

TRASPORTI

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& cultura

rivista di architettura delle infrastrutture nel paesaggio



**LOGISTICA E PAESAGGI
DEL COMMERCIO ONLINE**

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TRASPORTI

- 5 LOGISTICA E PAESAGGI DEL COMMERCIO ONLINE**
di Laura Facchinelli
- 7 LOGISTICA E PAESAGGI DEL COMMERCIO ONLINE: UN'APERTURA AD UN TEMA COMPLESSO**
di Marco Falsetti e Luca Tamini
- 11 INSEDIAMENTI LOGISTICI, E-COMMERCE E GOVERNO DEL TERRITORIO: INDIRIZZI PER UNA VALUTAZIONE INTEGRATA DELLE ESTERNALITÀ**
di Luca Tamini
- 19 LOGISTICA, TERRITORIO E CONSUMO DI SUOLO. UN ELEFANTE IN CRISTALLERIA**
di Paolo Pileri
- 29 IL RAPPORTO FRA COMMERCIO E LOGISTICA NEL QUADRO URBANISTICO DA RIFORMARE**
di Elena Franco
- 37 WHEN THE WAREHOUSE MOVE INTO THE CITY**
by Domingo Abrusci
- 43 LESS (SPACE) IS MORE (MONEY): MAGAZZINI MULTIPIANO E TORRI DELLA LOGISTICA IN ASIA ORIENTALE E SUD PACIFICO**
di Marco Falsetti
- 51 THE LOGISTIC SHED: RETAIL ARCHITECTURE TODAY**
by Miroslav Pazdera and Kateřina Frejlichová
- 59 ARCHITETTURA DELLA LOGISTICA**
di Enrico Molteni
- 67 UNA CONTINUITÀ IDEALE**
di Franco Purini

cultura

75 TRANSIZIONI, TRASFORMAZIONI, TEORIZZAZIONI NELL'URBANISTICA D'OGGI

Intervista a Michele Talia a cura di Giusi Ciotoli

83 L'E-COMMERCE TRA REALTÀ, NARRAZIONE E IMMAGINARIO AUDIOVISIVO

di Fabrizio Violante

93 NEI SOTTERRANEI OSCURI DELLA STAZIONE DI MILANO. UN ROMANZO DI JACOPO DE MICHELIS

di Laura Facchinelli

97 SOTTO IL PIANO DEL FERRO. INDAGINI E STRATEGIE PER LA RIQUALIFICAZIONE DEI MAGAZZINI RACCORDATI DELLA STAZIONE CENTRALE DI MILANO

di Riccardo Miccoli e Maria Vittoria Monaco

103 PASSATO E FUTURO DEI NAVIGLI A MILANO. UNA PROPOSTA PER LA RISCOPERTA E IL RIUTILIZZO DEL NAVIGLIO DELLA MARTESANA

di Ambrogio Filippini

111 "ARCHITETTURA IN MOVIMENTO". L'AUTOMOTRICE BELVEDERE DI RENZO ZAVANELLA

di Giorgia Sala

Logistics and landscapes of e-commerce

by Laura Facchinelli

Our lifestyle is changing rapidly and radically: this is an actual subversion that seems to affect every field of our thoughts and actions. Some technologies at this point seem to be so ingrained in our everyday lives as to erase any memory of "before". Even the fundamental act of buying products today appears to be completely different from the "naïve" exchange between seller and customer that was traditional in markets, then in increasingly specialised boutiques, until after the 1950s when they gave way to concentrations of increasingly large vendors: shopping centres. In recent years (with a strong increase over the past two or three, driven by the limitations imposed by the pandemic) the phenomenon of online shopping has literally exploded.

The online commerce platforms are familiar even to those who are more resistant to technology: they may think it convenient, perhaps with the help of a "digital native", to be able to find any product at all: revealed, analysed and chosen on the basis of an exclusively visual contact without the contribution of any other senses (no touch to feel the texture of a fabric, no test of smell, or of the noise produced by the object when using it). Usually, the wait is just a few hours and the box containing the object you have ordered is delivered directly to the home. Security is provided by the return policy that allows any object that does not fully satisfy expectations to be returned (to a nearby collection centre, no charge), and too bad if it gets thrown away (vendors usually find no benefit in recycling): it will be replaced by another product, or money back. It doesn't get any better.

The buyer feels satisfied: She has saved herself the bother of going from store to store, and can boast that she is technological, "evolved". She will probably have little concern for the employees charged with handling and delivering the packages (is their salary regulated by contract and commensurate with the commitment? Is the work-tempo "humane"?). Rarely will she wonder if the circulation of vehicles for rapid delivery contributes to traffic congestion or pollution. More rarely yet will the buyer (any of us, in fact) notice the somewhat alienating proliferation of the warehouses in which the goods for online shopping are concentrated and distributed: yet they are warehouses that (irreversibly) blight our landscape and spawn a ramification of new roadways. At most she will notice that stores are closing in our city centres, along our streets, in our town squares that have traditionally been friendly and vivacious. But one might observe that the decline was already underway, caused by the proliferation of giant shopping centres and outlets in the city outskirts, which attract vehicles and actual tours organized for discount shopping. E-commerce platforms therefore enjoy a relatively good reputation, which they build up with astute advertising campaigns on television.

These are just some of the themes discussed in this issue of our magazine, in the hopes of offering some insights to reflect upon critically. Beyond a simple "everyone does it". Beyond the apparent, playful ease characteristic of a phenomenon that underpins a colossal business. We present comparisons with other geographical areas and some cultural interpretations, looking at history and the memory of representations on film.

In the "Culture" section, there are three articles dedicated to Milan: to the Centrale train station (with an adventure novel and an account of the projects developed to renovate the Magazzini Raccordati) and the Navigli (which could partly recover their original function as connecting waterways).

Logistica e paesaggi del commercio online

di Laura Facchinelli

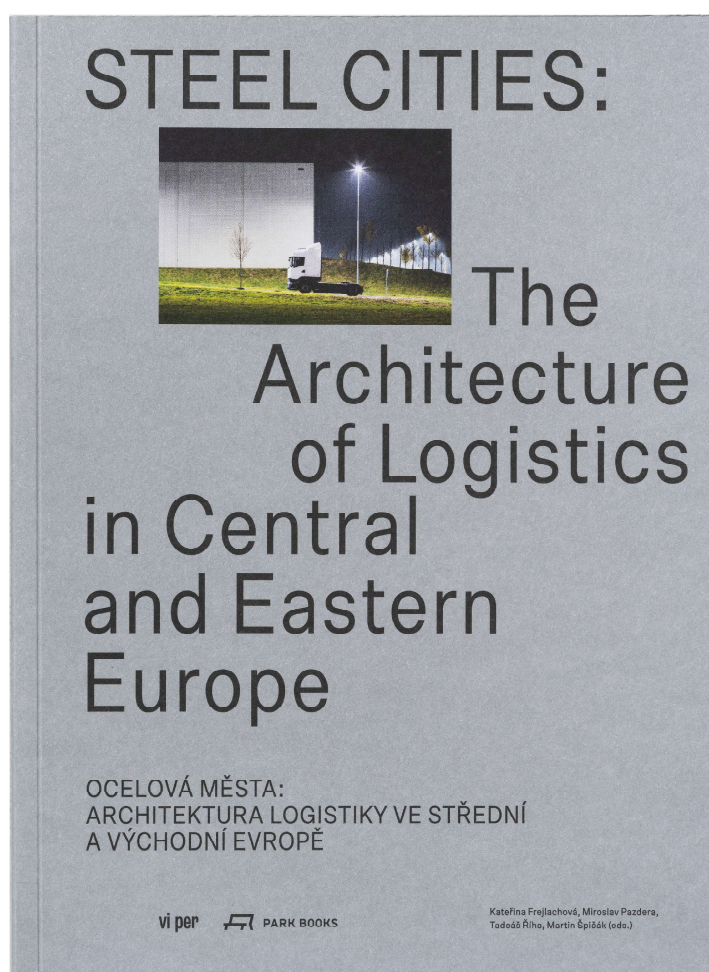
Il nostro modo di vivere sta cambiando, da alcuni anni, in modo veloce e radicale: si tratta di un vero e proprio sovvertimento che sembra investire ogni campo del nostro pensare e del nostro agire. Alcune tecnologie (pensiamo al cellulare, nella sua evoluzione, entusiasmante, da telefono a strumento di collegamento totalizzante) sembrano ormai talmente connaturate alla nostra dimensione quotidiana da cancellare persino il ricordo del "prima". Anche la fondamentale azione dell'acquisto di prodotti appare, oggi, tutt'altra cosa dall'"ingenuo" incontro tra venditore e cliente che era proprio dei mercati sulle pubbliche piazze, poi delle botteghe sempre più organizzate, che dagli anni '50 del Novecento hanno lasciato il posto a concentrazioni di punti vendita sempre più grandi: i centri commerciali. Negli anni recenti (con un forte impulso negli ultimi due o tre, complici le limitazioni imposte dalla pandemia) è letteralmente esploso il fenomeno degli acquisti online.

Le piattaforme delle vendite online sono note anche alle persone più refrattarie alle tecnologie, che trovano comodo, magari con l'aiuto di uno "smanettatore", procurarsi un qualsivoglia prodotto scovato, analizzato, scelto sulla base di un contatto solo visivo, senza l'apporto degli altri sensi (niente tatto per la consistenza di un tessuto, nessuna prova sull'odore o il rumore prodotto dall'oggetto d'uso). L'acquisto è digitale. L'attesa, di solito, ridotta a poche ore e (cosa molto divertente!) la scatola contenente il prodotto acquistato arriva direttamente a casa. La sicurezza è data dalla possibilità di restituire l'oggetto che eventualmente non soddisfa le attese (punto raccolta vicino, nessun costo): un altro prodotto è in arrivo, oppure i soldi verranno restituiti. Meglio di così!

L'acquirente si sente soddisfatto: si è risparmiato il giro per negozi e può fregiarsi del titolo di persona tecnologica, evoluta. Probabilmente non penserà al personale addetto alla manipolazione e consegna dei pacchi (la retribuzione è contrattualmente regolata e adeguata all'impegno? I tempi sono "umani"?). Poco importa se il prodotto respinto verrà gettato via (al venditore non conviene il riciclo). Raramente l'acquirente si chiederà se la circolazione dei veicoli per la consegna veloce provoca congestione delle strade o inquinamento. Ancor meno il soggetto acquirente (che poi siamo tutti noi) noterà l'estensione un po' alienante dei magazzini dove le merci del commercio online vengono concentrate e smistate: non sono altro che "capannoni" come ce ne sono tanti che deturpano (ahimè, in modo irreversibile) le nostre pianure e provocano una ramificazione di nuove arterie stradali. Tutt'al più verrà da pensare che spariscono i negozi nei nostri centri urbani, nelle nostre strade, nelle piazze che per tradizione sono sempre state accoglienti e vivaci. Comunque il declino era già in atto, per via della proliferazione frenetica dei vari centri commerciali e outlet fuori porta, attrattori di veicoli e di veri e propri tour organizzati per l'acquisto-conveniente. Pertanto le piattaforme per l'acquisto digitale godono, tutto sommato, di una buona fama che sanno alimentare con astute campagne pubblicitarie in tivù.

Questi sono alcuni degli argomenti sviluppati o suggeriti in questo numero della rivista con la consueta nostra esortazione ad esercitare il senso critico. Al di là del "così fan tutti". Al di là dell'apparente facilità, quasi giocosa, di un fenomeno che muove un giro d'affari colossale. Interessanti sono, ancora una volta, i confronti con altre realtà geografiche, con le soluzioni diverse rispetto ai non-progetti di casa nostra.

Nella sezione "Cultura", tre contributi sono dedicati a Milano: alla stazione centrale (con un romanzo-thriller e un resoconto dei progetti per il recupero dei Magazzini Raccordati) e ai Navigli (che potrebbero riprendere almeno in parte l'originaria funzione di vie acquee di collegamento).



The Logistics Shed: Retail Architecture Today

by Miroslav Pazdera and Kateřina Frejlichová

The architecture of logistics is one of the most dynamically developing fields of the construction industry. The acceleration it is currently experiencing is of e-commerce as well as in the rising demands for the speed and continuous flow of goods delivery.

The Shed

Accustomed to our living standards, we do not pay enough attention to logistics and perceive it as an autonomous service. We do not realize that a single click in an e-shop triggers a mechanism of processes which require the existence of a massive apparatus. We have become accustomed to the situation in which the ordered goods arrive to the designated address within a couple of days, or even hours. The contemporary modus of retail creates the illusion that there is nothing easier than shipping goods from one corner of the world to the other.

It comes as no surprise that the term logistics was first used in a military context to describe the organization of armies¹. Logistics was concerned with the supply, the movement of army units, and of material. The military style of thinking, orders and coolheaded planning is still inherent in logistics as it is understood today. The logistics shed, i.e. the warehouse or distribution center, represents the nodal element of this apparatus, a tangible witness to the rationalization, standardization, and calculating nature of logistics. It stands at the intersection of temporal and spatial movements, commands, and complex operations which it enwraps within its simple envelope. In other words, it is the simplest and cheapest possible architecture, spanning the largest possible surface area to serve the

Il capannone logistico: l'architettura del retail oggi

di Miroslav Pazdera e Kateřina Frejlichová

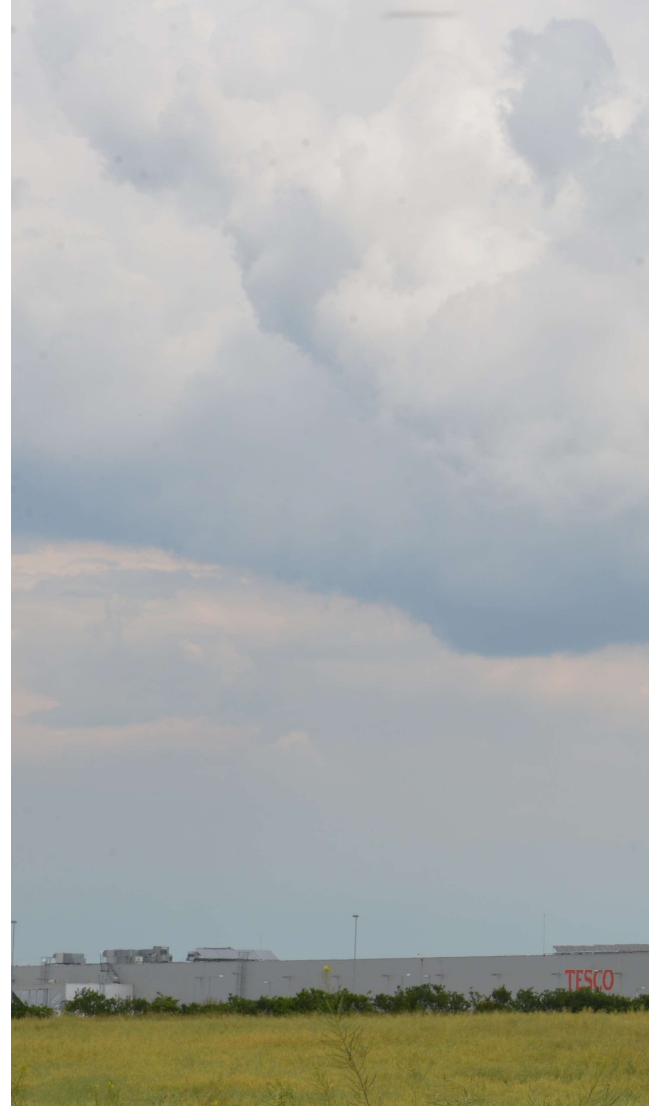
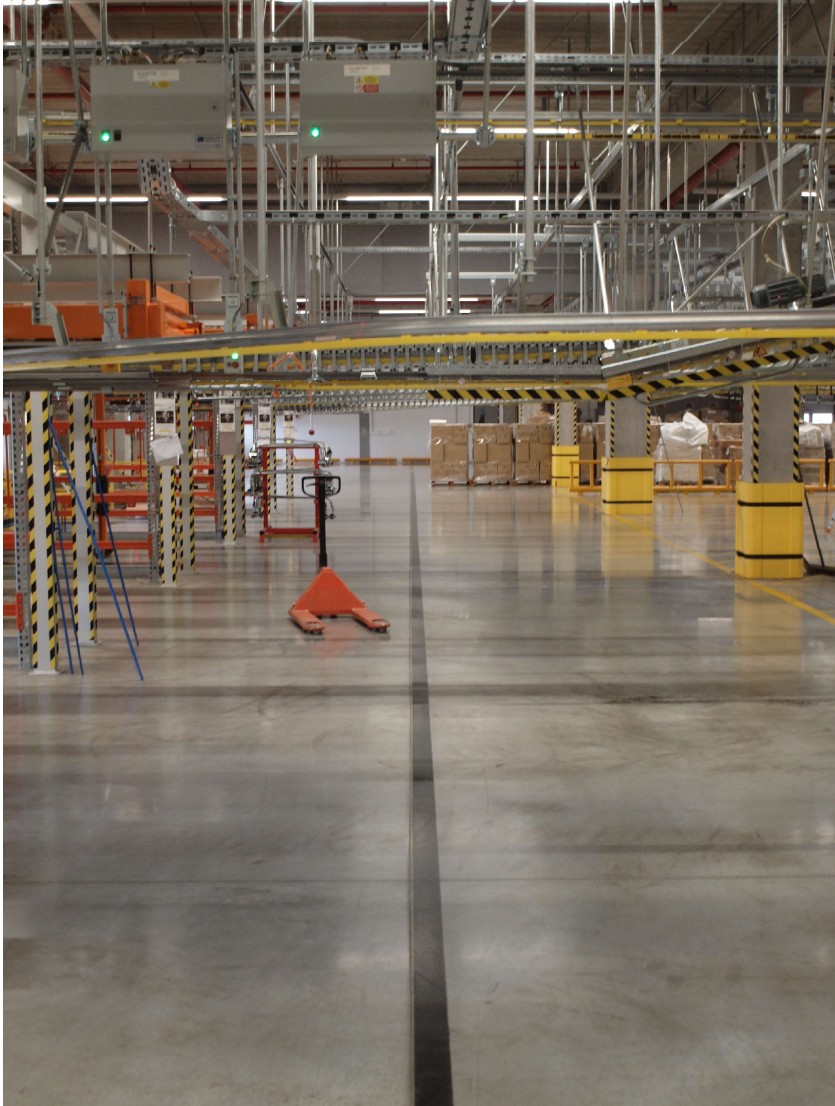
L'architettura della logistica rappresenta uno degli ambiti più dinamici dell'industria delle costruzioni.

L'accelerazione che questa sta vivendo negli ultimi anni va ascritta alla grande diffusione dal commercio elettronico, con la relativa crescente richiesta di beni e merci da ricevere in tempi sempre più rapidi. Quali fruitori ultimi dei beni del commercio online siamo soliti prestare poca attenzione alla logistica, ritenendola quasi un automatismo. Non ci rendiamo conto, invece, che un singolo clic in un e-shop innesca una serie di processi che richiedono la presenza di un apparato imponente e che le dinamiche del commercio online creano solo l'illusione che sia facile spedire la merce da un angolo all'altro del mondo.

Il capannone logistico, ovvero il magazzino o centro di distribuzione, rappresenta l'elemento nodale di questo apparato, una testimonianza tangibile della razionalizzazione, della standardizzazione e della natura calcolatrice della logistica. Situato quasi sempre all'intersezione dei flussi geografici e di traffico, deputato a gestire operazioni complesse a dispetto della semplicità del suo involucro, lo shed rappresenta un'architettura basica, la più semplice ed economica possibile, che si estende su vasti appezzamenti di suolo per gestire lo smistamento, l'imballaggio e il controllo delle merci nel loro viaggio dal produttore al consumatore.

On the previous page, at the top: Antoine-Henri Jomini, *Tableau analytique des principales combinaisons de la guerre, et de leurs rapports avec la politique des états, pour servir d'introduction au Traité des grandes opérations militaires* (Paris: Chez Anselin, 1830), p. 74. Below, from left to right: "Keith Tantlinger," *The Telegraph*, September 15, 2011, <https://www.telegraph.co.uk/news/obituaries/finance-obituaries/8766380/Keith-Tantlinger.html>; cover of the book *Steel Cities: The Architecture of Logistics in Central and Eastern Europe*.

¹ Antoine-Henri Jomini, *Tableau analytique des principales combinaisons de la guerre, et de leurs rapports avec la politique des états, pour servir d'introduction au Traité des grandes opérations militaires* (Paris: Chez Anselin, 1830), p. 74.



1 - "Warehousing & Distribution," <http://aw2logistics.com/3pl-solutions/warehousing-distribution>.

purpose of sorting, packing, and checking goods on their way from the producer to the consumer.

Large scale logistic parks occupy the area of a town of several thousands inhabitants, but consist of only a few buildings. While the sheds are certainly three-dimensional volumes, they are also strikingly horizontal as if the fields have been gently raised up several metres in height. Monumental yet banal.

The Standard

When businessman and transport tycoon Malcom McLean and engineer Keith W. Tantlinger met for the first time in 1955, they laid the foundations for cooperation which would lead to the introduction of a completely new concept of transport². Consi-

derably simplifying the transport of goods and setting the new course to the ensuing development of transport industry, the new standardized unit became its basic principle. The intermodal container, from land to sea and back, was the direct predecessor of the most heavily used containers today: a 20-foot-long (i.e. 6.1 m) and 40-foot-long (i.e. 12.2 m). The key innovation of the new containers was the so-called twistlock – a lock placed at the corners of the containers which enables them to be connected to one another, to be manipulated easily using a crane or to be secured to the deck of the freight ship³³. Thanks to this invention, the containers can be easily reloaded from one means of transport to another without any need to manipulate the goods placed inside it. The new containers

2 "Keith Tantlinger," *The Telegraph*, September 15, 2011, <https://www.telegraph.co.uk/news/obituaries/finance-obituaries/8766380/Keith-Tantlinger.html>.

3 Kelsey Campbell-Dollaghan, "The Simple Metal Mechanism That Changed the Global Economy Forever," *Gizmodo*, February 26, 2014, <https://gizmodo.com/the-simple-metal-mechanism-that-changed-the-global-econ-1530878459>.



influenced not only the entire concept of transport, but also the design of cargo ports, ships, and automobiles. The heavy manual work of dockers and longshoremen was replaced by the metallic arms of freight cranes, and traditional delivery trucks were replaced by large tractor-trailers.

The introduction of the container kindled further development of transport organization and the tracking of shipments. The goods were no longer transported in boxes and bags by units based on their type. Instead, the container filled to the top with arbitrary content, to make sure its cargo capacity is used to the fullest, became the standard. In 1968, the International Organization for Standardization (ISO) with its headquarters in Geneva implemented the standard ISO 668, which classifies the container and specifies its parameters⁴. The international standard made the container a globally compati-

ble unit. An ISO container is the same in Asia, Europe, and America regardless of its place of manufacture or its ownership by some specific transport company. It has become the elementary unit of logistics.

Similar to the container, the logistics shed is also a unit replicated around the entire planet by means of standards and certificates. The A-Class warehouse represents the standard of an industrial structure which, on account of its unification, shines with its white or colored facades into the landscapes around the whole world⁵. The structure is governed by simple rules and procedures based both on its construction and its operation. In the world of transport, where time and minimization of costs play the principal role, there is no space for sentiment. The distribution centers are merely simple compositions of certified parts delivered to the con-

2 - Kelsey Campbell-Dollaghan, "The Simple Metal Mechanism That Changed the Global Economy Forever," Gizmodo, February 26, 2014, <https://gizmodo.com/the-simple-metal-mechanism-that-changed-the-global-econ-1530878459>.

4 "ISO 668," https://en.wikipedia.org/wiki/ISO_668.

5 "Warehousing & Distribution," <http://aw2logistics.com/3pl-solutions/warehousing-distribution>.



3 - "ISO 668," https://en.wikipedia.org/wiki/ISO_668

struction sites and assembled according to the manuals, in a manner no less easy than assembling IKEA furniture. Construction of such shed is the response of the logistics apparatus to an immediate demand. Its surface area in square meters fully describe the capacity as well as the price of the property. The surface is the main variable; other measurements or expectation of the investor and tenants are stipulated and described by certificates, standards, which represent the basis of future contractual relationships. And in turn, the construction module is derived from the dimensions most inherent to logistics - the dimensions of the ISO container.

The Envelope

The process of construction organization is also subordinated to the maximum use of the cargo capacity. The distribution center is laid out according to a rectangular grid of 12 Å~ 24 meters. Likewise, the typical height of the shed is itself 12 meters, a figure determined by the maximum possible load on the floor and the usual height of the racks (10 meters). The A-Class warehouse shed is a universal type of property which fits an ab-

solute majority of its potential tenants, transportation companies, retail, and e-shops. The overall construction of the shed takes no more than four to six months on average. The envelope of the shed is composed of a systematized sandwich panel facade. Panels formed from two steel sheets are mounted directly to the frame, and the space between them is filled with a core of mineral foam. The panels only need to perform in a few given criteria: heat-insulating parameters, airtightness of their joints, and sufficient fire resistance. The facade panel is 6 meters long, a dimension also derived from the length of the 20-foot ISO container⁶. The trailer of a regular truck fits up to two packages ready to be dispatched to the corresponding construction site. The panel system consists of both facade and roof components, which display no considerable construction differences. Only three tools are needed for assembly: lifting suction cups and clamps

⁶ It is a technically accurately standardized and unified object. The containers come in three lengths: 20 feet (6.1 m), 40 feet (12,2 m), and 45 feet (13,7 m). The volume of container transport is stated in TEU units (Twenty-foot Equivalent Unit), where 1 TEU is the equivalent of one 20 feet container.



for manipulation of the panel, an electric screwdriver with a minimum rotating speed of 3,000 revolutions per minute for fixing the panel to the frame, and a machine saw with steel cutters for the potential modification of standardized parts and removing casting flash. The assembly of components is most easily performed using a crane⁷.

The scope of facade colors is set by the limited choice of possibilities: each exception presents an unnecessary expense. The darkest shade used corresponds to the greywhite RAL 9002. There is a practical justification as to why companies offer mainly bright colors in their catalogues: sunshine heats up steel sheets with dark coating, thus causing

a considerable thermal difference between the inner and outer surface of the panel. In turn, this thermal difference causes the corrugation of the entire facade and in extreme cases can even lead to the mechanical damage of the panel. For this reason, the use of metal panels is limited in certain areas and they are replaced by materials with lower thermal expansivity. In the case of the latitudes of Central Europe, the conditions for the facade sheathing are contained in the European standard EN 14509 from 2010. The required minimum width of the sheathing has currently increased to 260 mm.

4 - It is a technically accurately standardized and unified object. The containers come in three lengths: 20 feet (6.1 m), 40 feet (12.2 m), and 45 feet (13.7 m). The volume of container transport is stated in TEU units (Twenty-foot Equivalent Unit), where 1 TEU is the equivalent of one 20 feet container.

The Certificate

The construction-set system of the envelope of the shed is a direct proof of the economic pragmatism and military nature of logistics. Related to the construction activity and the fierce market with these properties are also the specific methods of management and decision-making together with rules and agreements followed by the individual participants in the process. One of the key roles in the construction and operation of the logistics sheds is played by different kinds of

⁷ The cleaning and revisions of façades and roofs are performed at least once a year. The objective is to check the technical condition of the panels, corrosion, and the tightness of joints connecting the individual components. Washing of the façade is performed using water with the regulated use of detergents of 4–9 pH, the water pressure from the nozzle should not exceed 5 MPa and the water temperature should not be higher than 30 °C (86°F). See *Sandwich Panels SP2B, SP2C, SP2D, SP2E, SPF, SPB, SPC: Assembly Instructions* (Zyrardów: Ruukki, 2016). Available at <https://www.ruukki.com/docs/default-source/b2b-documents/sandwich-panels/1ruukki-assembly-instruction-for-sandwich-panels-cee.pdf>.

building certifications. The certificates are mostly products of private organizations creating rules independent from those of national governments. If not implemented directly in the law of individual countries, they are voluntary.

Buildings are assessed based on several different criteria and the awarded corresponding rating then guarantees problem-free lease or sale of the property to the builder. As for the tenants of the logistics companies, the certificate provides them with the guarantee that the building was constructed according to the latest requirements and that it complies with all the necessary legislative and other regulations. In *Extrastatecraft*, American architect and theoretician Keller Easterling likens certification and standardization to independent sovereignty which negotiates compatibility of the globalized world⁸. In 1996, the International Organization for Standardization introduced the document ISO 14000 entitled Environmental Management Systems which sums up the ecological requirements and specifications related to construction⁹. ISO 14000 is a bureaucratic tool which lays down the basic rules for the design of buildings and their relationship to the environment. This document became the tool for organizations such as LEED or BRE.

It was the organization BRE (Building Research Establishment) which launched its first certificate BREEAM (Building Research Establishment Environmental Assessment Method) held to this day by more than 250,000 buildings around the world. The portfolio of these buildings also includes numerous cases of distribution centres and logistics halls¹⁰. The BREEAM certificate assesses the building in nine categories. Besides the building's environmental impact during the construction or the energy parameters of the envelope, it also assesses the quality of the interior environment. Based on the performance of the individual requirements, the

building can be awarded the following ratings: *pass*, *good*, *very good*, *excellent*, or the highest rating *outstanding*.

The fundamental paradox of the sheds certification is the fact that the presumed care for environment encourages the construction of more and more new buildings. Why is that so? The reason is simple: It is economically as well as temporally more advantageous to build a new building rather than to modify several-year old structures, in a way which would still make them meet all the standards and various certificates criteria. The certification's mask of sustainability, behind which the construction companies and developers often hide, creates a paradoxically unsustainable situation. The individual categories of the certificates are rather mild and can be met easily in the context of Central Europe. The shining plaque of the BREEAM certificate rating *very good* can embellish almost every building built to the construction standards prescribed by the national laws. The certification of industrial and logistics halls could therefore be rather a marketing and PR tool which serves the purpose of creating a favourable image. On one hand, its objective is to lull the society and the politicians into inaction and on the other, it opens up the possibilities for the closing of new lucrative contracts.

The Floor

The floor of the logistics shed is perfectly even and smooth. The goods are transported over it on conveyor belts and pallets in a similar way to how they travel in a broader geographic context, in containers on ships, train carriages, and trucks. The floor of the logistics hall can be seen as a metaphor of logistics as a whole. The goods, especially those in highest demand, are in constant movement. All operations inside of the distribution centres are managed by software and simple commands of the management which monitor the ever smooth flow of the goods. The only tasks performed inside the hall are sorting, organizing, indexing and archiving in the digital database. The employees, whose movements are directed and controlled by an algorithm, constantly pack and transport the goods. Simple commands appear directly on the displays of personal scanners which represent the main tool of the warehouse worker. The building, software, management, and human bodies form a single unique mechanism. The steps of the workers are also guided by navigation signs located directly on the floor. The floor

8 Keller Easterling, *Extrastatecraft: The Power of Infrastructure Space* (London, New York: Verso, 2014).

9 "ISO 14000 family – Environmental management," <https://www.iso.org/iso-14001-environmental-management.html>.

10 BREEAM does this through third party certification of the assessment of an asset's environmental, social and economic sustainability performance, using standards developed by BRE. This means BREEAM rated developments are more sustainable environments that enhance the well-being of the people who live and work in them, help protect natural resources and make for more attractive property investments. See "What is BREEAM?," <https://www.breeam.com>.

of the logistics hall therefore resembles a playing field of some peculiar sport. It is full of colourful lines, symbols, crossings, and boarding which guarantee the problem-free movement of all the present entities-people, machines, and goods.

Constructionwise, the floor is a concrete slab which complies with all the regulations concerning static and dynamic load. The load bearing capacity of the floor is usually five tons per square meter and its surface must show only minimal wear in the long-term. For this purpose, the concrete slab is fitted with a resistant top layer. The reinforcement is widely distributed and made of steel, plastic, or glass fibres. The thickness of the slabs varies between 100 and 250 mm based on the load capacity and the size of the reinforcement used. The wear layer can be made from colourful concrete, skim coat, and can be treated by several types of anti-slip layer. The basic precondition for the casting of the floor is the prepared state of the construction site and flatness of the terrain which had undergone grading. The preparation of the construction of the baseplate is accompanied by manipulation with large volumes of land, which is the consequence of the large surface areas demanded by single-storey buildings of distribution centres. Unlike the prefabricated construction-set nature of the assembled sheathing, the floor is a permanent, durable, and substantial construction impact¹¹.

It comes as no surprise that care and attention is given to the most important element of logistics architecture, the floor. Moreover, the continuous technological developments are steadily increasing the importance of the floor. The profitability, the reduction of energy consumption, and the shortening of the time needed for work tasks are the main driving forces behind this development. The floor of the distribution centre is a floor loaded with information and it becomes the real foundation slab, or motherboard, of the logistics apparatus. It is a digital platform in which the signs and symbols are gradually replaced by data flows and the workers by robotic systems.

The Retail Typology Today

The architecture of logistics is the architecture of needs, desires, and dreams of contemporary society. Using the word architecture in this context is actually merely a metaphorical game since engineering and economical pragmatism, which disregards social and

spatial qualities, leaves no space for what we traditionally understand under "architecture." The impression of temporariness of the prefabricated steel envelope stands in stark contrast to the irreversible impact of the construction of concrete slabs, asphalt pavements, foundations, and infrastructure. With the A-class sheds, the modernist dream of prefabrication turns into a boring nightmare of the endless repeat of construction elements. Ecological certificates cannot conceal the urgency of the irreversible transformation of the landscape which is well under way. At the same time, our society today cannot function without logistics and current economy is dependent on its speed and reliability. It is necessary to search for sustainable and just transportation concepts. Therefore, we need to map, research, and describe the environmental and social issues connected to the phenomenon of logistics, and to which the current, constantly accelerating logistics apparatus is more or less indifferent.

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Note

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