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**RESCUE AND REGENERATION OF THE EX-RAILROAD WORKSHOPS IN  
AGUASCALIENTES, MEXICO**

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**a).- Location:**

Founded in 1575 with the name of “*Villa de la Asunción de las Aguas Calientes*” and it was one of the obligee an safer points in the “Silver route” that united the rich mineral zone of Zacatecas to Mexico City, and from here to Veracruz and finally to Spain; or from Acapulco to the Philippine Islands. It also served for the conquer and colonization of the north of Mexico and the south of the United States during the XVI and XVII centuries.

Located in the centre of the Mexican Republic in the Central Highland with an altitude above the ocean of 1,800 meters and without any important geographic accident, the State of Aguascalientes is a great valley surrounded at east and west for two low ridge of mountains, without physical limits at north and south, and it counts with plentiful thermal waters, therefore since its foundation it has been a strategical communication and mutual exchange point between north and south, and east and west sides of the country. For its dimensions, it occupies the fourth place among the smallest states of the country, with a 5,471 km<sup>2</sup> area and a population of 1,000,000 inhabitants.

In a distance of 586 km from Mexico City and 1,385 km from El Paso Texas, in Aguascalientes is located the biggest Railroad Conjoint of Mexico and Latin America: **The General Reparation Workshops of the National Railroad of Mexico .**

**b).- Railroad in Mexico**

*( Insert figure 1 here)*

Mexico is a country that is in need of navigable rivers and with a central highland limited by two big rockie systems, so it couldn't find a better solution but the railroad for the union

and consolidation of the country in relation with its housing development and political integration to permit it the entrance to the modern world. Therefore, since the first concession in 1837, our history and culture have been inseparable from Railroad, fortifying the bows between the different and variegated regions of the country, assuring links for the National Identity.

Along the “*Porfiriato*” (1884-1910) capitalists interests in Mexico were defined in relation to the origin of themselves. Northamericans and British investors attended railroad and mining above all. From all the inversions, the richest ones were the railroad extensions till the north border of the country by the middle of the eighties decade. According to estimated facts near to the year 1900, 1,507 million dollars had been invested in the country, from where 644 million were destined to Railroad development.

### **c).- Railroad in Aguascalientes**

The main railway of the Mexican Central Railroad began to be built in 1880 from Mexico City to Juarez City, inverting a total of 1,388 days in a vertiginous rythm to have a day middle of 1.5 kilometers of railways riffle.

The arrival of the *Ferrocarril Central* in 1884, had immediately effects in the increasing of the little Villa de Aguascalientes, transforming it into a real capital city of the State, propitiating a massive immigration of inhabitants from common bundary localities, who were looking for better job sources and giving advantages to its agricultural producers.

The little station took such excellence, that in 1890 the *Ferrocarril Central* proposed it self to be joined to the *Ferrocarril del Golfo* de Mexico throw San Luis Potosí, with the purpose of controlling the loadding traffic that left Tampico and Veracruz ports.

*( Insert figure 2 here)*

Near to the end of 1893, facts show an intense trains movement, wich were effectuated with minutes of difference between them. In a few time Aguascalientes became an obligee pass by the national and foreigner passage. Most of the time travelers went to Mexico City and

the United States by the most important north railways to get to Chicago, New York or Washington among other cities, thanks that in El Paso converged the lines of enterprises like Southern Pacific, Atchinson, Topeka and Santa Fe, Texas and Pacific. However, real transportation was made by the trade that circulated to different points of the country and outside of it.

Because of the privilege characteristics of its geography, water, weather and the work assiduity of the people, the Guggenheim family chose Aguascalientes to built in 1894 their huge “ the American Smelting Company” and because of the *Ferrocarril Central* they built the “General Construction and Repairing of Machinery and Variant Material Workshops”. The facilities of the clauses of the concession contracts added subsidy and taxes stings from the local Government. Don Rafael Arellano Governor at that time, could pact the concession of 830,00 m2 of land belonging to the *Hacienda de Ojocaliente* for those workshops, starting to work in 1898.

There was born the highest railroad technology, being the most important and modern workshops, as for their dimensions as for the diversity of the machinery tools and the number of the clasified personal that they count on.

When the first big part of the construction was ended in 1903, lots of employees worked at the “*Casa Redonda*”: over a huge spinning platform the work started: machines and dragging units were displaced in reparation, the process was a serie of shared actions where the qualilty depended on the capacity and individual responsability of the operator.

Next to this building, the construction of many workshops and departments cleared the way to different “specialities” or fraternities which became the base of the Mexican Republic National Railroad Workers’ union.

In 1902 the Ferrocarril Central took the control of 5,055 kilometers of railways, acquiring the *Ferrocarril Monterrey al Golfo*, the *Ferrocarril México-Cuernavaca* and the *Ferrocarril del Pacífico*. Later with the railroad nationalization in 1908 the enterprise belonged to the *Ferrocarriles Nacionales de México*.

*(Insert figure 3 here)*

The railroad presence in Aguascalientes transformed its physiognomy, the urban stain grew up and the railroad workshops occupied the 25% of its total area, fortifying it as a regional rector, centralizing the capital, the administration and the culture. These two industries conjoined with the Asientos Municipal District and Tepezalá occupied at the beginning of the XX century, the 60% of the 11,000 workers of the local industry from a total of 22,117. In the meantime the 40% left were distributed in brick-kilns, soap, cloth and flour factories and in surrounding workshops of the big enterprises.

Aguascalientes changed quickly, progress and development possessed the capital city. Its urban and architectonic physiognomy were transformed thanks to the constant immigration of people from neighbouring entities who were attracted by the high salaries the Railroad Workshops paid; therefore new avenues, residential districts and services were needed. The way of life evolutionated, new organization structures and recreation elements -like movie theatres- appeared.

Commerce received an unusual impulse, a lot of little and big industries appeared, most of them were located surrounding the Railroad Workshops. Therefore, Aguascalientes entered into the powerful world stage.

Federal Government procured since 1906 that benefits the railroads produced get equitably to the workers, therefore in 1908 foreigner expeditors, machinists, telegraphers and engineers were substituted by Mexican qualified personal.

Railroad culture was not conformed by deliberated acts, it was an organic structure that availed the transmission of dexterity and knowledge from generation to generation; to be a railroad worker ment being part of a tradition, sons and grandsons of the railway personal were part of the fraternities their parents founded; therefore in our days is feasible to rebuilt genealogical trees from complete families, because they belonged to the railroad world since the infancy; they lived among dormants, railway coaches, stations and workshops. Railway culture is not only the sum of this “chain-reaction” activities, because besides work processes, social relationships and material & symbolical values made it different from the rest or the labor sector.

In this manner we can affirm, that railroad in Aguascalientes was generator of a tactile and intangible cultural patrimony of the city and it is the symbol of its identity.

For its excellent railway communication, Aguascalientes was the centre of revolutionary battles in 1910; Mexican Revolution cannot be understood without railroad, because Government's army and the rebels fought for its control, transporting by its railways military ammunitions, provisions, soldiers, revolutionaries and common people. Francisco Villa's forces occupied the city and the "1914 Sovereign Revolutionary Convention" was established, and our Constitution bases – that were defined in 1917- were seated, pretending to end at that Convention the differences between the *carrancistas*, *villistas* and *zapatistas* fractions.

*(Insert figure 4 here)*

For 1927, the first technical school "*La Maestranza*" also called "*La Universidad Ferrocarrilera*" was built. Technicians from all Latin America came to it to be extended, spouting high qualified operators and officials for the workshops and factories of different countries.

In June 23<sup>rd</sup>, 1937 President Lázaro Cárdenas expropriated the Ferrocarriles Nacionales de México because he consider it strategical and of public utility for the country. The technological change from steam to diesel, promoted Aguascalientes' Railroad Workshops to be transformed; starting in 1947 with the arrival of the first locomotive engine of this kind and the new plants were integrated in 1967.

It was such quality and efficiency of the work developed at the workshops, that on September 27<sup>th</sup>, 1980 started by an agreement with the General Electric Company the framed and joinery of diesel-electric engines, installing a 14,917 km<sup>2</sup> area with the compromise to deliver 1,000 locomotive engines in 10 years.

The apogee ends in 1991, with the formal announcement of the privatization of the *Railroad Coaches Manufacturer*, setting free lastly the commercialization, services, the railway maintenance and the reparation of the rolling equipment to the private sector, and

on February, 1995 the Congress approved the constitutional reform promoted for President Zedillo, starting with the auctions of private enterprises to get the concession titles.

**d).- Compromise and Rescue:**

Before this situation, the people from Aguascalientes were in risk to lose forever the historical and cultural legacy and the identity Railroad gave them.

Responding to the social reclaim, the State Government headed took the responsibility to rescue them for the future generations, so the necessary efforts to recover them all were done to the highest level, gaining in the national circuit what no other Governor could do ever: the donation of most of the 88 hectares of land with its 87 buildings from different epochs and styles in it.

Thanks to these actions, a national level landmark like the ancient General repairing workshops are today and forever legacy and property of Aguascalientes' people.

The Conjoint, unique for its generous dimensions, for its location, for its relation with Down town's Principal Square, for the identity that refers according to its historical, architectural and symbolical contents, is today a huge challenge for its complexity. Its rescue and regeneration confronts in a conscious way the quality that railway tradition demands with a brightly future vision, articulating actions that foment in a sustainable and harmonical way the human and social development, impulsing educative, cultural, economical and technological activities in this center, which will be without doubt the New Heart of Aguascalientes.

**e).- First Approaching:**

When the present State Government took possession, by the end of 2000, it started to analyze the complex restrictions and conditions inherited with the donation of the property:

- Legal:

Padlocks, imprecisions and lineaments established at the Donation and Acquisition agreement by the Nacional Republic General Auditorship & National Financial.

- Laborable:

About the ex-workers and pensioner rights about the use and enjoying of the instalments.

- The possibility of water exportation:

New perforations because of the overthrowing of the freatic mantle from a 10 meters depth in 1910 to a 450 meter depth in 2000.

- Ecological:

The natural enviroment, soils, the endemic existing vegetation and regeneration of green areas.

- Invasions:

The clandestine ocupation of railway coaches and areas that were given in “temporary loan” to particulars without any document.

- Social:

Necessities and characteristics of common boundary people, from different economical y cultural level, delinquency and accumulation, as their needs of services, lendings, and options to be integrated to the zone’s development.

- The Occupation

Of the buildings by Federal dependences, National railroad companies, Asociations, The railroad ex-workers Union, The concessionary company “*Ferromex*”, etc.

- Historical:

According to the Historical, Artistic, Archeological and Typical Regions Patrimony Protection Law, The Protection and Fomentation of Aguacalientes’ Cultural Patrimony Law for the construction’s restoration and re-usings, the technological inheritance, as the rescue of traditions and local & regional identity elements.

- Housing development:

The isolation the property was for over a hundred years respect to the city, because of its change from being an east border to be an island into the heart of the city. The necessity of integrate it to the City Plan throw new avenues and housing services, softening areas, etc.

- The Concessions:

All rights and services the Communication and Transports Secretary’s Office condescended to the concessionary *Ferromex* for the using and occupation of railways and several buildings until the construction of their own ones.

- Pollution:

It exists into the ground and substratum by metals, garbage and hydrocarbons, dust and smoke, as for some construction materials like asbestos covers in over 60% of the buildings. It means that this point covers all the residues and accidents caused by a tough and constant industrial work done for over a hundred years, and the requisites established by the Federal Environment Protection Attorney's office for soil remediation.

- Colonists:

*Ferronales* Colony is a housing area from the XIX century, occupied by the second or third generation of specialists and functionaries that worked at the railroad workshops. It is surrounded by three adjacent sides of the property, among the industrial and sports areas.

- Uses.

The uses are already predetermined by: -the equipment like the "(Railroad's Sports Center" which has a sever deterioration degree; - the railway workers' families and pensioners rights to use all the Conjoint equipment free. – The "Station's Garden" is an obligee ride for inhabitants from the east side of the city.

#### **f).- First Actions:**

As it can be seen, the Conjoint is very complex, for its dimensions and its problems multiplicities, so because of that is the most important regeneration and restoration project in Mexico.

For the same reason, we have to do the pertinent analysis to the "indisposed one" (The railroad workshops), knowing its body exactly dimensions, its diseases characteristics and its potential and weaknesses, to apply in some cases a greater surgery, and in some other cases only preventive or cleaning actions.

Six priority actions began:

#### **Buildings and machinery Inventory and Catalogue:**

It let us know the evolution, construction stages and technological changes from steam to diesel engines in the 87 buildings of the Conjunct, built in five periods: from 1884 to 1900, from 1900 to 1920, from 1920 to 1945, from 1945 to 1965 and from 1965 to 1985; where the changes of construction systems are clear, because they get transformed as along as the industry needs and production progresses requested it. According to the Federal Mexican Legislation about Cultural Patrimony, 26 of those buildings are considered Historical and the rest of them Artistic.

Architectonic elevations were made to know the conservation conditions, their architectonic value, the construction period, their transformations, the potential for their fitting and reusing and the existing equipment into them, to transfer later the donation or selling before the *Nacional Financiera*, the Federal organism in charge of the liquidation of actives and passives of the *Ferrocarriles Nacionales de México* after its privatizing, because the agreements only contains the buildings, not their contents.

For these reasons the National Photographic Archives from the Antropology and History National Institute, the Mexico's National Exrailroad Archives in Buenavista, Mexico City and the Mexican Railroad National Museum in Puebla were consulted to get all the possible information.

These general and particular studies of Railroad Workshops and its housing area permitted, along with other 22 sites from different nature and another one of industrial characteristics to be inscribed before the UNESCO to be analyze so they can be declared Humanity Patrimony.

#### **Analysis of Pollution's different types and degrees:**

During eight months, soundings and laboratory analysis were done in coordination to the "Enviroment, Natural Resources and Fishing Attorney's Office" with the "Federal Enviroment Protection Attorney's office" and by an agreement with the University of Aguascalientes, to know the different kind of pollution like garbage, junk, foundry material,

hydrocarbons, leakage, dust, high risk construction materials, affectation of the freatic mantle, etc.

Knowing the distribution of pollution in the Conjunct, its penetration into the soil, its impact to the nearest zones and to the buildings, risk levels, possibilities, kinds and remediation degrees and needs, like retreat, carry and incapsulary of dangerous material.

The study has been very complex, that the strict legislation in this matter aloud the State Government to be the first auto-remediator in Mexico.

### **MASTER PLAN'S ELABORATION**

Parallel and according to the Development State Plan 1998-2004 and the Aguascalientes City Housing Development Plan 2000-2020, it was contemplated that this big property - geographic centre of the present city-, gets integrated to its plan and activities, breaking the physical barrier that for over a hundred years kept it as an urban island. Therefore, and by means of extensive studies and diagnostics, with the support of the *Universidad Autónoma de Aguascalientes*, Master Plan was conceived with short, medium and long term followings.

In each one of them, the rector element was the existing patrimonial construction, the railways, the substructure and installation of the whole Conjunct, so the reference and lecture of its industrial characteristics didn't get loose. According to these characteristics, the planning of primary, secondary and pedestrian avenues were subordinated; the establishment of a garbage transference plant, a residual water treatment plant for irrigation, water, electric energy, telephone and gas installations.

The soil's use and destiny and the existing constructions according to their characteristics; the equipment and urban furniture needed, reforestation and density of future constructions. As the Donation Agreement establishes, the land is a State Government's property, therefore it cannot be sold, but it can be rented for even 99 years; so the housing planning system established by means of an Architectural and Urban Formal Analysis of the Conjunct rules for new constructions or fitness of the existing ones.

*( Insert figures 5,6 here)*

## **REGENERATION & RESTORATION PROJECTS AND WORKS**

The first part contemplates two big areas separated between them by primary avenues but united to the south by the *Alameda* at east is located the Railroad's

Studies and construction works began the second half of 2001 and during 2002 and the great opening will be on Mars 8 th 2003 by President Vicente Fox; and it had been executed until this day 37 million dollars.

For the Railroad's Sports Center modernization the east side was rehabilitated; it contains soccer and baseball stadiums, tennis, frontennis and basquetball courts, skating areas, a running trace, aerobic exercise areas, children playgames and eating areas. Therefore, it was dowered with electric, sanitary and irrigation substructure as equipment and urban furniture.

During the present year Railroad's Sports Center weast side works will be concluded; it contains an administrative area, a restaurant, a gym, a parking area, a Hall of fame and a shot-practicing stand.

Conjunct's public area named as "Station's Square" was dowered with all the necessary substructure. A monumental lance of 60 meters high was built as the edge of Madero Street –the main communication artery of the Conjunct to the Principal Square- , a parking area, the Station's Garden was reforestated, and all the benches (made of china, wich make them unique) were restored.

*( Insert figure 7 here)*

The Station's Garden big pile was restored and dowered with electronic equipment, so there will be a lights and sound show with Aguascalientes' traditional, railway and popular

music. The Steam engine's monument was elevated. Besides, a remembering of the sixteen thermal water flowings which were the origin and gave the name to the city were built. The "Express building" was remodeled to be a gastronomic center and a street theatre. The "Whistle Square" was built as a homage to the sound that marked the rhythm and the hours of the city and its inhabitants; a dynamical model of the Round-house shows in a didactical way the engines' repairing process and the mechanical systems that were their support.

The Passenger's Station built in 1911 and the Loading Warehouse built in 1898 were restored to be the Railroad site and Railroad's Workshops Museums respectively, acquiring rolling material for their railways.

Therefore the priority of the historical material preservation was established, as in the Conjoint as in an individual way, respecting the constructive systems, materials, architectonic distributions, the different historical epochs and, in case of new interventions, the original order was not alterative. For new interventions, their contemporariness were evidenced by a contrast or analogy integration.

Simultaneously it was pretended to recreate the human aspect, placing sculpture conjuncts in a natural scale, representing workers and personages that made this magnificent Conjoint possible.

### **The Ex-Locomotives Workshop**

The New Government of the State, headed by the Governor Eng. Luis Armando Reynoso Femat proposed itself that within the Ex-Railroad Workshops Complex will be established *The Great Convention and Exposition Master Plan Centre*, which will be the most important of its type in the Centre-North Region of our Country, impelling this legacy, because its characteristics, qualities, dimensions and location makes it unique in Mexico.

To begin this great Convention and Exposition Centre, one of the Ex-Railroad Workshop's emblem was chosen, the place where the first Mexican steam-locomotive was built: *The Ex-Locomotives Workshop*, the biggest historical building of the Complex which with a

surface of 7,450m<sup>2</sup> was transformed in the Multifunctional Space par excellence of the State, becoming it into the detonator of the Master Plan.

This workshop belonged to the Mechanical Department and it dates from the beginning of the XX Century. In its interior were found three work graves that extended their railways from the south to the north through every one of its three entrances. Into these work graves the locomotives were examined and diagnosed with the maintenance they were going to be subjected, rectifying the damaged pieces with the machinery the building lodged in or replacing them if it was necessary. In this place, the Locomotive 40 was built in 1913.

Most of the machinery that succeed it and it's located in its original place belonged to a wing of productive process called West Apparatus, one of the most antique areas into the Systematic Workshop of Aguascalientes, also known as "La Maestranza". In this place were made labours of rehabilitation and creation of needful tools for the workshops: metallic pieces of specific measures like round-headed pins, screws or brushed of complementary pieces of the machinery; in support of other departments, the mallets of the steam-pile drivers that were in the lamination and ironworks workshops were repaired

because of the consumed of so many hits; the longs located in the Foundries were rectified, because the heat consumed them and the moulds\_for moulded were brushed; they also helped the Power Houses and the Cars Workshop to mention one of them. This type of light labours were made to all the workshops, because there was always something consumed, slack screws to remove or ready to be repair in West Apparatus.

*(Insert figure 8 here )*

The characteristic work machinery of this building were winches, planes, drilling machines, chisels; if it does exist two machines of the same activity, it was because of the need of covering similar operations in great quantity. This machinery worked with a belt impelled with an electric engine that turned around constantly a system of axis with pulleys and in each pulley there was a machine with a belt.

The arrival of the Diesel epoch to Aguascalientes, at the beginning of the 70's decade changed the name of this building to *Locomotives Assemble Workshop* because here was made the assemble of the diesel locomotives after receiving each one of their components. In the same period the building gave space to the *Recoveries Plant*, and its activity consisted in improve the old rail brushing it to make the toads and the needles of the railway of the railroad system.

Having as a base the international norms of restoration and with a first investment 4 millions dollars, it was proceed to its fitness works: the consolidation and restoration of the structures, coverts, armours, floors, machinery and equipment, establishing a respectable and dynamic dialogue between the past and the present, where each and everyone of the elements that integrates it are the silent witnesses that consent the easy lecture of the past. And for honesty, the new elements maintain an actual language continuing with the industrial sense of the Complex.

*(Insert figures 9 and 10 here)*

This precinct already counts with the necessary installations for the variability of multiple events and it will be completed with a second investment 5 millions dollars restoring and fitting the buildings that surround the *Locomotives Workshop* and the construction of the *Round House's Forum and Parking*.

### **Round House's Forum and Parking**

For this project it's going to be re-used the excavation that was necessary to make for the mending of the soil that was contaminated by hydrocarbons of the Ex-Railroad Workshops; these works were made under the strict vigilance of the Ecology Secretary's office, the SEMARNAT and the PROFEPA during 2003 and 2004.

During the excavation processes, the vestiges of the foundation of the Round House and its Turn-table were rescued and they were watching over and guided by the Railroad Museum according to the lineaments established by the National Institute of Anthropology and History.

The project is subordinated to the projection of the vestiges, therefore the special restoration and fitness project was elaborated, consisting it in the cleaning and consolidation of the ruins (not the construction of a new Round House which is to be against the elemental principles of restoration). The Turn-Table is going to be used as a forum for different types of events counting with seats, public squares, cabin for the actors and complementary services; the foundations will be part of the Landscape Architecture and from their location they're going to be appreciated from different angles outside and inside the parking, which has two levels and a capacity of 500 vehicles.

The criterion used for making the projects and works are those established by the CONACULTA and the INAH to give the Complex the opportunity to be declared Industrial Patrimony of the Humanity. When the project will be finished it will be subjected to its analysis and evaluation with these instances.

### **“La Maestranza” Mural**

This mural which author is the artist Victor Zamarripa Alférez is a faithful copy of his technique “papyrus pruning” made of steel thin sheets cut with plasma. Its principal theme is the Railroad and its transcend in the economical, political and cultural development of Aguascalientes City. It is located at the south of the Complex, next to the Gómez Morín Avenue and the Railway Auditorium; it consists of a concrete basement supported by a metallic structure and it is composed of steel panels, electronic mechanisms, illumination and special effects. It measures 14.00 m long by 4.00m high, flanked by a bubbling fountain. This mural costed one million dollars.

Rescuing the patrimonial value of the Complex along the tourist, economical, cultural and social forces will permit it diffusion in an international level. Thus, this development centre is created and its benefits will come as vigorous beatings of a new and huge steel heart, improving every place of the Entity with the same force that in its time originated the arrival of the Railroad.

