platform

Échange et recollement IFC via plateforme online

source: BxlMrs©

MEP

LES TECHNIQUES SPÉCIALES



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La ferme NOS PILIFS

Grâce au réseau constitué par BEcircular et la confédération de la construction, une mise en relation avec la ferme NosPilifs a été possible.

L'a telier bois de la ferme va récupérer une partie des chassis

Inventaire NosPilifs

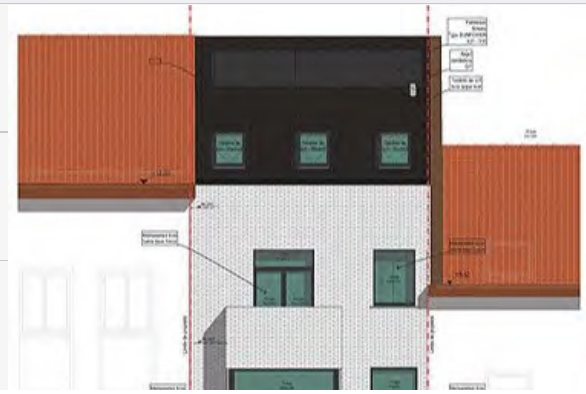
20/09/2018

INFORMATIONS SUR LE PROJET

Nom
DETHY

Adresse
Rue Dethy 3

Type de construction
Immeuble mixte bureaux/logements



REMARQUES

1) FENETRES ET PORTES EXTÉRIEURES

Note du	Description	Pour le	Statut
20/09/2018	Chassis PVC rdc et porte entrée BOIS habitation		

20/09/2018	Chassis BOIS salon R+1		

APPROUVÉ

1) FENETRES ET PORTES EXTÉRIEURES

Note du	Description	Pour le	Statut
20/09/2018	Porte PVC Rdc cour		

Note du	Description	Pour le	Statut
20/09/2018	Chassis PVC Rdc cour		

Note du	Description	Pour le	Statut
20/09/2018	Porte BOIS terrasse R+1		

1) FENETRES ET PORTES EXTÉRIEURES

Note du	Description	Pour le	Statut
20/09/2018	Chassis BOIS Sdb R+1		

Note du	Description	Pour le	Statut
20/09/2018	Chassis PVC escalier R+1		

Note du	Description	Pour le	Statut
20/09/2018	Chassis BOIS R+2		

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COLLABORATION INITIÉ AVEC DESIGN WITH SENS DONT L'ATELIER EST À 250m DU PROJET

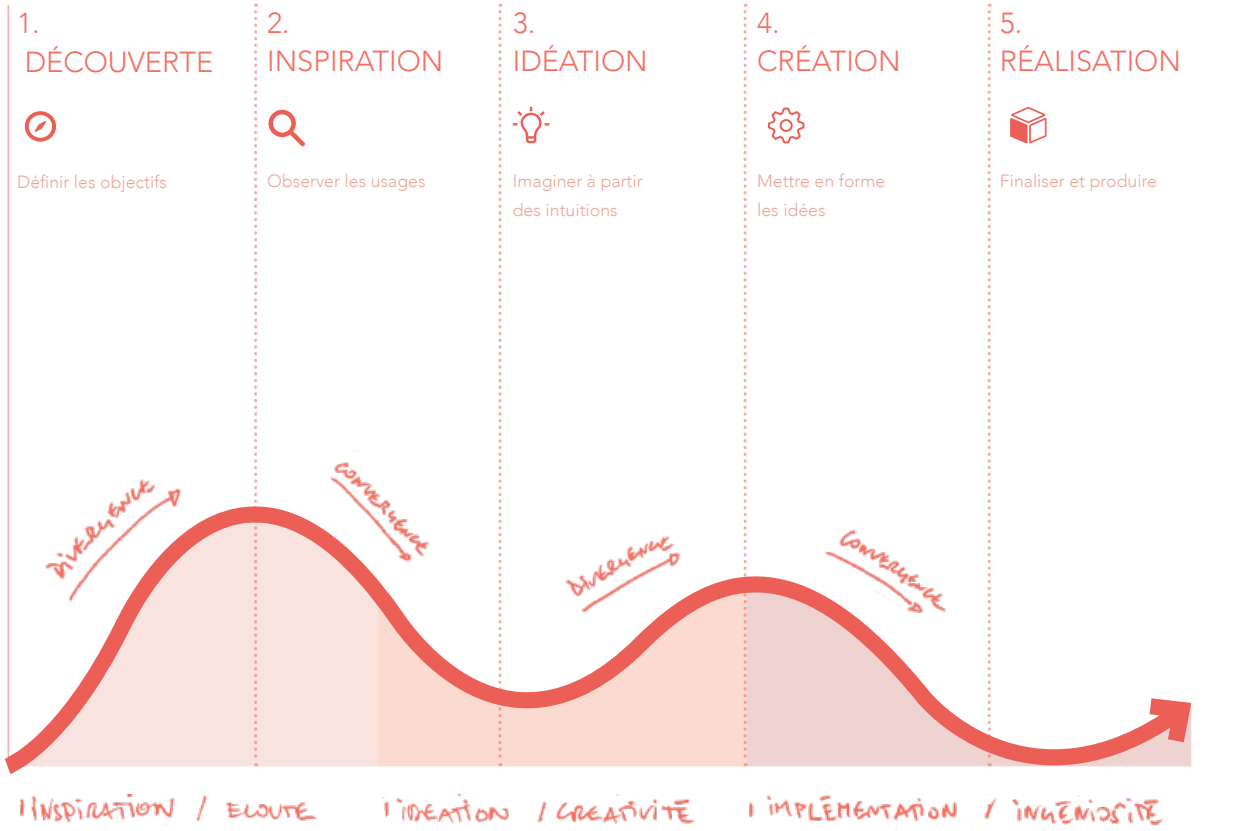
DESIGN WI+H SENSE

L'atelier collaboratif de design intérieur et de fabrication

MÉTHODOLOGIE

Le « Codesign d'espace », qui implique la participation active des utilisateurs au projet, est à comprendre dans la méthodologie comme une approche transversale, centrée sur l'humain, son potentiel créatif, sa capacité à proposer, à reformuler et à co-créer. Notre méthodologie fait donc largement appel à l'intelligence collective. Elle se développe au travers de plusieurs phases entre divergence (aller de l'avant et s'ouvrir à toutes les idées) et convergence (mettre l'accent sur le problème et la solution), créant ainsi un modèle itératif se resserrant vers l'objectif du projet.

Dans le même esprit, la préoccupation au sujet de l'économie circulaire et plus particulièrement l'éco-conception et le réemploi de matériaux, se retrouve aussi comme un fil conducteur dans toutes les phases du projet.



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DESIGN WITH SENSE

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Grâce au réseau constitué par BEcircular et la confédération de la construction, une mise en relation avec l'entreprise Jacques Delens a été possible.

Un stock d'isolant XPS utilisé pour des tests devait être mis à la décharge a pu être récupéré et stocké sur le site Dethy

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JACKON INSULATION

JACKODUR
KF 300 Standard

JACKON Insulation GmbH
Carl-Benz-Straße 8
33803 Steinhagen
Germany

CE
0432
16
Euroclass E

extrudierter Polystyrolschaum extruded polystyrene foam mousse de polystyrène extrudé	EN 13164 ETA 17/0950
Wärmeleitfähigkeit thermal conductivity conductivité thermique	λ_D = 0,036 W/(m K)
Wärmedurchlasswiderstand thermal resistance résistance thermique	R_D = 2,75 m²K/W
Verwendungszweck intended use usage prévu	ThIB

DoP: AE07458B
www.jidop.com/AE07458B

XPS DIN EN13164-T1-CS(10\Y)300-DS(70,90)-DLT(2)5 CC(2/1,5/50)100-WD(V)2 WL(T)0,7-FTCD1-TR200-MU50

Format/size/dimension	2500x600	mm
Paket/package/paquet	6,00	m²
Dicke/thickness/epaisseur	100	mm
Stück/pieces/pieces	4	
Kante/edge/bords		

4 025345 065459

039
MPA NRW-00381-01

Anwendungsbereich DIN V 4108-10:2006
DAD,DAA-dh,DUK-dh,DI,DEO-dh,WAB,WZ WI,PW-dh,PB-dh
Z-23.15-1477

4507458

XPS-G30 nach ÖNORM B 6000

SIA 279
Wärmeleitfähigkeit
λ_D=0,036 W/(m·K)

Isolant thermique certifié
N° 10/074/659
Profil d'usage ISOLE certifié
R_{cs}=140 kPa
dsmini=0,7%; dsmaxi=2,0%
R_D =2,75 m²K/W
www.acermi.com

1822
2922301R

H 826

KF 3 NF 100

Reg.-Nr. 067674
Vertrags-Nr. 322 1
HBCD free
basis
THIRD-PARTY VERIFIED EPD
Institut Bauen und Umwelt e.V.
EPD-FPX-20140157-IBE1-DE

ÉMISSIONS DANS L'AIR INTÉRIEUR*
A+
A+ A B C

* Information sur le niveau d'émission de substances volatiles dans l'air intérieur, présentant un risque de toxicité par inhalation, sur une échelle de classe allant de A+ (très faibles émissions) à C (fortes émissions)

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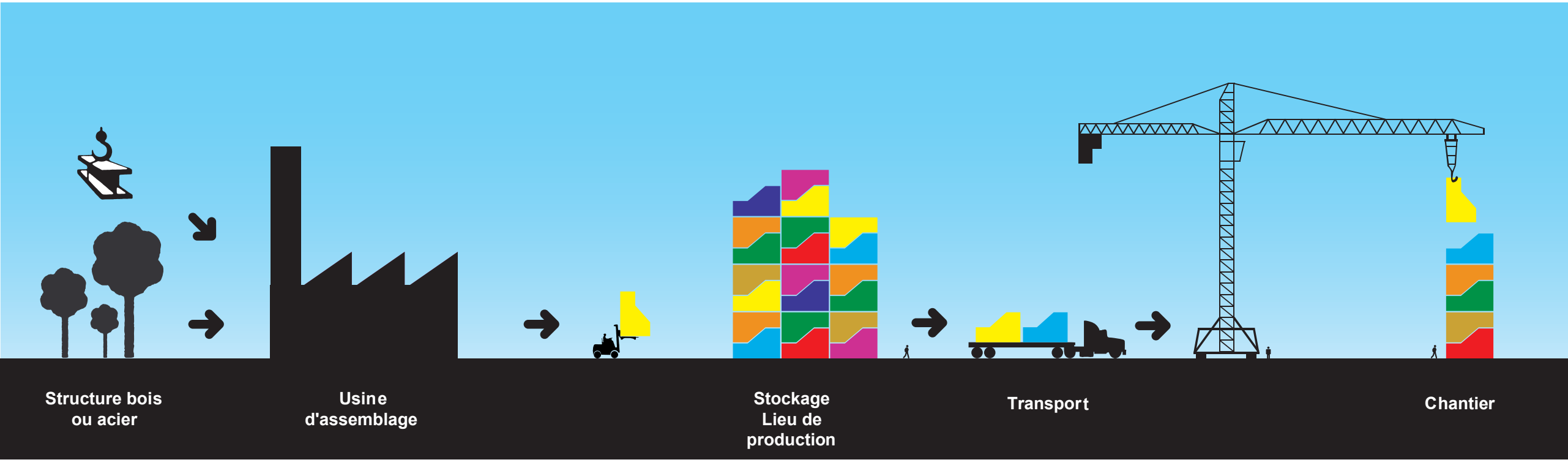
3. ORGANIZING BUILDING SITE

LA PRÉPARATION DU CHANTIER

source: BxlMrs©

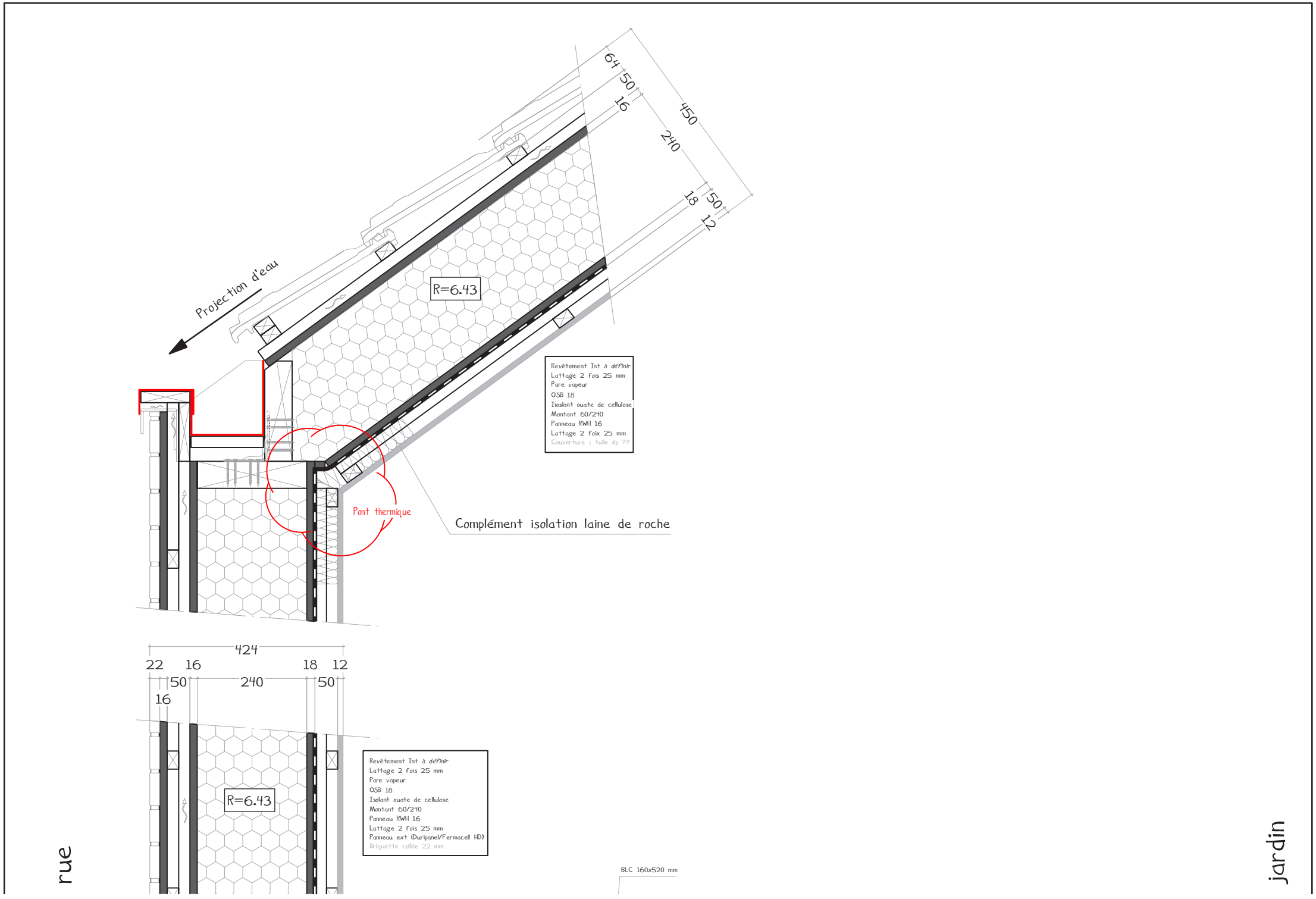
Optimized prefabrication

Préfabrication optimisée



source: BxlMrs©

Conception structure bois



source: Bois&Structure©

Groundfloor - material storage

Rdc - stockage des matériaux démontés

source: BxlMrs©

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PRODOTTI BIOLOGICI
100% PRODOTTO ITALIANO
La Natura è Servita
Sicilia

LE MARCHÉ
BIO
MARKT
des tanneurs

56
58

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good food, good people
BIO
COÖPERATIE
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SHOP
BIO-OBST
Augustin
biosikelia
ORGANIC FARMERS ASSOCIATION
bella da vedere
Sicilia
buona da mangiare
260 TSX
43

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BIO-OBST
Ass. Prod. Agr. Biologici
Azahar
ORGANICLY GROWN
AGRICULTURE BIOLOGIQUE
Prodotti Biologici
biosikelia
ORGANIC FARMERS ASSOCIATION
bella da vedere
Sicilia
buona da mangiare
carpenaturam
da agricoltura biologica
I FRUTTI DEL SOLE

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PRODOTTI DA AGRICOLTURA BIOLOGICA
GEIMA
ATTENZIONE
VERA FRUTTA

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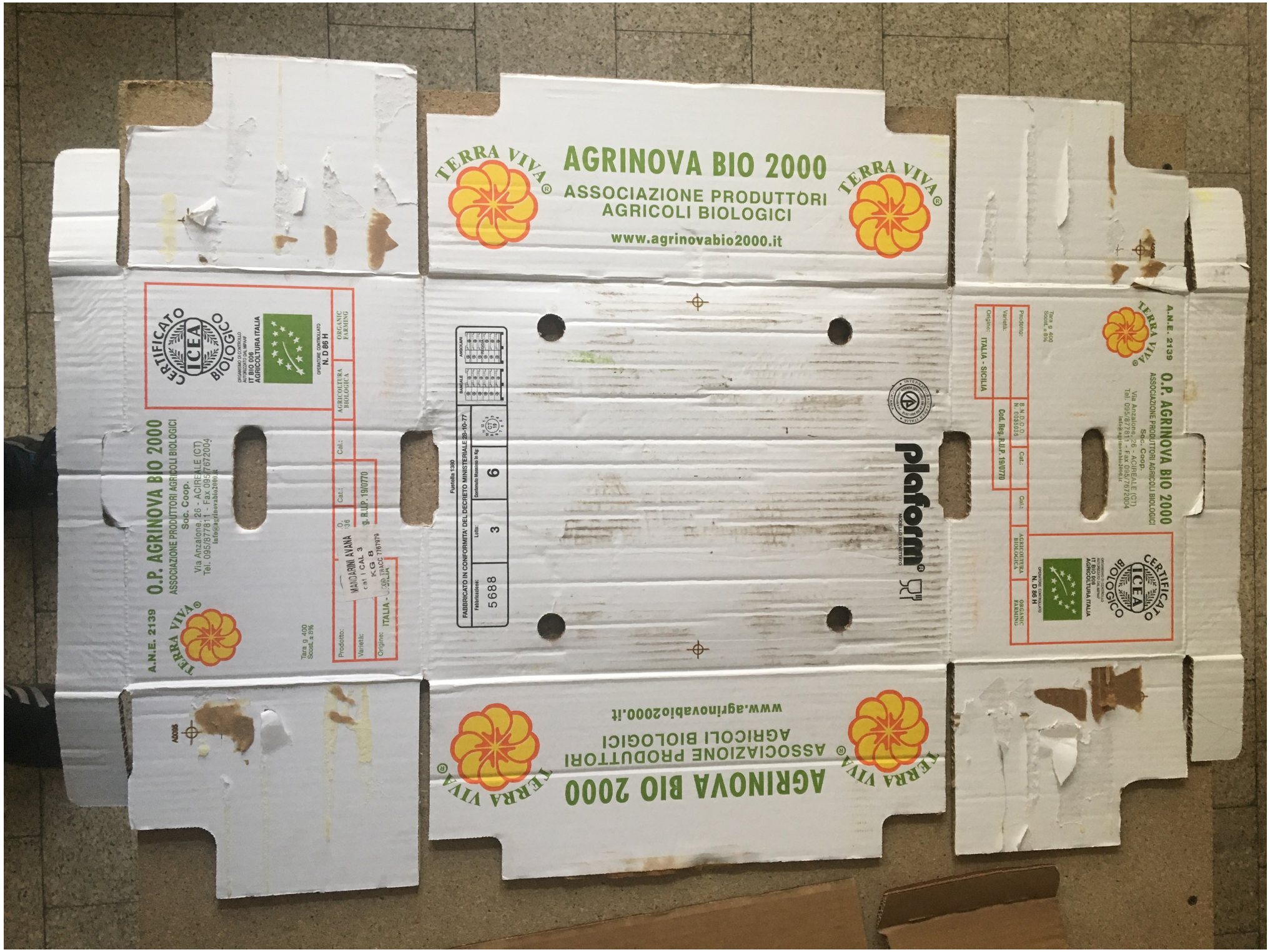
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Tel. 095/877811 - Fax 095/7672004
CERTIFICATO BIOLOGICO ICEA
ORGANISMO DI CONTROLLO AUTORIZZATO DAL MIPAAF
IT BIO 006
AGRICOLTURA ITALIA
OPERATORE CONTROLLATO
N.D 86 H
AGRICOLTURA BIOLOGICA
ORGANIC FARMING
Prodotto:
Varietà:
Origine: ITALIA - SICILIA
Cat.I:
Cod. Reg. R.I.P. 19/0770
Tara g. 400
Scost. ± 8%
FABBRICATO IN CONFORMITA' DEL DECRETO MINISTERIALE 28-10-77
Fabbricazione: 5688
Lotto: 3
Contenuto Massimo in Kg 6
Fustella 1380
platform
MANDARINI AVANA
cat I CAL 3
KG 8
ITALIA - SICILIA

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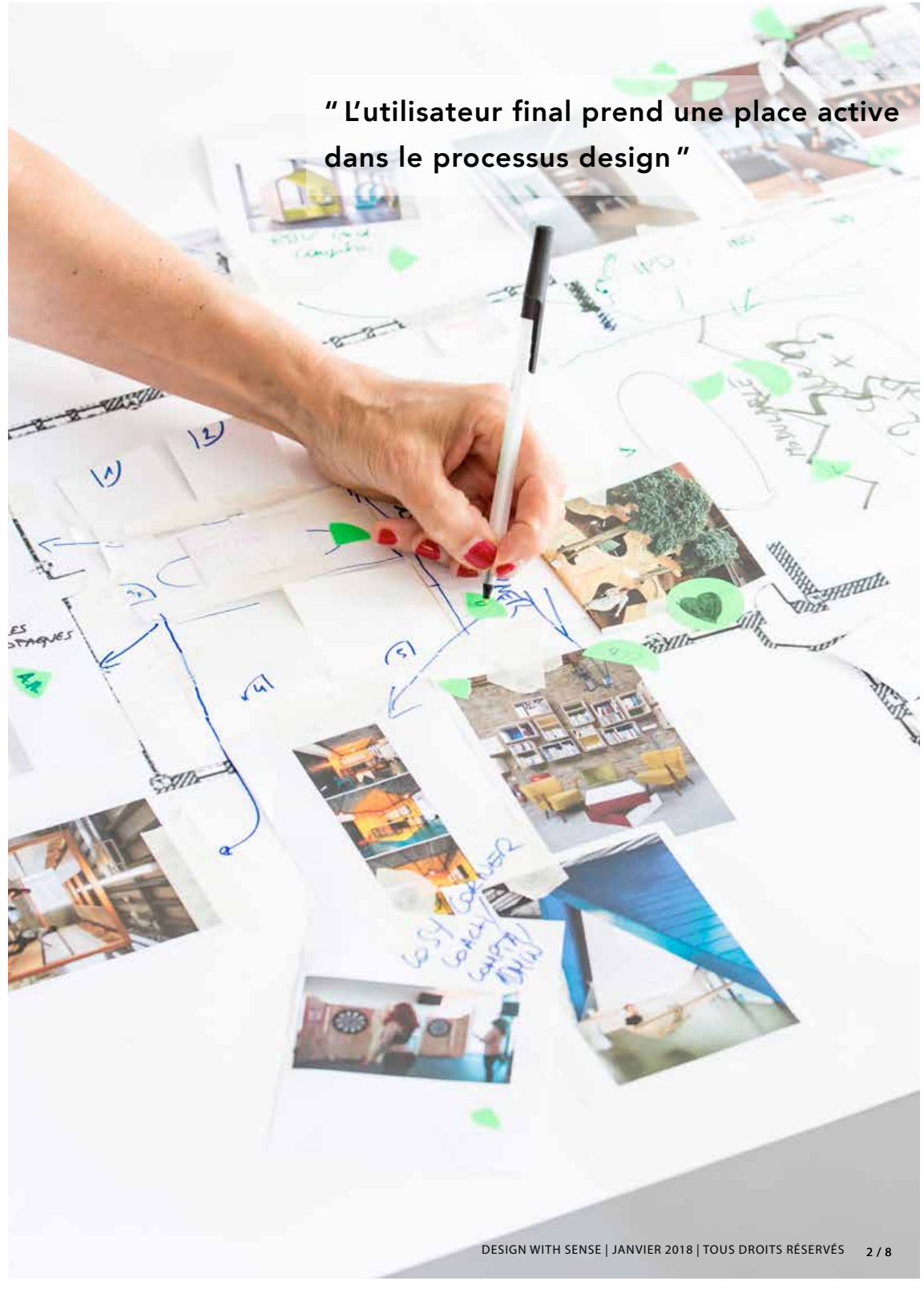
LOCAL, ECO ET HUMAIN

Design With Sense est un projet collaboratif de fabrication d'espaces intérieurs mené par des architectes, artisans, designers, convaincus que le processus créatif doit être réalisé de la conception à la réalisation selon une ligne de conduite responsable et digne de bon sens.
Les collaborateurs de Design With Sense mettent leur bon sens à l'oeuvre selon des principes qui se sont affinés au fil de leurs expériences professionnelles, de leur parcours de vie et de leur engagement commun à agir pour un avenir soutenable. Dès lors, la participation des usagers par une méthodologie de «Codesign d'espace» et l'économie circulaire par l'éco-conception et/ou le réemploi sont inscrites dans la raison d'être de Design With Sense.

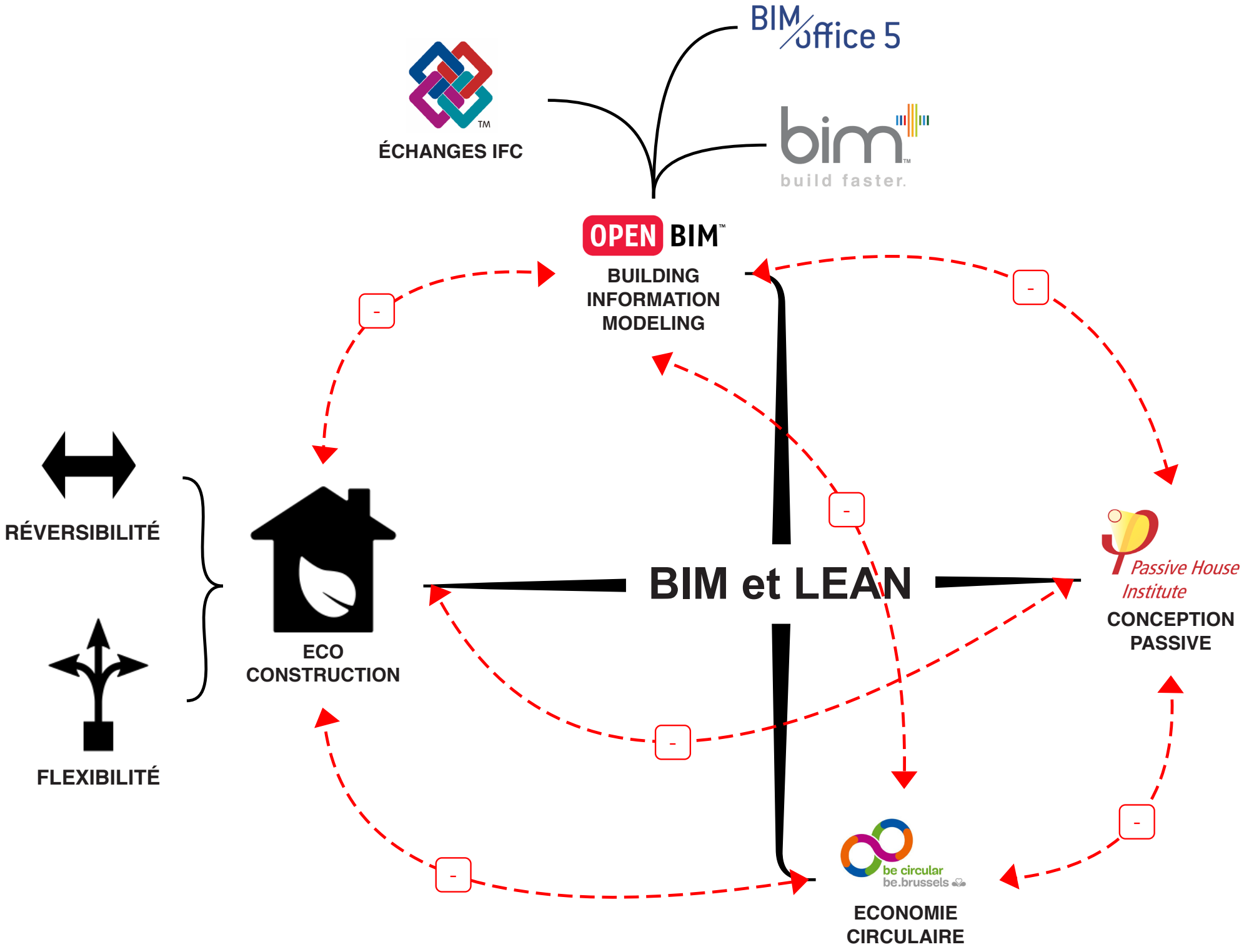
Une démarche de « Co-design d'espace » : l'usager final au coeur du processus !

Notre vision est simple. Plutôt que de nous contenter d'intuitions, d'intentions formelles, qui créent le « beau » geste mais ne correspondent pas ou peu aux intérêts des usagers, nous avons pris le parti de fabriquer des espaces qui répondent réellement aux attentes et à la personnalité des individus qui les utilisent. Nous tenons à réinstaurer le dialogue souvent minimisé, voire évincé, entre les individus et les espaces qui leur sont dédiés et sont censés améliorer leur qualité de vie ou de travail. Pour y parvenir, nous mettons en oeuvre une méthodologie de « Codesign d'espace » où l'utilisateur final prend une place active dans le processus design, du brief initial à la réalisation de l'espace. En plus de notre rôle professionnel classique, nous endossons celui de facilitateur, capable d'empathie, doté d'une curiosité constructive et d'une ingéniosité singulière. Nous sommes suffisamment habiles pour mettre l'utilisateur en capacité d'agir pour son espace plutôt que de le subir.



4. LE BIM CONTINUUM

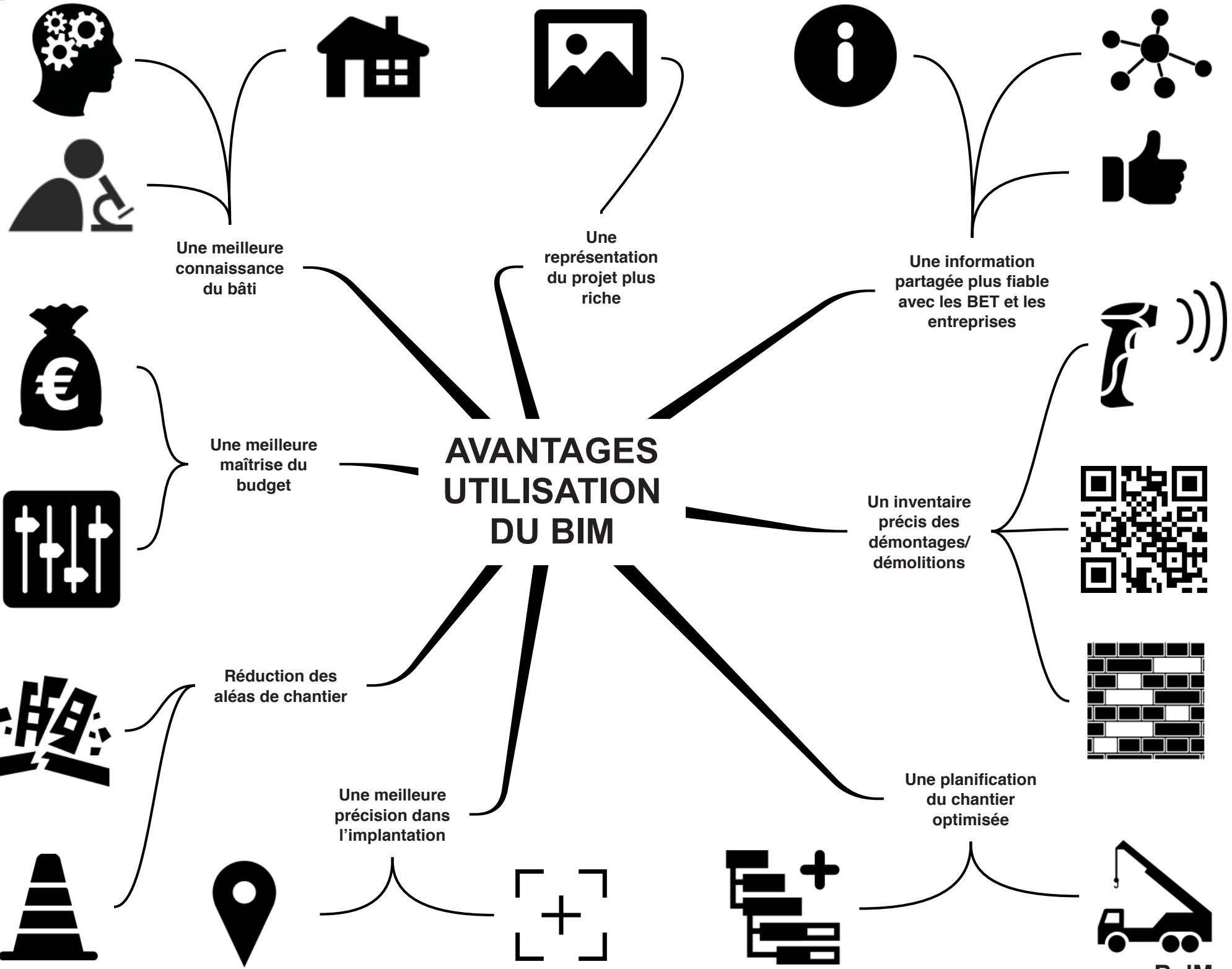
Le BIM Continuum



source: BxlMrs©

Advantages of BIM in the project process

Avantages du BIM dans le processus de projet



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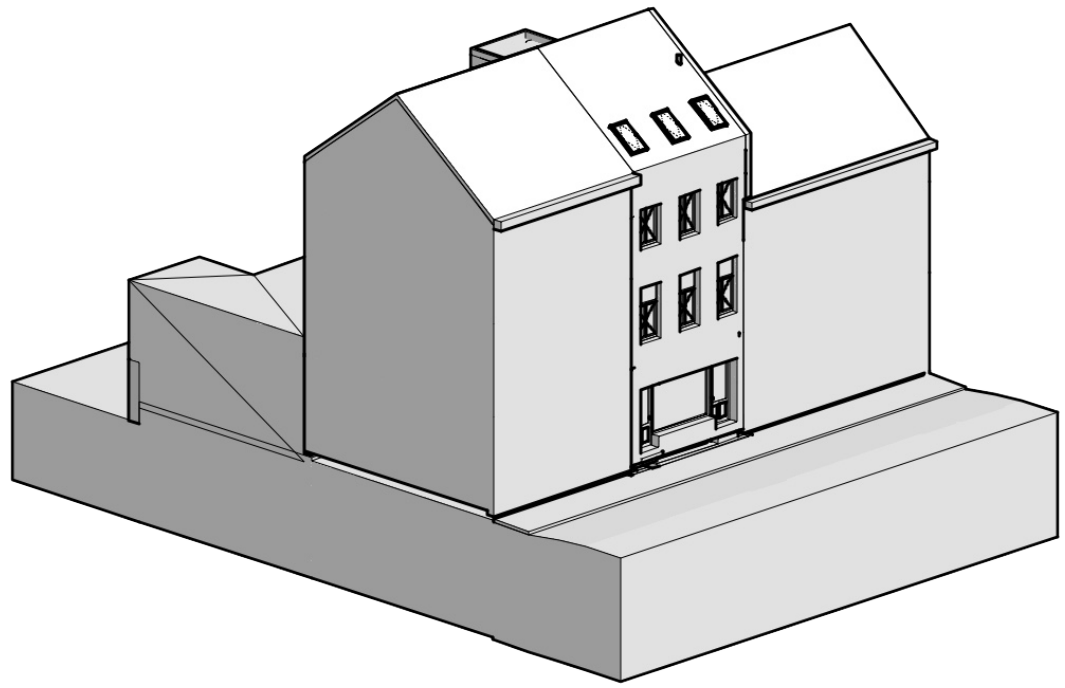

merci, thank you