

CHARACTERIZATION OF ARCHITECTURAL AND URBAN ATMOSPHERES IN “GRANDS ENSEMBLES” (LARGE-SCALE HOUSING ESTATES), BUILT IN FRANCE OF THE 1950s AND 1973s

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ABSTRACT

This paper introduces results of three case-studies of large-scale housing estates situated in Nantes (France): Dervallières (1952/1965), Breil Malville (1955/1967) and Malakoff (1967/1971). The main objective of this “grands ensembles” study is to produce knowledge about their architectural and urban atmosphere characteristic. The atmosphere concept is defined as interaction between some physical phenomenons like: sound, light, wind with urban environment as perceived by the space occupant [Augoyard J-F, 1998]. This paper is organized globally in two parts, the first part presents brief synthesis of history and current context of these areas, second part gives idea about atmosphere’s characteristic for three cases-studies. This consists in clarifying and analyzing complex relationships between urban, social and physical (sound, light, sunshine, wind, etc.) environment, taking into account user’s perceptions and urban renewal.

Keywords: “grands ensembles”, atmosphere, renewal, perception, characterization.

INTRODUCTION

In reference to current stake related to “the town of tomorrow”, the residential zones type grands ensembles are the subject of multiple and pressing requests. These blocks constitute by their large free spaces attractive areas for dense city concepts, responding to suburban expansion and its harmful effects on the environment. The stake is also to assure harmonious social and economical development between town center and its periphery. Questions that arise about these stakes concern living conditions and atmosphere quality in these areas: is this quality taken into account in their refitting? If yes how? Are the errors made during the time of massive construction of these social housing in France avoided in their rehabilitation? These questions pin up an important aspect of urban design, which is inhabitant’s practices and feelings. As you know, their requirements for comfort and wellbeing are increasingly

important, not only about functional aspects but also about environment, esthetics, and safety aspects. Therefore, renovation project can't be done without a "diagnosis" relating both material components with practices/feelings in these spaces (public and private space).

In this research, we characterize the atmosphere quality in three case-studies of large-scale housing estates situated in Nantes (France): Dervallières (1952/1965), Breil Malville (1955/1967) and Malakoff (1967/1971). Our method consists to use three separate and complementary approaches: observation approach, sensitive and physical approaches. The first two approaches are questioning true-life of the inhabitants: how do they perceive their living environment? What do they think of the social life in their district? And what are the renewal operations contributions? The last approach allows us to explain some micro-climatic phenomenon (sun, wind and temperature) by using simulation tools.

To answer previous questions, the characterization method consists initially of an "exploring" approach of urban spaces using observation (continuous and punctual) in order to discover how the inhabitants appropriate their urban spaces by identifying different types of interactions *individual-individual*, *individual-space* and *individual-microclimate*. This first approach also enables us to prepare "sensitive" approach, which consists to collect information about inhabitant's perception from surveys (questionnaire, interview). It allowed us to explain and understand some observation "scenes" noted in the first step of characterization approach with observation. Microclimatic environments described by the inhabitants are crossed thereafter with third approach called "physical" so as to determinate their emergence conditions, by using digital modeling and simulation. Finally, this multidisciplinary approach allows to establishing knowledge of architectural and urban atmosphere, which characterize large-scale housing studied, taking into account the renewal operation and the atmosphere as imagined by architect-designer.

"GRANDS ENSEMBLES" IN FRANCE FROM SUCCESS TO FAILURE

Massive construction of these housing areas in France is not only a quick and economical solution for the housing crisis after the second World-War, but also a response to the unsanitary lodgings. A census conducted in 1940 showed that only 8% of French houses had bathtubs and toilets, hot water, few windows, a minimum area ... [Comité des Grands Prix Nationaux de l'Architecture, 2007, p33]. While these estates have brought more comfort with spacious, airy and sunny apartments surrounded by green spaces, an occupant says: "...I immediately had "love at first sight" for our new apartment. It was luminous, spacious and had the central heating; it offered fabulous view on the countryside and the greenery" [Giovanna Francavilla testimony]. The official start construction of these housing was in 1953, when the Minister of Reconstruction and Housing Pierre Courant, carried out a series of interventions named "Courant plane" consisting in facilitating housing construction with land and financial supports, giving priority to the large-scale housing estates. In order to meet the growing demand of housing, other programs were conducted like: "ZUP, Zone à Urbaniser en Priorité" (Priority Development Zone) in 1957 replaced by "ZAC, Zone d'Aménagement Concerté" (Concerted Development Zone) in 1967. Certainly this policy had allowed massive construction of social housing but it didn't create dynamic and attractive districts. In fact, a few years after their construction, first sign of degradation appeared (in the late 1950s)

revealed by social and urban surveys. Social contexts characterized by juvenile delinquency, an enrollment rate of adults who never attended school that exceed 10%, higher unemployment, and degradation for framework built. Finally these areas were associated with segregation, nuisances and danger zones, reason why Olivier Guichard Minister of Construction, decided in 1973 to stop the housing construction exceeding 500 units.

How can be explained this degradation and this change from modern living condition to degraded and unhealthy habitat? When looking back at “grands ensembles” history one can observe that majority of these housing are assimilated to concentration camp cities, housing exiguity, proximity, noise... boredom. Overall, these areas are characterized by spatial and social relegation, with lack of transportation and leisure area, and with difficulty to create a social life and to adapt to these new conditions (to have 200 to 500 neighbors from different backgrounds and cultures). So people still feel some kind of social relegation in comparison to the people living in the city center, and this social segregation was accentuated when middle class leaves to detached houses, knowing that 80% of French people at that time desired to live in detached house. The accumulation of problems inside and outside house has made life very difficult in these housing, that’s why these urban housing were a priority for urban political, in order to improve their living conditions through urban renovation and social actions. The main principle of these operations is to take into account inhabitants by creating social office council, so as to centralize the problems and inhabitants demands for giving immediate solutions.

DIVERSITY, DENSITY, COMFORT...: THE RENEWAL OF “GRANDS ENSEMBLES”

Demolish, convert or renew? Such are the questions which arise since 1980s for the future of these urban areas. Since, measures are presented in diverse actions: social (example: National Commission for the Social Development of the Districts), urban and environmental (example: Great Urban Project become Great Project of City) in order to improve the life quality in these districts. For the professional of building, the partial or total demolitions of these buildings are essential to fight against them insalubrities and enclosure, in spite some inhabitant’s refusal to see their housings disappearing. First restoration operations described as “classical” (building front renovating, change of the windows, refitting of public spaces), have been carried out, with mitigate results. But the present renewal programs are deeper, diverse and more effective, consisting in complex programs, conceived on a large territorial scale with a long-term thinking on the future vocation of the district. This policy takes into account sustainable development criteria in all steps of restorations, from construction waste recycling to the improvement of the energy performances.

In a comparative study between large-open spaces of the “grands ensembles” and those of the traditional city Hatzfeld and Moutton [2006], highlights capacity of areas to adapt to urban transformations contrary to traditional centers. These open spaces have a great potential for an equal development between center city and its periphery. Successful densifications of these open spaces should allow creating social and functional diversity awaited in these districts, and reduce periphery-center displacements. If urban renewal seems to satisfy inhabitants, the important transformation must to be in apartments, because inhabitants estimate that changes

inside apartments are insufficient (handing-over in standard of electricity, change of the windows), adding the renovation defects.

Malakoff case in Nantes (1967/1971) seems a good example of this new urban policy. As part of a “Grand Projet de Ville” (Great Project of City) launched in 2004, thought was developed on Malakoff district and neighboring areas. This project was carried by social landlords, the National Agency for the Urban Restoration (ANRU) and the community of agglomeration (Nantes Metropolis) with participation of inhabitants. Budgets inequalities set up by each landlord gave interesting results to analyze. First public landlord had opted for a “classical” rehabilitation with budget of € 25 000 by apartment, the second private landlord had opted for a radical change with € 60 000 by apartment, which has enabled to improve energy performance of buildings. Indeed, energy consumption was reduced by 80kWh.ep / m² / year, saving load about 70 € / year by home [Barthel P, 2008], with double-insulation of the buildings (inside and outside) by semi-rigid 10 cm thick rockwool panels. The building architecture is also revised: apartments became more spacious, with original architecture and diversity of functions. On an urban scale, ensure house diversity and the reinforcement of the connections to city center are the priorities of this project.

STUDIES CASES SITUATED IN NANTES

The three large scale-housing [Fig. 1] choices were built between 1953 and 1973. The first case study is “Dervallières”, first “grand ensemble” built in Nantes (1957-1965) in an old park, building implementation is done in away to preserve the natural framework, and to adapt to the climatic conditions, in order to have better quality of sunning and a protection of the dominant winds. This neighbored is situated in town periphery and contain 2600 housings. The second case is “Breil Malville” designed by the same architect than the first one. It is featured in the presence of different housing type (detached, semi-collective and collective housing) and contains 1600 housing built in 1961-1967. The last case is “Malakoff” situated close to town center, with exceptional natural framework (Loire River and “Amazonie” preserved park). Built in 1967-1971 Malakoff contains 1658 housing. The three selected districts are the subject of many restoration projects, differing in level quality, progress report and budget.



Dervallières (1967/1971)



Malakoff (1967/1971)



Breil Malville (1967/1971)

Figure 1: the three studies cases.

SOCIAL DIMENSION AND ITS IMPACT ON PEOPLE PERCEPTION

Interrelations between a social dimension of the district and a sensitive atmosphere are strongly present. The feature of social life in these urban areas: delinquency, poverty, unemployed and unoccupied, drug users with low education and a difficult social condition, insecurity is a major preoccupation of the inhabitants in their life environment. This report is pointed by inhabitant testimony, one of Dervallières occupant says: “... *you know, the morning when I go out from my home, I do not really pay attention to the sun, wind. I think especially to my work, my children, and to not be burgled*” [testimony taken 15/07/2009]. This mistrust feeling concerns most of “grands ensembles” inhabitants, especially the women. That’s why these persons not invest in social life of district and stand apart from the others inhabitants. Hence some spaces judged dangerous and bad reputation areas are not used. For middle class family which lives in these areas a departure is a priority especially for the victims of these conditions: “*I made burgle my apartment twice, each time I go out with baggage’s they steal me, fine, I can’t take it anymore*” [testimony taken 15/07/2009] for the poorest class their socio-economic level not allow them to hope to leave the district, so they seek to adapt by trivialized the bad social life aspect. An inhabitant of Dervallières told us: “*Yes, these are young people, they like to have fun, and they do nothing wrong*” [testimony taken 23/07/2009].

This category of people is able to create his ideal world of sociability. What they often call for solidarity, good neighborhood, is a feeling shared by a group of people or even families who can provide some protection from outside world, seen also as a means of mutual help, mainly present between families of same origin and culture, the old neighbors and neighbors simply. This solidarity can also be found inside blocks; it concerns the cleanliness of common places as stairwells, elevator, landing of floor and also the limitation of noise at certain hours considering the bad soundproofing of apartments. On the contrary, other neighbors distinguish them by their lack of civism and the lack of respect for the community life: trash front of doors, strong music...

PRESENCE AND BEHAVIOUR IN THE PUBLIC’S AREAS FOR “GRANDS ENSEMBLES”

This paragraph presents observation results of public’s areas in three cases studies, recalling that objective for this step is to identify inhabitant presence and behavior in these spaces. Observations realised during winter and summer days (day of week or weekend) in the three districts show that urban activities take place mostly in the following areas: square, playing and green areas. Other frequent activities occur in entrance hall of buildings, cellars, parking’s, and stairwell. We notice that square is the most used space in these districts [Fig. 2]; the inhabitants justify it by the presence of equipments and services necessary to the everyday life. We can find in this space different activity like: purchases, meeting and discussion. By its central and strategic situation in the district, it is considered as the favorite place where young people grouping and activity, so that it experiences motorcycles and cars races, quarrels, business.

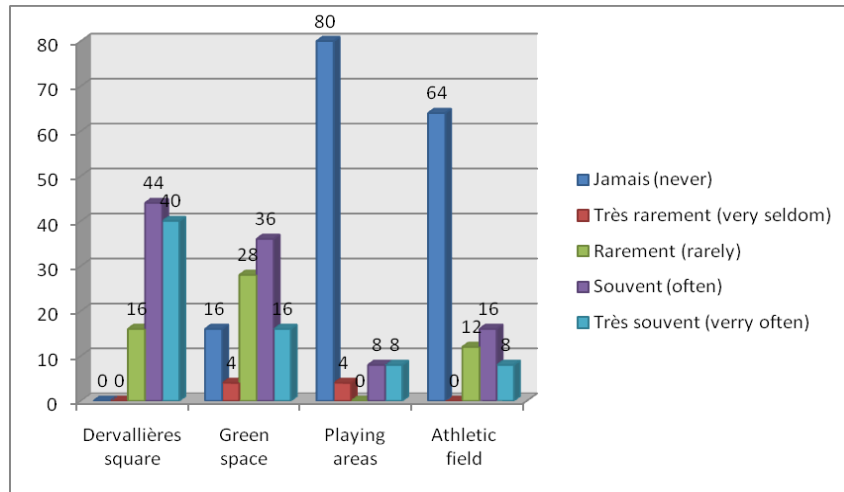


Figure 2: use frequency of Dervallières public's space

That is why some inhabitants prefer not to frequent this place. The city planning (street furniture, green area) and configuration of these spaces plays an important role that determinates people practices and urban dynamic. For example, Breil Malville square is not used by people because of its poorest urban arrangement, contrary to the Malakoff and Dervallieres square where inhabitants take advantage of the presence of terrace (bar and restaurant) and of the benches, to create convivial meeting moments for woman and man. In the Malakoff square, women say that they don't like to go to this place, because the glance of the person's occupation of this space is concentrated and oriented to the persons arriving at the place, which is inconvenient for them. This situation is resulting from the square configuration. If squares are the most frequented space in the three districts, the green spaces (with or without pond) are the favorite spaces of the inhabitants. In Dervallières, inhabitants display particular attachment to green space called "pond", which know another dimension after its renovation. Inhabitants appreciate this space natural landscape (vegetation, pond and ducks) that they qualify as "exceptional", "quiet", and "pleasant".

Before its renovation, space was given up by inhabitants for its dirt and for offensive odor emitted by water. Another example related to Malakoff, is the "rock" park, a green space very appreciated in spite of its bas urban arrangement. Rest areas situated in front of buildings are practically unused in three districts, while these areas are well equipped. According to the inhabitants, they prefer isolated spaces sheltered from view coming from buildings.

Atmosphere quality in large-scale housing studies

It consists to give an overview of inhabitant's perception. This was collected by surveys where thirty people by district were participating; responses were given in home or in public space, the questionnaire being completed by the investigator. Generally, the perception of architectural and social framework is rather positive, more particularly in renovated districts. According to inhabitants, this report is justified by improvement of the residences quality of many people that were living before unhealthy houses of old centers and left them to live in these "grands ensembles" (like Malakoff people). They so accessed to spacious apartment, with better sunshine and natural lighting. Of course, many inhabitants are dissatisfied about

the degradation of the built and social framework, but they remain overall satisfied of their life framework.

One of the first questions asked to the inhabitants was: do you live in your district by choice or constraint? Their answers [Fig. 3]; reveal that for 46% to 59% of the inhabitants (according to the district) it was constraint. One can distinguish in this category of inhabitant people that have become accustomed to life in these districts with time, whereas others consider that their presence is temporary, especially persons whose residency duration varied for six months to six years (young household). In the category of people having freely chosen to live in these areas, choice is generally justified by: natural and social framework of the district (like in Dervallières), proximity of worksite and town centre (the case of Malakoff), equipment and the services presence, family reunification. This people invest more in district life compared to the people forced to live there.

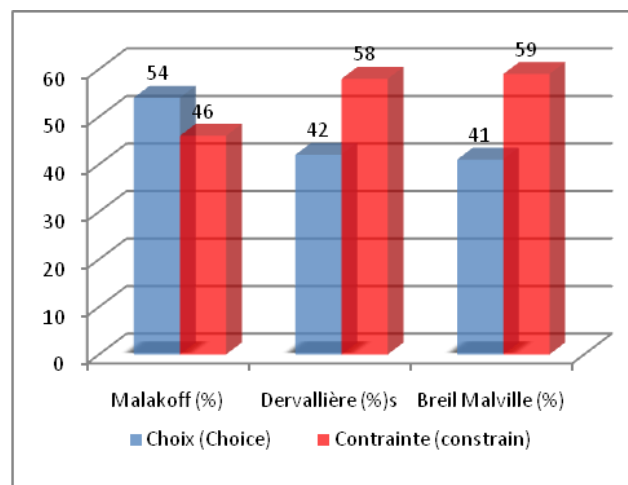


Figure 3: live you in your district by choice or constraint?

Evoking the natural and built framework, most of inhabitants interviewed say that architecture which characterizes blocks is banal and old [Fig. 4], consisting of standard buildings dating from the fifties years. Note that this observation is more presents in degrading and not renovating districts like Dervallières. In Breil Malville and Malakoff, renovation of some buildings is well perceived by inhabitants who found it current and original, as well as facades refitting, terrace extensions, with using of some noble materials into facades such as wood, and ceramics (thermal and aesthetic roles), very appreciated by inhabitant. For renovation called "classic" (refitting facade, change of windows), often conducted with some budget constraints, people consider them like a "mask of misery". The outside image of clean and nice building does not reflect true-life of people inside building, this judgment is justified by the bad sound and heat insulation, lack of space, defect, mediocre maintenance and degradation of commonplaces.

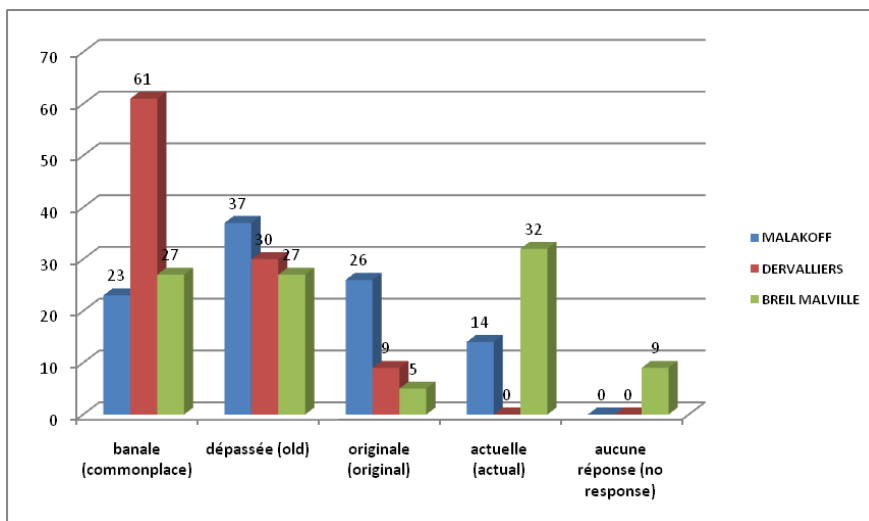


Figure 4: How do you find the architecture of your neighborhood?

The will of first architects to develop healthy and pleasant districts away from center town and their pollution (noise and others), has not always been respected in construction of these large-scale housing. Indeed, the choice of implantation sites depends to some land and financial constraints (a property at a lower price). For example Malakoff area built on a site near center town, bounded in the north by a railway that inhabitants see as a major source of noise in district. Contrary Dervallières is built on the site of an old park, near the town center but with more relaxed and calmer landscape. According to surveys conducted in these areas, one can observe that the urban context is not the only determining factor of the sound environment, but the social life and especially social practices are also determining for this atmosphere. In Malakoff and Dervallières, the inhabitants say that district are quite noisy (on a semantic scale of seven levels from very loud to very noiseless), noise sources are mainly associated with racing motorcycles and cars, grouping and discussions at feet of buildings (children and young people), neighborhood noise, young people conflict, renovations noise. Square is a noisiest place in these areas, before children's playing and green areas. Inside buildings, the bad soundproofing gives rise to a less intimate soundscape, as described by an inhabitant [testimony taken 27/07/2009] of Dervallières “we hear everything in apartments, the neighbouring who walk or who speak, even when they go into WC we know it”.

Our surveys contain questions about sunshine quality and winds sensation. In three districts, 80 % of the inhabitants say that their apartments are sunny. Indeed, the double orientation of housing allows benefiting from a maximum sunshine hours in different periods during the day. In these three districts, different built forms and orientations can be distinguished. In Dervallières, for example one can find especially low blocks (with an average of 9 floors), so the shadows caused by buildings to others are very low. On the contrary, in Malakoff, buildings are composed of low- and high- rise buildings. The last ones, with their important height (18 floors) and their respective nearness often create extended shadows with consequences on sunshine quality. In Dervallières and in Breil Maville, architect Marcel Favraud privileged an orientation on a diagonal axis (45°), what makes that buildings have a north-west south-east and south-west north-east orientation, which allows an equitable distribution of sunshine on facades. Effectively, 80 % of inhabitants questioned in

Dervallières says that their housing is well sunny, but there are particular cases where some spaces are bad sunny, because of north orientation or plants shading.

Some inhabitants have talked about overheating phenomenon in summer, localized specially in space where openings sizes are large; this finding is verified by simulation of sunshine duration [Fig.5], with the “Solène” software. The simulation affirms an overexposure of some facades. For a maximal duration equal to 12 hours (for a clear sky, and 21 June day) Mean sunshine duration by facade and for day are: 6h58 for North-West, 6h20 for South-East, 9h00 for South-West and 3h25 for North-East. Concerning Malakoff, the architects Evano, Cormier, Choisel and Leroux have opted for North-North West and South-South East facades orientations. 78 % of the inhabitants of this district say that their housing are well sunny, but others find also some spaces especially a rooms with bad orientation (North-North West). We notice that the sunshine duration of this facade is null.

Besides the sunshine quality, wind flow in these areas is also analyzed through inhabitant’s perception and simulation (Saturne software), in order to evaluate the impact of built form. In regards to this climatic factor, inhabitants mainly express discomfort situations. One can notice numerous “corner effects” in studies cases. They consist in wind accelerations at buildings angles, which can reach speed of 5m/s according to simulations made in Malakoff [Fig.6] and Dervallières with a reference wind speed equal to 3 m/s. All the identified effects have been listed in the Beaufort evaluation grid for wind speed [Gandemer G, 1976], that allows considering the impact of wind on the built space in function of categories of wind speed. As example: A speed equal to 5m/s is situated in the category 4 (hair is shaken, leaves and small branch are in permanent movement).

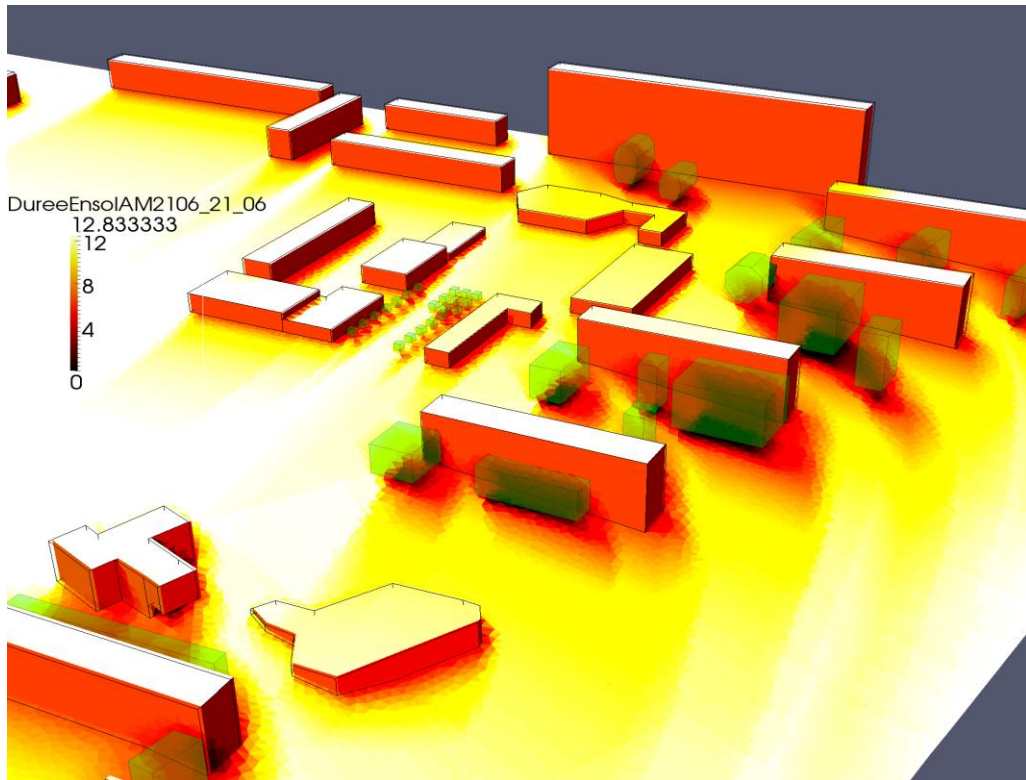


Figure 5: sunshine duration in Dervallières simulated with Solène software, for summer day 21/06 including the simulation of vegetation

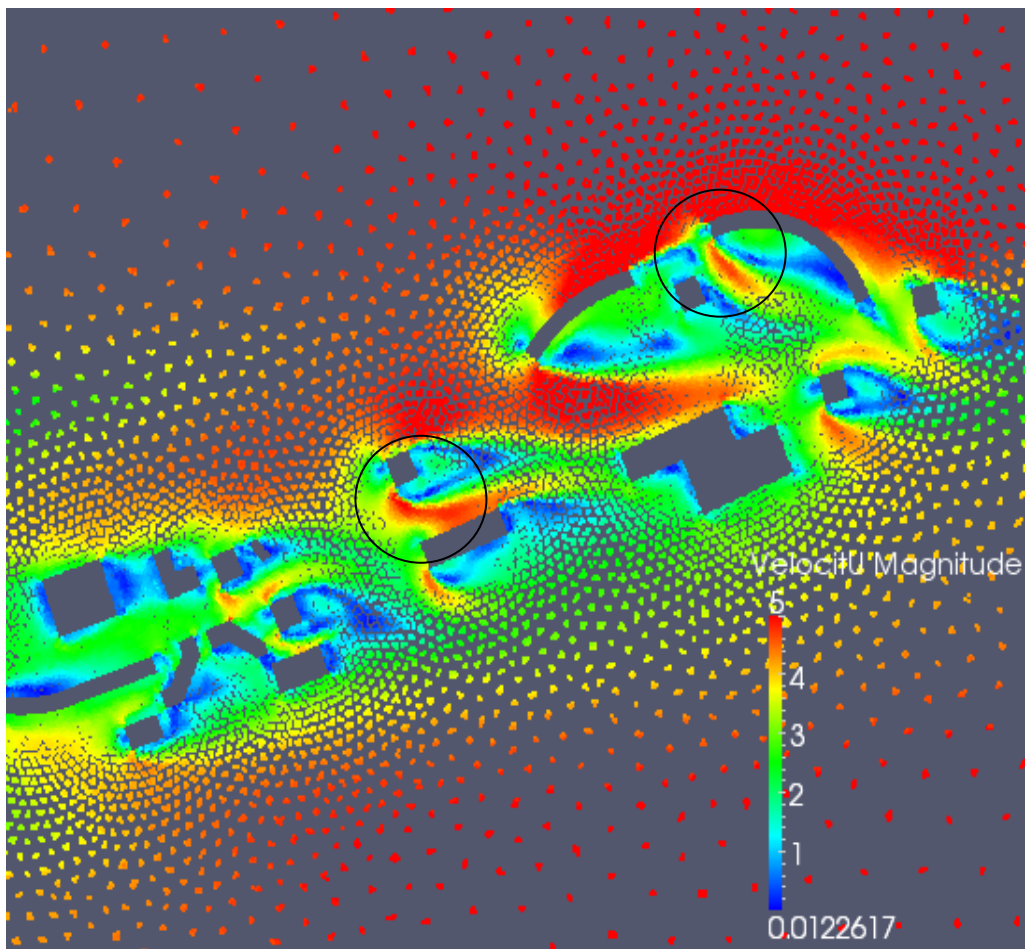


Figure 6: flow velocity of the wind (m/s) in Malakoff, for west winds. The reference speed is 3 m/s.

CONCLUSION

Historical and current framework of “grands ensembles” exposed briefly in the beginning of this article indicates that these blocks are French peculiarity because of their construction process and their evolution. However, they have features in common with other models of social housing developed in other countries (Holland, Germany, Spain), in terms of architecture or of their living condition often considered as rough. This study focusing on French cases allowed us to demonstrate that life quality in these districts does not only concern some difficulties that need to be surmounted, but also some qualities that should be highlighted like some inhabitants who manage to ignore negative aspects of their district and to estimate positive aspects, their life spaces become an integral part of their history and their culture. Paul Chemetov says *“ce qui est positif, c’est l’air, la lumière; ce qui est négatif c’est l’enfermement. Comment met-on en relation dans le réseau de la ville, les services, les espaces?”* (The positive in these areas, is the air, the light; and what is negative? it is the confinement. How can we put in relation the network of the city, the services, and spaces?) [Committee of national Grand Prix, 2007, p35], this architect-planner underlined the quality potential, which still exists in these blocks, namely the natural living environment (aeration, light, sunshine, vegetation).

We notice that low use of their public areas is justified by social life difficulties (violence, traffic, crime), creating an atmosphere of fear and mistrust among the inhabitants, without forgetting the built degradation. This situation was at the origin of several debates about demolition or conservation of this heritage, where some architects (ex: Claude Vasconi, Lacaton and Vassal) were against the idea to remove these districts knowing that the crisis of housing is still current in France, while others persons estimate that partial and/or total demolition is indispensable. If the inhabitants are globally satisfied by the restructuring of public places in these districts, the most important remains to improve inside buildings quality (insulation, exiguity) where degradation is harder to live and to bear. It is what the three architects Frederick Druot, Anne and Jean Philippe Vassal Lacaton have tried to do in a research paper "Plus" (More) on “grands ensembles”. They proposed to adapt these blocks to the current lifestyle: expansion of livable space, sun lounge with full height, garden terrace, but just one (the tower Bois-le-Prêtre in Paris) of those proposed projects in their research is under realization.

For renovation, we think that architectural and urban atmosphere can be considered as most suitable tool for urban diagnosis in these areas. Because classic sociological surveys not give precise idea of real people expectation in terms of atmosphere quality and wellbeing in their district. Solution can be consisting in organizing some “commented walk” with inhabitants; so as to enable them to describe their perception of district spaces (house and public space). These sensitive experiences can be afterward crossed with physical data (microclimatic, sound and other), what allows designers to clarify some discomfort situations raised by the inhabitants and thus to bring an improvement, or simply to ameliorate atmosphere.

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