



# INDUSTRIAL ARCHITECTURAL HERITAGE OF THE OSIJEK FOUNDRY

izv.prof.dr.sc. **Sanja Lonar Vicković**, dipl.ing. arh.

Građevinski fakultet Osijek

Sveučilište J.J. Strossmayera u Osijeku

doc.dr.sc. **Dina Stober**, dipl.ing. arh.

Građevinski fakultet Osijek

Sveučilište J.J. Strossmayera u Osijeku

**Abstract:** During the 19th and 20th century, industrial architecture represented a progressive component in the physical development of cities, whereas the loss of productive function of factory buildings opened the possibilities of enriching the urban identity through the continuity of industrial sites. Industrial architecture of Osijek belongs to the European modern architecture, concerning the period from the beginning of the 20th century until 1945. Basic common characteristics put it in this context, namely: the use of load-bearing concrete structures, reinforced concrete and steel, as well as functionalist and minimalist approach to the façade. The vanguard of Art Nouveau in Osijek was the building of the iron foundry and welding work - OLT from 1912 in which concrete and iron were used as primary materials. This article presents in detail the general historical development and architectural heritage of the OLT foundry, taking into account its place and role in Osijek's modern architecture. The most important buildings of the foundry were built between 1913 and 1922, and are still located within the complex of OLT: the original foundry, the screw factory, Directorate office and the old toolroom (one of the larger warehouses). Today, buildings within OLT factory are in poor condition as a result of their age, many years of neglect and disuse, as well as two wars that overran these areas. Most significant reinforced concrete buildings dating from 1913 are seriously damaged showing structural cracks, damaged roof truss and supporting elements of reinforced concrete frame, together with bare armature (influence of moisture and mechanical damage - grenade strikes).

**Key words:** industrial heritage, iron foundry, architectural values, Osijek



## INDUSTRIJSKO ARHITEKTONSKO NASLIJE E OSJEKE LJEVAONICE

**Sažetak:** Tijekom 19. i 20. stoljeća, industrijska arhitektura je predstavljala naprednu komponentu u prostornom razvoju gradova, dok je gubitak proizvodne funkcije tvornica kih zgrada otvorio mogućnosti obogađivanja urbanog identiteta kroz kontinuitet industrijskih lokacija. Industrijska arhitektura Osijeka pripada europskoj modernoj arhitekturi što se vidi razdoblju od početka 20. stoljeća do 1945. godine. U ovaj kontekst su u smjestile osnovne zajednice koje značaju, a to su: korištenje nosivih betonskih konstrukcija, armirani beton i ekliz, kao i funkcionalistički i minimalistički pristup proiectu. Prethodnica secesije u Osijeku bila je zgrada ljevaonice željeza i pogona za zavarivanje - OLT iz 1912. godine, u kojoj su se beton i željezo koristili kao glavni materijali.

U ovom članku detaljno je predstavljen opći povijesni razvoj i arhitektonsko naslijeđe ljevaonice OLT, uzimajući u obzir njezinu mjesto i ulogu u Osjeću modernoj arhitekturi. Najvažnije zgrade ljevaonice izgrađene su između 1913. i 1922. godine, i još uvijek se nalaze unutar kompleksa OLT-a: prvobitna ljevaonica, tvornica vijaka, ured uprave i stara alatnica (jedno od većih skladišta). Zgrade unutar tvornice OLT su danas u lošem stanju zbog svoje starosti, dugogodišnjeg zanemarivanja i neupotrebe, kao i dva rata koja su opustošila ova područja. Najznačajnije armiranobetonske zgrade koje potječu iz 1913. godine ozbiljno su oštećene otkrivajući strukturne pukotine, oštećene krovne rešetkaste veze i potporne elemente okvira od armiranog betona, skupa sa golom armaturom (utjecaj vlastite i mehaničke oštete enja - udara granata).

**Ključne riječi:** industrijsko naslijeđe, ljevaonica željeza, arhitektonske vrijednosti, Osijek



## 1. HISTORY OF THE FOUNDRY

Osijek iron foundry and machine factory, joint stock company (OLT) was founded in 1912, located between Opkopni ka Road (today King Petar Sva i Street ) and Vukovar Street. The first mention of OLT found in Osijek daily newspaper *Narodna obrana (National Defence)*, on February 29 , 1912 under the title "New Industrial Company in Osijek ", alleges that a graduate mechanical engineer Vjekoslav Pilpel and Robert Koller from Virovitica , in cooperation with the Croatian National Bank, intend to "bring to life , in every aspect, a modern factory of economic engines and motors, and an iron foundry, which should employ about 100 workers. In this respect, they have asked the gentlemen of the city government of the land convenient for the factory and, the urban land between Vukovar roads and railways , which leads to Pecs was taken into account"[1]. A journalist, in the text, praises the idea and recommends the city government to open the door for the young company to every aspect.

The most important record in the *National Defence* dates from the issue from 5 August , 1912, entitled as "Construction of the Machine Factory ", in full: "An architect Bruno Bauer presented the day before the city government a draft for the construction of a new machine factory and iron foundry, and asked for a permission to build it" [2]. Furthermore, the issue from 24 August 1912 mentioned that the draft of the future of the company had been proposed to the city government.

Although not explicitly stated, it is clear from these texts that the factory was built and became operational sometime in May or April 1913, whereas it began with production on 1 April 1913[3].

The factory, according to the ideas of the founders, should have produced and repaired economic and agricultural machinery. Activities of OLT factory in 1913 included iron casting, turning, repair of machines and production of agricultural tools , as well as grinding and calibration rollers.

A couple of texts appeared in the *National Defence*, indirectly related to the construction of the factory - one from 23 February 1912, concerning the problems with circulation of the railway station Drava bridge (near the location of OLT factory ) and the other from 28 May 1912, concerning the paving of the road from the Drava bridge to Vukovarska Street (necessary for the functioning of the factory which land could be entered from the mentioned paved road ). The train entered the railway station "The Drava Bridge" for the first time on 1 July 1913, a year after the station had been built.

OLT factory achieved the biggest production in 1938 when 3400 tons of iron were casted , 1700 tons of all types of machines and structures and devices were produced , all valued at 37 million dinars. Seven hundred forty workers and only twelve engineers were employed in OLT factory at that time.

Some interesting facts are related to the functioning of OLT factory in the period from its establishment until the beginning of World War II . Thus, in 1927 OLT factory was connected to the Osijek power grid with seven engines and one transformer. Vjekoslav Pilpel was established as managing director of OLT factory that same year , and Stjepan Juraš became technical director3. OLT factory regularly exhibited at the Osijek Fair where Vjekoslav Pilpel as Chairman of the Board opens the Fair on May 3, 1930[4].



Picture 1. The visitors of an industry fair gathered around OLT machines date and location unknown  
Photo: OLT archives.

As in other enterprises of the metallurgical industry, an active labor movement was notable in OLT factory between the two world wars . Thus, in 1929, legal actions were taken against OLT workers who were members of various metal workers' associations. The Court did not bring condemnation but the file was returned to the implementing judge who should have ascertained whether alleged Union (actually an independent trade union) was a political or a professional organization, something that affected further proceedings.

On 12 December 1935, a big strike started in OLT factory, in which, according to various sources, 270-400 workers (out of about 450 ) participated . The reason for the strike was Teodor Kompanjcu , a Russian refugee that was fired for disobedience. Both the union and OLT management reports noted that the strike did not take place because of wages, amounting to 4.80 Kn / hour, at that time the biggest wages in the metallurgical industry in former Yugoslavia[5].

During World War II OLT factory still operates as a joint stock company until 17 April 1945, when the company, according to the decision of the District National Council in Osijek, was confiscated. According to the decision of the Court for the protection of national honor of Croats and Serbs in Osijek, on 19 July 1945, the entire property of OLT factory was considered to be "district property" and was registered in favor of the Federal Republic of Yugoslavia . The complex of OLT factory, in the period from 1945 to the 1991/1992 war, includes the facilities for the production in Brijest as well, and employs up to 3000 employees in the period of greatest growth.

Due to insolvency of the company, bankruptcy proceedings started in May 1991; bankruptcy procedure was completed in 1992. During the war in 1991 and 1992, the complex was severely damaged so that several facilities and production capacity units were out of use for a longer period. Today, OLT factory joint stock company Osijek employs 140 people and produces plows, seeders, cultivators, disc harrows, equipment for slaughterhouses, water towers and sowing preparers.



## 2. ARCHITECTURAL HERITAGE OF OLT FACTORY

In 1913, 1200 m<sup>2</sup> of the built environment occupied the area of OLT, raising up to 12000 m<sup>2</sup> in 1924. Although the main factory buildings of OLT were constructed in 1912 and 1913, applied materials and construction were extremely significant and, in that time, unique to this area.

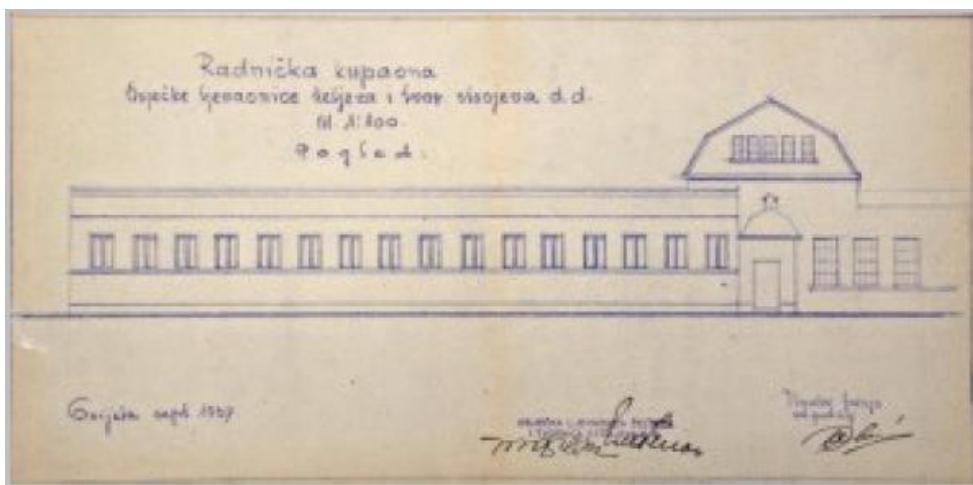
The main factory building, merging a foundry and a turnery in 1913, with its original size of about 1500m<sup>2</sup>, was built as a skeleton construction with columns (pillars) from reinforced concrete and brick wall infill. The roof of the turnery was held by a reinforced concrete grid welding work, cover was made of concrete, floor was pure soil, and the windows were made of shaped iron.

Facilities of both the screws' factory and stove factory had a similar construction in 1913. The factory complex was extended during the interwar period: a dry-kiln was built in 1917, following the construction of the building for officials and workers in 1919, work of the architect Ivan Domes.



Picture 2. Main factory building roof construction  
Photo: authors' photo archives, 2011.

OLT's situation plan, dating from 31 October 1922, shows the layout of the foundry complex buildings in the scale of 1: 500. Dimensions of the complex are presented in the form of an irregular trapezoid roughly measuring parallel pages of 230 m (south side), 130 m (north), 297.5 m (west) and 266 m (east side) in the vertical direction. The situation shows a total of 39 buildings in the area around the OLT factory, including wells, storage rooms, lavatories, sheds, stalls for coal, awnings and other smaller buildings. Among the storage rooms the following unit is specified: a water tank, having a layout of 4m in diameter and height of 15 m. The largest buildings are the foundry occupying 1073 m<sup>2</sup>, locksmithery 450 m<sup>2</sup>, turnery 420 m<sup>2</sup> and the screws' (bolts) factory occupying 300 m<sup>2</sup>. Width, length and method of construction are documented for each building. The list also consists of six residential buildings with 31 apartments for workers, clerks and managers.



Picture 3: Workers' bathrooms designed by Franjo Dlouhy in 1937

Photo: State Archive in Osijek

Fundus Nr 6.

Iron craft school from 1929 , the iron operational office from 1931 , the factory warehouse from 1931 (constructors Dlouhy and Fulla), enamelling unit conducted in 1931 , the warehouse (storage) from 1936 (constructor Franjo Dlouhy), were all built in the period after 1927. Workers' bathroom was built at the site of the so-called Russian barracks in 1938 (constructor Franjo Dlouhy). Buildings constructed in 1931 (enamelling unit, varnishing facility, warehouses) are bungalows made of load-bearing brick walls and iron roof structure covered with tiles. In addition to buildings described, some other constructions are interesting: tin chimney with masonry plinth 18 meters high from 1931 and a concrete well 45 meters deep.

Site plan from October 10, 1927, shows (in a similar way to the last draft from 1922) disposition and list of OLT buildings . In the period of five years four new buildings were built so that a total of 43 buildings were described. Additional buildings are not designated as new facilities but square footage of buildings is broadened , so that the foundry occupied 1650 m<sup>2</sup> at that time.

Documents in the State Archive in Osijek testify to the construction activities within the complex of OLT, based on issued building and use permits. So for the extension of the main administrative building, a construction permit was issued on August 10, 1922, and a permit for usage and habitation on December 24, 1922. The address listed was Obkopni ka road in Osijek's Donji grad.

For the "the concrete extension of the courtyard", a use permit was issued by the city government on September 15, 1924, and the building permit was issued on November 6, 1923. The construction was carried out by the Piri and Pelzer company. For the company's director's flat addition, a building permit was issued on September 25, 1925, and a permit for usage and housing on June 25, 1926, for the residential unit next to the director's flat. The address stated was Opkopni ka Street in Osijek's Donji grad.

Ground floor iron house, patented by Förster, was built in the courtyard of the factory in 1928. The permission for construction was given by the Town Hall on April 2 , 1928, provided that within 8 days the cross-section of the building, the roof and the details of iron structure "within the meaning of static" were additionally submitted - this was delivered on April 4, 1928.



Factory warehouse was built in 1931, received a permit for usage on May 11, 1931, on the basis of building permits from November 27, 1930. The building permit was modified so that the designed brick pillars were replaced by iron ones.

Building permit for a brick chimney with iron sheet was issued on May 20, 1931. This time the address was Putnikova Street. On the neighboring location (now all within the OLT factory fence), trading house Vesna builds a warehouse of mineral oils in 1929, two street residential buildings and a fence in 1930, constructors Piri and Pelzer.

The liqueur factory Luxardo was built in the area of today's OLT factory in the early twenties. The draft of the main and supporting buildings was made by Aksmanović, Malin and Rožić in 1922. The main building is a Romanesque basilica type construction with supporting concrete columns and a wooden roof. On the front there are large window surfaces and the front itself is shaped in a way that follows the inner triangular structure, which is rare in Osijek's industrial architecture.

Unlike the buildings of the trading house Vesna that are nowadays parts of the OLT's estate[6], the building of Luxardo was probably destroyed, although there is a possibility that it was not even built[7].

In October 1937, OLT factory made Assessment of the Iron Foundry and Machine Factory Inc. facilities in Osijek.

This twenty pages long document is an important source of information about the buildings of the complex because it enumerated 85 different buildings, and for each it listed specified size (length, width and size), also describing the construction and the materials used, method of use and financial value with depreciation included.

A comprehensive and detailed situation of the factory's grounds, named Osijek's Foundry and Machine Factory Inc. Site Plan, did not indicate the date of origin. However, several indicators point to 1937 - the fact that the name of the street was Putnikova ulica (Passenger Street- in 1939 the name was changed to Trpimirova) and that the draft shows 85 facilities which is precisely the number that is listed in the Assessment of the Iron Foundry and Machine Factory Inc. facilities in Osijek in 1937. Also the list does not indicate bathrooms for workers for which construction a permit was issued in September 1937, whereas the use permit was issued in June 1938.

The complex that has spread to the north so that the east side of the complex on Putnikova street is now 328.5 m long as described in the scale of 1: 5000, while in the site plan from 1922 and 1927 the east side was 266 meters long.

Position of OLT factory in relation to major roads, railways, barracks and Tvrđava was also illustrated. The main building of the foundry has the square footage of 1750 m<sup>2</sup>. During 1937 and 1938 buildings along Sve i Eva Street were constructed with the aim to upgrade labor standards - bathrooms and dressing rooms. Building permits for building a bathroom and dressing room were issued on September 13, 1937, provided that the same kind of structure must be built south of the transformer within three years.,

City Government defined certain basic requirements for constructions in that period and the following are applicable to this building: construction of massive roof structure, waterproofing of walls, roof water drainage under the pavement into the city sewer, isolation of the wooden parts of the roof from chimney heat. Franjo Dlouhy was the building contractor, under the supervision of Antun Vuksan. Use permit for the bathroom was issued on June 24, 1938. The building permit was issued on December 21, 1939, for the construction of masonry fence around the complex of OLT, with a new change of address: the street is now called Trpimirova Street (as today).



A specific type of construction occurs in the forties, before the start of World War II in former Yugoslavia. In larger factories in Osijek, shelters were being built as a protection from possible air strikes. Several of these shelters were built in 1940: in OLT for 30 people, constructor Franjo Dlouhy, in the silk factory, constructor Viktor Axmann, and in Mercury mill, constructor Franjo Dlouhy again. Similarly, a shelter was constructed in the sugar factory for 200 people, by Ivan Piri in 1943.

A construction permit for a shelter from air attacks for OLT was issued on May 30, 1940. The first recorded construction activity after World War II is related to the reconstruction and extension of the southern part of the foundry hall in 1952. Reason for this extension was repairing the damage from bombing as well as the need for additional illumination of the factory hall. The first and only post-war site plan preserved under the name Site plan of OLT Osijek, from January 1962, at a scale of 1: 500, represents a layout view of buildings within the complex of OLT. The plan is simpler than the pre-war drafts; it does not include a list or a description of existing buildings, and it does not provide neither a number nor the names of the facilities.

During the 1991/1992 war activities, OLT has suffered great damage, both material and indirect one, associated with the limitations of business, purchase of materials, sales and other. Additionally, a large part of documentation disappeared or was destroyed during the war so that there is no data on any building processes related to OLT during the 60's, 70's and 80's. After the war, no significant construction works within the OLT took place.

At the end of 2011, the OLT complex was composed of 104 buildings of various types, purpose, date, methods of construction and size. Over time, several buildings were demolished or removed, including the building of OLT transport.

Residential buildings in Vukovarska Street, once part of the original complex, are no longer property of OLT. Most of the buildings within the complex are closed and are not used for their original purpose.



Picture 4: Aerial view of the OLT complex  
Photo: authors' photo archives, 2011.



During hundred years of existence of the OLT, there have also been some negative aspects of the development of the company that diminished the value of the complex as a whole. Intensive construction activities resulted in the fact that, in just ten years, the number of buildings inside the factory fence doubled from 43 buildings in 1927 to 85 buildings in 1937. Initial asymmetrical position of buildings on the terrain, large building density, factory buildings extensions and uncontrolled approach to further construction, led to illegible and ambiguous structure of the site organization. Today, buildings within OLT factory are in poor condition as a result of their age, many years of neglect and disuse, as well as two wars that overran these areas. Structural cracks, damaged roof truss and supporting elements of reinforced concrete frame, together with bare armature (influence of moisture and mechanical damage - grenades strikes) are visible in the most important reinforced concrete buildings from 1913.

### 3. CONCLUSION

An aspiring iron and steel plant, OLT, started with production in Osijek in 1913. It was situated within a large compound, located between major urban traffic routes, not far from the city centre. The main factory building was originally constructed in concrete and steel, thus being a pioneering early 20th century structure in Eastern Croatia. During its 100 operating years, OLT rose to success and prosperity, climbing to the spot of the largest iron and steel plant in Yugoslavia and one of the largest in Europe.

Complex of the OLT factory, its history, location, its position within the city as well as a significant railway station (Drava Bridge) related to this area, carry a part of the visual identity of Osijek. For the inhabitants of Osijek, along with sugar refinery (Še erana), match factory (Šibicara), leather factory (Kožara), agricultural machinery factory (Standard), furniture factory (Mobilija) and other factories, the foundry represented the industrial spirit of the city.

In 2013, the industry is gone, the people are leaving – a long term result of the war in 1991/92 and new borders – and Osijek is a city defined by its university and living of it. Where does its industrial heritage fit in? What is its importance in the long history of a city with Roman origins?

Industrial architecture of Osijek belongs to the European modern architecture, concerning the period from the beginning of the 20th century until 1945. Basic common characteristics put it in this context, namely: the use of loadbearing concrete structures, reinforced concrete and steel, as well as functionalist and minimalist approach to the façade.

The vanguard of Art Nouveau in Osijek were OLT iron foundry and screw factory buildings from 1913 in which concrete and iron were used as primary materials.



## BIBLIOGRAPHY

1. Gašina, Sonja Ivanković, Grgur Marko *Planovi i vedute Osijeka*. Muzej Slavonije, Osijek. 1996.
2. Hrvatske novine, May 4, 1930, Osijek
3. Hrvatske novine, December 1935, Osijek
4. Mažuran, Ivo [et.al.] *Povijest Osijeka 2: Od turskog do suvremenog Osijeka*. Zavod za znanstveni rad Hrvatske akademije znanosti i umjetnosti Osijek Školska knjiga, Zagreb, Osijek 1996.
5. Martinčić, Julijo (ur.) *Osječka arhitektura 1918-1945*. HAZU Zavod za znanstveni i umjetnički rad u Osijeku, Osijek 2005.
6. *Narodna obrana*, February 29, 1912, Osijek
7. *Narodna obrana*, August 5, 1912, Osijek
8. Sršan, Stjepan *Osijek kulturnopovijesni vodi*. Državni arhiv u Osijeku, Osijek 2000.
9. Živaković – Kerže, Zlata *Urbanizacija i promet grada Osijeka na prijelazu stoljeća (1868-1918)*. HIPPodružnica za povijest Slavonije Društvo za hrvatsku povjesnicu Osijek 1996.
10. Živaković – Kerže, Zlata *S tradicionalnih na nove puteve: Trgovina, obrt, industrija i bankarske ustanove grada Osijeka na prijelazu stoljeća od 1868. do 1918. godine*. HIPPodružnica za povijest Slavonije Društvo za hrvatsku povjesnicu Osijek, Osijek 1999.

[1] *Narodna obrana*, February 29, 1912, Osijek

[2] *Narodna obrana*, August 5, 1912, Osijek

[3] Z. Živaković – Kerže, *From traditional to new pathways*, Osijek, 1999.

[4] *Hrvatske novine*, May 4, 1930, Osijek

[5] *Hrvatske novine*, December 1935, Osijek

[6] But not without consequences; all the windows on the front facade of the Vesna building were walled up.

[7] According to the stories of older workers, the building was demolished, and not to be found inside the labyrinth of the OLT plant.