

## HISTORICAL URBAN CENTER AND RENOVATION PROJECT IN CASE OF EARTHQUAKE: İSTANBUL TARLABAŞI NEIGHBOURHOOD CASE

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**Abstract.** *The study discusses the renovation project of Tarlabası neighbourhood which is located in the historical centre, Beyoğlu district in Istanbul due to the earthquake risk mitigation policy of the government. Tarlabası neighbourhood is located in the northern part of Beyoğlu district which it is the historical, cultural and commercial centre of European side of Istanbul Turkey. The big part of the building stock is brick masonry structure most of which was built in 19th century. Most of the buildings located in the neighbourhood need to be repaired. Tarlabası neighbourhood has been counted as an urban renovation area depending on the law (2005, Law No. 5366) which came into force in 2006. According to the renovation project, three quarter (sub-neighbourhoods) named as Bülbül, Çukur and Şehit Muhtar in Tarlabası neighbourhood were selected as project implementation areas. This project targeted renovation of 278 buildings including 210 registered historical buildings. In addition, nine blocks of building area in the selected region was redesigned and re-functioned according to various new functions such as apart housing, office, hotel, shopping area, and underground parking area. The main three goals of the project can be asserted as physical renovation and rehabilitation of buildings and infrastructure, social development, and economic revitalization. The study discusses the reflection of Tarlabası renovation project due to the risk mitigation approach in general. In particular, the impact of functional change in existing buildings, physical quality of renovation, physical and social density adjustment, and conditions of open area and routes in order to sustain safe evacuation and meeting in case of disaster events are evaluated and critically discussed. The condition of architectural heritage under the disaster hazard and risk is also discussed according to the scope of the renovation project.*

## 1 INTRODUCTION

Being under the threat of natural or technological hazards, weak structure, intervention emerging during use process and unsatisfactory maintenance-repair conditions inevitably creates devastating results. Historical urban centers may be subjected to a number of threat elements. Among these elements are changes in use and densities and interventions received during this process. Current changes in social, economical, physical conditions in addition to planning interventions on urban structure and relevant issues have left deep impacts on historical urban centers.

In cases of bad maintenance conditions, historical urban centers are physically vulnerable to potential threat of earthquakes. The structure is, in terms of both life of structure and maintenance-repair conditions, likely to perform poorly in the face of an earthquake. It is thus a necessity to reinforce physically vulnerable structure of historical urban center. The most effective tool to achieve that is improving structural performance of the building but the most discerning factor between structures and ordinary ones during this process is to preserve authentic characteristics of historical buildings.

Protecting the samples of civil architecture that compose historical urban centers against any disaster not only ensures the sustainability of such buildings but it also poses a necessity to mitigate loss of lives. Disaster-preparation process of such works takes place with the combination of technical, legal and economical laps. In addition to the measures to take on the structure itself, reducing density in urban fabric and taking precautions against access problems due to narrow streets are important [1].

Risk analyses on cultural heritage should encompass not only structural risks but devastation risk emerging from income pressure. Particularly in areas where the use of manufacturing and storing which are inappropriate for historical urban centers is dense, as well as in areas where deliberate destruction triggered by urban income pressure may intensify and areas likely to expect post-disaster looting depending on use it is vitally significant to identify risks [1]. Certain issues to consider in national conservation policies for historical urban sites are; constructing a safe environment against earthquake disaster risk, rendering technical& financial and tax aids to private sector towards the aim of reinforcement of weak structures, providing safe evacuation route for the dwellers on this site [1].

## 2 İSTANBUL TARLABAŞI NEIGHBOURHOOD

### 2.1 Location and History

Tarlabası neighbourhood is located in the northern part of Beyoğlu district which it is the historical, cultural and commercial centre of European side of Istanbul Turkey (Figure 1). Istanbul Beyoğlu district consists of 45 quarters settled in 889 hectare space. The big part of the building stock is brick masonry structure most of which was built in 19th century. According to TUIK 2000 population census data, Beyoğlu has a population of 234.964 and the total of all buildings is 26.468. Population density is around 264 person/hectare [2].



Figure 1: Location of Istanbul Beyoğlu District, Tarlaşa Neighbourhood

Within Beyoğlu Urban Protected Area the numeric percentage of registered civil architecture sample is 85.6% while the ratio of space is 59.33%. As Updated Beyoğlu Immobile Cultural and Natural Assets Inventory is evaluated in terms of lost registered constructions it is revealed that the numeric percentage of registered civil architecture sample is 89% while spatial size is 87.86% ranking the first on the list [3].

The majority of Registered Monumental buildings in Beyoğlu district belong to Ottoman Period. Within registered civilian architecture samples the ones not researched constitute the greatest majority. Aside from that the samples from Late Ottoman Period are the highest in number [3].

In Beyoğlu Urban Protected Area Construction Implementation Plan, the complex residential, manufacturing and commercial urban tissue of Tarlaşa has been replanned to reflect the authentic structure of the residential town [3].

## 2.2 Earthquake and Istanbul Beyoğlu District

Earthquakes and fires have always posited great effects for the urban structure in Istanbul. In the city which has been under the effect of natural disasters parallel changes have taken place in construction traditions and norms which were all shaped accordingly. In September 10, 1509 Earthquake having left the greatest effect on Istanbul city, circa 1000 houses collapsed and 4000–5000 lives were claimed. Galata Walls and Galata Tower were also severely damaged. May 22, 1766 Earthquake shook not only the settlements in Üsküdar and Bosphorus but districts of Galata and Pera where some of the chimneys collapsed and walls cracked down [4]. The great number of fires in the 17th century initiated new arrangements in construction field. 1870-dated Beyoğlu fire devastated a gigantic space and most wooden structures have collapsed. During the same period palace buildings moved from old Istanbul to Dolmabahçe and Çırağan Palaces so that royalty intensified around Beyoğlu district [5].

According the JICA Report that in Beyoğlu district the quantity of quarters of which density is above 500 person/hectare is five and the quarter with the greatest density is Çukur Quarter (928 person/hectare) [2]. With respect to building density among all Istanbul districts Beyoğlu district, with 30 building/hectare ranks second after Fatih district. In terms of structural features of buildings, high-ratio of masonry (briquette, brick) 39.5% buildings. The ratio of reinforced concrete structures is 52.5% [2]. The ratio of masonry structures rises up to 72% in Tarlaşa region [6]. In Beyoğlu region 31% of structures date back to 1949 and earlier. As for the storey ratios of buildings: 1-3 storey structures are 45.3%, 4-7 storey structures are 52.3% and 8-15 storey structures are 3.2%. In the region the ratio of roads of which width is narrower than 6 meters is higher [2].

Pursuant to JICA Report in a potential earthquake structure damage failure and building vulnerability have been studied on quarter scale and with various levels of damage ratios, it has been detected that 44 quarters (98%) have vulnerable to an earthquake. In Beyoğlu district the number of districts of which narrow road ratio is above 80% on quarter scale corresponds to 20. On quarter scale, the number of quarters of which primary emergency evacuation fields such as park and open spaces is below 25% corresponds to 31 (69%) [2]. In a majority of quarters there are no safe evacuation fields in cases of emergency. In the same report there are earthquake-risk analyses and strategic urban transformation measures offered in parallel. In the location assessment including specialized measures to protect historical urban sites Beyoğlu is listed with its 29 quarters next to Fatih and Eminönü (Currently Fatih and Eminönü are under one roof as Fatih Municipality). As indicated by the research data of the report and subsequent rehabilitation project covering three quarters in Tarlabası region the region is rich in terms of the finest samples of civil architecture (Figure 2).



Figure 2: Case study area site view (Photo by Gül Yücel, 2003).

Tarlabası region has lately been defined as “slum” which encompasses a variety of physical, social and financial handicaps requiring immediate intervention. The greatest negation to this region is created by the construction process of Tarlabası Boulevard. In order to construct this boulevard intervention has been made on the existing historical urban tissue and in 1986 a number of buildings, including civil architecture samples, have been demolished [7]. Due to demolition works, urban integrity was disrupted and as worded by a good number of experts the transmission process of 19th cc. civil architecture samples was interrupted. The boulevard constructed upon demolition was incompatible with current urban tissue and cut two ends distinctively.

### 3 SUBJECT OF THE STUDY: TARLABAŞI RENOVATION PROJECT

#### 3.1 Methodology

Assessment on Tarlabası Renovation Project constituting the scope of present research has been based on the preliminary designs published on project internet website [8, 9]. Ongoing field studies have been livingly examined on-site. On city blocks facing Tarlabası Boulevard demolition has been performed in all structures except a few and debris has been removed. According to interview with project manager that only one city block (Block no 360) has been approved for construction and others are still ongoing [10].

### 3.2 Project Area

Tarlabası 1st Leg Renovation Project is implemented in Istanbul Beyoğlu district Tarlabası region, which is a historic settlement adjacent to Taksim Square (Figure 3).

Pursuant to Law No. 5366 Tarlabası Region has been proclaimed as renovation site in 2006 (Cabinet Decree, Decree no: 2006/10172). This decree extends to Tarlabası and Cezayir Dead End Street and its Surrounding, Tophane Region, Galata Tower and its Surrounding, Municipality Building and its Surrounding and Bedrettin Quarters within the territory of Beyoğlu district. Among 21 construction blocks set as renovation site in Tarlabası region (9) nine city blocks constitute the scope of 1st Leg Renovation Project [8]. Pursuant to 5366 no law, the municipalities were licensed to intervene cultural properties within municipality borders and accordingly a number of renovation sites have been proclaimed in a variety of fields. The decree is based on the Law on the Preservation by Renovation and Utilisation by Revitalizing of Deteriorated Immovable Historical and Cultural Properties (Approval Date 16.6.2005- Law No: 5366).

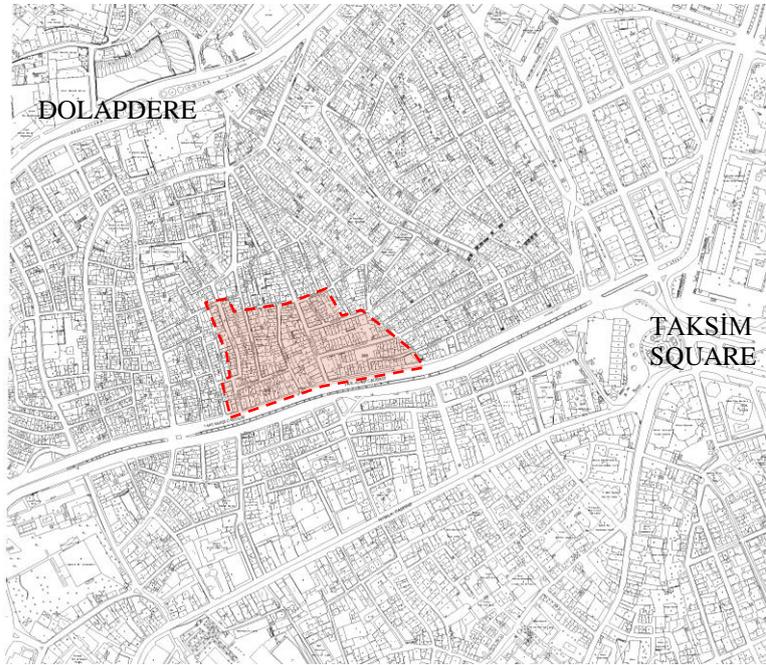


Figure 3: Tarlabası 1st Leg Renovation Project Area

Implementation Act of 5366 no Law states that pursuant to 2006/10172 no Cabinet Decree decision and Beyoğlu Municipality Regulation on Basis and Procedures for the tenders to be made on renovation sites the implementations are conducted. In the Administrative Specifications on this project urban renovation constituting the subject of work is defined such; *“redefining as a city which embraces its historical and cultural assets, in which all service sectors, commercial, touristic and cultural activities coexist; creating a positive and attractive effect on national-international level for Istanbul city and Beyoğlu district; forming a reliable, sustainable and high-quality life urban settlement which is resistant against all types of disasters and which enables the protection and continuity of cultural architectural tissue”* [8].

Project site is composed of Bülbül, Çukur and Şehit Muhtar quarters in Tarlabası. Nine city blocks are located in circa 20 thousand square meter area (Figure 3) [8, 9]. Ongoing construction space in this Project is 72.104 m<sup>2</sup> (Excluding the structures to keep untouched in Renovation site, total construction are of the licensed buildings (approximate fixed size) 62.804 m<sup>2</sup>

and total area of the structures to keep untouched 9.300m<sup>2</sup>) [8]. Renovation site combined with existing area equals to 150 thousand square meters [8, 9].

Of the 278 buildings 210 are registered civil architecture samples and the area also encompass buildings and intermediate streets and substructure. The area corresponds to 3% of Tarlabası [8, 9]. Renovation contract of the area was co-signed with Beyoğlu Municipality in 2007 and the construction is still in-progress. Partial demolishment has been continuing on the city block (Figure 5).

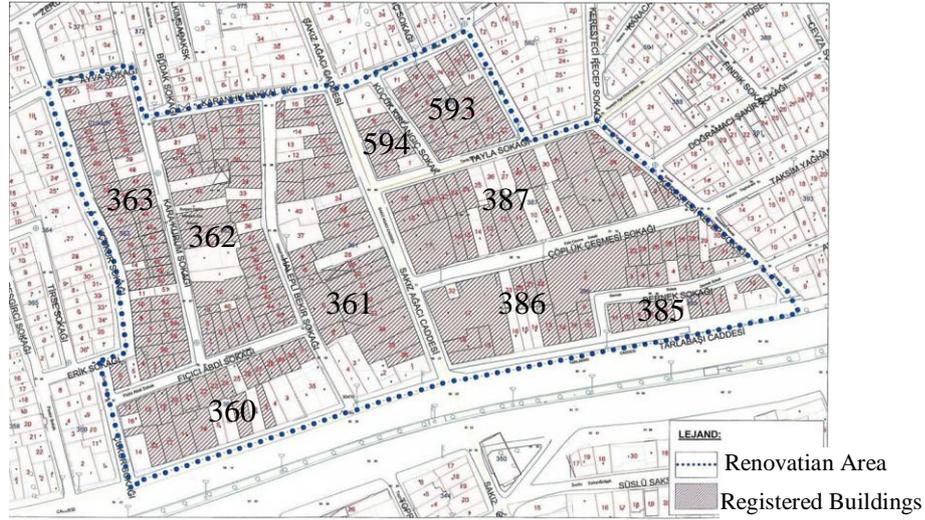


Figure 4: Tarlabası 1st Leg Renovation Project area with registered buildings [8]

Envisaged targets of the project are physical renovation, financial revival and social development. As physical renovation it is envisaged to thoroughly renovate weak and dangerous construction stocks and the entire substructure. It is stated that during this process historical urban tissue shall be preserved, historical features of buildings shall be maintained, underground car parks and social recreation fields for pedestrian traffic shall be created [8, 9].



Figure 5: Case study area site view (Block 360 area) (Photo by Gül Yücel, 2014).

### 3.3 Renovation Project

The use is subject to change according to structure blocks. No. 360 block adjacent to Tarlabası Boulevard has been planned as an office. No. 361 construction block on the other hand has been designed as office for the part facing Tarlabası Boulevard and the remaining part as residence. In No. 362 construction block, except the church inside, the whole structure has been saved for housing. Similar to the other block there is an underground car park below this block. 385-386 no city blocks are designed as house and hotel. Again the registered building within the block has been separated from new structure division. 387 No. city block has been designed as a house covering the whole city block and a car park with three storey. By uniting 593 and 594 no. city blocks existing street has been designed as a passage inside the building. Car park extends towards four basements (Figure 7).

It has been claimed that no changes will be made to the morphology of streets but in three streets basement building has continued and the characteristics of street have transformed. In 593 and 594 no. city blocks on the four basements the intermediate street has been removed to create plan integrity.

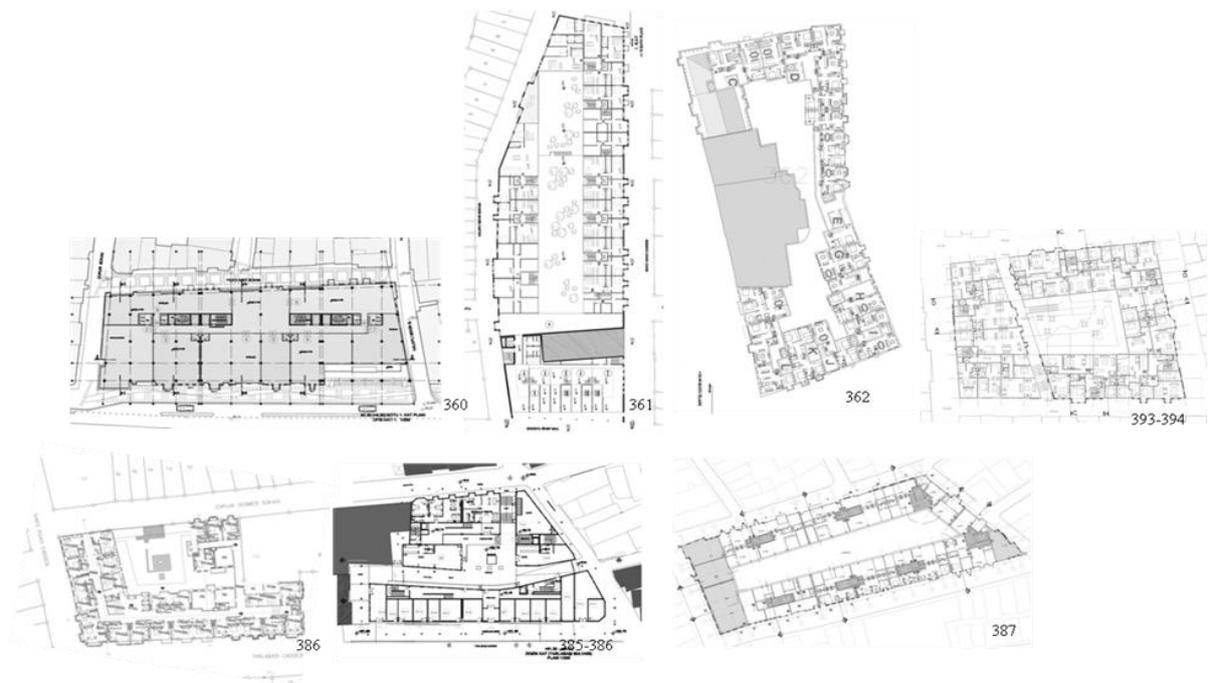


Figure 6: Case study area block plans [8].

The street to which 360 no. city block faces hosted a building alongside five storey under the basement. It is still unclear whether the structures on the city block facing the street that widens on the base floors shall be adversely affected during the process. The future of the other streets which have entrance-exit relation with the car park on the basement of single structure below the city block is also unclear. Car park exits have been pointed outside city block inside the road.

In this Renovation Project there is no safe open area alternative to select as emergency excavation site. By altering the authentic structure in blocks a middle patio has been formed (Figure 6). However active usability of this area is not clear due to the structure height on the block it is situated on. The change of sectional structure adopted in Tarlabası Renovation Project into monolithic structure body on city-block scale triggers an impact on structure-

street relation on sloped topographic pattern. The new construction body which is formed with extra storey as well cannot maintain its authentic identity with the road staying on the same scale. Unified city-blocks or using underground section of the road increases the affectability of the problematic transportation network of the region in the face of disasters. In the current structure stock, the rise in the number of basement floors not higher than one increases the amount of excavation on natural ground. Building of basement floors projected for city-block scale poses risks for registered structures to remain untouched. The excavation works to be conducted for basement floors which were absent on city-block scale before put existing historical tissue under threat.

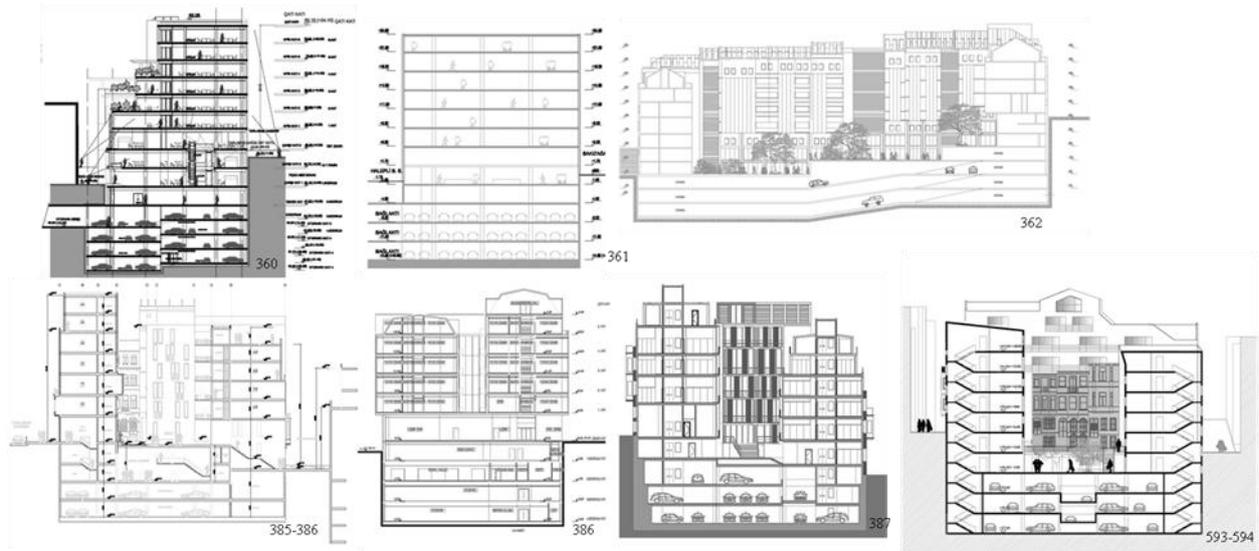


Figure 7: Case study area block sections [8]

In the existing settlement the dense commercial traffic in the parts near Tarlabası street change into residential areas towards the inner parts. As city-block scale renovation is conducted by uniting the parcels it becomes impossible to conduct independent renovation on parcel scale.

#### 4 CONCLUSIONS

- Within the scope of disaster risk mitigation, Tarlabası region characterized with cultural heritage civil architecture samples shall, with the implementation of this Renovation Project, lose its authentic structure to a large extend.
- Extra storeys expand usage capacity of the existing tissue whereas the studies on transportation network and safe open field against disaster risks are not adequately clear. Besides extra storeys also affect authentic characteristics of the street.
- Renovation process of historical urban centers is multi-component. It is debatable whether interventions to physical tissue alone or social and financial interventions solely shall be active in the sustainability. The projected intervention and distancing from authentic structure fuel the contradiction between renovation concept and protecting cultural heritage.
- Renovation in historical urban centers can only become possible instead of new construction process, using in line with the tissue of cultural heritage and rehabilitating without

losing the authentic form. Once its implementation on renovation site is terminated, in the surrounding city blocks too, the authentic tissue shall disappear due to similar demolition works.

- To improve the disaster-resistance of historical urban centers, in addition to improving the structures, there are other important factors such as safe evacuation route and creating safe open fields against disaster risks.

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