

CONSTRUCTION OF A ROSARIO DIGITAL RATIONALIST HERITAGE ARCHIVE USING AN ALTERNATIVE METHOD OF PERSPECTIVE RESTITUTION.

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KEY WORDS: perspective restitution, archive, architectural heritage, data base, digital work.

ABSTRACT

Our work deals about compiling a Rationalist Heritage Archive, here in Rosario, using a simple method of perspective restitution.

For researches and professionals who study urban cultural heritage, it's become a great help the access to graphic information of the different buildings. We consider that the work we're developing is a fast and effective way to construct a large archive that may include even the domestic architecture, so important in the city consolidation.

The digital archive allows professionals, students to consult active information instead of passive draws

The survey method proposed is as fast and accurately enough to let us reconstruct graphically the selected buildings.

Based in the perspective restitution of a conventional photograph and the knowledge of a few metrics facts, the alternative method proposed is developed in Autocad 14 through the followings steps:

A. Application of the photograph perspective restitution method

*Survey: taking the photographs, determination of the different reference plans, principal directions, etc.

*Control measurements: to allow the method and the ones need so as to know the accurately we gets during the perspective restitution.

*Angular measurements control.

Graphic steps

*Photograph digitalisation.

*Perspective restitution.

*Restitution itself.

B. Graphic documents building reconstruction

INTRODUCTION

Many researchers and professionals are dedicated to the study and conservation of the urban cultural heritage.

The archives and date base have become a great help at the time of value, transmit and protect the architectural heritage.

Organisations like UNESCO, ICOMOS, CIPA agree in the need of developed accurately and objective surveys, that may be the base of inventory works, historic, typological or morphological studies and preliminary register for restoration works.

The register efficacy depends not only in the rationalisation but in the optimisation of it too.

The photogrammetrie is the best method to record any architectural good but in an context such ours is impossible to think about it. Neither qualified personal nor the appropriate technology the expansive equipment are available here, so we always record "in situ".

Besides, sometimes, we're asked to make an accurate and quickly survey when a heritage building is going to be demolished.

Architectural heritage researchers, professionals, need graphic documents of the different buildings or urban fragments, those which are not considered as paradigmatic, singular ones, the domestic architecture. In our Municipal Archive (created in 1878) many documents have been stolen or tore them up, so a great number of buildings have no original graphic plans, not even later recorders to let us studied them.

Again photogrammetrie seems to be the right tool to use but us we have said it is not applicable.

In order to contribute to the development of an effective archive we proposed an alternative recorder method that allow us to offer active information.

THE PROJET

The present work propose the construction of a Rationalist Digital Archive, using an alternative method (developed in a graphic computer programme) of perspective restitution.

The idea of a digital archive is based in two facts:

- Researchers and professionals may consult active information instead of passive draws.
- After constructing the archive it will be possible to build a digital data base so as to introduce it in the university network (REDUR).

We think that information nets are the contemporary information way, indispensable nowadays, because it allows the decentralisation consult.

OBJETIVES

- . To compile an efficient Rationalist archive in Rosario.
- . To developed new tools, based in new technology, though contribute in the cultural heritage protection, enrich our traditional archive.
- . To research the incidence of new technology into traditional survey method.
- . To generate an accurately and low cost recorded instrument.

BUILDINGS SELECTION

It was necessary, before deciding the method we were going to use to survey the buildings, to established the guide lines that let us select them.

We began with the ones that, sharing the Rationalist lines, what we call Modern Movement, have no graphic documents.

Those examples have a common aspect, they present themselves as unitary composition that let a clear morphological lecture.(principal architectural elements).

As we were interesting in compiling a large archive, which include both the industrial and the domestic architecture, the guide lines proposed were based in historic, urban, morphological and anthropological facts.

The list was conformed as follows:

1. **La Comercial de Rosario.** Cia. de Seguros.
Oroño y Córdoba. 1939.
Arqs. De Lorenzi, Otaola y Roca. Figure 1.
2. **Edificio Gilardoni.**
Oroño y Rioja. 1938.
Arqs. De Lorenzi, Otaola y Roca. Figure 2.
3. **Edificio Unione e Benevolenza.**
Maipú y San Juan. 1943.
Arqs. Fernandez Diaz y Funes. Figure 3.
4. **Edificio De Bernardis.**
Oroño y Tucumán. 1940.
Arqs. De Lorenzi, Otaola y Roca. Figure 4.

Figure 9

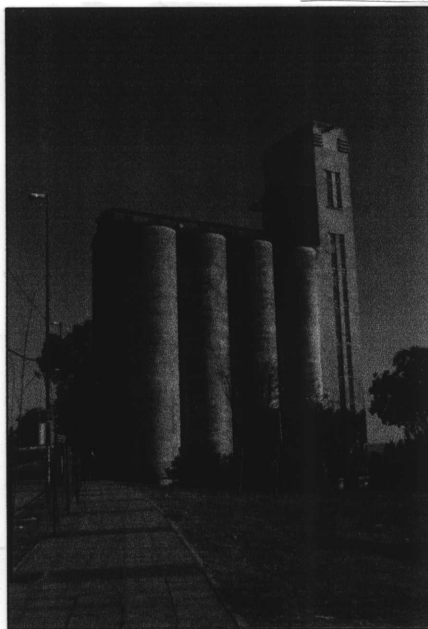


Figure 10

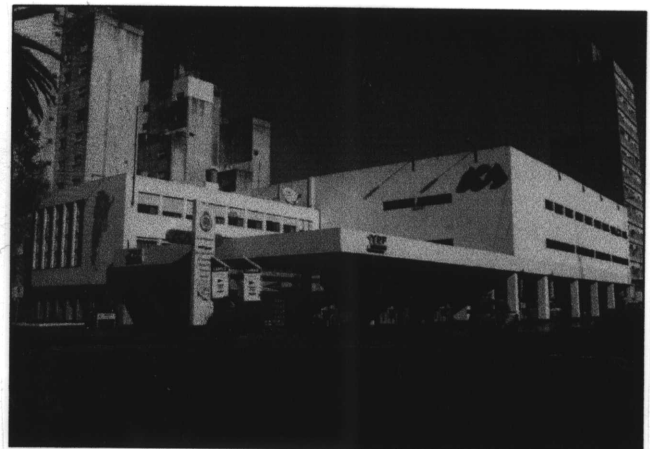


Figure 8

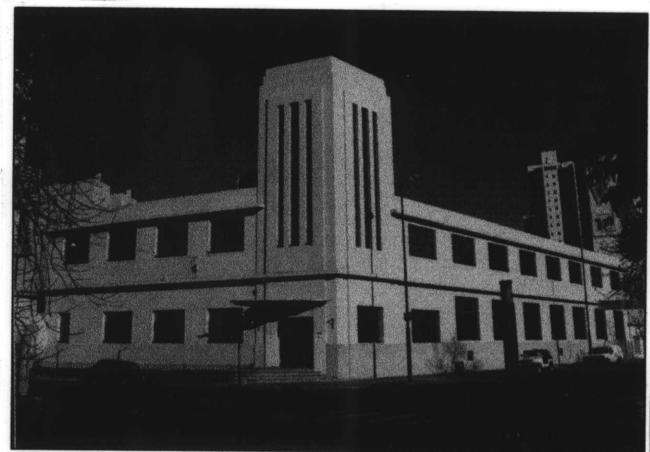




Figure 1



Figure 2



Figure 3



Figure 4

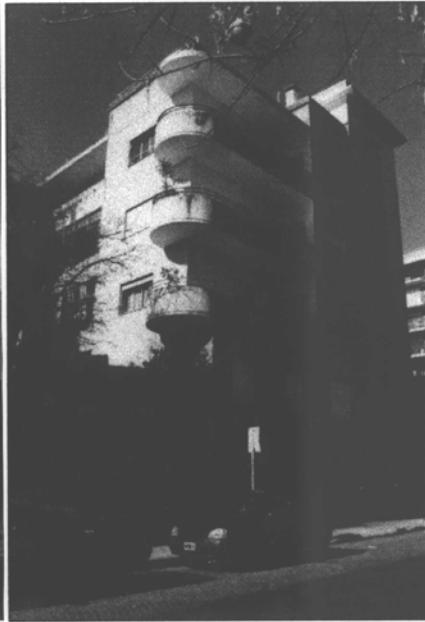


Figure 5

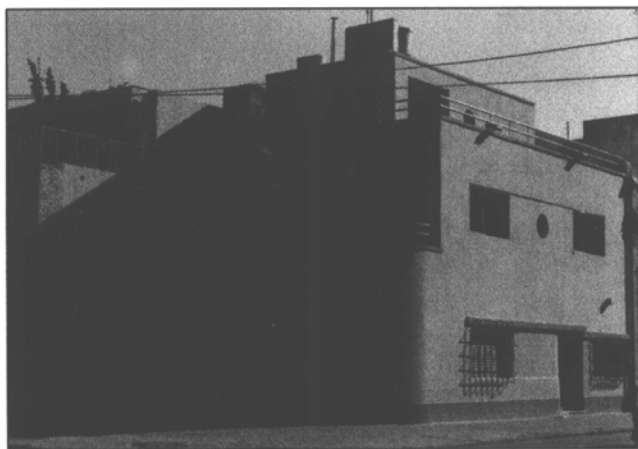


Figure 6

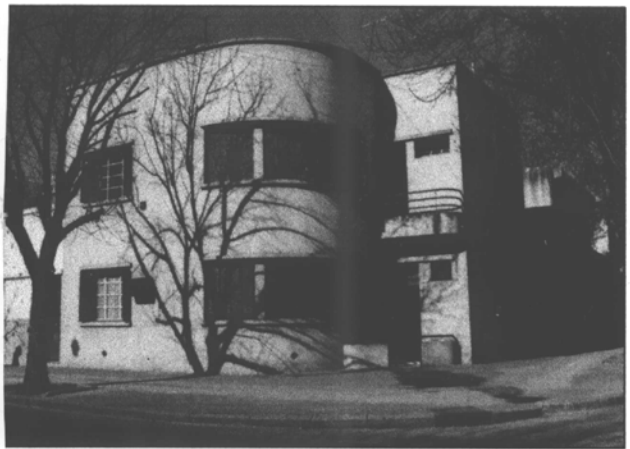


Figure 7

5. **Edificio de Renta.**
1° de Mayo 1071. 1947.
Ing. Gerlenios. Figura 5.
6. **Casa Vanzo.**
Moreno y Cochabamba. 1938
Arq. Schwuarz. Figura 6.
7. **Casa.**
Viamonte y Sarmiento. 1942. Figura 7.
8. **Automovil Club Argentino.**
Oroño y 3 de Febrero. 1936.
Arq. A. Vilar. Figura 8.
9. **Silos Davis.**
Oroño y Av. de la Costa. 1935. Figura 9.
10. **Establecimiento Industrial.**
Av. Wheelright y Moreno. Aprox. 1935.
Figura 10.

FRAME METHOD

The conventional photograph as an auxiliary tool in the architectural graphic reconstruction

Based in:

- . photograph and perspective share the same "geometric base"

- . photograph has itself metric information.

Then, it may be established the photograph restitution, that it's to say to convert the "perspective photograph" into a graphic metric recorder.

DEVELOPMENT

We can divide the work development in two steps:

A. Application of the photograph perspective restitution method.

.B. Graphic document buildings reconstruction.

In this case we decided to compile the ground floor outline and the facades. Scale: 1:100.

To explain the method we present an example:

A. Photograph perspective restitution

First of all, we defined the recorder needs. The recorder ought to let us redraw the building documents so as to be studied, morphologically, typologically, etc.

A.1. Recorder

1. Photographic take. (Figure 11)

The camera used was an Olympus IS-10.(no metric).

We:

- . established the different horizontal, vertical, reference flats.

- . defined the principal directions, in the vertical planes, so as to match with the facades ones.

- . took several central and angular photographs.(horizontal, optic axis has to be perpendicular to the facade plane).

In both cases it was not use the zoom camera to prevent the flatten image.

- . avoided the oblique photograph (respect to vertical reference planes).

- . controlled the parallelism in the vertical edges.

- . took the photos at a distance that let us use a compatible scale with the graphic document to draw, so we may guarantee the need precision.

(we might have seen and understood all the elements to redraw).

The points of view were chosen, conditioned by the characteristics and the location of the building.

(a corner one).



Figure 11

2. Determiration of a some metrics facts. Control measurement.

We recorded "in situ" a few metrics facts that:

1. were required to the perspective restitution.

2. were compared with the ones obtained through the perspective restitution.

3. Angular measurement using a Teodolito WILD T.2.

A.2. Graphic step.

All this step was developed in AUTOCAD 14.

1. Photograph digitalisation by scanning file JPG.

2. Perspective restitution.

- . We established a draw *file Foto 1 DWG*. The photo image was imported and saved as the *layer FOTO*.

- . The scale was adjust according to the two longitudes measured "in situ". (site length and width).

Vertex distance: 46.45 m.

Vertex height: 2.74 m.

- . The building principal directions (facades flats) determined the *puntos de fuga F1 y F2*, it was evaluated the intersection polygon geometric center of the precedent direction; this procedure was saved as the *layer FUGAS*. Figure 12

- . The building principal outlines were determined by making scream approaches (zoom), both with the *F1 y F2 fugas* and the vertical directions, using the orthogonal command. They were saved as *layer CONTORNOS*. Figure 13

- . The *view point* was determined by knowing the geometric place of the principal vertical, two length corresponding to the sides building corner place directions (Tucuman street and Oroño Boulevard) and the *F1 y F2* measure points.

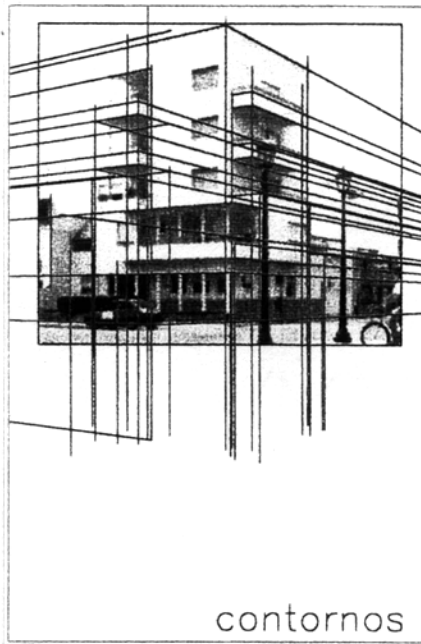


Figure 13

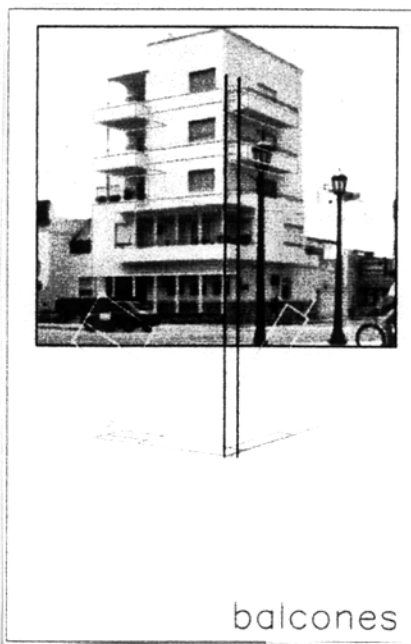


Figure 14

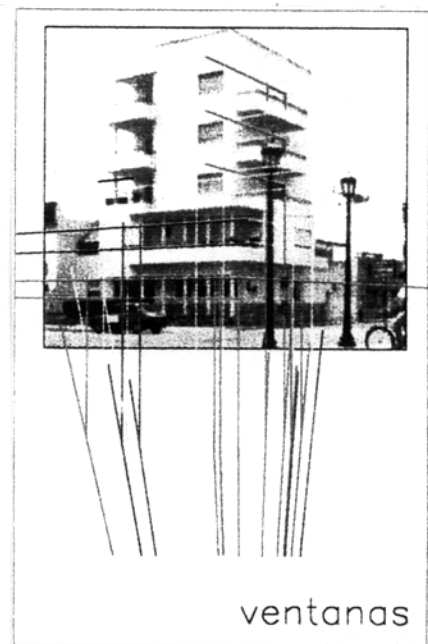


Figure 15

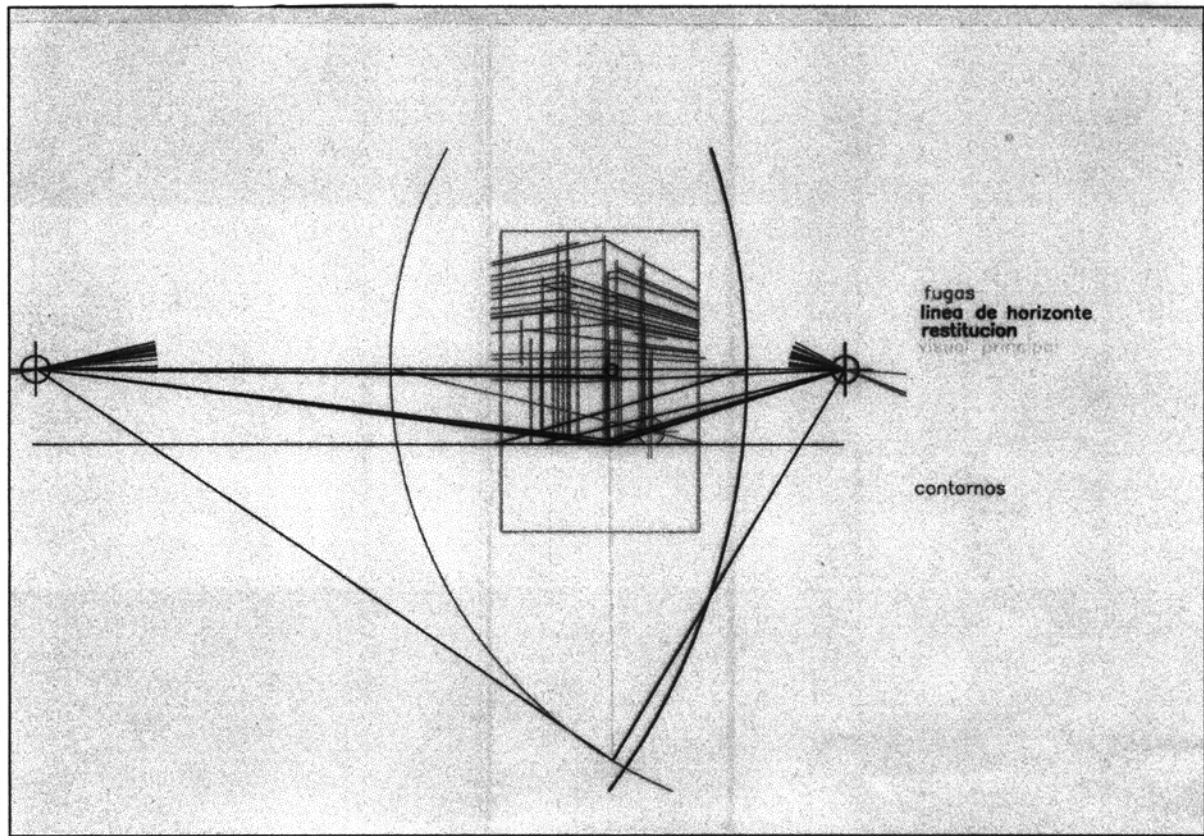


Figure 12

Horizon line/Principal View

As soon as there were defined horizon line, principal view, point view and F1 and F2 *fugas* we began the perspective restitution.

3. Restitution itself

We:

. decomposed the architectural building elements into its principal blocks (geometric view), fragments that became

more operative. **Layers PLANTA 1/2/4/5- BALCONES- VENTANAS.** Figure 14/15/16/17- 18-19

. used *homologia* method to determinate the *abatida* plan.

Layers PLANTA 1a/2a/4a/5a.

. established the real measures in height.

As the restitution was over we have compiled a data base, we were able to begin the last step, the graphic reconstruction.

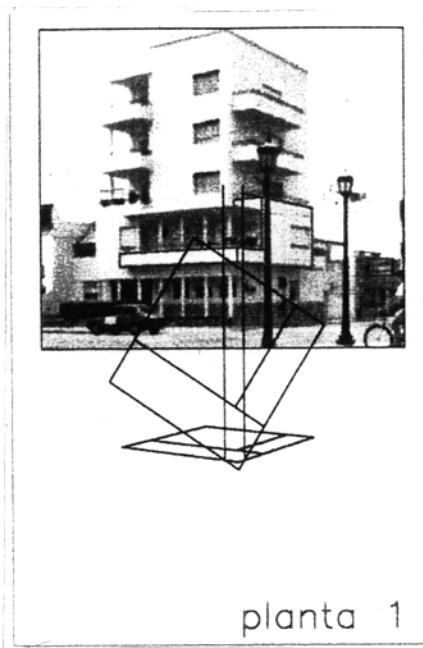


Figure 17

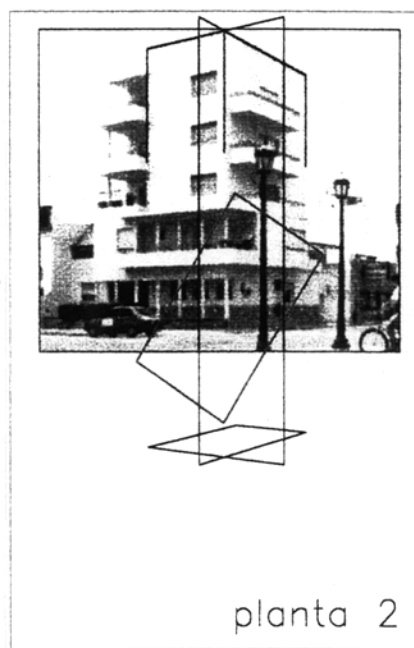


Figure 18

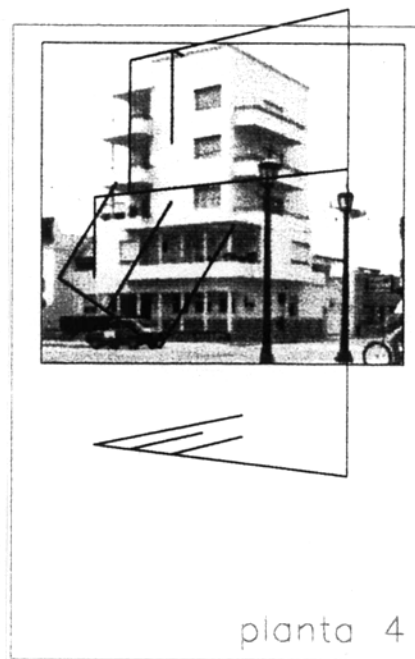


Figure 19

B. Graphic document building reconstruction

Processed in **Autocad 14** we determined as we expected both the ground floor outline and the front views .
The scale proposed was 1:100.

B.1. Evaluation of the accuracy obtained

Different elements were checked up:

Window(1)	Real width: 1.30m	Obtained width: 1.31m
		(using the method)
	Real height: 1.20m	Obtained height: 1.23m
Building place	width: 11.08m	Obt. Width: 11.14m
	length: 14.11m	Obt. Length: 14.04m
Vertex distance:	46.45m	Obt. Distance: 46.38m

As the recorder purpose was not to go into any restoration action the method measurement error has been absorbed by the graphic error (1mm. If you were working by hand in 1:100 scale).

COMMENTS

. the use method, let us work without graphic errors (by hand 1:100, in computer 1:1) so the only error we introduced was the one produced by the obtained photograph.

. we worked the restitution process over both the:

Frontal photograph

Angular photograph

The first one has to be disqualified because of the impossibility presented to determine the different depth planes.

. by using a conventional film it was not possible to obtain an accurate image definition at the time to resolve details. (by zooming the picture).

. the scanner used to do the photograph digitalisation did not let us reach an accurate side definition.

CONCLUSIONS

. the method is efficient to go into typological researches , architectural or historic studies, morphological analysis, or any action that may require a general building recorder, the most significance architectonic elements but to do an exhausted details recorder, the accurate decrease as the edge error is constant so, in this case, we recommend photogrammetric surveys.

. it may be the first recorder in conservation projects.

. it let a fast and efficient graphic reconstruction, facades and outline floors.

The method describe was applied to ten selected buildings, the first of a larger archive that we are compiling. The team was increased and the project is, by the time, developed through different areas at the Facultad de Arquitectura, Planeamiento y Diseño. Universidad Nacional de Rosario.

Nowadays, we are working in the design of each building page of the digital (operative) rationalist heritage archive. Figure 20.

Like a prothogrammetric archive we can defer the dates take from the restitution process so many examples would remain archived (photograph and the knowledge of some metrics facts) until the time they will be digitally processed.

IN this way we may reduce costs increasing the archive capacity.

We consider this archive a great help to researches, professionals, students because it allows them to get into active information. We mean that they may be reaching operative files instead of passive draws.

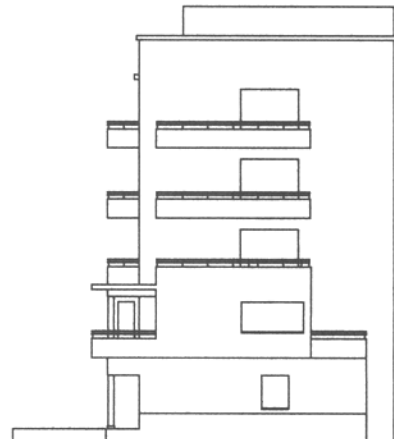
*Note: This project is directed by Arq. CRISTINA ARGUMEDO.

Profesora Titular, Cat. Computacion Gráfica Aplicada al Diseño. Fac. Arquitectura y Urb. Univ. de Buenos Aires.



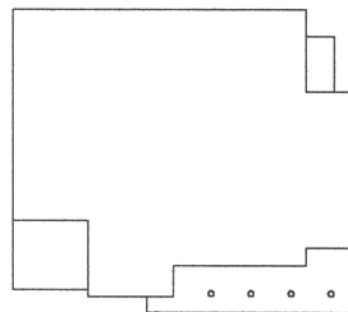
FACHADA 1

Obra: Edificio de Rentas Sr. de Bernardis.
 Ubicacion: Tucuman 2186. Bv. Oroño 393. Rosario.
 Proyectistas: Arq. De Lorenzi, Otaola y Rocca.
 Año de ejecucion: 1940.



FACHADA 2

ADELANTE	ATRAS
FOTO	
FACHADA 1	
FACHADA 2	
PLANTA	



PLANTA

Figure 20

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