RESEARCH REPORT

External Research Program

"PLEX" Housing: A Renewed Tradition

Canada

CMHC SCHL

HOME TO CANADIANS

CMHC—HOME TO CANADIANS

Canada Mortgage and Housing Corporation (CMHC) has been Canada's national housing agency for more than 60 years.

Together with other housing stakeholders, we help ensure that Canada maintains one of the best housing systems in the world. We are committed to helping Canadians access a wide choice of quality, affordable homes, while making vibrant, healthy communities and cities a reality across the country.

For more information, visit our website at **www.cmhc.ca**

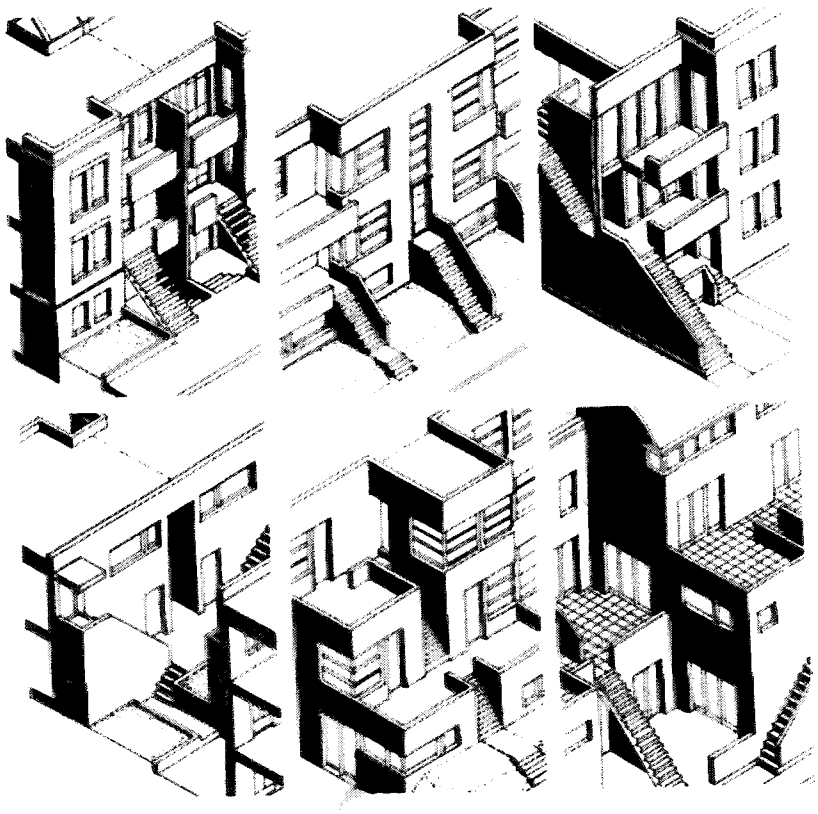
You can also reach us by phone at 1-800-668-2642 or by fax at 1-800-245-9274.

Outside Canada call 613-748-2003 or fax to 613-748-2016.

Canada Mortgage and Housing Corporation supports the Government of Canada policy on access to information for people with disabilities. If you wish to obtain this publication in alternative formats, call 1-800-668-2642.

"PLEX" Housing
A Renewed Tradition

Richard de la Riva
Suzanne Gagnon
Gavin Affleck



Original version by the authors in French. Translation by the CMHC.

This project was made possible through financial contribution from the Canada Mortgage and Housing Corporation through its External Research Program. The ideas expressed in this document are those of the authors and do not represent the official views of CMHC.

Shared B. F. no 6585-D9 *June 1997 / English edn 2000*

Project Officer: Fanis Grammenos

Plex Housing: A Renewed Tradition
MAISONNETTE – DUPLEX – TRIPLEX

Acknowledgements

This research project was made possible through the financial contribution made by the Canada Mortgage and Housing Corporation. We owe them our gratitude for their support and documentation, would like to highlight the contribution by Mr. Fanis Grammenos to the debate our study raised.

It is also important to acknowledge the significant influence the Montréal university community has had on us, since it has played a major role in shaping the public's current sensitivity to their city. For more than 20 years, the School of Architecture of the Université de Montréal has been teaching architecture by placing particular emphasis on readings concerning and the analysis of the various forms of urban housing. Tribute must therefore be paid to the persons who initiated that movement to promote awareness and recognition of the architectural heritage, including professors Melvin Charney and Jean-Claude Marsan. The latter, who authored *Montréal en évolution,* was able to spark in many readers a key interest in the diversity and specificity of our city.

We must also thank Jules Auger for his teaching, his contribution to the conservation of old buildings and his publications on the renovation of homes in Montréal. We would also like to mention the study by Réjean Legault to which we make reference – an excellent work explaining the urbanization phenomenon, which occurred at the turn of the century in the Saint-Jean-Baptiste area. The book presents the organization of the built environment and the traditional urban space are presented with much discernment. In the same research vein, the writings of David Hanna, Pierre Teasdale and Martin Wexler are also replete with observations which have largely contributed to our understanding of the residential development of different neighbourhoods on the island.

Abstract

This research project deals with the analysis and development of the basic components or structuring elements of attached housing. To do so, we have used as a frame of reference the typical Montréal *plex*, a model of great interest in the history of our city's development, as well as any new housing sector under development, wherever it may be.

Our analysis focuses on the various social and economic factors which have created and contributed to the popularity of this form of housing. The first part of our study places Montréal attached housing in context. It discusses subdivisions, the history, characteristics of *plex* housing and pertinent regulations. A selection of typical housing is presented in three categories or *archetypes,* namely the *maisonnette,* the *duplex* and the *triplex.* The last part of the study deals more specifically with the renewal of the *plex* housing model. In response to the observed development of social needs and changing lifestyles, we have reformulated the specific qualities of all three archetypes.

Summary

Why should we consider renewing a type of housing which, at least in Montréal, seems to have stood the test of time with a certain measure of success? Indeed, the overall interest people are taking in returning to the city justifies this reflection and allows the assimilation of new data which have had an impact on the form, plan and lifestyle that stem from it. If the *plex* model demonstrates values which we still hold dear to us, its blueprint deserves the reevaluation of its components and their construction.

In practical terms, the various types of attached housing must be understood as the expression of an urban lifestyle that is supported by the numerous services offered in the city. In that way, the critical role played by "soft" computer technologies in modifying work habits must be highlighted due to the independence which people have regarding the extent to which they can move around. It is ironic to note that, contrary to the social boom of the industrial revolution which gave rise to *plexes*, today they represent the urban and environmental concerns of a society that is no longer undergoing full development, and which is trying to curb urban sprawl. The fundamental qualities of attached housing are the source of the following observations:

- *Plexes* allow us to attain a sufficient level of housing density in order to make property financially accessible, particularly in the city;

- Construction density, however, is not excessive and emphasizes community living through the layout of the buildings;

- Its compact bi-directional volume has proven to be versatile by adapting quite well to the extreme weather conditions of Quebec. As it is closed on the sides due to a real concern for using less material and saving energy, the lighting and natural ventilation provided by its back and front facades create pleasant living conditions inside which do not excessively depend on electromechanical assistance;

- Its layout permits various uses, and it has adapted quite well to the various changes which occur in the life of a family.

Thus, people are sensitive to the quality of life the *plex* provides them, but the model can be perfected and certain general directions it has taken in its evolution must be highlighted. The new interest shown in gardening and terraces demonstrates that fact very well, and changes made to existing housing units confirm this liking. Thus certain trends can be observed and are indicative of new concerns: the relationship between the interior and the exterior, the possibility of working at home and of modifying living spaces to match one's lifestyle, an increased sensitivity toward environmental and historical issues—all of which are influenced by economic concerns.

Following a contextualization, our study will isolate three generic forms, or archetypes, of attached housing. The presentation of traditional *maisonnettes*, *duplexes* and *triplexes* will support that idea, while serving as a reference point in the discussion of the evolution of their components. The renewal of those building elements lead to the development of *renewed plexes*. As we have put forward in our discussions, the three models and their respective lots feature a variety of technical and functional solutions. We hope that these proposals will refresh our ideas concerning this form of housing by allowing us to examine its capacity for renewal.

INTRODUCTION

Early this century, Montréal *maisonnettes*, *duplexes* and *triplexes* [1] experienced much success, and even to this day, they have much to do with defining the character and quality of life of the older areas of the city. This type of housing, found in several North American cities between the First and Second World Wars, is still being built in Montréal and currently accounts for one half of all available units in Montréal.[2] But what qualities have allowed *plex* housing to stand the test of time and remain in favour with numerous city dwellers at a time when most of our values are being questioned?

First of all, in addition to taking advantage of nearby municipal services, the construction density of *plex* housing is such that considerable space and energy savings are achieved in comparison to single suburban homes. In that respect, they are a very interesting example of sustainable development at the neighbourhood level. Moreover, it is important to point out that, in spite of economic concerns which created this model, the urban scale resulting from this type of development is in no way intimidating. While occupation density is high (up to 350 persons per hectare), the lifestyle generated by *plex* housing centres on a dynamic neighbourhood lifestyle. Not only can this form of housing accommodate various functions (residences, offices, businesses), but it also adapts to various forms of ownership and emphasizes an intermingling of social groups by bringing together landlords and tenants, often under the same roof. Furthermore, by virtue of its design and some of its structural components (porches, balconies and stairs), *plex* housing fosters a sense of belonging and social interaction. At a time when rampant individualism and new technologies are driving people away from one another, these considerations show that sensitive city and architectural planning contribute to the social integration of its inhabitants.

According to another line of thinking, plex housing-because of the crossflow and openings front and back-provides effective ventilation and abundant natural light. In addition, plans for this type of housing are flexible from a development viewpoint, making it easier to adapt to the changing needs of a given family or various dwellers over time. The latter characteristic has likely contributed the most to the longevity of the plex as a housing model.

However, despite its obvious qualities, plex housing is not an ideal model in itself. The various innovations made in new construction do underscore some of the drawbacks of plex housing. For example, rooms in plex housing are sometimes too small, kitchens are rather dysfunctional, storage space is often non-existent, openings are tiny, basements are never used or seldom used and outside spaces are too narrow and lack intimacy. And what about automobiles which must necessarily be considered in the city? These factors explain at least in part the numerous transformations of plex housing in recent decades. One question we must ask ourselves, however, is whether new requirements can be combined with the qualities inherent in plex housing, rather than our having to completely abandon this model which has contributed so much to the originality of cities such as Montréal.

---

[1] The terms duplex and triplex, which are of English origin, are used almost exclusively in Montreal in speaking about this type of housing.
[2] Pierre Teasdale, "The Montreal Plex - A One-Century Housing Form That continues to serve Montrealers well, p42."

In addition, although this study deals with a specific context, the scope of this study is much more broad. The city organization principles found in Montréal do cause one to reflect on the renewal of attached housing in an urban setting, in North American municipalities which have few residents in their downtown cores and in countries experiencing very rapid development.

Though the architectural and urban forms are attributable to functional constraints, they cannot be disassociated from the values of their time, be they building, regulatory, economic or social in nature. Thus to begin, we will deal with the specific context which prompted the development of this type of housing. In that regard, we felt that a more in-depth discussion regarding the subdivision appeared essential. The presentation of artifacts, traditional models of *maisonnettes*, *duplexes* and *triplexes*, completes the picture of a neighbourhood where most of the units built are of this type, and, at the same time, it gives us the opportunity to discuss the main characteristics of these units.

In the second part of the study, each of the components of *plex* housing is discussed in detail following a brief background of its evolution and its potential to be adapted to meet more contemporary requirements. This analysis aims to establish the principles which allow us to consider the renewal of *attached* housing. Lastly, like the archetypes presented at the beginning, three models of renewed plex housing and three typical subdivisions, which can accommodate the construction of three levels of housing on lots of varying sizes, have been developed and are presented graphically.

Through this analysis, we hope to demonstrate that the renewal of *plex* housing is crucial. By adapting to current needs and respecting the spirit of this type of housing, it will be able to continue housing new city dwellers. Beyond the various forms it takes, the importance of *plex* housing is rooted in its social value and the profoundly urban lifestyle it offers.

Learning more about *plex* housing will benefit everyone concemed.

Montréal, A Model of Urban Architecture

Map of Montréal and its suburbs, 1876.[3]

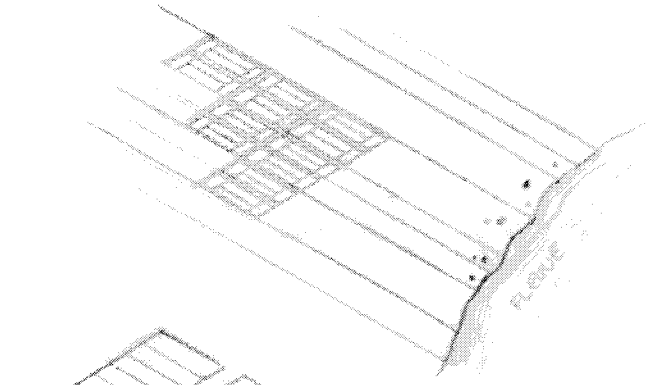
The rapid growth of the second half of the 19th century was the first large-scale expansion in Montréal. Urbanization tended to follow a orthogonal street grid based on deep and narrow lots, with some of the roads or concession roads becoming main arteries. Houses lined the streets with brick facades two or three storeys high. A relatively high density—200 people per acre—was established. The street was extended to the back of the lot through an initial row of housing which had carriage entrances allowing access to a second row of housing. Density was lessened by a network of back yards and common areas. The wall finish of brick surfaces, wooden construction, the shape of the "Montréal roof" which was well suited to drainage, small interiors, all formed a functional, utilitarian and human expression directly related to Quebec tradition.[4]

In this text, Melvin Charney describes how the rapid urbanization that Montréal experienced in the second half of the 19th century revamped city planning and housing construction. One of the initial changes, attributable to the increasing industrialization of the city, was a result of the development of a rigorous organizational model of new harbourfront, working-class or middle-class residential sectors.

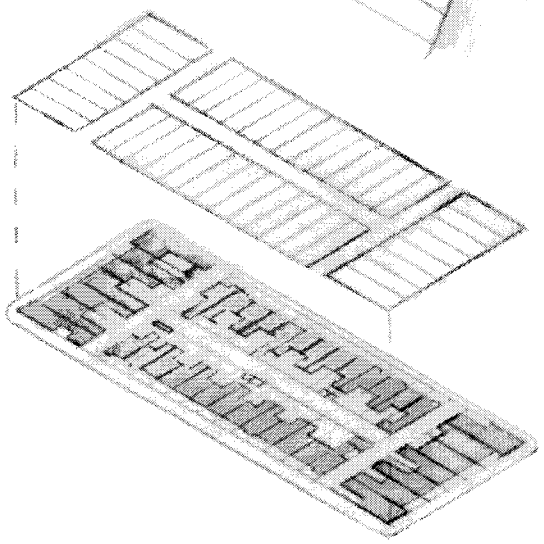
---

[3] Source: Bibliothèque nationale du Québec.

[4] Melvin Charney, *Pour une définition de l'architecture*, p.13-14.

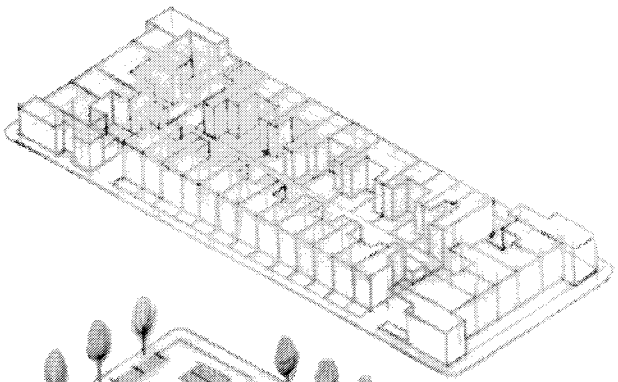


The ***subdivision*** of the lot is structured into the extension of agricultural rows.

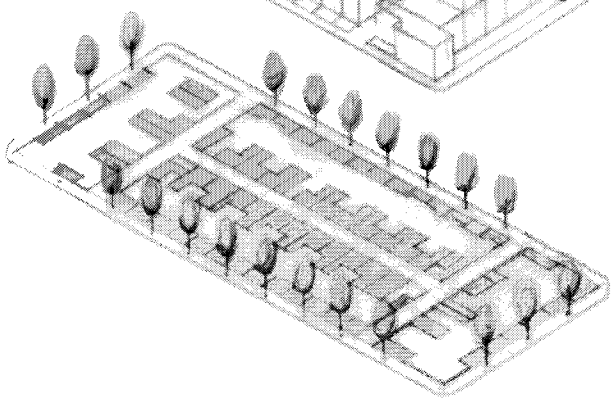


The ***typical block*** consists of one longitudinal lane and two crossing lanes, serving the rear of the buildings.

The building ***coverage*** averages out to 60% of the available land. The buildings are set back from the public thoroughfare, except *at street corners*.



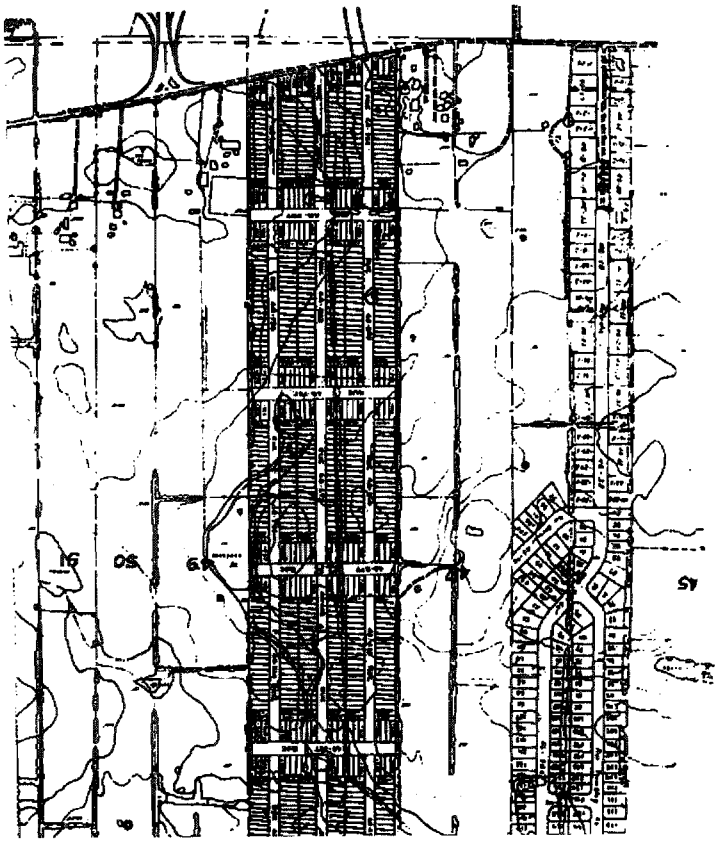
The ***massing*** of the "îlot" (or housing) consists of buildings two or three stories high.



Yards at the front and back of the buildings create ***transition spaces*** between the housing and the city.

With the invention of the automobile and the development of telecommunications, a new organizational matrix came into being, which was flexible enough "to mitigate the occupational segregations characteristic of an industrialized city." [5] In spite of a series of adjustments to the various technological changes, most neighbourhoods have retained their original qualities while at the same time remaining very lively areas in tune with current lifestyles.

Given the extent, the homogeneity and the systematic nature of its urban structure, Montréal's architectural heritage is particularly remarkable. In fact, it is an artifact of considerable historical value in North America. Although one might be tempted to give the city its look of yesteryear, it may be more important to understand the characteristics of its evolution and focus on the particularities - with full knowledge of the facts - in order to be able to proceed to their modernization. By delving into the principles which resulted in an original evolution of various types of housing, one can examine the social renewal of the traditional city from a less nostalgic perspective and make it a viable undertaking.



Cadastral map of Sainte-Anne-de-Bellevue. The three subdivision systems are juxtaposed - the agricultural row, its traditional subdivision in blocks which today characterize Montréal, and the preferred subdivision used to develop suburban areas over the past three decades.

[5] J. C. Marsan, *Modes de vie et occupation des lieux*, Le Devoir, 28 oct. 1996, p. E12.

The Traditional Subdivision

> *"This mode of subdivision is particular in that it creates a continuous orthogonal framework and establishes a hierarchy of access roads and thoroughfares. Moreover, it allows for a block system structured in such a way that the public space (in the front) and the private space (in the back) is clearly defined, and where the approach noses are in line with the crossroads."*
>
> *David Hanna*

Under the French regime, land is oriented and divided up in order to maximize the number of properties with access to the water. When Montréal was developed, the street pattern and the shape of the blocks were such that they could naturally fit into the existing subdivision of the land. Thus, most streets follow the direction of former property lines and, in order to ensure that a maximum number of properties overlook the street and have access to a lane, the lot lines are designed perpendicular to them. Though very effective, the orientation of the lots does not make optimal use of sunshine.

City blocks, which are rectangular, generally consist of two approach noses on an east-west axis with two bodies (or flanks) overlooking the north-south streets. In many cases, approach noses are occupied by businesses and, at least at intersections, are built flush with the sidewalk. The flanks are generally built with a setback to accommodate exterior staircases and the planting of trees.

The widest streets are between 50 and 65 feet (15 to 20 m) wide and are bordered by three-storey buildings set in from the property lines. The lots on either side of these streets are 7,6 to 9 m wide (25 to 30 feet). The narrowest streets are between 12 and 15 m (40 to 50 feet) wide and are bordered by two-storey buildings. Lot widths vary between 6 and 7 m (20 to 23 feet).

Lanes, which were located in the middle of the block, were right at the heart of domestic activities. The piercing of buildings with carriage entrances was no longer needed, as was the case in older neighbourhoods. Peddlers would come to the houses, coal would be delivered, and horses would be tied up in the lanes. The width of a lane varied depending on the size of the lots and the structure of the buildings to be built there. Lanes were approximately 6 m wide (20 feet) for a block of triplexes, 5m (16 feet) for duplexes and 4m (12 feet) for maisonnettes

The traditional subdivision

---

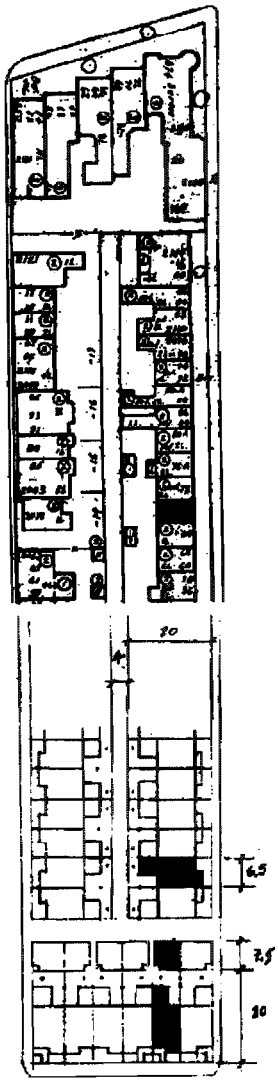
[6] Hanna, David *New neigbourhoods in nineteenth century Montreal.*

The traditional subdivision

As illustrated in the cadastral maps, the following three blocks were used as models to establish the typical dimensions of the various components of the subdivision. In addition to combining the conventional configuration of the blocks (top) with the configuration proposed for their renewal (bottom), they each illustrate a specific type of building to be constructed on them (*maisonnette*, *duplex* or *triplex*).

Maisonnette

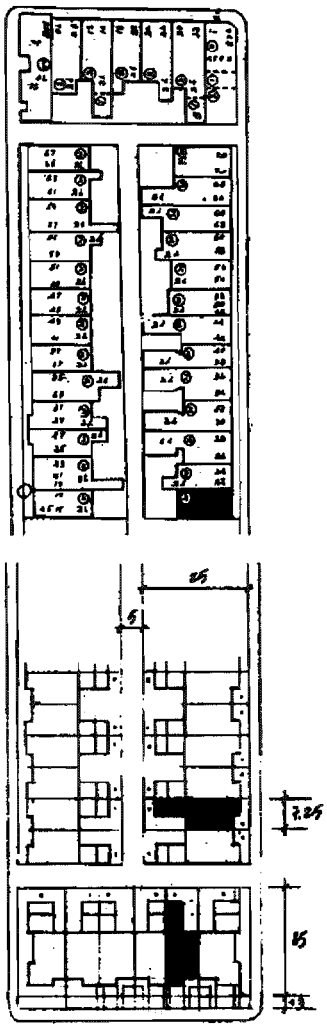
STREET 8 à 10 m
LANE 4 m
LOT
Width : 5.5 à 6.5 m
Depth : 20 à 25 m
DENSITY 82 units / hectare



TYPICAL LOT
Width : 6,5 m
Depth : 20 m, 27,5 m
DENSITY ACHIEVED
76 à 78,5 units / hectare

Duplex

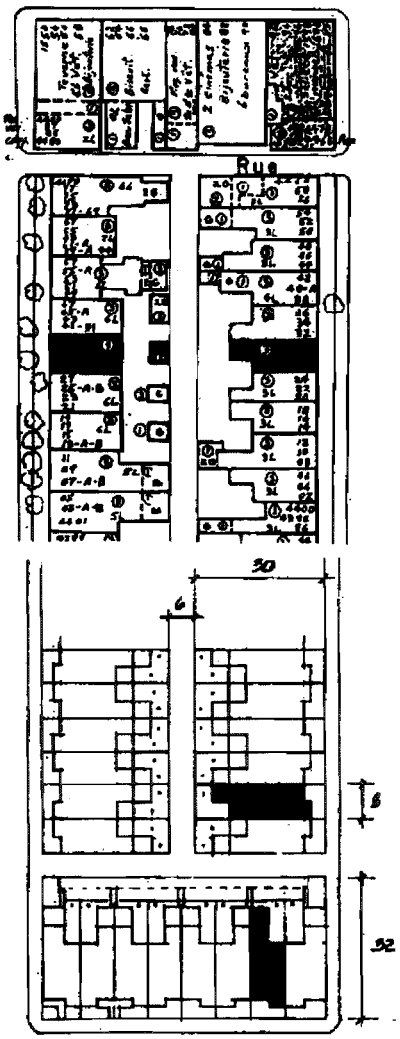
STREET 12 à 15 m
LANE 5 m
LOT
Width : 6.5 à 7.5 m
Depth : 25 à 30 m
DENSITY 69 units / hectare



TYPICAL LOT
Width : 7,25 m
Depth: 25 m
DENSITY ACHIEVED
61 à 62 units / hectare

Triplex

STREET 5 à 20 m
LANE 6 m
LOT
Width: 7.5 à 9 m
Depth : 30 à 35 m
DENSITY 72,5 units d'habitation et 13 commerces / hectare



TYPICAL LOT
Width : 8 m
Depth : 32 m
DENSITY ACHIEVED
73 units / hectare

TRADITIONAL PLEX HOUSING

Photo by Notman [7]

History

Between 1871 and 1921, Montréal underwent such a development of new population clusters in its outlying areas that it was described, at the time, as the equivalent to building *a new city*. At the same time, namely between 1895 and 1914, the Plateau Mont-Royal also boomed with the mass construction of thousands of *triplexes* and *duplexes*. "As far as the eye could see, rows of working-class housing, livened up with staircases and balconies of all kinds, covered the territory."[8] [tr] As the quote indicates, this new housing was initially intended for the numerous families leaving the country for the city, in search of jobs and better living conditions. Beginning in 1900, however, the arrival of an increasing number of immigrants was felt through the appearance of new businesses along the main streets of the neighbourhood.

As for the various types of properties available, the market offered newcomers small houses for both the working class and middle class. The most common, however, was the type in which the landlord of the building lived downstairs with tenants occupying the upper floors. Combined with the surprising diversity of housing models based on the width and depth of the lots, this characteristic quickly became one of the main structural elements of the built-up environment production and contributed to the creation of a highly coherent urban setting.

According to Réjean Legault, while too much emphasis was sometimes placed on the "working-class" nature of this form of urban housing, this issue needs to be considered from a broader perspective:

> *This hypothesis is contradicted by the social mix phenomenon noted in Francophone neighbourhoods and which seems to be characteristic of that time period (...) This type of housing seems to derive much from its roots found in the middle-class housing model in vogue at that time.*[9]

---

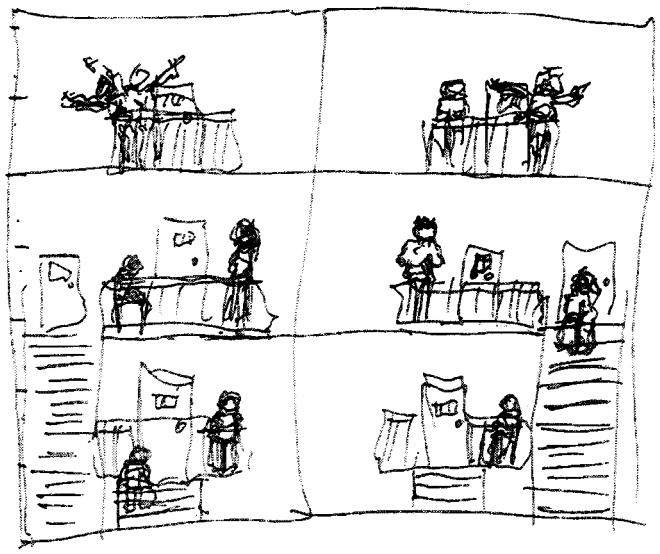
[7] Source: Archives of the Musée McCord, Montreal.
[8] Benoît and Gratton, *Pignon sur rue*, p. 6.10.
[9] Legault, Réjean *Architecture et forme urbaine à Montréal...* A thesis presented at the Université de Montréal, 1986.

Architectural Characteristics

> *The architectural characteristics and the social destination of the first triplexes illustrate the birth of a type of housing which seems to derive much from its roots found in the middle-class housing models in vogue at that time.*
>
> *Réjean Legault*[10]

The presence of porches, balconies and wrought-iron staircases — all in all a taste for an articulated and decorated facade — misrepresents the influence of the Victorian style in vogue at the time they were built. Moreover, these "natural extensions" to the public facade of the housing units create a favoured place for exchanges, and at the same time they reflect the traditional sociability of the French-Canadian people. Thus derived from both French and English styles, these architectural elements were initially built according to the craftsmanship of the time and were then adapted to suit the needs of the newcomers. Subsequently, catalogue purchases of prefabricated materials from the United States made for more elaborate decors in which doors, windows, cornices, dormers and decorative turrets hold their own against fantasy.

Although those aesthetic or social considerations seem to be a determining factor, it appears that the presence of porches, balconies and staircases resulted from an adaptation to the regulatory system of the time. In effect around 1890, the municipality imposed a 3 m (10 feet) set back from the facade line to the street. Anxious to take advantage of this new constraint and to save space inside the units, contractors then decided to move the staircases outside and install them precisely into this setback. In addition to more functional considerations, the front yard constituted one of the composition elements characteristic of the middle-class home. It made it possible to set the facade on a base and free up the space required for the construction of an elegant staircase leading up to the raised first floor. (see the example on Cherrier Street).



The triplex is a veritable stage in Michel Tremblay's plays.[11]

---

[10] Legault, *Ibid 8.*

[11] Sketch by Tremblay; handwritten from *Messe solonnelle pour une pleine lune d'été.*

Regulations

Back in the 19th century, urban regulations were not too restrictive at the time due to conventional building procedures and the know-how of craftsmen. However, in the wake of several devastating fires and the rapid increase in the number of buildings in the city, the *Code of 1900* was implemented to regulate and monitor the technical quality of buildings based on their use, a function carried out by the *National Building Code of Canada* today.

Recently, in response to several renovations which endangered the residential heritage, it became a matter of urgency to recognize and protect the special nature of the structures by establishing regulations based on the tradition and the present condition of the buildings. As a result, since 1995, the City of Montréal has been regularly updating its urban planning by-law to preserve and promote the architectural character of the older neighbourhoods. In these areas, renovations and new construction must meet several requirements, including the following:

The site must allow for the following elements:

- minimum lot width of 5.5 m (18 feet);
- row housing design;
- building/site ratio from 60% to 70%;
- construction lines similar to neighbouring plots;
- minimum and maximum numbers of floors (2 to 3);
- maximum height in metres (approximately 11 m (36 feet);
- a rear setback of 3 metres (10 feet) and a lateral setback of 1.5 to 1.8 metres (5 to 6 feet), as the case may be;
- the parking spaces required are calculated based on the number of units and their cadastral subdivision method.

Similarly, the frontage must meet the following conditions:

- a minimum principal layout of 60% on lineage;
- projections or avant-corps measuring 1.5 m (5 feet) maximum;
- minimum and maximum size openings;
- a percentage of masonry on the facade (60%);
- crowns on the roof, depending on the area.

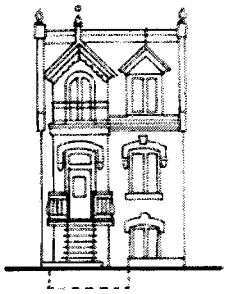
These regulations will be studied in more detail in the chapter on renewed *plex* housing, dealing with the development of new residential models inspired by the Montréal tradition.

ARCHETYPES

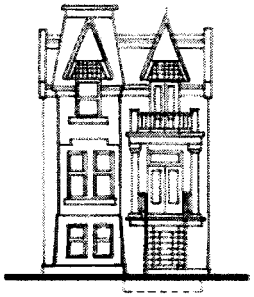
An *archetype* is a type of reference building or an original model of a building that gives rise to several construction variations. Given the diversity of housing models in Montréal, there is obviously more than one archetype and, in order to reflect that reality, we have grouped all of the various possibilities into three categories: the *maisonnette*, the *duplex* and the *triplex*.

In order to identify the characteristics of each of these archetypes, we have selected within a clearly delimited area, namely the Plateau Mont-Royal buildings which, in our view, are particularly representative. For purposes of comparison, we photographed, drew and measured them. The specific qualities of the various residences are described in the following pages, and emphasis is placed on how they have evolved over time.

Maisonnettes

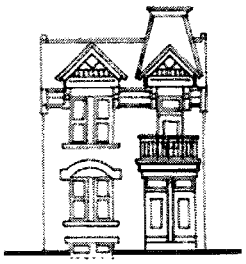


St-André Street

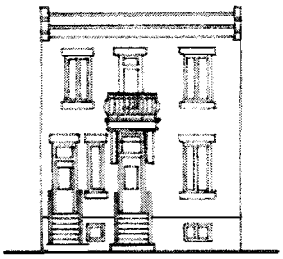


Cherrier street

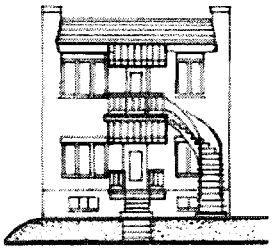
Duplexes



Marie-Anne Street



St-André Street



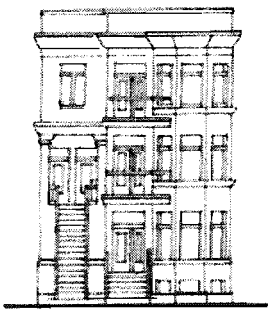
Terrasse Guindon

Triplexes

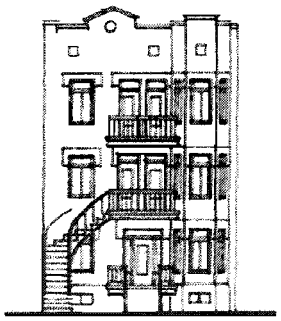
A quadruplex

A quintuplex

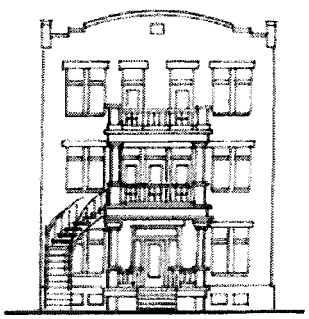
Parc Lafontaine Ave.



St-Hubert Street

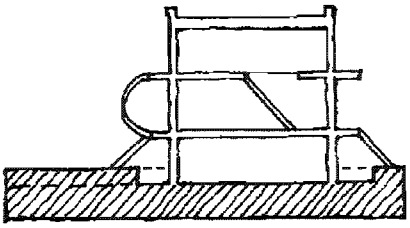


Chapleau Street

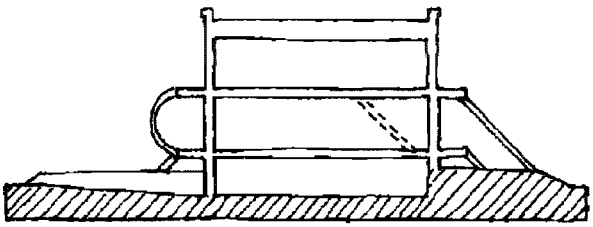


Fabre Street

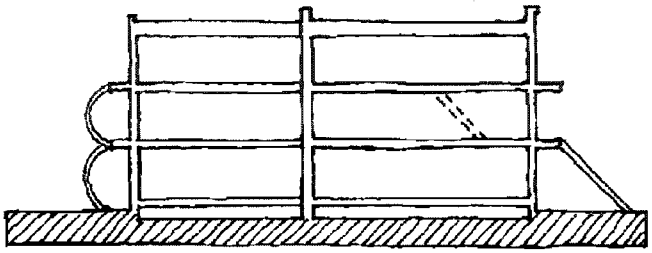
Archetypes



The ***city maisonnette***, or town house is one of the most typical forms of attached housing in Montréal. It can be part of a series of buildings built at the same time and in keeping with the same model or isolated and built unit per unit according to a personalized plan. Traditionally, the city maisonnette consists of one unit which has three levels. As it evolved, a second unit was established in a half-basement, opening onto an areaway and facing the street. The height of the ground floor can vary from 1.5 to 2.5 m (5 to 8 feet) from the sidewalk, as the front setback limits the length of the stairs to some degree. Maisonnettes vary in size depending on the subdivision, but they are usually between 5.5 and 6.7 m (18 and 22 feet) wide.

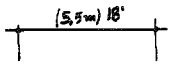


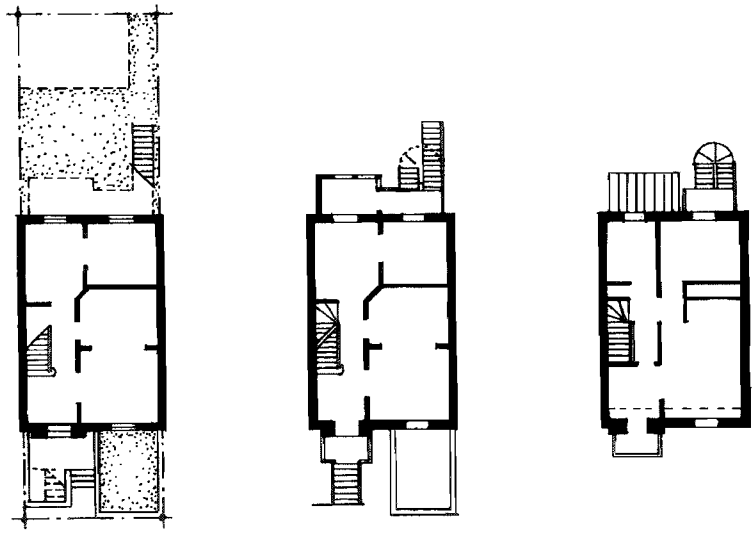
The ***duplex*** is a two-storey townhouse, usually comprising one unit per floor or sometimes two on the upper level. Duplexes have rather small units in a square layout. At the outset, they were owned by landlords with modest incomes who occupied a smaller area on the ground floor and rented out the upper levels. Duplexes vary in width from 6 to 7.6 m (20 to 25 feet) in most cases, depending on the work done to the access routes to the unit. The evolution of the duplex is denoted by the purpose for which the basement was used, whether it was used as a crawl space, a basement used more or less as living space or a garage.



The ***triplex*** is a three-storey townhouse usually comprising one unit per floor commonly called a flat. Triplexes provide large units, since their "L" shape allows for the capitalized use of the entire depth of the block. As in the previous example, the landlord often lives on the wider ground floor. In fact, this is the most popular form of income property, as there can be as many as six units. In cases where there are two units per floor, they are called *quadruplexes*, *quintuplexes* or *sixplexes*. The lots vary in width from 7.6 to 9 metres (25 to 30 feet).

CITY MAISONNETTE
2080-82 St-André Street





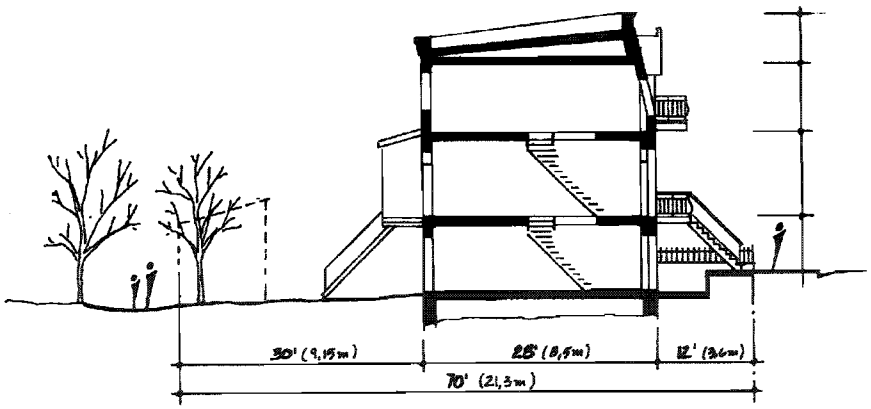
Date of construction ..... circa 1900-1910

Land surface area ..... **112 m²**
Siting surface area
main building ..... 47.6 m²
accessory building (100%).. 12.4 m²
60.0m²

Building/site ratio **53%**

Unit surface area
Half-basement ..... 40 m²
Maisonnette ..... 80 m²
120 m²

Floor Area Ratio FAR (120/112) **1.07**



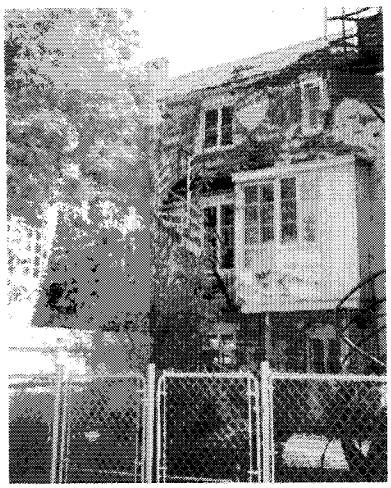
TRADITIONAL MAISONNETTE

2080-82 St-André Street

This maisonnette, built around 1900, is part of a homogenous complex on a sloping street which accentuates the flow of the facades. It has a facade of only 5.5 m (18 feet) in width, which is the minimum dimension allowed by the municipality for the construction of a home. These maisonnettes are always very popular due to their colourful expression, and the design flexibility and autonomy they provide their landlords.

Original layout

Originally, the ground floor housed public living areas and two or three tiny bedrooms on the floor. The basement was reserved for family activities. With a minimum floor area of 40 m² (430 sq. ft.) per floor, all rooms were small and had no storage space. Often, a small veranda and an exit staircase were added when the basement was turned into a separate unit. This unit was therefore accessible from the street by an areaway. The backyard had level access.

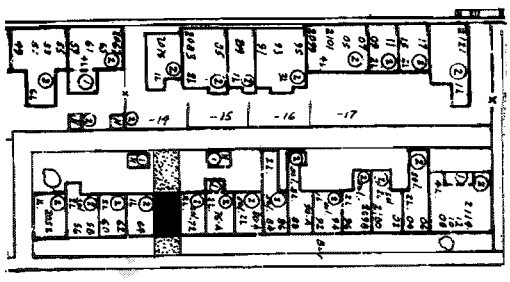


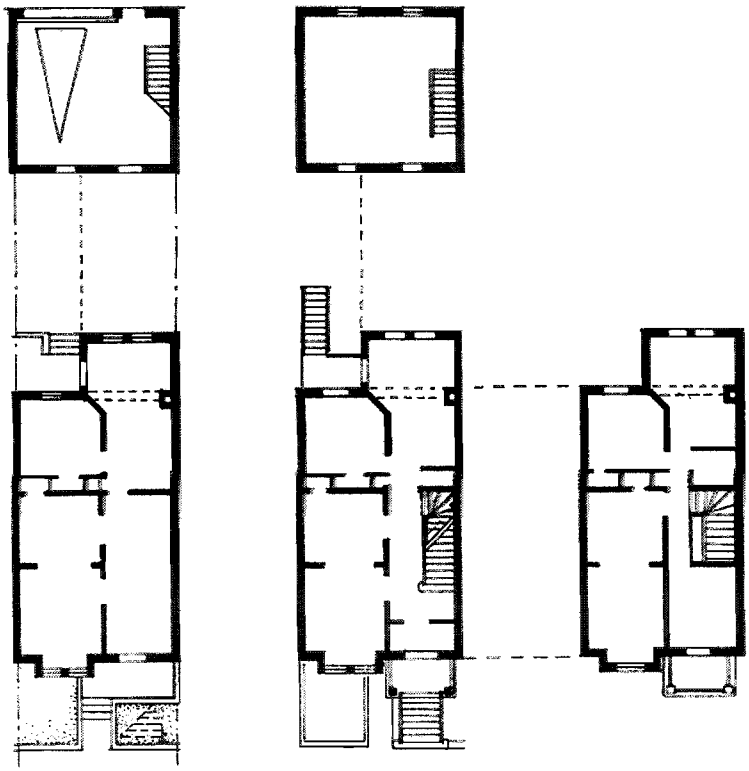
Evolution of tenure

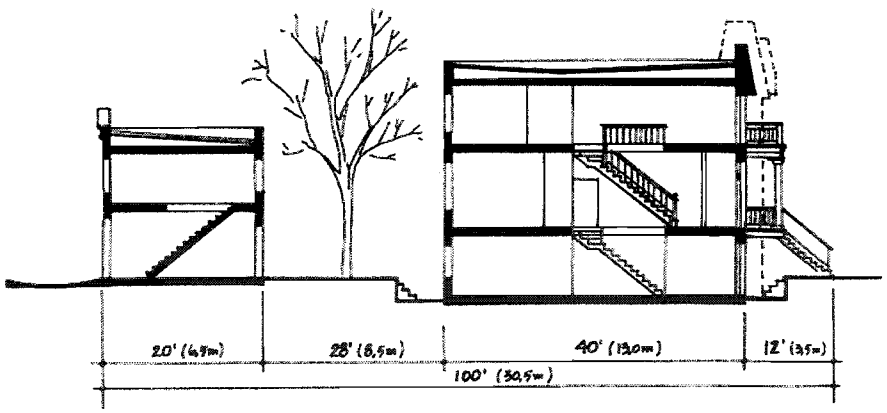
Although several elements of their facade have been reinterpreted through numerous renovations, the exterior of most of these maisonnettes has been well preserved. Most changes were made to the interior. On the ground floor the rooms have been departitioned to create an open-concept area with a small kitchenette, a dining room and a living room. There are two bedrooms and one bathroom on the top floor. The outside spiral staircase was required by the *Code of 1900*, but the passing of the new NBC did away with that requirement, as an additional exit for bedrooms is no longer required.

The half-basement is often rented out as a small one-bedroom unit. The house can be maintained on three levels; however, the half-basement can be converted into a home office, or used for a kitchen, dining room and an additional bedroom. The yard has been turned into a private garden and the lane made into a footpath, given its narrow width.

To make the most of this housing model, some developers have used it as a basis and experimented with the construction of homes narrower than the required minimum. However, that has created a disadvantage by making it very difficult to provide suitable parking spaces in the back yard.







CITY MAISONNETTE
937-39 Cherrier Street

Date of construction..... circa 1890-1900

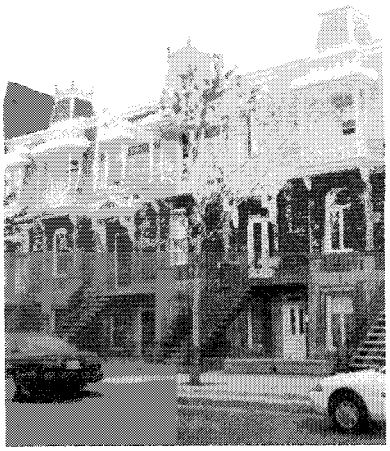
Land surface area (6.6x30.5)..... **200 m²**
Siting surface area
Main building ..... 83 m²
Accessory building (100%.... 44 m²

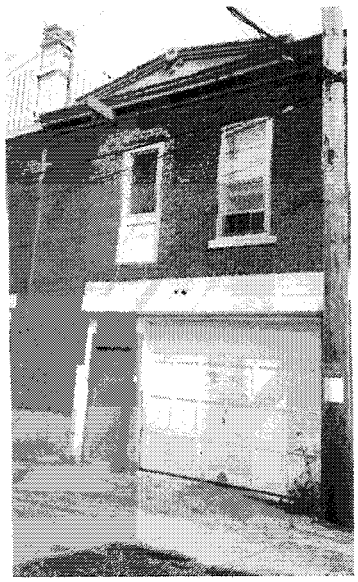
Building/site ratio **63.5%**

Unit surface area
Half-basement ..... 64 m²
Maisonnette ..... 128 m²
Shop inside garage ..... 36 m²
228 m²

Floor Area Ratio FAR (228/200) **1.14**

CITY MAISONNETTE
937-39 Cherrier Street





This type of maisonnette was very important in the development of housing in Montréal and was one of the most highly-regarded Victorian housing models of its era. It is believed that it gave rise to the duplexes and triplexes as we know them today. In effect, the staircase rising from the street to the piano nobile floor and the balcony were said to have inspired the development of the outdoor staircase as an independent access to each unit. The siting of these maisonnettes on a rather deep approach nose (30.5 m or 100 feet) allowed for the construction of a separate garage in the rear, which closed the yard off from the lane.

Original Layout

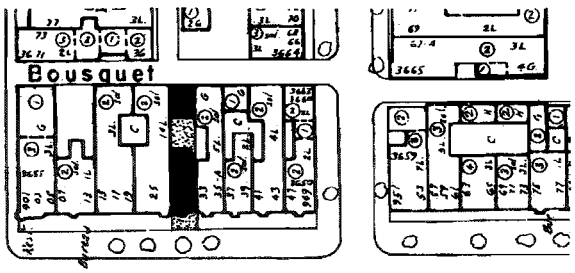
The first floor, which was elevated from street level, consists of a double living room in the front, a dining room in the centre and a kitchen in the rear. All of these rooms have good natural lighting, in accordance with the nature of each of these living spaces. A majestic staircase dominates the space in the entrance hall and provides a trademark worthy of a distinguished house. There are generally two or three rooms on the floor. A toilet and separate bathroom are located in the centre so they can be hooked up to the fall pipe. Originally, the unit in the half-basement was reserved for domestic services and to house staff. The building constructed on the lane was initially a stable and then it was converted into a car garage with a unit on the floor above for the driver.

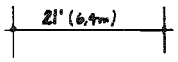
Evolution of Tenure

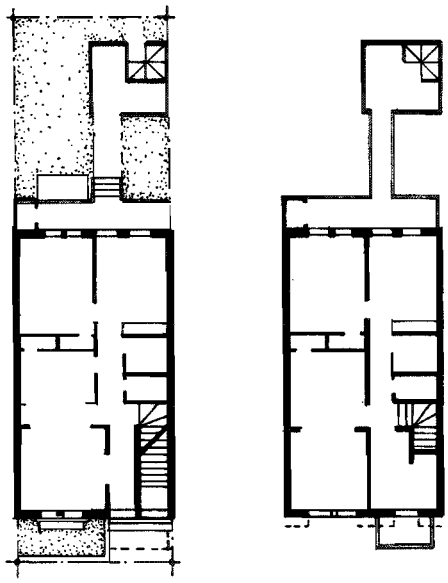
This archetype remained middle class over the years and has adapted to various uses. The half-basement was first converted into a rental unit and then into a professional office. The move toward more light and larger space resulted in a series of extensions in the back, including several greenhouses.

In order to allow commercial use, recent amendments to zoning by-laws resulted in occupation density of more than 85% on the ground floor. Following renovations and expansions, some maisonnettes now have six units. The small yard, which was pleasant and well proportioned in the original plan, is now significantly reduced or scaled down to a mere terrace. Fortunately, residential use has been reestablished since that time.

The creation of an interior yard and the construction of a second residential building on the same property does not conform to regulations in Montréal, but this type of layout could offer new promising solutions if it were carefully developed.







DUPLEX
1024-26 Marie-Anne Street East

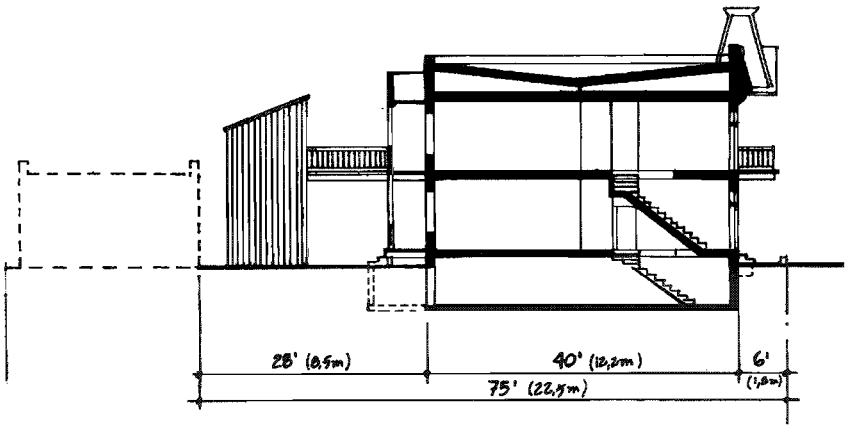
Date of construction..... circa 1910-1920

Land surface area (6.4 x 22.5 m) .....**144 m²**
Siting surface area
Main building ..... 78 m²
Accessory building (100%)... 9 m²
87 m²

Building/site ratio **60%**

Unit surface area
Ground floor ..... 72 m²
Second floor..... 72 m²
144 m²

Floor Area Ratio
FAR (144/144)..... **1.0**



DUPLEX
1024-26 Marie-Anne Street East

Since most of the balconies and mansard roofs have been well maintained, these houses are very good examples of a duplex as it could have appeared at the time.

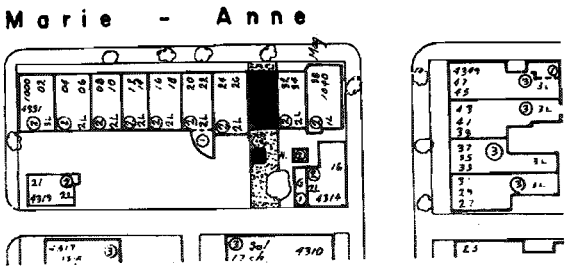
Original Layout

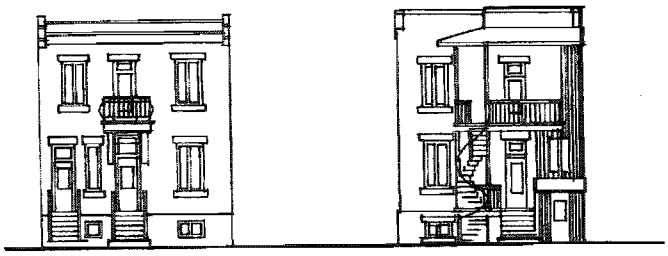
The rectangular design provides a surface area of 70 m^2 per floor. The large double living room can be used as two rooms — the master bedroom and a closed bedroom on the kitchen side. The rear porch stretches over the full width of the building at the back and is linked to a shed which contains the exit staircase.

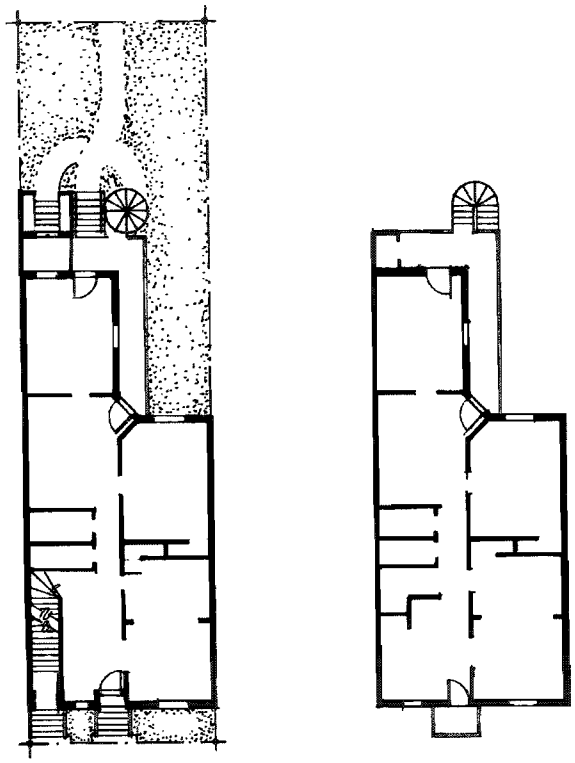
The access doors to the units are side by side and begin directly at the sidewalk. Each of the units has a partitioned vestibule and a staircase, which minimizes heat loss in the winter. Located a few feet above sidewalk level, the ground floor is usually built above a crawl space, but in this example, an access hatch or a small staircase leads down into the unfinished basement.

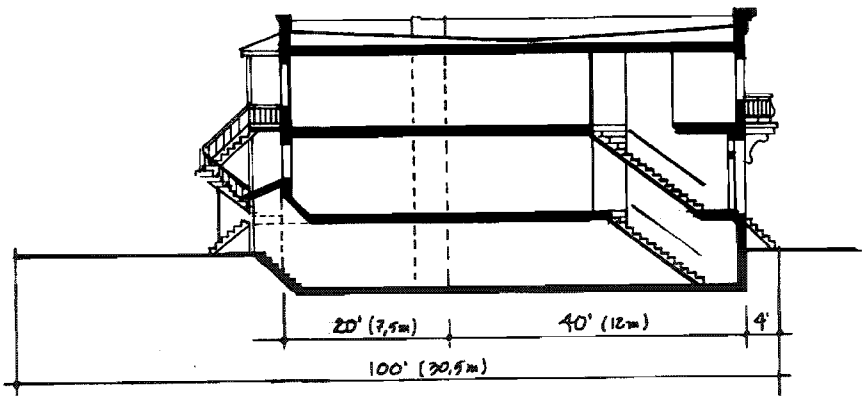
Evolution of Tenure

In most cases, this type of duplex was converted into a cottage to provide a single, more spacious unit.









DUPLEX
4312-14 St-André Street

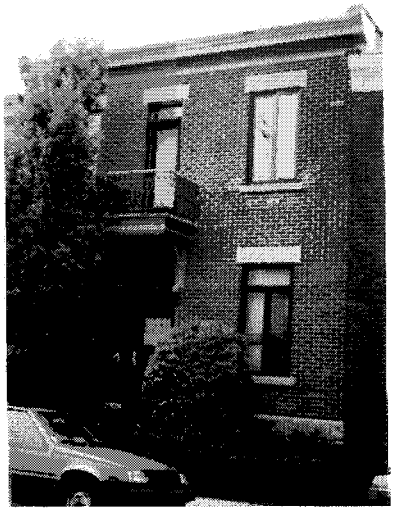
Date of construction..... circa 1920-1930

Land surface area (7.3 x 30.5 m) ... **222 m²**
Siting surface area
Main building ..... 116 m²
Accessory building..... 50 m²
165 m²

Building/site ratio (166/222) **75%**

Unit surface area
Ground floor..... 90 m²
Livable basement..... 98 m²
Second floor..... 98 m²
Housing unit above garage .. 48 m²
334 m²

Livable Floor Area Ratio
FAR (334/222)..... **1.5**

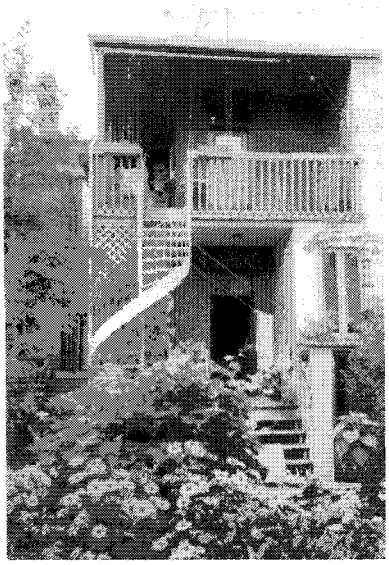


DUPLEX
312-14 St-André Street

This brick building, built in the 1920s, reduces the duplex to its simplest expression with its parapet adorned with a simple metal cornice. Because the front setback is short and the ground floor is elevated with respect to the street level, the staircases had to be set inside the building.

Original Layout

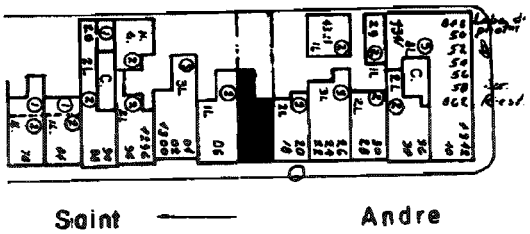
This building is characterized by a rectangular layout with an additional room in the rear, which is itself bordered by a porch. This archetype can therefore be considered a hybrid, as even though it does not possess all of the characteristics, it is very close to the "L" shape used in triplexes. Separate access doors provide a better layout and make it possible to add an additional room in the front. A significant innovation in this unit is the addition of a window in the angled wall where the two volumes meet in order to provide better lighting in the middle room.

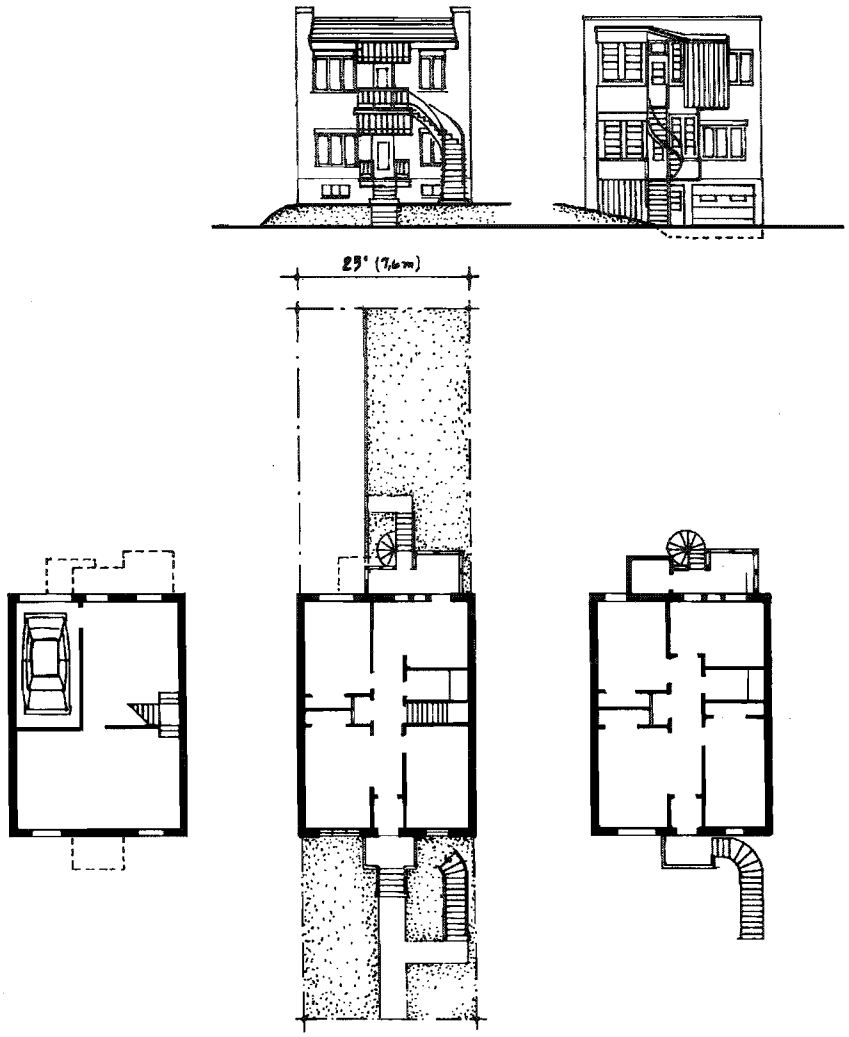


Evolution of Tenure

Except for the renovations in the bathroom, the interior divisions have not been transformed significantly. Moreover, as the basement has a good number of windows, it was easy to turn it into a laundry room and an additional room for teenagers with an exit on the side of the garden.

Over the years, many sheds and garages in the back have been demolished so that the yard could be landscaped. In some cases, however, these volumes have been annexed to the interior and converted into an additional room, as in this example.





DUPLEX
2419-21 Terrasse Guindon

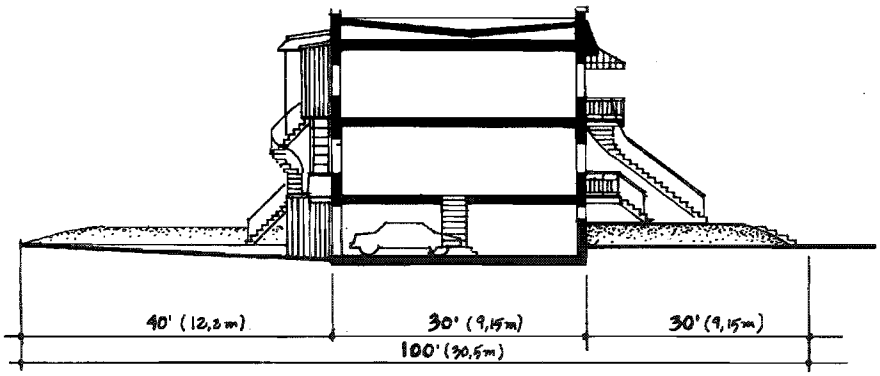
Date of construction..... circa 1940-1950

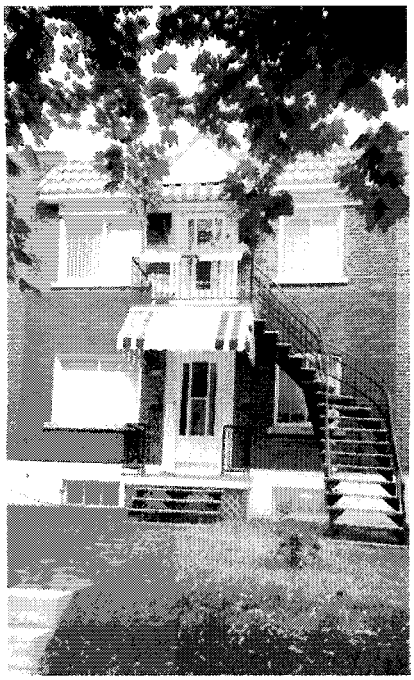
Land and surface area (7.6 x 30.5 m) **232 m²**
Siting surface area
Main building..... 70 m²

Building/site ratio (70/232) **30%**

Unit surface area
Ground floor ..... 60 m²
Livable basement ..... 40 m²
Second floor..... 63 m²
163 m²

Livable Floor Area Ratio
FAR (163/232)..... **0.7**





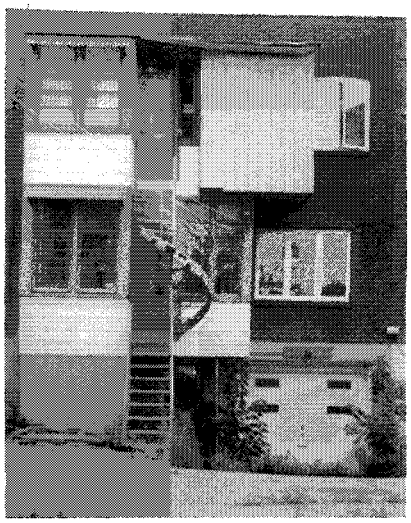
DUPLEX
2419-21 Terrasse Guindon

This duplex model appeared during the 1940s and 1950s. Its small roof consisting of orange clay tiles and wrought iron components on the balconies reflect the influence of Italian contractors who had recently immigrated to the country. The aluminum and fiberglass canopies were but some of the new materials which were developed and became more widespread during the 1950s.

This model has a very deep lot (30.5 m or 100 feet) in comparison to the dimensions of the house (7.6 m x 10 m or 25 x 30 feet). The ample front setback accommodates a terrace lawn and a basement garage, which can be accessed from the back yard. As the car had become a common consumer item for the working class, integrating a garage into the dwelling became a major concern at that time.

Original Layout

Because of its compact and effective square layout, this duplex has four small rooms which are well lit and well ventilated. In addition to the indoor access, the basement contains one parking place, a laundry room, a work space and space for storage. On the upper floors, the kitchen opens onto a veranda which serves as a summer kitchen and as a pantry. Since it is situated under the extension of the rear facade, this temperate wooden structure not only allows access to an exit staircase but also offers livable transition space.

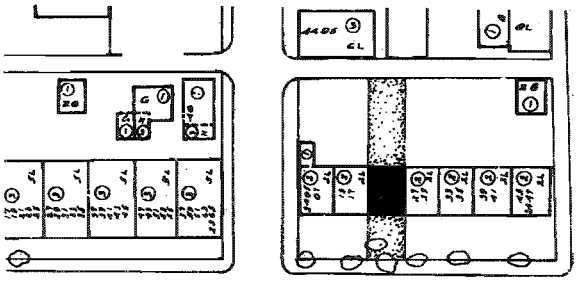


The only drawback is that the two entrance doors, which are situated one immediately above the other on the facade, mean that the main outdoor staircase has to be run in front of one of the ground floor windows. The traffic areas (vestibules, front and rear stairs) are reduced to a strict minimum.

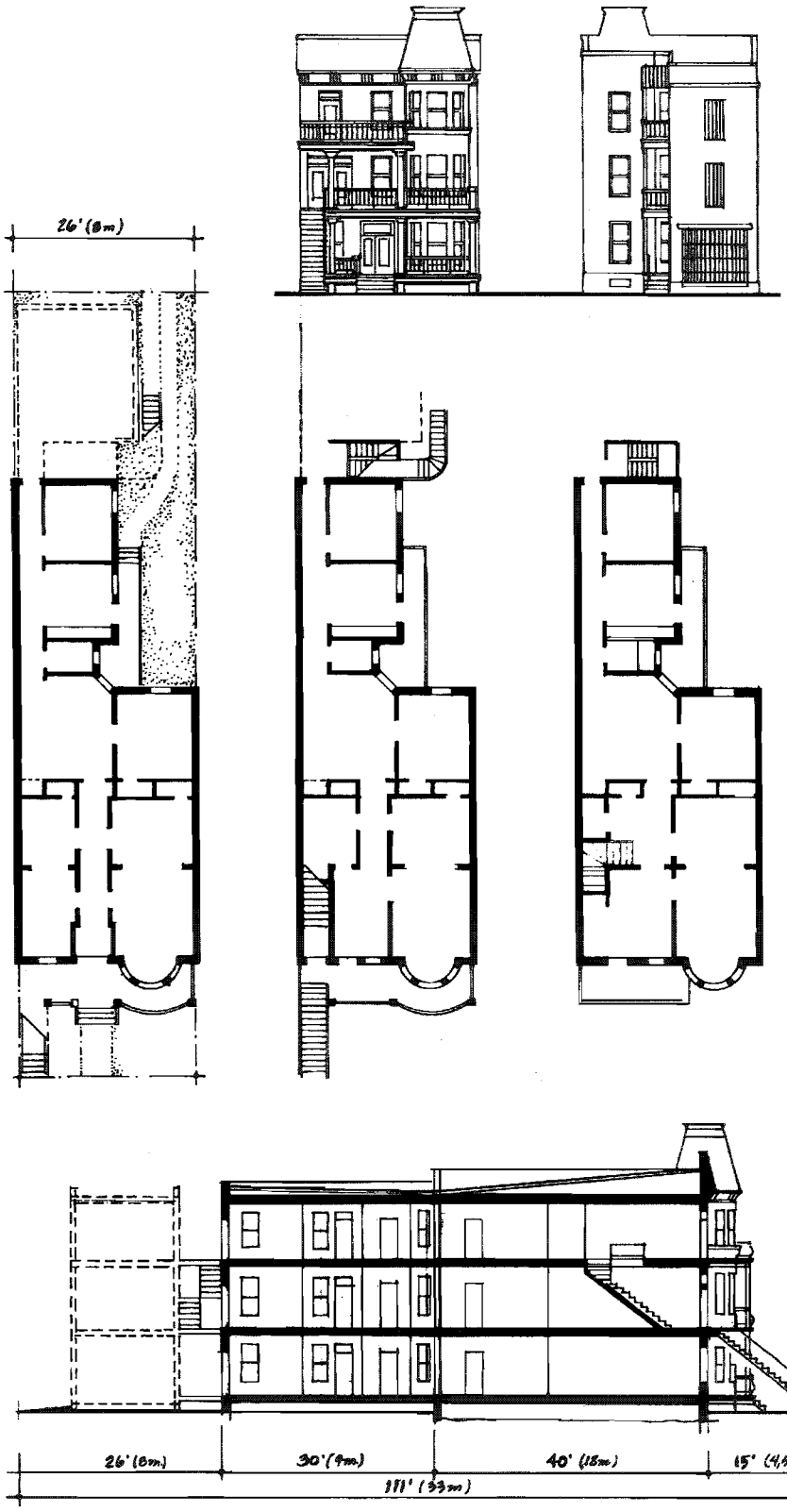
Evolution of Tenure

The kitchen also serves as a dining room, its small dimensions which do not allow room for many alternatives. Moreover, during renovations, the kitchen is often the first room to be redeveloped in order to meet current standards. The kitchen and the veranda are thus combined by knocking down a portion of the rear wall. This predominantly glass-walled room — a sort of closed-in porch — does make for a very pleasant area and slightly extends the warm season.

Although this type of layout does allow some flexibility when arranging the rooms, their reduced surface areas do not make them easy to furnish. As is the case with many old houses, the closet and bathroom dimensions are far below today's standards.



Terrasse Guindon



TRIPLEX
4148-50-52 Parc Lafontaine Ave.

Date of construction..... circa 1920-1930

Land surface area (8 x 35 m) ..... **280 m²**
Siting surface area
Main building ..... 140 m²
Accessory building 40m²
280 m²

Building/site ratio (180/280) **64%**

Unit surface area
Ground floor..... 116 m²
Second floor..... 110 m²
Third floor..... 110 m²
336 m²

Livable Floor Area Ratio
FAR (336/280)..... **1.2**

TRIPLEX
4148-50-52 Parc Lafontaine Avenue

The triplex is the most widespread form of housing in the old neighbourhoods of Montréal. Designed for the working class, it is simple in structure and has no avant-corps. It has a bumpy grey stone or brick facade, and ornamentation is limited to a sculpted parapet, balconies, stairs and sometimes a stained-glass transom above the doors and windows.

The use of limestone, extracted from several quarries around the island, was very popular for many public buildings, and the example in this instance is rather stylish. In addition to its facade of brick or grey cut stone, this triplex is particularly remarkable with its mansard roof with a turret and bow window, as well as its very elaborate porches.

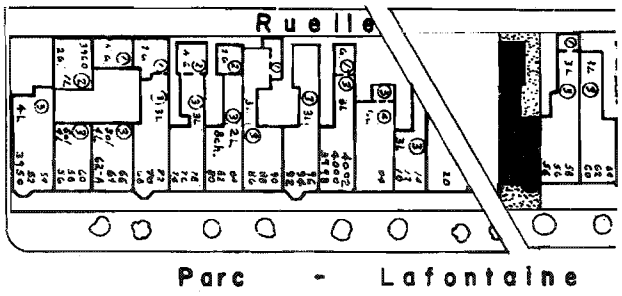
Original Layout

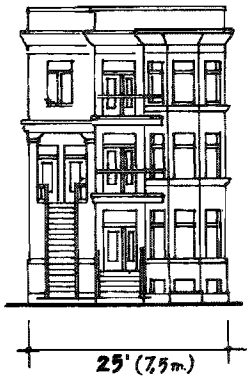
Extensively used in duplexes and even more so in triplexes, the L-shaped layout has become so widespread in attached housing in Montréal that it can be considered a true archetypal component. A wing extends the rectangular layout and increases the surface area of the units considerably. When *triplexes* are paired up side by side as a mirror image, they have a horseshoe-shaped backyard, which improves the lighting and ventilation in the rooms. This layout does have drawbacks, however: there is a direct view of the units across the way and noise reverberates more between the units.

Evolution of Tenure

Inside the triplex, the configuration with a double room centerpiece is still popular today. As in the original design, the living room can be combined with the dining room or be adapted to several lifestyles as it can be used as a small bedroom or a home office.

During renovations, the construction of a wider outside staircase is often a priority. Also, sheds located in the rear are often replaced by an additional bedroom or simply demolished to accommodate larger openings and a porch.





TRIPLEX
2003-05-07 St-Hubert Street

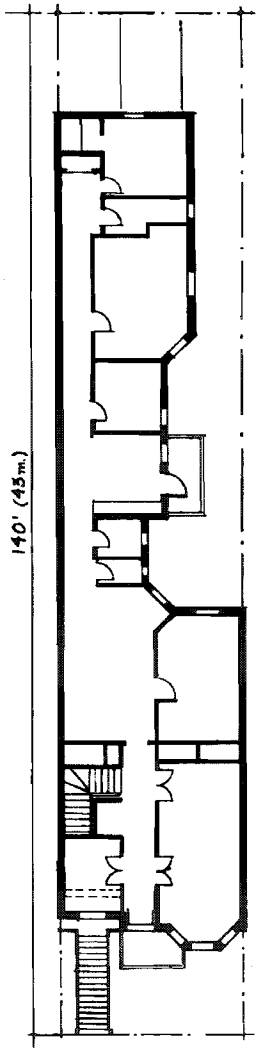
Date of construction..... circa 1920-1930

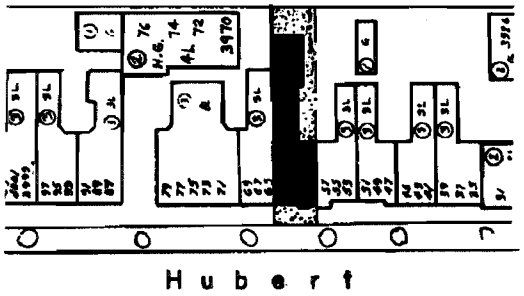
Land surface area (7.6 x 42.6 m) ..... **325 m²**
Siting surface area
Main building..... 200 m²

Building/site ratio(200/325)..... **61.5%**

Unit surface area
Ground floor..... 180 m²
Second floor..... 170 m²
Third floor..... 175 m²
525 m²

Livable Floor Area Ratio
FAR (525/325) **1.6**



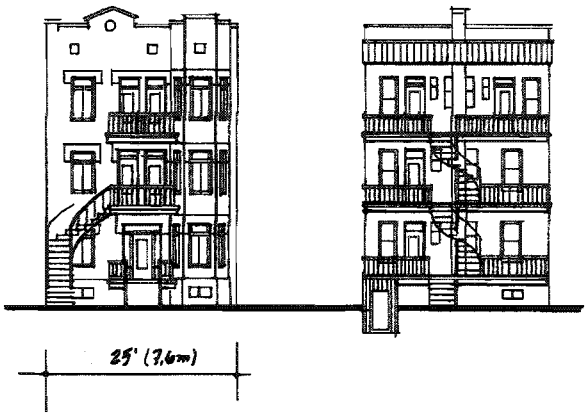


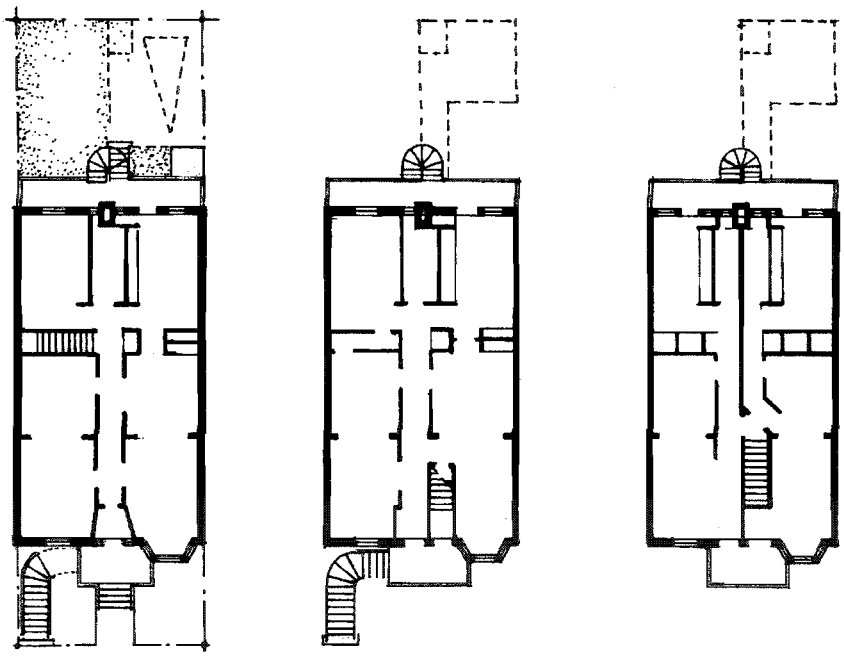
TRIPLEX
2003-05-07 St-Hubert Street

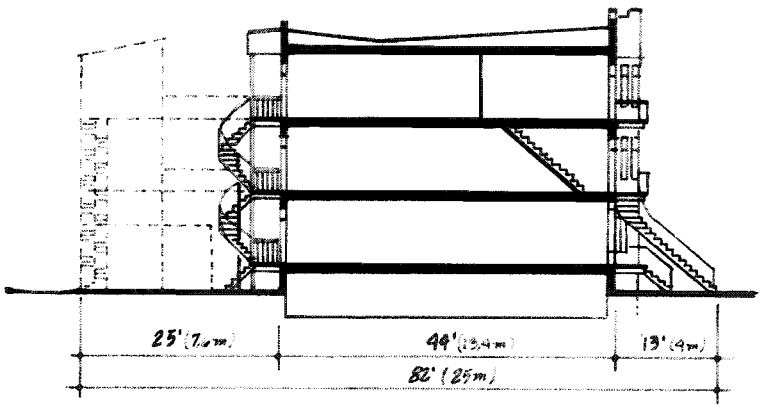
This triplex on St-Hubert Street is a good example of the "L" shape which extends 35 m (115 feet) toward the back on a lot which is 45 m (148 feet) deep. It is located on a very busy street but still radiates prestige given the large and beautiful homes. It is not unusual for professional offices to be established on several ground floors on St-Hubert Street.

Distribution

The characteristics of the triplex's layout are similar to other triplexes, but the rooms in the rear are strung together in a line in order to provide all the comfort of a three-bedroom house with a double living room, a home office, a bathroom, a laundry room and even storage space. In this example, the lot is so deep that it can even accommodate parking spaces or a garage on the lane side.







TRIPLEX
4289-91-93A-B, Chapleau Street

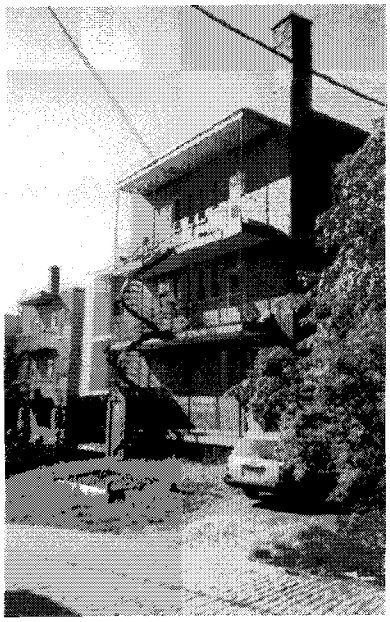
Date of construction..... circa 1930-1940

Land surface area (7.6 x 25 m) .....**190 m²**
Siting Surface area
Main building..... 103 m²
Accessory building..... 12 m²
115 m²

Building/site ratio(115/1) **60%**

Unit surface area
Ground floor..... 90 m²
Second floor..... 87 m²
Third floor (2 housing units).. 83 m²
260 m²

Livable Floor Area Ratio
FAR (260/190)..... **1.36**



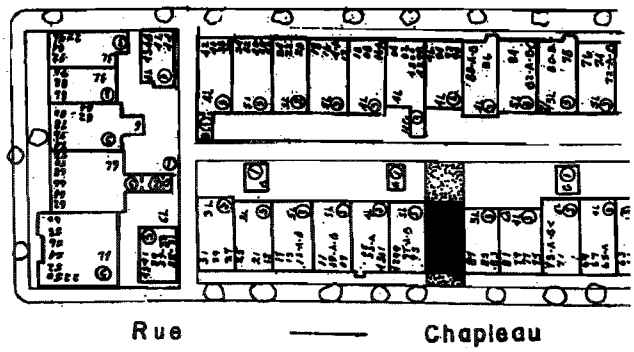
TRIPLEX
4289-91-93A-B Chapleau Street

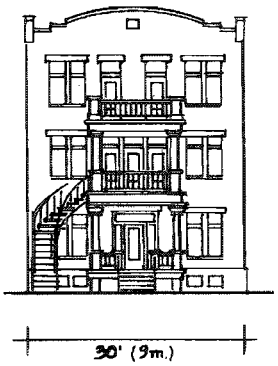
Chapleau Street has a series of triplexes which stand out especially because of their homogeneity, the uniformity of volume and the similarity of details from one building to another (brick, porches, stairs and cornices). Their appearance as a unit is all the more remarkable, since the houses are facing a park and the setbacks enhance their facades. With a few exceptions, the buildings all have straight balconies in the rear with circular steel staircases.

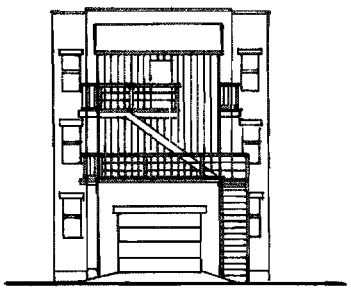
Distribution

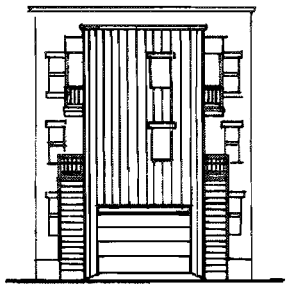
This *triplex* is in fact a *quadruplex*, as the top floor has two narrow housing units. It is interesting to note that, when some units of this type of housing were recently converted into condominiums, this floor was often turned into a single unit. The other floors, which are quite functional, have not changed much over the years. More often than not, renovations are limited to reconfiguring the bathroom and partially opening the living room onto the main hallway.

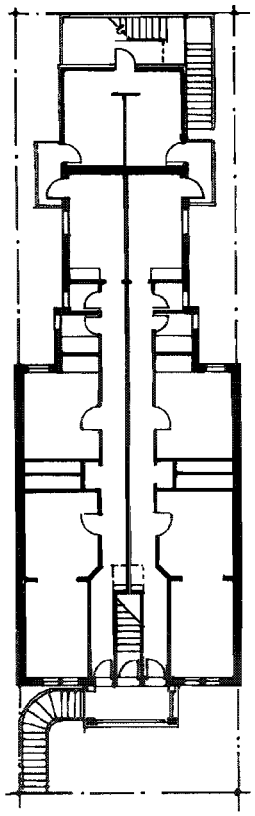
In the back, most of the garages were demolished in order to expand the back yards, and several porches have been widened in order to make room for a table which would allow people to eat outside in the summer.

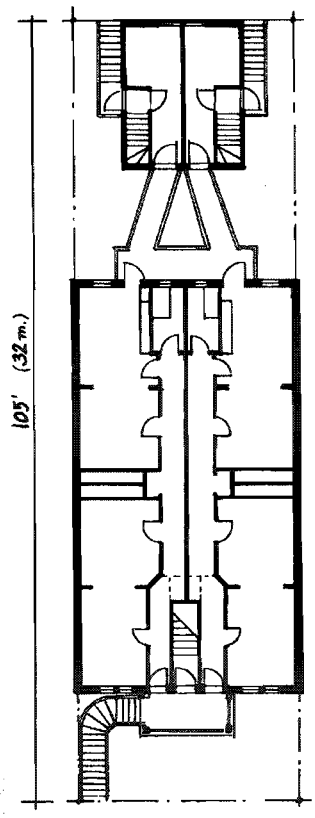












TRIPLEX
4426-28-30-32 Fabre Street

Date of construction..... circa 1930-1940

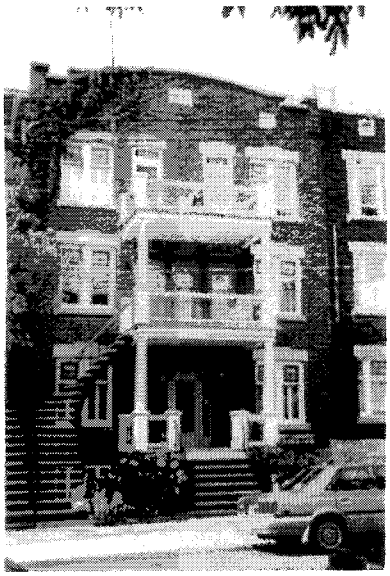
Land surface area (9 x 32m)..... **288 m²**

Siting surface area	A	B
Main building.....	150 m²	160 m²
Accessory building	30 m²	30 m²
	180 m²	190 m²
Building/site ratio.....	**63%**	**66%**

Unit surface area	A	B
Ground floor.....	140 m²	145 m²
Second floor (2 units)	130 m²	135 m²
Third floor (2 units).....	135 m²	140 m²
	405 m²	420 m²

Livable Floor Area Ratio

FAR	**1.4**	**1.45**



TRIPLEX
4426-28-30-32 Fabre Street

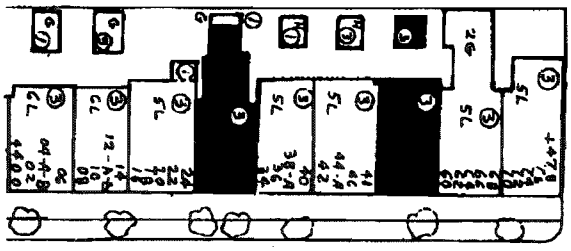
Fabre Street is regularly cited as an example because of its numerous wood porches which, to paraphrase Michel Tremblay, decorate the street like loges in a theater. Many of the original sheds are still standing behind the buildings, and the lane is strewn with catwalks and "secret passageways."

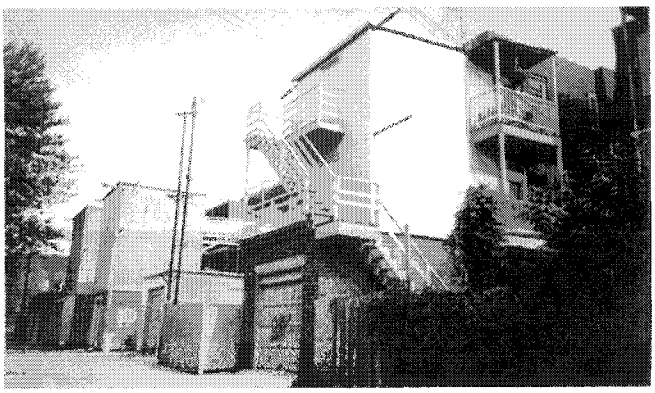
Distribution

Here, in fact, we find two examples of a *quintuplex*, which are three-storey buildings with five units each. The landlord lives in the unit on the spacious ground floor, has a garage in the rear and rents the four upper units.

The 9 m wide x 30 m deep lots (30' x 100') accommodate rectangular and L-shaped layouts. The latter offers the added benefit of better windows in the rooms at the back due to the great depth of the units (15 m to 20 m or 50 to 65 feet).

The backyard, which has given way to garages and sheds, has been reduced to a minimum. Furthermore, these protruding structures shade the units, and the exit staircases inside them are not very safe. Therefore, over the years, several of the sheds have been demolished in order to make room for patio doors and a landscaped yard.





RENEWED PLEX HOUSING

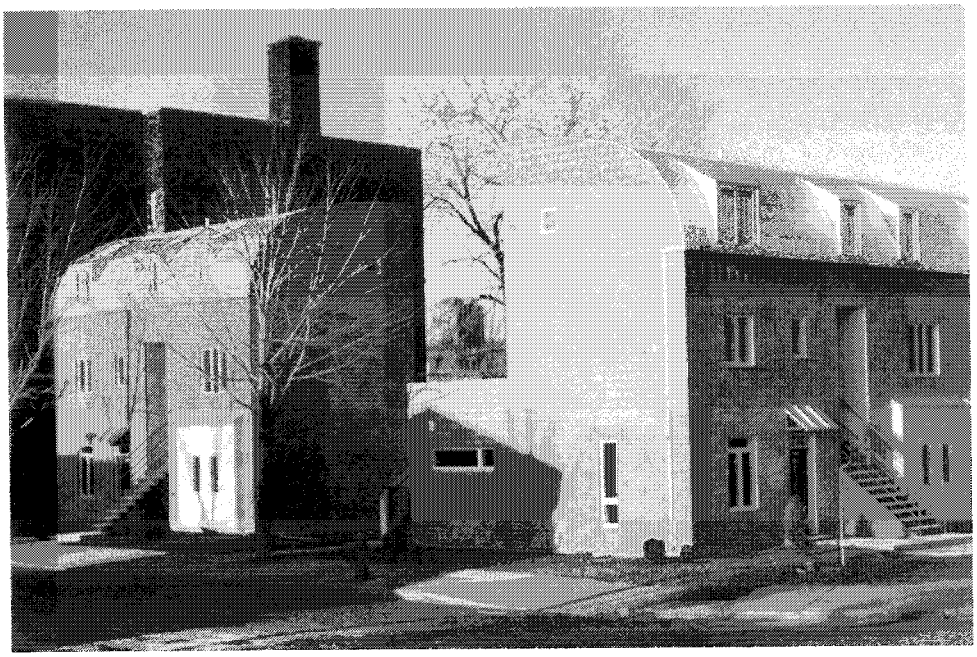


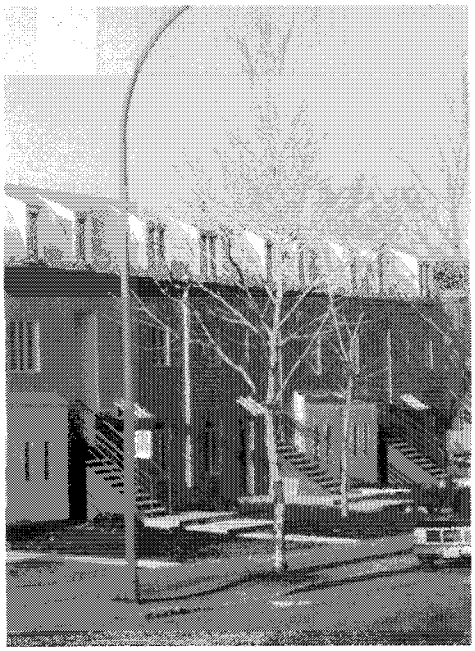
Photo by Habitations Georges-Vanier, Richard de la Riva, architect, 1994.

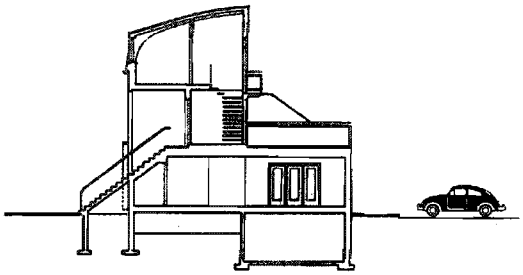
The Present Context: Recurrent Needs and New Realities

One might wonder why consideration is given to renewing a type of housing which, on the whole, seems to have enjoyed a fair amount of success over the years. From all indications, plex housing still seems to embody values which are dear to us. However, given the recent socio-economic upheavals which have affected lifestyles to some degree, it seems relevant, at the same time, to reevaluate the spaces provided by this type of housing.

For example, the increased mobility of the workforce and the autonomy some workers have gained due to computerization are factors which have considerably modified work habits in recent years. Therefore, it is becoming much more commonplace to create a space in the unit which is devoted solely to work.

Along the same line of thought, the increasing interest in landscaping, gardening and the development of outdoor terraces deserves consideration. Moreover, more and more emphasis is being placed on achieving a quality relationship between the interior and exterior of the unit. According to another line of thought, the public's concerns regarding the protection of the environment and sustainable development must necessarily be incorporated into the design of new homes.
Before we analyze in detail and re-evaluate each of the components of plex housing, the following is a summary of its main qualities:





Plex housing permits a housing density that is high enough for the property to be financially accessible to private individuals.
- However, this building density is not excessively high, but the articulations of the building contribute to the emergence of quality community living. Moreover, as numerous services are located nearby, attached housing reflects, above all, the expression of an urban lifestyle.
- Its compact volume and two-way orientation have made plex housing relatively well suited to the extreme weather conditions in Quebec. Although closed on both sides out of a real concern to save materials and energy, the natural lighting and ventilation provided by the front and rear facades ensure comfortable living conditions indoors without excessive reliance on any electromechanical system.
- Its very flexible layout is relatively well suited to various uses and types of ownership, according to the inevitable changes which happen in the lives of families.

This description shows our understanding that plex housing offers a good quality of life and can be adapted to current needs. In this vein, it is interesting to note that although a social and economic boom led to its creation, plex housing could accommodate the concerns of a society that is no longer in the throes of ever-increasing expansion and that is now increasingly intent to contain urban sprawl.

Through its preliminary design approach, this study proposes to discuss those issues using three models. The "renewed archetypes" provide a variety of technical, functional and urban solutions. Their design, which is based on the ideas discussed in the preceding pages, is not final or optimal in itself, as this step is more part of the true constructed project.

STRUCTURE

Fire-Resistant Party Wall

Historical Overview

Following the major fire of 1852, the reconstruction of several Montréal neighbourhoods resulted in a major review of the cadastral division. The proposed new subdivision favoured new narrower but deeper lots on the street facade. The townhouse, with its *firewalls*, appeared and succeeded the wooden townhouse, which was particularly vulnerable to spreading fire. In addition to offering sufficient fire resistance, this new wall had to be structurally stable on its own. The brick *party wall* appeared in high density housing areas when these walls, which are erected on the limits of the property lines, were shared by neighbours. The civil code called for the latter to share the construction and maintenance costs.

Evolution

At one time, brick or concrete *firewalls* had to extend two or three feet beyond the roof, depending on the use of the buildings. Today, they have been reduced to six inches (150 mm) for homes and can even be eliminated if certain constraints are met.

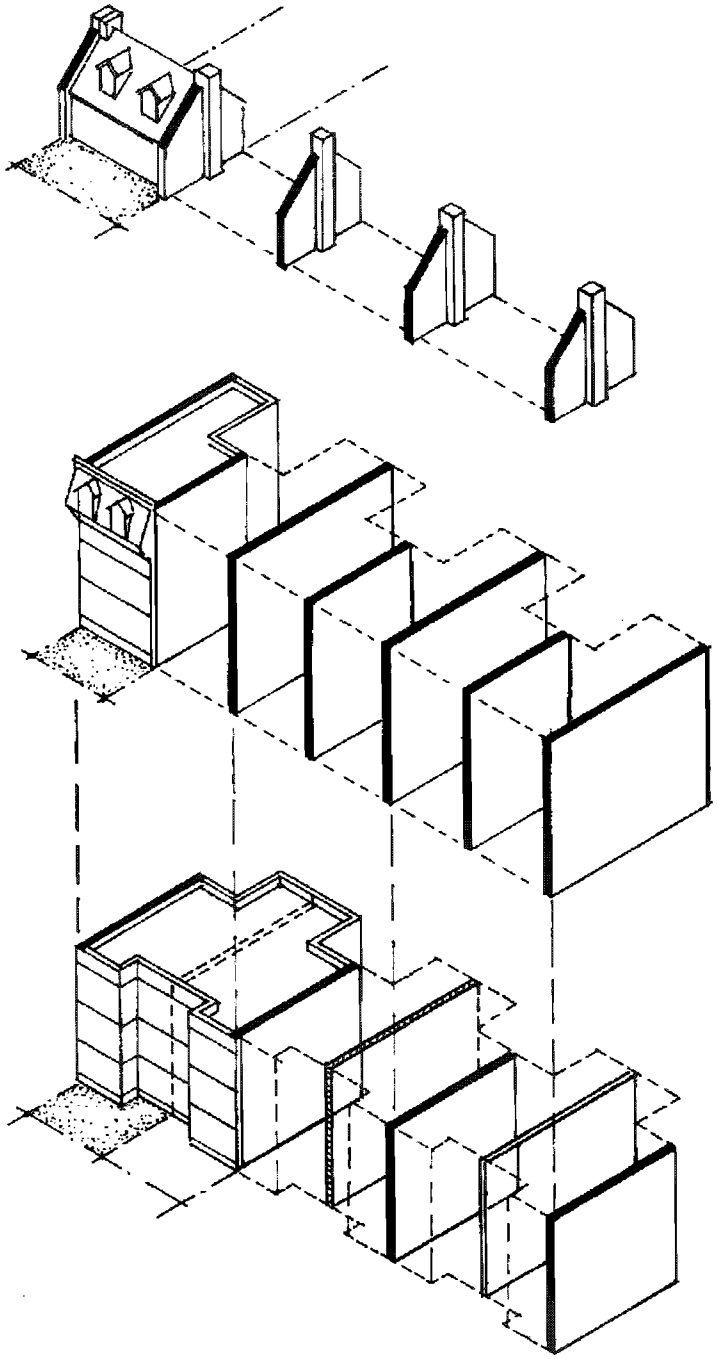
As building techniques evolved, standards were relaxed so as to allow for the construction of larger units without the requirement to build brick firewalls between each superimposed series of units. Less fire-resistant separations became acceptable. Each housing unit in the complex is considered to be a separate compartment with fire resistance. Because it is easier to build, the fire-resistant separation allows for greater layout flexibility and at the same time it lowers construction costs. If noise transmission problems are sometimes attributable to lower construction quality, an effective design and assembly can easily provide good soundproofing. For example, double walls with separate partitions separated by an air space give each unit its own acoustic independence — the same principle can also be applied to the floor structures.

Fire-resistant separations have become widespread in recent years for most condominiums, now that the vertical land registry allows for the stacking of condominium units. Traditional lots can also be re-divided for the construction of housing projects with a maximum of eight units between two firewalls.

Renewal Proposal

The three following archetypes of attached housing have been designed so as to include fire-resistant separations. Thus, double lots have been reorganized in order to create a single entity divisible as condominiums. The entrances and exits have also been regrouped in order to redistribute to the units the space recovered by the layout. Though the widths of these new units still respect the original subdivision, this component has still adapted well to market trends and new construction techniques.

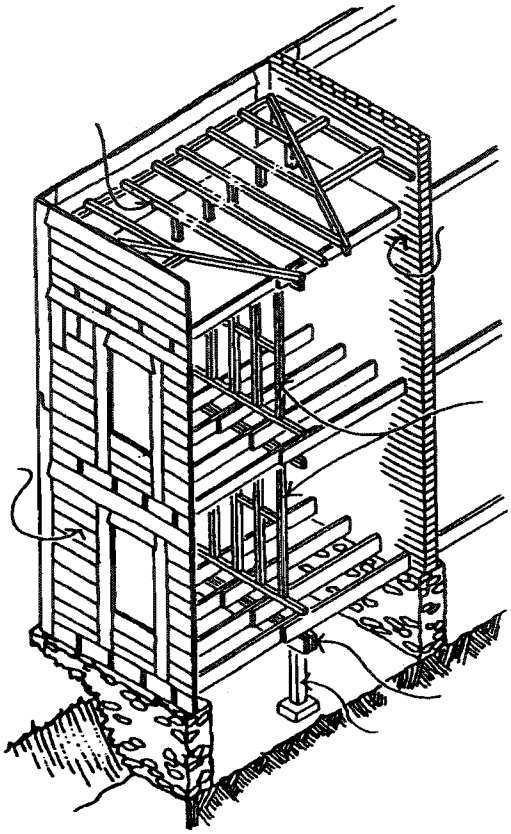
Fire - resistant Party Wall

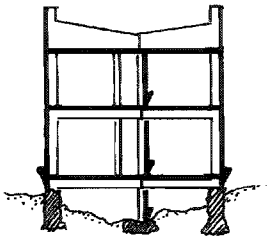


The first **fire walls** were required by the ordonance of 1727. Stone walls separating dwellings were required to bypass sloped roffs to prevent the spread of fire.

Shared between distinct properties, **mitoyen walls** in brick were built on lot lines and extended 2 feet (0,6 m) above flat foofs.

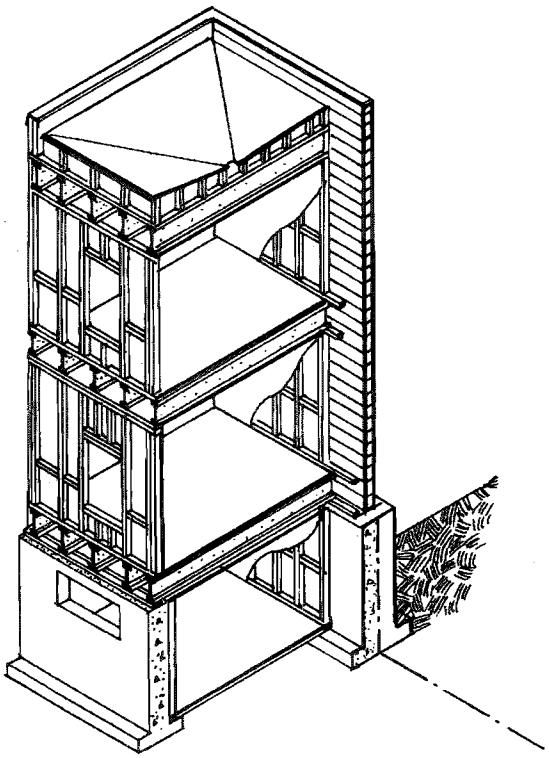
Present building codes generally require a fire separation providely 2 hours of resistance between each group of height dwellings. In this illustration, the units are protected from one another with 1 hour separations.

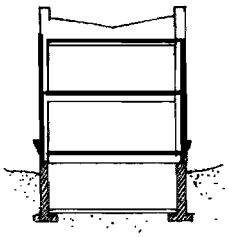




Traditional framing was limited by the span of the wooden joists. Loads were usually distributed laterally onto party walls and onto an intermediate load-bearing wall (on either side) of the hallway. The stone foundations were shallow, permeable and they limited the function of the crawl space to that of a stock room.

Illustration: J. Auger





Modern framing allows for an open layout because of its floor structure and roof trusses that transfers the loads to the side walls. The skeleton of the platform framing provides better heat insulation of outside walls. The basement can be refitted into a living space or even used as a parking area.

Our illustration

Framing

Historical Overview

The *plank square* was the most commonly used type of wood framing in the construction of Montréal *plex* housing. The outside walls consisted of an assembly of solid planks about 75 x 200 mm (3" x 8") which were used as joists, posts, lintels and fill. Weight-bearing partitions, generally located in the centre of the unit, supported the weight of the floors and the roof with the party wall. The span varied from 2.5 to 4.5 m (8 to 15 feet). The hardwood floors were often made of birch over a spruce sub floor. At both the front and back of the facades, floor joists overhung to the outside in order to support the balconies and porches. These components were later covered with various mouldings and their final appearance had much to do with the overall make-up of the facade.

Evolution

Though new concrete and steel framing techniques have revolutionized construction methods, wood is still clearly the most economical choice today for three-storey residential buildings in North America. Nonetheless, some structural innovations have changed the way things are done and now offer new possibilities. New wooden trusses or trusses made of composite materials have made it possible to broaden maximum spans to 9.1 m (30 feet) for floor and roof structures. Because the need for an intermediate weight-bearing wall has been eliminated, the plan offers more design flexibility.

As for outside walls, plank construction was replaced by *balloon framing* and then by *platform framing*. The latter has currently become the standard throughout the industry for small building construction. Among other things, it allows for the use of shorter wood units, quick assembly of partitions on floor platforms and lends itself, in many cases, to prefabrication. The wall studding of the outside walls, generally consisting of 38 x 89 mm (2" x 4") pine studs, tends to be replaced by studs measuring 38 mm x 140 mm (2" x 6"). Therefore, by increasing the dimension of the wall cavities between studs, walls can be stuffed with more insulation, such as fiberglass bat, mineral wool or sprayed foam, thus significantly improving the heating comfort of the housing units.

In order to prevent moisture condensation in the outside walls, "building science" recommends that vapour barriers such as aluminum or polyethylene sheeting be applied to the warm side or the inside (interior) surface of insulation. Outside walls should be equipped with air barriers to improve their resistance to air movement. Today, traditional tarpaper has been replaced with high-performance plastic or elastomeric films. These new wall compositions are evolving rapidly, as the challenges have been redefined — energy conservation, ecological materials and air renewal. Information available on the subject must therefore be updated regularly. Many experts have recently realized that an overly insulated and sealed house may cause toxicity problems in the surrounding air if the air is not sufficiently changed. It is anticipated that amendments to this effect will be made to building regulations.

Steel or reinforced concrete structures, which are affordable only for mass production, are generally characteristic of large-scale construction projects. Although the "internal" structure of *plex* housing is still wood, steel and concrete are regularly used on an ad hoc basis to reinforce certain parts of the structure or to support a masonry facing. In fact, concrete proves to be most important when used in the construction of the foundation. When reinforced concrete is used in place of stone footings, it offers three significant advantages: a solid and stable structure with thinner walls, an impermeability unmatched by stone and the possibility of creating more complex forms. As a result, today, basements can be lived in or used for storage and as a garage. Acoustically speaking, a thin coat of concrete poured over a wooden frame can produce the same acoustic benefits as conventional concrete slab flooring, and at a far lower cost.

Renewal Proposal

In the prototypes proposed herein, we have preferred the open layout because of the numerous layout possibilities it offers. In spite of their schematic nature, we assume that these proposals are built with wooden frames, for economic reasons. Lastly, according to current standards, concrete foundations are used so that the basement or half-basement spaces are livable or can be put to use.

Roofs

Historical Overview

In the city profile, one can see that the flat roof has replaced the pitched roof to allow the development of townhouses. In an urban setting, a flat roof prevents the drainage of water onto the neighbour's property or onto the street. It became more widespread around 1885 with the mass production of an increasing number of construction materials.

As the roof has very little slope, water converges at a main drain which crosses each building and is connected to the municipal sewer system. Depending on the type of building and in order to create slopes to allow for water drainage, some between the vented roofs are up to 2 m (6 feet) high. In order to ensure that the entire system is waterproof, a membrane consisting of several layers of tarpaper covered with gravel is installed and applied to the side of the *parapets* built atop the walls. In addition to retaining snow, ice and water build-up, and so as to increase the insulation value of the roof in cold weather, the parapet makes it possible to create copings with varied ornamentations.

Evolution

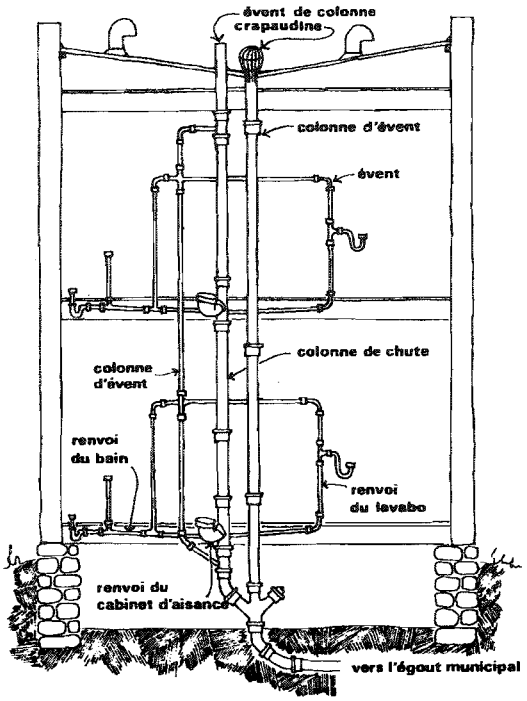
The flat roof has dominated the attached housing construction for the past century in Montréal because the safety and efficiency it provides is always appreciated in an area where most buildings are two or three storeys high.

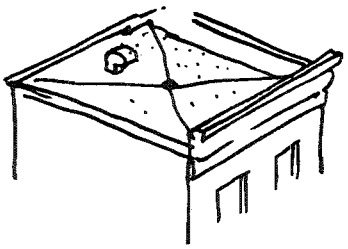
In order to make it possible to build a roof deck, the waterproof membrane must be very resistant. Unfortunately, conventional built-up roofing is rather fragile and prone to cracking when a new structure is built on it. When exposed to the sun and sudden temperature changes, the tar in the membrane tends to harden, which makes the membrane more vulnerable to water infiltration. Although roof decks must be carefully built so as to protect the roof's watertightness, *elastomeric membranes* used today are much more flexible and resistant than before. They are also more environmentally friendly in that they emit fewer toxic fumes because unlike asphalt products, they do not have to be heated.

Renewal Proposal

Roof Access
In each of our prototypes presented in the following pages, use is made of the space provided by the flat roof in order to extend the housing unit so as to create an outdoor space that city-dwellers appreciate so much. In the case of the *triplex*, a mezzanine provides access to the roof where a terrace or a garden can be established.

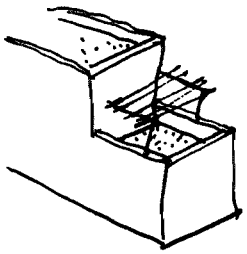
Skylights
During the renovation of the top floor, the addition of skylights or access to a multi-window roof allows considerably more natural light into the top floor.



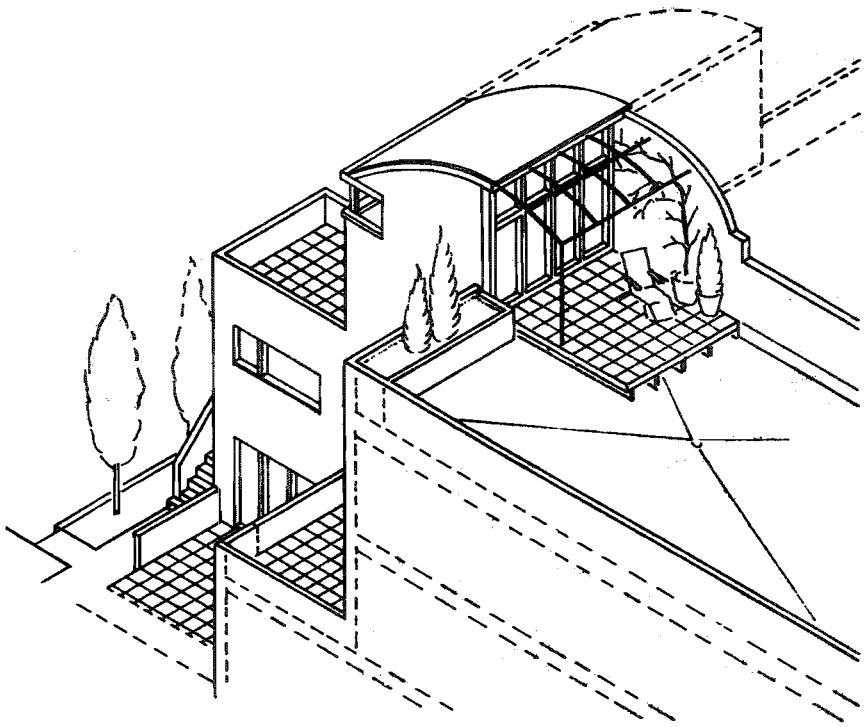


The ***traditional roof*** has a drain hooked up to the building's plumbing system and then to the municipality's sewer system.

Illustration: J. Auger.



The ***roof deck*** can be built above a room. Once considered a feat, new flexible and resistant roof membranes have made this type of construction easier.



A roof access makes it possible to part of the roof turn it into a deck. Regulations stipulate that when this access is from the inside, it should be no larger than a minimal. A larger surface add-on is considered a **mezzanine**.

Systems
Electromechanical and Communications Systems

Historical Overview

Throughout the 20th century, many various forms of energy and heating systems have been used to heat attached housing in Montréal. Homes were first centrally heated with coal and then equipped with oil and then natural gas furnaces. A series of pipes sent hot water through radiators to provide adequate heat throughout the unit. With the development of electrical energy, electric baseboard heaters caught on and became the economical choice. In spite of its advantages, convection heating of surrounding air is neither the most effective nor the most comfortable method.

Technological developments in the form of telephones, radios and televisions found their way into each unit. They certainly changed our lifestyles and transformed our way of interacting with the outside world. In less than a century, the wood stove — which occupied the centre of the house — was replaced with the television. One may now wonder : what effects the information society will have on our living environment?

Evolution

Heating
When choosing a heating system, the major points to consider are the following: economy, temperature control and, of course, comfort.

Electric heating systems have numerous advantages over oil or natural gas systems. The heating units of this system are compact, easy to install and can be adjusted independently of each other, making it possible to control the temperature in each of the rooms. Though these qualities and low delivery costs still make them a popular choice, newer and more powerful systems have recently begun to appear.

Forced-air heating can be hooked up to the air conditioning and, like the heat pump, can control air temperature efficiently. Installing these systems, however, is far more expensive than installing electric baseboard heaters. Moreover, since it may be somewhat more difficult to install in existing units, they are particularly suited to independent maisonnettes rather than *plex* housing units.

Radiant systems consisting of electric heating wires and heating foils can now be run beneath the floor or ceiling finishes. Flexible pipes can also be used to circulate warm air between thin concrete slabs. By warming the material rather than the air, these systems produce radiating heat that is much more comfortable.

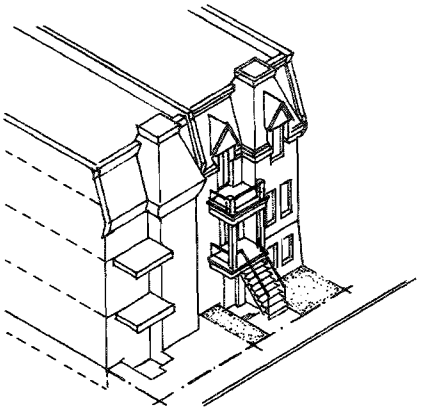
Plumbing
The major innovation in plumbing was the introduction of ABS or PVC plastic piping for waste water drains and water lines. These products replaced the traditional copper and cast iron pipes. Although plastic proves to be an economical choice, the downside is that these pipes need to be insulated.

Telecommunications, Electronics and Home Automation

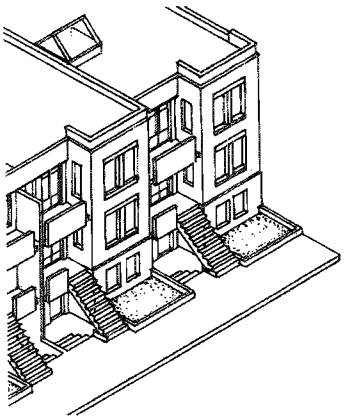
Aside from the obvious impact of television on family living, the development of telecommunications and computers have enabled a growing number of people to become self-employed and plan their schedules and travels with greater ease. Home offices have thus become increasingly commonplace. However, the work area should be fitted up in such a way that it does not interfere with family living.

Today, electronics and telecommunications have progressed to the point that most systems which ensure the smooth operation of homes can be programmed in advance or from a remote location. Know as home automation, this trend to centralize the start-up and adjustment of these different systems, allows, for example, one to control the security system, temperature, lighting, electric and audiovisual appliances and even fill the bathtub from a central location! According to their promoters, this technology has made our homes "intelligent," but in spite of this, the pros and cons of its use must be given careful consideration.

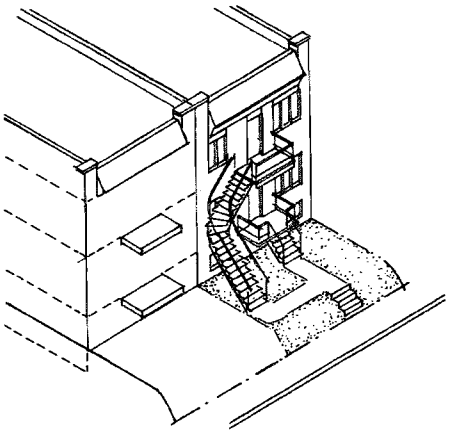
Front facade



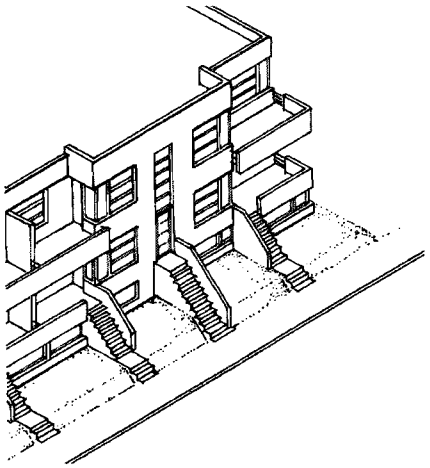
Traditional Maisonnette



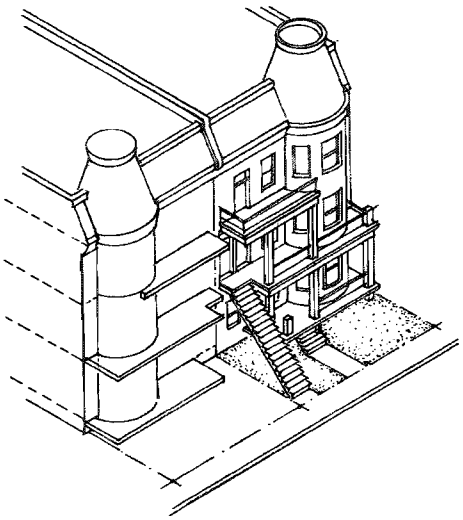
Renovated Maisonnette



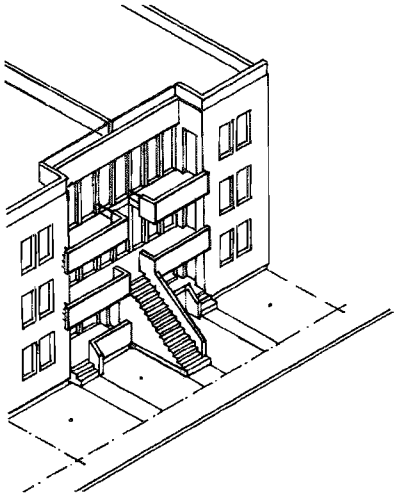
Traditional Duplex



Renovated Duplex



Traditional Triplex



Renovated Triplex

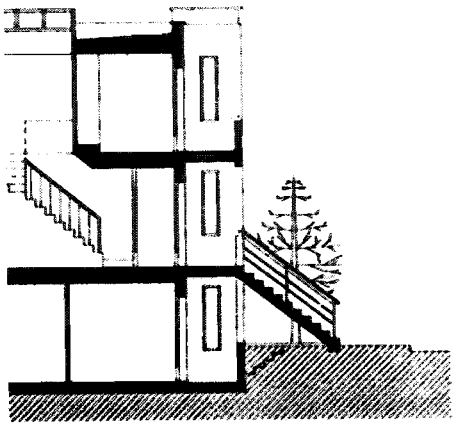
FRONT FACADE

"A neighbourhood is recognized by its facades, entrances, gardens and its yards."
Catherine Eveillard, *Montréal, côté jardin*

The urban landscape of Montréal draws its originality from its characteristic configuration of streets and lanes as well as the numerous outdoor spaces which residents have taken over. These yards, located in the front and the rear of the building, have been developed in many different ways and allow for as many interfaces between public and private properties, thereby contributing to the creation of a significant collective landscape.

Therefore, the study of the front facade thus cannot be reduced simply to functional considerations. The true expression of the building's personality, the front facade reflects the established relationship with the neighbouring houses and, in a broader perspective, with the city and the context in which it was built. Of course, the expression of the facade is due to the materials and element forms of which it is composed. The degree to which these components relate to each other generally has a bearing on how people judge the appearance of its structure.

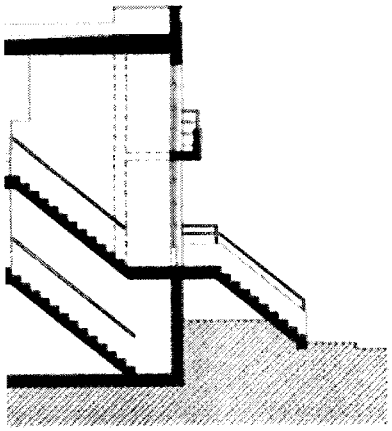
In addition to the expression of the facade itself, the use made of its extensions contributes a lot to the impression we have of a building. In short, the gardening area in the front yard, the ritual of accessing the unit through an outdoor staircase, or co-existing as neighbours via the balcony, the choice of siding materials and the opening of interior rooms to the outside are all components which make up a facade. In the following pages, we will study each element through a historical perspective, a summary of their evolution and present renewal proposals according to construction and urban planning regulations.



The English Courtyard

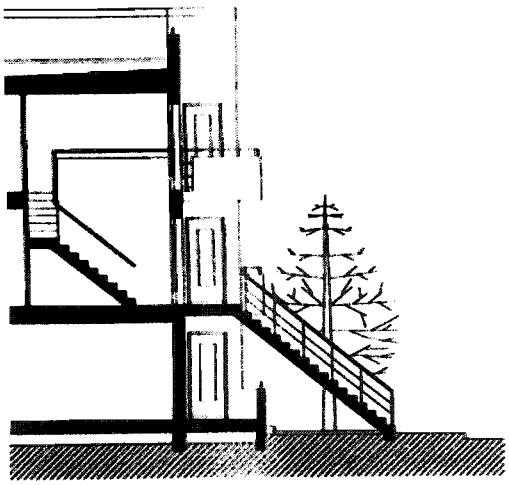
This type of sunken yard has its origins in England and is a feature in many city houses with such a layout. To create a courtyard, one must dig out and expose a part of the facade of the basement; however, minimum surface area, maximum depth and some clearance requirements must be complied with in order to create a pleasant and safe space. Some municipalities only allow English courtyard on the front facade if the height of the ground floor does not exceed 2.5 m (8 feet), in which case it would be considered a floor.

The "renovated maisonnette" incorporates the courtyard solution in order to provide sunshine and good ventilation for the unit in the half-basement.



The Raised Terrace

The creation of a ground surface on the facade is one way of reducing the building's out-of-ground height. Legally, it reduces or cheats on the regulated height of the building. Thus, the "renovated duplex" is considered to be a two-storey building, with access to the basement from the rear if the lot is sloped slightly. The 5-m (16.4 ft.) front yard space is subdivided by the stairs and their landing is at the level of the ground surface. The garden is therefore raised by one metre (3.3 feet) over the sidewalk and limited by the slope.



The Level Access

The "renovated triplex" proposes a ground floor with a level access. Therefore, with short ramps, this unit offers the possibility of a *universal access* and can be used by persons with restricted mobility. The front yard, which is 6 m (19.7 feet) deep, is divided into two zones or two separate gardens.

The Front Yard

As small as it may be, the front yard plays a vital role in how people identify with the neighbourhood in which they live. The feeling of belonging to a small part of the city seems to be directly linked to the physical and emotional investment one has made to one's yard. The quality of life of a street also depends on the extent to which such transitional spaces can generate a certain feeling of togetherness. In fact, this exterior space allows for the transition from public to private property, not only for their owners and immediate users, but also for all the residents in a neighbourhood. On a larger scale, front yards help define the character of an entire urban landscape.

Historical Overview

On a formal note, the appearance of yards at the front of these popular housing units originated in a willingness on the part of builders to borrow from middle-class residences the components which conveyed that image of prestige.

Most of the traditional entrances have level accesses or a few stairs leading up to the ground floor, which is raised by only .3 to .7 metres (1 to 2 or 3 feet). Since basements were quite rare, breathing holes allowed for ventilation in the crawl space. Around the periphery of major civic areas such as Carré Saint-Louis, or on busier streets, the ground floor has been raised to create a real *piano nobile*, which is characteristic of middle-class houses (see the example of the maisonnette on Cherrier Street).

Regulations

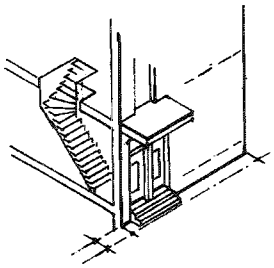
The front yards of attached housing units generally vary from 0 to 4.5 m (0 to 15 feet) deep. The shape of the stairs leading up to the second floor is influenced by this space. They are sometimes straight, but more often than not, they are curved to comply with property lines.

From a regulatory standpoint, the front yard is a *front setback* imposed by a construction line. The setback can be occupied by *projections* such as staircases and porches, or *avant-corps*, such as *bay windows*.

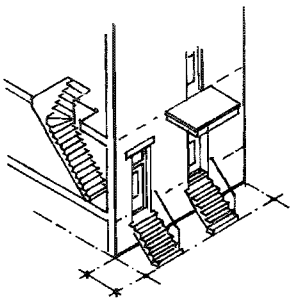
Renewal Proposal

The "renovated archetypes" offer three different approaches to configuring the front yard and its access routes, i.e., the English courtyard, the raised terrace and the on-grade access.

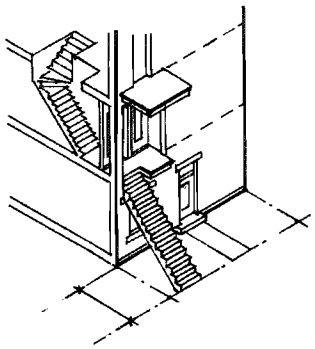
Examples of Existing Staircases



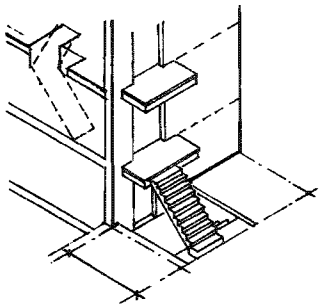
Marie-Anne Street
On-grade entrance
Setback: ***.5 m*** *(1.6 feet)*



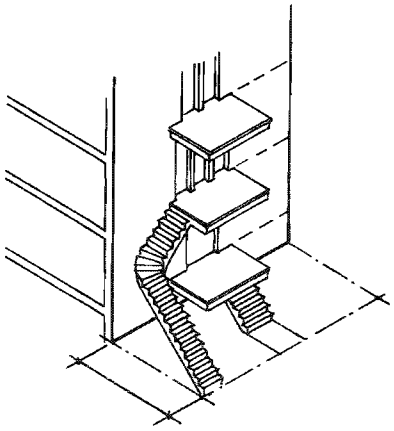
St-André Street
Raised ground floor to
open out the basement
Setback: ***1.5 m*** *(5 feet)*



St-Hubert Street
Straight penetrating
staircase in front
of a window
Setback: ***2.5 m*** *(8 feet)*



Cherrier Street
The *piano nobile* and
the English Courtyard
Setback: ***3.5 m*** *(11.5 feet)*



Fabre Street
Winding staircase in
front of a window
Setback: ***4.5 m*** *(14.75 feet)*

Stairs

Historical overview

There are so many metal staircases in Montréal that they have become one of the main characteristics, even a living symbol of its architecture. Designed specifically to fit within the tight lot dimensions, staircases highlight and personalize the entrance to the units, while allowing for more space inside the units.

Evolution

Though outdoor staircases offered a practical and original solution for more than a century, the City of Montréal decided to ban their construction in the 1950s for aesthetic reasons. According to some, they had become an "eye sore" and too much of a death trap in the winter with the snow and ice. A movement to bring them back was initiated at the beginning of the 1980's They were permitted once again, subject to compliance with certain constraints (particularly with regard to the angle and size of winding staircases) as well as architectural characteristics of the vicinity.

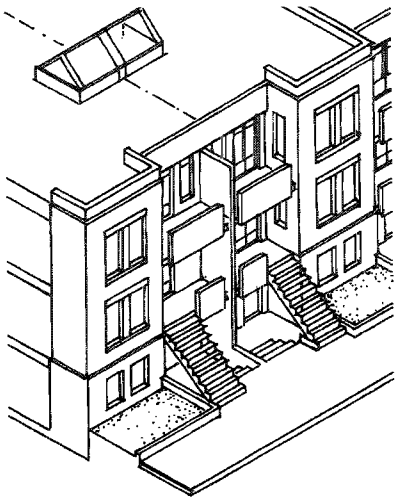
In general, the outside staircase leads to the balcony on the second floor, and an inner staircase serves the third floor. The second floor balcony is used as an access balcony for tenants on the upper floors. The shape of the stairs often varies from one building to the next and is essentially determined by the depth of the front setback. Therefore, with their fairly steep stairs, the staircases are not always very safe. Despite its openwork structure, the staircase often reduces the amount of light entering the ground floor unit when it passes in front of a window.

Regulations

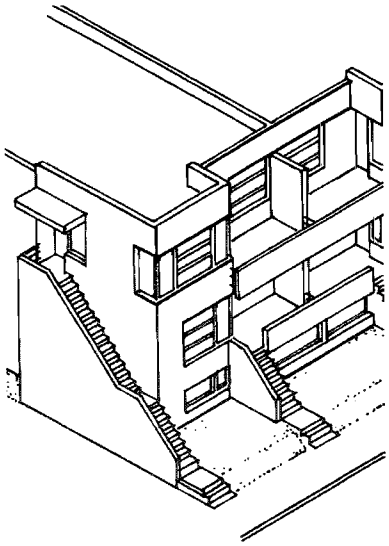
Today, new municipal by-laws allow the replacement of existing staircases and the construction of new staircases when new buildings are erected in order to preserve the character of heritage neighbourhoods. The National Building Code permits the construction of straight outdoor staircases when the integrity of fire exits is assured. Special provisions in *Annexe Montréal* waive the maximum angle restrictions in the National Building Code for winding staircases.

Renewal Proposal

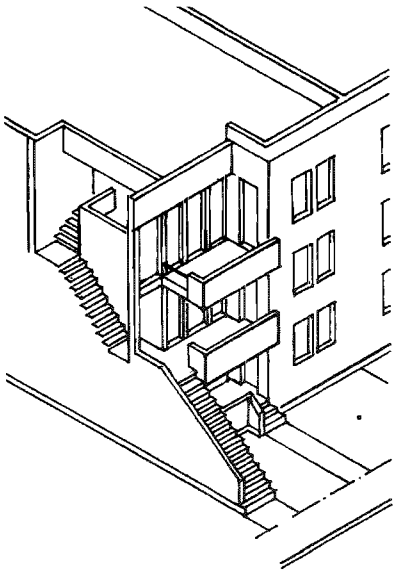
Given the originality of Montréal staircases from both a social and architectural standpoint, it seems obvious that they should be used in the design of new attached housing complexes. However, they can be made safer and compliant with standards if they are built in a straight line rather than in a curved line. This would avoid running the stairs in front of the window and would free up some leftover space under their structure for storage. It would even be advisable to provide indoor staircases with sufficient natural light.



The ***maisonnette*** has an elevated ground floor (*piano nobile)* as well as a English Courtyard to make the unit in the half-basement look more inviting. Moreover, the stairs are separate, which stresses the individuality of each maisonnette. The sunken yard allows natural light in to shine in on the indoor stairs to the floors.

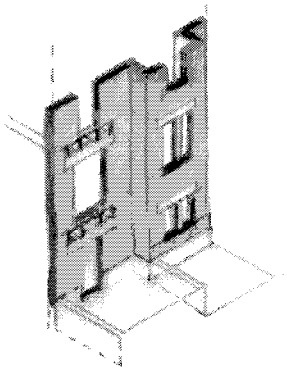


The ***duplex*** must make do with long straight staircases on the facade. The staircase leading to the upper level has a large bay window on the facade to bring in natural light.



The ***triplex*** has a long staircase with a complete flight of stairs outside and another one inside. Large windows allow for natural light to shine on the inside staircase, which opens onto the rooms on the third floor.

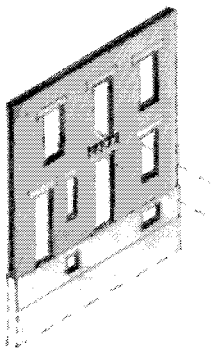
Facing



Historical Overview

In the wake of the 1721 fire, wood siding was prohibited in Old Montréal and then in the suburbs after the fire of 1852. Wood continued to be used in surrounding villages until they were annexed to Montréal at the beginning of the 20th century.[12] At that time, in addition to meeting the most basic safety standards, construction with brick cladding became the rage. Imported or grey stone; common brick, multicolour or glazed: the variety of materials used in the construction of Montréal townhomes is such that they constitute a true "siding catalogue". The textures, colours and decorative features reflect in their own way the building style and traditions of the era in which they were built.

Although there are several examples of load-bearing masonry walls, these are largely used as a self-supporting facade borne by the foundation wall and cladding the interior enveloppe of the building. The openings in the facade are traditionaly supported by stone or moulded concrete lintels, brick arches or sometimes even wood. This is still a very effective method, as the facing of a facade can be repaired or replaced without altering the structure.



Regulations

Masonry facing remains a requirement in almost all major municipalities in Quebec because of its durability and fire resistance. The urban planning by-law in Montréal calls for no less than 60%, brick, natural stone or artificial masonry work on the facade.

Evolution

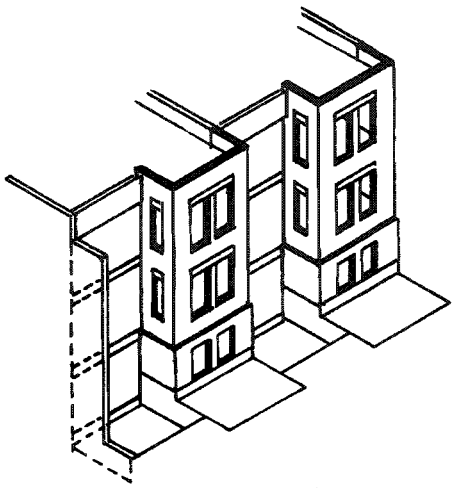
Because of the weight of masonry work, traditional assembly methods offer little flexibility in modulating the facade. The widespread use of steel today allows for more leeway in the design of more elaborate volumes by alternating masonry surfaces with larger openings.

Moreover, new materials have been added to the list of available cladding. Depending on the model, artificial stones can be more or less integrated to the character and the materials of existing and neighbouring buildings. Colour, texture and size play a determinative role in appreciating the product, as do proportion design and jointing techniques. Moulded concrete blocks often measure up to the same level of good ashlar work, a certain connection with traditional facing or a quality assembly to more contemporary appearances.

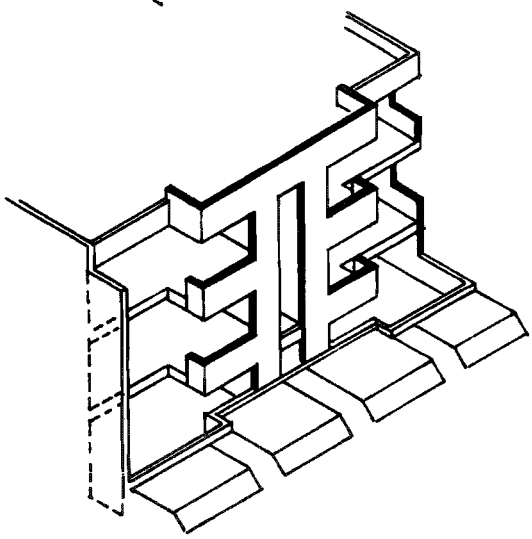
New lighter cladding such as stucco, consisting of cement or polymer-bound aggregates offer a wide variety of colours and textures. However, as these materials are not considered masonry, they are limited to only a portion of the facade overlooking the street or the building's secondary facades.

---

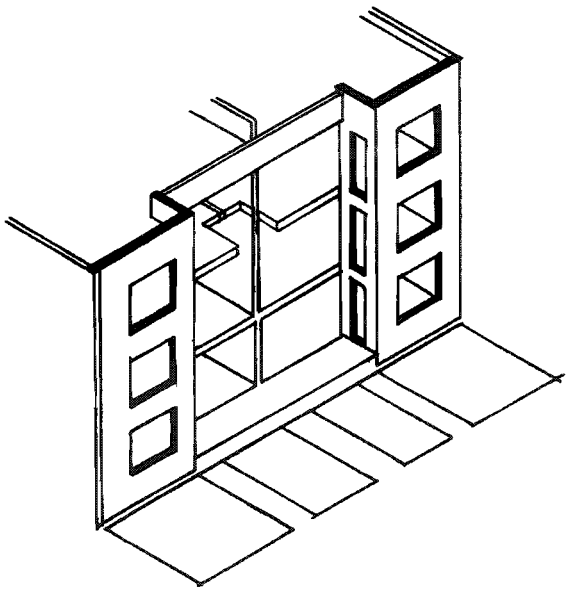
[12] Benoît and Gratton, *Pignon sur rue les quartiers de Montréal*, p. 7.12.



The ***semi-detached maisonnette*** has two juxtaposed facades. The masonry facade is limited to the avant-corps. Coloured stucco siding has been applied to the setback.



The ***semi-detached duplex*** offers a symmetrical facade centered along the cut of the large staircase. Wide horizontal openings are supported by lintels and steel posts in order to accommodate corner windows. Masonry cladding can be installed on the avant-corps and on the entire front facade. Stucco is reserved for use on the secondary facade.



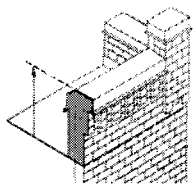
The ***semi-detached triplex*** uses the symmetry of its facade on both sides of a staircase framed by balconies. Masonry is still used on the avant-corps or it can be extended to the fronts of the balconies with the addition of a separate steel structure. The rear facade is almost entirely enclosed by windows.

Renewal Proposal

The facades of the three prototypes described in the following pages reflect the layout of their units in the way in which they are put together. The *avant-corps* complies with both the lineage and required masonry facade (50% - 60% of the facade). The part of the facade in the background may have a light finish, since it is a wall which consists mainly of windows and balconies.

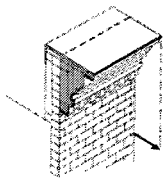
Crowns

Historical Overview



Parapet

Crowns on Victorian homes are often very exuberant. However, from a strictly functional standpoint, they are no more than adorned parapets. For example, the false mansard we see in the following photograph is a construction laden with so many references that it makes us forget the flat roof behind it. The role of the parapet, however, is not just limited to brightening up the facade. From a technical perspective, the parapet controls the runoff of accumulated water from the roof, and the edge created by the *cornice* protects the top of the brick wall from rain.

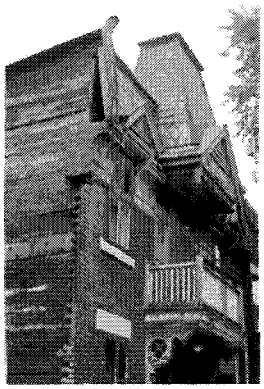


Cornice

Many of the architectural components on historical facades were lost during the free renovation spree of the 1960s and 1970s. Complete restoration or reconstruction was very costly, and more often than not, builders would simplify them or just eliminate them. The imitation of these components on new constructions often lacked the finesse of the models on which they were based. We have however noted a new appreciation for traditional craftsmanship and have noted at the same time a greater concern for preserving the components during renovation work.

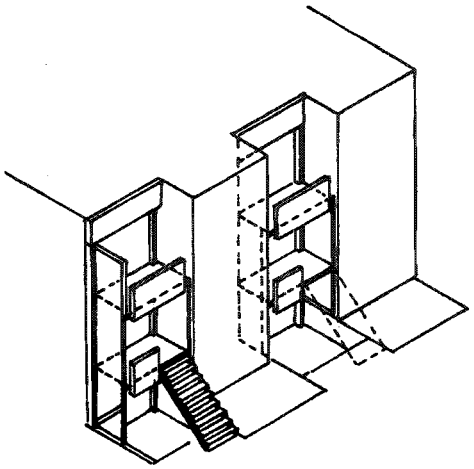
Evolution and Renewal Proposal

The influence of modernism as well as recent construction methods have given rise to building crowns that require fewer materials and does not have as refined a style. We believe that the traditional components can be reinterpreted using contemporary language rather than ignored.

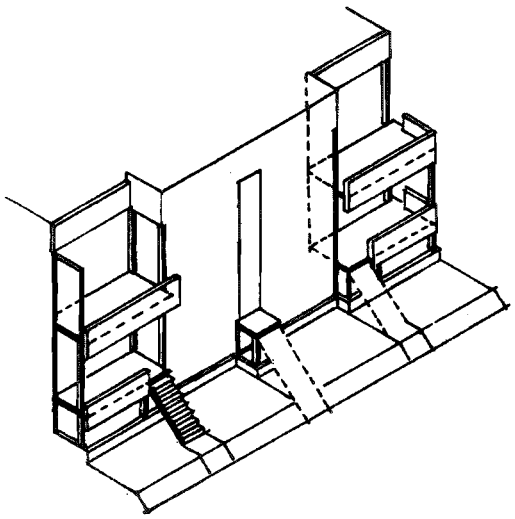


This renovated house on Marie-Anne Street shows how this structure was assembled and reveals its false mansard roof.

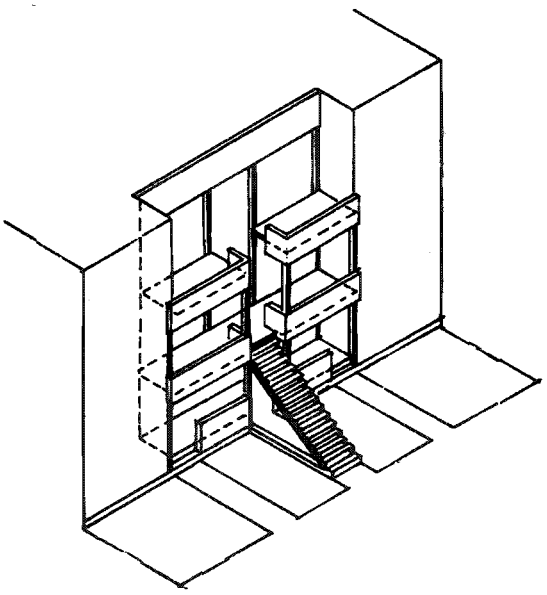
With its curved roof, this project on Georges-Vanier Blvd. proposes a modern interpretation of the mansard roof.



The ***maisonnette*** borrows from the rhythm of houses on Cherrier Street by alternating avant-corps and porches, and gives a contemporary interpretation of balconies over sunken courtyards.

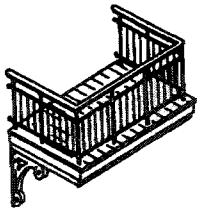


The ***duplex*** has a porch which houses the middle landing of the central staircase. The balconies extend out from the front facade and the ground floor balcony is built over a room in the basement.



The projections in the ***triplex*** appear on each side of the main staircase, the full length of which is visible from the street.

Projections

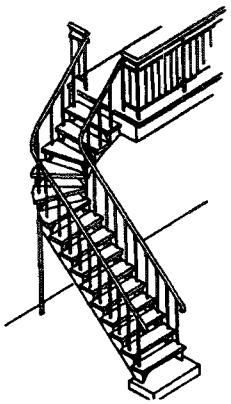


Balcony

Historical Overview

Aside from the more luxurious city homes which often had facades decorated with ashlar, the overhanging wooden balcony became the decorative component of working-class housing. In fact, the columns, handrails, friezes and wooden corbels produced a *portico classico* like the craftsmen would make.

The portico was part of the public domain and tailored to the dimensions of the front yard, while at the same time providing the units with personalized exterior spaces. When viewed as a group from either side of the street, these porches and balconies now look like loges in a theatre. Unfortunately, too many of these wooden structures were demolished and replaced with steel structures, the modest proportions of which cannot begin to match the effect of the symbolic portico.

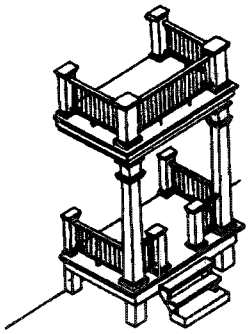


Exterior stair

According to tradition in Montréal, by-laws limit the depth of balconies to 1.5 m (5 feet) on the front facade. Balconies, porches and stairs are also all considered to be *projections* on the front setback with respect to the construction lineage. *Bay windows*, *box windows* or *bow windows* are considered *avant-corps* which form an integral part of the building. They are also limited to a depth no greater than 1.5 m, and their surface area must not exceed 3 m^2.

Evolution

It is interesting to note that while materials and their assembly have changed significantly, the traditional shape of projections in renovation work has remained the same. For balconies in particular, the sheathing and structure have changed without changing the original shape. With regard to porches, the wood floor has often been replaced with prefabricated fibreglass sheets while their structure — made of joists overhanging the facade — has given rise to an independent steel structure.

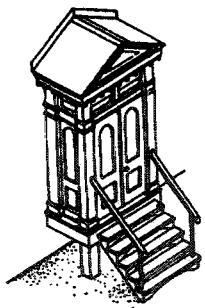


Porch

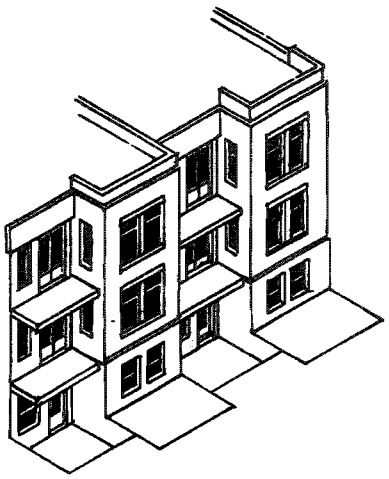
Renewal Proposal

In our study of new prototypes, the avant-corps and projections receive equal treatment in the facade in order to give it rhythm. The *box window* represents approximately 50% of the lineage and therefore constitutes the main facade. The balconies and porches project 1.5 m. Designed like a glass wall, the setback facade consists of balconies which, once closed, can make for an additional room to the unit.

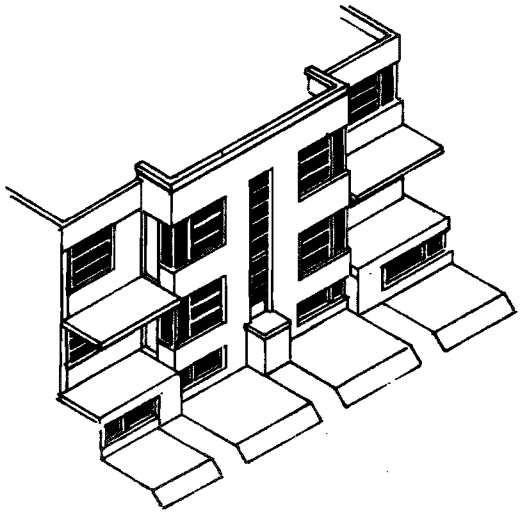
Without consideration for regulations, which require masonry siding, and in a context where the surrounding area lends itself to open rooms, the entire front facade could consist of a curtain wall. However, in an urban setting, the making of large openings and construction of verandas and greenhouses seem to be better suited to rear facades.



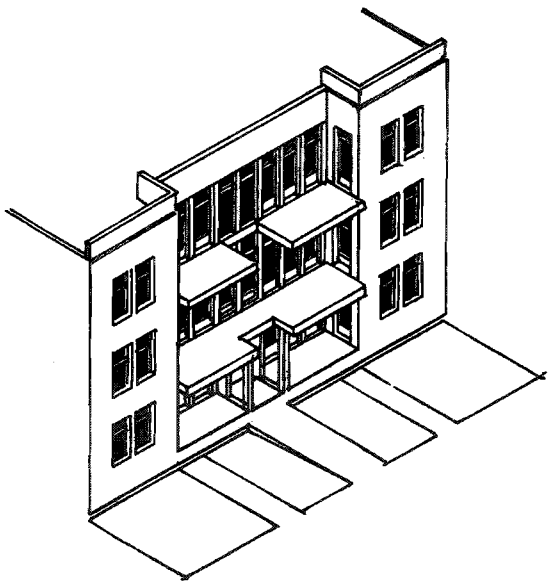
Enclosed porch



The ***maisonnette*** uses the traditional French door as the main entrance to the unit and balcony. Casement windows with or without transoms are installed.



In contrast to its vertical structure, the ***duplex*** accentuates the horizontal for its openings. Since the units have plenty of windows, access doors can either be solid or come with one window.



The ***triplex*** has vertical or horizontal openings. Hung sash windows and doors with transoms can be used in combination.

Openings

Historical Overview

Originally, the sizes of doors and windows of attached housing were very important as they determined the maximum surface area of the rooms inside. According to the *Code of 1900* in effect at the time, the surface area of windows of a double living room measuring 30 m^2 had to be a minimum of 3 m^2, i.e., 10% of the opening to allow for sufficient lighting and ventilation. Windows made of wood were either casement windows, following French tradition, or *hung sash* windows, according to models introduced by the British. Openings were designed vertically like the silhouette of the human body to allow the sun to shine further into the unit. Horizontal window strips appeared when more elaborate techniques were mastered and when there was a taste for something modern, but remained foreign to the dimensions of the traditional house.

Evolution

The introduction of long-lasting and high-performance materials such as steel, aluminum, plastic and fibreglass completely changed the assembly of window frames and reduced home maintenance considerably. The thermal pane, which seals a thin layer of air between two windows, also did away with the need for double windows.

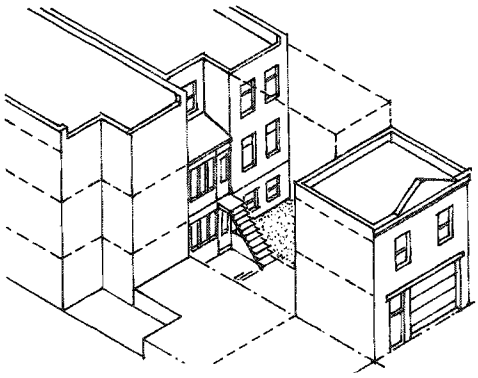
Appearing in the 1950's, sliding windows disfigured building during renovations, as their dimension were not particularly well suited to those of older houses. New products such as patio doors or steel doors made their presence in the market, but they often detracted from the appearance of the house when installed on the main facade overlooking the street.

As the renovation market has grown significantly in recent years, several manufacturers of doors and windows have returned to the old models, improving them by using increasingly sophisticated hardware. The turn-and-tilt window is a good example of such adaptation.

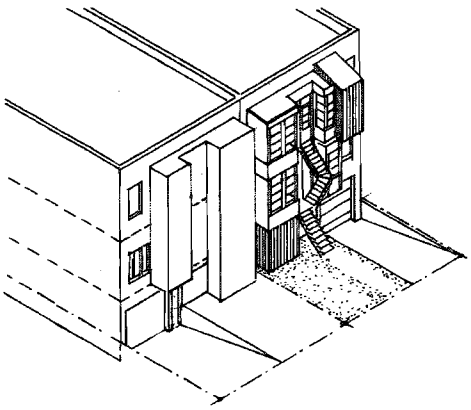
Renewal Proposal

Municipal by-laws require a minimum of 10% and a maximum of 40% of glass surfaces for projects in old neighbourhoods. The portion of the facade back from the setback can, at most, be fully enclosed by glass like a curtain wall. On the secondary facade, a type of curtain wall can be used. However, in certain directions, this large glassed-in surface is likely to turn into a true greenhouse, unless it has venetian blinds or air conditioning. In short, the opportunities afforded by by-laws and technology deserve consideration, but one must always take care to respect both the architectural and environmental context when designing a new structure.

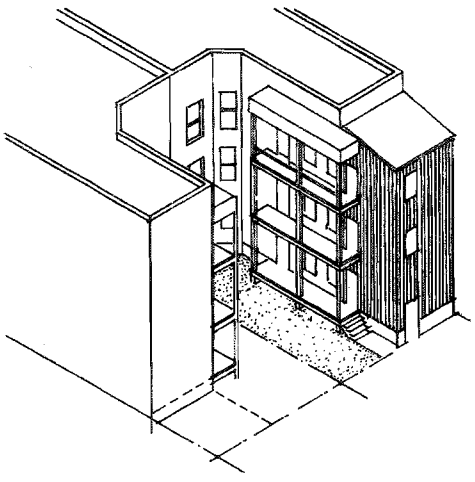
The traditional rear facade



Maisonnette

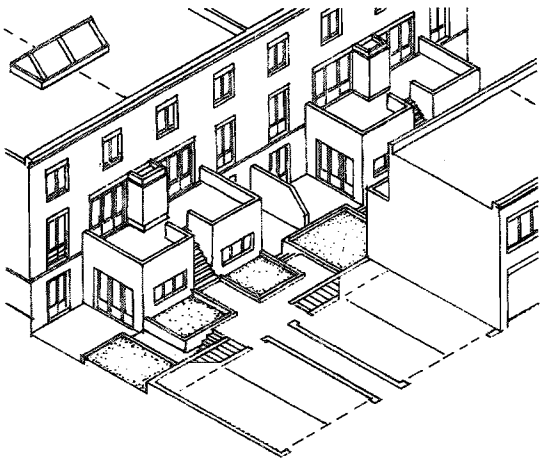


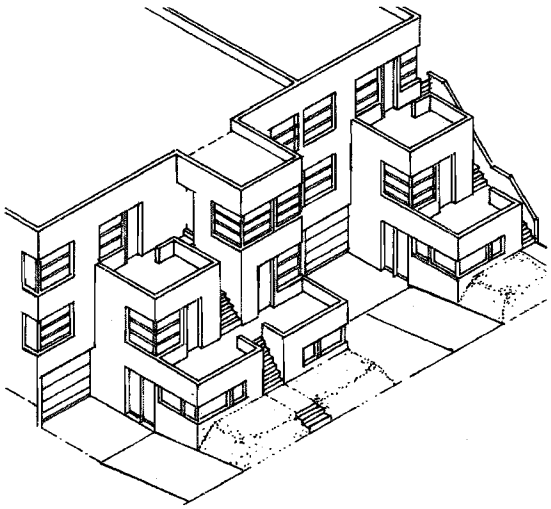
Duplex

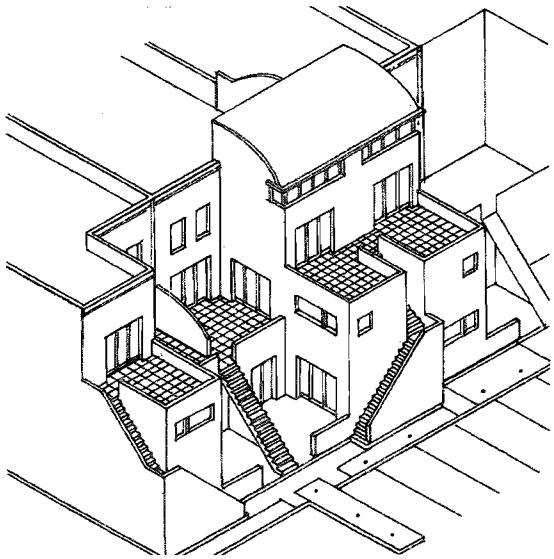


Triplex

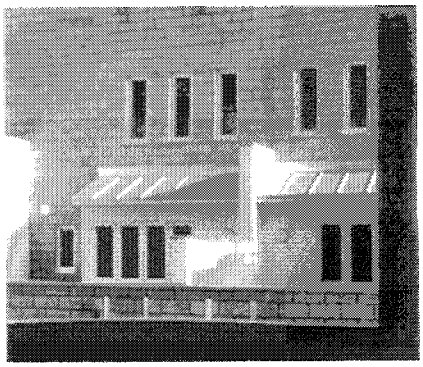
The renovated rear facade







REAR FACADE



Historical Overview

As an integral part of the laneway landscape, the rear facade of attached housing — with its porches, catwalks and sheds — revealed an entire chapter of domestic life at the turn of the century.

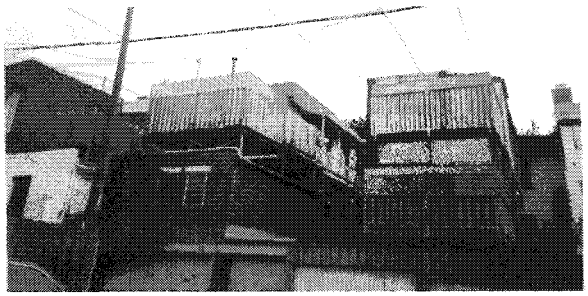
The porches built along the lateral and rear facades of *plexes* rarely extended beyond 1.2 metres (4 feet), as they were built right out to the limit of the setback. Verandas were often built onto the lateral and rear facades of maisonnettes and sometimes duplexes. Functionally, the rear porch was a type of access balcony which provided access to the exit staircase, the shed and the oil tank in the shed. Residents also used the porches to hang out the laundry on the clothesline, watch children playing in the yard and, of course, to chat with female neighbours.

Evolution

As technological advancements have made several domestic chores easier, outside spaces behind homes are being devoted more and more as a place of relaxation. Access from each unit to an outdoor deck (a space which can accommodate a table and chairs) has increasingly become a priority for many occupants. Also since the narrow elongated shape of traditional porches are ill suited for this type of layout, it is only when sheds are torn down that wider wooden decks are put up in their place. Unfortunately, while these structures enable some to enjoy time in the sun, it often leaves others living on the lower levels in the shade.

Renewal Proposal

To provide quality outside space for each unit, stacked roof decks built over lived-in spaces is a most interesting solution. The yard is placed in such a way that it maximizes exposure to the sun and is lateral along the volumes added to the main buildings. In this way, each unit has a terrace 4 m x 4 m (13 feet x 13 feet) which can be transformed into a solarium, veranda or a greenhouse. The idea then is to design the structure, the parapet walls and the roofs of these volumes so that they can be adapted easily to subsequent changes.



The Back Yard

Historical Overview

Through the transformations and additions over the years, back yards are often encumbered with a large number of various structures. Confined by a minimal lateral setback and high building density, the yard is restricted to the space not taken up by sheds and garages. Needless to say, sunlight and fresh air have little chance of penetrating such structures.

Evolution

In recent years, the increasing importance given to the quality of natural lighting has frequently resulted in the demolition of sheds and the expansion of openings on the rear facade. In the 1970s, the city of Montréal established a financing program to encourage landlords to demolish these "add-ons", considered to be fire hazards. Ground floor occupants were thus finally given the opportunity to use the cleared land for gardening, decks and a play area. However, the need for privacy gave rise to the construction of numerous fences, some of which reduced the visual appeal of lanes, not to mention sunshine and the possibility of social interaction.

Renewal Proposal

In all neighbourhoods, whether in the city or in the suburbs, landscaping, gardening and horticulture has become a real craze in recent years. The front yard does not always lend itself to those activities, given its smaller dimensions and more urban appearance. However, the back yard does provide privacy as residents indulge in leisure activities and gardening. Each of the prototypes comes with a layout diagram of the back yard. Depending on user preferences, part of the land is used for a deck and the other part is used for planting trees and bushes, growing lawns or a vegetable garden.

Exit Staircases

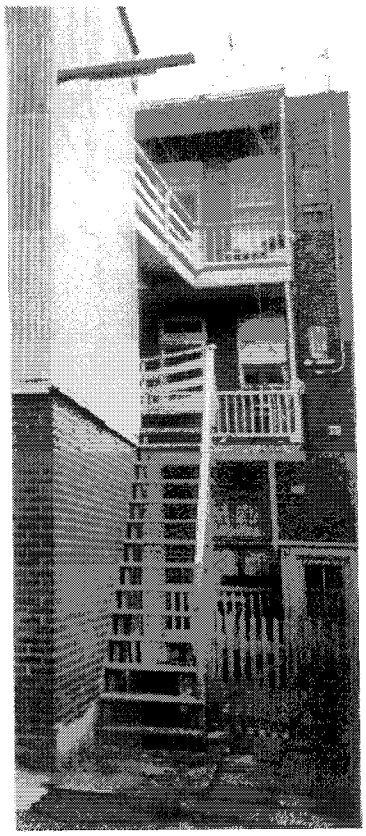
Historical Overview

At one time, Montréalers were allowed to use winding wooden staircases built in a corner of their sheds as a secondary exit from the unit, in case of fire. As they were found to be dangerous, in the 1950s, by-laws called for the installation of circular metal staircases when sheds were demolished. Although the kite winders of the staircases do not meet national security standards, they have been exempted from the National Building Code regulations, as this is a situation specific to the City of Montréal.

Renewal Proposal

The three prototypes proposed in this study have all been designed so that all the units share the same accesses and exits. Furthermore, the front and rear staircases are straight for the following reasons:

– They offer safer access to the rear lane;
– By separating the decks, they help to ensure everyone's privacy;
– The space they covered can be used for storage or to accommodate an interior staircase leading to the basement.



Parking

City regulations generally require that one parking spot be provided for each housing unit built on a lot, a ratio which declines as the number of units increases. When the rear of the dwellings opens onto a lane, the yard or a portion thereof is paved over to accommodate a car, to its own detriment. In the other case, the front yard loses its integrity in making a driveway for a car. Therefore, the issue of parking must be given consideration in order to ensure that parking areas blend in nicely with the environment.

Considering the traditional subdivision, the pros and cons of parking access from the lane and optimal development of back yards, the three prototypes presented herein explore various ways of creating enough parking places for the housing units.

– For the *maisonnette*, we propose that the back yard be closed off with a separate building—a two-car garage with lane access.

– For the *duplex*, the garage can be built in the basement of the main building and accessed from either the lane or the street. If necessary, this space can always be converted into an apartment or an office.

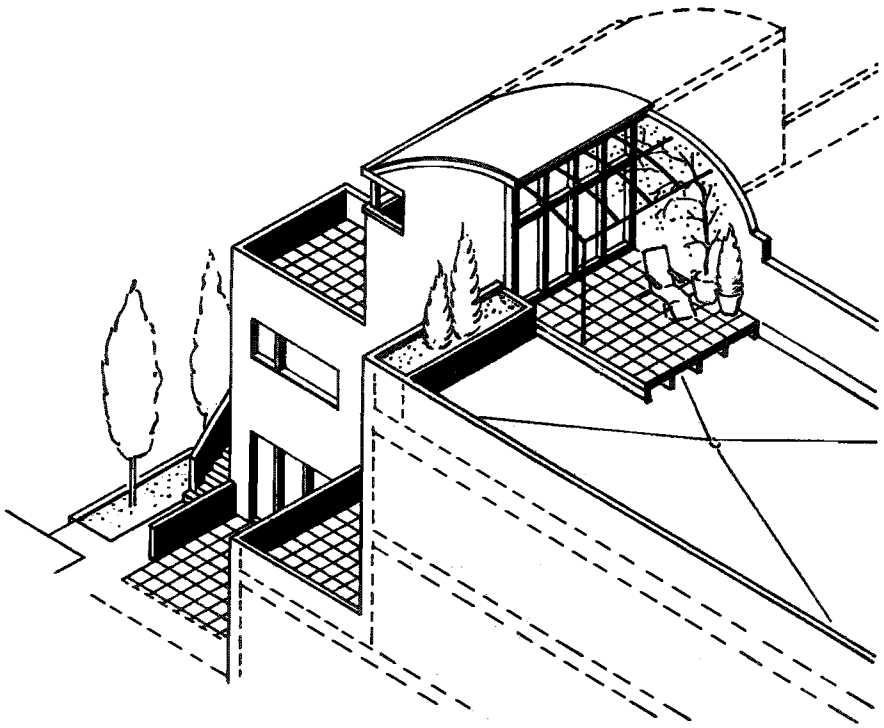
– For the *triplex*, the width of the lots can accommodate three parking spaces in the yard which are accessible from the lane. For larger projects, it could be beneficial to make the parking spaces underground or in a half-basement and coordinate them between several houses.

HOUSING UNITS

Our three *renovated* attached housing models appear on the following pages. They incorporate most of the ideas discussed in the analysis of their components and draw lessons from the pros and cons of traditional housing. Moreover, they reuse ideas which have proven their mettle through their contribution to the quality of life in housing and to the vibrancy of city life. The great popularity of components such as balconies and stairs alone justifies reusing them.

Far from disregarding new ideas, each prototype also shows originality in the solution it proposes to take into account some realities that are quite contemporary. So as to reflect the evolution of lifestyles, it now appears essential to offer housing that can be easily adapted to different requirements and outside quality landscaping developments such as yards, decks or gardens.

During the course of our research, we carefully examined numerous original drawings and uncovered the recurring characteristics such as, for example, the proximity of the kitchen and the rear porch, in order to come up with configurations with specific intentions in mind, e.g., a triangular living room/kitchen/dining room configuration. In short, in each of our proposals, the interior spaces are considered according to their use, how the functions of each are organized and the wealth of the resulting relationships.



The Renewed Maisonnette

Judging by its cross-section, this prototype is based on the maisonnette with a light well on Cherrier Street and the transformations that have been made to it. The half-basement is therefore treated as a separate unit and its surface area is larger in order to accommodate a second unit or office space. This unit, which takes full advantage of the lower yard in the front, also has a private inner court in the rear. The levels and volumes have been adjusted to create several quality outside spaces for each of the housing units. Along the lane, a double garage ensures privacy and closes off the yard, while the space above that has been created can be used as a workshop or an office. It remains to be seen when these garages can be used in Montréal as additional units for parents or teenagers.

Access and Traffic

In addition to protecting the unit from the cold, the vestibule is a transition space which should be maintained. When combined with the staircase in the main hall and a powder room just underneath the stairs, the vestibule helps create a room where visitors can be greeted. There is no vestibule per se in the basement, as people enter directly through a small office. The workshop and the garage have been designed for shared or exclusive use, depending on whether there are one or two owners. Lastly, the footpath linking the backyard to the lane has a gate between the garage and the neighbouring property.

Design Flexibility

Living areas
Grouping living areas together does provide for shared lighting and ventilation, easier circulation and increased flexible design. Ever practical, the traditional double living room has been restored and can open out in the front or in the back of the unit. The dining room can be subdivided with the living room or an office. A rather recent layout innovation, the living room/kitchen/dining room triangle is popular with many buyers and is a highlight of this plan. However, some prefer the physical separation and sound insulation of the dining room in order to retain a more solemn atmosphere. This room can be separated by French doors, for example.

Bedrooms
The upper unit has three bedrooms on the floor, and a possible fourth on the ground floor. The master bedroom has a small living room/office which opens onto a front balcony. The unit in the half-basement has two large bedrooms and a small office adjacent to the main entrance hall.

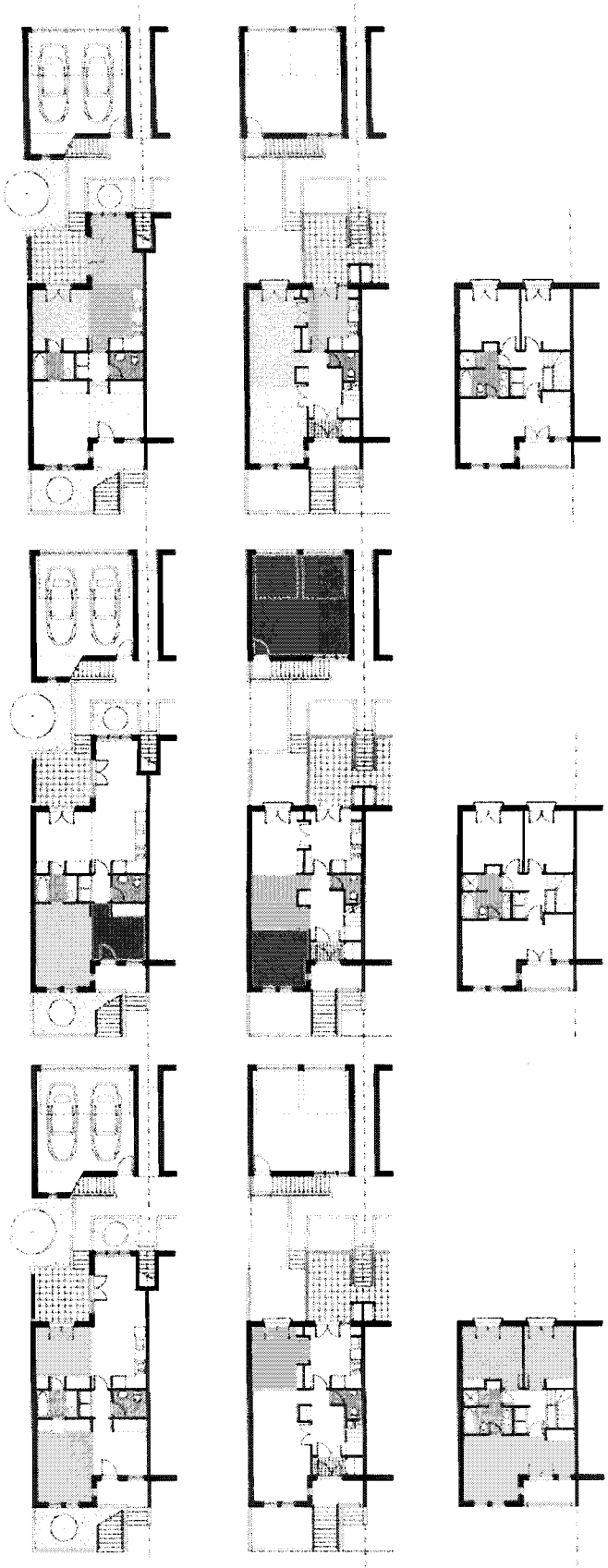
Water cabinets
According to tradition, water cabinets have been located in the middle of the unit to separate the functions performed in the front and the back and to allow natural light into the larger rooms. On the floor where the bedrooms are located, the bathroom is directly accessible from the master bedroom and the secondary rooms through the hall. The bathroom also has a shower which is separate from the bathtub, and a laundry room has been fitted up on the floor to avoid having people going up and down the stairs.

Yard and Deck

Each unit has living areas with many windows and which open onto a large deck, the "exterior room" which is such a big hit with city dwellers. Trees and bushes can be planted in the large grassy area in the back yard. Ideally, one tree could be planted for each unit.

Flexibility Offered by the Unit

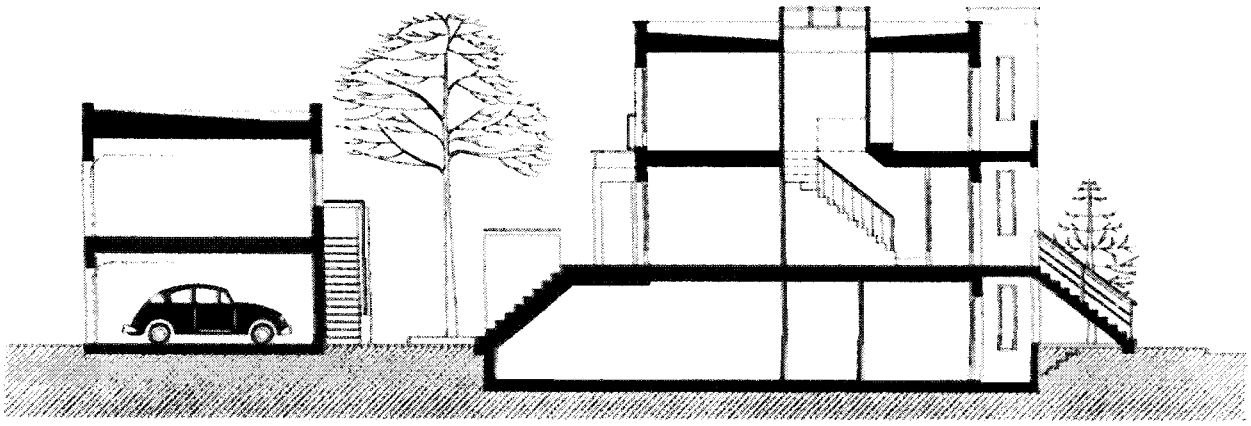
Design options for the renewed maisonnette



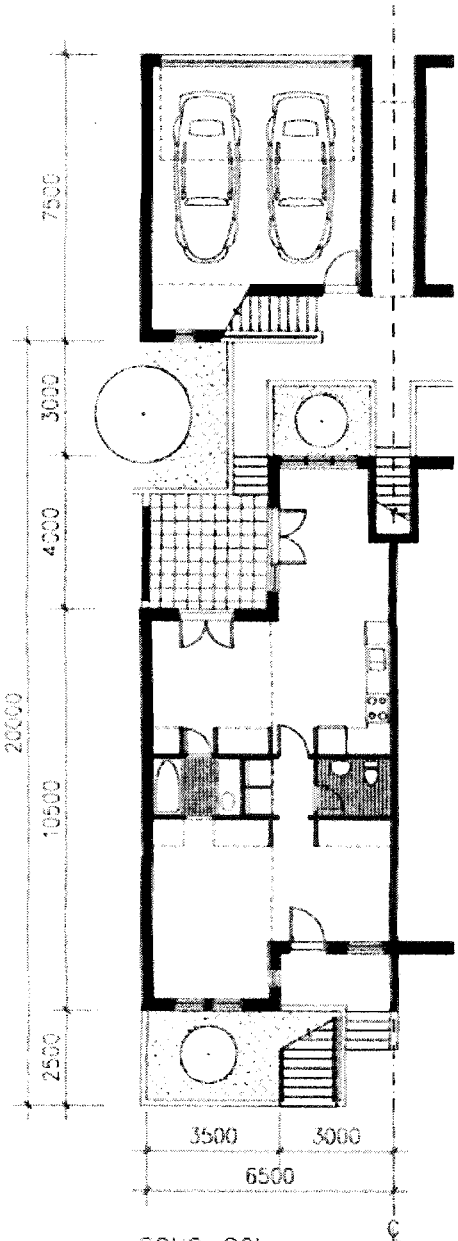
Living areas
Living room, dining room, kitchen.

Work areas
Home office, workshop.

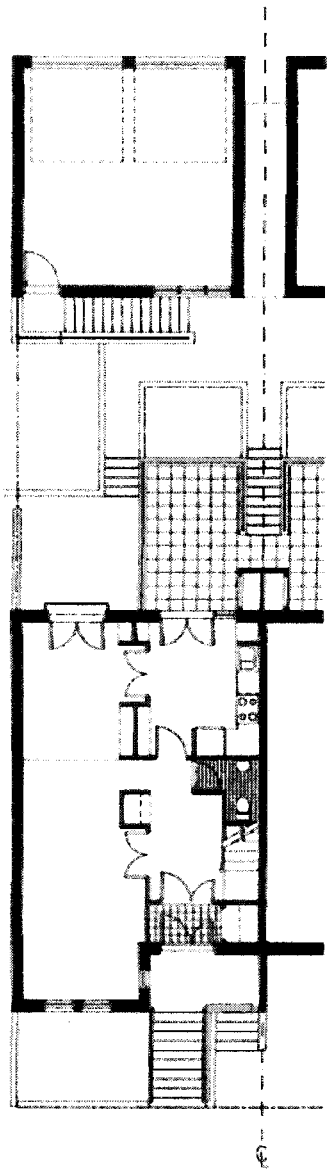
Rest areas
Master bedroom.
Secondary bedrooms.



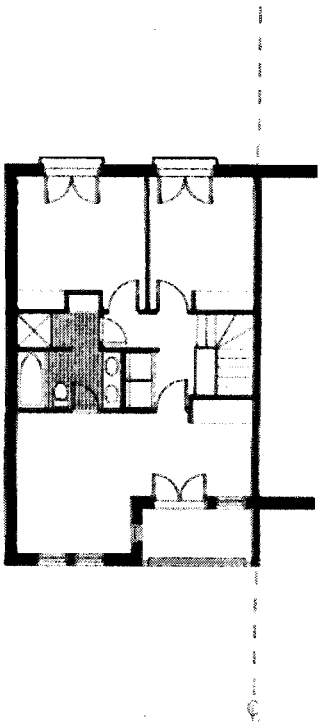
COUPE DE LA MAISONNETTE
1:200



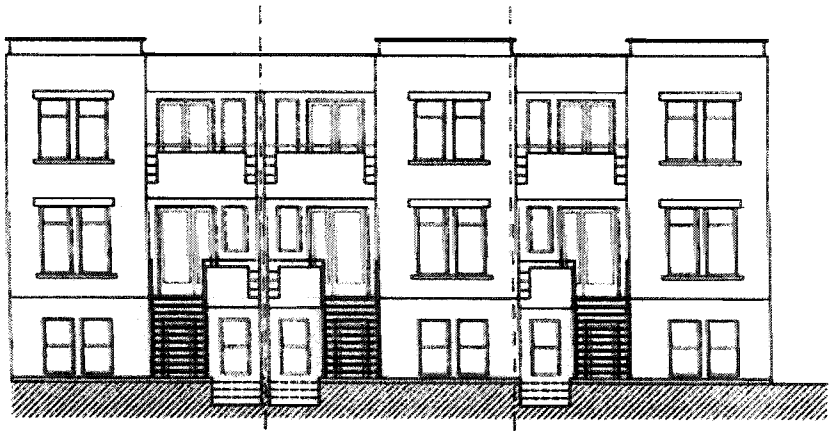
SOUS-SOL
1:200



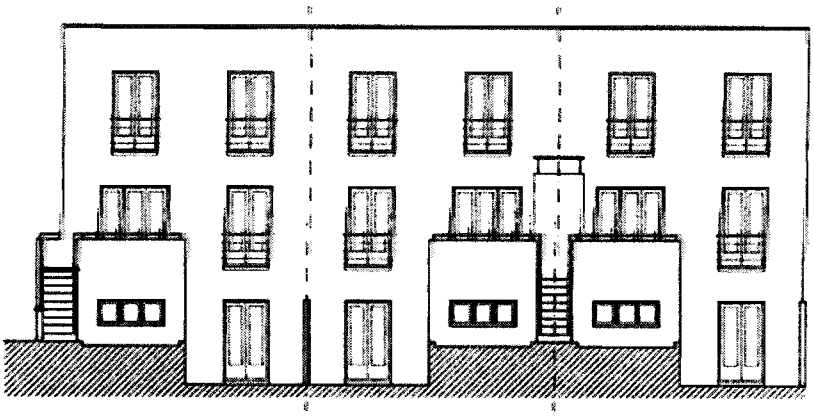
REZ-DE-CHAUSSÉE
1:200



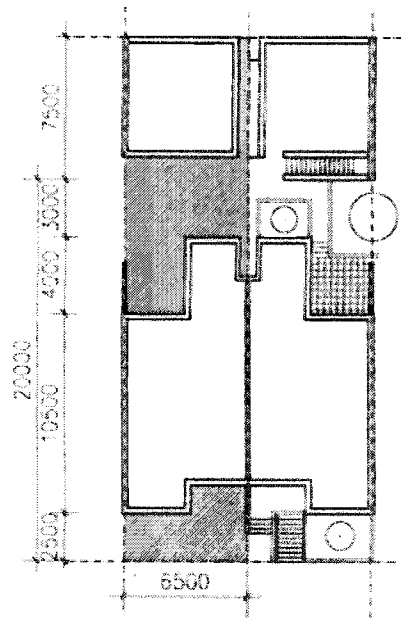
PREMIER ÉTAGE
1:200



ÉLÉVATION AVANT 1:200



ÉLÉVATION ARRIÈRE 1:200



IMPLANTATION 1:400

The renewed maisonnette

Land surface area (6.5 x 20 m)	130 m²
with garage (6.5 x 27.5 m).....	179
Siting surface area	
Main building	77
Accesory building.....	39
Total.....	**116 m²**
Building/site ratio	
Main building (77/130 m²).....	59%
With accessory building (116/179 m²)	**65%**
Net surface area of floors	
Half-basement.....	67 m²
Floors (2).....	56
Workshop on floor, garage.....	30
Total ...	209 m²
Garage.....	34 m²
Liveable Floor Area Ratio	
FAR (209/179 m²).....	**1.17**

The Renewed Duplex

Given the great flexibility it offers and the room it allows for the automobile inside, this prototype is based on the duplex on Terrasse Guindon. The larger of the two units occupies two levels, including a half-basement which could house teenagers, grandparents or a workshop/office. The indoor garage is also located on this level. The unit on the floor can provide one, two or three bedrooms for its occupants, depending on whether they are a couple or co-tenants. To preserve the integrity of the front yards, car access to the garage from the lane has been proposed, but depending on the urban setting, street access could be another possibility.

Access and Circulation

Given the limited width of the house, the main corridor is still an advantage, as it allows for an effective distribution of functions. Both units on the floor share a large staircase at which point the transition from public to private space occurs. Access can be gained to each of the units in the basement underneath this common staircase both in the front and in the back.

Flexible Design

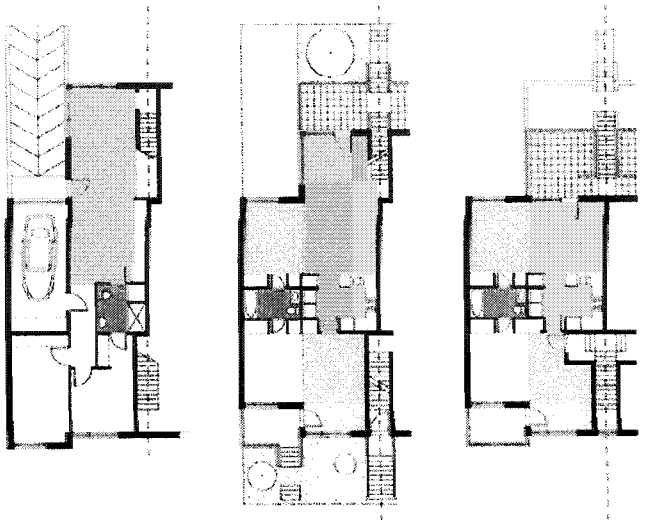
Depending on the location, lighting and noise conditions, the living areas and the bedrooms can be set up in either the back or the front of the building. On the ground floor, either of the rooms in the front would be particularly ideal for a home office, which can be easily separated from the rest of the unit. This large space can be subdivided by mobile partitions in various ways.
On the floor, the kitchen and dining room open onto a living room, unless a clearer distinction between these rooms is preferred.

Access to the basement is level with the back yard is readily accessible to persons with limited mobility or in wheelchairs. A washroom and a kitchenette could make this level partially self-containing, which could accommodate grandparents or a person with a physical disability with a vehicle. In this case, closing the interior staircase and designing a light well with an entrance door on the street side would make this level fully independent.

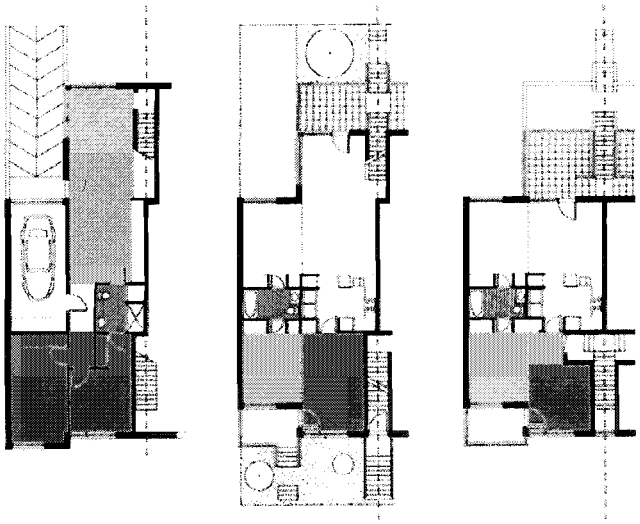
Yard and Deck

The ramp to the garage takes up a major part of the yard, but grass could be planted in the centre in order to make it appear more appealing. As for the garage, it can be converted into living quarters or a workshop. The decks on the upper floors are protected from the summer sun by trees or can be converted into verandas in order to prolong their use during the cold seasons.

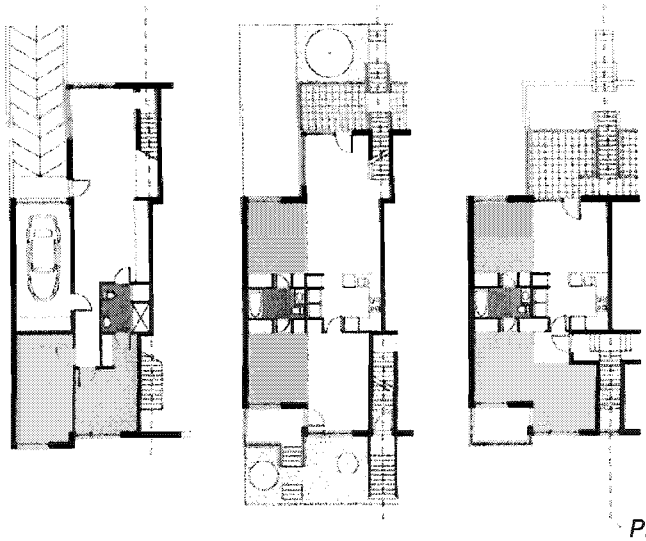
Flexibility Offered by the Unit
Design options for the renewed duplex



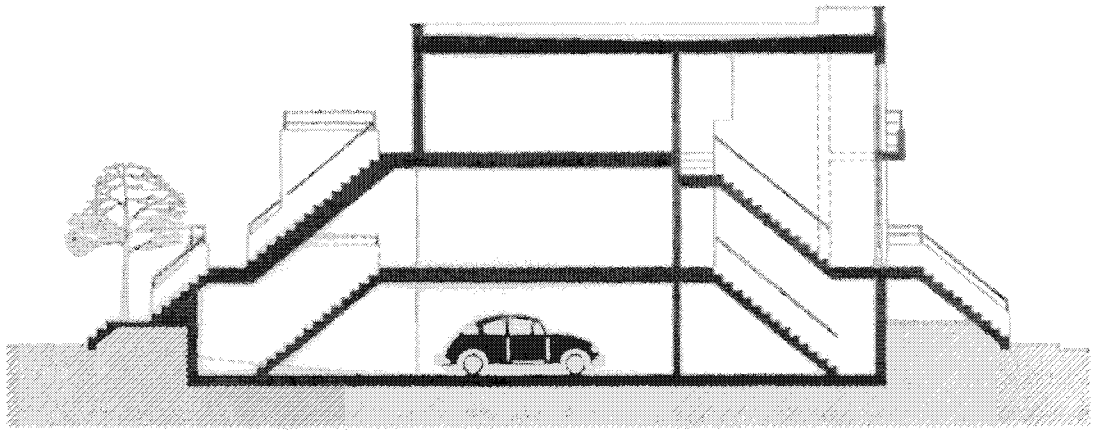
Living areas
Living room, dining room, kitchen.



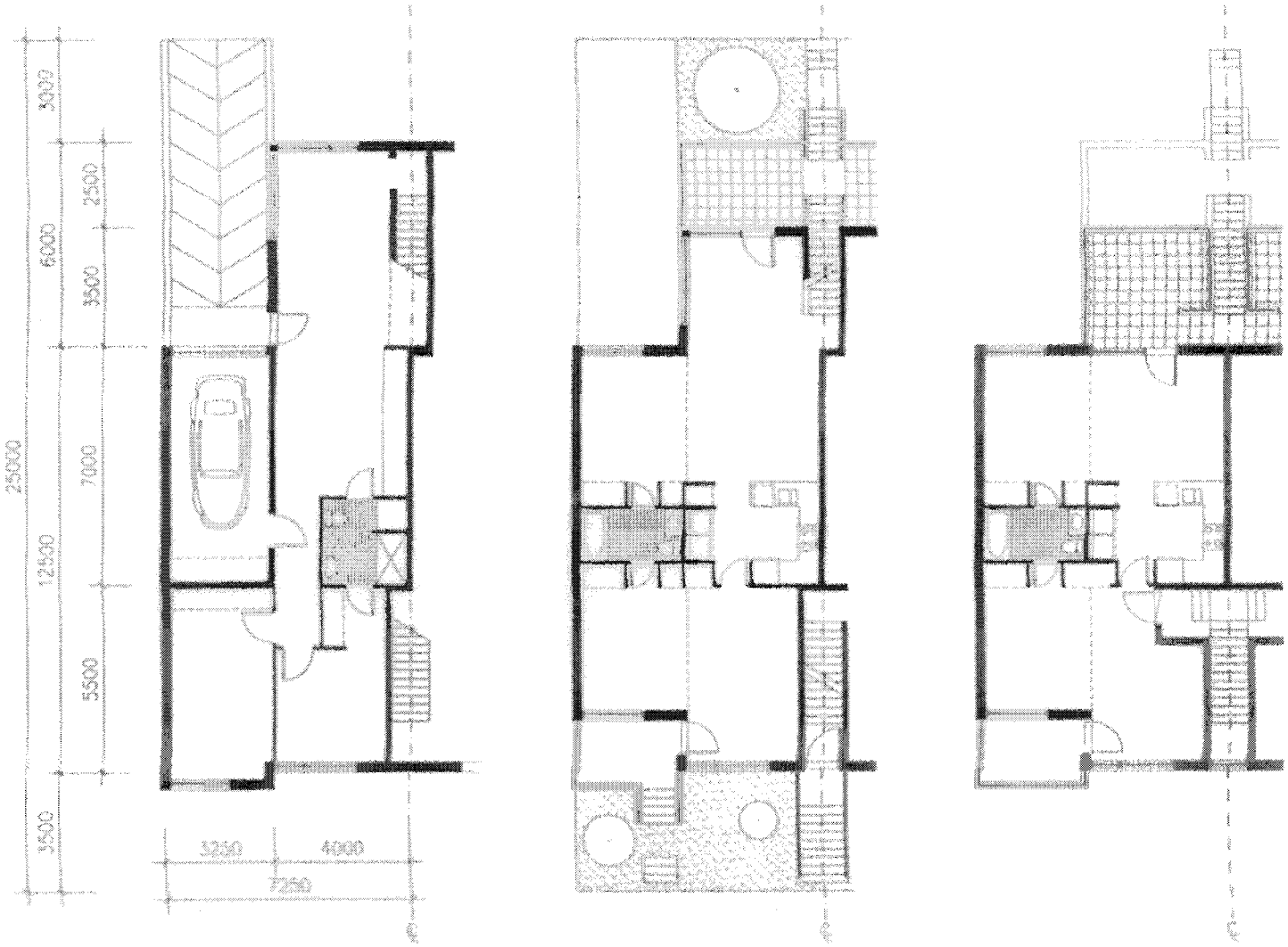
Work areas
Home office, workshop.
Work space.



Rest areas
Master bedroom.
Secondary bedrooms.



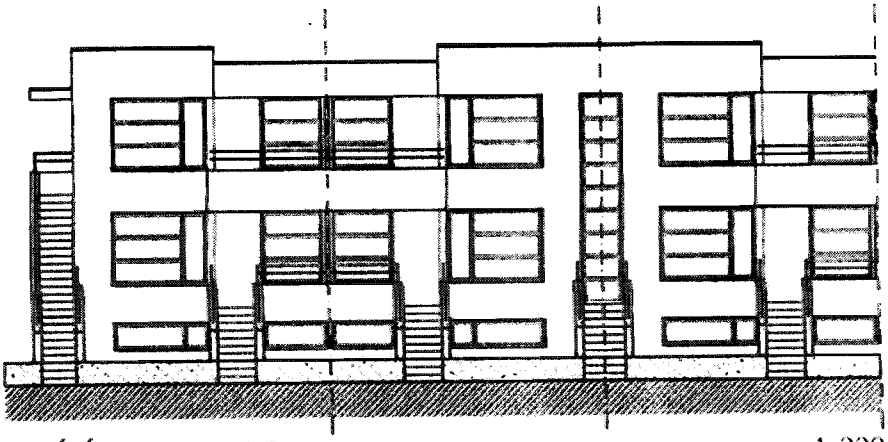
COUPE DU DUPLEX
1:200



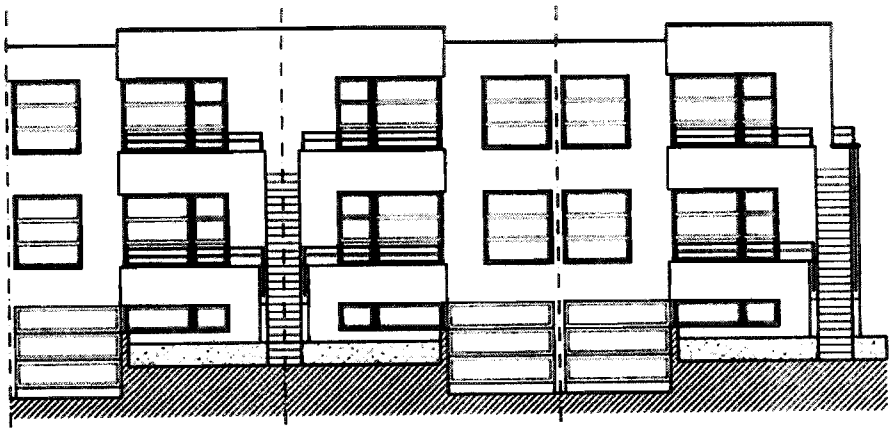
SOUS-SOL
1:200

REZ-DE-CHAUSSÉE
1:200

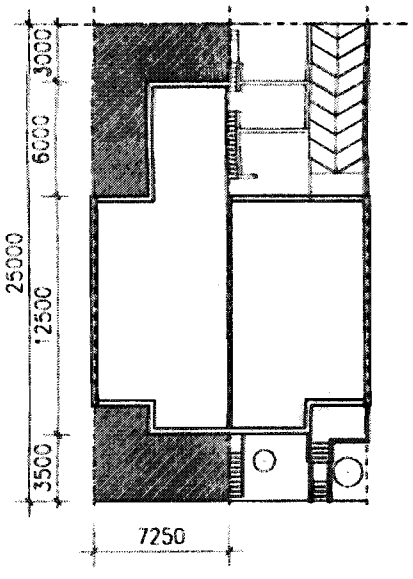
PREMIER ÉTAGE
1:200



ÉLÉVATION AVANT 1:200



ÉLÉVATION ARRIÈRE 1:200



IMPLANTATION 1:400

The renewed duplex

Land surface area (6.25 x 25 m)	181 m²
Siting surface area	116.4 m²
Building site ratio (116.4/181 m²)	**64%**
Net surface area of units	
Ground floor	84.7 m²
Half-basement	103.8
Second floor	72.1
Total.....	260.6 m²
Livable Floor Area Ratio	
FAR (260.6/181 m²)	**1.44**

The Renewed Triplex

As shown earlier, the typical triplex has the widest floor areas of all attached housing units. The L-shaped layout allows for adequate lighting and ventilation of spaces in the rear of the building. The following changes have been proposed for the renovated triplex: the centre of the unit is clear in order to improve circulation and offer more flexibility with respect to room layout and design. The articulated volume in the rear of the building is intended to ensure the privacy of exterior living spaces. Space has been provided on the lane side in order to comfortably accommodate three vehicles.

Access and Circulation

Each unit has its own entrance door on the facade. The ground floor unit has a small vestibule, the unit on the second floor opens onto a wide hall, and the third-floor unit is accessed from the second floor by a long staircase which opens onto the hall above. The first two levels can easily accommodate a home office with the addition of a side door on the outside and even be given its own street address. If a decision is made to set up a home office, adding a door half way down the hall would ensure the privacy of the home area. The main hall remains one of the most effective solutions, given the limited size of the units and the way in which it segregates the various functions. On the third floor, the room at the front can open completely onto the staircase, and with exits opening onto the staircase and the balcony, it can be a very dynamic living or work area.

Flexible Design

Living areas
The front room offers a high degree of design flexibility, as it can be used as a living room, bedroom or office. In the rear, the L-shaped configuration of the building allows for the creation of a vast versatile space which can accommodate a living room/kitchen/dining room combination and open out onto a deck. The kitchen can remain open to the other rooms or be closed, depending on the occupants' taste. These living areas, which are mostly glassed in, provide good lighting and ventilation.

Bedrooms
This layout is most flexible, as bedrooms can be fitted up in all four corners of the unit. For example, if the space adjacent to the kitchen is made into a bedroom, the back of the unit would be freed up for a combined living area along the long continuous space. As for the unit on the third floor, the mezzanine could also be used as an additional bedroom.

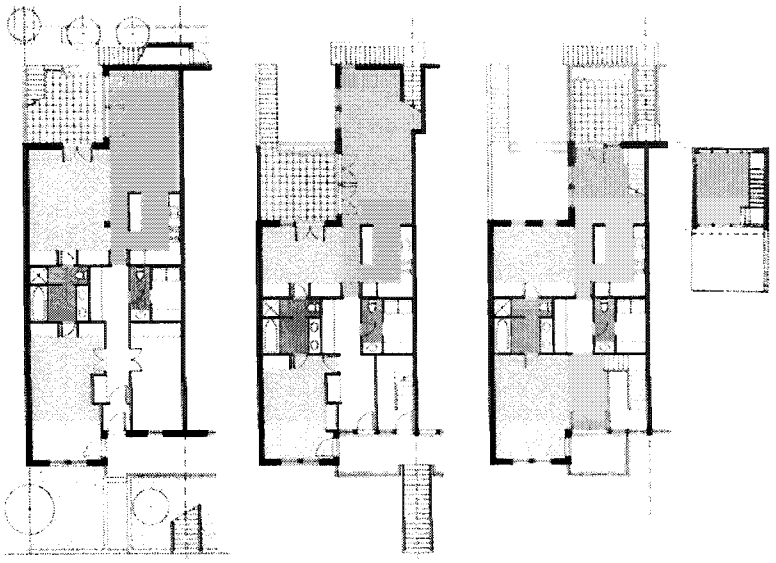
Washrooms
All washrooms are located in the middle of the unit and fitted up to accommodate various configurations. The largest washroom is equipped with a separate shower and is accessible from both bedrooms. The laundry room and a secondary bathroom open directly onto the hall.

Yard and Decks

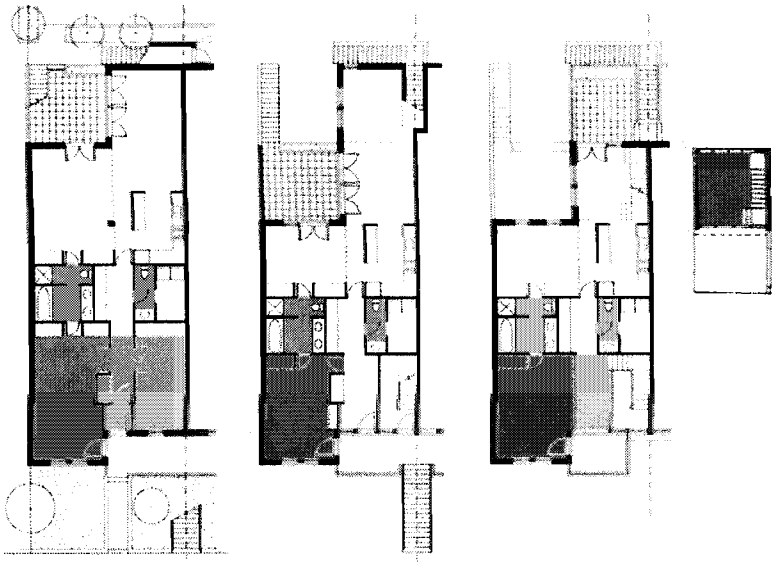
One of the most pressing needs in plans to improve the triplex model is integrating the larger exterior living areas. Older, rather narrower porches are therefore replaced with large rear balconies in the square layout to create exterior rooms. Since they communicate directly with the kitchen or dining room, these decks provide a most pleasant area for people wishing to eat outside in the summer. The rear volume of the house has been organized to accommodate three exclusive roof decks. Depending on the orientation, sunshine and an individual's privacy can be controlled if pergolas are planted and a seasonal canopy is installed. In addition to these decks and the back yard, this prototype suggests that the main roof be used to take advantage of this space which normally goes unused. The three parking spots on the lane side are shielded by a series of trees.

Flexibility Offered by the Unit

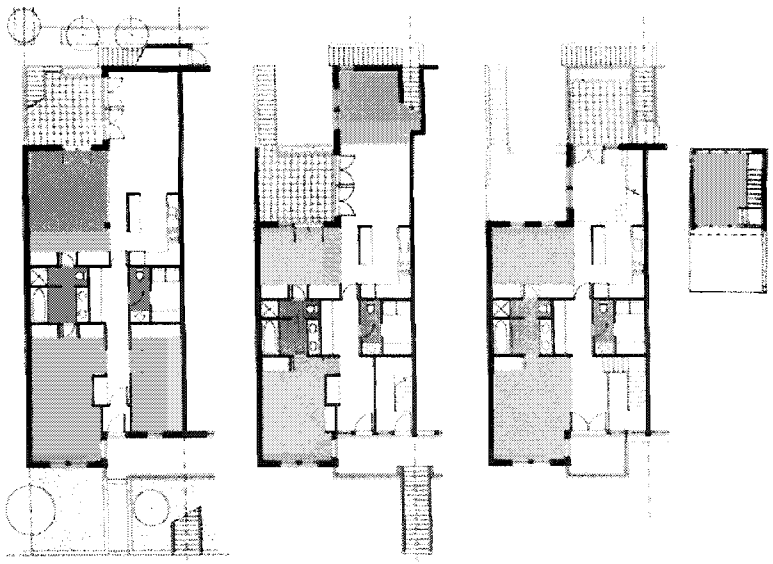
Design options for the renewed triplex



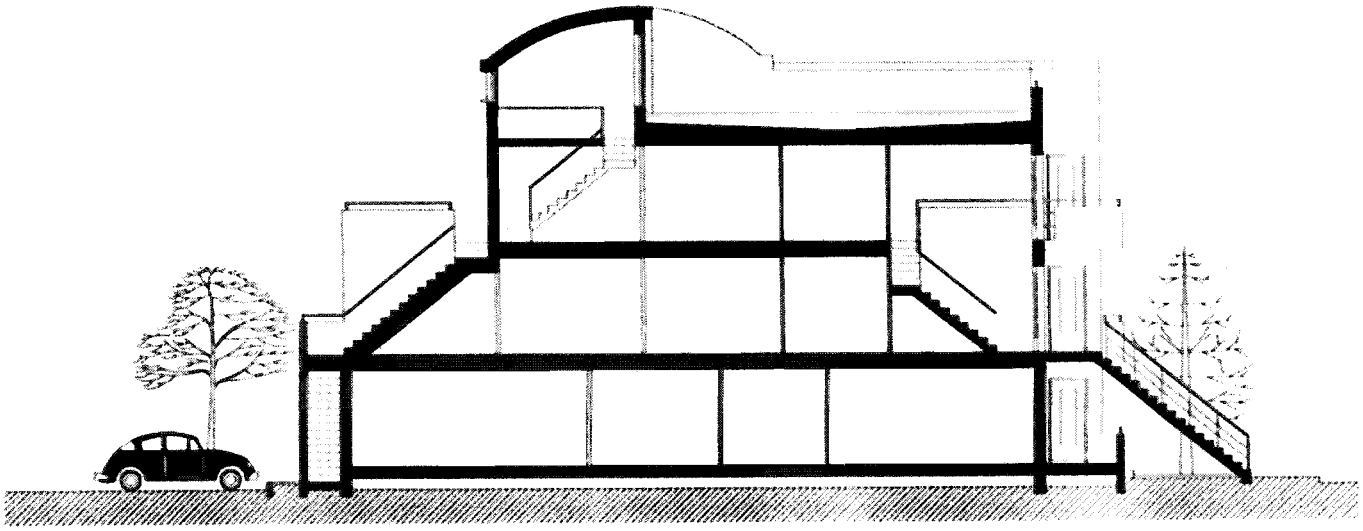
Living areas
Living room, dining room, kitchen.



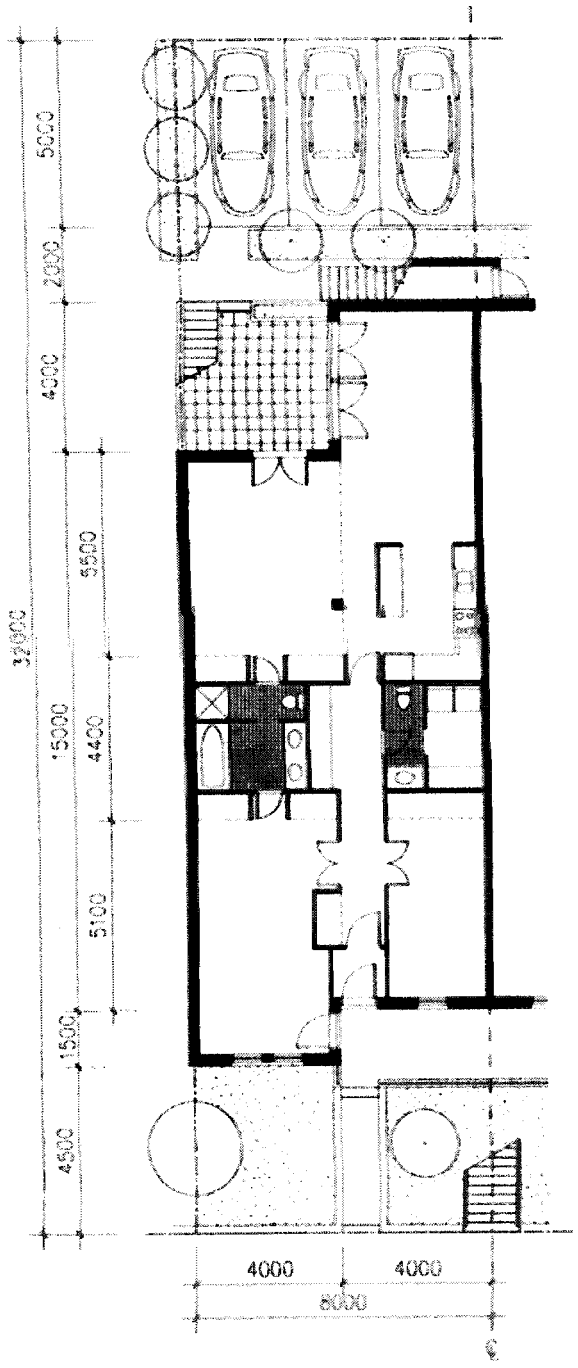
Work areas
Home office, workshop.



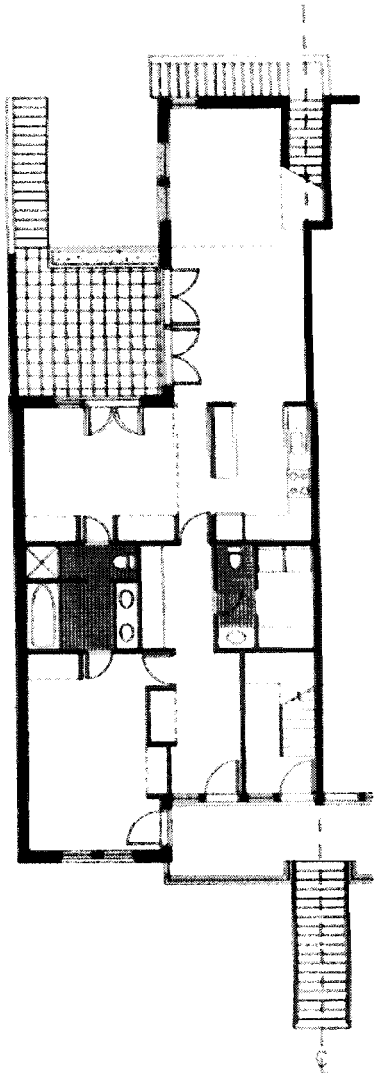
Rest areas
Master bedroom.
Secondary bedrooms.



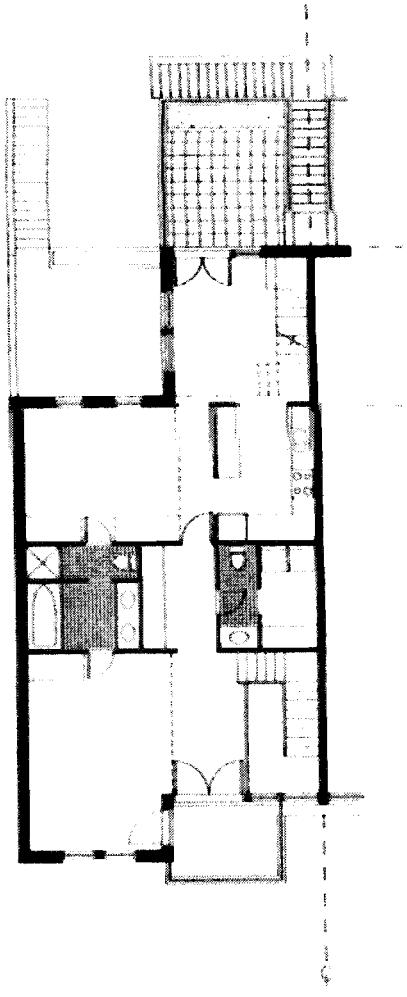
COUPE DU TRIPLEX
1:200



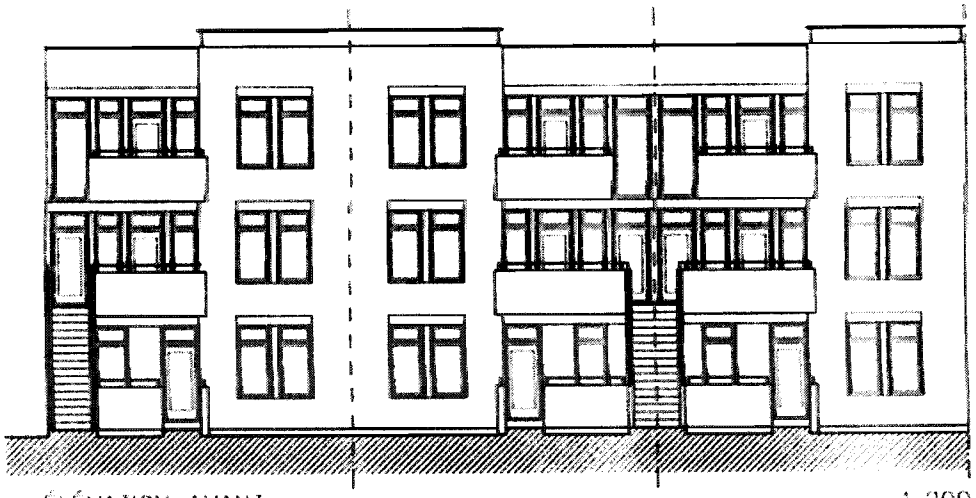
REZ-DE-CHAUSSÉE
1:200



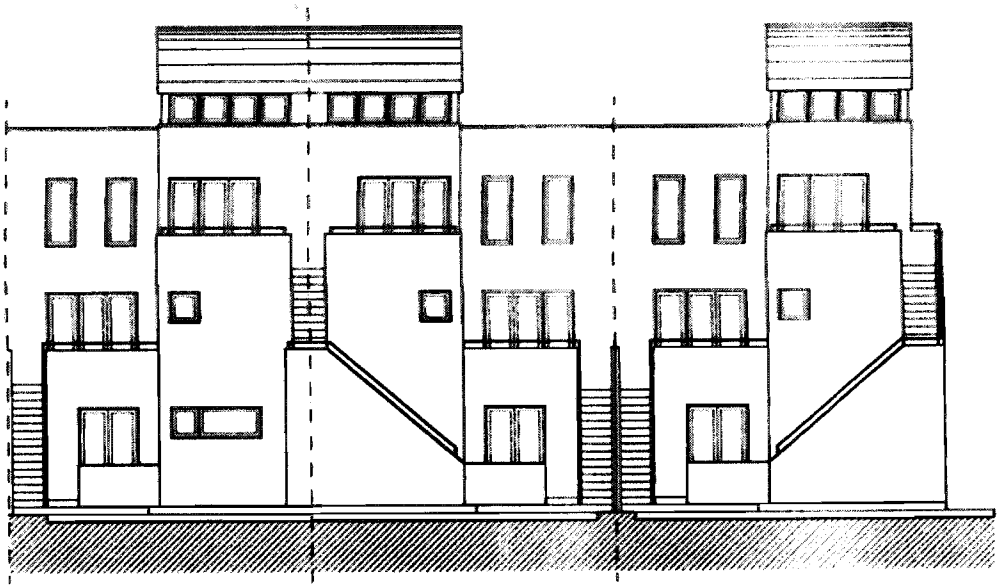
DEUXIÈME ÉTAGE
1:200



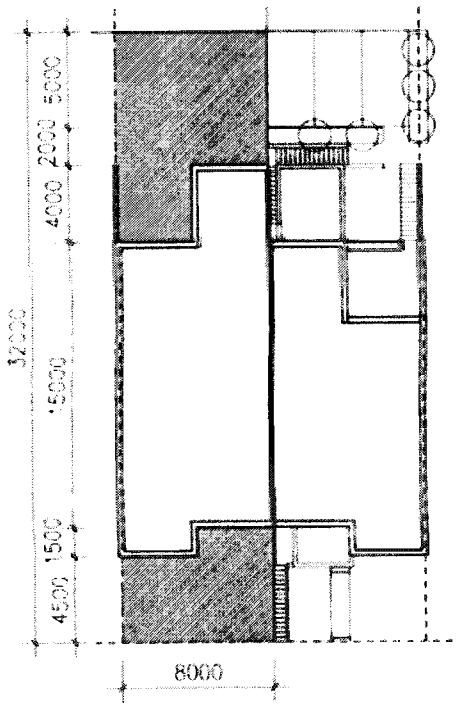
TROISIÈME ÉTAGE
1:200



ÉLÉVATION AVANT 1:200



ÉLÉVATION ARRIÈRE 1:200



IMPLANTATION 1:400

The renewed triplex

Land surface area (8 x 32 m) ..... 256 m²

Siting surface area

Main building.....	142
Accessory building.....	5
Total	147 m²

Building/site ratio (147/256 m²) **57%**

Net surface area of units

Ground floor.....	128.7
Second floor	104
Third floor	89
Mezzanine	9.5
Total	331.2 m²

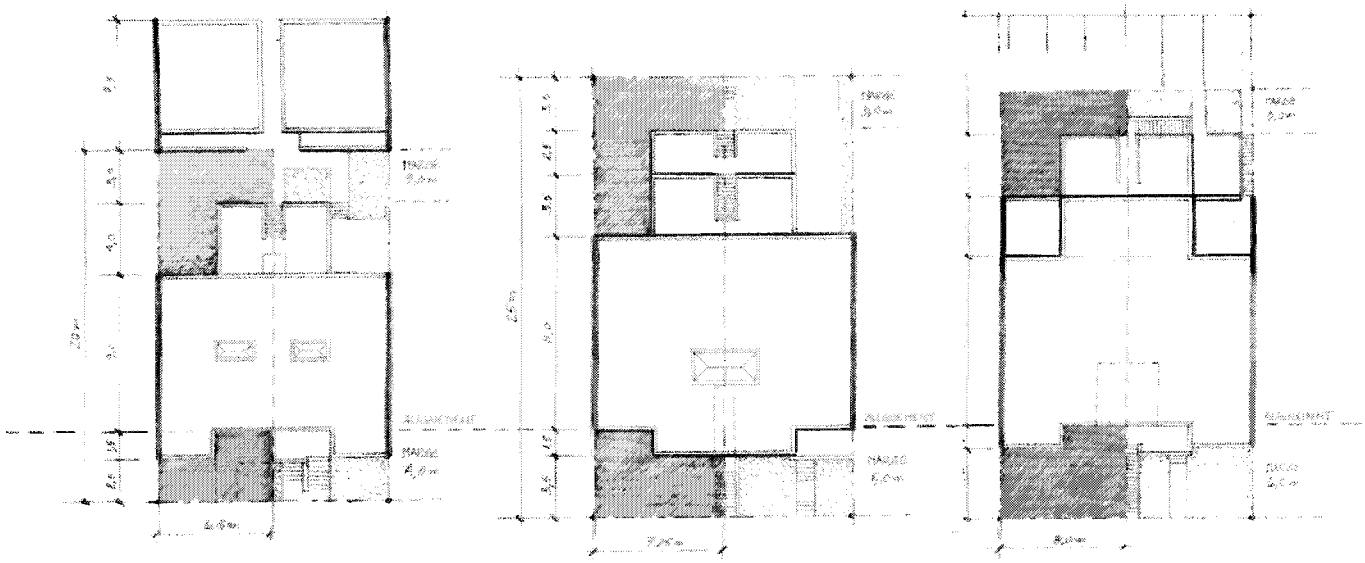
Livable Floor Area Ratio

FAR (331.2/256 m²) **1.29**

SUBDIVISIONS

As was discussed in the presentation of Montréal's urban setting,[2] the delineation between public property, front yard transitional space and the domestic space of the back yard is very important in the traditional attached housing subdivision. From either side of the street, the alignment and height of the buildings define the urban scale of the complex. The front yard ensures passage from the street to private property on which stairs, balconies and porches (semi-public use) are erected in what is often a very confined area. The backyard is, by nature, more private and represents an extension of the inside living space of the unit. Finally, the volume, the rhythm of the facades, the quality of details and materials come together to define the built-up landscape of the city.

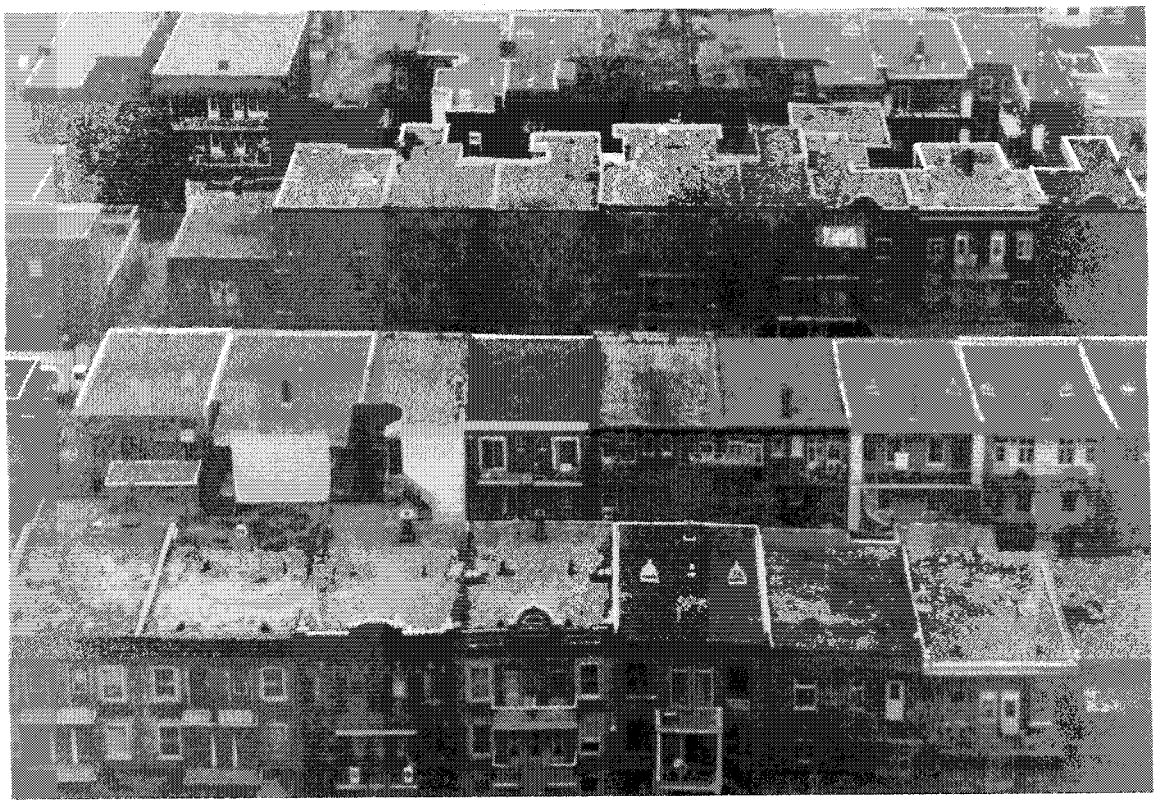
Given its undeniable qualities, the traditional subdivision merits serious consideration vis-à-vis the construction of higher density neighbourhoods. We favour maintaining the traditional subdivision and its relations with streets and lanes in order to build renewed *plex* housing units previously presented. Some changes were made to make it easier to fit up the rooms, ensure good traffic flow in the stairs and halls of the units and incorporate a reasonable number of parking places.



Maisonnette *Duplex* *Triplex*

TYPICAL LOTS (Scale – 1:400)

[13] See: *Montréal, un modèle d'architecture urbaine, p.13-14.*

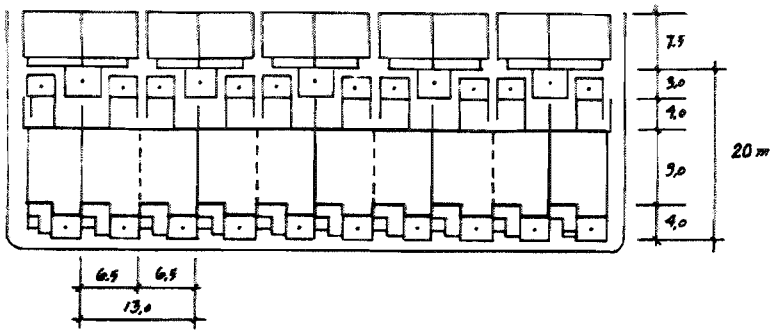


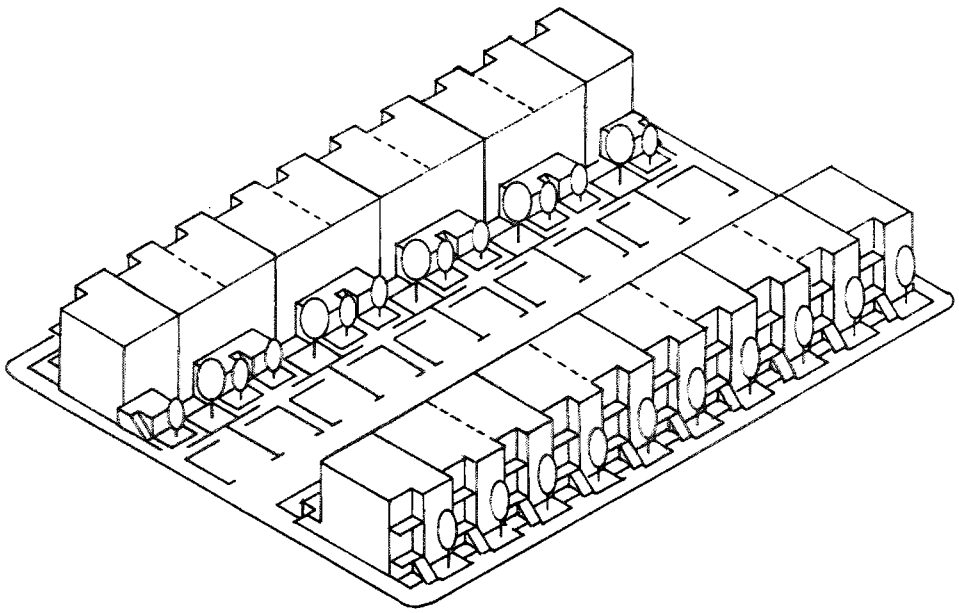
Maisonnette Block

Overview: a volumetric view of the flank of a maisonnette block.

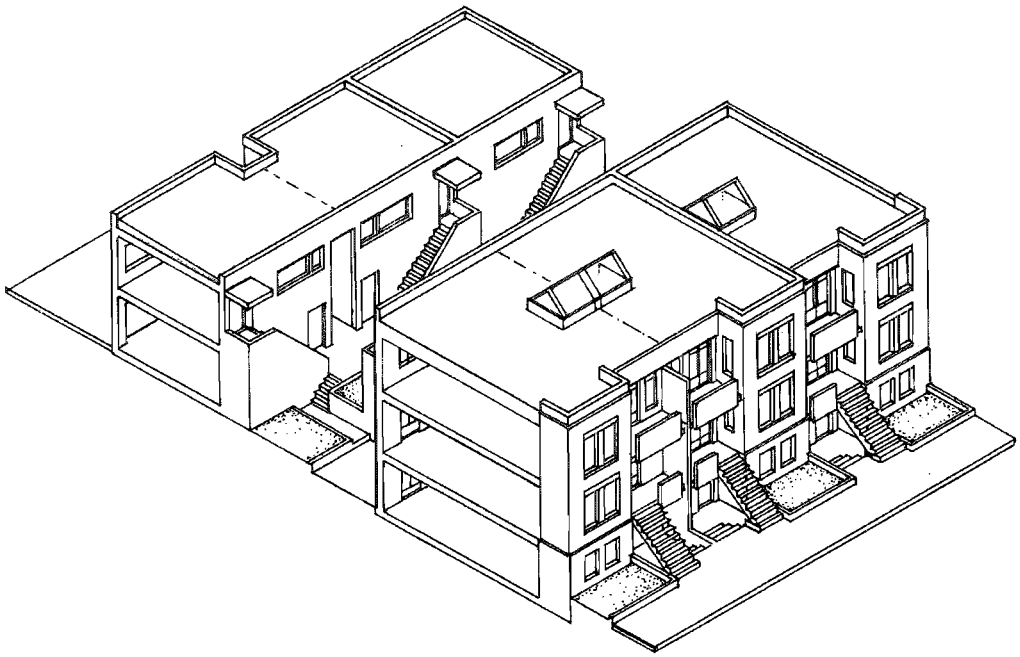
Density Achieved: 76 to 78.5 housing units per hectare[3] with garages at the head of the block; 69 housing units with general area garages.

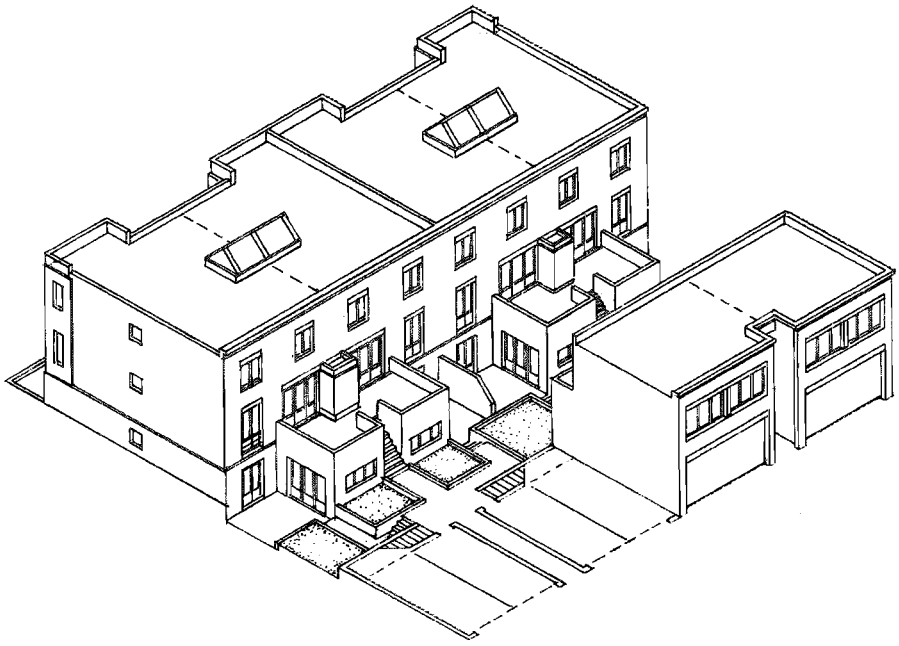
Following Page: 4 units, as seen from the lane; 3 units, as seen from the street.





[14] 1 hectare = 10 000 square meters = 2,471 acres



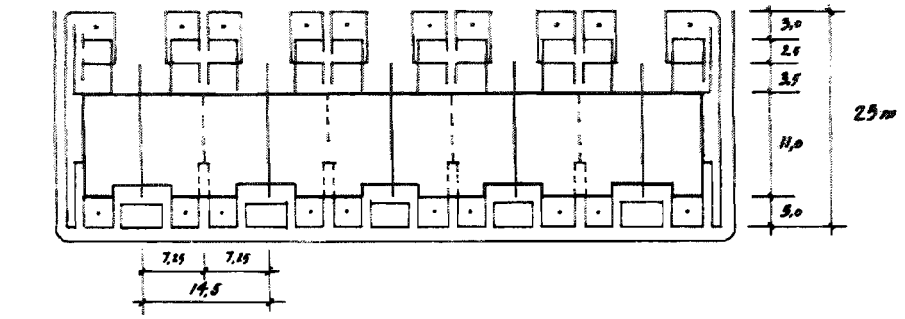


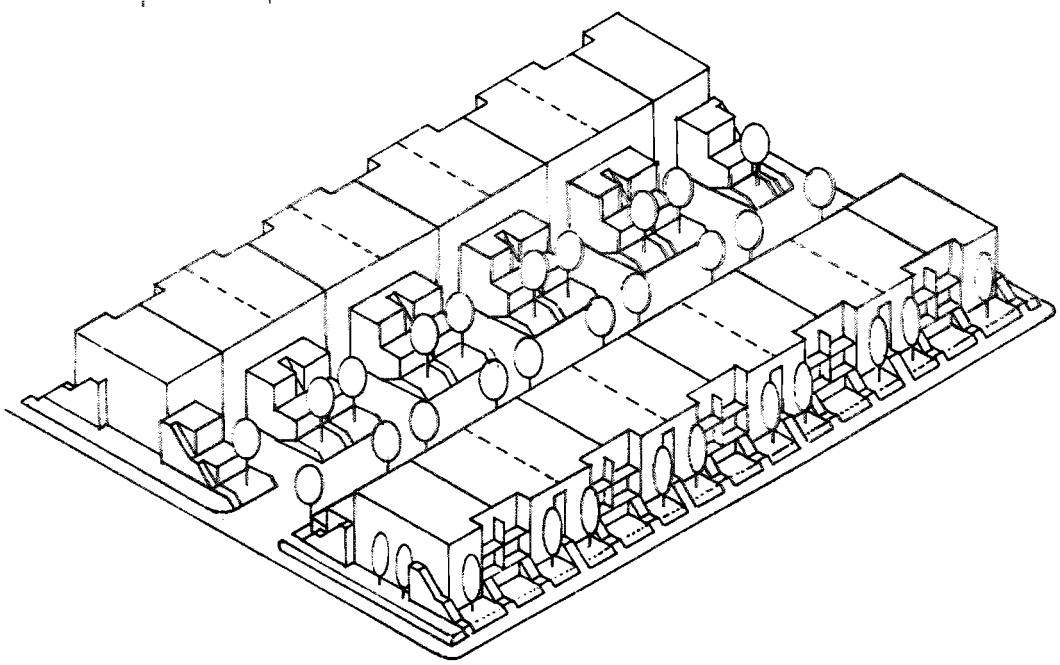
Duplex Block

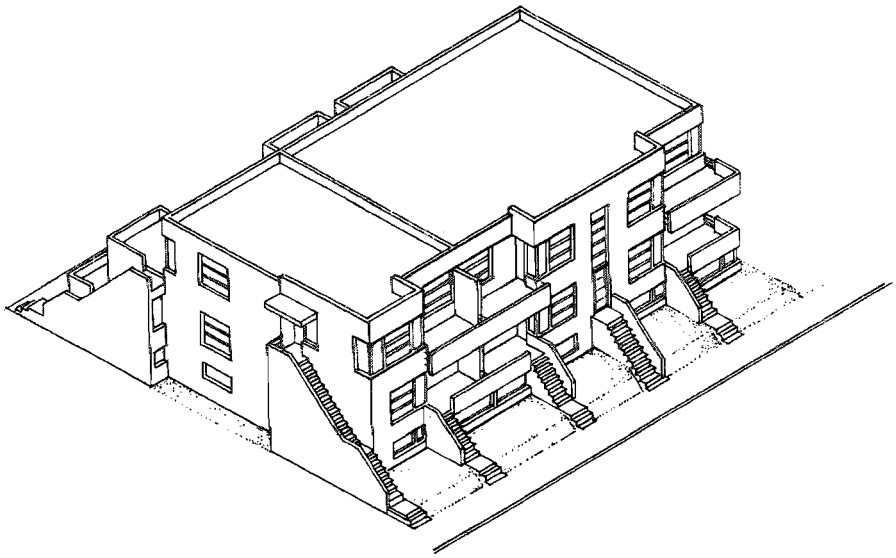
Overview: a volumetric view of the flank of a duplex block.

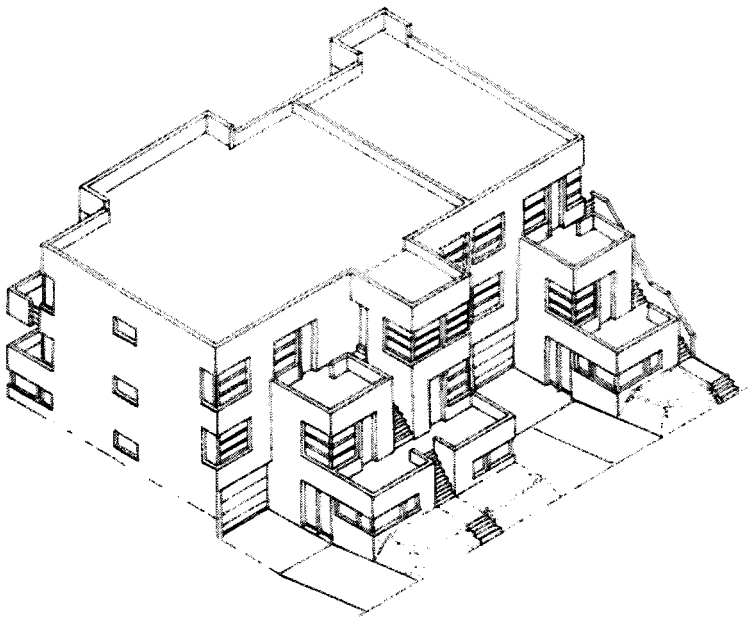
Density Achieved: 61 to 62 housing units per hectare, with 1 indoor parking space per unit.

Following Page: 3 units, as seen from the street and from the lane.







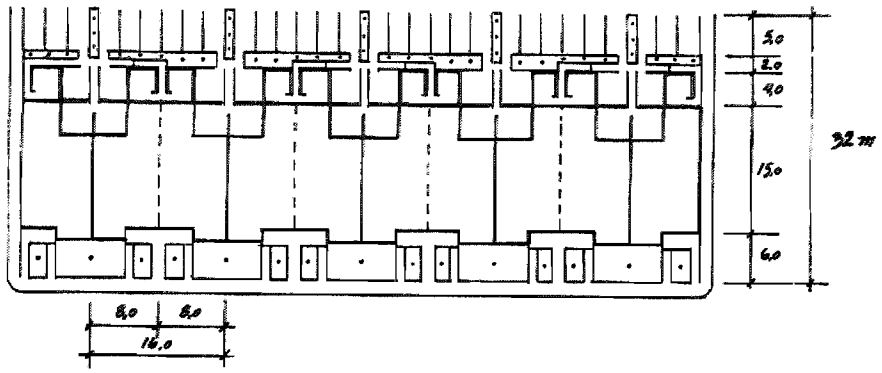


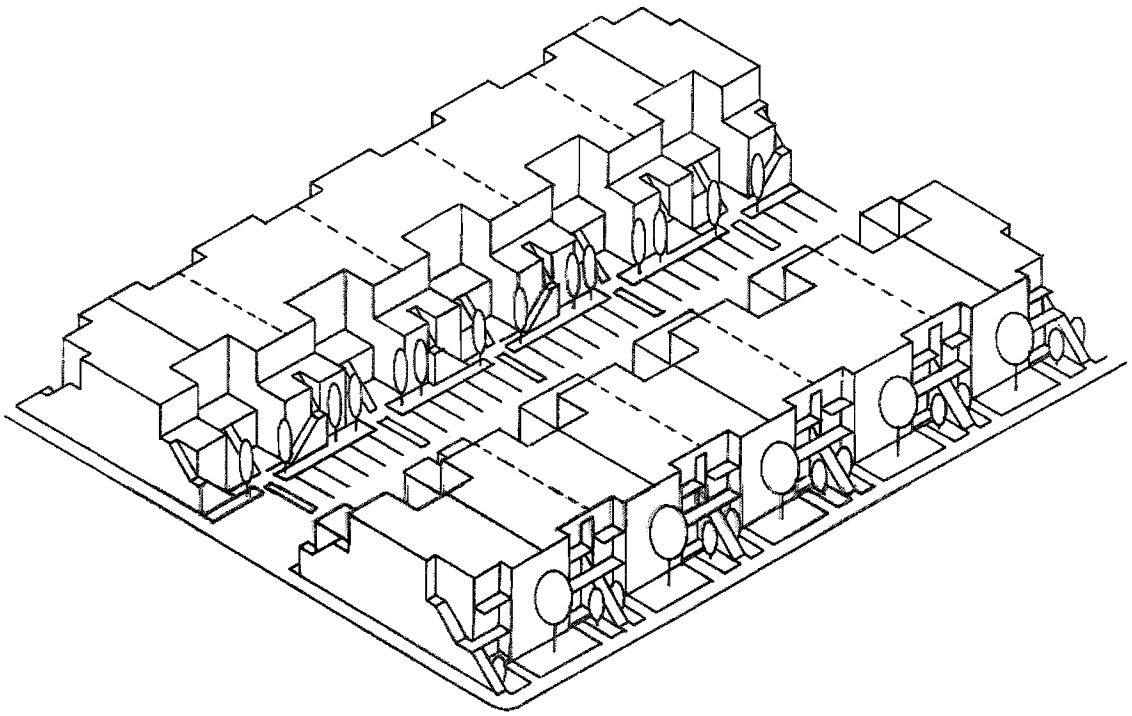
Triplex Block

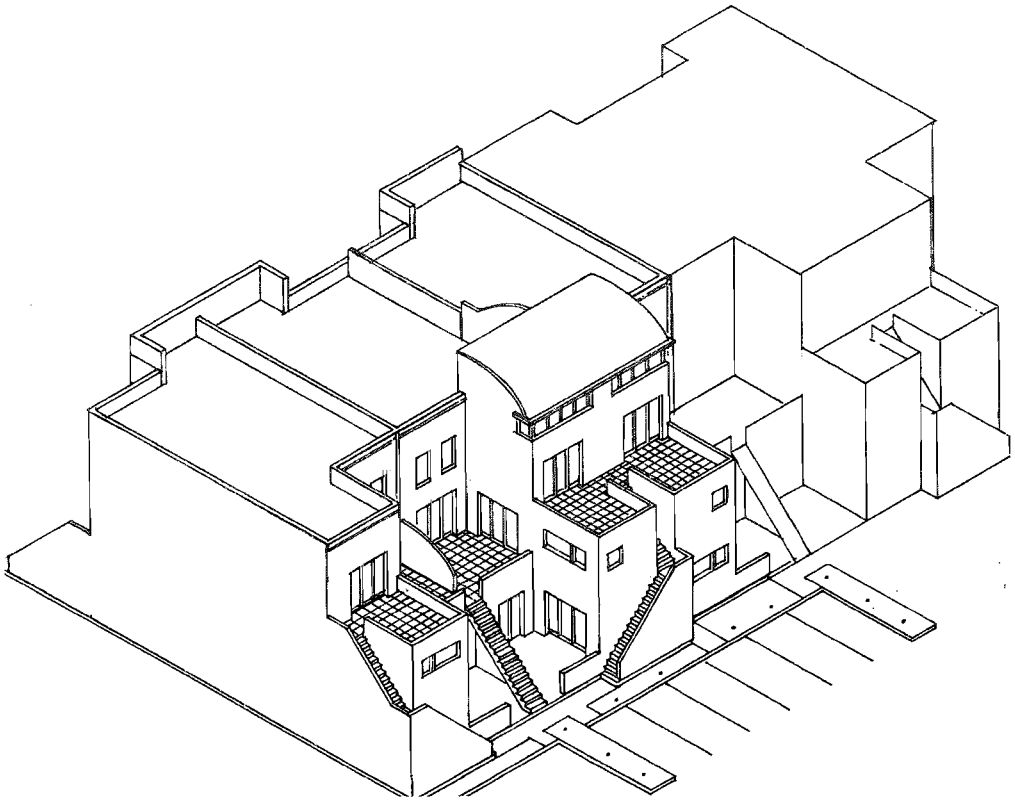
Overview: a volumetric view of the flank of a triplex block.

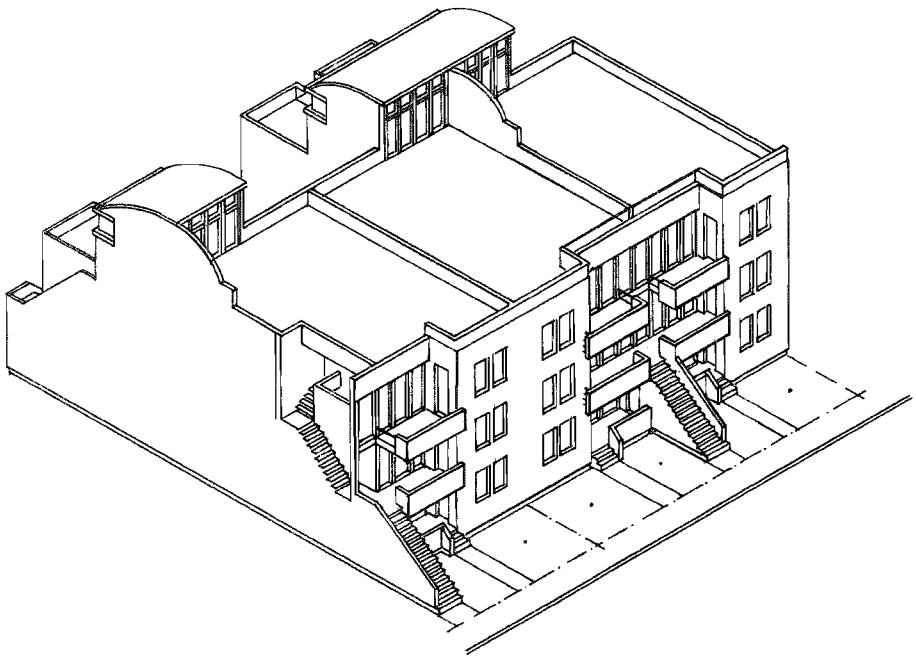
Density Achieved: 73 housing units per hectare, with three parking spaces in the rear per triplex (at the head of the block);70 housing units per hectare with general parking in the rear.

Following Page: 3 units, as seen from the street and the lane.









CONCLUSION

Attached housing units are found in most major cities and they are an integral part of their history and development. In Montréal, this type of housing is so consistent to this day that it seems essential that we understand the original forms, workings, civic values and savings principles.

With its many formal variations and spacial layouts, *plex* housing has accommodated families of varying social groups from the outset. Yet, a few years ago, promoters and private citizens alike did not think too highly of attached housing units were demolished or extensively renovated. The *plex* did survive however, and today an ever-increasing sensitivity to architectural heritage has prompted an overall appreciation of its qualities. As people continue to live in this housing which is typical of the City of Montréal, it has proved to be a model of considerable value, although improvements can be made to take account of some more contemporary requirements.

After describing the urban context specific to Montréal, we analyzed a certain number of attached housing units that were built within a delineated area, namely, the Plateau Mont-Royal. We were able to quickly group these buildings into three separate categories or archetypes—the *maisonnette*, the *duplex* and the *triplex*. We analyzed each component to gain a better understanding of the particularities of each and we proposed improvements which take into account socio-affective values specific to *plex* housing and the values of our time. We placed emphasis on the symbolic potential of the public facade, the development of private yards and outdoor decks and the extreme flexibility with which the layout could be adapted to current lifestyles and forms of ownership. We had to explore various solutions that addressed these concerns in their own way.

This study, of course, can clearly serve as a guide when renovation work is undertaken and it can contribute, in a broader context and through renewed *plex* housing, to the quality of life in neighbourhoods that are consolidating or expanding, here and elsewhere.

BIBLIOGRAPHY

AUGER, Jules and ROCQUET Nicolas
Mémoire de bâtisseurs
Dessins de systèmes constructifs à Montréal aux 19e et 20e siècles
Exposition catalogue, Université de Montréal, July 1994.

BENOÎT, Michèle and GRATTON Roger
Pignon sur rue, les quartiers de Montréal
Guérin éditeur ltée, Montréal, 1991.

BISONNETTE, Lise et al.
"Un lieu dit Québec"
Special section on landscape, *Le Devoir*, October 26, 1996.

CHARNEY, Melvin
Pour une définition de l'architecture au Québec
Architecture et urbanisme au Québec, Conférences J.A. DeSève,
PMU, Montréal, 1971.

DUFF, Jocelyn and CADOTTE Francois
Logement et nouveaux modes de vie
Édition du Méridien, Montréal, 1992.

EVEILLARD, Catherine
Montréal, Côté Jardins
Master's thesis, Faculté d'aménagement,
Université de Montréal, August 1991.

FRIEDMAN, Avi and RYBCZYNSKI Witold
Urban Planning for Affordability, Rivière-des-Prairies
Affordable Homes Program, School of Architecture,
McGill University, Montréal, February 1991.

HANNA, David B.
New Neighbourhoods in Nineteenth Century Montréal
Occasional papers in Geography, No. 1
D.B. Frost Edition, Concordia University,
Montréal, 1981.

LARUE, Monique and CHASSAY Jean-François
Promenades littéraires dans Montréal
Québec/Amérique, Montréal, 1989.

LEDUC, Maryse and MARCHAND Denys
Les maisons de Montréal,
Mémoires pour l'an 2000 : Montréal, son histoire et son patrimoine
Ministère des Affaires culturelles du Québec,
City of Montréal, 1992.

LEGAULT Réjean
Architecture et forme urbaine à Montréal :
Le développement du quartier St-Jean Baptiste de 1870 à 1914
Master's thesis, Faculté d'aménagement,
Université de Montréal, August 1986.

MARSAN, Jean-Claude
Montréal en évolution
Fides, Montréal, 1974.

PEICHL, Gustav, STEINER, Deitmar et al.
New Housing in Vienna
An exhibition by the Austrian Ministry of Foreign Affairs
and the City of Vienna, 1986.

POGHARIAN, Sevag
SPROUT - The Versatile, Dynamic House
Canada Mortgage and Housing Corporation, 1995.

ROSSI, Aldo
L'architecture de la ville
Édition de l'Équerre, Paris, 1981.

SHOENAUER, Norbert
Cities, Suburbs, Dwellings in the Postwar Era
School of Architecture, McGill University,
Montréal, 1994.

Canada Mortgage and Housing Corporation
Two Decades of Innovation in Housing Technology 1946-1965
CMHC, Ottawa, 1994.

Teasdale, Pierre and Martin Wexler
"The Montréal 'Plex' – A One-Century Old Housing Form that continues to serve Montréalers well"
Open House International, Vol. 21, No. 1, pp. 40-46, 1996.