

11. ANNEXOS

A.1: TRADUCCIÓ A LA TERCERA LLENGUA

SUMMARY

This Final Project combines two different specialties: sciences and technology building studies. On one hand, the rehabilitation and environmental impact of energy speciality, and on the other hand, the interior refurbishment speciality; giving place to such project. This project is based in an apartment building located in the Sagrada Familia neighbourhood, in the Eixample district in Barcelona.

Located at number 34 of Gaudi Avenue, we find a building of typical structure and morphology in construction, which is divided into seven different floors.

Is important to say that tourism is increasing on visits during summer and winter. Nowadays, tourists prefer to leave the rooms in hotels to stay in rental dwellings where tourist can feel like at home, without any other condition like codes of conduction because of sharing accommodation with other neighbours. Unfortunately, this respect is hard to maintain, especially with young tourists. At this point, there is an inconvenience of finding residential homeowners, and apartments declared as tourist housing, at the same building.

The City Council is promoting a record of such households to apply control, and often we find orders of declaring the entire buildings as households for tourists.

For this purpose, the project we are developing has as main objective the suitability of a residential building to create a building exclusively for tourist use; because the advantage of such housing is that if the owner wishes, in the future he could sale the different homes as residential housing, the way the law allows.

We seek the maximum use of space, thinking about the different types of tourist groups that can be submitted, according to small touristic surveys of the area and the services offered by the Eixample district, particularly in Sagrada Familia.

In conclusion, the aim is to adapt the building to suffer a change in use, making proper management of interior space with the use of materials and systems that cause less environmental impact and describing the entire building with remarkable improvements in energy.

1. INTRODUCTION

The main objective of this work is the fulfilment of a change of use project for a building with two major factors to consider: the optimization of the interior space and the remodelling of the environmental rehabilitation.

The building is located at 34 Gaudi Avenue, at the Sagrada Familia district. Because of its location, it presents a typical construction of this area. Its construction dates back to 1945 as the Contemporary Municipal Records indicate, but, we can say that the date we have is not accurate because of the information we received from neighbours that lived there before 1945.

The work can be divided into two parts, the current condition and the refurbish state.

For the current condition we proceed to an energy analysis, a study of the used materials and an overview of the constructive morphology and the interior arrangement. Highlight the non-control use of post-war materials, the orientation of the site and the type of projected housing.

The most extensive part is there refurbished state. We proceed to make a new interior distribution adapted to the current habitability rules. We made a research of materials that will be used, in order to use the most optimal. Also, we are planning a new facility system designed to fulfill the touristic apartments and in a future, the possible residential building. In a constructive way, due to the interior intervention, stairs must be demolished, and a new stair cage and roofs must be constructed. As a final detail, we planned a small part of the interior project, where we deal with materials, colours, etc.

So there is a combination between two specialties in order to obtain one concrete result: a building with improved characteristics for different sectors.

The building consists of a renovation in 1998, where a specific flat beam of a floor is repair, the front and rear facade rehabilitation, the improvement of the drainage system and the refurbishment of the roof, which receives a new waterproofing.

Our project is based on a small section of working drawings offered by the President of the homeowners, although the building was not complete, we have carried out some measurements and an exchange of views between the neighbours that had allowed us to control and consider interventions that each one had made at home (demolition of walls,insulation, interior refurbishment,etc.).

2. HISTORICAL INTRODUCTION

CERDÀ'S EIXAMPLE

In the late eighteenth and early nineteenth century, the city of Barcelona, full of amazement and great economic boom shows the imminent need to expand beyond the 6 km of walls that used to limit it. Walls that gather social, labour and economic devotion making Barcelona the starting point of great trade routes of the time.

For this reason the boundaries of urban design, approved in June 7 of 1859, the Refurbishment Plan for the Eixample district of Barcelona.

Previously planned, the first technical draw offered for the urban development project of the city appears in 1838, when the Work Board of Barcelona carried out the proposal to widen a triangle limited between the current Fontanella and Pelayo Street, Universitat and Sant Pere Square and the current Urquinaona square.

Against this proposal, the Engineers Commandant presents a project of moving forwards the walls onto the Tallers and Junqueres streets. Miquel Garrigai Roca was the municipal architect responsible for the planning of the Eixample and its ornamental embellishment.

The City Council established that the sites obtained from the demolition of the walls would belong to municipal authority, which the military authority did not see the act appropriate, and opposed it.

Such disagreement caused the suspension of the project until 1841. From this date, the competition organized by the city council was granted by Pere Felip Montlau, that under the title "Down the Walls: Memories about the advantages that the demolition of the surrounding walls would bring to Barcelona and specially to its industry", which includes the expansion of the city from Llobregat to Besos, won the competition and got a great popular acceptance. Unfortunately, due to bombings in the city, the project is once again suspended.

The year 1846 was not enough to solve the network when the Gràcia neighborhood and the City of Barcelona, came together to become a union between the two populations. Various projects were tried to carry out by a committee composed of military engineers, among which are the Barcelona's Topography and Eixample's study.

Ten years later, a terrible cholera epidemic and a wide spread growth of people, causes that the Finance Minister, Pascual Madoz, promulgated the demolition of walls except the ones near the sea; Ciutadella and Montjuic.

Finally, in 1856 the engineer Ildefons Cerdà presents at 1:5000 scale, a topographic project map of the city of Barcelona, the area between Barcelona and Gràcia and between Sants and Sant Andreu de Palomar.

Meanwhile, the City Council began promoting an Eixample project. The architect Miquel Garrigai Roca was chosen to present the first draft project of Eixample district.

This draft tries to satisfy essential needs, which proposes the use of the area between Barcelona and Gràcia without exceeding the west limits. This is approved in April 1858.

However, the central government is ordered to require Cerdà a new project for Eixample district. Annoyed by such occurrence, the City Council of Barcelona paralyzed Miquel Garrigai Roca's project to start a public tender for the new area of the city.

Such is the tension that exists between the government and the City Council, that Ildefons Cerdà went directly to the central government to present the finished project. Between the carried out visits, we found Pascual Madoz (Minister of Finance), Laureà Figuerola (Economics Professor at Madrid and Barcelona) and the Corvera Marquis (General Director of Public Works).

The arising effects are the approval of Cerda's Plan by the Government.

The great struggle creates new disagreements in different areas such as technical, economic and especially political, therefore, against the central government, the City Council requested the repeal of the said order and Antoni Rovira i Trias was declared winner.

The differences between Cerda's Plan and Rovira i Trias's Plan are quite extensive. Mainly, it was clear that the winning project did not had the enough qualities to satisfy the sought requirements in the Eixample. Between those, we found: the less fitting of people, less advantage of land use and therefore less buildable surface.

Such network is solved by the implementation of the Cerdà's plan ordered by Minister of Development in July of 1860 against the City Council.

GAUDI'S AVENUE, A DISRUPTION IN THE ORTHOGONAL LAYOUT

As mentioned, a project is initiated to link Barcelona and neighbouring villages. Although Jaussey Plan, winner of the tender, is not carried out, the City Council ends up accepting and executing Romeu-Pòrcel Plan, which keeps some of the urban features of Jaussey Plan.

In 1914 the game starts once again in the city government, prepared to agree with the owners of the insoluble renewal plans to link the Eixample and the attached municipalities. Romeu-Pòrcel Plan would be executed. It is clear that the city government was willing to do everything to destroy Cerdà's Plan established by the central government.

There are some features in Romeu-Pòrcel Plan that reminded of Leon Jaussely's project, due to the cancellation of the Jaussely Plan because of the expulsion of the government of the City Council during the Tragic Week of 1909. One of these features is Gaudi's Avenue; route that the French planner introduced in his project.

This avenue broke every orthogonal rule, and established a key link between Antoni Gaudi's Sagrada Família and Sant Pau de Puig i Cadafalch Hospital, joining together these two modernist spaces.

Finally, the avenue is opened in 1926 (according to the arrival of the Universal Exhibition of 1929) with Primo de Rivera dictatorship, which is called up with his name during the Second Republic until the Civil War (1931 - 1939) which became Gaudi's Avenue.

However, in 1939, with Franco's dictatorship was renamed again as "Avenida General Primo de Rivera", proclamation that lasted until 1962, which changed its name to Gaudi's Avenue, just like it's called today.

It is necessary to outline its urban layout. Since its inauguration in 1926, the section was intended for vehicular traffic.



Image 2: View of the avenue in 1927.

Source: LLIMARAGAS I CASAS, M., FIGUERAS BORRULL, L. *L'Eixample: gènesi i construcció*. Ed. Barcelona Lunwergrt, 2009.

In 1980 the City Council proposed a redevelopment, changing the Avenue into a pedestrian boulevard, where traffic is limited to neighbour vehicles and loading and unloading areas for shops. More recently, from 2009 the two small lanes in both directions for vehicles have been limited, so there is only specific access to each section of the avenue, meaning you cannot continuously go up and down the four sections.

These small details have made the Avenue a social space for tourist and neighbours. Nowadays, is a social space where activities in the area as the town festival is celebrated, as well as markets, fairs and other important social concentrations. The orthogonal layout of Cerda's Plan interrupt the bases and breaks with the orientation of buildings, over time a closed space has been achieved, that maybe we cannot consider it a green area because of the lack of garden, but it reminds of a section similar to the parallel house types that one day Cerdà tried to capture in his theories and urban design projects.

MORPHOLOGY OF EIXAMPLE CONSTRUCTION

Speaking about building, in the boundedspace by the Eixample we highlight the existence of a homogeneity emerged from an anonymous architecture, but in many cases with quality. If we analyse this homogeneity, we highlight two important physical levels: the shape and construction technique that it supports.

We associate parameters arising from customs with the shape, which could be the lots, plant and facade.

As part of the technique we associated its structure and its resistant section. The fundamental characteristics for such value are: the unknown construction, the technique used and the system used to build buildings.

We can mention several evolutions of the crafthome, on its interior and volumetric level (building depth, different reassembles, etc.).

Externally, the different urban projects implemented in different parts of the city forced to construct new buildings that did not associated with pre-existing ones.

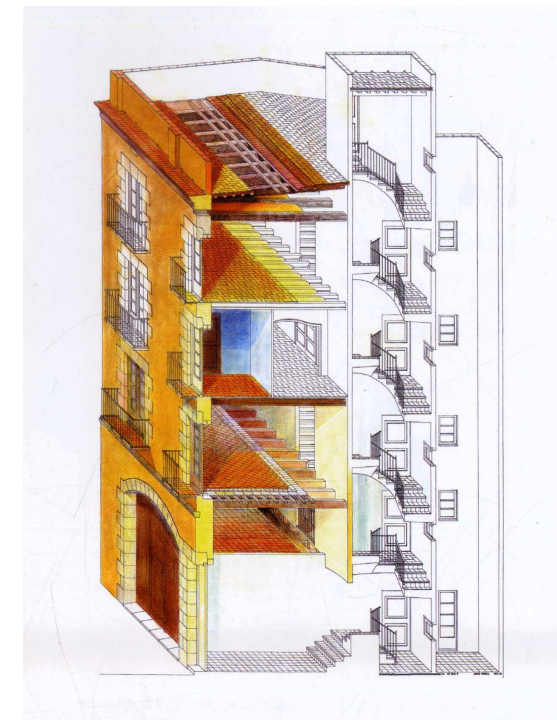


Image 3: Dimensional section.

Source: PARICIO CASADEMUNT, A. *Secrets d'un sistema constructiu, l'Eixample*. Edicions UPC, 2001.

So, we proceed to list the parameters that define the model of any building in the Eixample. These parameters that influence us in different proportion and final result of the building are:

– The plot, consisting of the starting plane, breaks the old ground structures into units. It gave us a result of a residents housing model with widths between 11 and 14 meters, perpendicular to the street and consequently to the facade to facilitate internal division.

– The floor is a parameter that depends on the plot and the ordinance regarding the building depth. The plant presents us two models of building, the side and the bevel. The second one, in a less quantity. But in both cases, the basic variable is the number of lightpatios.

– The facade gives us the regular height. The Ordinance of 1856, which affects the first buildings of the Eixample, heights are regulate, as well as the number of floors and balconies, grandstands, viewpoints and overhang of the cornice are mentioned. From the Ordinance of April 1877 and final regulations of 1890, some characteristics are introduced to finish the facades. Meaning, the facade becomes a very regulated aspect in order to control and ensure the whole town.

– The section is associated to a constructive act and it's a parameter that helps us to distinguish four different situations. We found four types of building according to its section: The ones developed entirely above ground level (first of Eixample times), those that have basement (second generation buildings), buildings with a basement located in the whole body of the building (rare) and buildings with semi-basement ventilated directly to the outside.

– The Ordinance is the last parameter to highlight. Is the one that definitely sets the geometric parameters of the building. The Ordinance became a regulation known as the townhouse multi-family building within dividing walls.

The model of Eixample itself let us see a rectangular floor that will benefit the constructive structural values, in which load-bearing walls system would properly be adopted.

It is, therefore, a model of the Eixample which suppose a repetitive pattern that allows us distinguish two versions of the building: the band and the corner. From the first version, we get the majority of buildings and it provides us a division of two flats per floor.

3. PREVIOUS INFORMATION AND LOCATION

Based on the touristic information of 2013, we can say that Barcelona is a city that had received 15.7 million visits by foreign tourists this year, most of them Russian, British and Asian (according to the Tourist UAB 2013index).

Tourism is strength despite the economic situation of the city. The accommodation is set as the primary factor in terms of the tourism.

The Eixample, as the Old Town, is the district that gathers more tourism of the city. The data is quite clear: it is one of the largest districts of the city, and the most central. We will see then, the collection of data of the district in order to set a site for the work.

The statistics department shows the following information regarding the territorial area in which we will move:

1. Territori de l'Eixample		2. Superfície per districte i barris. 2012										
	BARCELONA	EIXAMPLE	Barris del districte									
			Dte 2.	5. el Fort Pienc	6. la Sagrada Família	7. la Dreta de l'Eixample	8. l'Antiga Esquerra de l'Eixample	9. la Nova Esquerra de l'Eixample	10. Sant Antoni			
Superfície (ha)	10.215,9	747,6	92,9	105,1	212,3	123,4	133,8	80,1				
Població	1.620.943	265.828	32.296	52.109	43.355	41.785	57.911	38.372				
Densitat població (hab/ha)	159	356	348	499	204	338	433	479				
Densitat neta (1)	826	713	987	1.012	381	624	884	925				

Nota: Densitat neta: població/superfície residencial (hab/ha).
 Departament d'Estadística. Ajuntament de Barcelona.
 Font: Informació de base i cartografia. IMI-Hàbitat Urbà.
 Lectura del Padró Municipal d'Habitants a 30 de juny 2012. Ajuntament de Barcelona

Table 1.1(Annex 2)

As we can see, data of territory and population predominates in the Eixample in relation to Barcelona.

On the other hand, the Eixample district assume more than 32% of tourist accommodation in Barcelona, according to all 10 districts throughout the city (see table 1.3 in annex 1). Furthermore, inside the districts we can highlight the neighbourhoods. The building we are studying is located in Sagrada Família neighbourhood. It is the third largest neighbourhood, but the second most populated (with respect to a total of 6 neighbourhoods) of the entire Eixample district, as seen in Table 1.1.



Image 5: Limitation on the Sagrada Família's neighborhood

Source: Web Ajuntament de Barcelona (www.bcn.cat)

The Sagrada Família neighbourhood is bounded by the St. Antoni Maria Claret street, Dos de Maig Street, Nàpols Street, Rosselló Street and Diagonal Avenue, and having on one corner Glorias square.

Without any doubt, we can say that the neighbourhood is a touristic epicentre throughout the year, considering that at the center is located one of the major cultural and architectural monuments of Barcelona, aside from St. Pau Hospital and Santa Creu.

The visits to the Sagrada Família Temple received 3.2 million on tourists in 2012 (according to tourism sources at the City Council). This is why the impact caused by tourism at monumental areas is important.

The building that we are studying, as we had mentioned before, is located at the road that connects the two World Heritage Site declared by UNESCO. The building is found at the second section of the four existing ones, situated at 34th Gaudi Avenue.

In fact, it is a busy road by touristic traffic, and at the same time, the cultural centre of the neighbourhood.

During the year, different parties take place, including the Major Festival of the neighbourhood, that last between 4 or 5 days during the second half of April. For many weeks there are organized craft fairs, dining and shopping stalls and especially the respective fairs for Christmas and Eastern time.

Our building is surrounded by many services. In terms of transportation, there are two subway lines, L2 and L5 which reach downtown. The metro station is 50 meters from the building. On the other hand there are bus lines, both downtown and up town, which also bring us closer to the centre. Also, we found a taxi stop at the same corner between Padilla Street and Còrsega Street.

The restaurant business offers is fully extended, from fast food restaurants, informal restaurants or even more selective ones.

For medical services, our building is close to the service (Sagrada Família CAP) or the emergency of Sant Pau hospital.

Finally, note the commercial services of the area, from clothing and footwear shops to supermarkets and other grocery stores, including the Sagrada Família Market, one of the busiest on Thursdays and Saturdays, with a wide range of products.

4.MEMORY DESCRIPTION

DATA AND CURRENT CONSUMPTION

General Building

The building consists of 15 apartments, divided in 7 different floors, two flats per floor and one ground floor.

Of all the homes we have completely refurbishment in its inside, we've made a list with all the flats completely refurbishment in order to create new spaces, whenever the reform that has been made in specific periods and finished as the bathroom and kitchen (will denominated as half-intervention), and it will be known as original when if retained all finishes despite having refurbished the bathroom or kitchen.

At annex number 4 we see the survey filled up by each floor and the consumption that their tenants have been able to provide.

Of the 15 homes, one has undergone a complete refurbishment, 4 suffered a semi-intervention and 5 remain in its originality. There is no information from the remaining 4 flats because of being uninhabited, rented or not wanting to participate in providing information for the project.

The information available about consumption has been provided only from one of the neighbours.

Throughout the building, there is only one rental property with tenants, another uninhabited and a total of 3 flats that have undergone a complete interior renovation. Of the 15 homes we've just being able to talk to 11 tenants, and with the help of those, we have extracted data about consumption and the state of the floors. It should be noted that 80% of the 11 respondents are old people, so we have got little information.

The obtained consumptions have being:

Consumptions of the community:

SUPPLY	DATA	TOTAL CONSUMPTION
Water	Novembre2011-novembre 2012	2m3
Electricity	Desembre 2011-desembre 2012	4041kWh

First floor second flat:

SUPPLY	DATA	TOTAL CONSUMPTION
Water	maig 2012-maig2013	108m3
Gas	any 2012	2544kWh-217m3
Electricity	any 2012	3855kWh

Second floor second flat:

SUPPLY	DATA	TOTAL CONSUMPTION
Water	febrer 2012-març 2013	291m3
Gas	maig 2012-maig 2013	1760kWh
Electricity	novembre 2012- abril 2013	1490kWh

[...]

5. STUDY OF CHANGE USES

OUR INITIATIVE AND THE H.U.T

As we have seen, we are in a totally tourist area.

To justify our initiative to undertake a building used exclusively for tourist Housing (HUT), we will base on the latest data provided by the sources APARTUR, and on the other hand, from information found on the City Council, among others.

In any case, we will give our opinion first and then focus the data.

I personally believe that the exclusive use of the entire buildings to HUT create a bond of respect and comfort among residents and tourists, since there is no interference created between them. On the other hand, is easier to notice and record the location of the remains collected. Meanwhile, the legality of these houses should be imminent in order to regulate and organize their use.

What is a Housing tourist?. Barcelona's Eixample figures

According to the Department of Enterprise and Employment of the Government of Catalonia, tourist housing is a type of housing where the owner cedes to third parties in exchange for a fee during a maximum period of 31 days, two or more times a year. The owner of HUT is the owner of each flat.

The conditions that must be fulfilled in order to be this kind of housing:

- Must have valid Certificate of Occupancy.
- Must meet the technical and quality requirements.
- The occupation must not be higher than the mark certificate.
- Must be sufficiently furnished, equipped with appliances and utensils in perfect condition of health.

Tourist applicable regulations relates to the Law 13/2002 June and Decree 159/2012, by which apartments and / or HUT are regulates.

The figures found are from 2008, and they are quite clear:

- Barcelona has a total of 2,505 HUT which provides place for 9346 people. (Table 1.5 of Annex 1).
- The Eixample district is the most populated one, with a total of 849 HUT, although Barceloneta has the title of being the district with more illegal residential neighbourhoods. (Table 1.6 of Annex 1).
- The predominant housing is the one with two bedrooms.

(Table1.7in Annex1).

-The longest stays are corresponding to two rooms houses (Table1.8in Annex1).

-The months of February and August reap the maximum length of stay, with averages of 4.4 nights and 4.6 respectively (Table1.9in Annex1).

-However, the maximum occupancy occurs in July (79.5%) and August (80.4%) (Table1.10of Annex1).

- Prices per person and night reach the 40€ per person, while the average price is 158€ per day (Table1.11in Annex1).

-The months with the highest daily price are June, July and August reaching prices like 158€ for the first two months and 157€ for the last month (Table1.12in Annex1).

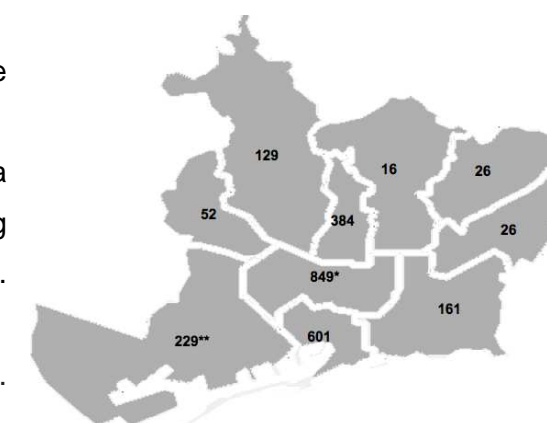


Image 8: HUT's Distribution by districts.

Source: APARTUR, 2008.

REDUCING ENVIRONMENTAL IMPACT: MATERIALS AND WASTE.

The impact of the useful life of materials

Everyone knows that most of the buildings are made of materials that do not respect the environment, either because of its constitution, its way of being produced or the impossibility to be recycled once finished its useful life.

The reasons for choosing these materials are; first, the lack of sensitivity that, little by little, is taking more strength in new buildings today and the willingness of the population to consume new products which are more respectful with the environment. Secondly, the traditionalism of materials, ie the custom that has being used, for example, brick or gypsum plasterboard partitions to lift interiors, without stopping to analyze other constructive ways that, perhaps, are equal or better than what we have today.

However, only in Barcelona there are thousands of buildings that have a huge demand of energy, and therefore, excessive energy expenditure, producing tons of CO2 which could be reduced in a large degree if we would apply simple energetic rules, that would not suppose any changes in the lives of its habitants.

Finally, we have to consider that the life of a material is not just focused on its use within the building, but previously the raw material has to be extracted, stored, transported and placed the product where it will be set until the day of the demolition. From this moment on, it begins a new phase of the life of this material, which can take two different paths.

These suppose the death or the reuse of the material. In the case of reusing or recycling the material, we anticipate that it is very possible it has to undergo a series of changes which require a certain amount of energy to carry them out. In the second case, in case of death of the material, we must predict whether this will be easily integrated by nature once again or, in contrary, it will remain as residue for, in some cases, thousands of years.

That is why, at this stage of design, will take into account all these parameters, although no changes can be made with the materials already used, we will try to introduce new ones that do contemplate them.

The death of the material: the ruins

According to the World Watch Institute, the building consumes 60% of the extraction of raw materials from the lithosphere. For every m2 built in a building, we will consume more than 2.5 tons of materials, 9000MJ of energy and more than 700Kg of CO2 will be issued.

With the wasted materials obtained from a work or a demolition, we will have to transfer it to various storage points. These include: deposits, recycling plants or transfer plants.

The deposits are large landfills that receive all materials. The recycling plants are a selection of materials that can be recycled, which cannot be mixed with other materials. Finally, the transfer plants are plants that are dedicated to separate debris and classify them according to the kind of material it is, in order to take them to recycling plants or deposits.

The following map shows the location of deposits, recycling plants and processing plants in Catalonia as Manager of Construction Debris.

As can be seen, around Barcelona there are two recycling plants (located in El Prat de Llobregat and Barcelona Port) and in the outskirts, there are two deposits (Located in Papiol and Badalona).



Image 9: Map of recycling, storage and processing plants.

Source: Gestora de runes de la construcció, S.A.

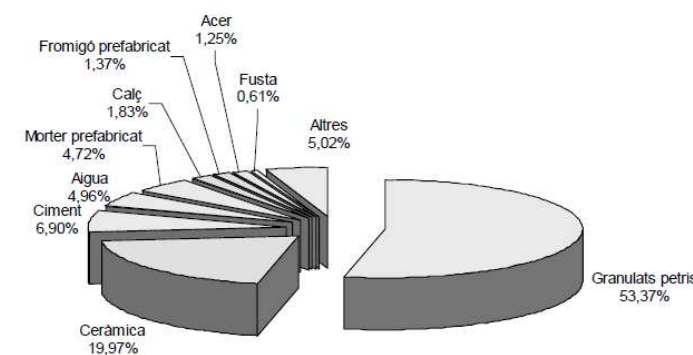
The closest plants transfer in Barcelona is located 120 kilometers far away (Esplugua Francolí and Solsona). In any case, this is too far away for taking the dirty debris so those can be properly classified. The easiest way is to take from Barcelona all trucks of rubble into one of the two deposits mentioned above.

Looking at what we just mentioned, we can make a quick and clear assessment about the environmental impact that it means to recycle or reuse materials.

- Impact produced by uncontrollable tipping
- Impact produced by authorized landfills that do not have a good management of this
- Impact due because of the transport of wastes to the landfill (appropriate landfills too far from cities)
- Impact produced by the raw materials that we will need since we have not reused or recycled wastes that end up at the landfill (extraction, manufacturing, transportation, etc.)

Then we see a chart that shows the approximate percentages in the demolition of a building. As we see, most of it is granulated stone, although ceramics also has an important role.

Considering that the majority of construction waste are stone, have characteristics very similar to natural materials and their transformations are relatively simple (Crushes screening and classification); why reused materials in Catalonia is less than 10% of the materials?



Source: COAC editions, 2009.

The answer can easily reflect on the following points:

- The mix of construction waste prevents recycling of aggregates at the same time of plastics, paper and wood materials become impossible to reuse or recycle the difficulties of separation. As we explained above, transfer plants are too far, so all the debris will be taken to nearby deposits, which do not get penalized for anything dirty debris.
- In construction projects there is no adequate space for storage different materials, and if space is available, new materials for rehabilitation will have priority over the waste materials. On the other hand, the use of public roads is limited based on the authorization of municipal ordinances and employment.
- As point to consider, there is a large presence of foreign elements in the demolition, such as mattresses, furniture, appliances ... This is due to the lack of public awareness and ignorance about problems related to deposits and recycling plant, before mentioned.

PROPOSED ACTION: INTRODUCTION MATERIALS

For the proposed rehabilitation of the project, we will introduce materials and systems that reduce environmental impact and promote the work energy in the overall size of the building as much as possible, taking into account the conditions under we find and the focused environment.

Bear in mind we are before an old work, so we can replace those items that do not attend a structural nature. On the other hand, note that introducing new systems such as water recycling systems, solar panels, among others, we find the handicap of space and form of the building.

In general, when we refer of an intervention over an existing building, improvement proposals aimed lengthening of the useful life of the building. By providing a new use to the building (as in our case), it is not just a matter of improving the interior, resolve their diseases and condition it, but also put it in the middle, helping it to sign against this is the lowest as possible. This is why we try to reduce the buildings operations, and this provides us an improvement.

Unfortunately, it is difficult to introduce improvements in buildings that have strict morphology in its construction. But not because of that, we must stop trying to improve it.

In this project we have met the challenge of achieving an improvement before a building with a complex structure. We played with many major handicaps such as orientation, the space, the weather and the environment.

The purpose is clear: despite having limitations and the idea of giving the building a new feature, we want to propose an improvement towards the environment and an energy improvement towards the users.

The building and purchase a new use that has physical difficulties is not an excuse for not trying that the rest of the useful life of the building is lighter, less striking and probably more efficient in its operation.