4th dimension

visual development of architecture over time on the example of historical "case study building"

Masterarbeit

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Graz - Lodz
2015

content:

acknowledgements:

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introduction:

The theme of this work is the digital analysis of the historical development of the historical "case study building" – former Franz Ramisch Cotton Products Factory, located in Lodz, Poland at Piotrkowska 138/140 Street in the very centre of the city.

Work presented below is designed to closely match and imitate the course of changes in the structure of architectural - urban foundation of this unique factory. It aspires even to the role of reconstructive surgery: with reference to any possible historical sources and archives, thorough their deep, profound and painstaking study tries to reveal the structure of factory facilities, whose existence is today known to just a few, and which were so important in years past for the proper and the model functioning of a textile factory. It is a multifaceted work, bringing together elements of many disciplines, seemingly distant from the issues which are addressed on regular basis by so called 'standard' Architecture .

However, the Architecture is not only the buildings around us. It weaves seemingly unimaginable number of factors

apparently not related to this field. These factors include, for example aspects of political, social or economic meaning. Great importance and enormous influence on the development of architecture in the world today is the development of modern technology, augmented reality, the implementation of programming languages in a design process. The architecture is a synthesis of all these and subsequent factors not listed here.
It is a living organism sensitive to stimuli from the outside, ready to adapt and evolve. It is eager to grab the Promethean torch of knowledge and meaning and do another step into the darkness of the unknown abyss of the development, embrace and assimilate it.

Franz Ramisch Cotton Products Factory also was (and still is) a living organism, a vital element in the urban tissue of the city of Lodz. Element that is responsive to external stimuli, which constantly adapts to new circumstances, adopting new approaches, technologies, changing its functions, processes and production targets depending on the current economic situation, responding to the needs, expectations and social discontent, like a sensitive barometer responds to light pressure changes. Describing the development of such a body, one should make its architecture and urbanism only a part of the whole process, depending on the other factors. One have to meet and face the new methods and opportunities.

This work, deriving from the above assumptions, attempts to describe and archive the legacy of Franz Ramisch using the methods of the conglomerate of fields such as architecture and urban planning, design, 3d graphics, computer game design, archiving, sociology and economics. Subsequent chapters will throw on each of these areas and their meaning in the project definitely more light.

This work has been divided into two main parts:

The first part is devoted to the analysis of the development of the Franz Ramisch company and divided into, again, two sections, each devoted to a different aspect, which is a part of the whole study.
The first chapter analyses the development of the Factory on a background of socio - economic changes. Description of the development stages of the Company has been divided in terms of significant historical events that in a good way

reflect the momentum of transformation occurring at Piotrowska 138/140.
The second chapter focuses on the analysis of a strictly architectural - urban issues of the Factory complex.
Its mission is to bring closer the aspects of the construction of buildings, their aesthetic value, as well as to analyse the unique urban layout assumptions.

The second part focuses in particular on the description of archival sources used. The essential part, however, is a description of the solutions used in the design of digital archive, their capabilities and benefits of the use of virtual reality in the process of archiving and revitalization of the complex architectural – urban premises. It is also devoted to the wider description of the potential integration of game engine technology in architectural and consequently also urban reconstruction, discussing the application in the context of up – to – date research and existing prerequisites determining scientific conditions of such an application.

1st Part

historic analysis

(that is, everything we missed)

chapter 1:

The development of
Franz Ramisch Cotton Products Factory
on the background of socio – economic changes

Franz Ramisch - Profile

Ramisch Family came to the Polish Kingdom from the little Czech town called Cvikov (ger. Zwickau in Böhmen) in 1835. Franz Ramisch grandfather – Anthony Ramisch – was a weaver, who migrated to the new textile settlement, which were supposed to become the new Promised Land of the textile industry, he founded and ran a weaving manufacture on two handlooms he had brought with him from Czech. His younger son, John Nepomuk Ramisch – Franz father – was a foreman weaver and the owner of a non-existing today storey house at Piotrkowska 208 in Lodz, where in the years 1850 – 1869 led the weaving manufacture. At the back of the property, before 1850, dye shop was also founded. During this period, because of his material status and the nature of his activity, Jan belonged to the group of "appreciable manufacturers and weaving masters". In 1850, Jan married the widow of his older brother, Peter Paul Ramisch, also his sister - in - law, Wilhelmine Caroline nee Schelkopf at the same time taking

under his protection her three children: Antoni, Paweł and Edward. The fruit of Jan Nepomucen relationship with Wilhelmina Karolina Schelkopf was Franz, who was born on October 13th 1856 in Lodz.

Franz Ramisch graduated from 4-class gymnasium and industrial school in Lodz, as well as the College of Commerce in the Czech Lipka (Böhemische Leipa). After returning from college to Lodz he was a trainee at "August Teschich and Otto Goldammer" commission company. Second stage of his professional development was work in the Warsaw branch of Lodz Banking House of Adolf Goldfeder, where, at the age of 19, he was a proxy.

In 1879, he rented from the Lodz industrialist G. Lehmann government one-storey house at Piotrkowska 140 on the settlement plot No 548 and founded there a small textile manufacture. He employed 8 workers working on 4 handlooms, producing 10 000 silk scarves per year of a total value of probably 10 400 Russian roubles. Ten years later he transformed his manufactory into »Cotton Products Factory "Francis Ramisch"«. By 1911, he owned almost three settlement plots of land numbered 547, 548 and 550. He financed the construction of the weaving and spinning mills, boiler room, engine room, stores, apartment, reel, ironworks and carpentry buildings, as well as many others, and also purchased the necessary equipment (including steam engine machine with a power of 25KM) gradually expanding his thriving business. According to historical sources, in 1905, Franz employed in his factory 450 workers and in 1914 already 587. Annual production value achieved at that time reached up to 550 thousand Russian roubles. Such a prosperous company has provided Franz Ramisch a place among so called "the great bourgeoisie of Lodz". The success that has become his participation somehow represents the schema that can be derived from the observation of Lodz textile industry development as well as the careers of its founders. This scheme has been cited by A. Rynkowska and states that as a rule the third generation of foreman weavers - this generation includes Franz Ramisch, the grandson of Anthony, who initiated the family fate in the city and bounded it strongly with the textile industry - usually constituted more than affluent social class(1).

During World War I the company suffered significant losses as a result of compulsory requisition of the machines and raw materials for the German war industry, which lasted from the turn of 1914 and 1915 till November 1918. In 1922, the company showed a loss by way of the aforementioned requisitions for the amount of approximately 216 thousand Russian roubles, respectively. Nevertheless, despite the economic difficulties Franz successfully managed his enterprise employing in the interwar period from 600 to 800 workers (most of them in 1928 – approximately 1000 people, least - during the Great Depression in the years 1929 to 1933 – from 200 to 250 people). In 1924 the company was converted into a family company under the name of »Cotton Products Factory "Franz Ramisch" SA in Lodz«. Franz remained its chairman and managing director. At this time he owned also a farm Zabrzeźna nearby Głowno in the district Brzeziny, which included, among other things, villa with park and forest. In 1930 Maurice and John Landau joined the company. Each one held 22% of the company's shares. Ramisch family owned a majority stake untli 1936. After the death of Franz in 1932, Maurice Landau became the company's president. In the years 1931 - 1939 the company belonged to the Association of Cotton Yarn Manufacturers in Lodz. During World War II, the family retained

[1] Rynkowska, zit. n. Salm 2007, 2.

its ownership and administration of the facility. This changed in 1946 when the company was nationalized and incorporated first in the structure of the National Cotton Industry Plant N°4, and in 1963 into the Gen. Walter Cotton Spinning Plant as "Plant B".

Not only had Franz Ramisch run the factory but he was an active member on economic and social scene as well. At the time of his activity he was an active part of the authorities of several business organizations operating in Lodz: Lodz Industrialists Cooperative Bank (member of the Committee from 1883 to 1893, member of the Supervisory Board from 1907 to 1932), the Association for Mutual Aid of Foremen of Spinning, Weaving, Finishing and Dyeing of the city of Lodz (honorary member in 1898), the Monetary Stock in Lodz (member of the Assembly from 1900 to 1903, 1914, 1915, 1923; member of the Committee from 1911 to 1919), the Credit Company of the city of Lodz (a member of the Supervisory Committee from 1904 to 1905), the Association of Lodz Industry Stakeholders for Coal Purchase (Member of the Board from 1904 to 1913), the Office of the Senior Assembly Merchants (Representant 1911, 1912), Section of the Fibrous Industry in Lodz District which was a branch of the Lodz Society for the Promotion of Trade and Industry, which was known later as the Textile Industry Association in Polish State (Member of the Board from 1913 to 1918, member of the Union 1913 – 1932), and also was a member of the Assembly of Textile Foremen in Lodz.
His social activities were focused on the development of German culture and education in Lodz. He belonged, inter alia, to Deutschen Real - und Gimnasialvereins, which in 1907 he helped to co - found and a member of the Board of Trustees a year later; Verein Deutschsprechender Katholiker, of which he was also a co –founder; Deutsche Schul – und Bildungsverein in Lodz, the German Theatre Society (1912 – 1913), Lodzer Männer Gesang Verein und Kirchengesangverein "Cäcilie" in Lodz. He was also a philanthropist. He was a member – co – founder of the Ad Hoc Medicaid Society, which in 1899 formed Emergency Ambulance Service in Lodz. He belonged to the Christian Charity Association of Lodz, and together with his wife Wanda was a supporting member of "Anna Maria" and "Kochanówka" hospitals. Moreover, he was one of the founders of the Lodz Society for Cancer, which was founded in 1927.

Moreover, despite all of professional and social activities, Franz was a family man. In 1881, he married Wanda (1857 – 1935) from the Schatke (Schadke) family, evangelical, with whom he had six children: Artur (1882 Lodz – 1936 Karlstadt), Gertruda (1885 Lodz – 1985 Munich), Małgorzata (1887 Lodz – 1946 Lodz), Cezar (1891 Lodz – 1943 Lodz), Zygmunt (1893 Lodz – 1941 (?) civilian POW camp in Gdańsk Nowy Port) and Szarlotta (1894 Lodz – 1994 Munich).

Francis had three half-siblings, children of Piotr Paweł Ramisch and Wilhelmina Karolina Schelkopf, whom Piotr Paweł married after the death of his brother Jan Nepomucen Ramisch. Two of them, Antoni and Paweł, remain mysterious – we know little, if not practically nothing, about them. Genealogical tree of the Ramisch family does not give even their dates of birth or death. Only about an older half-brother, Edward, we know a little bit more. Edward was, since 1871, the owner of a weaving mill located at Piotrkowska 144, and since 1898 he owned also a spinning mill at Senatorska 16 Street. He was one of the group of landowners who had decided to convey parts of their plots free of charge for the construction of the road connecting

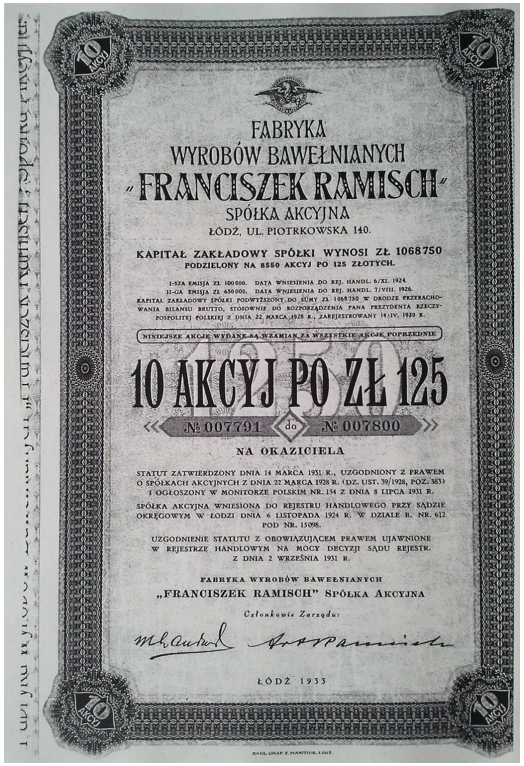
Piotrkowska Street with newly built (in the years 1880 – 1888) Evangelical church of St. John at Wild Street, Evangelical Street (now Franklin Delano Roosevelt Street), back then known as the Evangelical Alley. Edward was not so lucky as his half-brother, and after World War I his company leased its buildings to Isler and Cygan company, which later bought it definitively for the amount of PLN 1 895 000.

Franz Ramisch died on 16 March 1932 in Lodz and was buried in the Roman – Catholic cemetery of Saint Joseph located at the Ogrodowa Street.

addendum 1:

Franz Ramisch Profile

Pic. 1. Franz Ramisch



FABRYKA
WYROBÓW BAWEŁNIANYCH
„FRANCISZEK RAMISCH"
SPÓŁKA AKCYJNA
ŁÓDŹ, UL. PIOTRKOWSKA 140.

KAPITAŁ ZAKŁADOWY SPÓŁKI WYNOSI ZŁ 1068750
PODZIELONY NA 8550 AKCYJ PO 125 ZŁOTYCH.

I-SZA EMISJA ZŁ 100 000. DATA WNIESIENIA DO REJ. HANDL. 6/XI. 1924.
II-GA EMISJA ZŁ 650 000. DATA WNIESIENIA DO REJ. HANDL. 7/VIII. 1926.
KAPITAŁ ZAKŁADOWY SPÓŁKI PODWYŻSZONY DO KWOTY ZŁ 1068750 W DRODZE PRZEKSZTAŁCENIA BILANSU BRUTTO, STOSOWNIE DO ROZPORZĄDZENIA PANA PREZYDENTA RZECZYPOSPOLITEJ POLSKIEJ Z DNIA 25 MARCA 1928 R., ZAREJESTROWANY 14/IV. 1930 R.

NINIEJSZE AKCJE WYDANE ZA WYJĄTKIEM ZA WSZYSTKIE AKCJE POPRZEDNIE

10 AKCYJ PO ZŁ 125

№ 007791 do № 007800

NA OKAZICIELA

STATUT ZATWIERDZONY DNIA 14 MARCA 1931 R., UZGODNIONY Z PRAWEM O SPÓŁKACH AKCYJNYCH Z DNIA 22 MARCA 1928 R. (DZ. UST. 39/1928, POZ. 383) I OGŁOSZONY W MONITORZE POLSKIM NR. 154 Z DNIA 8 LIPCA 1931 R.

SPÓŁKA AKCYJNA WNIESIONA DO REJESTRU HANDLOWEGO PRZY SĄDZIE OKRĘGOWYM W ŁODZI DNIA 6 LISTOPADA 1924 R. W DZIALE B. NR. 612 POD NR. 11098.

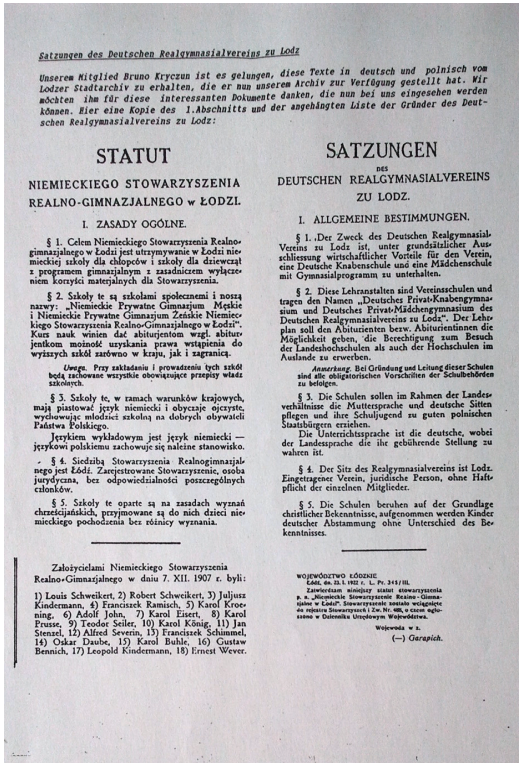
UZGODNIENIE STATUTU Z OBOWIĄZUJĄCEM PRAWEM UJAWNIONE W REJESTRZE HANDLOWYM NA MOCY DECYZJI SĄDU REJESTR. Z DNIA 2 WRZEŚNIA 1931 R.

FABRYKA WYROBÓW BAWEŁNIANYCH
„FRANCISZEK RAMISCH" SPÓŁKA AKCYJNA

Członkowie Zarządu:

ŁÓDŹ 1933

Pic. 2. stock share of the Cotton Product Factory „Franz Ramisch"



Satzungen des Deutschen Realgymnasialvereins zu Lodz

Unserem Mitglied Bruno Kryczun ist es gelungen, diese Texte in deutsch und polnisch vom Lodzer Stadtarchiv zu erhalten, die er nun unserem Archiv zur Verfügung gestellt hat. Wir möchten ihm für diese interessanten Dokumente danken, die nun bei uns eingesehen werden können. Hier eine Kopie des 1.Abschnitts und der angehängten Liste der Gründer des Deutschen Realgymnasialvereins zu Lodz:

STATUT

NIEMIECKIEGO STOWARZYSZENIA
REALNO-GIMNAZJALNEGO w ŁODZI.

I. ZASADY OGÓLNE.

§ 1. Celem Niemieckiego Stowarzyszenia Realno-gimnazjalnego w Łodzi jest utrzymywanie w Łodzi niemieckiej szkoły dla chłopców i szkoły dla dziewcząt z programem gimnazjalnym z zasadniczem wyłączeniem korzyści materjalnych dla Stowarzyszenia.

§ 2. Szkoły te są szkołami społecznemi i noszą nazwy: „Niemieckie Prywatne Gimnazjum Męskie i Niemieckie Prywatne Gimnazjum Żeńskie Niemieckiego Stowarzyszenia Realno-Gimnazjalnego w Łodzi". Kurs nauk winien dać abiturjentom wzgl. abiturjentkom możność uzyskania prawa wstąpienia do wyższych szkół zarówno w kraju, jak i zagranicą.

Uwaga. Przy zakładaniu i prowadzeniu tych szkół będą zachowane wszystkie obowiązujące przepisy władz szkolnych.

§ 3. Szkoły te, w ramach warunków krajowych, mają piastować język niemiecki i obyczaje ojczyste, wychowując młodzież szkolną na dobrych obywateli Państwa Polskiego.

Językiem wykładowym jest język niemiecki — językowi polskiemu zachowuje się należne stanowisko.

§ 4. Siedzibą Stowarzyszenia Realnogimnazjalnego jest Łódź. Zarejestrowane Stowarzyszenie, osoba jurydyczna, bez odpowiedzialności poszczególnych członków.

§ 5. Szkoły te oparte są na zasadach wyznań chrześcijańskich, przyjmowane są do nich dzieci niemieckiego pochodzenia bez różnicy wyznania.

Założycielami Niemieckiego Stowarzyszenia Realno-Gimnazjalnego w dniu 7. XII. 1907 r. byli:

1) Louis Schweikert, 2) Robert Schweikert, 3) Juljusz Kindermann, 4) Franciszek Ramisch, 5) Karol Kroening, 6) Adolf John, 7) Karol Eisert, 8) Karol Prusse, 9) Teodor Seiler, 10) Karol König, 11) Jan Stenzel, 12) Alfred Severin, 13) Franciszek Schimmel, 14) Oskar Daube, 15) Karol Buhle, 16) Gustaw Bennich, 17) Leopold Kindermann, 18) Ernest Wever.

SATZUNGEN

DES

DEUTSCHEN REALGYMNASIALVEREINS
ZU LODZ.

I. ALLGEMEINE BESTIMMUNGEN.

§ 1. Der Zweck des Deutschen Realgymnasial-Vereins zu Lodz ist, unter grundsätzlicher Ausschliessung wirtschaftlicher Vorteile für den Verein, eine Deutsche Knabenschule und eine Mädchenschule mit Gymnasialprogramm zu unterhalten.

§ 2. Diese Lehranstalten sind Vereinsschulen und tragen den Namen „Deutsches Privat-Knabengymnasium und Deutsches Privat-Mädchengymnasium des Deutschen Realgymnasialvereins zu Lodz". Der Lehrplan soll den Abiturienten bezw. Abiturientinnen die Möglichkeit geben, die Berechtigung zum Besuch der Landeshochschulen als auch der Hochschulen im Auslande zu erwerben.

Anmerkung. Bei Gründung und Leitung dieser Schulen sind alle obligatorischen Vorschriften der Schulbehörden zu befolgen.

§ 3. Die Schulen sollen im Rahmen der Landesverhältnisse die Muttersprache und deutsche Sitten pflegen und ihre Schuljugend zu guten polnischen Staatsbürgern erziehen.

Die Unterrichtssprache ist die deutsche, wobei der Landessprache die ihr gebührende Stellung zu wahren ist.

§ 4. Der Sitz des Realgymnasialvereins ist Lodz. Eingetragener Verein, juridische Person, ohne Haftpflicht der einzelnen Mitglieder.

§ 5. Die Schulen beruhen auf der Grundlage christlicher Bekenntnisse, aufgenommen werden Kinder deutscher Abstammung ohne Unterschied des Bekenntnisses.

WOJEWÓDZTWO ŁÓDZKIE
Łódź, dn. 22. I. 1932 r. L. Pr. 345/III.
Zatwierdzam niniejszy statut stowarzyszenia p. n. „Niemieckie Stowarzyszenie Realno-Gimnazjalne w Łodzi". Stowarzyszenie zostało wciągnięte do rejestru Stowarzyszeń I Zw. Nr. 488, o czem ogłoszono w Dzienniku Urzędowym Województwa.

Wojewoda w z.
(—) *Garapich.*

Pic. 3. Statut of Deutschen Real - und Gimnasialvereins in Lodz

The chronology of the Factory transformation development

Draft of the situation in Lodz before the year 1879

Economy

After the November Uprising, which broke out in 1831, so soon after the demarcation by the municipal authorities the new industrial settlement along the axis, marked with Piotrkowska Street, Lodz became the most important centre for the cotton production in the Polish Kingdom[(2)]. In the years 1831 – 1849 the production of cotton grown here more than 33 times. The share of total production of Lodz cotton weaving industry in the Kingdom in the year 1833 was over 22%, and 13 years later, in 1846 already 60,6%. Besides weaving, through K. Scheibler, L. Geyer, T. Grohman, D. Lande and K. Moessa factories, the city also played a leading role in the cotton spinning industry. In the '50s of the nineteenth century cotton weaving industry has expanded rapidly in other industrial centres of Lodz district, which included, among others, Pabianice, Aleksandrów, Konstantynów, Zgierz, Tomaszów Mazowiecki and Zduńska Wola. Overall, after a period called "cotton famine" that occurred in the years 1861 - 1864, Lodz companies clustered in their hands about 41% of the total production of cotton in the district of Lodz.

[2] Badziak/Puś, zit. n. Rosin/Baranowski/Fijałek, u. a.,1988, 244.

Cotton famine period also contributed to the development of the wool industry, which until the '60s of the nineteenth century did not play a greater role in the city. After the events of the years of crisis, its share accounted for over 20% of the total wool production in Lodz district.

Development and the gradual mechanization of the textile factories encouraged changes in the structure of the textile industry. Slowly and progressively concentration of production in large mechanized factories has followed. This tendency was supported by the occurrence of economic crises periods during which small factories went bankrupt. The dominance of the big units of the factory type could have been seen at first in the cotton industry, which has set the development of workplaces representing the entire production process from spinning till finishing. The first companies of the new type, existing already in 1845 were plants of: L. Geyer (spinning, weaving, printing and dyeing) in which he employed 715 workers; T. Grohman (spinning and weaving) employing 118 workers. The company of K. Scheibler (spinning and weaving) employing 167 workers, joined in 1859 this group of large enterprises[3].
With the increase in population, other industries, not related to cotton one began to develop, such as food industry (which in the '60s of the nineteenth century noted the largest increase). Also craft and trade developed, which have significantly contributed to the overall city growth. In the years 1832 - 1865 the number of people who are accustomed to trade has increased more than 13 times, while the number of taverns and restaurants (services) over 3 times[4].

The city was rapidly changing its character and adapting itself to the needs of the new capitalist economy. In the reviewed period it grew into a major economic centre of the Polish Kingdom. The industrial district of Lodz emerged, where the city of Lodz itself was on the leading position, narrowing the other textile towns of the Warsaw Province down to the role of its satellite centres. The dynamic development of the city witnessed a rapid population growth, which number already in 1842 secured its status of the second largest city in the Polish Kingdom, just after the capital city – Warsaw. In 1860, counting approximately 32 650 inhabitants in the scale of tri – annexations it backed down only Gdansk, Cracow and Poznan.

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[3] Ebda., 246.
[4] Ebda., 247.

Socio – political circumstances

Economic changes taking place in Lodz at a very fast pace left their mark on the social structure of the city conformed it to the great industrial centres of Western Europe. Rapidly growing industry, absorbing masses of workers, contributed to a huge increase in the population of the city. Lodz became the Promised Land of virtually all social classes and professions: such a basic elements of both the proletariat and the bourgeoisie, as well as complementary layers such as intelligence or middle class. Lodz owed its growth mainly to the immigrating element, which built a diverse and complex ethnic and religious structure. Indicator of the rate of the population increase for the city was, in the second half of the nineteenth century, higher than the corresponding figure for the well-known rapidly developing cities of Western Europe such as Lyon or Manchester. The unofficial name then enjoyed by the city of Lodz, was exactly the "Polish Manchester".

In ethnically diverse city, where in the second half of the nineteenth century almost 50% of the population were Poles, followed by Germany and the Jews, there was a definite relationship between ethnic affiliation and source of livelihood and the role played in the

economic life of the city[5]. The social structure, however, was strongly dominated by the German element, which was the strongest group, mainly because of possessing in their hands most of the largest factories, commercial companies as well as real estate premises. It constituted the possessing class – the bourgeoisie – and remained in a close functional relationship with the municipal authorities, in many cases loyally serving the Russian invaders. Second position in the class hierarchy was occupied by Jews, who were in possession of most of the medium and small industrial plants, and who exceedingly dominated trade and crafts. Despite owning only a small number of commercial and industrial businesses, the main source of income for Poles, however, was the industry labour. It is mainly Poles who created the proletarian class.

Lodz also struggled with the problem of outdated municipal administration organization, resulting from the backwardness of the possessive administration. Municipal board was unprepared for such a sudden and rapid development of the city, as well as escalating unresolved needs of many urban life areas. Pressing problems the city faced were then mainly urban: poor sanitary condition, the lack of water supply network as well as sewerage, lack of plans to regulate the city – street network formed hastily and spontaneously, often without any legitimate arrangements with municipalities; overpopulation, catastrophic housing conditions – mainly in the so-called "Jewish territory" existing in the years 1825 – 1862 in the Old Town, and was inhabited mainly by poor Jews not having enough resources to live; unregulated urban, sanitary, and residential condition in the district Nowe Bałuty, a suburban village inhabited mainly by workers, servants, and so-called lumpenproletarian class, as well as the habitat of the so-called social – scum (about poor housing conditions prevailing there daily newspaper *"Rozwój"* was writing in 1911 (!): "The interiors of the houses in Bałuty are nothing but a stinking holes that you enter with disgust"[6]).

Affiliation of Lodz to the Russian occupation zone created unfavourable conditions for the formation of socio – political life. National oppression, persecution and repression of occupational authorities in relation to citizens of Polish nationality as well as lack of political freedoms, forced timidly emerging political parties to illegal and underground work. Lodz was also lacking crucial elements necessary for proper development of political life. Rapidly developing city was not able to introduce and create appropriate models of social attitudes for the masses of incoming population. Lodz does not have at the time, in contrast to other Polish cities, such as Cracow or Warsaw, neither resorts shaping public opinion, such as the press, nor too large intelligence or properly shaped working class. Working habitat was formed mainly by alluvial peasants who having broken with the rural environment and bounded their fate with the city had to re – build their systems of values and to look for new patterns of behaviour, at the same time trying to find their place and to adapt to the new reality. But they had nowhere to draw them from. Bourgeoisie and intelligentsia were too sparse and weak to even try to prepared them, and the church could not cope with the number of migrant new believers, which he was supposed to reach. Patterns of ethical behaviour also could not been sought among the Lodz bourgeoisie, consisting mainly of the element of foreign origin.
In the era of the emerging capitalist society, possessive class have characterized selfishness,

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[5] Barszczewska - Krupa/Samuś, zit. n. Rosin/Baranowski/Fijałek, u. a.,1988, 380 - 382.
[6] "Rozwój" 1911, N°199, zit. n. Ebda., 347.

greed, haste and lack of social empathy. The synonym of these negative imperfections became a type known as *"lodzermensch"*, which was often attributed to the representatives of the Lodz bourgeoisie (later this expression acquired less pejorative meaning). This negative side can be found in many literary positions, such as *"The Promised Land"* by W. Reymont, which shows the bourgeois class as "people mostly without political principles who found their homeland on the ground of Lodz, captured here their living and positions, tied themselves rigidly to the city"and that "for the lodzermensch type bribe is called a commission and fraud – a good deal"[7] as the bourgeois columnist was then writing. Others were writing for instance: "who in Lodz does not have a 100 Russian roubles – is yet not a man, who has – has ceased to be"[8].
Lodz developed rapidly, suddenly, almost as if by magic, in the striking impetus of change not paying attention to the details.

Population

"We have not in the country any city that owed as much to the industry as Łódź did; a city that whether not of the industry from complete oblivion, from utter nothingness, rose to such a level of wealth and development; ... During half of the century over 100 times the population of Łódź increased. Such a result would still only North America managed to provide" [9]

[7] Gorski, S., zit. n. Rosin/Baranowski/Fijałek, u. a., 1988, 382.
[8] Gostkowski/Karwacki/Wóycicki, zit. n. Ebda., 382.
[9] Flatt 1853, zit. n. Ebda., 192.

One of the most rapid growth in population, occurred in Lodz in the years 1836 – 1842, when it grew by 9 thousand and with a number of 17 thousand residents became the second largest city in the Polish Kingdom. Symbolic recognition of its position in the Kingdom was marked in 1841 when Lodz become the provincial city.

Population of the city underwent dynamic increases usually during periods of severe economic recovery and bullish prosperity situation, stabilizing at a certain level in periods of economic stagnation, while decreasing in times of crisis or warfare (the November or January Uprising, World War I).

And so in the years 1842 – 1877 Lodz was inhabited by more than 51 thousand residents. This number, however, during the discussed period underwent some changes, as a consequence of what the total increase in population can be considered rather small.

One of the most dramatic periods for the city population was the winter in 1845. It was related to the mass emigration of families which did not have any means of livelihood, as well as to increased mortality caused by malnutrition and diseases. Exodus continued until 1847. The total number of inhabitants remained was oscillating then around 15 thousand people.

After overcoming the economic depression, the population increased again very quickly, and as soon as 10 years later there were about 40 thousand residents. In the '60s of the nineteenth century, and especially in their first half, Lodz survived the subsequent economic downturn associated with a so-called. "cotton famine", and further deepened with the outbreak of the January Uprising. the population stabilized than at around 40 thousand people. In the period between 1866 – 1877, which represents the beginning of the development of great capitalism in Lodz, its population went from the state of lively growth, stagnation and decline of its size to the period of firm development. Whole population grew during this time of approximately 10 thousand people.

From that moment until the outbreak of the Revolution of 1905 due to the favourable economic conditions and the successful development, the population of the city increased gradually to reach eventually in 1905 a state of nearly 350 thousand.

The time of precipitate growth

Situation of Franz Ramisch Factory between 1879 – 1900

In 1879, Franz Ramisch started his own business as a foreman weaver. In the one-story wooden house at Piotrowska Street 140, rented from the local entrepreneur G. Lehman, on a plot marked as a mortgage settlement N°548, established a small weaving manufacture. At this time he employed eight workers and had four handlooms. The value of the annual production amounted to approximately 10 000 silk scarves which was equal to approximately 10 400 Russian roubles of income[10].

Franz could not have chosen a better time to set up his own business. It was a period of amazingly rapid development of the capitalist relations in the area of Lodz, not shaken by any uprisings or wars. Therefore providing relatively stable economic development, only vulnerable to market fluctuations. Markets of goods produced in Lodz also underwent a lot of changes. Until the mid – '70s of the nineteenth century Lodz entrepreneurs worked for and supply the needs mainly of the local market, which increased significantly after the emancipation of the peasants in the mid – '60s of the nineteenth century. After the

[10] Ihnatowicz 1965, 184 - 185.

Russian Empire introduced protectionist tariffs that protected domestic production, significantly limiting the share of goods produced in Western Europe, the target market of Lodz goods became the Russian lands, particularly the Far East (Lodz goods reached for some time even to China and Manchuria). Lodz industry, with a significant technical advantage over backward Russian industry mastered, until the end of the nineteenth century, the above mentioned markets exporting there approximately 75% of its production. The expansion of the Lodz export to Russia raised in the mid – '80s of the nineteenth century a great concern and anxiety among Russian industrialists, which led to the so-called "Fight between Lodz and Moscow" – fierce competition for the influence on the markets as well as Russian attempts to minimize or even stifle the industry in the Lodz district. Special committees were invoked to assess the conditions of industrial development of Lodz, demagogically accused by Russia of remaining under strict German influence, which was obviously against the interests of the Empire. A total of four such committees were established. The last one in the final report clearly stated that the Lodz industry was developing in mouc unfavourable conditions than the Russian one, mainly due to the fact that the Moscow district was disposing of cheaper labour, lower wages, longer working hours, cheaper fuel (mazut rather than coal) , cheaper raw material (Russian cotton as well as imported one, for which duties were significantly smaller in Russia than for the same one imported to Polish Kingdom), as well as convenient rail tariffs. It finally ended the dispute of the two bourgeoisies. At the time of the aforementioned competition, however, the directional orientation of export has changed, which until the mid – '80s of the nineteenth century was focused mainly on the markets of central Russia. That is when Lodz entrepreneurs began to move their export towards the Far Eastern lands of the Russian Empire (Tomsk, Irbit, Bukhara, Khiva, Persia, Baku, Batum and Tiflis). With the change of markets, changes in the production profile and assortment occurred naturally. Textile factories of Lodz district, cotton and wool mutually, switched its production to lower-quality products which could been sold successfully in these markets of the Empire, where the main recipient was still recruiting from the peasant population.

Rapidly growing industry, however, was dependent on fluctuations occurring in the global economic situation, especially on the situation in Russia, which has become its natural outlet. Until 1889, Lodz industry went through just one serious economic crisis associated with crop failures in Russia in 1881, which in the cotton industry echoed only in the years 1885 – 1886. Difficulties in the sale of goods, and consequently the problem of overproduction occurred. The decrease in production that occurred as a result of these changes led to the bankruptcy of more than 100 plants, mostly small, technically backward. The situation improved already in the following year.

Described situations can easily be transplanted onto Ramisch property while trying to see it in the pace of the development and the number of buildings erected on the plot during this period. We would notice that the plant that originated in the late '70s the nineteenth century had not changed its building structure until the end of the '80s. Franz managed to save the company from bankruptcy in the mid – '80s, and in the following period of economic recovery in 1889, began its modernization and ushered in a new phase, changing from manufacture to a factory with fully integrated production process. And so, after an earlier purchase of the settlement plot at Piotrowska Street 140, expanded his factory of a three-storey weaving mill layed with

brick, boiler room building, constructed the chimney, built stables and coach house and several auxiliary buildings. Also bought a steam engine with a 25HP power. At that time, the factory employed 120 workers. Employment on such a level placed the »Cotton Products Factory "Franz Ramisch"«, into which manufacture has been transformed, in the group of large factories and plants.

In the last decade of the nineteenth century Lodz industry was hit with another crisis of overproduction, which, however, did not harmed cotton industry too much, but did the wool sector. Since 1890 the production of cotton industry increased steadily, and the industry developed rapidly and flourished. Favourable economic situation positively affected also the technical condition of Lodz factories. By the end of the nineteenth century factories were equipped not only with steam machines but also gas engines, steam turbines, locomobiles and gasoline engines. Electricity became widespread; Franz Ramisch introduced it in his factory already in 1893. The old machines were also exchanged with modern textile machinery imported from abroad, mainly from England, Germany, France and Belgium, as polish metal industry had not yet been capable of producing such a machinery on its own.

In such good conditions Ramisch factory developed further. Basically its main development in terms of construction of the most necessary building falls precisely in the period of the last decade of the nineteenth and the beginning of the twentieth century.

In 1891, the weaving mill was extended towards the east, as well as the brick carriage house on the south side of the current plot was constructed. This extension established the eastern boundary of the plot at 125 meter from the Piotrowska Street.

Another large expansion took place two years later, in 1893. Probably a year earlier Franz purchased from Wilhelm Hanneman the plot of land marked with a number 547 at Piotrkowska Street 138, adjacent to the north of his current property. This plot, however, did not reach the Mikołajewska Street (today H. Sienkiewicza Street) as it was separated from it with a smaller plot, belonging to another owner (probably due to the former transaction carried out by Wilhelm Hanneman). Thus Ramisch came into possession of several properties located on the purchased piece at that time, namely: the front one-storey wooden house with accompanying auxiliary buildings and residential two-storey brick tenement he probably already than adapted for his apartment. The purchase of an adjacent plot enabled a significant expansion of the Factory. New four-storey spinning mill was built on the east side of the existing weaving mill and a on the north side a small building was constructed, equipped with a steam engine. Also the boiler house was extended by one axis in the direction of Piotrowska Street. Two-storey, laid with brick cantor building was erected on the south side of existing coach house. In addition, number of the buildings on the plot has increased by three new one-storey, brick auxiliary buildings, two of which were located on the southern border of the lot N°548, and one on the northern border of the lot N°547. It is likely that at that time the windows in the northern walls of the weaving mill buildings were created that earlier have remained blind due to the fact that these buildings were located on the border of the plot.

Years 1894 – 1896 were abundant in modernization and expansion of buildings located on

the plot. At that time, narrow track system designed for trolleys carrying yarn and other necessary materials also appeared, making transport system within the factory more efficient. Existing residential tenement building were rebuilt: on the east side slightly wider, one-storey module were constructed and connected with existing one with an internal passageway. Engine room underwent expansion as well: on the west side, in between second weaving mill building and northern border of the plot N°547, one-storey brick building was built equipped with four-storey "tower" made of brick, directly adjacent to the transmission shaft constituting the first, the most western axis of the spinning mill building. Building of the engine room, according to archive plans, was divided into two spaces: northern one covered with gable roof and southern one covered with saw – tooth roof. The existing cantor building was expanded in an eastern direction with the four – axis, two-story brick building, to which, in turn, also on the east side, a small one – storey outbuilding was added, probably serving as concierge at that time. Auxiliary building located on the southern border of the plot N°548 was also extended towards the west. However, in the archives we will find a quite accurate plans of the modernization of the engine room building, yet transformation of the residential tenement building could be retrieved only from land development plans. The same problem applies to modernization of the cantor building. This building, however, was transformed on the basis of addition of subsequent modules, without explicit interference in its overall structure. The fact that it survived to the present day, makes it easier to extract information about successive stages of occurring changes taking place in the physical object by comparing it with archive plans.

Until 1898 the factory was in the possession of the plot marked N°550 located at traced in the years 1880 – 1884 new Evangelical Street connecting Piotrkowska Street and Mikołajewska Street (until 1888 under the name of Wild Street). Plans from the year 1898 indicate intentions to expand factory in the eastern and southern directions. Most likely, at this time the boiler house was expanded to the north by adding virtually identical module to the existing one, creating a two – aisled building. Another investment was the construction of single-storey auxiliary buildings and warehouses within the newly acquired plot N°550, including the central building wider than the others and heighten with an attic, housing ambulatory, staff canteen and concierge office. On the west side of the described building, from Evangelical Alley side, main crossing gate was located. These buildings were hidden behind the screen façade made in neo – Gothic style.
On the border of the plots N°548 and N°550, facing the ambulatory building, small, one-storey forge building was located.
Plans from this year assumed also spinning mill extension toward the east with another seven – axis module and the construction of a small auxiliary building neighbouring with a forge. However, these plans were not realised, according to preserved drawings of the state of the buildings from 1899 and following years.

In 1899 engine house was rebuilt, which includes the unification of the façade and its lift to a height of about two stories without dividing its interior space height into two separate floors with any ceiling. An interesting and quite astonishing part of the new engine house interior was an encrusted wooden ceiling and wood panelling wall, as well as floor laid with ceramic tiles. Ambulatory building adjacent to Evangelical Street underwent modernisation as well. It was raised by one floor and connected with the crossing gate, which was also covered with a gabled

roof. The plans included also an expansion of the cantor building towards the west, however, as seen in the drawings of later projects, this design was implemented in following years.
The main investment that took place in the factory this year was the construction of the reel house building in the south – west corner of the plot Nº550, combined with the weaving mill building with suspended connector and facing the Evangelical Street. It was designed by architect Paweł Rubensahm, approved by city architect Franciszek Chełmiński. The project involved the construction of a three-storey building equipped with a cellar, bedighted with a six – axial impressive façade facing the street. The façades dominant feature was to be a four-storey tower topped with a hipped roof with a soaring spire. The break of a tower, housing representative staircase, was to be located in the third elevation axis counting from the east. The project anticipated also an implementation of a three-storey tower comprising a water tank on the north side of the building, as well as a suspended, three-storey connector building linking it with a weaving mill. Probably due to the lack of funds the project was not implemented entirely at that time. Only two-story, basement main reel house building with an attic was built. Staircase was made at the prearranged place, yet without the tower. From the north, the planned water tower was completed, as well as the above – ground connector, but one storey only. In the same year toilets for workers were planned to be constructed, but unfortunately the project remained unfulfilled.

Following the dynamic development occurring in the F. Ramisch Factory over – starting from 1889 (the date when the first factory building in the strict sense was erected) by the year 1900 – a total of 11years, we can easily notice how fast did the fortunes raised in Lodz, and with what vigour did the progress of the new capitalist economy followed. This period was the time of the most intensive development of the factory. Subsequent periods would no longer be so abundant in terms of number of investments. From 1898 the state of enterprise boundaries would no longer change.

Thriving economy of Lodz district, and especially of the city of Lodz and the accompanying rapid development of capitalist relations, exacerbated incredibly social conflicts on an unprecedented and unknown scale in other industrial centres of the Polish Kingdom. Lodz was a city of enormous social contrasts, where poverty neighboured directly with great wealth. Bad situation of the workers was expressed, inter alia, by inadequate medical care, poor housing state, low level of education, or the brutality with which the workers were treated by the factory administration representatives consequently infringing factory legislations. In such a conditions the social awareness of the workers were shaped more and more explicitly, whose fight to improve living conditions and political rights dominated socio – political life of the city. As the largest concentration of the proletariat in the Polish Kingdom, Lodz became also an ideal goal for emerging socialist and Marxist movements. Slowly here also socialist organizations, such as The Proletariat (later The II Proletariat) or Polish Workers Union began to appear. The first great shock to Lodz bourgeoisie was the so – called "Lodz rebellion" that broke out on May 2nd 1892. The workers demanded from employers to raise wages and improve working conditions, including a shorter working day. Manufacturers gathered in the "Grand Hotel" were divided into supporters and opponents of concessions. As a result, however, possessive government forces brutally suppressed protests, dead and wounded fell. The strike was lost, but won the intended effect: manufacturers scared that similar accidents may happen in the fu-

ture, raised wages, shortened working time by one hour, and have made concessions in the social field. Considering, on this background, the question of Franz Ramisch himself and his company, we hypothesize that the lack of any investments at the time was also the result of these aforementioned events, and probably that he also had to re-arrange and improve his relations with the workers. The strike exposed to the workers the alliance between government and capitalists, and thus, pushed them to keep fighting on the field not only economical but also political. The fact that Franz Ramisch remained loyal to occupational authorities, is demonstrated in the book by Stefan Pytlas *"Lodz bourgeoisie in the years 1864 – 1916"* on page 154 where he writes: "In 1896 the celebration of Tsar Nicholas II coronation were held throughout the Empire. Also in Lodz. On this occasion palaces of Meyer, Kunitzer, Fr. Ramisch, M. Silberstein were decorated"[11]. This as it may indicate something, does not need to as well. Yet it could be a purely political trick of Franz, trying to assure a better future for himself and his company. Since we cannot prove this in any possible way, let us leave it just as a hypothetical statement, from which each reader would be able to draw their own conclusions.

The atmosphere in the working – class environment thickened and swelled. Soon, in a spectacular way this was supposed to reflect on the city of Lodz and its social – political and economic relations.

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[11] Pytlas 1994, 154.

The Revolution and period before the World War I

Situation of Franz Ramisch Factory between 1900 – 1914

In the years 1899 – 1913 Lodz has faced three main economic cycles, the first of which covered the years 1899 – 1907, the second 1907 – 1909, and the third from 1911 to 1913.

The first, initiated by the economic crisis, which affected all areas of production, additionally escalated by growth of prices of basic raw materials, engulfed building industry and practically stopped an investment boom lasting so far in the textile industry. The market faced the significant overproduction and increased level of reserves, yet the lack of sales. Many companies went bankrupt at the time, while others had big losses. Image of the crisis was completed by ongoing Russo – Japanese war and low harvest in the Empire, and thus the inability to sell goods on the eastern Russian markets, on which Lodz industry based its existence. Between 1900 - 1904, industry faced significant decrease in employment. This further worsened the already bad situation of the working –class population, which lacked basic means of livelihood. The number of deaths from hunger exhaustion and prevailing poverty contributed to an increase in crime. Thousands of people left the city in search of a better tomorrow. The prevailing misery fostered radicalization of

the tempers among the proletariat, increasingly spotting the dissonance between the working class and the bourgeoisie. Reigning Russo - Japanese war and defeats of Tsarist troops fuelled further the revolutionary mood in Lodz. Revolution, which broke out on January 26th 1905 and lasted until 1907, was held in conditions of economic recovery, the extent of which was limited by factors such as: the consequences of the working class strike struggles, crop failures in the Russian Empire, the effects of Russo – Japanese war and the loss of some of the markets owned previously by Lodz industry. In May 1905 economic recovery occurred, which covered all areas of production and maintained for the next two years, while at the beginning the demand for cotton goods was so big that all existing stocks were sold out. 1906 was particularly favourable for the cotton industry, which had not applied a lockout against the striking workers, just as the seven largest enterprises in Lodz did (I.K. Poznanski, K. Scheibler, J. Heinzl and J. Kunitzer, L. Grohman, K. Steinert, R . Biedermann, H. Grohman).

The economic recovery after the second crisis, which at the turn of 1908 – 1909 overwhelmed the cotton industry, has already occurred in 1910 and covered all branches of industry, as well as construction and trade.
Second crisis, accompanied by a ruthless police terror, which was a response to revolutionary activities. During this time socio – political as well as cultural life, was almost completely suppressed. Raging repressive politics introduced in Lodz by N. Kaznakow led to the breakdown of the workers' political parties, trade unions, cultural and educational institutions. Arrests rampant among political activists and workers, and many of those arrested were sent to distant, eastern provinces of the Russian Empire. Police terror and lockouts policy used by great industry in response to the workers claims, wreaking panic and despair among the working population and decreased if not completely destroyed their willingness to participate in political life.

Another, third crisis in 1911 - 1913 caused by crop failures in the Empire, swaying credit – cash markets and mass bankruptcies of commercial companies, led in Lodz to the bankruptcy of dozens of small and medium – sized textile mills, resulting in mass unemployment. Left to themselves, the workers decided to once again fight for their rights. And so, shortly after the quench of the crisis, in summer 1913 years strikes began again, which in their climax included circa 70 thousand workers. The answer of the great industry that accumulated during the crisis sufficient amount of reserves, which in turn gave him the opportunity to temporarily stop production, was lockout of 26 thousand workers and not meeting their demands. After strikes and lockouts processes were completed, Lodz industry enjoyed buoyancy and prosperity until the outbreak of World War I.

Factory development progressed further in these rather turbulent years, but in terms of construction investments and their strategic importance this period was not so intense as the one described earlier. Probably between 1900 – 1907 a few new objects were founded on the area of the factory. Between the spinning mill, ambulatory and warehouse buildings, on the site of demolished forge and auxiliary building, detached carpentry and ironworks workshop was build. On the west wall of the object one-storey wooden building, housing toilettes for the crew working at the factory, was erected. In front of the engine house, on its western side, the wooden cooling tower was erected, while on the eastern side, a short distance from the house, small fire

pump building was constructed. Residential tenement – Ramisch family house – underwent a thorough reconstruction as well. It was raised to a height of three storeys and its elevation uniformed. On site of two demolished wooden auxiliary buildings adjacent to the front house on Piotrowska Street a small, one-storey brick laundry building was built. In that period Ramisch Factory employed 450 workers, and annual production value reached 545 thousand Russian roubles.

From 1909 came another development plan of the plot belonging to F. Ramisch. It bears the date 11th August 1909. Probably later this year the implementation of it began. However, taking into account the crisis prevailing then so in the cotton industry as in construction, the implementation could perhaps began first in 1910, during the economic recovery.
One of the main objectives was the completion of the reel house building which construction started in 1899. The extension was designed and signed by city architect by Franciszek Chełmiński. The main building was raised by two storeys and attic, while giving uniform expression to the southern facade facing Evangelical Street. Its six – axial façade was expressed in the geometrical style of Art Nouveau in the concrete finish and done by one of the best construction companies in Lodz Nestler and M. Ferrenbach. Three-storey water tower located on the north side of the building was raised by four floors and topped with a decorative, geometric cupola. To the water tower, from the east, slightly lower one – the extraction (dust) tower – was added, with a square cross – section, not divided with ceilings. Its task was to remove dust from warehouses and production halls. The suspended connector was also rebuild and raised by two floors, covered with a gable roof, and the east and the west side of the gable walls were decorated with small tympanum flanked by pinnacles. This building served now the role of a warehouse, cantor as well as the so-called "Treasury".
To the two-storey warehouse building, adjacent to the reel house east side, was raised. The building was connected with the ambulatory building at the level of the crossing gate, and its southern façade was rebuild in a neo – Gothic style, matching the rest of the existing façade. There was also a major refurbishment of the one – storey auxiliary building adjacent to the eastern boundary of the plot Nº550, raising it to a height of two storeys and giving its facade analogous appearance to the western elevation of the reel house building in terms of its secession detail. Henceforth it housed administrative offices of the Factory, coach house and coachman apartment.
The last building investment was the extension of the cantor building, adjacent to the southern boundary of the plot Nº548. The office was extended towards the west with two-story, three – axial unit. Appended figure of the building investment project envisaged the construction on the west side of the so-called "Treasury" one-storey building with a saw – tooth roof that was supposed to house the new reel workshop. Preserved iconography, as well as investment plans for the subsequent years, indicate clearly that the building had remained to the end only in the planning stage and was never constructed.
The following year, 1910, brought only redevelopment of the ground floor of residential tenement house, to which, on the south side, on the axis of an existing entry, ornate vestibule with a terrace on the rooftop was added, with direct access from the stairwell.

Plans from 1911 anticipated superstructure of the stables, located in the south – east corner of the plot Nº550, up to two storeys, combining it with an administrative building and alteration

of its use for an office – warehouse, with offices located on the first and warehouses located on the ground floor. Another investment was the expansion of residential tenement house towards east by three – storey unit completed with an apse with a separate staircase shaped in the form of a circular tower, topped with an elaborate dome crowned with a spire.
However, these plans were never enacted and do not repeat it on any of the plans in the following years.

On the eve of war having to burst very soon than, Franz Ramisch Factory employed about 590 workers. According to the distribution of the size structure of workplaces in terms of employed workers adopted by Wiesław Puś and Kazimierz Badziak in the monograph *"Lodz History of the city"* [12], Ramisch factory could have, at that time, been counted among the group of huge cotton industry plants.

[12] Badziak/Puś zit. n. Rosin/Baranowski/Fijałek, u. a., 1988, 278.

World War I

Situation of Franz Ramisch Factory between 1914 – 1918

The outbreak of World War I put Lodz, and its industry in the face of the new situation, with the size and the consequences of which any of the previous economic crisis could not be compared. The war left the industry in a deplorable state: with destroyed machinery, lack of virtually any current assets and huge debts to foreign countries. This position had not been without an impact on the living conditions of the working class, disorganised social life and determined the inhibition of the development of Lodz in the next period[13]. The first period of the war did not necessarily changed the situation in city factories. Production continued, mainly supplying the needs of the Russian army. The effects of war were felt first at the end of 1914 when production began to reduce gradually and work was reduced or even stopped, what in between 1915 – 1916 lead to the complete immobilization of Lodz factories. This situation continued ceaselessly until the end of the war in 1918.

Since the beginning of the occupation that began in 1915, the German authorities sought to destroy the existing infrastructure and to maximally exploit material resources

[13] Ebda., 297.

located in the area. At the command of the German Ministry of War in Berlin requisitions aimed at the textile industry were started. First raw materials, semi-finished and finished goods were confiscated. Then requisition of any machinery, motors, turbines, steam engines, dynamo – machines and other elements of machine parks was announced. The purpose of these actions was to destroy the cotton industry in the city. According to estimations of the Chamber of Industry and Commerce, as a result of devastating policy of the occupational authorities, Lodz industry suffered a loss of 186 million Russian roubles.

Plunder occupational policy also touched »Cotton Products Factory "Franz Ramisch"«. After the war ended, he estimated his losses at the amount of approximately 216 thousand gold Russian roubles(14). During the war, however, neither territorial boundaries, nor the number of buildings changed anyhow.

[14] Kuciński o. J., 541 - 543.

In free Poland!

Situation of Franz Ramisch Factory between 1918 – 1939

Independence found Lodz industry in at least deplorable state, which was the result of the destructive policy of the German occupant authorities. Nevertheless, Lodz did not lost its leading position as the Polish State's main textile industry centre. Production started again in 1919. Polish independent lands became its new natural target markets. Market change forced Lodz entrepreneurs to change the assortments, and at the same time to modernize machinery parks and to adapt its businesses model, as well as enterprises, to the new market needs. This was mainly due to the fact that domestic customers, mainly from Wielkopolska and Silesia, were accustomed to high – quality products from Western Europe. By contrast, Lodz, remaining so far in the Russian occupational zone, profiled and developed its production according to the needs of absorptive but not sophisticated Russian market, satisfied with cheap and low quality products. Throughout the interwar period, Lodz performed attempts to return to the absorptive eastern markets, but because of political changes that occurred in Russia (Bolshevism, Communism, the downfall of tsarist regime) it was an extremely difficult task to accomplish and, consequently, the efforts came to naught. Lodz textile industry, however,

managed quite well in the new reality, remaining though dependent on the country's economic situation and the international economy fluctuations. In the years 1922 – 1925 the country was affected by economic stagnation caused by hyperinflation and inability to find any investment loan. Many companies in Lodz district went bankrupt, their number at that time was halved.

Franz Ramisch company, however, survived this unfavourable period. In 1924 was converted into a stock - offering company »Cotton Products Factory "Francis Ramisch" S.A. in Lodz«. In the interwar period company employed an average of approximately 600 – 850 people. The largest employment showed on the eve of the Great Depression. In 1928, Ramisch factory employed approximately 1,000 people.

Before the Great Depression shook the world, since 1926 Lodz enjoyed a successful economic situation, which was the result of increasing foreign capital investments and currency matters dealt within the country.

On October 29th 1929 New York stock market crash interrupted though, so far profitable economic situation. The next year brought such a fatal deterioration in trade that by the end of 1931 in Lodz region over 200 factories and plants were closed definitely. Employment fell dramatically. United Company of K. Scheibler and L. Grohman expelled more than 8,000 workers. Franz Ramisch Factory also had to limit employment, which at that time had dropped to about 200 employees, and thus practically by 80%! Depression engulfed all sectors of the economy. The crisis did not spared as well once powerful textile companies and plants. Among others L. Meyer Cotton Industry Betting, Juliusz Heinzl Equity Industrial Society fell. Ramisch company emerged from the crisis almost unharmed and could continue to count on the market. Since 1933 a period of new investments in Lodz industry began. Automation of weaving mills, adaptation of new production technologies, development of new designs followed. These trends occurring in Lodz, although economic crisis reigned until 1935, attracted crowds of people eager to improve their financial situation and living conditions. The increase in migration at this time was still higher than in other big cities in the country.
Franz, however, did not live to see the economic recovery. He died in 1932. Maurice Landau took over the management of the company - was appointed Chairman of the Board - Ramisch family, however, retained a majority stake and was still a main stakeholder.

The turbulences of the interwar period affected as well building investments carried out by the Factory F. Ramisch. From this period, many projects of plant expansion have been preserved, but only few have been completed. Realized submission had more aesthetic, rather than strategic character.
The first of preserved documents, dating from the year 1922 and relating to the whole factory, is a plan summing up the factual state of the buildings on the plot in this year[15].
Since 1919 Franz applied to Lodz Magistrate requesting permission to demolish two one-storey wooden houses in front of his property, facing Piotrkowska Street, with accompanying auxiliary buildings.
In the Archive of the Lodz City Hall some of these applications were preserved and are now

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[15] Department of State Archive in Lodz (*Oddział Archiwum Państwowego w Łodzi*), RGP Wydział Budowlany - Archiv, Sign. 7794

quite interesting historical material. Until 1923, Franz did not receive the approval of the Magistrate to carry out his plans. In the application from January 15th 1923, so he explained the need to demolish aforementioned two cottages (translated original spelling):

Lodz, January 15th 1923

To

Faculty of Civil Engineering
Magistrat Lodz

in situ

Referring to my application, filed on 10/12 l.y. to Esquires concerning the demolition of two wooden, single – storey cottages located at Piotrkowska Street Nr.138/140 I give this further explanation, namely:

1) The demolition of these buildings is necessary because of the fact that such buildings are located too close to the boiler room building and as flammable may be the cause of the fire, which for reasons of my cotton spinning is a serious danger;

2) completely unsuitable for residential use due to moisture, cold and complete ruin, - and were unbearable even for the room of my office.

considering these considerations, I was forced to move my cantor temporarily into depths of my property, which, due to my large clientele is not convenient.

So I carry out the intention, after the destruction of aforementioned clogs, to build a multiple dwelling tenement house, that for the reasons of convenience to my customers and because of my desire, extending now greatly compressed offices, to have a sufficiently comprehensive - for the above purpose – locals and rooms for the use of my employees.

Assuming that Esquires take my valid arguments into account I remain

Sincerely
p.pa. FRANZ RAMISCH [16]

Only application from August 1st 1923 to the Directorate of Public Works of the Lodz Region resulted in the cancellation of the previous decision and permission to build in the site of demolished buildings, a new fence with a porter (as can be seen, in half a year quite serious changes took place in Franz investment plans). It follows from the application that the houses were to be sold to the contractor Edward Zell, who wanted to move them to his plot of land on Sienkiewicza Street 115 and restored put there as houses.
In 1924, the fence with a porter on Piotrowska Street was built. On Sienkiewicza Street

[16] Archive of the Lodz City Council, Delegation Lodz – Downtown (*Archiwum Zakładowe Urzędu Miasta Łodzi Delegatury Łódź – Śródmieście*) , Karton P - R.

a fence with a gate in the same style was made. According to Magistrate requirement, Franz was obliged to plant trees in the area behind the fence. Probably in this period a garden surrounding residential tenement house was established, extending from the fence until the engine room building. The plans for this year anticipated also a project of two-storey warehouse – residential building with a garage, which was to be carried out on a free plot of land on the west side of the building of so-called "Treasury" (the place where in 1909 the new reel house building was planned to be raised). Those plans were, unfortunately, not realised and the plot left empty again.

Four years later, in 1928, modernization of the water – dust tower was planned. The project involved superstructure of the extraction tower by one storey, equating it with a water tower, construction of the surrounding attic , covering the whole with a shed roof as well as the demolition of the existing helmet, which crowned the tower. This project was not realized, as evidenced by photographic materials from the following year and from the Second World War.

In 1929 Cotton Yarn Manufacturers Association in Poland was founded. Franz Ramisch made rooms available in his factory, most likely in the building of the "Treasury", for offices of the Lodz branch of this organization. His company joined the organisation in 1931 and remained there until the outbreak of World War II.

Another project from 1931, so from the time of raging economic crisis, involves rebuilding of the front elevation of the "Treasury" building. The project involved the alteration of the central window of the ground floor to the entrance door, and the construction of the stairs leading from the street level to the relatively elevated ground floor of the building. The plan enacted.

In 1934, the Building Inspection Director Eng. Henry Goldberg issued the permission to build "(...) one-storey , brick water toilettes". The statement "water" in this case is of extreme importance. Since just a few years the city centre could enjoy the first plumbing installation in its history. During this time urban water supply network was built. Until than factory was supplied with the water coming from artesian wells located in the corner between the engine room building and the weaving mill. The investment was realized. Toilets have ten stitches for women and three for men and they were heated. The ratio of female to male toilet places perfectly illustrates the ratio of employment in factories in the interwar period. Women constituted a foundation of the textile industry and usually significantly outnumbered male workers.

World War II

Situation of Franz Ramisch Factory between 1939 – 1945

On 8th September 1939, Lodz for the second time in the course of the twentieth century was under German occupation.
After the occupation and division of Poland, Germans planned to incorporated the city into the district of the General Government, however, at the request of the Germans living in Lodz, supported by Wartheland Gauleiter Arthur Greiser, Lodz was on October 4th 1939 finally included in the administrative boundaries of the Third Reich. A widely understood Germanisation or as defined by the invader, "renewal" of the city followed: the name was changed to Litzmannstadt, coat of arms was redefined and became double swastika on a deep blue background (such a swastika was carved on an burial urn that was found in Zgierz – that was supposed to mean the proto – Germanisation of Lodz lands), the names of streets and squares were changed, the monument of Tadeusz Kosciuszko was demolished, German became the official administrative language. The invaders proceeded to blast the Polish intelligentsia, Jews living in the city and the Poles themselves, who were to become a slave workforce as called by the president of the Kalisz regency Friedrich Übelör in a speech delivered on November 11th

1939 in the main hall of the German high school in Lodz. German inhabitants faced a decision about signing, or not, so called Volkslist – the list confirming their affiliation to the German nation. Many signed it purely for a opportunistic reasons, not compromising their relations with Poles, mostly because most of them just feel like Polish citizens.

Just as it was during World War I, so as this time Nazi occupier begun gradual takeover and destruction of Polish economic assets. In the city the branch of the Central Trust Office – East (*Haupttreuhandstelle – Ost*) was established, which task was to take over the management of all Polish factories and businesses. Expropriation process was completed in the spring of 1940 when all major manufacturing, trading and transportation companies were in German hands. All banks and credit institutions existing in Lodz were taken over by German banks.
Lodz textile industry were submitted to a process of rapid devastation. Many factories were closed. Devastating process was compounded by the transfer of German armaments industry to the eastern lands of the thousand-year Reich, and thus also to Lodz. Companies like *Krupp*, *Siemens* and *BMW* were installing their equipment in the halls of textile factories, destroying all the existing machinery there as unusable. New administrative authorities allow the continuation of production in textile factories at 30% of the pre-war status. 25% of the production were military orders, while most of it were supplying the needs of the civilian population.

During the Nazi occupation family Ramisch retained the ownership and administration of the factory. This means that the plant could continue to work, and so that it did not fell, or was taken over by the Central Trust Office – East. In the archives very detailed inventory plan of buildings at Piotrkowska Street 138/140 (Adolf – Hitler – Strasse N°138/140) with a description of the buildings located there is kept[17]. Throughout the occupation, no changes in the factory building structure occurred, as evidenced for example by the plans from the year 1948 preserved in the Archive of the Lodz City Hall (those are probably the first plans of new investments since the end of the war).

During the occupation, two of six children of Franz Ramisch and Wanda nee Schatke (Schadke): Cezary, who died in 1943 in Lodz in the age of 52 and Zygmunt, who died in the camp for civilian prisoners in Gdansk Nowy Port probably in 1941 at the age of 48. Shortly after the liberation, in 1946, Małgorzata, sister of Cezary and Zygmunt, having then 59 years died as well.

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[17] Archiv der Firma OPG - Orange Property Group.

In Polish People's Republic

Situation of Franz Ramisch Factory between 1945 – 1989

The Second World War forever changed the image of Lodz. So far multicultural, built by Poles, Germans and Jews, became a national monoculture, as a result of the German extermination policy carried out against people of Jewish origin, and also as a result of the mass exodus of Germans in 1945. The war effectively broke the cultural continuity of Lodz, which always formed the basis and foundation on which the city survived every next crisis ravaging it. Although Lodz stood up again this time, launched its machines, stood firmly by the looms and returned to its textile reality, it was no longer the same Lodz. It was a city of the bleeding wound after its nurturing tissue of social, cultural and mental misch – masch was torn away. But it was still, it lived on. Exactly as Wladyslaw Reymont wrote in *"The Promised Land"*: *"Lodz is, Lodz will be"*[18].

The extermination of Jewish people, exodus of the German population, as well as losses in the Polish population resulted in a significant decrease in the number of inhabitants. In relation to data from the year 1939 (672 thousand inhabitants), in 1945 remained in the city less than 50% of

[18] Reymont, W., Ziemia obiecana, 1987, 90.

the previous state of its inhabitants (approximately 300 thousand). However, losses were quickly made up for. To Lodz, undamaged by war residents of neighbouring villages flowed countlessly, the inhabitants of the destroyed Warsaw, Poles from the east ends, former inhabitants of the city displaced during the war. Jews who survived the Holocaust came back to the city as well. By the end of 1945 Lodz counted already approximately 420 thousand residents.
The new reality brought, as it soon turned out, only the apparent freedom. The place of black now was taken by the red dictatorship. In 1946 planned action of deportations of the citizens of German origins began. Probably this fate met also living relatives of Franz Ramisch. In the same year the industry was nationalized. Ramisch factory was nationalized and incorporated into the structure of the National Cotton Industry Plant at number 4.

At this time the era of »Cotton Products Factory "Franz Ramisch"« ends definitely. Until now it was closely associated with the person of its owner, the man who created it, who shaped it, who set the tone and direction for many years. Its development was to some extent very personal. Lodz factories have always been bonded and associated with their owners, as children are always bonded and associated with their parents. Economic nationalism took children away from their parents. It destroyed the spirit hovering above the cotton fortresses of Lodz. Although the older residents of the city further associated factories with their owners, it was, however, no longer the same. An important period of customer – manufacturer relationship, shaping the image of the Lodz textile industry, was quickly fading away. Its thriving character presented by Władyslaw Reymont in *"The Promised Land"* was definitely drifting away. Replacement was soulless administrative system, which contributed to national forfeit of a sense of ownership and responsibility for the property, which shaped times past. This resulted from impersonal relationships being created by the new totalitarian system. Something that became national, automatically became unowned as the owner became unknown, non – material.
This was a serious harm to the city's cultural structure. Harm, which hurts to this day, which left us no intuition and any sense of caring for our common space. As previously Franz Ramisch and him alike manufacturers cared about the appearance of their property, but also tried to shape and take care of the urban space, and its inhabitants.

Cotton industry remained the most important and strategic branch of Lodz economy, which gave employment to over 80% of the workforce. Till '60s of the twentieth century textile industry in Lodz was bypassed by the national investments carried out on a large scale in the context of the three – and six – years plans. This has resulted in low productivity, caused in turn by outdated, dating back from the turn of the century equipment and installations. '60s brought new trends in the centrally controlled economy, which assumed concentration of enterprises in the big conglomerates with the characteristics of national monopoly. In 1963 Ramisch Factory was incorporated in the structure of Gen. Walter Cotton Spinning Plant as "Plant B" and it remained there until the fall of the Communist regime in Poland.

In the discussed period 1945 - 1989 on the premises of the Plant N°4 rather small building investments occurred, mainly related to the conversion of existing buildings, construction of the necessary auxiliary objects or demolitions carried out over the years, caused mainly by the modernization of the production process and adaptation of new technologies.

The first post – war change was, according to the written statement applied to the Department of Buildings of the Municipal Administration in Lodz on 23rd August 1946, the change of use of the residential tenement house – the former home of Franz Ramisch. One can learn from this document that the tenement from then on hosted the factory's kindergarten.

Two years later, in 1948, expansion project of the Plant Nº4 assumed construction, in the eastern part of the plot along its northern border adjacent to the property on Sienkiewicza Street 79, of factory central kitchen with complementary food warehouses. The plans from following years reveal, that this project was never realised.

1949 brought the refurbishment of the auxiliary buildings on the property of the factory located at F.D. Roosevelt Street 4 to garages, and so in the functioning CPN (Polish: *Centrala Produktów Naftowych* – Communist Poland's petroleum retail monopoly) station located there.

In 1951, on the west side of the "Treasury" building, which housed than offices and locker rooms for plant staff, a brick, single - storey substation (transform station) was erected.

A year later, the roof of the boiler room building underwent complete modernisation. Southern wall was raised about two meters and aligned with the northern wall. In the upper zone of the two walls window openings were created. New roof structure was made as a hanging – lattice girder. Another project this year was the reconstruction of the toilets building, located on the western wall of the carpentry and ironworks building, at that time already housing a mechanical workshop. The building was divided into three unequal parts. Northern part was occupied by a welding workshop, middle by women toilets (only two!), while the southern by toilets for men (six in number – was the ratio of employed women to men changing here already?).

1962 brought the replacement and modernization of the plant water supply system, as well as the construction of a series of single - storey wooden auxiliary buildings, located primarily in the eastern part of the plot, from Sienkiewicza Street at its northern and southern borders. Storage shelter on the eastern wall of the spinning mill was constructed, as well as an outbuilding at the northern boundary of the plot Nº547, between kindergarten and engine house building was raised. Between 1952 – 1962 cooling tower was demolished and the garden area surrounding residential tenement house (factory kindergarten) was narrowed, if not totally eliminated.

In 1963, the factory which was already a part of Gen. Walter Cotton Spinning Plant bearing the name of "Plant B" was equipped with a lift shaft installed in the spinning mill building. In the same year the first modernisation of the weaving mill building took place: west stairwell module was raised by one storey; in the resulting room water pump was located. Window openings located at the second and fourth axis starting from the west were enlarged downwards and converted into door. Above them, on the length from the second to fourth axis, roof was stretched in form of three gabled modules structured in wood.

Two years later, in 1965, due to the recommendation of the Fire Brigade Headquarters at the Union of Cotton Industry (*Komenda Straży Pożarnej przy Zjednoczeniu Przemysłu Bawełnianego*) and the approval of the Department of Architecture and Construction at the

Bureau of the National Council of Lodz – Downtown (*Wydział Architektury i Budownictwa Prezydium Rady Narodowej Łodzi – Śródmieścia*), wooden auxiliary buildings were rebuilt with brick. In the same year, "Plant B" was connected to the district heating network and characteristic pipes appeared meandering on the height of first floor virtually around the whole possession.

Most likely, in 1968 screen neo – Gothic facade on the F.D. Roosevelt Street was rebuild. Rich architectural detail was almost completely removed, and the entire facade was plastered leaving only the general impression of its original form. In the same year there was a slight change in the arrangement of the openings in the building of the former carpentry and ironworks. Also, small auxiliary module located so far at the southern corner of the east façade was definitely removed. Probably also this year the network of narrow tracks located on the premises was dismantled.

The year 1971 witnessed the demolition of the 82 years old chimney.

From 1974 comes a letter intending the demolition of the fence located on the front of the factory at Piotrowska Street 138/140. The letter bearing the signature of the Chief Economist Ryszard Sławiński states that this property is not under administration of the Municipal Administration Board of Residential Buildings Lodz – Downtown (*Miejski Zarząd Budynków Mieszkalnych Lódź - Sródmieście*), and therefore cannot be demolished by the above mentioned institution. In this case, bureaucracy and lack of officiousness proved to be beneficial! Art Nouveau fence was saved.

No plans are available for subsequent years. Probably in 1986 kindergarten, also the historic residential tenement house, which history began in 1887 with Wilhelm Hanneman, was demolished. In the same year "Treasury" building got a part of unknown origin and use in the form of small, cubical outbuilding. "Eagle's nest" was built on the first floor, on the north wall of the stairwell. Water tower was rebuild in accordance to the existing project from 1938, but the extraction (dust) tower was not raised, as suggested originally.

By the end of the socialist era, yet the Polish People's Republic, there was no further interference neither with the architectonic nor urban tissue of "Plant B" complex.

In free Poland again !

Situation of Franz Ramisch Factory between 1990 – 2014

In the ‘80s of the twentieth century Lodz industry began to feel increasingly deepening economic decline. Investment and production decreased, and with it did employment. Crisis manifested itself completely in 1990, when the economic boom collapsed due to the loss of internal and eastern markets, further exacerbated by the political changes. Companies related to light industry and so to textile industry started to bankrupt massively. Unemployment increased dramatically, inflation was rising. Difficult period of arduous economic transformation and the transition from a centrally controlled economic system to the market driven system began.

In August 1990 Gen. Walter Cotton Spinning Plant declared bankruptcy.

At this point, second important chapter in the existence of the former Franz Ramisch Factory was completed – the production of cotton – which all the objects on the plot were intended to without any exception, which altogether formed a perfect machinery of fluent production of this most important raw material in the history of Lodz – was stopped

forever.

Shortly after the closing the plant was purchased for, as it turned out, practically nothing by the KPK company, which until 1993 did not reclaimed the plot in any way. The only investment at this time was the conversion of the engine room building to supermarket called VIK, to which from the east – between the northern boundary of the plot Nº547 and the spinning mill building – one-storey module with shed roof was added. VIK lasted only a year and a half and then declared bankruptcy. The remaining undeveloped buildings were successively dilapidating. Another investment undertaken by the new owners was to rebuild the fence on Piotrowska Street, including perforation of a new gate in the second of its spans from the north, addition of trade pavilions glued to the fence from the inside of factory premises, as well as the construction of two more pavilions along the northern border of the site in the place of the former residential tenement. Until 1993 also the boiler house roof was demolished, as well as auxiliary buildings located in the eastern part of the plot at its southern border. The fact of those demolition is provided and can be proved by the aerial photos of Lodz, which were made in 1993. A year later, the boiler house building was demolished permanently. In the meantime, in the post-industrial courtyard among trade pavilions oriental food bars started to emerge. In a short time the area of the former factory began to be identified with booths offering Chinese delicacies, in the Lodz colloquial language dictionary was defined as "the Lodz Chinatown".
Over the years, except of the courtyard adjacent to Piotrowska Street, which seemed to pulsate with a little bit of life, remaining factory buildings stood in silence, abandoned and neglected.
Since 1999, the factory buildings began to be used by various companies. They populated the buildings on F.D. Roosevelt Street (former infirmary, warehouses, garages, factories administration building – electromechanical workshop), in the 'Treasury" building Ganimedes and Riff-Raff clubs appeared, carpentry and ironworks building, ground and first floor of the spinning mill, as well as the building of the former cantor building located next to Piotrkowska Street were occupied.

In 2004, the area of the former Franz Ramisch Factory was acquired by an Irish company called Orange Castle (Orange Property Group), which remains the only owner of the premises.

By 2011 auxiliary buildings on the east side of the plot on its northern border (except for one garage), an outbuilding and a fire pump building located at the northern boundary of the plot Nº547, trade pavilions located at the site of the former residential tenement house, as well as the pavilions directly adjoining to the fence at Piotrowska Street were demolished permanently. Administrative building was renovated, and some changes were introduced in its historical appearance.

In the same year, the site manager, OPG company started an OFF Piotrkowska project and made the Factory area the basin of the creative industries in Lodz. From that moment, the Factory forgotten for a long time which was often referred as "... urinal for all the drunks from Piotrowska Street"[19], has become the most fashionable place in Lodz, a real cultural melting pot. This unique place is now a contact point of various cultural and artistic fields. In one place fashion designers studios, design and architectural studios, music clubs, restaurants, cafes, exhibition spaces, rehearsal rooms, showrooms, concept store, influential club spaces, artistic

[19] Interview mit Hikie Fromer, geführt von N. N., Spór o Orange Castle, in: Dziennik Łódzki, 9. 12. 2004, 8.

ceramics workshops, the wine-bars, and more coexisting and neighbouring with each other. Creativity and the unique atmosphere of more than 100 – year old industrial architecture which witnessed the development of the City, remembering all dramatic and compelling moments of its rich yet turbulent history are the features that characterize this place.

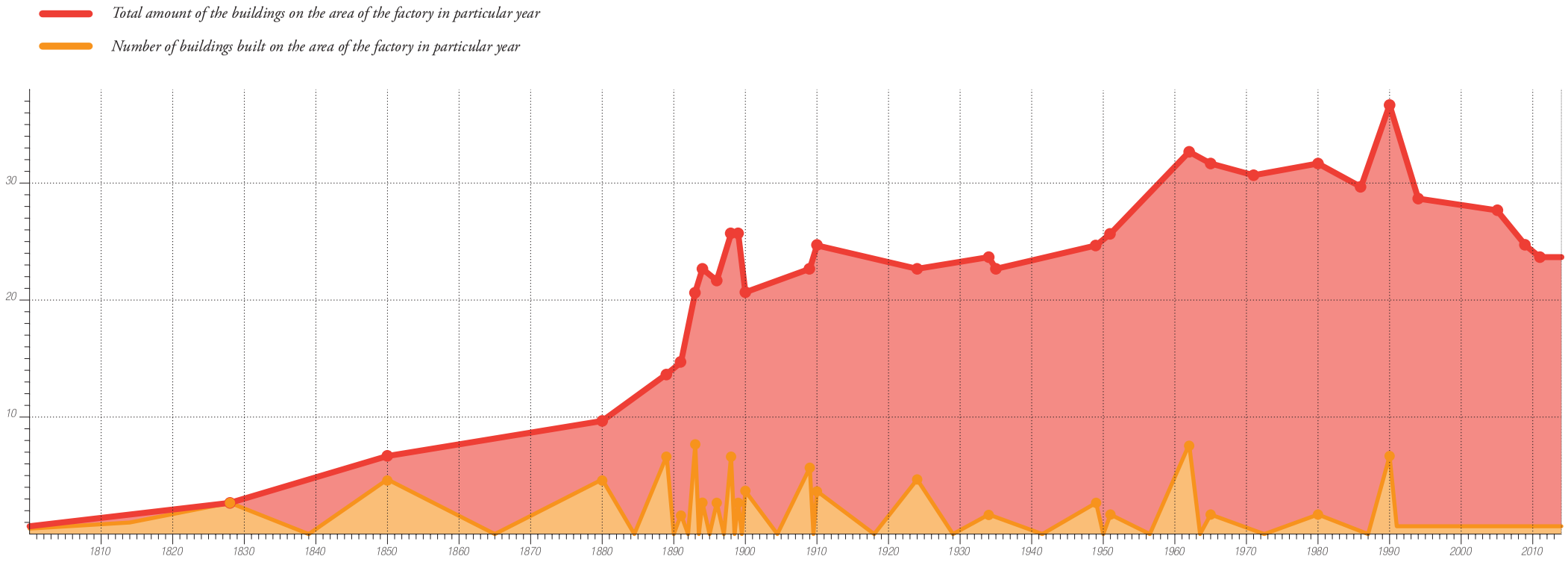
After the next crisis encountered on its way, the Factory is on its feet again, overcoming stagnation of dramatic political transformations. However, how many crises has it faced already? And from each managed to get out unscathed! Why not from this one as well! The Factory continues to lead, now metaphysically, but still production of the most valuable element for Lodz which is constituted in the new reality by its inhabitants opened to once again emerging unstoppable potential of the City. Ready – as once young Franz Ramisch and his ilk – to face it, embrace it and bend it to fit their needs for great mutual benefit. To revive the spirit of the past, pulsating in the joyful suspense of change, courageous, young Lodz, this very one and only Promised Land.

addendum 2 - 13:

Factory - Development

addendum 2:

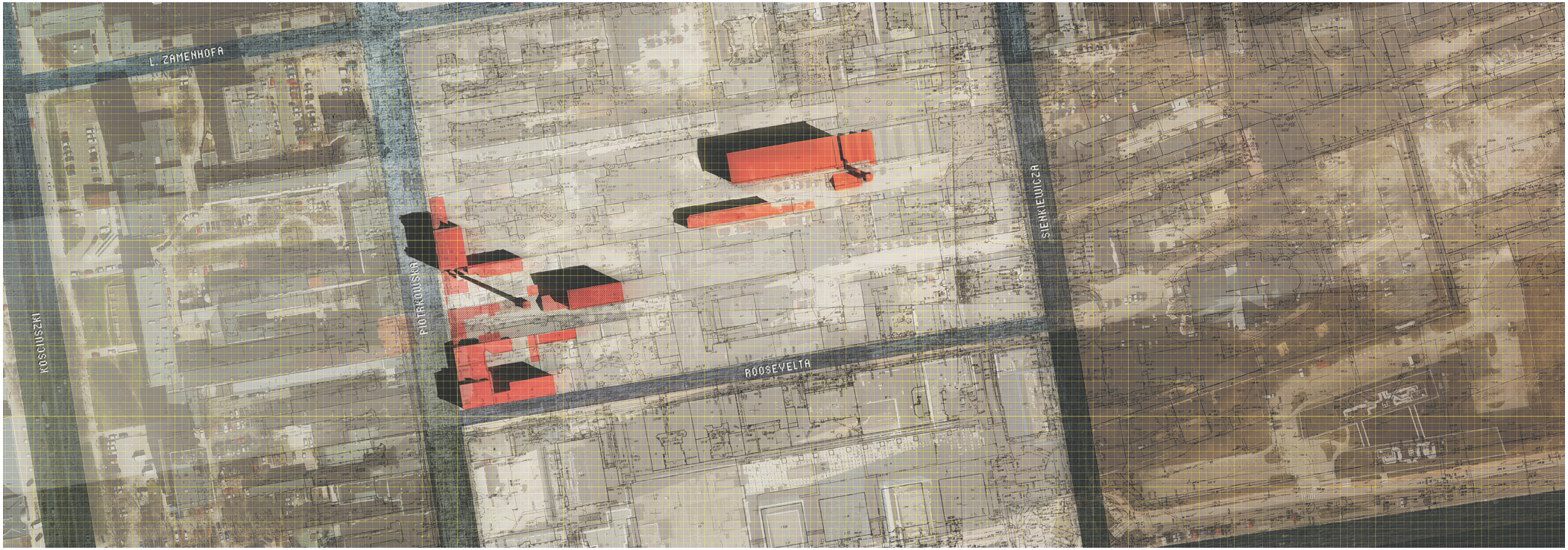
Diagram of the pace of the development progress of
Franz Ramisch Factory



addendum 3:

Phases of development of
Franz Ramisch Factory

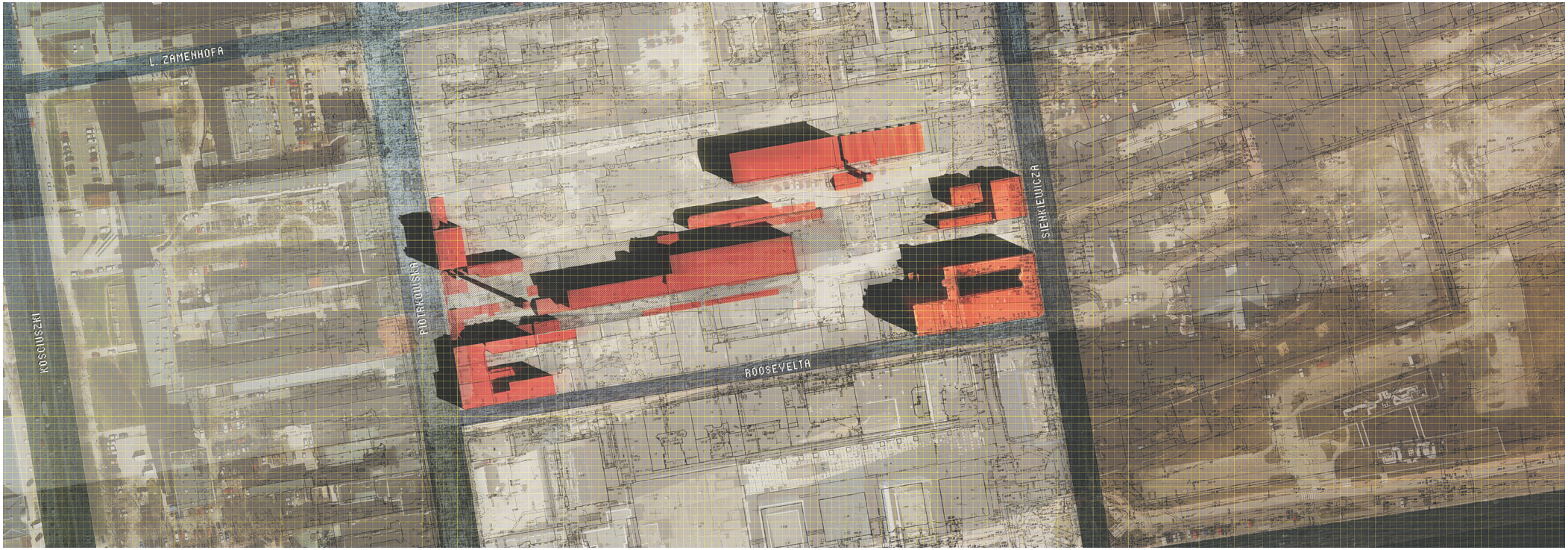
1889



addendum 4:

Phases of development of
Franz Ramisch Factory

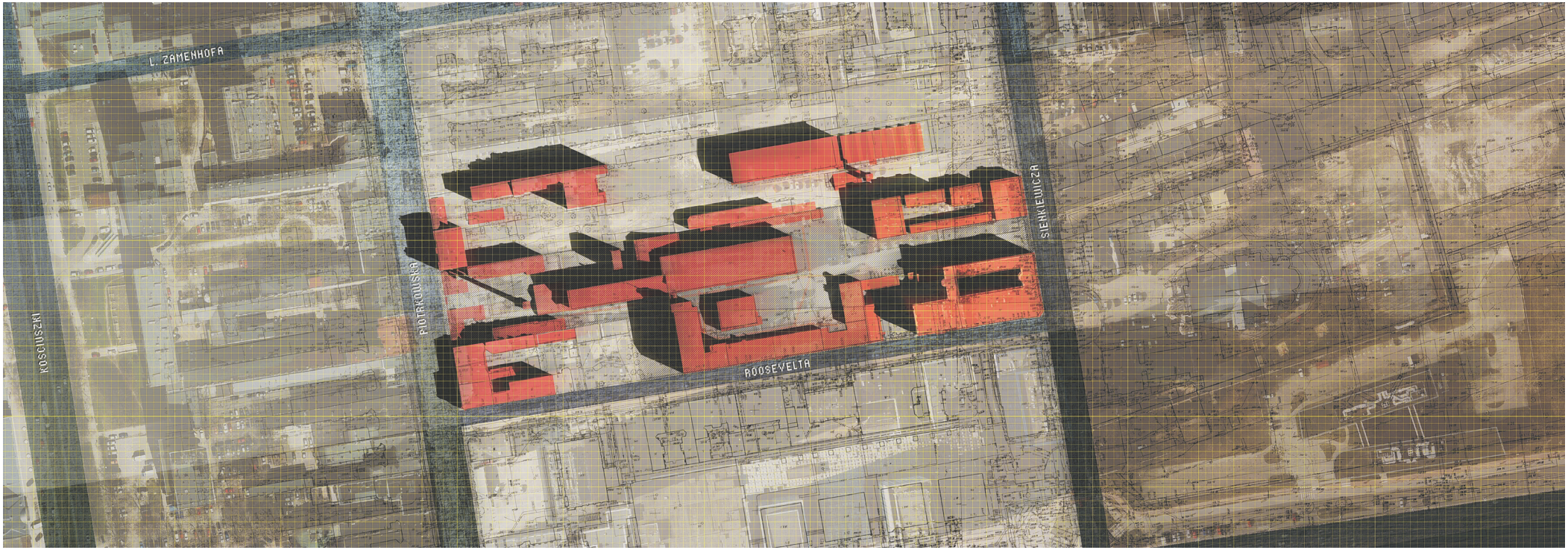
1893



addendum 5:

Phases of development of
Franz Ramisch Factory

1909



addendum 6:

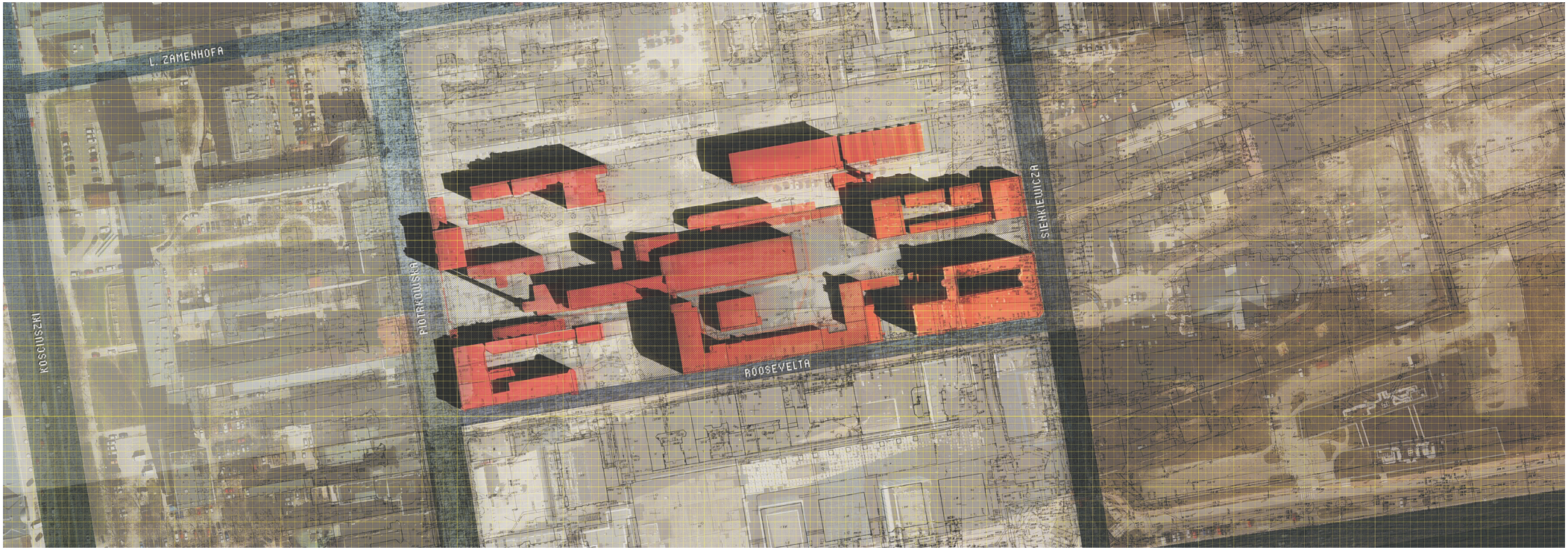
Phases of development of
Franz Ramisch Factory

1924

addendum 7:

Phases of development of
Franz Ramisch Factory

1965



addendum 8:

Phases of development of
Franz Ramisch Factory

1991

addendum 9:

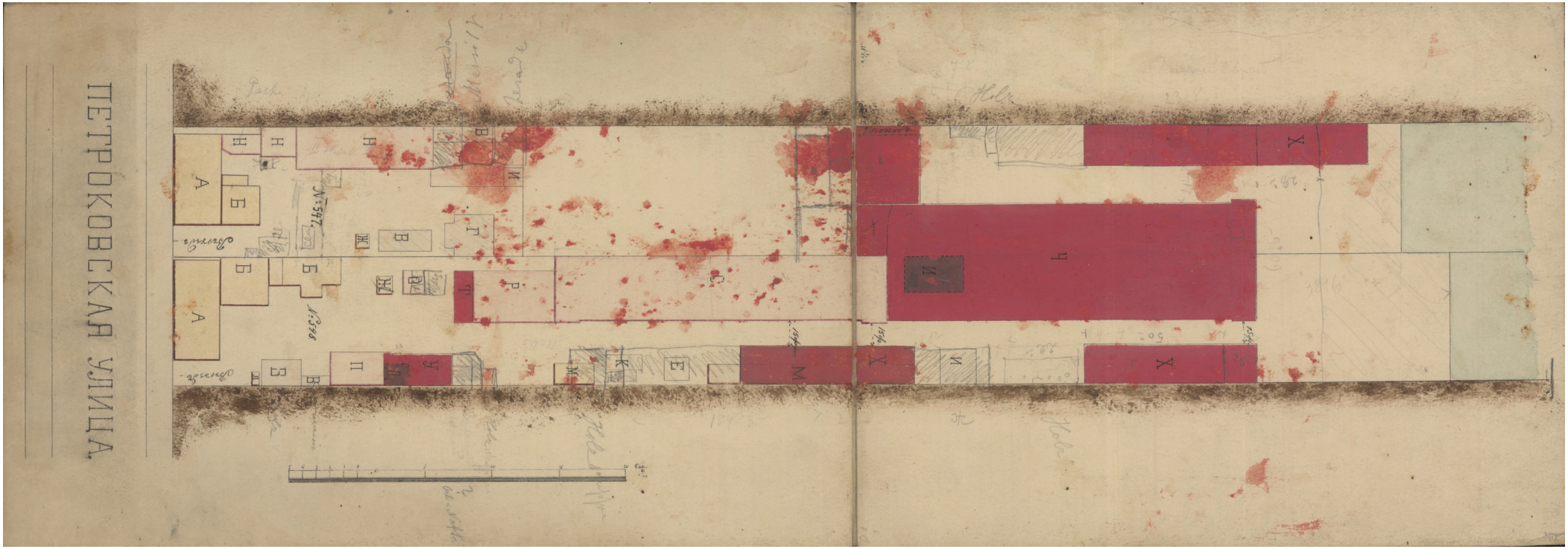
Phases of development of
Franz Ramisch Factory

2014

addendum 10:

Archive development plans of
Franz Ramisch Factory

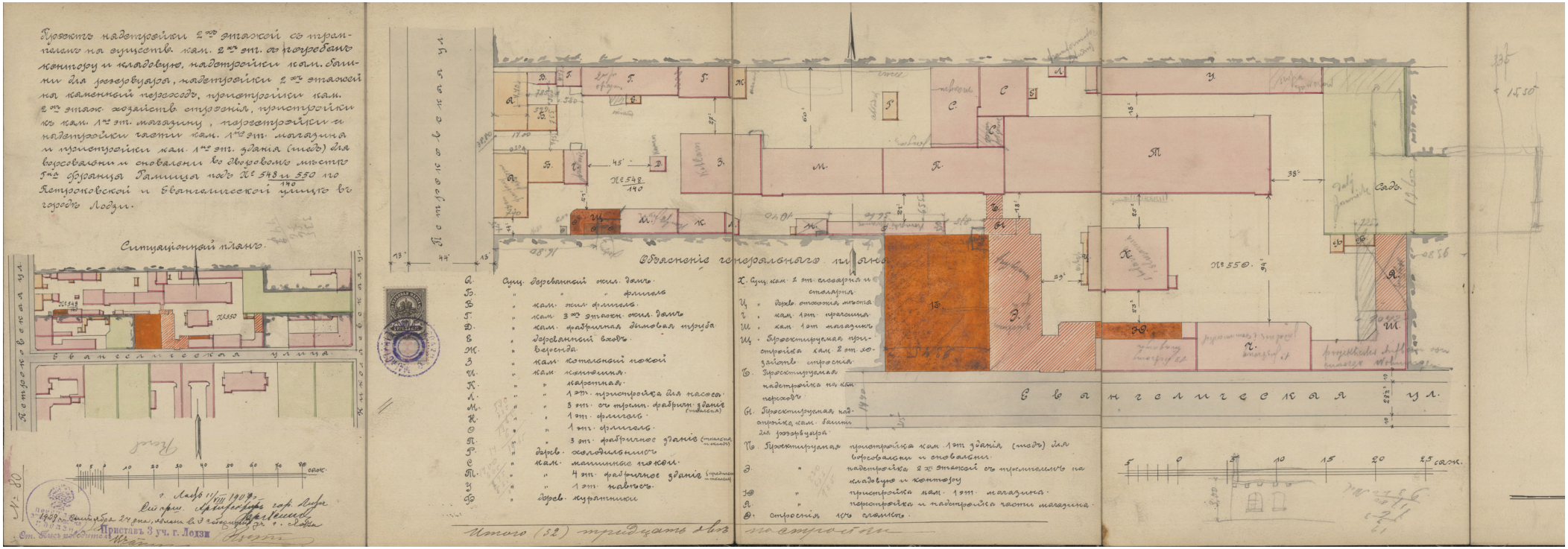
1893



addendum 11:

Archive development plans of
Franz Ramisch Factory

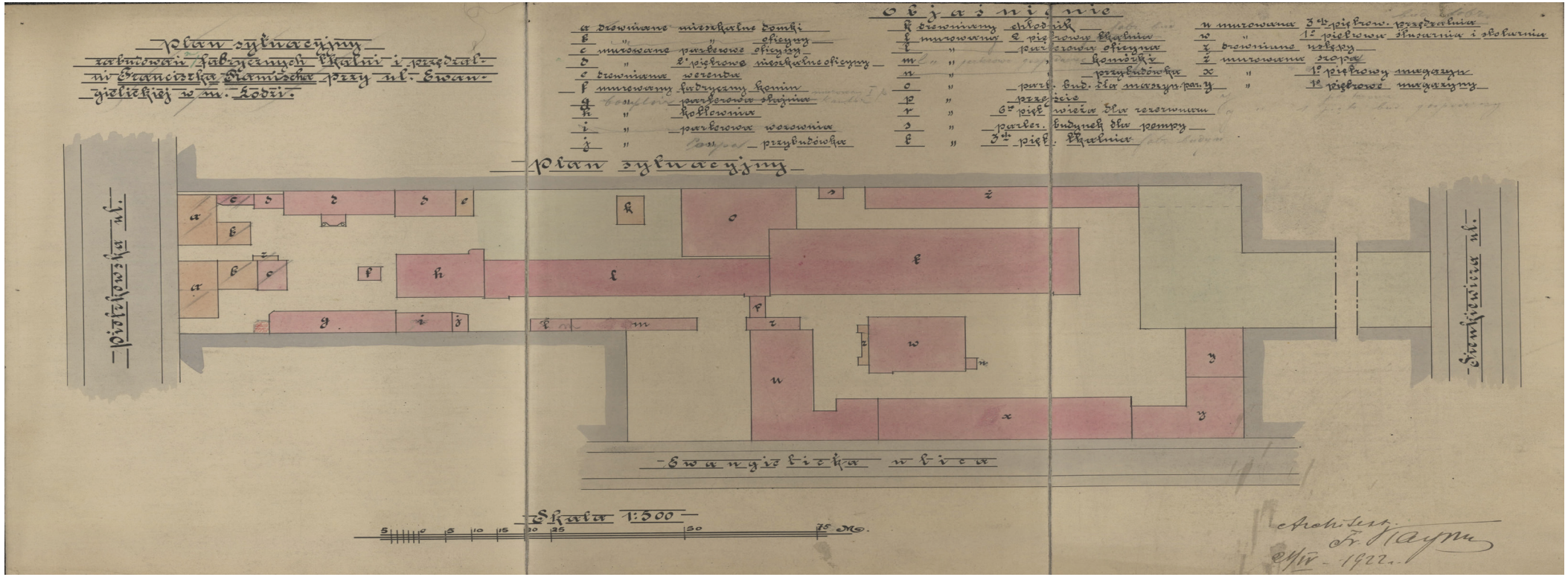
1909



addendum 12:

Archive development plans of
Franz Ramisch Factory

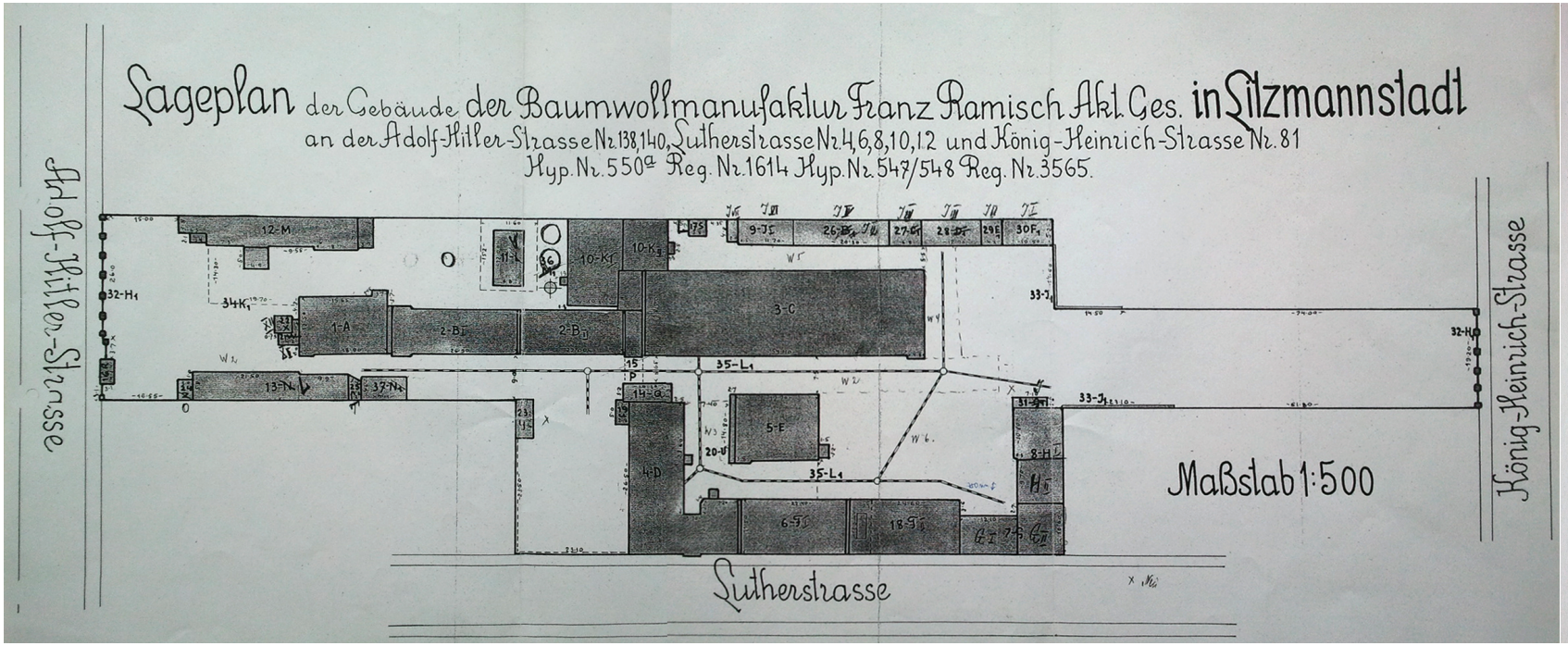
1922

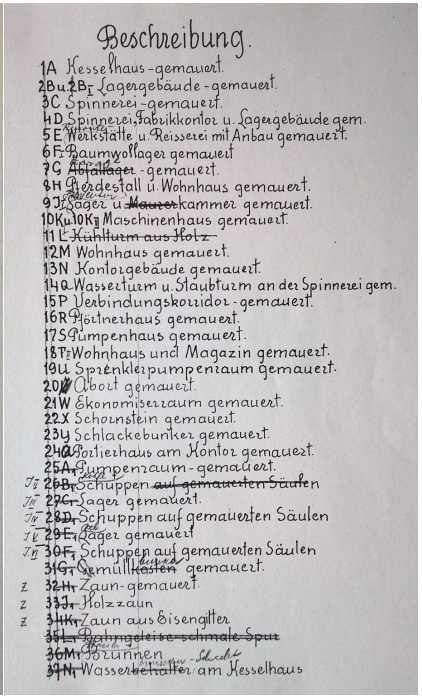


addendum 13:

Archive development plans of
Franz Ramisch Factory

1940





chapter 2:

Architectural – Urban analysis
of Franz Ramisch Factory premises

Spatial and communications system

»Cotton Products Factory "Franz Ramisch"« grew from 1879 in the strict city centre, on the settlement plots of land Nº547 and Nº548 demarcated in the years 1824 to 1827 as part of staking out a new handicraft settlement called Łódka.

Reasons for decisions to create a manufacture, which over the years has developed into a thriving factory, in the city centre, one have to search in the impairment of the urban development of Lodz progressing since mid-nineteenth century. Regarding massive influx of people in the '50s and '60s of the nineteenth century the unpreparedness of the city to absorb such a large number of new residents while maintaining a harmonious and balanced development was revealed. Unpreparedness for the increase in the number of industrial investment became also a searing problem. It was manifested in the lack of land allocated strictly for the location of factories and industrial plants, such as the factory – water possession delineated by Rajmund Rembiel-

iński by the Jasień river. The whole area was owned by Karol Scheibler as a result of his speculative operations in the period of the so-called "cotton famine", which led to the ruin of many businesses in Lodz. Despite constantly harassing economic crises, Lódź entered in the '60s of the nineteenth century the way of vigorous population and industrial development. This coincided with the tsarist government repression, however, being a response to the January Uprising of 1863 evincing in serious limitations of the city administration, including urban planning sector. This in turn, began the process of chaotic and uncontrolled centripetal development. In such a situation, and because of the lack of available industrial sites such as by the Jasień river, factories and industrial plants began to emerge virtually on every unbuilt area and every free municipal land property, including strict city centre and its representative Piotrkowska Street. One of the first plants that originated at this elegant street were J. Heinzl and A. Hentschl plants at Piotrowska Street 104 and in place of today's "Grand Hotel" respectively[20].

In this situation Franz Ramisch also had not too much choice as where to locate his business. Lots N°547 and N°548 were respectively 18,7 and 20,0 meters wide and 286 meters long. Northern plot located physically within the administrative boundaries of the factory was about 1/3 of the length shorter and did not reached H. Sienkiewicza Street. In the second half of '90s of the nineteenth century Factory expanded the boundaries of the plot N°550, specifically of the plots at the newly delineated Evangelical Alley numbered 4, 6, 8, 10, 12. Redistribution of the plot N°550 (Piotrkowska Street 144) belonging to Franz half-brother – Edward, took place in the years 1880 - 1884 and was the result of the division of an existing building quarter limited by the streets to the north – Nawrot, to the south - Główna (today Pilsudskiego Alley), to the east – Wild (today H. Sienkiewicza) and to the west - Piotrkowska, with the new Evangelical Street connecting Piotrkowska Street with Wild Street on the axis of newly built Evangelical Church of St. John. Therefore, the owners of the properties at Piotrowska Street 142, 144, 146 and 148 submitted to the Municipality explanatory application stating that they want to voluntarily waive some of their sites for the construction of a new road. After the street was constructed, adjacent settlement plots were divided, a number of new plots were created and the care was taken that the resulting street would receive an urban, organised character afterwards.
The factory has a specific linear buildings layout resulting from such production technology, above described existing land division system, as well decisions taken by F. Ramisch to purchase next parts of the aforementioned parcels. It should be recalled that in 1879, Francis did not own any land. Within the development of his business and increasing financial capacity, he gradually acquired more plots and their parts. The final urban layout was also influenced by the development strategy involving gradual addition of new segments, their extensibility or redevelopment. It was a synthesis of the requirements of the factory location in a cramped downtown tissue as well as a response to changing economic conditions and market demands. The same applies to changing functionality and purpose of the buildings located within the complex.

These changes are very visible during the first (1879 – 1892) and second (1893 – 1898) Factory development stage, where the narrowness of the area forced the "one after another" location of buildings, and that they are built on a rectangular plan. The second stage of development allowed additionally small extension of the horizontal plan of the spinning mill building and

[20] Koter zit. n. Rosin/Baranowski/Fijałek, u. a.,1988, 184.

the erection of the engine room building on its north side, reaching the northern boundary of the plot N°547. It was only in the third stage of development (1899 – 1914) when it became possible to change the building layout – construction of the "Treasury" perpendicular to existing weaving and spinning mills, and even the construction of a detached carpentry and ironworks workshop. Buildings arising in this period, which were creating also Evangelical Street frontage, were strictly subordinated to the plots divisions.

In the first two development stages factory was supplied from the Wild Street constituting the access road to the parcels delineated at Piotrowska Street. With the purchase of the plots on the Evangelical Street the next gate was marked, which was intended to facilitate connection of the factory with an external street network and its internal communication. In the interwar period (1924) one -storey wooden houses at Piotrowska Street were demolished and substituted with a fence with a gate and a porter. Therefore, the it was made possible to service and supply the factory from three main directions, which remarkably improved also its internal communications. An additional element used in order to improve internal communication, as well as the transport of goods was the installation of narrow rails for small transport wagons. Its network also developed gradually. German inventory plan from 1940 shows the whole of its course, at that time serving all major buildings located on the plot.

In the first period of existence, before the first factory buildings were erected, the floor area was probably mostly packed earth. Along with the development also the flooring material changed, which until the after war period was a pavement made of rough stones (i.e. cobblestones)[21]. In the post-war period it was replaced with hexagonal paving concrete slabs, which forms the courtyards floor until today.

[21] Salm 2007, 10.

Changes in the land ownership structure

Most likely, soon after the demarcation of the new handicraft settlement Łódka, on two plots of land numbered N°547 and N°548 two one-storey wooden houses with accompanying outbuildings were built. They can be dated back to 1826 – 1850. It is possible to assure their ownership, in the light of subsequent records of commercial transaction carried out by Franz Ramisch. And so plot N°547 belonged to the entrepreneur Wilhelm Hanneman, and plot N°548 to the Lodz industrialist G. Lehman. Starting in the '80s of the nineteenth century Franz Ramisch began to gradually redeem the plot belonging to G. Lehman and probably until 1892 was already in the possession of the whole. In the same year he came into possession of the lot N°547, which part adjacent to the Wild Street Wilhelm Hanneman previously sold to another investor. In the '80s of the nineteenth century the organizational structure of the plots numbered N°549 and N°550, which due to the construction of the Evangelical Alley were subjected to a secondary division into nine plots oriented perpendicular to the new road. Until 1898, Franz Ramisch acquired plots numbered 4, 6, 8, 10, 12 located at aforementioned street. Until World War II, neither the boundaries of the company

nor land ownership structure did not change. With the advent of the communist regime in Poland factory area was nationalized, and so became the property of the state. Probably in the ‘90s of the twentieth century after the socialist system collapsed and the democratic system was established, as a result of privatization processes, factory area was divided into three plots: the first – western, adjacent to Piotrowska Street with mortgage number 387/2, the second – middle, where all the factory buildings are located with mortgage number 387/3, and a third – eastern adjacent to H. Sienkiewicza Street, where now has one building and parking lot, mortgage number 387/4. Since 2004, lot number 387/2 and 387/3 became the property of OPG - Orange Property Group.

Description of buildings in terms of architecture and construction

General description of architecture

Franz Ramisch Factory buildings create fairly uniform in terms of architectural forms used building complex , that created its essential character before the outbreak of the First World War. In the course of changes during socialist period, when several buildings were demolished, the complex did not lost its essential form or character of its development.

Analysing the form of production buildings, we can easily notice that they have a similar form, and that they utilize characteristic style and prevailing architectural "fashion" of late nineteenth and early twentieth century solutions of Lodz "factory-style" referring mainly to defence Gothic architecture. Buildings were made of bare machine brick, so characteristic in the architectural landscape of Lodz. The facades have characteristic rhythmic, uniform axial and horizontal systems with large window openings bringing light into production halls(22). Ground floor window openings closed with a full arch, while the upper floor

[22] Ebda., 11.

window openings – with segmental arch. Windows divided into small rectangular pieces.

Architectural detail of objects created by the end of the second development phase (till 1899) was limited to various forms of dripstones, window bands, niches and small triangular peaks. A reference to specific defence style used in the design of Lodz factories is the second weaving mill building super structured water tower battlements, which was built in 1893.

Architectural detail of objects created in the third development phase (years 1900 – 1914) is characterized by the use of elements characteristic to geometrical Art Nouveau variation. This effect can be observed in the facade of the administrative building (Nº16), the upper part of the connector between the weaving mill and the " Treasury" and decorated top of the water tower, which was supplemented with now non-existent crowning helmet. The most characteristic and yet monumental part of the whole factory complex is the southern facade of the "Treasury" adjacent to F. D. Roosevelt Street, referring to its representative character. Its asymmetry, concrete rustication and intricate detail, as well as the ability to distinguish two main stages of its formation gives it the status of a peculiar object of a special nature and importance. Another stylistic sensation at Roosevelt Street is the facade of the former infirmary and warehouse building with crossing gate. Although the word "is" is there probably out of place, since the period of its glory is already gone and should be referred to the past tense. The facade was made of bare brick (plaster and lack of detail is the effect of post-war "renovation"), embellished with elegant brick detail, fitted with a pinnacles defining harmonious rhythm of the whole. Additionally decorative wrought iron spires and the magnificent, forged iron gate. During the heyday it was a very good example of Lodz architectural factory style strongly inspired by Gothic defensive architecture.

Detailed buildings description

1.A. Craftsmen house Piotrkowska 138

One-storey wooden house with a loft, four-axis, with an entrance on the north side and the windows on the east and west sides, as well as with the exit to the west side. With three chambers, including one residential and one dedicated for workshop, also performing both residential and manufacturing functions.
Project: Krzysztof Wilhelm Dürring or Louis Bethier, the first quarter of the nineteenth century.
House demolished in 1924.

1.B. Auxiliary buildings

One-storey wooden outbuilding with shed roof with a decrease towards west. Built in 1850 – 1873. Demolished together with residential house in 1924.

2.A. Craftsmen house Piotrkowska 140

One-storey wooden house with a loft, seven-axis, with an entrance on the central axis and side windows on the east and west, as well as through-passage on the west side. Consists of a hall, kitchen and three chambers, including a bigger – workshop and two

smaller – residential and commercial. The house performed also both residential and manufacturing functions
Project: Louis Bethier, the first quarter of the nineteenth century.
The house demolished in 1924.

2.B. Auxiliary buildings

Group of one-storey wooden outbuildings covered with shed roofs.
The two most western buildings demolished most likely already in the years 1900 – 1909. The last of them, along with the tenement house in 1924.

3. Tenement house – phase I, II, III

3.A. Phase I

Probably before 1887 Wilhelm Hanneman placed at the north boundary of his plot the first part of the future residential tenement house. It was a one-storey, residential, two-axis tenement made of brick combined with the wooden front house, roofed with a shed roof. Indicative dimensions of the building approximately 6,5 x 3,5m.
Demolished in 1924.

3.B. Phase II

Two-storeys, brick residential tenement with a loft, covered with shed roof with construction made of wood. 10 - axial tenement, entrance and staircase located in the fifth axis from the east. Staircase marked in elevation with a slight break. The building was erected on a rectangular plan, while the segment containing the two western axes narrower than the rest of the building. Ceilings made in wooden construction. The building is located on the east side of the building 3.A, at the northern boundary of the plot No547. Indicative dimensions of the building approximately 27,0 x 6,5m. Built in 1887.

3.C. Interludium

One-storey, brick, residential tenement house covered with shed roof made in wooden construction. Three-axis building, which is the eastward extension of the existing residential outbuilding (3.B), connected with the passage. Indicative dimensions of the building approximately 9,5 x 7,5m. Built between 1894-1896.

3.D. Phase III

Three-storey residential, brick tenement house was based on 3.B and 3.C buildings as part of the reconstruction in the years 1900 - 1907. Covered with shed roof made

in wooden construction. Indicative dimensions of the building approximately 37,0 x 7,5m (at the widest axis). The first and second floor of the three eastern axis equipped with balconies. Ceilings made of wooden. In the post-war years, building served the function of factories kindergarten. Ultimately demolished probably in 1986.

4. Chimney

Factory chimney with a rectangular base with a cornice and panelled articulation referring to factory buildings. Above the base up to half the height octagonal, then cylindrical gradually tapering its cross-sectional diameter upwardly. Built in 1889 as a free-standing, in the interwar period permanently associated with the boiler house building. Demolished in 1971. Approximate height of 40m.

5. Boiler house building – Phase I, II, III, IV, V

5.A. Phase I

Built in 1889. Four-axis, brick, one-storey building. The object covered with a gable roof made in wooden rafter – purlin construction, where pillars standing on the ceiling beams support the joists using swords ridge purlin. The window openings on the north and south, the entrance is located at the south elevation extreme eastern axis. Indicative dimensions of the building approximately 12,7 x 7,6m.

5.B. Phase II

1893 expansion of existing 5.A building by one axis westward, extension of the roof. Indicative dimensions of the building approximately 15,7 x 7,6m.

5.C. Phase III

1898 - 1899 expansion of the existing building 5.A + 5.B involving one-storey symmetrical module addition and covering it with a pitched roof made with the same construction as the roof of the 5.A building. Four of five windows of the north wall of the building 5.A were immured, which was now a wall separating the two parts, while one of the openings was turned into door. The northern elevation of the new building was constructed as a mirror image of the southern facade of the building 5.A & 5.B As a result, the reconstructed boiler room reached the approximate dimensions of 15,7 x 14,7m.

5.D. Phase IV

In the years 1924 - 1928 another reconstruction of the building occurred.
Only south wall of existing building was left, the rest of the object was completely upgraded. The building remained one-storey. From the west it was permanently connected with the

chimney with a small one-story building covered with shed roof concealed from the west with a high attic. From the north, window openings were walled up and in the extreme eastern axis small module with window was added. The whole was covered with unsym metrical gable roof, with the southern slope inclined at greater angle than the north, which also changed the appearance of the east elevation. The roof was made in wooden rafter construction, with columnar support of the ridge beam in the southern part. In addition, rectangular wooden structure covered with a gable roof with surfaces parallel to the main roof surfaces, was added on top of the roof in its south – east corner. This addendum was most likely of technological importance. During the reconstruction the building was plastered. Its approximate dimensions were 21,8 x 16,2m measured at the extremes.

5.E. Phase V

Reconstruction of building 5.D carried out in 1952 increased south wall by about two meters, and aligned with its high northern wall as well. In the upper zone of those two walls window openings were created, symmetrically, respecting axis of existing window openings, while in the southern wall 5windows were created, and in the northern wall only 4 apart from the eastern edge axis. Object was covered with symmetrical gable roof made of wooden girder hanging - lattice construction. Western wall was also rebuilt and the attic were re-shaped to match the geometry of a new roof. Modernization has not changed the outer contour dimensions of the building.

6. Weaving Mill – Building I – Phase I, II

6.A. Phase I

Weaving mill building was built in 1889. Made of bare machine brick, three-storey with attic, covered with a shed roof. Wooden roof structure. Ceilings made in wooden construction, supported on beams which are supported by columns dividing the room into two unequal aisles. Poles of the first two floors were made of cast iron, poles of the other floors made of wood. On each floor seven pillars. Seven-axis elevation. The communication core situated in the extreme west axis, marked on the façade with delicate break. The building is made of machine brick combined with lime mortar.
Used brick dimensions: 27,5 – 28,0 x 12,7 – 13,0 x 6,0 – 6,5cm.

6.B. Phase II

Superstructure of vertical communication shaft of 6.A building in 1963. The staircase raised by one floor, built pump room repeats the outline of the staircase. Covered with symmetrical gable roof with a north - south slope declines. Roof covered with an attic from the east and west. From the south, at the top of the wall simple cornice was made. Expansion was made of bare machine brick with dimension of 25,0 x 12,0 x 6,5cm.
The window openings of the second and fourth axis starting from the west have been forged downward and turned into door. Above them, on the length from the second to

fourth axis the wooden roof structure consisting of three gable modules was stretched.

7. Weaving Mill – Building II – Phase I, II, III, IV

7.A. Phase I

The second weaving mill building built in 1891. Brick, non-plastered, three-storey with attic, covered with a shed roof. Fire wall on the joint with building 6.A. Wooden roof structure. Ceilings on the second and third storey made of wood supported on the wooden beams. The ceiling above the first floor made in Klein system supported on I-shaped cast iron beams. Ceilings supported by columns dividing the room into two unequal aisles. Poles of the first two floors, made with cast iron, of next with wood. On each floor seven pillars. Seven-axis elevation. Communication core situated in the extreme eastern axis, marked on the elevation with delicate break. The building is made of machine brick combined with lime mortar.
Used brick dimensions: 27,5 – 28,0 x 12,7 – 13,0 x 6,0 - 6,5cm.

7.B. Phase II

In 1893 superstructure of the stairwell to the height of five storeys - creation of the first water tower on the plot. The superstructure was made with machine brick combined with lime mortar. Used brick dimensions: 27,5 – 28,0 x 12,7 – 13,0 x 6,0 – 6,5cm. Tower completed with battlements. Water tank positioned on the segmental ceiling (Klein structure).

7.C. Phase III

Rebuilding of the second floor window opening located on extreme eastern axis to the entrance for the connector linking the weaving mill with the "Treasury". Rebuilding made in 1899.

7.D. Phase IV

Reconstruction of the window opening of the third and fourth floors located on extreme eastern axis for access openings adapted to connect the second and third floors of the connector made between the weaving mill and the "Treasury". Rebuilding made in 1909.

8. Coach house

Biaxial, brick, one-storey building with an open loft. Probably non-plastered. The ground floor had two gates defining the two axes of the building. Above the gates cornice, above which two small windows were located illuminating the interior of the coach house. The building was built in 1893, demolished before 1896.

9. Spinning Mill

Built in 1893. Brick, non-plastered, four-storey, with a non-usable attic covered with symmetrical gable roof. Made in the wooden rafter - purlin construction with the posts supporting purlins. The south elevation sixteenth-axis with additional, seventeenth axis from the west, much narrower than the other, housing the transmission shaft connected to the engine room. Vertical communications located at the extreme eastern axis, emphasized by a gentle elevation break, ended at the top with a small brick tympanum. In 1974 communications shaft were fitted with an cargo – personal lift. Eastern elevation triaxial with the fake window openings in the forms of shallow panels. The northern elevation is a mirror image of the southern one, but the extreme eastern axis is not surmounted by a tympanum. The building is made of machine brick combined with lime mortar. Used brick dimensions: 27,5 x 13,5 x 6,5cm.
Ceilings made of wood, supported on hauling beams. The ceiling above the first floor in the first three axes from the west was made as Klein ceiling . Ceilings of I, II and III floor supported by three rows of cast-iron pillars and the ceiling in the fourth floor on the two rows of cast-iron and one row of wooden poles. Columns divided the production halls into four aisles of equal width.
In the central belt of the southern elevation open emergency staircase is located.

10. Engine Room – Phase I, II, III, IV

10.A. Phase I

Built in 1893, made with brick, non-plastered, single-storey building covered with a symmetrical gable roof in northern and shed roof on the southern side. Rafter made as girders. Building adjacent to the north of the weaving and spinning mill. Three-axis eastern elevation with central entrance flanked by two window openings closed with a full arch. The six-axis western elevation with window openings closed with a full arch. In the extreme northern part of the building the gap between two walls located opened towards the east and the west, covered (now also walled up). In the northern part of the building ornate coffered wooden ceiling.

10.B. Phase II

Redevelopment of the building 10.A in 1896. To the existing building on its west side, between the second weaving mill building and the north border of the plot N°547, one-storey brick building with a four-storey "tower" directly adjacent to the shaft of the transmission constituting the first, the most western axis of the spinning mill (N°9) was added. Building 10.B according to preserved plans was divided into two spaces: a northern covered with a gable roof and a southern covered with a saw-tooth roof. In addition, the northern part was divided into two spaces, the eastern one was combined with the extended slot going on from building 10.A in the extreme northern part. The western part was covered with the Klein ceiling supported with an I-beam that run

parallel to the facade, supported centrally by an iron pole.
New façade got a five-axis system with a narrow sixth axis located at the northern boundary of the building. Western front wall of the building 10.A, which was now the inner wall of the new boiler house was rebuilt, replacing the window openings to the transition between rooms.

10.C. Phase III

redevelopment of the building 10.B in 1899. The building was raised to a height of about two stories, not divided with ceiling . Internal divisions were removed, one nave space was created. The building was covered with a symmetrical gable roof, which was made as truss girders. By the wall of the second weaving mill building, an aperture was made that illuminated the space. West façade was also rebuilt, which received a single five-vested structure with a central entrance. Characteristic were high, almost the entire height of the facade, window openings closed with a full arch, alike the door opening. The interior had an exquisite wooden coffered ceiling and wall-mounted wood panelling. The building was made of machine brick, non-plastered.

10.D. Phase IV

Reconstruction of the building 10.C + 10.A in the '90s of the XXth century. The existing 10.C building was divided into two floors with concrete ceiling. The vertical communication core was located at the southern wall. Illuminating gap was partly walled up to the height of the first floor. However, it has lost its function due to the fact that the wall was put between it and the staircase. Western facade underwent modernisation. High windows have been bricked up. In the first floor were rectangular window openings were pierced, while in the second floor windows filled up the spaces of existing full arches. The entrance to the building remained in the central axis.
On the east side of the building 10.A one-storey, brick, plastered segment covered with a shed roof was added. Existing eastern facade of the building 10.A was rebuild, depriving it of its brick detail and window openings were turned into transitions between rooms. Also connection with the spinning mill(9) in the form of the passage was pierced.

11. Cantor – Phase I, II, III, IV

11.A. Phase I

Built in 1893, brick, two-storey, probably during this period still non-plastered tenement, covered with a shed roof. Five-axis, with the staircase core (single speed stairs) vested in the far west axis. Location of the stairwell was enhanced with a small break in the facade. Additionally, two door openings were located in the second and third axes from the west. Two window openings in the extreme eastern axes of the first and four window openings in the second floor axes. The building was located on the east side of the existing coach house and converted into plants cantor. Building on a rectangular plan

with indicative dimensions of 12,3 x of 5,4m.

11.B. Phase II

Coach house building (8) rebuilt in the years 1894 – 1896. Tenement raised to a height of two storeys and levelled with the building 11.A. Probably staircase serving both parts of the building rebuilt at this time. The building received a four-axis façade system. In the far eastern axis of the first floor doorway was located. On the east side of the building 11.A single axle, single storey, brick building, covered with a shed roof was located. The building most likely served a role of the gatehouse / porter. Building 11.A + 11.B probably already plastered.
11.A +11.B building on a rectangular plan with indicative dimensions 26,2 x 6,0m (at widest point).

11.C. Phase III

Extension of building 11A + 11B in 1909, consisting of the erection from the west side of two-storey, brick, three-axis segment covered with shed roof, with its own two-speed staircase in its extreme eastern axis. The western facade single axis, with one window opening on the second floor. Façade completed with high attic decorated with shallow panel and framed in the upper part with a simple cornice. Building 11.A + 11.B + 11.C plastered. Modest architectural detail limited to the cornice which runs between the floors and in the top of the second floor, as well as delicate bands in the basement of the building.
Building 11.A + 11.B + 11.C on rectangular plan with indicative dimensions 35,3 x 6,0m (at widest point).

11.D. Phase IV

Extension of building 11.A +11.B + 11.C in the years 1922 – 1924, which consisted of staging on the west side a small, uniaxial, brick module of the new concierge, covered with a shed roof. The west elevation had an window opening, while the north had a door. Building obverted with its southern wall with the building 11.A + 11.B + 11.C. Approximate dimensions of the annex are 3,3 x 3,5m. The whole building plastered.

In 2014, the building of the former cantor was painted black and decorated with a red – yellow – white lettering "*CZEŚĆ !!!*".

12. Group of auxiliary buildings

The group of auxiliary buildings built in the '90s of the XIXth century, probably along with the spinning mill building, also around 1893. One aisle, brick, single-storey, multi-axis buildings, covered with a shed roofs made of wooden construction. Non-plastered. Situated at the northern boundary of the plot N°547 was composed,

according to the preserved plans, of two parts: the eastern opened, four-axis, stripped of the front wall, and Western closed, nine-axis with centrally located entrance. The building was rebuilt in the years 1922–1924, reaching the eastern border of the plot Nº547. Two buildings located at the southern border of the plot Nº548, seven-axial, probably devoid of the front wall. In 1898, on the west side another single-storey, brick and covered with shed roof, most likely nine-axial, with entrances at the extreme eastern and central axis was added.
Auxiliary buildings standing on the plot Nº548 were gradually dismantled from 1899 on. The northern building was demolished in 2011 and only one-span segment was left, which in turn was demolished in 2014.

13. Treasury – Phase I, II, III

Phase I

Construction of the reel house building in the south – west corner of the plot Nº550, combined with the weaving mill with an suspended connector, facing Evangelical Street. It was designed by architect Paweł Rubensahm, approved by municipal architect Franciszek Chełmiński. In 1899 brick, two-storey main building with a basement and an attic was built (13.A), a three-story water tower (13.B) from the north was implemented, and a one-storey suspended connector was constructed (13.C) linking the weaving mill building at the height of the first floor. Building realized on the L – shaped plan. Made with full ceramic brick joined with cement – lime mortar. The front (south) elevation of the main building with six axis. The staircase in the third axis from the east, marked in elevation with a slight break. The building communication core divides it into two parts: the longer western and the shorter eastern. The western part of the western facade eight- and east elevation seven-axis. Ceilings made in Klein system supported by steel I-beams. Ceilings of the first and the second floor supported by a row of cast iron columns, dividing the room into two equal aisles. In the western part eight columns in a row. In the eastern part ceiling supported by just only one pole on each floor. The segmented ceiling of the basement without any vertical support. Stairs of the staircase made of concrete. The roof is made of wood. Ceilings of the water tower (13.B) above the basement, first and second floor ceramic, segmented, made in Klein system. Probably pent or envelope roof, made of wood. The whole building non-plastered.

Phase II

Reconstruction of buildings 13.A + 13.B + 13.C in 1909 according to a design signed by architect Franciszek Chełmiński. The main building was raised by two storeys and an attic, while a uniform expression to the southern facade was given. The six axial façade was done in geometrical Art Nouveau style in concrete finish by one of the best construction companies in Lodz: Nestler & M. Ferrenbach. Ceilings of the third and fourth floors made of wood supported on the wooden beams, supported on the third floor on iron poles, and

on the fourth floor on wooden poles, arranged as in Phase I. The building covered with multi hipped roof made of wooden construction. The break of the staircase ended with triangular tympanum. Alignment of all axes of the facade preserved. Three-storey water tower (13.B) raised with four floors to a height of seven storeys in total. The floors of the second and third floors made of wood. On the fifth storey wooden beam ceiling, above the ceiling made of steel beams, anchored in the walls. Vertical communications realized through the stone stairs, double-speed, located on the south - east corner of the "Treasury" building. Wooden ladders lead to higher floors. Tower topped with a decorative helmet, which structure was made of wood. Helmet topped with a spire. Architectural detail refers to the geometrical motifs of Art Nouveau style and responds to the style of main building. To the water tower, from the east, lower extraction tower (dust tower) – 13.D – was added, made on a square plan, without any internal divisions. Tower covered with a shed roof made of wooden rafter construction, declining to the east. The tower has a technological openings, secured with metal shutters, located in the upper part of each wall. Also the suspended connector (13.C) was rebuilt, raised by two floors, covered with a symmetrical gable roof made of wooden rafter. The connector has one window opening on each floor, both to the east and the west. Just as in the case of the water – dust tower(13.B + 13.D) architectural detail refers to geometrical secession motifs and stylistically corresponds with the character of the main building.
The whole building non-plastered, except of southern elevation which was made of concrete and panelled decoration of water – dust tower.

Phase III

Probably in the '80s of the twentieth century "Treasury" building underwent a little remodelling, which included removal of the water tower decorative helmet, its superstructure of approximately 2m made of ceramic brick and covering it with a shed roof made of wooden rafter with a small decrease into the south direction; addition of an outbuilding of unknown origin and use on the first floor, on the north wall of the staircase core; west facade of the main building, as well as the eastern gable wall was plastered. Overall dimension of the building is approximately 40,8 x 22,7m.

14. Forge

Built in 1898 brick, one-storey, probably non-plastered building of a forge, covered with a wooden shed roof. Three axial south elevation, with an entrance located on the central axis. Eastern and western facades biaxial, while the northern façade blind. Windows closed with segmental arches. On the central axis in a gable wall prominent chimney was located. The building was situated on the border of the plots No550 and No548, back to the existing buildings. Approximate dimensions of the building was 7,3 x 5,5m. Demolished in the years 1900 – 1907 for the construction of the carpentry and ironworks workshop.

15. Laundry

Built probably in the years 1900 – 1907. Brick, one-storey, probably non-plastered and covered with a shed roof. Located in the place of demolished auxiliary buildings adjacent to the front house at Piotrowska Street140. Dimensions of the building was approximately 7,3 x 5,5m. Laundry building was demolished in 1924.

16. Administration Building – Phase I, II, III

Phase I

Built in 1898. One-storey, without the basement, brick building covered with a wooden shed roof. In this phase, combined with the building 17. The entire facility was made on the L – shaped plan, perpendicular to Evangelical Street. Five-axis western and three-axis northern facade. Non-plastered building, made of ceramic brick.

Phase II

Reconstruction of the Phase I of the administrative building in 1909. A clear distinction between administrative building and warehouse building at the height of the former fifth axis, starting from the north, was introduced. Separated building was than raised to a height of two storeys and covered with a shed roof with a small decline, made in the construction of wooden rafter.
Ground plan of the building was expanded to the west. The front – west – facade was given a six-axis system, referring to the style of architectural decoration of the "Treasury", also to the geometrical style of Art Nouveau. The main entrance, and also vertical communication core, which consisted of a wooden double speed stairs, was located on the fourth axis from the north. In the two extreme southern axes of the first floor gates were placed. On both sides of the staircase one room was located, wherein to northern one was accessible from the outside as well. The ceiling of the northern room was ceramic, segmented, made in the Klein system, supported by two pillars of cast iron dividing a room in two aisles. The ceiling of the southern room was made of a wooden structure, with the central substring beam resting on a wooden pole. Above the staircase mezzanine a small room was constructed, which was accessible with a single speed stairs running up from the first floor.
Building, except of decorative panels, non-plastered.
Overall dimensions of the building are approximately 20,5 x 10,5m.

Phase III

Renovation of the building in 2011. The building remained its basic form, however, changes in the appearance of the front elevation occurred. The two extreme southern axes of the first floor, which were by far gates, were replaced with windows, but their appearance and shape was preserved. The window openings of the first and third axis of the northern part were walled up, and they were than pierced as rectangular window

openings, one in each of the aforementioned axis. In the northern wall three window openings were pierced: two in the first floor and one on the height of the second floor.

17. Garage – Warehouse Building – Phase I, II

Phase I

Built in 1898. One-storey, brick building covered with a shed roof made of wooden construction. In this phase combined with the building Nº16. The entire facility was made on L – shaped plan, perpendicular to Evangelical Street. The five-axis western, three-axis northern elevation. Southern facade elevation, adjacent to Evangelical Street, seven-axis, divided by narrow pillars completed with pinnacles. Façade made with ceramic brick, non-plastered. Facade detail referred to the Gothic style (neo-Gothic).

Phase II

Reconstruction of the Phase I in 1909. After the division with the building Nº16, was given the form of an inverted letter "C". Five-axis western elevation. The building was raised by approximately 1,5 m, but remained further one-storey. Extreme western axis of the north elevation was extended and obverted with the infirmary (ambulatory) building (Nº18). The building was covered with a shed roof with made in the construction of wooden rafter, with a small decline. Roof received an rectangular form, regardless of the polygonal shape of the building, which hidden the northern elevation under a prominent hood resting on a cast iron pole. Non-plastered building, made of ceramic brick.
Representative southern facade underwent redevelopment as well. It was raised by approximately 1,5 m above the existing cornice. Pointing pinnacle endings were removed. The resulting gaps between the pillars were filed with rectangular brick panels, decorated with simple geometrical ornament. Non-plastered façade.

18. Building of the former Ambulatory – Phase I, II

Phase I

Built in 1989, brick, non-plastered, one-storey, covered with a symmetrical gable roof. Probably with the attic. On the west side of the building crossing gate covered with a roof of the building based on a self-supporting western wall. Five-axis northern elevation. The entrance to the building from the gate passage. Representative seven-axis southern facade, built of ceramic brick, non-plastered. Eighth axis was marked by the gate richly accented in the facade. Façade uniformed stylistically with the facade of the building 17, yet higher and with more brick detail. Central axis crowned with the triangular tympanum topped with a pinnacle and forged spire. Toll gate closed with a basket arch.

Phase II

Rebuilding made in 1899 or between 1899 – 1909. The building was raised to a height of two storeys, divided with a ceiling made of wooden structure. The building was covered with a symmetrical gable roof of wooden structure. The northern façade remained five axial. The rhythm of the facade was disturbed in the extreme west axis: there is no window opening at the first floor, while between the second and first floor the door opening was pierced. In the extreme western axis was double speed staircase leading to the second floor was located. Façade at Evangelical Street was also rebuild. In the spans of the raised second floor, in existing axes of the first floor windows, two small windows were pierced, closed with segmental arches, illuminating rooms of the building.

In the post-war years, probably in '60 – '80 of the XXth century, front façade was stripped of its brick detail, and the whole was plastered.

19. Auxiliary – Warehouse Building – Phase I, II

Phase I

Built in 1989, brick, non-plastered, one-storey, covered with a shed roof made with wooden rafter construction. Five-axis elevation. The building got the southern elevation similar to the southern facade of the building No17.

Phase II

Rebuilding made in 1899 or between 1899 – 1909. The building was raised to a height of two storeys, divided by the ceiling made of wooden construction. The building was covered with a symmetrical gable roof of wooden structure. Building obverse with the building No18. The northern elevation remained five-axial at the level of the first floor. The second floor façade four-axial. The communication core – double-speed staircase – was located at the far eastern axis of the building, in which also the entrance was located. Other axes of the first floor marked gates openings. Axes of the second floor marked window openings closed with segmental arches, of which the second from the west was forged up to the crowning cornice and turned into a warehouse door. Detail of the north facade was limited to the brick cornice. Façade at Evangelical Street was also rebuild. In the spans of the raised second floor, in existing axes of the first floor windows, two small windows were pierced, closed with segmental arches, illuminating rooms of the building.

Elevation of buildings 17, 18 and 19 created a uniformly styled facade, serving the representative role at Evangelical Street.

20. Cooling tower

Cooling tower of wooden backbone – frame construction. Demolished in 1952 – 1962. Approximate dimensions of the horizontal projection of the tower was 11,0 x 5,5m.

21. Carpentry and Ironworks Workshop

The building was built in the years 1900 – 1909. It was built on a square plan with indicative dimensions of approximately 18,0 x 14,7m. Brick, non-plastered, two-storey, covered with a symmetrical gable roof, made in a wooden rafter construction Northern and southern elevation six-axial, eastern and western elevation four-axial. Eastern and western elevation completed with triangular attics. No window or door openings in the area of the first floor of the west elevation. Axes of the second floor of above mentioned west elevation determined by the panels in the form of window openings. In the extreme eastern axis of north elevation vertical communication core – double-speed concrete stairs – were placed. Entrance area was highlighted in the façade with a slight break. Ceramic ceiling episodes made in Klein system, supported on the exterior walls and the wall dividing the first floor. The ceiling of the second floor in the area of the extreme eastern axis ceramic, made in Klein system; over the rest of the room ceiling made with wood beams anchored in the north and south walls, supported on a wooden substring beam resting on a row of three wooden pillars dividing the room into two equal aisles. In 1929, according to the iconography, beam ceilings was covered with loosely scattered wooden planks. First floor window openings closed with full arch, second floor – with segmental arch. Window opening, in the second axis from the south of the second floor, was pierced slightly lower than the line of a cornice, and in its place door were placed and small wooden platform limited by simple cast-iron railing. In the extreme south axis of the first floor rectangular annex of the height of one storey, covered with a shed roof was made. Annexe of indicative dimensions approximately 3,7 x 2,0 m. After its dismantling in the post-war years, pierced passage connecting both parts, closed with a full arch, was exposed.
In the post-war years some window openings were replaced with door openings.

22. Fence with a Concierge – Piotrkowska Street 138/140

It was built in 1924. Concierge and a fence built with brick, plastered. Concierge on a square plan, with a corner arcade supported by the column on both sides of the fence. Topped with an envelope roof covered with plain tile. Fence with nine spans. Spans separating pillars topped with bulbous domes. Spans closed with segmental arches, filled with wall, in which upper part holes are pierced in the shape of a flattened ellipses. Holes filled with ornate wrought-iron lattice. On the northern side of concierge building vehicular gate, somewhat withdrawn into the plot area, was located.

In the ‘90s of the twentieth century the fence was rebuilt: second span from the north

was replaced by an crossing gate, while all elliptical holes were pierced down to the street level and showcase windows of the trade pavilion, located behind the fence, were created.

23. Fence with Gate – H. Sienkiewicza Street

It was built in 1924. Fence built with brick, plastered, with five spans. Spans separating pillars topped with bulbous domes. Spans closed with segmental arches, filled with wall, in which upper part holes are pierced in the shape of a flattened ellipses. Holes filled with ornate wrought-iron lattice. Southern span hosts the gate.

24. Toilettes

The first wooden building was probably built in the years 1900 – 1909. It was probably one-storey building, with a shed roof.
In 1934 in its place brick, non-plastered, one-storey building, with shed roof made of wooden rafter was built. The western elevation with six - axes – in the extreme axes entrance doors located. The northern elevation empty, while the southern elevation biaxial - axis defined by the two doorways.
The building was rebuilt in 1952. The basic form unchanged. The building was plastered. The interior was divided into three parts: northern – housing welding room, central – toilettes for women, southern – toilettes for men. The western facade punctuated with a few new window and door openings.

25. Transform Sub Station

In 1951, transform substation building with a volume of 460,0m3, adjacent to the western wall of the "Treasury" (N°13) building was constructed. The building was made on square plane with dimensions of precisely 10,24 x 11,23m. Building made with ceramic brick joined with cement – limy mortar, covered with a flat roof of 9cm thick reinforced concrete slab, insulated from the top with 5cm thick Supra.
Probably in the '80s of the twentieth century the building extended to the south. One-storey outbuilding, covered with a shed roof, was added on the whole length of the facade. Addition of indicative dimensions approximately 3,0 x 10,24m. The southern facade got two doorways.

26. Garages and Auxiliary Buildings

Built in the '60s of the twentieth century. One-storey buildings, covered with wooden shed roof. Replaced with brick buildings of the same shape and form in the '70 s of the twentieth century. Mostly demolished at the turn of the XXth and XXIst century.

27. Trade Pavillions

One-storey commercial pavilions built in the early ‘90s of the twentieth century. Dismantled at the turn of the XXth and XXIst century. Only two booths remained, housing Chinese eateries.

addendum 14 - 15:

Factory - Architecture

addendum 14:

Map of the factory objects for detailed architecture description

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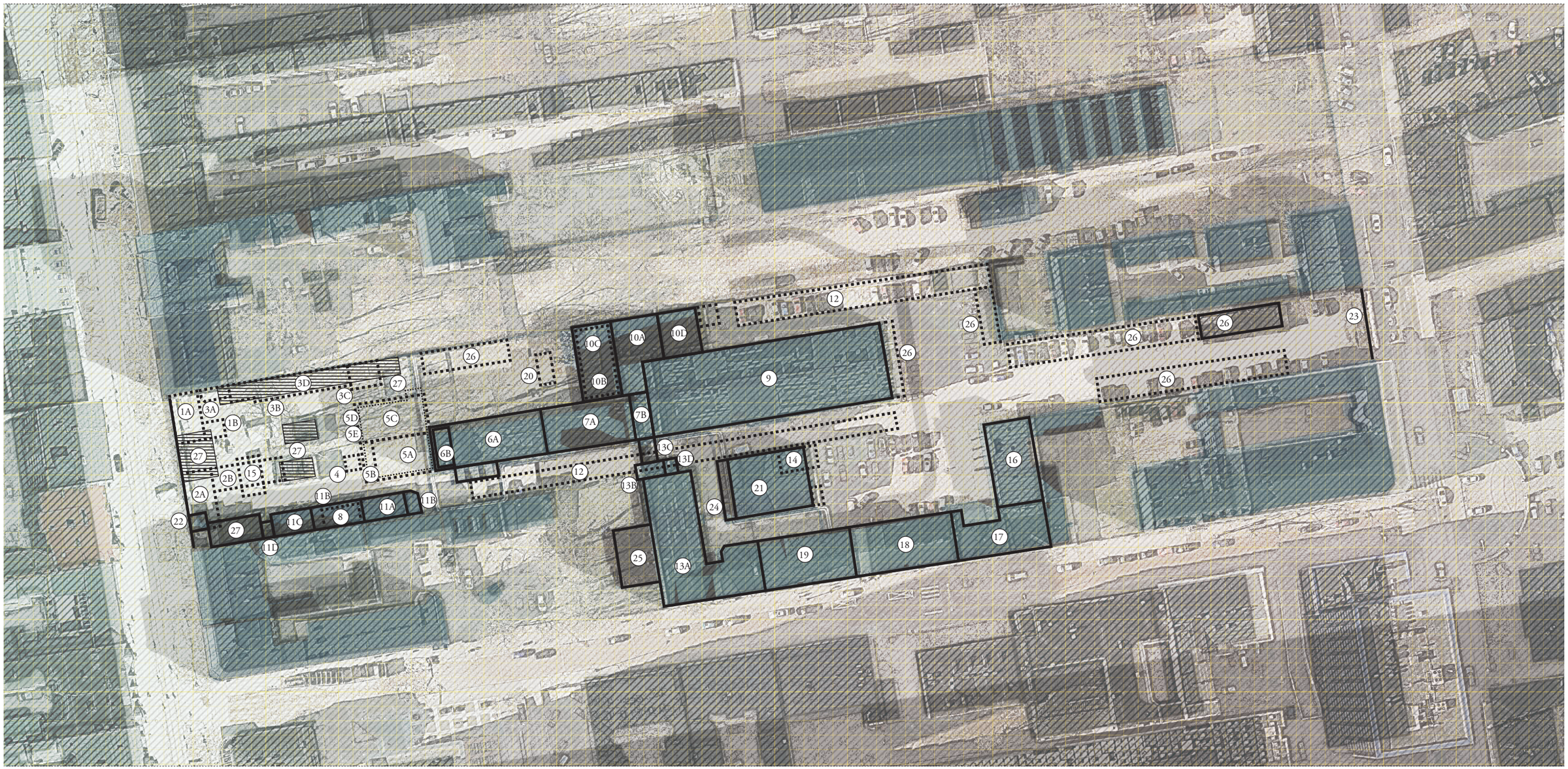
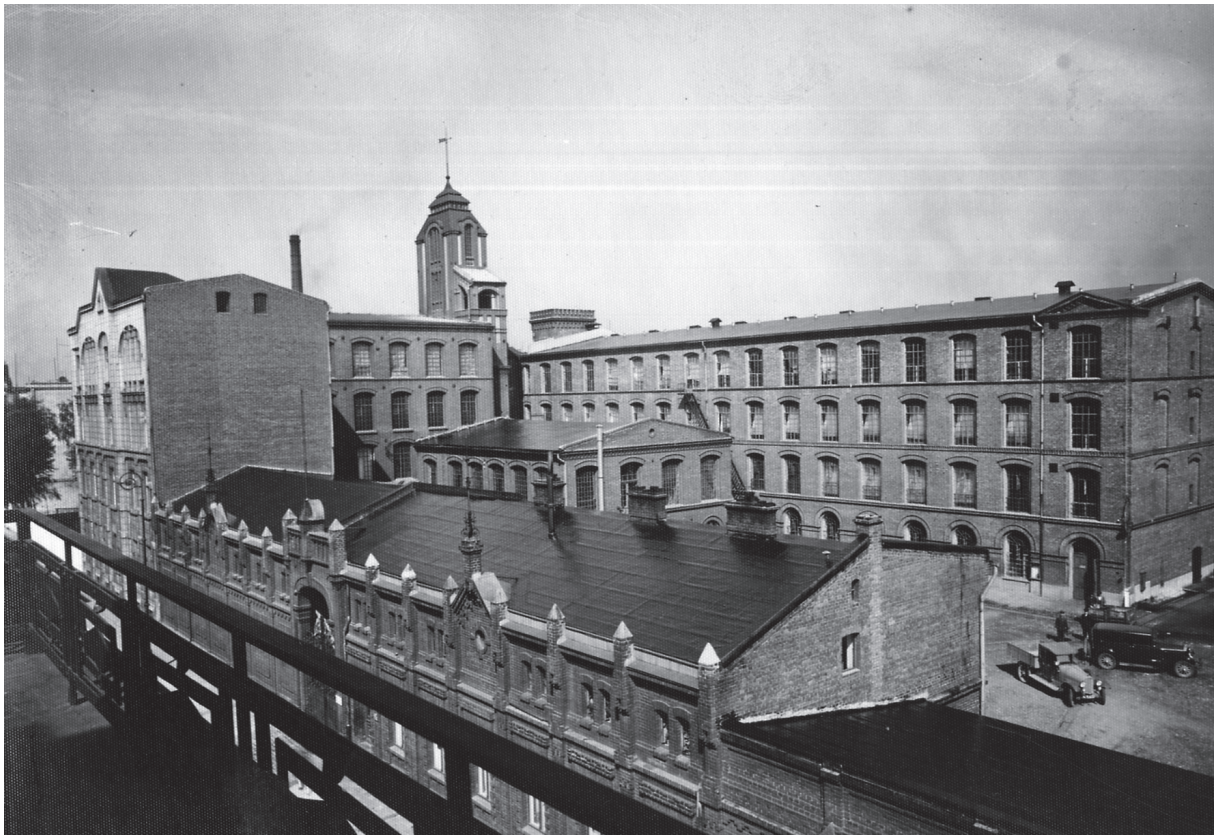
Non-existing buildings

Existing buildings



addendum 15:

Archive iconography of
Franz Ramisch Factory buildings



Pic. 1. Factory buildings seen from Evangelical Street (todays F. D. Roosevelt Street) / 1929

Pic. 2. South – East view on the spinning mill and carpentry and ironworks buildings / 1929

Pic. 3. Western façade of the administrative building / 1929

Pic. 4. Southern façade of the first weaving mill building and boiler house building / 1929

Pic. 5. North residential tenement – house of the owner – with surrounding garden / 1929

Pic. 6. Southern tenement – factory cantor building / 1929

2nd Part

4th dimension

(that is, the possibilities we have)

introduction:

Franz Ramisch Factory essentially – if we base our reasoning on the basis of the dating of the objects located on the plot at Piotrkowska Street 138/140 – is a thing belonging to the past. Following this track we will have to admit that most of the materials concerning it, such as development plans, descriptions, plans and sections of buildings from different periods of its activity, we would find now in the archives. In many different archives – scattered around the city, and maybe even the country or Europe (until now 25 direct relatives of Franz Ramisch lives across Europe). Difficulties in obtaining the data can be depressing, and ultimately force to abandon the quest and focus on the good old, not necessarily complete and reliable pieces of information that we have at hand. Not only the difficulty but also "flatness" of data. All materials stored in the archives are nothing but a hand drawn ink drawings on paper and moreover described mainly in Russian language, as in the period of its rapid development, Lodz was under tsarist occupation. Someone might say, "No, this is too much! After all, we live in a three dimensional world!". It is these two main problems: the difficulty of obtain data and its flatness, that became the leitmotif of this study. Another brick was laid by

a very important feature of our times, from which we cannot run away anymore and which theoretically makes our lives easier and less complicated – interactivity. Everything we are creating today should necessarily be focused on the end-user, and ultimately respond to his actions. Few things today has a right to remain static, only to watch. At this point, first common denominator between the Factory as a living organism reacting to various stimuli, and the interactivity of our commonplace, where we are creating incentives, on which objects are to react, shows up. At this point, it is noticeable that it is impossible to present the history of the factory in a static way, using only drawings and diagrams. They may, however, become supporting structures, tools used in the show, but cannot make the depiction itself.

Difficulty, flatness, interactivity.

With the "difficulty" not much can be done. One should perform one's own Sisyphean exploration and analytical work without losing the higher purpose that motivates one out of the sight, in spite of adversity and slog, which silhouetting dramatically against the horizon . After the closure of the analytical phase of gathered pieced of flat information, everything should be moved into the realm denying their two-dimensionality. All the objects that were in the time from 1824 until 2014 part of the factory, even if just for short period and of seemingly insignificant function, were modelled in three dimensions with an accuracy allowed by the source material and available knowledge about particular epochs. Closest surrounding of the Factory was also rebuild containing inter alia lots at Piotrowska Street with numbers 134 – 144, along with any possible changes occurring in the division system and their development. Upon completion of this stage, the time has come to strip all the three-dimensional objects of their outrageous static and throw them into the vortex of pervasive interactivity. At this point, computer games development environment, which is principally based on the user's intervention in the created world of events, as well as the programming language allowing free creation of the User – Environment relationships, were of great help. Unity game engine was selected as the environment, and the C# programming language as the main language of the programme, in which whole functionality was scripted.

The combination of these elements helped to create a new digital archive program, through which the User has the opportunity to thoroughly examine the development of Ramisch Factory and also has access to virtually every object individually. The above-mentioned effect of socio – political – economic changes on the development of the factory has also been implemented in the program, so that the user is in dispose of much broader spectrum of possibilities to analyse changes over time in this particular part of the city in relation to the morphing characteristics of the living environment.

chapter 1:

Characteristic of the archives

Archival materials on which this paper is based, in the absence of any broader monographic study concerning former »Cotton Products Factory "Francis Ramisch"«, are a collection of materials gathered from many different sources.

F. Ramisch production plants and their history are briefly discussed in a few publications concerning the industry of Lodz. These include, among others:

- Otto Heike,
  Aufbau und Entwicklung der Lodzer Textilindustrie;
- Julian Kuciński,
  Ramisch Franciszek, Polski Słownik Bibliograficzny;
- Jacek Kusiński, Ryszard Bonisławski, Maciej Janik,
  Księga fabryk Łodzi;
- Wisława Jordan,
  W kręgu łódzkiej Secesji.

The history of the company and transformations in the building tissue taking place over the years is broader described in *Dokumentacja historyczno – architektoniczna zabudowań*

dawnej fabryki F. Ramischa przy ulicy Piotrkowskiej 138/140 w Łodzi, compiled in 2007 by Jan Salm. A key source is also the Office of the City Historic Preservation Officer (*Urząd Miejskiego Konserwatora Zabytków*), being in possession of various records, which consists mainly of papers an iconographic materials prepared by Krzysztof J. Madziara and Elżbieta Kajzer.
However, the greatest importance has the collection of records regarding F. Ramisch Factory gathered in the Department of State Archive in Lodz (*Oddział Archiwum Państwowego w Łodzi*). Archive holds a number of historical documents that in unprecedented way illustrate the transformations taking place on the premises of the company in the time since the late '80 of the nineteenth century till '20s of the twentieth century. The second, according to the size and quality, archival source of information is the Archive of the Lodz City Council Delegation Lodz – Downtown (*Archiwum Zakładowe Urzędu Miasta Łodzi Delegatury Łódź – Śródmieście*) having in its collection a variety of documents concerning transformations on the premises of F. Ramisch, covering the time span since '20s to mid '70s of the twentieth century.
Document of particular importance for the recognition of the external and internal appearance of the factory buildings, is a photo album of 48 unique images taken in 1929, on the 50th anniversary of the establishment of the Factory (signature F - 1487). The album is held by the Marshal Józef Pilsudski Provincial Public Library in Lodz(*Wojewódzka Biblioteka Publiczna im. Marszałka Józefa Piłsudskiego*).
A valuable, yet unpublished material is a collection of documents held by the site manager, OPG company – Orange Property Group. These documents are a conglomerate of various newspaper articles, fragments of studies, which contained infromation about Franz Ramisch and his enterprise, private letters of manufacturer descendants, various drawings depicting factory buildings, buildings plans together with a description from the year 1940, photos, as well as genealogical tree of the Ramisch family.
No less important source of knowledge is also an architectural inventory of existing factory buildings conducted by the Autorska Pracownia Architektury mgr inż. arch. Grażyna Zuterek in 2006, commissioned by OPG.

The aforementioned materials constitute a framework, on which this paper is based. Enriched was by many other sources and information, of less or more importance, not listed here. Despite such a rich historical background, the Factory still hides a few white spots, which could provide an interesting object of study, and on which this work tries to shed some light.

chapter 2:

Adapting Game Engine and Virtual Reality in reconstruction of Architectural and Urban Heritage

"Technology is the answer… but what was the question?"[23] Cedric Price famously chose this provocative title for a lecture he gave in 1966, almost fifty years ago. His provocation remains valid to this day. It challenges us not only to critically assess the questions we expect technology to answer but also to explore whether a technology couldn't also be applied to uses it was never intended for.

It is a well-known fact that computing power has been increasing exponentially since the late 1960ies[24]. Each year the computer industry is surprising users with novel possibilities, opening exciting perspectives and new horizons. The growing speed of information technology also impacts the field of architecture. Computing has tightly woven itself into the fabric of what traditionally used to be a matter of craft. *CAD (Computer Aided Design)* and *BIM (Building Information Modelling)* systems have long become standard in practice, currently more specialized applications such as Augmented Reality are receiving broader attention.

[23] Price, Cedric 1966, lecture: "Technology is the answer... nut what was the question?", <http://www.cca.qc.ca/en/collection/540-cedric-price-archive>.
[24] According to 'Moore's law': over the history of computing hardware, the number of transistors in a dense integrated circuit doubles approximately every two years.

As a consequence, the field of architectural design is significantly expanding beyond its traditional borders.

A relevant part of this shift is driven by advances in real-time visualization. The graphics performance of standard computers is currently starting to blur the boundaries between reality and virtuality, not only for still images, where we have become accustomed to photorealistic renderings, but more and more also in real-time 3D applications. The main driver behind these advances is the gaming industry. The production of video games is now the biggest entertainment industry – ahead of movie or music[25]. The production of blockbuster games requires huge budgets and the sophisticated games that are produced in this high-powered fashion are gaining greater influence and recognition. Growing user expectations, especially related to the immersive quality of the real-time graphics, are constantly forcing the gaming industry to accelerate its development, setting the goals exceedingly high.

This constant "arms race" has led to the development of a variety of game engines. Among the most powerful engines currently available are: *CryEngine (4th generation)*, *Unreal Engine 4*, *Frostbite 3*, *Unity 5*, *Dunia Engine (2nd generation)* and *AnvilNext Engine*. On the basis of these engines visually stunning games such as *Crysis 3*, *Battlefield 4*, *FarCry 4* or *Assassin's Creed Unity*, are produced.
The latter, the latest installment of the Assassin's Creed saga, set a new standard for the visual quality and detail of its architectural and urban environments. The plot of the game is embedded within historic urban environments – cities like Jerusalem, Damascus, Constantinople, Venice, Florence, Rome or Paris – in different epochs and times. The level of detail achieved by those reconstructions – they can indeed be called thus – is captivating., Of course, even though a considerable amount of research went into their production[26], they are clearly not meant to be taken as proper scientific reconstructions. They are games, after all.

With the maturation of the industry, creating graphics engines for computer games, as well as gradually improving relationship Environment – User, so-called. serious games become to appear, which are used, inter alia, in the conduct of military and medical simulation, visualization, architectural - urban planning, as well as are part of many training programs in different industries. In recent years interactive visualization of architectural – urban planning has gained wide popularity, especially among building developers, who noticed there high advertising potential. One of the companies working in this field is Canadian office *NVYVE*, which is usually involved in the creation of interactive applications presenting new or planned architectural – urban designs providing the user with access to multi-levelled details – from the foundation of the general to the specific model of the future housing areas, additionally with the possibility of its customization. The above leads to a reflection on the possibilities of the use of such a great technology in virtual archiving and architectural – urban revitalization.

Nevertheless, at this point the question might well be asked: why not make an effort and ap-

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[25] Kamenetz, Anya, 2013: Why video games succeed where the movie and music industries fail, <http://www.fastcompany.com/3021008/why-video-games-succeed-where-the-movie-and-music-industries-fail>, in: <http://www.fastcompany.com/>, 2013.
[25] Rice, John, 2010: Exploring the Reneissance Through Videogames, <http://edugamesresearch.com/blog/tag/assassins-creed-2-educational/ >, in: <http://edugamesresearch.com/>, zit. n. Kaylan, M.:Time travel gets closer to reality., in: The Wall Street Journal, 12. 1. 2010, D7.

ply something so almost perfect for detailed real-time visualizations to the needs of a complex scientific reconstruction? Maybe these impressive game engines can not only be used to entertain us, but also to confront us with the complexities and uncertainties of scientific fact-finding? Maybe they could even make these scientific findings more entertaining?

Making scientific reconstructions more appealing not only to professionals but also to the broader public, who might well have an appetite for more than just stunning visuals, certainly seems to be a worthwhile goal.

Game Engines in Heritage Reconstruction

The idea of implementation and utilization of Game Engine Technology in the process of visualizing cultural (architectural) heritage is not new. It has been addressed and discussed by numerous conferences and research projects. (e.g. Bertuzzi and Zreik[27], Hoon and Kehoe[28], Boeykens, Himpe and Martens[29], etc.)

Along with the beginning of the computerization process the potential of implementation new technologies in the field of digitization of architecture and urban works was noticed. One of the first examples of such activity was the virtual reconstruction of ancient buildings in Bath, England, which was made as early as in 1983. Another, made in the years 1984 to 1986, was a model of the Winchester Cathedral, and ten years later the virtual real-time simulation of the Forum of Trajan[30]. Works on the development of a coherent reconstruction systems persists acting as a very complex and extensive matter. With the constant development of information technologies, new ways and methods of

[27] Bertuzzi/Zreik 2011, 304 - 307.
[28] Hoon/Kehoe 2003, 349 - 355.
[29] Boeykens/Himpe/Martens 2012, 729 - 737.
[30] Kępczyńska-Walczak 2013, 453 - 462.

reconstruction are emerging, such as 3D laser scanning, Augmented Reality - AR and others. 3D laser scanning method is often used in the inventory of architectural buildings (and other works) allowing to get the most accurate and precise measurements, as well as three-dimensional representation of the spaces in form of spatial models consisting of point clouds. The technology was used, inter alia, during the inventory of Lodz monuments that are the flagship examples of nineteenth century industrial and representative architecture – former factory of Adolf Daube located at Wólczańska Street 128/134, villa of Józef Richter, located at Skorupki Street 10/12, as well as the former spinning mill of Izrael Poznański, located at Ogrodowa Street, performed on behalf of the company Apsys when conducting preparatory works for the adaptation of the factory complex for shopping – service – recreational Manufaktura Centre. Contributed to the issue of digital reconstruction is also department of Digital Technologies in Architecture and Urban Planning Institute of Architecture and Urban Planning at Lodz University of Technology in Poland, which has many examples of digitally reconstructed models of Lodz architecture in their inventories. In 2013, local media widely echoed the implementation of digital reconstruction of the Great Synagogue building destroyed by Germans during World War II, performed by a TUL student of Informatics. One year earlier, another interesting project emerged, using *BIM (Building Information Modelling)* deployed in the historical reconstruction of the Vinohrady Synagogue in Prague[31]. This project was conducted by the international team of researchers from the Departament of Architecture, Urbanism and Planning at KU Leuven in Belgium and Faculty of Architecture and Regional Planning at Vienna University of Technology in Austria. The subject of virtual reconstruction is sometimes also included in the framework of computer animation. An example of such reconstruction are works of Philipp Erkinger, ShotShotShot Studio or Roland and Ulrike Berger who performed, for example, animations reconstructing the development of Technical University of Graz[32], at its 200th anniversary, or the development of the Schlossberg[33] and the city of Graz[34].

However, even though Game Engine Technology is commonly known and acclaimed, somehow its potential isn't investigated more in depth. The use of computer game functionality seems to be considered as an add-on, but not as the main focus of any research. The reason for this might be its complexity, as stated by Boeykens[35]. Game Engines (GE) are not only powerful, they are also highly evolved specialist tools that require a long and often steep learning curve. This makes them intimidating, if not discouraging to the scientists in heritage reconstruction who are rarely familiar with gaming technology. Whether the project is a real-time adventure game or a cultural heritage reconstruction – proper work with GE typically requires an interdisciplinary team of specialists.

The most important piece of any GE lies in its programmability. This is what lets the bestselling games be so much more than just virtual models we can experience. The flexibility inherent in their programmability is also what makes it possible to apply GE to other uses than gaming.

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[31] Boeykens/Himpe/Martens 2012, 729 - 737.
[32] Erkinger, Philipp, TU - Campus2011 - Animation, AT, 2011, <http://www.erkinger.net/philfolio/?portfolio_item=tu-graz-campus-2011>
[33] Berger, Roland/Ulrike, Der Mythenberg, AT, 2011, < http://www.erkinger.net/philfolio/?portfolio_item=der-mythenberg >
[34] ShotShotShot, Auf den Spuren des steirischen Panthers, AT, 2009, < http://www.shotshotshot.com/projekte/auf-den-spuren-2/ >
[35] Boeykens 2011, 493 - 509.

Though for many, their lack of programming skills may have been the first and sometimes definite obstacle that results in reducing the application of GE to its most basic functions. Therefore to produce appealing and foremost valid – from the scientific point of view – reconstructions, emphasis should be placed on creating interdisciplinary teams of experts with various backgrounds and abilities: architects, architectural historians and theorists, experts in urban theory and history, researchers, computer graphic artists, artists, programmers, IT specialists as well as others according to the needs and size of the project. It takes such an interdisciplinary team to get the most out of working on/at the intersection of physical and virtual reality.

Accuracy and credibility of the digital reconstructions

Reconstruction of architectural monuments confronts with considerable problems. Architecture, like many other areas, was and is a living area, susceptible to change. In centuries past, due to ignorance of the term "maintenance of monuments" and likely the absence of such a need, that in turn, was related to the lack of appropriate education, objects which would be seen today as historic and protection worthy, were simply replaced by other objects. Conservation of monuments exists in the strict sense in social mentality since nineteenth century being born with Eugene Viollet – le –Duc in France. He, however, considered the father of the preservation of monuments of architecture, raises a lot of controversy related to the methods he used, being considered as a stylish purist. Nowadays, owing to powerful technology, it is fairly easy to reconstruct almost any building of any period of time and to put it in the corresponding historical context. This is especially important for the understanding of objects that no longer exist, have been destroyed, undergone extensive renovation or have been seriously altered as a result of prevailing circumstances. In such cases, the digitally reconstructed model allows to trace the process of change occurring over the years, to penetrate

the structure and function of the object, to understand its history and meaning. Having to deal with the object still existing, which can be used as a reference to the source material at disposal, the problem of the reliability of the reconstruction descends into the background. However, attempting to reconstruct an object that no longer exists, and to which the limited archival resources relate, or do not relate at all, and the building is listed, e.g. only on the development plan bearing only concise description, then the question of credibility is of a colossal importance. Reconstruction of the object of such a status may be than just an attempt to restore its historical form. Being in possession of even more specific information about the object, for example plans, cross-sections and elevations, we still need to be on the guard. Mainly because of the fact, that records kept in the majority of archives are just a design documentation and does not reflect the executive form. During the process of construction of an object a lot could have happened, a lot of changes could have taken place, about which available archives would remain silent. Problems of this type occur very often. One example is even a project of the first factory building on a plot belonging to Francis Ramisch – the weaving mill building. Very well-preserved building elevation drawing shows that it was planned as eight-axial system. Available photographic documentation, however, shows that eventually it was built in seven-axial system. At this point, it was possible to compare the object designed with the built one which allowed to correct the way the object was perceived. However, it is not possible in every case. Then the resulting reconstruction is only a hypothesis about the possible appearance of the building, which cannot be regarded as a one hundred percent reliable source of knowledge about the object, but only as a suggestion, though supported by the knowledge of building trends and systems prevailing in a given historical period. Such objects, occurring in the reconstruction, should be proprietary marked or clearly described, as the danger exist that any layman not familiar with the topic of reconstructions may take such a depiction for granted, therefore causing historical confusion spreading false beliefs, according to informally prevailing rule that "seeing is believing"[36].

In addition to the above-described problem of the reliability of data another problem, however, associated with the first, namely the accuracy of the carried out reconstruction, arises. The accuracy of the reconstruction can be performed at multiple levels, but the most important and vital process is to select an appropriate degree of specificity depending on the desired end result and the area subjected to the reconstruction. The London Charter, which remains by far most important document trying to gather and describe all possible aims and measures of digital reconstruction of cultural heritage, makes attempts to define reliable framework for performing scientifically valid reconstructions. Above discussed issue is also adressed in the Principle 2: Aims and Methods of the Charter, at position 2.3: "While it is recognized that, particularly in innovative or complex activities, it may not always be possible to determine, a priori, the most appropriate method, the choice of computer-based visualization method (e.g. more or less photo-realistic, impressionistic or schematic; representation of hypotheses or of the available evidence; dynamic or static) or the decision to develop a new method, should be based on an evaluation of the likely success of each approach in addressing each aim."[37] Therefore appropriate measures should be used. While analysing an urban layout, the decision can be made about a monochrome presentation of its elements while maintaining a corresponding

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[36] Kępczyńska-Walczak 2013, 453 - 462.

[37] London Charter 2009, Principle 2: Aims and Methods, <http://www.londoncharter.org/principles/aims-and-methods.html>, in: <http://www.londoncharter.org/>, 2009.

level of detail, leaving the materiality, also the texturing of the models, as in this case irrelevant matter. Reconstruction of a historic interior can also remain in the realm of monochromatic representations focused only on precisely reinvented details, but as the interior is a very specific space, the materials used and the light plays a very important role in its perception. In such a case, the question of the materials, as well as adequate lighting system used in the model takes a colossal role. Poorly and inadequately chosen parameters of the aforementioned factors, may downgrade the reconstruction to the purely hypothetical level, as not entirely faithful to the original.

This project focuses on the reconstruction of architectural – urban development of F. Ramisch Factory complex and the immediate environment. Monochrome method of presentation was adopted, with an emphasis put on the changes taking place in the development of the plots and objects architectural detail which, in case of the industrial architecture look sufficiently good without any additional components such as textures, exposing the essence of each of the buildings. Ramisch Factory complex is an establishment which has archival resources of very high quality, and the maintenance level allows its very accurate representation in the virtual space. As for some objects, or stages of their development a degree of indefiniteness remains, associated with a lack of basic information, lack of preserved iconographic documentation or simply caused by their physical absence on the described area.

Graphic Engines process issues

Aforementioned methods should be included in the set of generally static methods of reconstruction – creation of three-dimensional interpretations without introducing any elements of interaction with the End User (excluding the of reconstruction of the Great Synagogue, which, beyond the ability to move around the site does not provide any other interaction possibilities with and within the object). Static models created using 3D modelling programs such as *3dsMax*, *Blender*, *ZBrush*, *Maya, SketchUp,* etc., always have a huge number of polygons forming them. However, it is necessary and indispensable, if the intention is to replicate all possible details or damages of the structure with the greatest degree of precision. When beginning to work with the computer game engine the number of polygons, and thus the number of vertices (vertices of each polygon) is the first thing to which attention should be paid. Moving the, made with reverence, three-dimensional model into the engine realities one can immediately run into a problem with the overall performance. It is associated with the information processed by the GPU (graphics processor unit) on the number of vertices and their parameters. At the time of import, graphic card analysing the information about the

model multiplies the total number of vertices building "sub-meshes" required for the necessary calculation and distribution of lighting, texturing of the imported model, creating a sharp (hard-edge) or rounded (smooth-edge) edges, and shading. Importing a very detailed model of alarming number of vertices, a model with two –, three – or maybe even four times the number of vertices will be created, which would remarkably lower the efficiency and performance of the whole environment. Design of optimized models containing balanced structure is the basic and most important principle when working with graphics engines. However, there are also ways of implementing the models with a high number of polygons (high-poly models) involving creation of so-called *LOD – Level Of Detail* groups. This process involves creation of multiple copies of the same model, yet with different detail quality (which means fewer polygons count), and then making its appearance dependant on the distance from the camera (the player). This allows an object that is far away not to be rendered with all details and consequently not to overload the computer's memory with unnecessary calculations and operations. It is only as the player (the camera) approaches the object, that displays more and more detail, while at the same time the field of view is gradually reduced to just a single object. This system is a reflection of the normal phenomena perceived on the regular basis. Looking at the distant objects, gives only their general shapes, when approaching more and more details are noticeable.

The above-mentioned problems are not the only ones encountered in the process of creating a computer game, but these are some of the most important, which should not be forgotten.

Reconstructing »Cotton Products Factory "Franz Ramisch"« in Lodz

The project described here is not the work of a large team. It was developed only by the author of this Master Thesis project. The thesis concerns the reconstruction of the spatial and architectural development of one of the textile factories in Lodz – Franz Ramisch Textile Factory.

The city of Lodz was founded in the XVth century but it was not until the beginning of XIXth century that its economic potential was noticed and real development started. By decision of the state authorities Lodz was included into the group of industrial cities with the main scope focused on textile production. The city's natural conditions such as the land ownership status, which belonged to state, surrounding forests – availability of building material, and a lot of small rivers with steep drops which were ideal energy source for the machines, were favourable to this kind of activity. The first textile manufactures started to emerge as early as in 1823. This year is also known as the beginning of a period of rapid growth that led to the industrialization of the city. The first textile factory was erected in 1825 by the Saxon entrepreneur F. Wendisch, followed by L. Geyer (1828), K. Scheibler (1839), T. Grohmann (1845), I. Poznański (1852)

and others. In a short period Lodz became the most important textile centre in the Polish Kingdom and the industry itself became the beating heart of the city. In the second half of the XIXth century Lodz was a thriving borough, maintaining mercantile contacts with Western and Eastern Europe, as well as with Asia, and constantly attracting entrepreneurs and ordinary people from all around Europe. The constant growth of its industrial importance resulted in an enormous growth in population. The citys' rate of population growth in the second half of XIXth century was exceeding those of quickly growing Western European industrial cities such as Lyon or Manchester. Back then, due to its rapid development, Lodz was also known with as the *"Polish Manchester"*. Initially, the development of the city was regular and planned: zoning laws had been adopted, separating parts of different usage. Everything changed in the mid '60es of the XIXth century, when due to the lack of further administrative regulations, political crisis, as well as economic and social boom, the development reversed its direction from outwards of the city centre to inwards. Industrial and civic tissues were mixed, intersected. Factories were built on practically every scrap of free land, even next to the main representative street – Piotrkowska. The Franz Ramisch Textile Factory portrayed in the thesis, is one of those erected in the very centre of the city.

Rather than just focusing on the reconstruction of the factory at one point in time, thesis focuses on its development through time – from when the very first dwellings were erected on the factories' plot of land in 1828 till the present times – 2014. This time mapping of the development is meant to enable a better understanding of the changes that have occurred in the factory as well as in the part of the city where it is located, and give deeper insight into the historic structure of the area. The 3D representation of reconstructed buildings is combined with information about relevant economic, social and political changes that have occurred within the given time period in the city itself, the country and the world. This information is crucial for creating an understanding of Architecture as not being an isolated discipline, but rather one depending on and being constantly shaped, changed, and complemented by factors and incidents in its context. The term 'context' here is not just referring to the physical surroundings, but rather to the entanglement of consequential factors influencing the decision making process of subjects that eventually led to the architectural creation.

The documentation of the development of mentioned factory was primarily made with the *Unity* game engine. Unity's functionality has been extended with the *C#* scripting language. This was used to create a 4th dimension in the interface: a timeline that allows users to experience the factory in both space and time. Highly detailed 3D models representing existing and non – existing pieces of architecture of the Factory were modelled with *Autodesk 3dsMax*. Emphasis was also put on the proper reconstruction of the construction elements. While modelling the entire city was outside the scope of a one-person project, the closest surroundings of the factory were modelled (also changing over time) to create a spatial reference of the urban context.

The resulting scene offers many of the viewing functions of the Game Engine, but on top of that it also offers a timeline, which enables the user to travel through time from the very beginning to the end of researched time span, observing all the changes occurring in the build-up of the factory. Users can orbit around emerging objects, zoom into the model and pan the camera to change the point of view and better inspect an individual area of interest. One of the core

features includes historical analysis and dating of the plots' objects. It is achieved by colouring buildings, or parts, respectively to the year of creation. A similar principle was adopted for the analysis of the changing state of ownership of the factory's plot of land. Tracking of function change is also embedded enabling inspection of the changes occurring in the uses of the factory objects. The second crucial feature empowers to isolate selected building for better inspection, including 3D horizontal and vertical sections as well as detailed description of development phases including construction details. The program also includes links to historic data references in the form of a gallery. This enables users to relate the 3D data to archived plans, photos and other available documentation. Furthermore, the interface includes some minor functions such as camera matrix switch, disabling/enabling of surroundings, etc. for better representation of the whole on slower hardware.

Functionality of the programme

The core of the program is the timeline, around which the whole architecture of the program oscillates. Chronological period begins in 1800 and ends in 2014. By moving the time slider respective objects appear or are destructed, depending on the date of their construction, alteration or demolition. Navigation around the resulting object is performed with a so-called free-fly camera, meaning the camera, that is controlled by the user, and virtually flies through the scene. The camera has three main functions: rotation around a point on the screen, pan of the image in the X and Y axes and zoom. Dedicated manual can be read in the main menu of the program, before hitting the *"PLAY"* button. Above the described timeline, buttons extending the functionality of the program are located, such as: *AUTOMODE, TIMELINE TAB, TERRITORY TAB, DISABLE SURROUNDING, ORTHO MODE, ARCHIVE TAB, DEFAULTS*.

AUTOMODE – responsible for launching one out of two pre-programmed animation modes. Animation is a free camera flight around the changing building development without user participation, as the trajectory is pre-programmed.

Available modes are:
GENERAL – camera is focused on showing general changes occurring on the Factory area;
DETAILED – camera is focused on showing buildings closely, with detail, not neglecting interior spaces.

TIMELINETAB – generates self-fulfilling list of time nodes, depending on the actual position of the time slider. Each time node is depicted with corresponding, unique colour. Active node changes the colour of corresponding buildings, which construction year refers to the nodes label. Along with the colour change, new button shows up, labelled *FUNCTION*. After activating this button, user is presented with the list of the functionality of the buildings in the corresponding time period. Located at the bottom of the list is a button called *RESET LIST* which deactivates all changes made by active time nodes, therefore resetting the colour to the default.

TERRITORY TAB – activates the possibility of showing actual borders of the Factory plot. It also contains information about the historical borders and areas of the factory. Those areas are marked with different colour than surrounding plots.

DISABLE SURROUNDING – switches off or on surrounding buildings, not being a part of the factory complex. This feature allows analysis of just the Factory, not being disturbed by other objects.

ORTHO MODE – changes the camera matrix from perspective to orthogonal and back.

ARCHIVE TAB – shows a picture gallery on the screen, which contains archive drawings, plans, as well as photos, everything larded with appropriate commentary.

DEFAULTS – activates two buttons:

RESET TIME – allowing to reset the timeline to its default (year 1800) state, resulting with clearing up the scene;

RESET CAMERA – resetting the camera current position to the default position, known from the beginning of the play.

Further functionality involves so-called isolation mode, allowing to trace the structure of each object individually. After clicking with right mouse button on desired building, it becomes isolated, everything else vanishes and new interface appears.
In the group of buttons called *SECTIONS*, two main modes are as follows:

HORIZONTAL – allowing to trace horizontal sections of each storey of the building;
VERTICAL – allowing to trace and analyse vertical section of the building.

The next option to choose is *DESCRIPTION*, which shows the description of currently previewed building and contains information about its history, development, architecture and structure.

RESET VIEW enables to reset the camera view to the original view from after entering isolation mode.

EXIT ISOLATION MODE takes the user back to the general view of the programme.

At this very time this work is just a prototype and should be regarded as such. Nevertheless it is in constant development successively increasing its possibilities and functionality.

Future Extensions Possibilities

The scope of this project is limited, but it documents an approach and a philosophy that can be extended. In order to truly capture the genius loci of an architectural form or place, a broader and more complex view is needed. For digital heritage reconstruction to come close to this ideal, open, extensible documentations are needed which can contain not only high quality 3D models that can be rendered and experienced immersively in real-time. They should also support the travel through time and through different historical – and perhaps only conjectured – versions of a historical ensemble as well as links to pictures, plans, photographs, texts that form its context. To be of relevance and to faithfully respect existing research this approach requires enormous effort. It cannot be achieved by a one-man-operation, but instead should involve, as mentioned earlier, interdisciplinary teams. In this way, truly valid and valuable reconstructions of architectural heritage could be created that could also be shared with a broader public. If these models are open, that is extensible, then such an effort would produce lasting results. New research could be added to it, so that its documentation would not become outdated, but grow to become more refined over time. With

enough people working on it, such a project could well tackle not only single architectural objects, but whole cities.

The use of GE for such ambitious scientific purposes goes outside the commonly adopted boundaries, schemes and conventions. But it is actually rather straight-forward. The level of development of today's GE is very high and they have been tested with millions of users. Therefore, investing in the development of comprehensive and historically correct city models in game environments is not as outlandish as it might appear. In the following paragraphs we will describe some basic principles that we derived from the textile factory model, which could guide the development of much larger, comprehensive, open models for architectural heritage.

The main principle is that such models should be four dimensional (4D). The 4D representation supports the mapping of architectural and urban growth and development through time. Users can access data and embedded information on different levels of detail, likewise to narrow or expand the scope of interest, remaining, at the same time, aware of the ensemble. It is possible to move from general to specific cases and back. The basic units of such 4D models for urban and architectural reconstruction are single buildings, respectively architectural forms. Out of these units, groups could be formed as meaningful collections – districts, neighborhoods, etc. – they have an important role in creating an understanding of the changes occurring during development (as seen in the Ramisch factory example). The whole 4D model is then comprised of Units and Groups – the reconstructed city itself.

Further, each level is equipped with unique features that take care of high quality analysis possibilities adequate for selected standard. Such a gradation is required for better readability of the complex data structures, as well as for creating clear and transparent navigation and *UI/UX*[38] elements. We will present this additional data embodiment on the example of the simple Unit case – isolated building. Digital reconstruction of the single building is itself a challenge as for numerous aspect that could have been analyzed and included in the representation. What matters most at a very first glimpse, and what is exceedingly developed and important in computer games – what makes them so appealing and magnificent – is naturally the graphics. The visual attractiveness of an object marked by its fine details and high resolution textures and materials. Therefore the materiality of the building's exterior (and the interior) should be a matter of high priority. Not only because of the visual attractiveness, but mainly due to the requirement of creating valid and scientific representation of the reconstructed object. There are, of course, known problems with acceptable representation of materials during the visualization process, as already mentioned by Kępczyńska – Walczak[39]. Current GE though, as far as lighting and materials are considered, are equipped with up-to-date tools enabling real time execution of different light conditions for material testing. Nevertheless, as game engines were created in order to support formation of hyper realistic worlds in the first place, there is a temptation of using provided features to boost up and correct the reality. This should be avoided, as it would produce inaccurate and false interpretations and reconstructions. The 4D model should respect historical facts more than looks and rely on collected data in order to depict the past (which was not always as picturesque and aesthetically pleasing as presumed) as faithfully as possible. Other issues to consider on the Unit level are the

[38] UI/UX - User Interface / User Experience.
[39] Kępczyńska-Walczak 2013, 453 - 462.

structure and construction of the building. The possibility of analyzing the sections of the building is very advantageous for architectural research. Each building undergoes changes in terms of structure, construction, used materials, functionality (functions served by it), is rebuilt, partially demolished, reconstructed, etc. From the historic and reconstruction point of view all those things are very relevant and important to present.

Already at this point the Unit level itself is extremely complex and encapsulates a lot of intersecting layers and information. As we aim at creating the application that would also provide educational value for a general public that is not necessarily familiar with the topic, there is an urgent need to introduce different levels of abstraction (as mentioned before) to present all this information in an approachable and understandable way. The levels of abstraction should consider visual appearance that corresponds with the exhibited topic. The versatility of the presentation layouts, though unified and kept together as a system, positively enforces the user and clarifies what may have been unclear.

To fully take advantage of the power of GE for projects in digital heritage reconstruction geared towards a wider audience, there is a need to create appropriate navigation and exploration system that would intuitively lead the users through the vast maze of included data. The ideal system we are outlining here should refer to, exploit and utilize existing and tested systems implemented in various computer games, as they have mastered this particular challenge very well. It should also, obviously, implement original ways of navigation appropriate for presented pieces of information. Furthermore switching from first person camera control – providing cognition of the environment in human scale, walkthrough modes, city or building exploration on regular, natural basis – to perspective/isometric 3D aerial views allowing perception of the Units, Groups and Organisms as a whole with additional features, should be considered and effectively implemented.

As the brief ideal outline makes clear, such a comprehensive system would entail challenges beyond those of a traditional computer game. Therefore the most important aspect of such a system cannot be stressed enough: it should be open to future improvements! The ideal 4D system we are envisioning should allow the contributions of many contributors, would allow the introduction of new features and elements and could be expanded – rather like a Wiki. Ideally it should also be developed in an open source fashion.

Summary

Dynamic advancement in the field of computer graphics, particularly in game engines technology creates great potential of its implementation in the scope of architecture, especially in reconstruction of Architectural Heritage. Integrating and taking advantage of the full potential those disciplines represent, would enable us to enter the next level of interdisciplinary work and integration between digital and non-digital worlds. As the prototype example presented by this thesis, the Franz Ramisch Textile Factory in Lodz, makes clear, this would enable us to perform procedural reconstructions not limited to the static depictions of Architecture at one particular point in time, but rather to embrace the change of and in Architecture throughout time dynamically. Taking the ideas presented in this prototype further, we can envision the dynamic reconstruction of urban complexes and eventually whole cities based on today's Game Engine technology and thereby acquainting a broader public with scientific knowledge about our past. While this would necessitate the collaboration of large interdisciplinary teams of specialists and would open up many questions regarding existing, as well as establishing new standards for scientific reconstruction of Architectural/Urban Heritage, such comprehensive digital 4D systems could become powerful means of educating our society about our past and empower us with new perspectives on our future. In this way, Game Engines can be used to produce much more than just games.

addendum 16:

Reconstruction of cities
in Assassin's Creed saga

addendum 17:

Comparison of the reconstructed Factory 3d model with archival iconography

View from H. Sienkiewicza Street towards Piotrkowska Street (East – West direction). Carpentry and ironworks building, spinning mill and water – dust tower topped with decorative helmet, dominating above the complex, can be seen.

View of the front courtyard from Piotrkowska Street towards H. Sienkiewicza Street (West – East direction). Boiler house, chimney, west gable wall of the first weaving mill building, north façade of the cantor building as well as water – dust tower topped with decorative helmet, dominating above the complex, can be seen. On the left side, part of the garden surrounding residential tenement house can be observed.

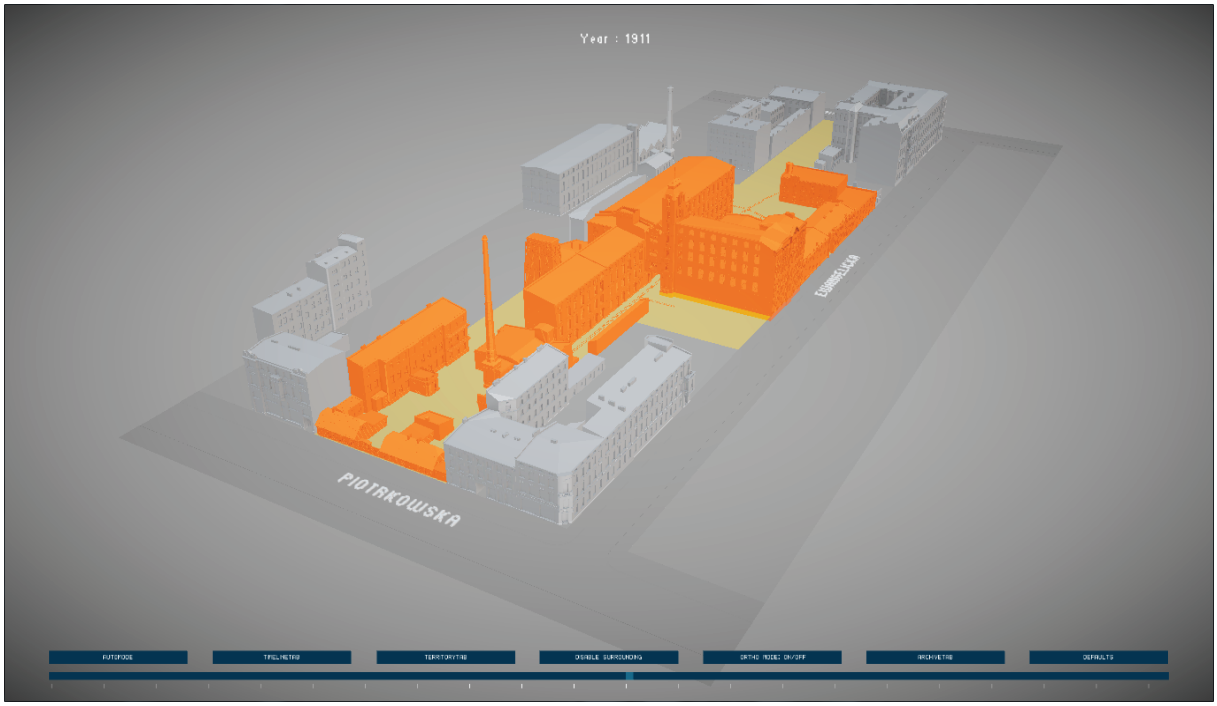
Representative front of the Factory at Evangelical Street (today F. D. Roosevelt Street).
On the foreground neo-Gothic façade of warehouses and infirmary building can be seen.
In the background, "Treasury" building and the water – dust tower can be observed.

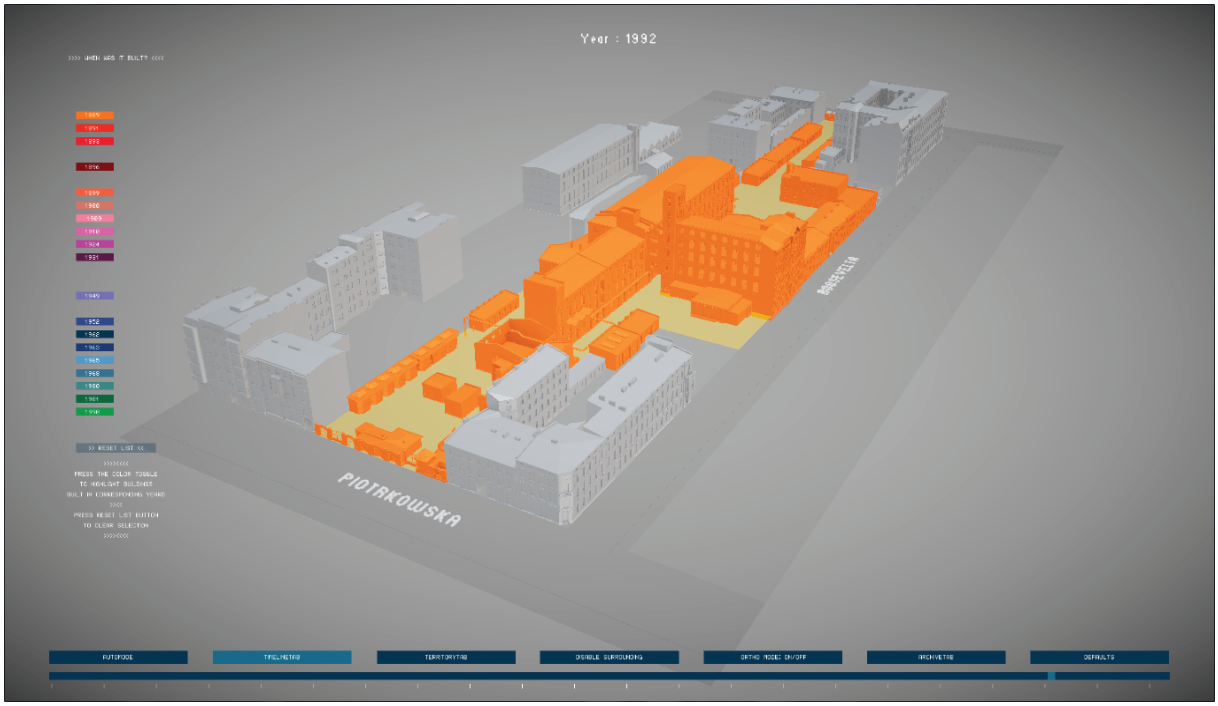
addendum 18:

Frames of the Programme

Pic. 1. Menu of the Programme

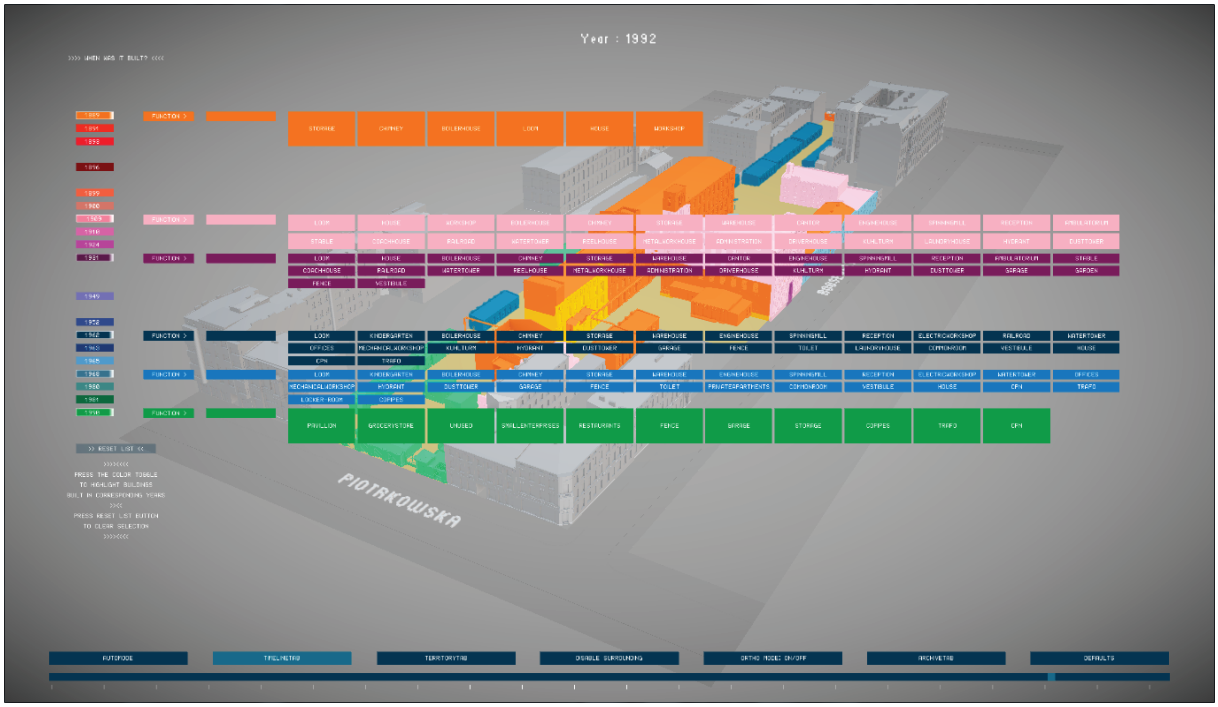
Pic. 2. Main screen of the Programme after launching

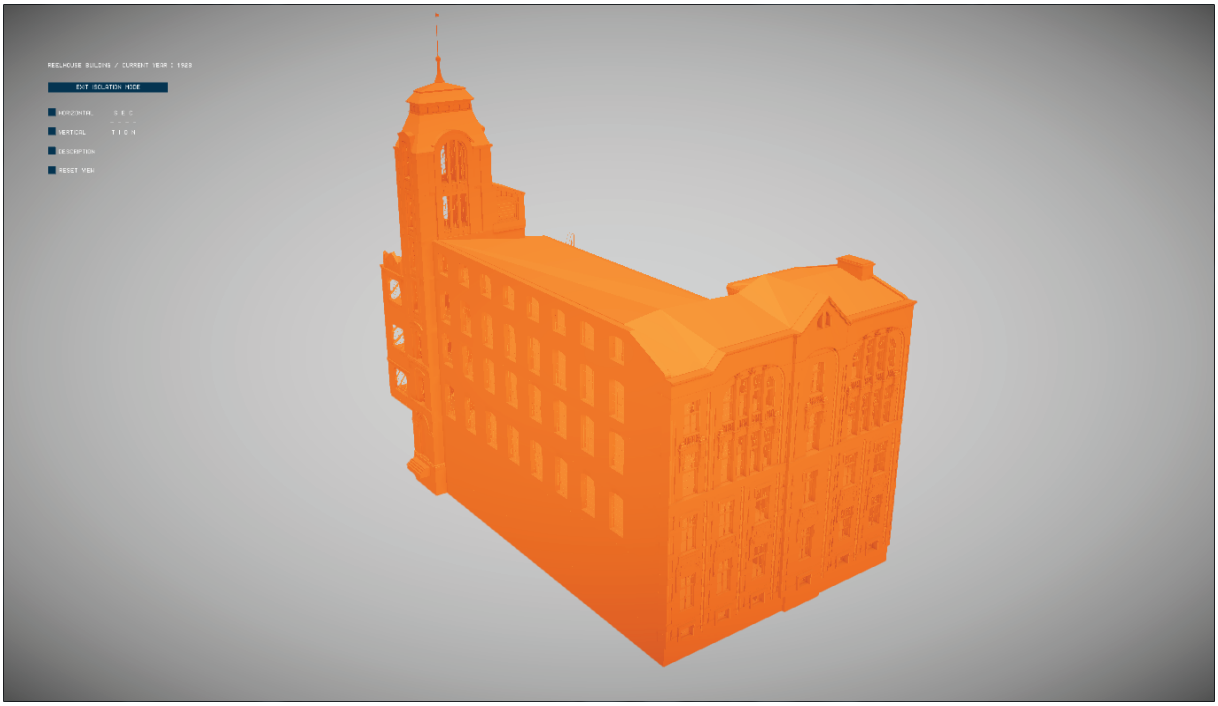




Pic. 3. TimeLineTab function activated

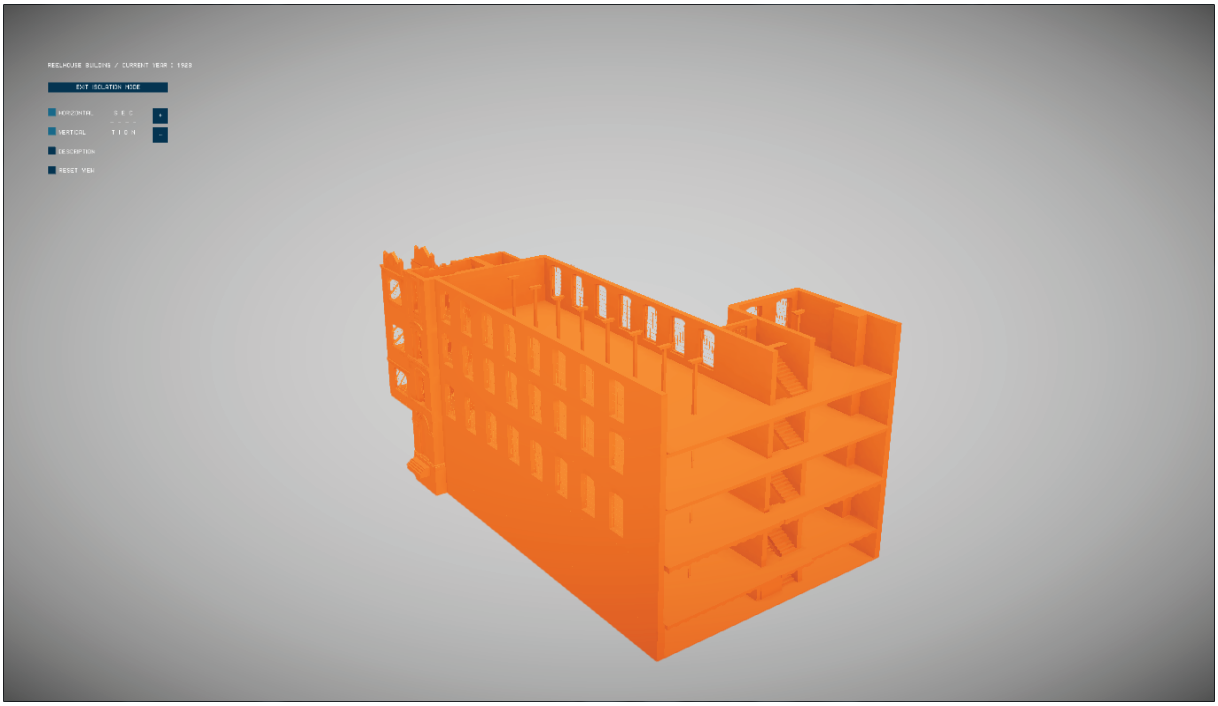
Pic. 4. TimeLineTab function with Building Function list expanded





Pic. 5. Building Isolation Mode activated

Pic. 6. Basic functionality of the Isolation Mode – horizontal and vertical sections of the building



3rd Part

annexes

(that is, resources)

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Marshal Józef Pilsudski Provincial Public Library in Lodz, Photo album containing 48 photos made in the year 1929, on the occasion of the 50th anniversary of establishment of the Factory, Sign. F - 1487

Archives of the Department of Architecture and Urban Planning Delegation Lodz - Downtown of Lodz City Council, Technical documentation concerning Piotrkowska Street Nº138/140 and F. D. Roosevelt Street Nº10 (Archiwum Wydziału Urbanistyki i Architektury Delegatury Łódź - Śródmieście Urzędu Miasta Łodzi, Dokumentacja Techniczna dotycząca ul. Piotrkowskiej 138/140 oraz Roosevelta 10)

Archive materials of loose character in the possession of the present owner of the former Franz Ramisch Facotry area - Orange Property Group

State Archive in Lodz
(Archiwum Państwowe w Łodzi)

Catalogue

477.
1: 138
2: 547/550
3: Ramisch Franciszek
4: Proekt" postrojki karnennoj 3-h" etažnoj kladovoj, pristrojki 4-h" et. bašni, nadstrojki 2-h" etažej na suščestvujuščej 1-no et. kamen, žilyj fligel", pristrojka 1-no etažnoj oranžerji, pristrojka 1-no etaž. navesov" dlja šersti, pristrojka 1-no etažnoj prjaćećni, nadstrojka suśćestvujuśćego pokoja parovoj maśiny, postrojka 1-no etaźnyh" othoźyh" mest", pristrojka 1-no etaźnoj slesarni, pristrojki 2-h" odnoetaźnyh" pomeśćenii dija pożarnyh" instrumentov", nadstrojka na suśćestvujuśćem" pomesćenii dija dvornika ambulatorii i stolovoj, pristrojka 1-no etaźnago pomeśćenija dija masła i pristrojka 1-no etaź. służb" [...]
5: Projekt budowy murowanego, dwupiętrowego magazynu, dobudowy trzypiętrowej wieży, nadbudowy dwóch pięter w istniejącej parterowej, murowanej oficynie mieszkalnej, dobudowa parterowej oranżerii, dobudowa parterowych wiat na wełnę, dobudowa parterowej pralni, nadbudowa w istniejącej maszynowni, budowa parterowych ustępów, dobudowa parterowej ślusarni, dobudowa dwóch parterowych pomieszczeń | na sprzęt przeciwpożarowy, nadbudowa w istniejącym pomieszczeniu dla stróża ambulatorium i stołówki, dobudowa parterowego pomieszczenia na smary i dobudowa parterowego budynku gospodarczego [...]
6: fasady, przekroje, rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Ribenzam Paweł
8: 1899
9: rkp, wbw, płótno techniczne
10: 451x31,5
11: l sąż. ros. - 25 mm; l sąż. ros. -12 mm; 5 sąż. ros. - 25 mm; 50 sąż. ros. - 25 mm

12: 1:84; 1:175; 1:420; 1:4200
13: RGP Wydział Budowlany; 7794

477 A
1: 138/140
2: 547/548
125
3: Ramisch Franciszek
4: Vmazka parovago kornvalijskogo kotła [...]
5: Wmurowanie parowego kotła korwalijskiego
6: fasada, przekrój, rzut, plan sytuacyjny posesji, plan orientacyjny
7: Lubotynowicz Leon
8: 1898
9: rkp, wbw, karton na płótnie
10: 88x31 11: l sąż. ros. - 25 mm; 1 sąż. ros. - 12 mm; 5 sąż. ros. - 25 mm; 5 sąż. ros. -12 mm
12: 1:84; 1:175; 1:420; 1:840
13: Ramisch, 13

478.
1: 140
3: Ramisch Franciszek
2: 548
4: Proekt" postrojki 3-h" etaźnoj tkal'ni i kotelnago pokoja dymovoj truby i odno-etaźnago saraja [...]
5: Projekt budowy dwupiętrowej tkalni, kotłowni, komina i parterowej szopy [...]
6: fasada, przekrój, rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Majewski Hilary
8: 1889
9: rkp, wbw, płótno techniczne
10: 161x32 11: l sąż. ros. - 25 mm; l sąż. ros. - 12 mm; 5 sąż. ros. - 25 mm; 10 sąż. ros. -10 mm;
12: 1:84; 1:175; 1:420; 1:2100
13: RGP Wydział Budowlany; 846

479.
1: 140
2: 548
3: Ramisch Franciszek
4: Proekt' dostrojki treh „-etaźnoj tkal'ni i odno-etaźnago saraja [...]
5: Projekt dobudowy tkalni dwupiętrowej i piętrowego budynku gospodarczego [...]
6: fasada, przekrój, rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Majewski Hilary
8: 1891
9: rkp, wbw, płótno techniczne
10: 120x33 11: l sąż. ros. - 25 mm, l sąż. ros. - 12 mm, 5 sąż. ros. - 25 mm, 10 sąż. ros. – l0 mm
12: 1:84,1:175,1:420,1:2100

13: RGP Wydział Budowlany; 1931

479 A
l: 140
2: 547/548
3: Ramisch Franciszek
4: Proekt" postrojki kamennoj ćetyreh" etaźnoj prjadiini, pokoja dlja parovoj maśiny, dvuh" navesov" i dostrojki kot. pokoja i konjuśni [...]
5: Projekt budowy murowanej, trzypiętrowej tkalni, pomieszczenia dla maszyny parowej, dwóch wiat i dobudowy kotłowni i stajni
6: fasady, przekroje, rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Miks Fryderyk
8: 1893
9: rkp, wbw, karton na płótnie
10: 361x32
11: l sąż. ros. - 25 mm; l sąż. ros. -12 mm; 5 sąż. ros. - 25 mm; 10 sąż. ros. - 10 mm
12: 1:84; 1:175; 1:420; 1:2100
13: Ramisch, 13

480.
1: 140
3: Ramisch Franciszek
2: 548
4: Proekt" elektrićeskago osveśćenija fabriki [...]
5: Projekt oświetlenia elektrycznego fabryki [...]
6: rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Miks Fryderyk
8: 1893
9: rkp, wbw, płótno techniczne
10: 200x34
11: l sąż. ros. -12 mm, 5 sąż. ros. - 25 mm, 10 sąż. ros. - 10 mm
12: 1:175,1:420,1:2100
13: RGP Wydział Budowlany; 17830

481 A
1: 140
2: 547/548
3: Ramisch Franciszek
4: Proekt" pristrojki kamen, l-o etaź. pomesćenii dla vol'k maśiny, akumulatorii i slesarni, a także nadstrojki II-go i III-go etaźa dija fabrićnoj kontory [...]
5: Projekt dobudowy murowanych, parterowych pomieszczeń dla maszyny wilka, akumulatorowni i ślusarni oraz nadbudowy pierwszego i drugiego piętra dla kantoru fabrycznego
6: fasady, przekroje, rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Chełmiński Franciszek
8: 1896

9: rkp, wbw, karton na płótnie
10: 175x33 11: l sąż. ros. - 25 mm; Isąż. ros. - 12 mm; 5 sąż. ros. - 25 mm; 10 sąż. ros. -10 mm
12: 1:84; 1:175; 1:420; 1:2100
13: Ramisch, 13

481.
1: 140
2: 548
3: Ramisch Franciszek
4: Parovoj kotel' sistemy „Kornval' „s" 16-ju galoveiskmu trubkami, poverhnost" ogreva 105 m2 davlenije 8 atm [..]
5: Kocioł parowy systemu kornwalijskiego [płomienno-rurkowy] z 16 rurkami, powierzchnia ogrzewalna 105 m2, ciśnienie 8 atmosfer [...]
6: przekrój, rzut kotła, rzut kotłowni, plan sytuacyjny posesji, plan orientacyjny
7: Miks Fryderyk
8: 1894
9: rkp, wbw, płótno techniczne
10: 157,5x32
11: l m - 50 mm; l sąż. ros. -12 mm; 5 sąż. ros. - 25 mm;
10 sąż. ros. -10 mm
12: 1:20; 1:175; 1:420; 1:2100
13: RGP Wydział Budowlany; 3775

482.
1: 140
2: 548
3: Ramisch Franciszek
4: Proekt" pristrojki kamennago ćetyreh" etaźnago fabrićnago zdanija pristrojki kamennago odnoetaźnago kotel'nago pokoja postrojki kamennoj odnoetažnoj slesamoj kamennoj odno-etaźnoj oranźerej, kamennyh" odnoetaźnyh" kladovyh" i kamennago odno-etaźnago pomeśćenija dija dvornika, ambulatorii i stolovoj [...]
5: Projekt dobudowy murowanego, trzypiętrowego budynku fabrycznego, dobudowy murowanej, parterowej kotłowni, budowy murowanej, parterowej ślusarni, murowanej parterowej oranżerii, murowanych parterowych magazynów i murowanej parterowej stróżówki, ambulatorium i stołówki [...]
6: fasady, przekroje, rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Ribenzam Paweł
8: 1898
9: rkp, wbw, płótno techniczne
10: 380x33
11: l sąż. ros. - 25 mm; l sąż. ros. - 12 mm; 5 sąż. ros. - 25 mm; 10 sąż. ros. -10 mm
12: 1:84; 1:175; 1:420; 1:2100
13: RGP Wydział Budowlany; 7025

482 A
l: 140
2: 548/550
3: Ramisch Franciszek
4: Proekt nadstrojki 2-h" etaźnoj s" trempelem" na suśćestv. kam. 2-h" et. s" pogrebom" kontory i kladovuju, nadstrojki 2-h" etaźej na kamennyj perehod", pristrojki kam. 2-h" etaź. hozjajstv. stroenija, pństrojki k" kam. 1-no et. magazinu, prestrojki i nadstrojki ćasti kam. 1-no et. magazina i pristrojki kam. 1-no et. zdanija (sed) dija vorsoval'ni i snoval'm [...]
5: Projekt nadbudowy dwóch pięter z tremplem nad istniejącym, murowanym, piętrowym kantorem i magazynem, nadbudowy dwupiętrowego, murowanego przejścia, dobudowy murowanego, piętrowego budynku gospodarczego, dobudowy do murowanego, parterowego magazynu, przebudowy i nadbudowy części murowanego, parterowego magazynu i dobudowy parterowego budynku (szed) czesalni i snowalni [...]
6: fasady, przekroje, rzuty, plan sytuacyjny posesji, plan orientacyjny
7: Chełmiński Franciszek
8: 1909
9: rkp, wbw, karton na płótnie
10: 361x30
11: l sąż. ros. - 25 mm; l sąż. ros. - 12 mm; 5 sąż. ros. - 25 mm; 10 sąż. ros. - 10 mm
12: 1:84; 1:175; 1:420:1:2100
13: Ramisch, 13

483.
1: 140
2: 548
3: Ramisch Franciszek
4: Plan' perestrojki niżnogo etaźa 3h" et. fligelja i pristrojki tambura [...]
5: Plan przebudowy parteru dwupiętrowej oficyny i dobudowy przedsionka [...]
6: fasada, przekrój, rzut kondygnacji, plan sytuacyjny posesji, plan orientacyjny
7: Chełmiński Franciszek
8: 1910
9: rkp, wbw, płótno techniczne
10: 80x32,5
11: l sąż. roś. -12 mm; 5 sąż. roś. - 25 mm; 10 sąż. roś. -12 mm
12: 1:175; 1:420; 1:1750
128
13: RGP Wydział Budowlany; 10976

484.
1: 140
3: Ramisch Franciszek - firma
2: 548/550
4: Proekt" nadstrojki 2-go etaźa na l-o etaźnyh" kladovyh" i dostrojki 3-h" etaźnago fligelja [...]
5: Projekt nadbudowy pierwszego piętra w parterowych magazynach i dobudowy dwupiętrowej oficyny [...]

6: fasady, przekroje, rzuty kondygnacji, plan sytuacyjny posesji, plan orientacyjny
7: Chełmiński Franciszek
8: 1911
9: rkp, wbw, płótno techniczne
10: 161,5x33,5 11: l sąż. roś. - 25 mm; l sąż. roś. -12 mm; 5 sąż. roś. - 25 mm; 10 sąż. roś. -12 mm
12: 1:84; 1:175; 1:420; 1:1750
13: RGP Wydział Budowlany; 12180
14: Budynek narożny przy ul. Roosevelta.

484 A
l: 140
3: Ramisch Franciszek
2: 548/550
4: Proekt" postrojki 3-h" etaźnago figelja i nadstrojki 2-go etaźa na 1-no etaźnyh" kladovyh" [...]
5: Projekt budowy dwupiętrowej oficyny i nadbudowy piętra nad parterowym magazynem [...]
6: fasada, przekrój, plan sytuacyjny posesji, plan orientacyjny
7: Chełmiński Franciszek
8: 1911
9: rkp, wbw, karton na płótnie
10: 81x33 11: 5 sąż. roś. - 25 mm; 10 sąż. roś. -10 mm
12: 1:420; 1:2100
13: Ramisch, 13

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Iconography

Addendum 1:

Pic. 1. Photo of Franz Ramischa - Photo album containing 48 photos made in the year 1929, on the occasion of the 50th anniversary of establishment of the Factory. Inventory of Marshal Józef Pilsudski Provincial Public Library in Lodz, Sign. F - 1487.

Pic. 2. Photo of the stock share of the Cotton Product Factory „Franz Ramisch" - archiv materials in the inventory of Orange Property Group.

Pic. 3. Photo of the constitution of Deutschen Real - und Gimnasialvereins in Lodz - archiv materials in the inventory of Orange Property Group.

Addendum 2:

Diagram of the pace of the development progress of Cotton Product Factory „Franz Ramisch" - own work of the author.

Addendum 3 - 9:

Maps depicting development progress of Cotton Product Factory „Franz Ramisch" - own work of the author.

Addendum 10:

Archive development plan from the year 1889 - State Archive in Lodz (Archiwum Państwowe w Łodzi), R.G.P. Wydział Budowlany - Archiv, catalogue N°482 A

Addendum 11:

Archive development plan from the year 1909 - State Archive in Lodz (Archiwum Państwowe w Łodzi), R.G.P. Wydział Budowlany - Archiv, catalogue N°482 A

Addendum 12:

Archive development plan from the year 1922 - State Archive in Lodz (Archiwum Państwowe w Łodzi), R.G.P. Wydział Budowlany - Archiv, catalogue N°485

Addendum 13:

Archive development plan from the year 1940 - archiv materials in the inventory of Orange Property Group.

Addendum 14:

Map of existing, as well as non-existing buildings on the area of former Cotton Products Factory "Franz Ramisch" - own work of the author.

Addendum 15:

Archive photos of the buildings on the lot at Piotrkowska Street 138/140 - Photo album containing 48 photos made in the year 1929, on the occasion of the 50th anniversary of establishment of the Factory. Inventory of Marshal Józef Pilsudski Provincial Public Library in Lodz, Sign. F - 1487.

Addendum 16:

Pic. 1. Constantinople - Assassin's Creed Revelations;
Image: Ubisoft,
<http://www.wired.com/wp-content/uploads/blogs/geekdad/wp-content/uploads/2011/11/ACRSPSC09ConstantinoplePRINTImperialNorthPort-HD_80583820247_9372.jpg>

Pic. 2. Paris - Assassin's Creed Unity,
Image: Ubisoft,
<http://cdn.eteknix.com/wp-content/uploads/2014/07/Assassins_Creed_Unity.jpg>

Pic. 3. Venice - Assassin's Creed II;
Image: Ubisoft,
<https://ubistatic9-a.akamaihd.net/ubicomstatic/de-DE/global/media/ac2_s_008__6_154594.jpg>

Pic. 4. Florence - Assassin's Creed II;

Image: Ubisoft,
<http://img2.wikia.nocookie.net/__cb20120827130809/assassinscreed/de/images/4/46/Santa_Maria_del_Fiore_2.jpg>

Addendum 17:

Comparison of the reconstructed Factory 3d model with archival iconography.
Archive photos - APhoto album containing 48 photos made in the year 1929, on the occasion of the 50th anniversary of establishment of the Factory. Inventory of Marshal Józef Pilsudski Provincial Public Library in Lodz, Sign. F - 1487.

3D model renderings - own work of the author.

Addendum 18:

Frames of the Programme - own work of the author.

Graz - Lodz
2015