



*S. Maria dell'Ogninella church: the entrance*

## Compatible reuse of the single hall churches in Catania (IT): thinking and proposals

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### ABSTRACT

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Summarizing the most recent studies about scientific approaches to the theme of building reuse, we propose a metadesign strategy applied to the single hall churches in Catania's historic centre. We have performed a census and analyses on them from a morphological, technical and thermo-physical point of view. We also conducted an analysis of the urban settlement system in which these historic buildings are located, in order to verify compatibility with the "new" potential uses. However, a critical issue emerges regarding the possibility to standardize the decision-making processes involving historic buildings with a high cultural relevance.

This study proposes a meta-approach to the problem of compatible reuse, looking at the specificity of disused or little used religious buildings. After making a short state of art, a cataloging and expeditious anamnesis, we have analysed a framework of needs that would consider the settlement demands in the urban context of Catania. We performed, at the end, an assessment of compatibility of reuse that satisfies the historic building safeguard, the reversibility of possible action and the requirements of the new undertaken functions.

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### KEYWORDS

*compatible reuse, conservation strategy, single hall churches, traditional building techniques, Eastern Sicily*

## 1. INTRODUCTION

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In our historical context, which is very sensitive to the sustainable development and the revitalization of the old European urban fabric at least theoretically, the existence of many historic religious buildings underused or disused represents an exciting opportunity of reflection on the compatible reuse and recovery of the buildings. This research, being carried out and whose programmatic results obtained so far will be briefly explained below, starts from these considerations. In association with other similar studies carried out in different geographical areas, we analyse a particular case study such as the single hall churches in Catania's historic centre. We propose a systematic methodological design approach to support recovery and reuse. These metadesign strategies shall pursue only minimal, specific and compatible actions with geometrical, typological and technological aspects of the buildings taken into consideration, without ignoring the improvement of energy performance. Since the decay processes of these buildings help to accentuate their urban and social fabric degradation phenomena, this approach can only be pluri-disciplinary and must, therefore, involve many actors within the decision-making process. Thus, recovery and reuse must be complementary. A new function that respects the historical and artistic character of the pre-existence on the one hand will contribute to the protection and survival of the building and on the other will represent an opportunity to raise the historic districts, catalysing several activities related to trade, tourism, education, training and leisure (Franco 2014).

## 2. STATE OF ART

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One of the recurring literature themes of the last twenty years is the compatible reuse of specialized buildings with a high cultural value, in order to make a reasoned choice about the new function to be undertaken. This theme has been the subject of previous studies by the authors: here we report our further progress.

One of the first researchers emphasizing the concept of systematic conscious reuse was Valerio Di Battista (Di Battista and alii 1995). In his study, he confirms the substantial difference between the practice of reuse and those of rehabilitation and restoration. In the definition of reuse design considering the cultural and economic value of the buildings, he argues that it is necessary to bring into play two interrelated conditions simultaneously: the evaluation of the actual performance compatibility and the reuse processes in relation to the opportunities suggested by the quantitative dimensions of the potentially involved heritage. For this purpose, the compatibility use control should start from pre-diagnosis through a prefeasibility study aimed to ascertain: the possibility to operate with minimum structural interventions; the compatibility with the socio-environmental context; the existing environmental system required by the new use and the level of the adjustments required in terms of deterioration and comfort. These considerations (implemented already in the 90's during the Master Plan of Parma revision) are the basis of a methodological approach that has also been followed and refined by other researchers. This method consists of several phases. The phases shall require: a detailed survey of settlement demand of socio-cultural context, the analysis in the field and the pre-diagnosis of buildings for reallocation, the elaboration of the hypothetical destination uses emerged from the settlement demand and the assessment of the compatibility reuse of each building, comparing the services offered by the building and the requirements of the settlement demand. According to the already mentioned researchers, the settlement application must be analysed by interviewing selected interlocutors in accordance with their skills and their ability to listen to the social needs of its sector, such as associations or public administrations. Through these interviews, we can identify the settlement needs and the new hypothetical uses, defining the functional layout of each of them on the assumption of new expected users in terms of dimensions, the characteristics of the access paths, the requirements of static safety, usability and visual and hygrothermic wellness

comfort. The analysis in the field allows us to define a knowledge framework of each building through a real anamnesis of its clinical history, and geometrical aspects of the space distribution, in addition to the necessary description of the technological system that characterizes it. According to these investigations, the authors emphasize the need for a prediagnosis to be conducted through the analysis of the conditions of pertinent areas and the plot, as well as of the structural, hygrothermal, lighting, acoustic and usability conditions offered by each building. The final compatibility evaluation is carried out by comparison at different levels; at the first instance, the authors refer to an essential dimensional global compatibility, which enables the selection or discarding of some use destinations for surplus or shortage of space made available by the building. Later, the studies must analyse dimensional disaggregated compatibility involving the comparison between the area of each floor, or each space, in the building and the required area for various activities under the envisaged use. The performance compatibility is finally checked by comparing the performance offered by the building and the necessary requirements demanded by new hypothesized uses. A contribution to the exposed methodology finds full application in the case study of the monumental Real Albergo de' Poveri in Napoli (Caterina and De Joanna 2007). In this historic building, all these considerations result in a systemic performance examination that defines two models of design support to be correlated between them. These models are: the pre-existing model (which involves the reading of the building performance) and the model represented by the general structure schemes of new uses. Preparatory to the compatibility check is then the definition of "congruence indices" between the pre-existing and proposed destination use. The assessment of the "congruence indices" is based on dimensional, distribution, environmental and design data. Comparing these indices and proceeding to cataloguing the possible technological actions, we can arrive at a conscious design choice, which denies any a priori assessment and highlights a range of possible and compatible actions. The reuse action must respond to a strategy that is able to locate a driving

function in the building, able to ensure the economic and financial sustainability of the project, and at the same a drawn function related to activities aimed at the satisfaction of social needs that would not be able to support themselves financially. In this perspective, the reuse action cannot be the prerogative of the only building activity but is the result of a multi-disciplinary strategy which must involve public and private actors at different levels. To this end, to define the new functions to be accommodated inside the considered historic container, the analysis of social needs and development dynamics of the concerned area is developed through a prior investigation of the requirements imposed by the existing planning instruments and through a statistical analysis to identify what the institutions and existing activities in the area are. Only at the end of these, interviews are performed with key informants, representatives of all the social groups involved, such as local communities, urban and regional companies and potential users attracted to the new possible uses. Another recent study (De Medici and Senia 2014) underlines the value of reuse as a strategic opportunity to trigger exploitation mechanisms that involve not only the building but also the settlement context in which it is inserted. In order to identify the most suitable use destinations, this study breaks down the settlement system in its physical, social and economic components through indirect analysis, assessing again the statistical data and the requirements dictated by the existing planning instruments. As for the physical system, the local context is examined describing the climate, the presence of protected areas, archaeological and monumental sites, the transport system, as well as the expired constraints of the current PRG and the guidelines of the new planning instrument in the process of being approved. The social system is examined through the study of demographic indicators relating to population growth and its average age, the percentage of foreigners, their integration, and coexistence requirements, the flow of tourists and accommodation choices. For the economic system, the leading economic sector is identified, the unemployment rate, the wealth distribution of the resident population, the existing cultural events

and related necessary support structures. From these analyses, which are only indirect, it is possible to recognize the attraction factors of the area and of use destinations that can be accommodated by the considered buildings.

## 2.1 RELIGIOUS BUILDINGS AND RE\_USE

In the transformation of built heritage the religious buildings, and churches in particular, have been a very common occurrence over the centuries, interesting also the lawmaker. In recent time the European Parliamentary Assembly Resolution 916 (1989) on "redundant" religious buildings called on the responsible authorities (Church, government and local) to co-operate with interested organizations and experts with a view to:

- taking effective measures to preserve redundant religious buildings and secure wherever possible their appropriate future use;
- consolidating (in compatible computerized form) surveys of redundant religious buildings, of their architectural and historical significance, and of their current use, and regularly updating such surveys which should also reflect contemporary interest and include nineteenth and twentieth century buildings;
- ensuring effective protection for the survival of the original fabric and fittings of such buildings pending future re\_adaptation;
- avoiding, except in cases of exceptional architectural, historic or commemorative interest, the preservation of religious buildings as ruins;
- promoting projects for reuse and re\_adaptation which are not incompatible with the original function of the building and do not cause irreversible alteration to the original fabric;
- providing funds or tax benefits for the restoration, repair and maintenance of religious buildings, whether in use or redundant, in order to ensure they are not abandoned;

- encouraging a more imaginative use of existing religious buildings;
- assuring the supply of appropriate building materials, and encouraging the research, crafts and support work necessary for the continuous upkeep of religious buildings;
- encouraging the inclusion of redundant religious buildings in the redevelopment of cultural itineraries throughout Europe, and ensuring that the proceeds of cultural tourism are channelled into the preservation of the tourists visit (Haynes 2008).

In September 2015 the European Parliament has adopted the resolution "Towards an integrated approach to cultural heritage for Europe", in which it said that "religious heritage constitutes an intangible part of European cultural heritage". It is also specified that " historical religious heritage, including architecture and music, must be preserved for its cultural value, regardless of its religious origins" (European Parliament Resolution 2015).

The interest in disused or under\_used religious buildings is promoted by numerous international associations, like FRH - Future for Religious Heritage (European network promoting, raising awareness, providing communication platform, sharing knowledge, influencing policy on religious heritage) and, in the UK, the Churches Conservation Trust (association that deals with the conservation of historic churches in a state of decay, involving today about 350 buildings that are visited by at least 2 million visitors a year). According to these premises, we can observe a great attention to this particularly wide built heritage which, for the spread of the Christian religion, is concentrated mainly in the European Community and in the United States. In Germany, for example, approximately 135,000 buildings belonging to the Protestant community and to the Catholic Church were surveyed (Novelli 2014).

### 3. METHODOLOGY

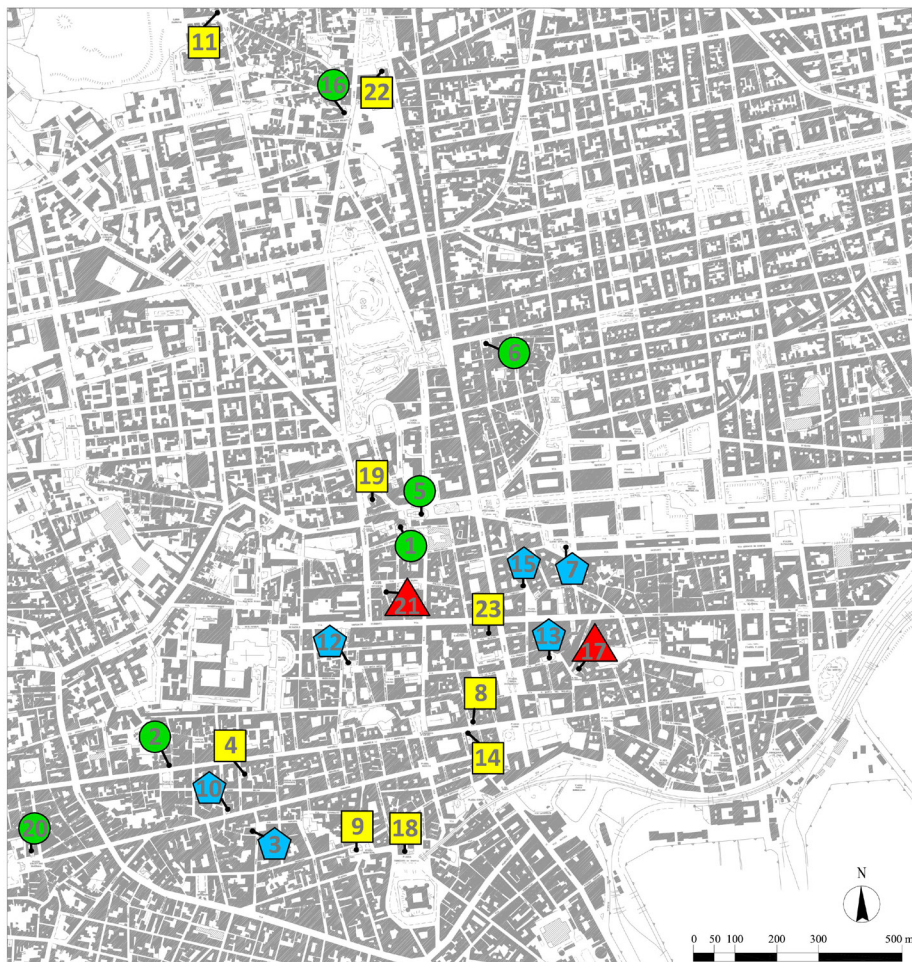
In the light of these well-established experiences in literature, this research is gradually proceeding to identify the areas of study to compare them for compatibility assessments so as to direct the design choices. The identified areas are:

- physical system: the historic buildings to be recovered;
- urban settlement system and possible uses.





As already mentioned, with regard to the historical

built study, the case object of interest is made up of twenty-three single hall churches that belonged to the brotherhoods and are distributed in Catania's historic centre, in an area of about fifty hectares (Fig. 1). For each of them, we have drawn up an anagraphic tab in phase of expeditious anamnesis that has allowed us to reconstruct information about dimensional, typological and structural aspects (Salemi and Mondello 2015). At this stage, we also collected information on the current use of each church, identifying four different categories: open to worship,

Figure 1  
The 23 single hall churches localized  
in Catania's historic centre



1. S. Agata al Carcere
2. S. Agata alle Sciare
3. S. Antonio Abate
4. S. Barbara
5. S. Biagio
6. S. Caterina al Rinazzo
7. S. Cristoforo Minore
8. S. Giuseppe al Duomo
9. S. Giuseppe al Transito
10. S. Maria del Soccorso o della Palma
11. S. Maria della Consolazione al Borgo
12. S. Maria della Rotonda
13. S. Maria dell'Ogninella
14. S. Martino dei Bianchi
15. S. Michele Minore
16. S. Nicolò al Borgo
17. S. Orsola
18. S. Sebastiano
19. S. Vito
20. SS. Crocifisso di Majorana
21. SS. Elena e Costantino
22. SS. Sacramento al Borgo
23. SS. Sacramento al Duomo

- |   |                 |   |        |
|---|-----------------|---|--------|
|  | OPEN TO WORSHIP |  | DISUSE |
|  | OCCASIONAL USE  |  | REUSE  |

occasional use, already been converted to other uses, in disuse. We investigated the presence or lack of local service annexes and aspects linking the building to the urban context, such as access roads, public transport and parking nearby. The expeditious analysis also laid the foundations for a future energy assessment of these buildings (Lo Faro and alii 2015), dividing the data into two different subsets. On the one hand the geometrical and typological information allows us to study the orientation, the shape factor, the position of the building compared to the block; on the other hand, the investigation into the building techniques employed has provided the opportunity to consider the technical and thermophysical characteristics calculated in static mode (Lo Faro and alii 2015) (Salemi and alii 2014) (Moschella 2013). The urban settlement system characterization was subsequently necessary to understand the context in which these buildings are inserted and then to evaluate the settlement demand. In the specific case of Catania's historic centre, the study of the requirements of the existing planning instruments is, however, unsuccessful because of the obsolescence of the General Plan of L. Piccinato (1964) and because of the different approved variants, none of which involved the historic fabric of the city. At this stage, due to the lack of specific urban studies, this report can hypothesize possible local needs through the elaboration of statistics, taken from the ISTAT data base, and through theoretical reflections justified by national and regional regulatory instruments of general validity such as Inter\_ministerial decree no. 1444 of 1968 and Regional law no. 71 of 1978 (D.I. 1968) (L.R. 1978). Once a plausible range of new functions to be accommodated within the examined churches is identified, for each destination of use we studied the distribution and dimensional minimum requirements and safety and usability aspects required by the new proposed activities. Putting all the data collected into the system, we will make the compatibility assessment, which will take place by comparing the requirements of the new functions and the buildings performance according to the Classes of Requirement defined by European regulations UNI 8289:1981 and UNI 11277:2008 (UNI 1981) (UNI 2008). The

discriminant requirement class for the first evaluation of compatibility will be usability, defined as the set of conditions relating to the attitude of the building system to be properly used by people in the activities. In Italy, the Code of Canon Law (art. 1222) provides indications on the compatible transformations of the churches. The Bishop can reduce a church to non-indecorous profane use "[...] if it can not in any way be used for divine worship, nor is it possible to restore it". Among the non-indecorous uses cultural ones are mentioned, such as venue for artistic activities, library, archive, museum (CEI 1992) (Montini 2000). According to this orientation some Dioceses, in relation to the reuse of deconsecrated religious buildings, proceed to exploitation by granting the churches to the local belonging Communities. Municipalities or other public bodies or associations operating in the territory must aim at a virtuous mechanism of "restitution" and "good administration": they are expected to be used for cultural and/or social activities in a manner consistent with the aforementioned purposes, preferably adopting the legal instrument of the loan for use rather than alienation and, if this is not possible, favouring owners who guarantee not only the full conservation, but also the public, at least temporary, use of the property (CEI 2012) (Dimodugno 2016). If we wish to propose a general classification of the ways of re-use of churches in Europe, we can identify: a) Mixed use, where the cultural destination exists in parallel with other activities; b) Use for events and recreational activities; c) Cultural use; d) Residential use; e) Commercial use; f) Use as a contemporary art installation (Novelli 2014). The risk involved in some proposals is that holy building is intended only as a polyfunctional container. The relationship between sacred and functional space is lost sometimes, deeply modifying the relationship between the original and the current destination (Novelli 2014). Instead, putting the user in a position to understand the shape of the building according to the cultural needs now lost, can offer an effective interpretation to deeply know the good, increasing the process of awareness that is the necessary prelude to conservation (Rudiero 2014).



Figure 2  
The 23 single hall churches facades



## 4. RESULTS

### 4.1 PHYSICAL SYSTEM

As already mentioned, the object of this study is represented by twenty-three confraternal churches of Catania's historic centre (Fig. 2). Recent research dealing with historic centre of Naples has highlighted that 50 % of confraternal churches are closed, a microcosm of 140 small sacred spaces (Alabiso and alii 2016).

Also in Sicily, until the late nineteenth century and the establishment of public cemeteries, confraternal churches responded mainly to the needs of the people to bury their dead, and now are largely underused or abandoned. Since the Middle Ages, corporations or charitable organisations and also wealthy aristocrats, created their own sacred space as the appropriate setting within which confirm their standing or manifesting their role in the urban context. When that role weakened to the point of exhaustion, such as to bury their dead, its tangible symbol lost its function, and so the reason for its maintenance. For these reasons, the current use of the examined churches manages to give an idea of the conservation state in which they are found. During preliminary investigation, it was found that only 25% of the churches is open for worship, because they are linked to the cult of the patron saint of the city or even managed by the homonymous brotherhoods, while 40% of the temples is used only occasionally. The churches in complete disuse are two, one of which, the church of Ss. Elena e Constantino, hosted the workshop of a blacksmith for many years and now is in a state of disrepair. There are also cases of a successful reuse, such as the provincial library-art gallery of the church of San Michele Minore, or less successful (for design and building techniques employed) such as the theatre accommodated in the church of Santa Maria della Palma and the dance school in the ex-church of Sant'Antonio Abate. We should also mention the church of Santa Maria della Rotonda, archaeological site, and two cases in which the temples were reassigned to another group of worship: the Orthodox one for the local Romanian

community at the church of San Cristoforo Minore and the Catholic one for the Sinhalese community in the church of Santa Maria dell'Ogninella (Salemi and Mondello 2015).

As for the typological aspects, these traditional buildings have similar characteristics. The single nave, crowned by a barrel vault with lunettes, usually ends with a semi-circular apse closed at the top by a hemispherical bowl (Fig. 3). The nave's useful area varies between 85 and 280 square meters, to which are added small surfaces formed by the service areas present in most of the analysed churches. For the recognition of technical and structural characteristics, we performed a specific survey of all building elements. The vertical envelope is formed by bearing masonry in shapeless basalt blocks or square basalt blocks and lime mortar with volcanic aggregates. They are coated with several layers of plaster or with an elaborate brickwork formed by stone slabs and blocks in tender or compact limestone in the most significant cases. The overall thickness of these vertical load-bearing structures ranges from 60 to 160 cm. The horizontal envelope is characterized by concrete vaults in pumice stone and gypsum mortar, with a thickness ranging between 20 and 50 cm, or "camorcanna" vaults, made of a wooden frame that supports reed mats on which a layer of gypsum mortar is spanned, or by reinforced concrete and hollow tile mixed plan floor, in rare cases (Fig. 4). The roofs are pitched and there are gable or pavilion roofs. Sicilian tiles always form the discontinuous surface of the roof. The main structure used in these roofs follows a constructive procedure to purlins on trusses. In many cases, in correspondence with the second roof frame, the presence of a wooden plank and/or corrugated metal under-tile is also found. We have defined the ratio between these buildings and the urban context in which are located, detecting the orientation and the nave position within the block, also taking note of the presence of secondary entrances and the main and side road overlooking. As for the environmental aspects (Lo Faro and alii 2015), the survey shows that the single hall churches of Catania's historic centre have no high gross dispersing floor areas and no S/V high shape factors (Tab. 1). The nave location within the

N	SINGLE HALL CHURCHES IN CATANIA	Current usability				Relations between the urban fabric				
		Disuse	Occasional use	Open for worship	Reuse	Orientation	Plot	Road overlooking	"Street (V) Square (P)"	Secondary entrance
1	S. Agata al Carcere			X		Est	Landlocked	Secondary	P	
2	S. Agata alle Sciere		X			Sud	Corner	Main	V	X
3	S. Antonio Abate				X	Est	Corner	Secondary	P	X
4	S. Barbara		X			Ovest	Landlocked	Secondary	V	
5	S. Biagio			X		Est	Corner	Main	P	X
6	S. Caterina al Rinazzo			X		Nord	Head	Main	V	X
7	S. Cristoforo Minore				X	Sud - Ovest	Isolated	Main	P	X
8	S. Giuseppe al Duomo		X			Sud	Corner	Main	V	X
9	S. Giuseppe al Transito		X			Est	Corner	Main	P	X
10	S. Maria del Soccorso o della Palma				X	Sud	Corner	Main	V	X
11	S. Maria Consolazione al Borgo		X			Sud - Est	Corner	Secondary	V	X
12	S. Maria della Rotonda	Regional Archaeological Site								
13	S. Maria dell'Ogninella				X	Sud - Est	Head	Secondary	P	X
14	S. Martino dei Bianchi			X		Nord	Corner	Main	V	X
15	S. Michele Minore				X	Sud	Corner	Main	P	
16	S. Nicolò al Borgo			X		Sud - Est	Head	Main	V/P	X
17	S. Orsola	X				Sud - Ovest	Corner	Secondary	P	X
18	S. Sebastiano		X			Est	Corner	Secondary	P	
19	S. Vito		X			Ovest	Landlocked	Main	V	
20	SS. Crocifisso di Majorana			X		Sud	Landlocked	Main	P	X
21	SS. Elena e Costantino	X				Nord	Landlocked	Secondary	P	
22	SS. Sacramento al Borgo		X			Nord	Landlocked	Main	P	
23	SS. Sacramento al Duomo		X			Sud	Landlocked	Secondary	V	

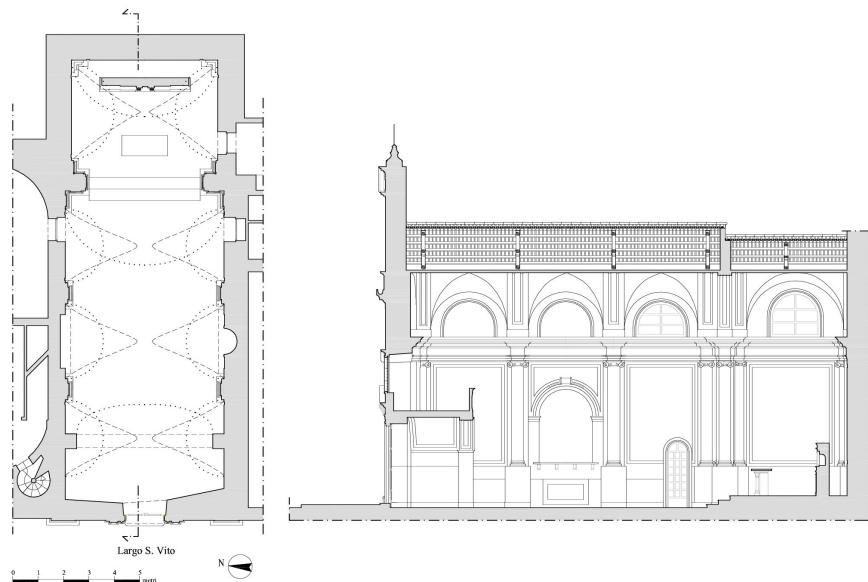
**Table 1**  
Geometrical, typological and thermophysical  
aspects of the case study

N	SINGLE HALL CHURCHES IN CATANIA	Typological analysis			Thermo-physical parameters				
		Nave [m <sup>2</sup> ]	Service spaces [m <sup>2</sup> ]	Service spaces position	"Vr [m <sup>3</sup> ]"	"S/Vr [m <sup>-1</sup> ]"	L/H		CO - CV
							Lp/Hp	Llt/Hlt	Um [W/m <sup>2</sup> K]
1	S. Agata al Carcere	176,2	98,0	Side	1346	0,40	0,47	-	1,43
2	S. Agata alle Sciere	82,1	60,8	Side	957	0,41	4,20	0,24	0,95
3	S. Antonio Abate	120,8	-	-	1120	0,48	1,85	0,71	0,91
4	S. Barbara	90,2	22,0	Side	983	0,42	0,73	-	0,89
5	S. Biagio	193,8	39,1	Side	3696	0,30	11,76	-	1,12
6	S. Caterina al Rinazzo	145,5	226,6	Side	2452	0,33	0,95	0,33	1,13
7	S. Cristoforo Minore	121,2	46,3	Side	1562	0,47	0,70	2,39	0,91
8	S. Giuseppe al Duomo	124,2	-	Behind	1212	0,48	0,69	0,48	0,93
9	S. Giuseppe al Transito	231,0	30,1	Side	2759	0,38	1,83	-	1,04
10	S. Maria del Soccorso o della Palma	115,8	71,6	Behind	1227	0,47	0,75	0,49	0,97
11	S. Maria Consolazione al Borgo	97,6	27,2	Side	1030	0,41	2,43	-	1,03
12	S. Maria della Rotonda	Regional Archaeological Site			Regional Archaeological Site				
13	S. Maria dell'Ogninella	255,9	48,2	Behind	4625	0,35	0,78	0,40	1,30
14	S. Martino dei Bianchi	285,1	181,0	Behind	2890	0,34	0,76	-	1,03
15	S. Michele Minore	109,0	55,7	Side	1287	0,50	4,05	0,56	1,18
16	S. Nicolò al Borgo	180,2	229,3	Side	1941	0,56	0,90	1,30	1,44
17	S. Orsola	145,4	27,8	Side	1960	0,28	0,76	-	1,18
18	S. Sebastiano	162,8	50,3	Side	1353	0,44	2,83	6,88	1,60
19	S. Vito	107,9	69,8	Side	1017	0,32	2,39	-	1,24
20	SS. Crocifisso di Majorana	129,8	57,9	Side	1819	0,37	2,78	-	1,58
21	SS. Elena e Costantino	81,1	44,2	Side	1345	0,55	0,76	-	0,95
22	SS. Sacramento al Borgo	263,2	62,1	Side	3425	0,28	6,83	-	1,30
23	SS. Sacramento al Duomo	112,8	42,3	Side	1486	0,32	0,50	-	1,33

block has a strong influence on shape factors for the same heated volume. The calculation of the L/H ratio, between the road section and the building fronts, and the orientation of the churches have instead allowed us to evaluate the cases in which the presence or lack of shading is convenient for the dispersing surface, but without achieving considerable critical issues. The thermal insulation properties of the vertical envelope and concrete vaults worsens with the increase of transmittance and with decreasing thickness, because the values of the calculated transmittance are predictably high and larger than the limit prescribed under current Italian law for the climate zone B (Fig. 4) (Lo Faro and alii 2015). To help the comparison of all the collected data, we calculated the weighted average of the found transmittances, in order to have a unique value to be compared with other thermophysical quantities. This comparison showed the critical issues related to exposure, shading and dispersing the surface of some churches such as San Sebastiano e SS. Crocifisso Majorana (see Tab. 1, lines 18 and 20). This first analysis has highlighted the lack of critical issues in absolute terms. This is because the mutual influence of the different parameters examined



**Figure 3**  
*The church of San Vito.  
Main front, plan and  
longitudinal section*



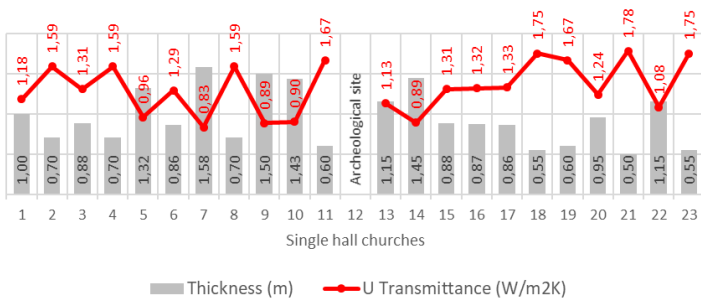
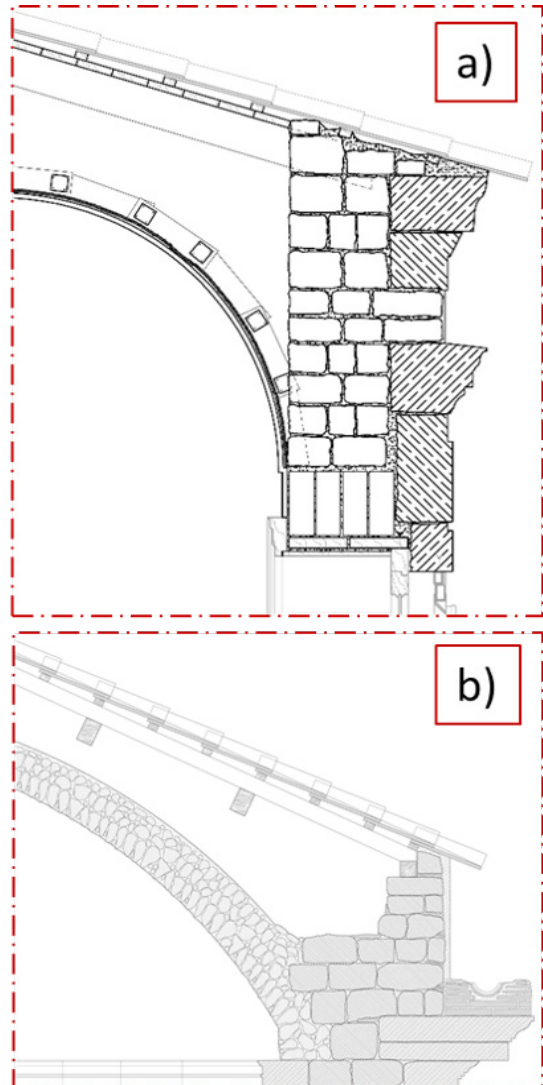
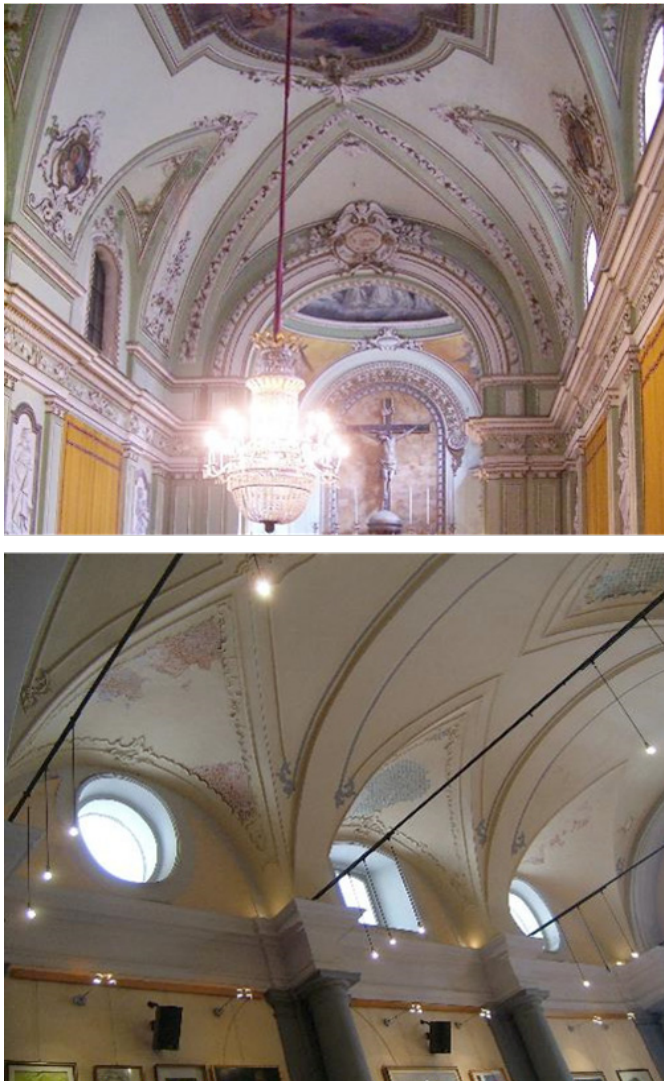


Figure 4  
 The physical system. On the top: thickness and transmittance of opaque envelope. On the bottom: the horizontal envelope: "camorcanna" vaults (a) and concrete vaults (b).



often generates compensatory conditions. This is only an apparent compensation, because the preliminary assessment carried out so far is based on the simplifying assumption of static mode. We have not yet calculated the primary energy needs in a dynamic system, which will be taken into consideration once we have defined the new use in the planning stages for the performance improvement of the external envelope transmittance.

#### 4.2 URBAN SETTLEMENT SYSTEM AND NEW POSSIBLE RE-USE

Without urban planning tools that give concrete guidelines to use of the examined churches, we can first refer to Inter\_ministerial decree no. 1444/1968, which defines the minimum provision of required public spaces in the extent of eighteen square meters for each settled and soon-to-be settled inhabitant, for each homogeneous area. Two square meters of these eighteen are intended for equipment of religious, cultural, social, welfare, health care or administrative collective interest. In the historic centres, in areas "A", in the absence of necessary areas to ensure the urban standard per inhabitant, decree 1444 allows us to compute the effective size available in double measure, or to find it in close proximity of the prescribed minimum quantities. In this perspective, to take advantage of the confraternal churches to recover needed public spaces without saturating the few unbuilt areas of neighbouring homogeneous zones becomes a possibility to be reckoned with in a sustainable land management. In Catania's historic centre there are also typical issues of the historic centres of other Italian cities. To these factors, we must add the effects of the progressive social degradation, related largely to the economic crisis, with rising unemployment and crime phenomena. We must also emphasize that in the last twenty years, Catania's historic centre has represented the portion of territory that has suffered most from the effects of globalization (Nigrelli 1999). There was the gradual replacement of the local population of Catania with that of non-EU immigrants in degraded housing, such as decaying buildings or unhealthy housing (Nigrelli 1999). More

than twelve thousand foreign "regular" residents (ISTAT data in January 2015), to which is added the presence of constantly increasing irregular migrants, reside there. Institutions that take care of these emergencies are few and most of the activities are managed by Caritas or by the Sant'Egidio Community to the best of their ability. Caritas manages a Support Centre with a canteen near the Central Station, a dormitory in Via Vittorio Emanuele and another made available by the Jesuits in Via Umberto. The Sant'Egidio Community, among other activities, every year at Christmas time organizes a canteen in the church of S. Chiara. There is also a shortage of cultural facilities even more paradoxical when you consider the great historic artistic value of the historic centre (UNESCO heritage site). Large spaces for culture are only concentrated in a few sites (around the Port, Piazza Duomo and Ursino Castle), leaving the rest of the studied area completely inactive. The result is a set of requirements that highlights the need for activities that are compatible with the development dynamics of the context that increase social cohesion and that are also able to raise the identity and sense of belonging to the urban centre. For all the reasons explained so far, some potential uses for the single hall churches in the Catania's historic centre could be district libraries, exhibition spaces, social canteens with administration of transported meals and halls for district councils, according to the non-indecorous uses suggested by Code of Canon Law and to European Parliament resolutions. For each of these activities, a general cognitive data sheet is being prepared, which highlights the dimensional minimum requirements and the distribution-function layouts, as well as the specific rules to be respected. The catchment area considered for each intended use amounts to less than 100 users, given the small size of the buildings examined, conceiving these churches as a true network of interdependent facilities. A first use here proposed is a district library (Fig. 5). The design guidelines to follow are those suggested by the technical literature (Zaffagnini 1992) (Zevi 2003) and the specific legislation. The prescriptive rules are general and they leave the final choice of the most appropriate actions to the planning stage. As an

example, for fire safety, the rule imposes exit pathways dimensioned according to a capacity of outflow of not more than 60 users per module, with a width of not less than 0.90 m. The paths do not exceed 30 m and the openings for the exit ways must be at least 0.90 m. These halls must be equipped with fire-fighting

equipment such as the automatic detection system, with speakers for emergency announcements, portable fire extinguishers, fire water mains UNI 45 inside the building and the network UNI 70 outside the building, pump delivery port near the main entrance. The shelves must be made of metal and

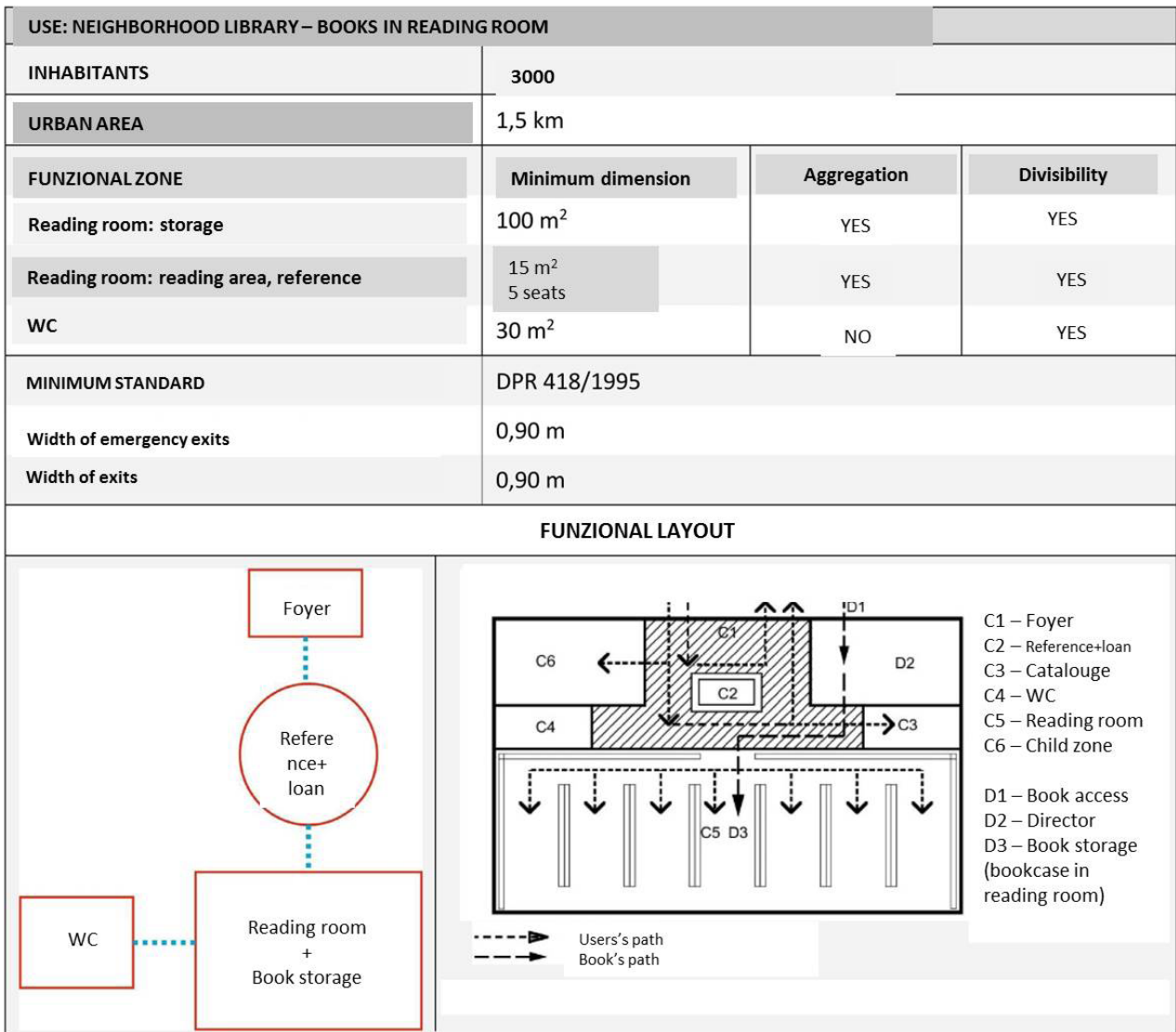


Figure 5  
Design layout of a compatible reuse: neighborhood library

new pieces of furniture made of combustible material must be approved (DPR 1995) (Giommi 2010). It must also comply with the rules concerning the overcoming architectural barriers, including through the simple installation of temporary and removable works that enable accessibility and visitability of the building (Frattari and alii 2005). Given the geometry of the studied churches, the separation between the different functions performed within the church-library will necessarily be assigned only to the furnishing and, in the absence of adequate service spaces, these libraries will be designed with the books kept in the reading room, for direct consultation. We will certainly respect the formal character of the church acting in a minimal and reversible way (Fig. 6).

## 5. CONCLUSION

To define areas of interest, the research wants to conduct a careful assessment of compatibility in order to better address the design choices. However, this does not mean to find a new compatible use for each of these small churches at any cost, especially if they are core to the inhabitants' sense of belonging to the places or if the brotherhood them runs it is still operating. Multiple reasons underline the high significance of church architecture: tangible factors (wide dimensions, accentuated visibility, recognisability of the architectural type) and immaterial aspects that are embedded in its symbolic significance for inhabitants (Russo 2017). For these reasons, the proposed anamnesis sets the stage for drafting a conservation and restoration plan that restores equal dignity to these historic temples, drawing an upgradeable knowledge framework. A recent example is the Pastoral Community of Vimercate and Burago di Molgora, in the province of Monza Brianza. For twelve churches of the Diocese, the community has planned a detailed plan of checks and cyclic actions of preventive maintenance with the involvement of the population. The ultimate aim is not limited to the preservation of the churches but also provides for the training of workers and professionals rooted in the territory (Moioli 2015).

The construction of a full knowledge framework about every aspect of the building being studied will allow one to define the degrees of freedom and the constraints that are opposed to the transformation. These constraints represent a system of rules and a guarantee and protection of the building. They suggest the building techniques to be followed or the performance levels that are reachable based on the historical, aesthetic, technical and structural values of the historic buildings (De Medici 2010). However, in conducting this research a critical issue emerges, which is still not a complete answer to the objective difficulty to standardize and translate into universal rules the decision-making processes that involve the study and recovery of specialized buildings through their high historic and aesthetic relevance because of various parameters to be considered. Moreover, the lack of adequate implementation plans for the



**S. Cristoforo Minore**



**S. Michele Minore**

**Figure 6**

*Actual Re\_uses: on the top S. Cristoforo minore, a church for Orthodox worship; on the bottom S. Michele minore, a library/art gallery*



historic centre does not facilitate the design choices behind any action. Over the years, this has led to punctual and unplanned actions and results that are incoherent with the historical and artistic contexts of the buildings, denying their original morphological characters with the creation of superfetation or new horizontal structures which prevent us from perceiving the spatiality of the pre-existing structure (Mondello 2014). Sometimes religious buildings become mute witness of a concluded historical cycle: they are buildings that embody past celebrations and devotions. Any choice relating to reuse can only be part to a "processual" research in which we compare different alternatives, whose primary goal is the absolute respect for the vocations of the architecture we restore, for its testimonial value and for the material and techniques that it is made (Russo 2017).

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