

# Building with Contaminated Waste Materials

When a School-based Health Needs Assessment Reveals Environmental Injustice



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## BACKGROUND

- Environmental concerns discovered during school health needs assessment
- Study site (a small rural town in the Midwestern United States): site of a former zinc smelter (closed down in mid-1980s)
- Former smelter site now an EPA Superfund site
- Materials from the smelter (cinder blocks, fill dirt, etc.) widely distributed to community members for use in residential construction projects after the smelter closed down
- Possible contamination of these materials and corresponding health hazards for residents were disregarded
- EPA soil sampling found several residential yards with elevated lead levels (attributed to materials from former smelter) community members' accounts of EPA interactions suggest that health hazards were downplayed.

## THE EPA AND AN UNDERINFORMED COMMUNITY

- EPA reports: reasonable expectation of exposure from site contaminants due to lack of site containment
- 2011: EPA recommends site for inclusion in the National Priorities List (NPL), declaring the site a "superfund site" – a site containing "known releases or threatened releases of hazardous substances, pollutants, or contaminants" (1)

## THE HEALTH NEEDS ASSESMENT

- Community members expressed little concern with environmental toxins: Students and adults surveyed listed "environmental toxins" last of 8 possible areas of concern, after "drug use", "jobs", "addiction", "having things to do", "health", "crime" and "safe housing"
- Community voices in focus group suggest lack of information by EPA and community denial:

*"...the cinders and that...a lot of people put that in their driveways; I mean my mom's house had the driveway with those cinders. The track out here was those cinders; that's what they used back then, and they didn't worry about lead poisoning or anything like that."*

focus group participant

*The EPA man said "you'd basically have to eat a lot of the dirt for you to be affected, like to literally affect you..."*

focus group participant

## THE RESEARCHERS' DILEMMA

- Community did not seem interested in further exploring environmental concerns or the (lack of) information provided by the EPA
- If we want to conduct community-focused research, how do we respond when the community does not wish to pursue a matter we perceive as an environmental injustice?

## WHAT WE COULD DO

- Identify local champion(s) to improve community interest and buy-in in the matter.
- Facilitate educational activities for and with the community.
- Identify other rural communities who have already successfully addressed (or solved) similar issues – establish connections
- Engage community in community-based participatory research (CBPR) to explore environmental hazards in their town.
- Explore possible funding mechanisms the community could pursue to further explore environmental toxins and exposures in their community.



The Constructed Environment

# Impact of Windows on the Visual Quality of Indoor Work Space Located in Hot and Arid Climates

## the Ninth International Conference on The Constructed Environment

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### ABSTRACT

Benefiting from natural light and a view of the outdoors in any indoor space are considered to be the most important functions of the window. For a window to contribute effectively to the increase of visual efficiency in buildings and especially to those located in areas with hot and arid climates, the selection of the best parameters must be made from the design stage in the construction process, but unfortunately most Algerian architects consider the window as an aesthetic aspect for the facades without paying attention to their yields. In this respect, this article presents an experimental study carried out to clarify the impact of different configurations of windows on visual efficiency using simulation software on models of real offices located in the city of Biskra, oriented south and released from a typological study. The simulation process was carried out during the 3 months (March, June, December), taking into account the climatic data of the city of Biskra. The experimental results obtained confirm the efficiency of the window, as an element makes it possible to contribute to the achievement of comfort conditions within a space.

### INTRODUCTION

In a whole building, the key element that ensures the relationship between indoor space and the outdoor environment and guarantees an ambitious indoor climate is "the window". Given its importance in a whole exchange outside - inside, we must first know its duality of advantage and inconvenience. Because according to (Gay, 2001), the window is a complex element for more than one reason. It is required to perform various important functions: source of natural light, heat, natural ventilation and vision to the outside world, and each of these functions is related to an undesirable effect: source of glare, overheating, noise and reduction of visual privacy (Ilknur, T., Mehmet T, 2007). So the best window was - in the absolute - the one that would answer all the functions in a well studied and controlled way.

In a workspace, natural light and the view to the outside are the most requested window functions because they can reduce energy consumption due to the use of artificial lighting and reduce stress and fatigue. give the space user a vision on the outside conditions (Hellinga H, Hordijk T, 2014). For this, a window that guarantees access for natural light and provides a quantitative and qualitatively adequate exterior view for a workspace must be well studied in terms of all its parameters: configuration, sizing, position, type of glazing, sun protection ... etc, in order to achieve comfort conditions and interior visual quality bearable for workers. (G. F. Menzies, J. R. Wherrett, 2005)

### PURPOSE OF WORK

The overall objective of this article is to study the effect of the window on the visual climate within a space. But specifically, the goal is to find the optimum settings related to window over the ratio of openness and sun protection in order to achieve a perfect visual quality for occupants of office space located in a warm area and arid in terms of the amount of natural light and the view to the outside.

### RESULTS & DISCUSSION

Model 01 before and after the correction	Model 02 before and after the correction	Model 03 before and after the correction
- Horizontal sunshade resizing (awning) helped to reduce the average illuminance surface that presents the discomfort with 10% difference compared to the model before the correction. This was a reason for reducing the risk of direct glare caused by the surface of the sunspot near the window and especially at noon (reduction of the area of the sunspot from 4.57m <sup>2</sup> to 1.60m <sup>2</sup> ). •Almost an increase of 8% in the area of insufficient illuminance in the model after correction before before correction. This is due to the increased length of the awning, which gives the space a feeling of darkness especially at sunrise. •The model maintained the same values of adequate illumination without and with correction with a percentage of 66%. (Table.4)	The addition of the Light shelf helped to reduce the average area of illumination which presents the discomfort with 76% of difference compared to the model before the correction. This has been a reason for reducing the risk of direct glare caused by the surface of the sunspot near the window and especially at noon. Almost an increase of 09% in the desired illumination area in the front model before correction from after the correction. The model maintained an adequate illumination value of 53% with correction compared to a value of 0% in the model without correction. (Table.5).	The LGS decreased the area that had an illuminance level greater than 950 lux from 14% to 6%, as well as, reducing the average level of insufficient illumination from 16% to 9%. The blind provides a good distribution of illumination in the office or it is found that the adequate illuminance surface is high from 55% to 75%. (table.6).

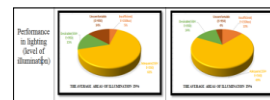


Table 4

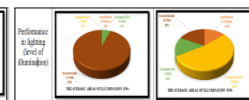


Table 5

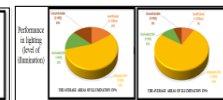


Table 6

models	The rate	Number of strata	The most affected stratum	Ratio of opening in the wall
01	Before correction	2 strata (upper stratum and sky)	No strata	15.27%
	After correction	2 strata (upper stratum and sky)	The upper stratum (sky)	15.27%
02	Before correction	3 strata	No strata	91.30%
	After correction	3 strata	The upper stratum (sky)	91.30%
03	Before correction	2 strata (upper stratum and sky)	No strata	8.39%
	After correction	2 strata (upper stratum and sky)	Stratum in the middle (balcony)	7.03%

Table 7

### METHODS & MATERIALS

#### . Analytical study :

✓ type of buildings analyzed : 12 office buildings located in the city of Biskra.

✓ The criteria of study : - the window wall ratio  
- The type of sun breezes used, Their adaptation to each orientation  
And The correct dimensions.

✓ The obtained results :

• **Model 01:** office with solar shading combined between awning and unsized flank (depth = 0.75m) with WWR= 14.30 % .(fig.1)

• **Model 02:** office with south-west facing window without any solar shading with WWR= 90 % .(fig.2)

• **Model 03:** south facing window with vertical sunshades not adapted to this orientation with WWR= 10 % .(fig.3)

#### . experimental study :

✓ Step 1: Proposal Corrections:

• **Model 01:** - resizing of the awning depth:

\* the required value of the occultation height in the south orientation = 43°  
So:  $\tan 20^\circ \times 1.60 = 1.71m$  deep .(fig.4)

• **Model 02:** the addition of a combined light shelf (external and internal) with a semi-reflective surface.(fig.5)

• **Model 03:** adding of horizontals light guiding shades.(fig.6)

✓ Step 2: Simulation :

• The models were simulated under climate data inputs from the city of Biskra, in order to define their visual performance in this hot and arid region.

• The simulation process was carried out during the 3 months (March, June, and December) and for three hours of the day: **8am, 12am and 4pm**, using the software Radiance.

• the study will be limited to studying the performance of a single physical parameter that is the illumination received on the work plan in an office.

### Exterior view results

Illuminance results : For model 01 and 03, the opening ratios are minimal to the recommended one. This implies that the views caused by these two models in both cases (before and after the correction) have insufficient ratios and this due to the opening size itself, not to the added protection.

• The addition of the Light shelf in model 02 presents the most optimal situation given the content of the view of all three strata (soil, buildings and sky), a minimal number of strata affected (a stratum ) and a maximum aperture ratio that provides about ¼ of the view to the outside.

### CONCLUSION

About lighting performance Regarding the average areas of adequate illumination, the three models after the correction give preferable values more than 60% compared to the models before the correction.

About exterior view, the results obtained in the three models, we find that the sun breezes add in the first affected windows the upper stratum (the sky), whose least affected stratum is the lower stratum (the ground). To conclude, when choosing to integrate windows for any space, all elements specific to the interior efficiency cannot be fulfilled in a compatible way. Whose purpose remains proportional depending on the shape, size and characteristics of the window and the space itself.

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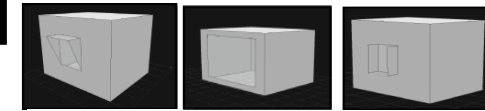


Figure1.model 01

Figure2.model 02

Figure3.model 03

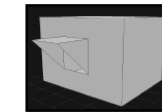


Figure 4.model 01 corrections

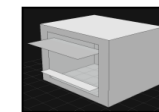


Figure5.model 02 corrections

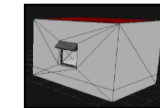


Figure6.model 03 corrections

✓ Step 3: Results interpretation steps :

#### Illuminance study

1. Illuminance level simulation for each model at 8.00h, 12.00h and 16.00h (table.1).

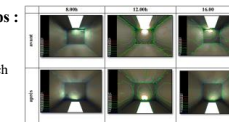


Table 1

2. Presentation of illuminance zones in percentage at 8.00h, 12.00h and 16.00h (table.2).

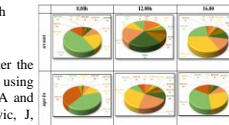


Table 2

3. Overall model results before and after the correction for each month (table.3) using reference values developed by Nbil, A. and Mardaljavie, J (Nabil, A., Mardaljavie, J, 2005) in their study "100 lux as a value of minimum illuminance and 2000 lux as maximum value for a space of job ".

• the study of the outside view was carried out according to:  
i) the number of strata  
ii) the strata the most affected  
iii) the ratio of opening in the office wall.

Based on the studies of Ne'eman, Hopkinson and Keighley, the minimum acceptable opening ratio in the office interior wall will be 35% of the façade wall

Exterior view study

Exterior view study

Exterior view study

Exterior view study

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Exterior view study



# Colonial Public Markets of Poona: Hegemony of British Raj

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## Abstract

Colonial urban edifices of Poona mark political statements and demarcate commencement of the early modern age in the setting of "native" Maratha architectural character. Those were key components helped in constructing the image of the city in late nineteenth century. Rather those religious structures, educational buildings, and offices built, which were the first of its kind, emerged as colonial public architectural landmarks in the Pune context utterly following western notions. The concept and its manifestation in architectural form both could be out of context in a typical Maratha-Peshwa town in various ways. There were several oppositions from local reformists and communities for constructing structures such as covered markets at the heart of indigenous towns. Which was eventually constructed under supervision of local contractor Vasudeo Kanitkar under the guidelines of royal engineer, Walter Ducat. The paper emphasizes the architectural models followed as a powerful symbol during the reign of the British, in Pune especially in the case of public architectural edifices eventually intervened strongly as colonial public landscapes. These religious, educational structures ultimately helped British "Raj" to build an image as ruler and to control on existing economic, social, and cultural system. These colonial landmarks are neglected from their significance as vital cultural resources and seen as alienated structures from the locals' point of view. With the help of qualitative research methods and archival resources, this paper examines the importance of these erections as a manifestation of power by sovereign imposed on numerous classes, castes of Pune.

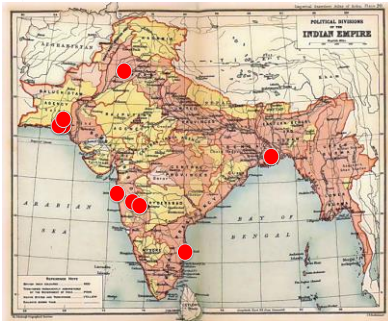


Figure 1, Map showing locations of 9 covered market built during 19th century in India before partition.



Figure 2, Open market opposite to fortress tin early 19th century, Ref: Pune Queen of Deccan, Diddi J., Gupata S.

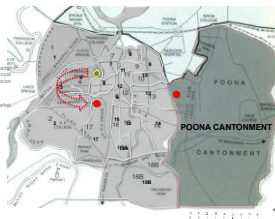


Figure 3, Covered Markets of Poona- Reay Market context

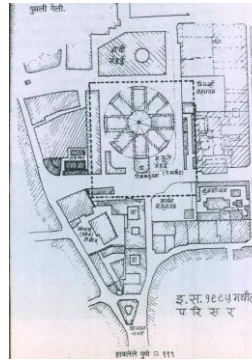


Figure 4, Conjectural map showing Open Space in Shukrawar Peth/ Ward with Reay Market, Ref: Sowani, Haravele Pune, 1995 map

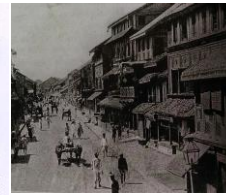


Figure 5, Mixed Use street markets in early 19th century Ref: Pune Queen of Deccan, Diddi J., Gupata S.



Figure 6, Areal view of Reay Market courtesy to Kimaya architects, Pune



Figure 7, 8, 9 Classical Façade treatment, central watch tower and wrought iron ornamental bracket and columns supporting roof



Figure 10, Plaque above and its text on right, at Reay Market on its inaugural day

THE REAY MARKET  
OPENED BY HIS ROYAL HIGHNESS  
THE DUKE OF CONNAUGHT AND  
STRATHKERN K.G.  
ON THE 5TH OF OCTOBER 1886.  
NAMED AFTER HIS EXCELLENCY THE RIGHT HONOURABLE  
LORD REAY LL.D. C.E. GOVERNOR OF BOMBAY  
PROJECTED BY THE MUNICIPALITY OF  
POONA IN 1882  
J.G. MOORE ESQ. BEING PRESIDENT  
COMPLETED IN 1886 KHAN BAHADUR  
DORABJEE PUDUMJEE BEING  
PRESIDENT  
DESIGNED BY COLONEL W M DUCAT  
R.E. AND CARRIED OUT BY RAO  
BAHADUR WASUDEV BAPUJI KANITKAR  
C.E.  
RAO SAHEB NARASO RAMCHANDRA  
GODBOLE SECRETARY P.M.



Figure 11 Areal view of Connaught/ Shivaji Market



Figure 12 Vasudev Kanitkar

## Conclusion

19th century covered markets in west and east shares similarity. Such as selection of public squares. Reay Market with Octagonal form with 80 feet tall tower at centre, this very unique form symbolises colonial control over old administrative and economic systems. Distance between ruler and the subject was though maintained by the scale and architectural vocabulary but at the same time creation of such public civic culture was very symbolic to notify commencement of democratic space breaking earlier feudal setup of Poona. Likewise this represents modern economic system implemented through government agents and local philanthropists in Indian towns. Reay Market as an important cultural heritage proposed and built by R.E. Walter Ducat and Local contractor Vasudev Kanitkat though neglected, as colonial past of town should be emphasized as an important colonial urban landscape of town. Connaught and Reay markets originated by R.E. Walter Ducat and executed by local contractors are significant examples from colonial architectural history in Indian context as vibrant public space.

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The Constructed Environment

# THE CONSTRUCTED ENVIRONMENT

## LIVING IN THE HISTORIC CENTER

### A DIALOGUE BETWEEN THE OLD AND THE NEW

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#### ABSTRACT

Given the importance of housing to promote urban dynamics in central areas, it is believed that the re-use of existing unoccupied structures is conducive to the revitalization of historic centers. The diffusion of the private house, isolated, single-family and decentralized of the housing action, together with the very low investments in infrastructure, constitute the history of Brazilian popular housing. The homogenization of space, with inflexible projects, frequently presented in housing programs in Brazil, suggests that all individuals have the same needs. In an economically globalized world, architectural standardization exerts an authoritarian function on users and their authenticity, and has become the new object of desire. However, the laws and norms applied today in the recovery of historical spaces do not consider the exceptionality of the identity characteristics of the old constructions. In this sense, re-use requires that creativity be a protagonist in contemporary housing projects. This article proposes the challenge of thinking about the reoccupation of the preexisting patrimony of Brazilian historical centers, in order to be recognized as modern and current. The hypothesis assumed here goes beyond historicist rigidity that inhibits the "recontextualization of architecture", with the restoration of patrimony and the implementation of architectural programs of a housing or mixed nature. However, it is difficult to establish the concept of contemporary housing, paying respect to the identity of the building, taking advantage of its morphological patterns in the project. In this context, flexibility and adaptability are essential characteristics that will give the resident the ability to express himself and, above all, to understand spaces with diversified ambiances.

#### INTRODUCTION

The challenge of reinserting of housing in historical sites, contrary to what it may seem, is not new in Brazil. Some decades of experience allows us to reflect from a historical perspective, be it of the morphological and functional evolution of these sites, or of the attempts to reverse the processes of degradation and loss of the resident population. The historical centers were, until at least the first half of the 20th century, part of less complex urban contexts. This condition enabled them to remain, for some time, as multifunctional areas. The multiplicity of situations and personalities together with an affectionate relationship with the site explain much of the charming exerted by these areas, and make the attempt to reproduce forms of sociability and relationship with the city that have been lost over time.

To inhabit is to live the space, integrating a set of daily activities, defined in 1931 in the letter of Athens. Realizing that each of us has distinct identities throughout life and that housing needs to express those differences has become essential in designing the new housing ways. Architecture must contemplate not only the diversity of inhabitants, but also the individuality of each user, relating families to their spaces. However, the standardization of housing in public programs expresses our rigid architectural system. This model of stagnant and hierarchical spaces, divided into functions, has become consolidated in many parts of the world.



Photos of Rio de Janeiro's downtown | Font: Personal Collection

#### 1. INTERNATIONAL MODELS AND THE BRAZILIAN EXPERIENCE

When facing the differences between Latin American and European or American cities, the discrepancy is in the extent to which diverse and recurrent social, political and economic problems occur. All of them demand complex solutions, especially when we consider their processes of formation, expansion, insertion in the global economy, income distribution and strategy of survival of the lower classes. Considering this context, how should we apply in Brazil the models and experiences of urban planning from other countries? In the middle of the last century, Juan Alberti already said: "to proceed with development means to acquire a civilization of its own, even if imperfect, and not to copy foreign civilizations, even if advanced. Each people must have its own age and its own ground, each people must be itself ..." (Cury 2000, p. 324).

In Brazil, we are faced with an economic policy that includes a spectacular increase in spending of public resources in the urban development sector, which is creating not a solution to social problems, but a feedback of an excluding and rigid model. Through housing programs, an urban dynamic of historical nuclei is created, i.e., the historical relationship of economic, social and ideological politics is established. These spaces are, as a rule, inconvenient and harmful, away from the production of labor and commerce or in deteriorated spaces within the productive areas. It is fanciful to imagine or argue that the development of third world and semiperipheral countries is a simple matter of time. In view of this, cultural and socio-spatial diversity are seen as obstacles by both the economic elite and government managers, inasmuch as "diversity hampers the division of standardized tastes, the preservation of scenic beauty, nature and historical architectural patrimony" (Souza 2013). In rare circumstances, established social groups are considered within the framework of urban planning strategies as inductive elements of the processes of rehabilitation or revitalization of the central areas of cities.

#### 2. HOUSING POLICIES IN BRAZIL

Faced with capitalist societies of underdeveloped countries, the wealth generated is selectively appropriated, without much environmental awareness, generating a need for consumption that results in an inevitable increase of production. Cultural and socio-spatial diversity are seen as obstacles by both the economic elite and government managers, inasmuch as "diversity hampers the division of standardized tastes, the preservation of scenic beauty, nature and historical architectural patrimony" (Souza 2013, p. 94). In rare circumstances, established social groups are considered, within the framework of urban planning strategies, as inductive elements of the processes of rehabilitation or revitalization of the central areas of cities. The debate is old, but an analysis of how housing policy and housing law in Brazil have developed since the beginning of the 21st century (Bonduki & Koury 2014a,b,c) shows that the emergence of housing policies really concerned with solving the problem of housing deficit is recent, having been implemented by the Federal Constitution of 1988 (Brasil 1988) and regulated by the 2001 Statute of the City (Brasil 2008). This statute disciplines the use of urban property in favor of collective interest and environmental balance, being an innovative instrument in housing policy and an important land regularization tool.

#### 3. CONCLUSIONS

For almost four decades, criticisms have been made about the need to insert housing in Brazilian historical centers. The current housing program has a negative impact on cities due to the inadequate location of large social housing complexes and the increase in the value of land and real estate, generating urban injustice, territorial segregation, informal housing, urban horizontal expansion, environmental unsustainability and speculation, all of which derives from the patrimonialist characteristics of Brazilian society. Allied to this, the obsolescence of historical centers makes it clear that the choice of the new locations of Brazilian state-subsidized housing is defined by agents of the real estate market, without obeying public orientation. Thus, these poorly located enterprises generate a waste of financial resources with the high cost of urbanization for the society that finances those investments. However, considering that most Brazilian cities are looking for ways to revert the population emptying of the central area to avoid deterioration of its historical building heritage, I consider it important to discuss the opportunity to make better strategic choices of

urban management, without the transposition of models outside their contexts. The reuse of preexisting structures should be considered in the process of revitalizing historical nuclei. For this, we need sustainable, flexible projects that meet the great diversity of users and their different ways of living. Unfortunately, in Brazil we live a dystopia that compromises historical patrimony and accentuates social barriers. However, I consider it possible to re-use preexisting structures for housing in urban centers in Brazil, although it is not feasible at this time.

It was based on a more flexible view of the protection of the historical patrimony that Rio de Janeiro took the first steps towards the Cultural Corridor law in Rio de Janeiro, approved on January 17, 1984. In the area destined for the project, the law privileged mainly the facades and the roofs of the constructions, which were supposed to maintain all their original constructive elements. However, the interiors were left more flexible in order to be adapted to more contemporary needs, as long as the reforms respected the internal illumination and maintained an organic relationship with the facades, avoiding the de-characterization of buildings and streets. There was fixing of standards for the height of new buildings in vacant lots or the replacement of de-characterized buildings of no historical or architectural interest. Therefore, the parameters for building in the renewable lots always obeyed the criteria of valorization of existing historical sets, harmonizing them to the new buildings. With the relaxation of the laws concerning the Cultural Corridor Project, the reformed properties were beginning to become part of the city center landscape, but due to the few fiscal incentives, the public-private partnership did not develop. Thus, besides the flexibility of the rules and laws, as could be seen in the case of the Cultural Corridor, I consider it imperative to reflect on the relationships between the inhabitants, the real estate market and the public authorities in the process of re-evaluation of housing projects within existing architectural contexts.

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