

Railway Architecture, Typological Analysis and Recycling Strategies

By Alessandro Gaiani & Valentina Radi[±]*

The railway system built in the first half of the 20th century pervaded the inland areas of the Italian regions, connecting small towns and favouring their settlement growth. The decommissioning of this heritage has left works and areas in a discarded condition, empty and in oblivion within urban and natural contexts, ready to be the object of circular regeneration, in the design process marked by the terms inheritance, retroactivity and metamorphosis. A process that allows a selection of assets by value character, recognised as archetypes, adaptable, able to redetermine themselves through mutative processes, which change their figurativeness, connection with infrastructures and variation of uses. Their foreshadowing as archetypes, becomes a link with tradition and an expression of its translation, making them inclusive and connected on an architectural and territorial scale, enhancing and reinforcing the peculiarities of the place.

Introduction

The early 20th century witnessed the exponential development and realisation of communication infrastructures capable of connecting territories, people and functions with greater speed. In Italy, the railway system was one of the main infrastructures built, which characterised the pervasiveness of peripheral and unspoilt areas in the regional hinterland, becoming a structural part of the landscape.

Railways represent an important land transport infrastructure, in which we find considerable engineering and architectural design. In addition to their primary function, they constitute a cultural and architectural heritage reflecting the historical and social identity of an era. However, many disused railway structures, such as stations, bridges and tunnels, are facing progressive degradation, sometimes turning into places of social distress. It is crucial to valorise and preserve this heritage in order to safeguard its historical and cultural value, as well as to promote the sustainable reuse of spaces.

From the 1950s onwards, there has been a mutation of some strategic sectors linked to industrial and economic choices, which, due to the lack of flexibility of the routes, has led first to a decline and then to a progressive decommissioning of railway lines in favour of road mobility.

Consider that, in Italy, railways transported 21.1% of goods in 1970, whereas today only 12%, compared to 70% in Switzerland. These data and strategic choices have led to a loss of economic interest for the railway operators, resulting in its decommissioning.

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Owned by the Italian State Railways, today about 1,500 km of tracks are available for redevelopment, of which 920 are totally decommissioned and about 580 decommissioned for variants. More lines have been decommissioned in northern than in central and southern Italy. In addition to railway lines, there are more than 400 stations and thousands of disused buildings.

From the report by Rete Ferroviaria Italiana, *Recupero delle stazioni impresenziate per finalità sociali*, Atti del convegno, “Arrivi, partenze, relazioni, Ferrovie e Comuni insieme per la qualità della vita di tutti i cittadini” Rome, 2005, we can deduce that 70% of stations are located near built-up areas or within 1 km.

With Law 128/2017, considerably later than in other countries, Italy has provided for the reuse of disused or decommissioned lines located in areas of particular natural or archaeological value.

Re-use that in Europe or the United States, has already been underway for some time. We can mention some of the most important and extensive ones, such as Euro Velo, with at least 15 routes connecting the various European nations through a cycle route, or Vélorail in France, Vias Verde in Spain, or the Empire State Trail in New York.

In Italy, thanks to the FS Foundation, and following the 2017 law, a virtuous path to rehabilitating these lines into greenways has begun, by virtue of ad hoc funds made available by the Italian state and European funds. Today, there are about 950 km of upgraded former tracks on both the Ferrovie Italiane network and private ones.

A renewed interest in people's enjoyment of the environment, the possibility of accessing funding, and the willingness of the Ferrovie Italiane to sell the properties for social purposes have led to the emergence of new initiatives in the area, also supported by local authorities.

It is within this framework that the present proposal to upgrade for tourism purposes the Ferrara - Porotto - Decima - San Giovanni in Persiceto - Modena railway line, about 60 km long, opened from 1909 to 1916 and decommissioned since 1956, managed by the Società Veneta, is inserted.

The stations and stops are Ferrara, Porotto, Vigarano Mainarda, Mirabello, S. Carlo, S. Agostino, Dosso, Renazzo-Corpo Reno, Cento, Morando, San Matteo della Decima, San Giovanni in Persiceto, Ravarino, La Grande, Nonantola, Navicello, Modena.

This route is one of the secondary lines¹ that were built in Emilia Romagna to connect all the small inland towns in the countryside with the larger cities, during the fervent period of land reclamation, when tunnels, riverbanks and artificial rivers were built in unison, and is part of a heritage that today counts 300 km of disused railways and tramways. The Ferrara-Cento infrastructure was approved in 1906, and completed on 27 July 1909 by the Società Veneta Ferrovie that managed it. The route comprised six daily runs, carried out with four passenger carriages combined with several freight wagons, thus including mixed transport for citizens, tourist groups, schoolchildren, groups of mondine, rice-field workers, and products, with public, administrative and commercial purposes. The latter in particular balanced the investments of the private company. The axis, which originates in the city of Ferrara, shows its first stop in the locality of Porotto, uniting the main cities in an east-west axis, covering a distance of approximately 54 km, and passing through the

1. Compared to those built and controlled by Ferrovie Italiane, the first interlocutor in the construction of this secondary system.

eight settlements, the subject of the latest mapping. After the second war, use was at full capacity and the new Ferrara station was inaugurated in 1946, followed in 1951 by the new Cento station. A few years later, in 1956, the railway ceased operation and the abandonment of the buildings and dismantling of the track began. A decommissioning that leaves the traces of the topographical modelling inherent in the type of infrastructure, but does not leave any rolling stock on the ground, which is extracted on pain of having to pay for the use of the land by the private company to the State.

The replacement will take place with the insertion, and subsequent development, of the road network, placed, in part, on the site of the original line, and cohesive with the system of still existing infrastructural, natural and energy networks. The road network in continuity changes its name to SP 66, Via Cento-Italia-Statale, SP 255.

At present, the railway track is not totally legible and some sections have been 'privatised', others removed, others included in cultivated fields or erased by urbanisation. On the line, artefacts such as stations, tollbooths, loading platforms, warehouses still recoverable emerge, where the relationship with the landscape is particularly interesting.

Aims and Objectives

Observing the landscape of the province of Ferrara, descending eastwards towards Bologna, we have identified this disused Ferrara-Cento² axis, considering it significant, with the Landscape Observatory of the Region of Emilia, which monitors together with the Department of Architecture of Ferrara, the possible regenerative scenarios to be developed in these areas on an urban and architectural scale of these assets. Observing their stratification, complexity and strategic context, the intention is to valorization the infrastructure, which passes over the sign, overlapping with the Roman centuriation and crossing it diagonally, according to Riccardo Merlo's³ reconstruction, a straight, irreversible and dividing line. A railway axis that today is an echo among the natural and road networks, in its linear geometries and gauges, an inaccessible entity placed in the settlements, a sign completely absorbed into the earth, but of which remains a building and structural heritage of its own, punctually scattered in the agricultural and urban topography, in the settlement systems that it has contributed to compose, becoming its regenerative interpreter.

2. Part of the entire railway section that connected Ferrara-Cento-Modena.

3. Reworking of an image contained in, Marco Marchesini and Silvia Marvelli. *Reconstruction of the plant and anthropic landscape in the centuriate areas of Emilia Romagna through archaeobotanical investigations*, 2019.

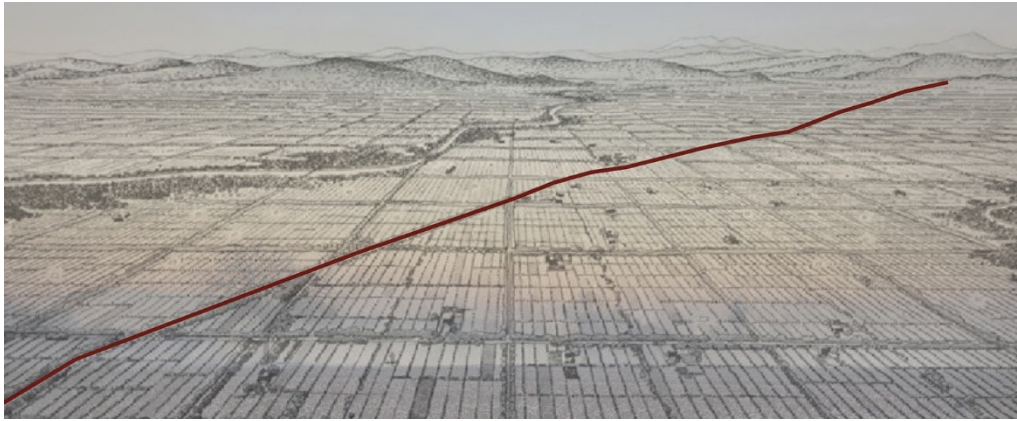


Figure 1. Image collage by Valentina Radi whit Photo ©Riccardo Merlo. *Railway Line and Centuriation in San Giovanni in Persiceto 2024.*

Source: Valentina Radi & Alessandro Gaiani 2024.

An axis born from the need to transfer labour and goods on a daily basis, from less developed areas to areas with greater labour development, first determining, and then confirming, the construction and maintenance of the railway line, until its decadence due to the choice to privilege road transport.

Today, it will have to interpret the will to redefine the role of small towns characterised by a prevalent agricultural, industrial and tourist development, an infrastructure that becomes the means for a system vision, of territorial enhancement through a sustainable development linked to the specificity of places and their slow connection.

The linear construction of the railway track has disconnected the vital links between man and landscape, humans and nature, and between humans: the objective is to regenerate the infrastructure through actions and tools capable of activating a new system of relations.

In fact, the futurist speed imparted by the use of the medium meant that the traveller perceived only a sequence of unconnected metaphysical views, composing a cognitive picture of places made up of monochromatic and autonomous tesserae, which although belonging to consecutive landscapes became disjointed and physically separated. The profound relationship between humans and nature has been lost, giving rise to autonomous systems that no longer foster human and non-human relationships. But man, by his nature, seeks in living direct relations with the group, so that we support each other and create the very essence of inclusion and sociality, groups that today, are the meeting and coexistence of several cultures and ethnicities. Human lines that intertwine and bind, through places firmly united to form a hybrid network of different traces, which assemble in a polyphony⁴.

An open and inclusive landscape system will be composed, in which the railway route will no longer have to be read only as a single line and for its directionality, but will be interwoven with the lines of the people who will inhabit it and with the lines of cross-sections that will act as a means of uniting the different points of the landscape marked by pre-existences along the route. There will be an interaction of

4. DeLanda M (2006) *A new philosophy of Society: assemblage Theory and Social Complexity*. Londra: Continuum. p.40.

lines that connect a network of correspondences and low-speed connections⁵. Human lines that in the research weave with those emerging from the urban reality and the disused railway, creating new relationships with the landscape and architecture.

New relationships will thus be defined between architecture, man and nature in which nature will no longer be a background, but a component that organically mixes and combines with the settlements and traces of human life, a fusion of urban and natural landscape, made up of heterogeneous matter, topographical consistency, traces, networks and buildings.

Theoretical Framework and Methods

It is precisely the mapping of the punctual transport architectures that existed and were realised between the early 1900s and the mid-1950s that will play a key role in the valorisation of the landscape with a new regenerative landscape texture, responding to Gilles Deleuze's statement "What to do with what we have?"⁶. The question will be answered by repurposing free assets, taken as archetypes predisposed to new relationships, destinations, architectural configurations and intertwining with existing and integrated infrastructures. These will be the place of coexistence of multiple subjects, even conflicting ones, capable of composing an interweave that adapts to the challenges of today's social and environmental crises, showing the characters of the new as the applicative result of additive and adaptive tools, of networks, forms and functions, which will combine with the lines and traces, emerged from the existing and valuable heritage. Their syntagmatic overwriting will rediscover the consistency and history of territories, and their reciprocal combination will define the complexity of the present and the future, with the composition of the *Post-naturality railway*.

5. Ingold T (2020) *Siamo linee, Per un'ecologia delle relazioni sociali*, Milano: Treccani. p.247.

6. Bourriaud N (2004) *Postproduction. Come l'arte riprogramma il mondo*. Milano: Postmedia Books. p.13.

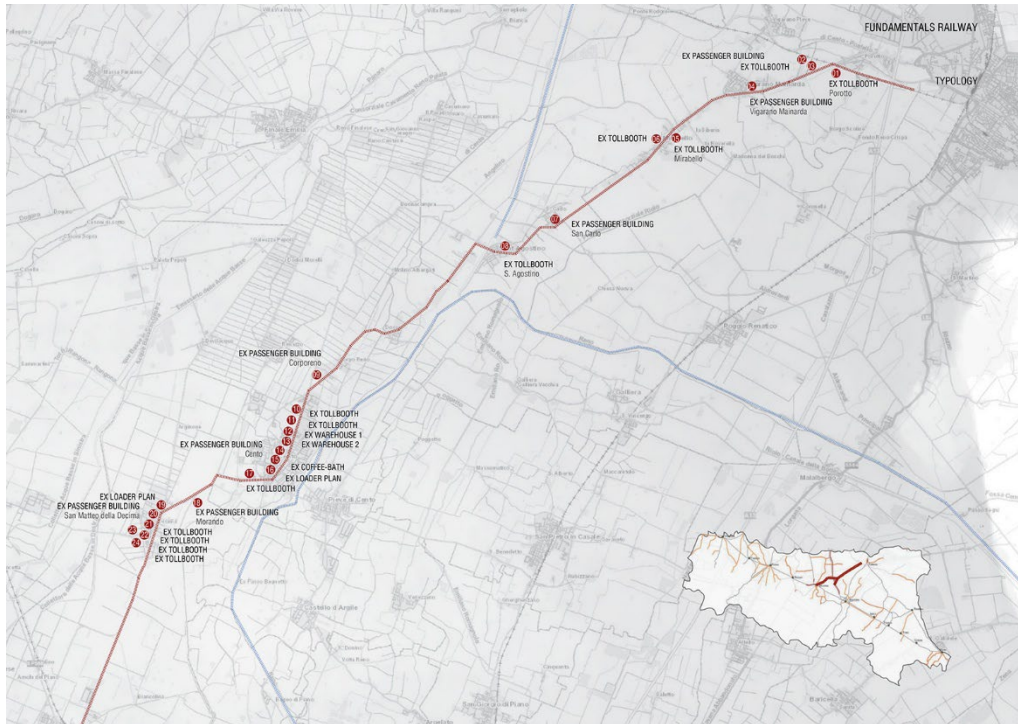


Figure 2. Plan of the Disused Railway Line, Ferrara-Cento Direction Modena, Heritage of the Assets Detected 2024

Source: Valentina Radi & Alessandro Gaiani 2024.

The method that will be applied posits the syntagmatic overwriting of buildings as an element of continuous evolution and adaptation to the conditions of the contemporaneity of historicised assets. Attention to the distribution, layout and composition of each inherited work, which reveals singularity, autonomy and belonging to a typological and topological system, proposes a codification as archetypes, whose consistency and operativity is defined by a retroactive reading that goes back to Vitruvius and his treatise *De Architectura*, excluding infrastructures and an approach on a territorial and natural scale, manifesting a new origin that the territory itself offers as modernity “[...] and in fact this book does not teach how architecture is born, but rather how the origins of buildings are determined [...]”⁷.

Buildings in which today, those productive and economic presuppositions that determined their realisation and activity are missing, and are in a condition of oblivion, because those relationships that determined architecture and infrastructure, that is, the past and specific location and interactions of necessity between building, settlement and urban/natural and human context, are missing. But it is precisely the same condition that makes them free and available heritage capable of accommodating and mutating destinations, infrastructural and figural. For this reason, with a primary vision that assumes the value of the archetype as an entity, proper to Vitruvius, through the architectural scale, we want to go beyond the scale of the work by exploring the relationships at the scale of the landscape along the given territory, applying this meaning to all the buildings of the Ferrara-Cento railway line.

7. Gros P (1997) *Vitruvio. De Architectura I e II*. Torino: Einaudi editore. p.33.

Interpreting the building archetype and the landscape context, but also the historical, economic, social and traditions context, as interacting elements in all the stratified landscapes that will be retraced and on which the objective will be to enhance the specificity of the places and settlements, valorising what history has handed down to us and inserting the new relations of contemporaneity.

Thus, the *Post-naturality railway* will be composed through three actions:

- *Inheritance*, research, reading and analysis of the identified heritage, which includes the characteristics of the inherited railway assets and areas. Description of the historical reference context, territorial consistency, existing networks, and construction, survey and historical archival, and typological documentary research. Filing of each asset in which all individual peculiarities are framed.
- *Retroactivity*, verification and selection of assets by value and aptitude, introducing parameters of memory and aptitude for the regenerative project.
- *Metamorphosis*, definition of mutative actions at the scale of the railway building and new relationships with the landscape and the cultural/productive system, in which adaptive tools of architectural mutations, allocation of destinations and network grafts will be codified.

It will change the relational condition of the original infrastructure, through punctual actions hypothesised on the assets, and described in cards. It will be possible to detect the impact of the method on a system scale and on active plans on an urban scale.

We are faced with the need to create a circular system capable of bringing into play the remnants of the built and the areas, a system capable of superimposing valorisation tools based on a new instrumentation, in particular by using the archetype, due to its capacity to be emptied of meaning, is ready to be a reservoir of new opportunities that can always be reprogrammed. The hybridisation between the traditional concept of the archetype and new methodologies will determine a new inclusive relationship between man and social community.

Inheritance: The Value of the Archetype

The former railway axis lies between the Panaro and Reno rivers, to the north by the Burana and Po rivers. At Cento, Sant'Agostino and Dosso, the Cavo Napoleonico converges. To complete the system of bridleways and waterways, the hydro-energy network⁸ polarities in the triangulation of the cities of Ferrara, Bologna and Modena each with three production sites.

The blue infrastructures intersect with the green infrastructures, the regular geometries of the centuriation of the countryside, the disused route, and the settlements.

The punctiform elements, buildings and trees form a historical stratification that can still be read, even when observing the territory from above on a photogrammetric map. They are gravitating between the intersections of the existing networks, making

8. Casalecchio di Reno (BO).

up the mass of the real estate that is the subject of in-depth study, consisting of 8 passenger buildings, 12 tollbooths, 2 loader plan built between 1904 and 1909, 1 warehouse and 1 service, built up to the 1950s. Appointed *Fundamental Railways*.



Figure 3. *Existing Architectural Heritage. Fundamental Railways. Collage.*

Source: Valentina Radi & Alessandro Gaiani 2024.

Their knowledge was deepened by means of an on-site survey, and in parallel an archival research in the documents of the Ferrovie dello Stato, and in those contained in the State Archives of Padua where the records of the Ferrovie Venete that constructed the buildings are kept, marking the morphological, spatial and linguistic traits impressed around them and recurring. Subsequently, a precise filing was made of each Fundamental Railways, identified in numerical order by travelling along the railway from north to south. Each file consists of an area image, an image of the property, year of construction, geometric characteristics, morphological features, archetypal classification, state of conservation, edge location, topographical positioning, and urban-natural context.



Figure 4. *Standard Filing*

Source: Valentina Radi & Alessandri Gaiani 2024.

Retroactivity: The Form of the Archetype

With retroactivity we will work to know what resides in the *notum* of goods, and “[...] to discover, in the double meaning of finding what [...] we have buried and forgotten, and of “invenire” what is *novum* that is proposed and requested of us”⁹, or to translate, as a hermeneutical and social paradigm, “[...] to recognise and go through all that has preceded and generated us [...]”. in other words, to translate, as a hermeneutic and social paradigm, “[...] to recognise and go through all that has preceded and generated us [...]”¹⁰. Archival research on the documents revealed complete plans of the railway apparatus, station drawings from 1906 and peculiar study and final drawings of buildings, with in-depth engineering studies of the construction of the railway and related artefacts.

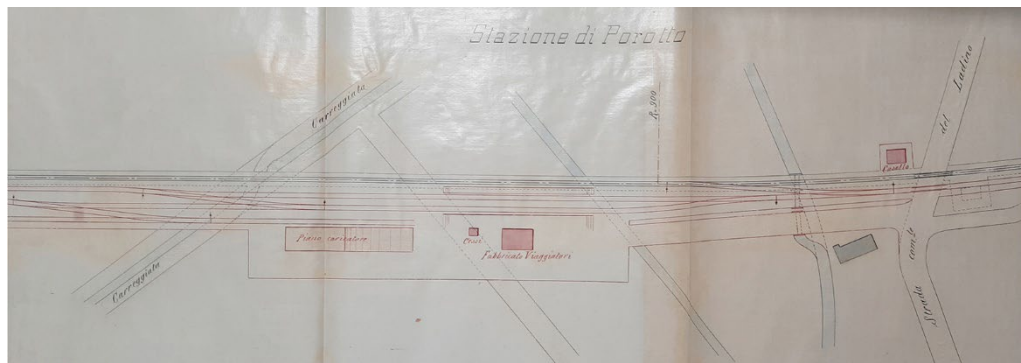


Figure 5. Drawing for the San Giovanni in Persiceto Station

Source: Ferrovie dello Stato.

The documents reveal clear archetypal imprints on which the basic configurations and later developments of individual buildings can be subdivided into passenger buildings, tollbooths and loader plan, warehouse and service¹¹.

In particular, there is a translation of finding the typological characteristics of these architectures, characterised by three prevailing archetypes:

- The *passenger buildings*, which have perfect compact regular forms, developed on two floors. They present on the ground floor the travellers' service compartments, and on the upper floor the staff quarters. The layout is symmetrical distributed over three or five areas, volumetrical profile concluded with a double-pitched or pavilion roof with cornice. Building constructed in brickwork with exposed brickwork. The project dimensions have a planimetric development of 8.00 ml x 13.50 ml¹². The architectural language on the façades is recognisable, where there is an order of basement fascia, moulded stringcourse and roof markings and a defined colour sequence. All the openings are marked by arched brick lintels and profiles, typical of the settlements on the railway line and the railway company to which they

9. Dionigi I (2019) *Osa sapere. Contro la paura e l'ignoranza*. Milano: Solferino. p.13.

10. Dionigi I (2019) *Osa sapere. Contro la paura e l'ignoranza*. Milano: Solferino. p.27.

11. Panconesi M (1993) *Quando lungo il Reno fischiavano le vaporiere. La Ferrara-Cento-Modena della Società Veneta e la Tramvia Bologna-Pieve di Cento*. Cento: Pavé.

12. Dimensions derived from the project for the Decima station.

belonged. Integrated spatial configurations that can still be used today. In the new buildings in Cento and Ferrara, positioned between the warehouses and the loader floor, they form a symmetrical whole, with a structure with a central hierarchy, lateral bodies and a projecting canopy highlighting their temporal and linguistic location. They have the character of rationalist architecture.

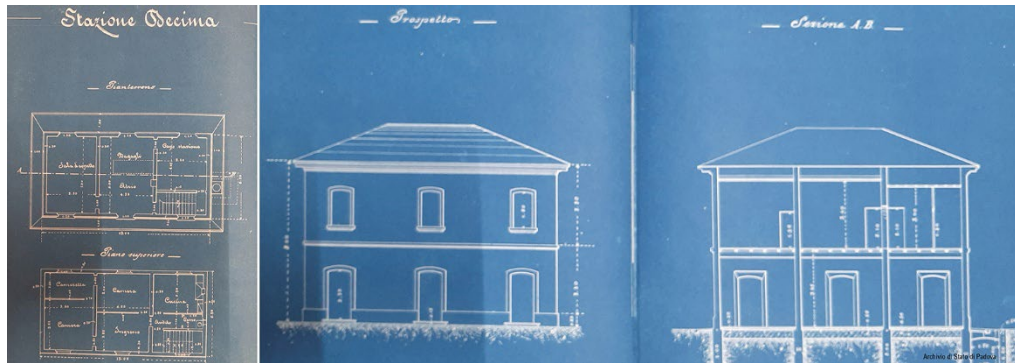


Figure 6. *Decima Station Project*

Source: State Archives of Padua.

- The *tollbooths* that have the same rectangular connotations, with design dimensions of 6.60 ml x 4.60 ml, developed on two floors in a compact form, a base on which additions have been made over time, such as a one-storey side module on the long side or body, doubling and staggering of the same type, linear and L-shaped bodies with flat roofs, grafts of walls, terraces, growth in the roof.

- The few one or three-partition *loader plan*, designed as 17.50 ml x 7.00 ml, with a height of 6.00 ml, have maintained the original features of symmetrical sloping wooden roofing, even with grafts. These are correlated with spaces dedicated to goods set in a serial manner by bays and gable closure, and refreshment services rooms, all of which are recovered masonry buildings.

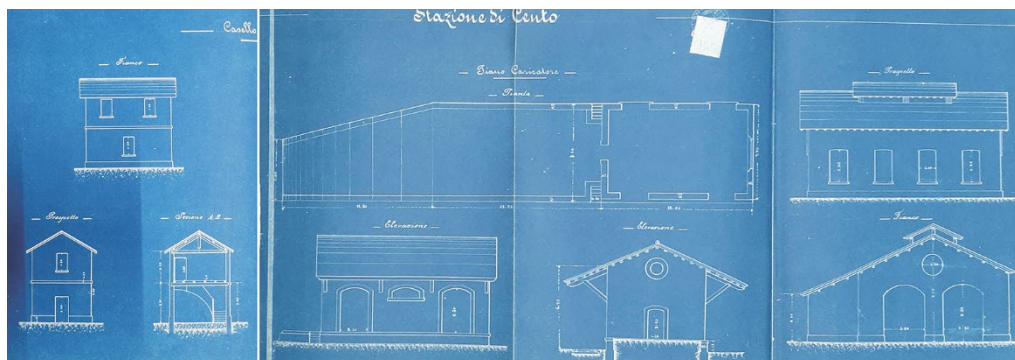


Figure 7. *Project for Cento Tollbooth. Project for Cento Loader Plan*

Source: State Archives of Padua.

- *Warehouse and service.* The former consists of four aisles, in pairs of two leaning against a building with the same morphology as the travellers' building, built at a short distance in time. The bar service building, square in shape according to the documents found, served as a toilet.

These drawings highlighted the main morphological and linguistic characters, the mutations undergone by additions from the time of construction to the present day, foreshadowing the capacity of the archetype to be a receptor of alterations, thus revealing the building's possibility of integration, connective with infrastructure, physical, social and economic, residual traces of memory that can be reactivated, to bring out all its potential. In these assets we identify the working architectural heritage, we identify our past, the Modern, as Alfonso Traina says, the “classic”¹³. Understanding as classic those who have spoken for “noi”. And precisely in virtue of this “per”, and in virtue of this “noi”, the architectures of the “classico” have the continuous capacity to be in flux to reveal to us the not yet accomplished, and what still has to be.

Public and private assets that are partly inhabited and partly disused, a legacy that retroactively confirms itself as the fulcrum of architectural reasoning in the definition of the *Post-naturality railway*, as a heritage of internal and external living spaces, of signs, morphologies, territorial geometries, memorial axes, and human histories, which are configured as heritage on which to set possible reconfigurations of architectural and urban spaces, which in section will dialogue in an osmotic and regenerative way with landscapes.

Their ability to be manipulable basic structures makes them suitable for mutation in the geometry of the three archetypal¹⁴ structures surveyed, operating in susceptibility to change, because “According to eternal laws all limbs are formed, and the strangest form secretly preserves the archetype”¹⁵. clarifying a consistency, character and susceptibility to mutation, confirming the capacity to accommodate new forms of living, whether private or public.

13. Dionigi I (2012) *Eredi. Ripensare i padri*. Milano: BUR Saggi, p.41.

14. Purini F (2002) *L'architettura didattica*. Roma: Gangemi editore, p.48.

15. Goethe J W (1986) *Metamorfosi degli animali*. Milano: SE piccola enciclopedia, p.29.

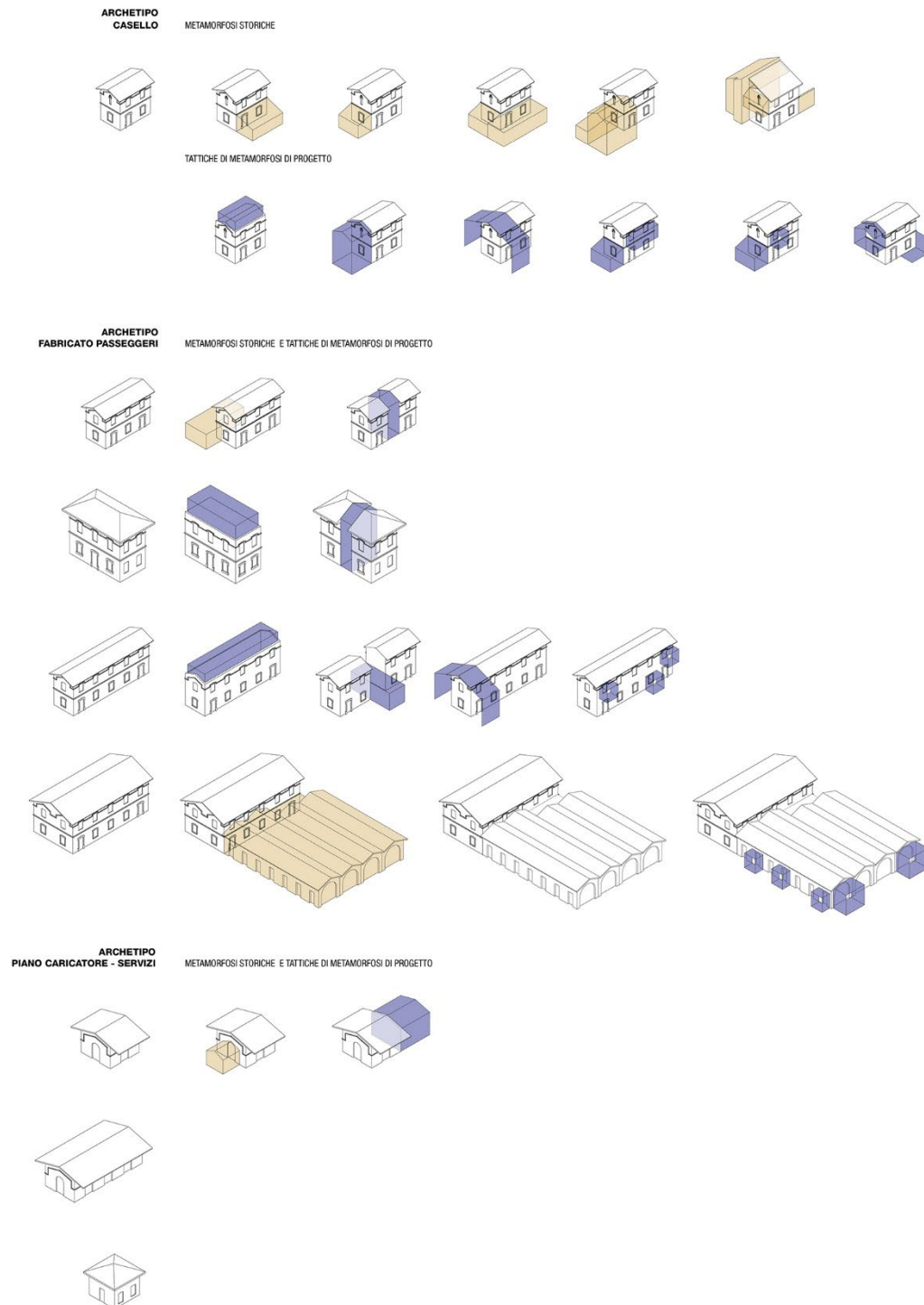


Figure 8. *Archetypes of Tollbooths, Passenger Buildings, Loader Plan, Warehouse and Service, Built from 1904 to 1909*
 Source: Valentina Radi & Alessandro Gaiani 2024.

Metamorphosis: Translation of the Archetype

After the accurate knowledge of the assets, one tackles the reasoning of relationships between the volumes, the sedimentary edges of each place, their memorial value and all the materials of nature that surround them, to enter into a post-natural mixture of unprecedented genealogical entanglements. Such an approach enhances the potential of the inherited and retroactively rehabilitated existing, taking it into the potential of a material resource, through the phases of:

- *Evaluation of the traces of the past*, the virtual railway track and the signs on the ground derived from the individual histories and layouts of small buildings.
- *Integration capacity in the logic of mutation*, preserving the traces as active signs on which applications of bodies variations of soils, interactions of networks are aligned.
- *Enhancement of the differences* between the architecture and the urban or natural settlement in which it is inserted.
- *Verifying whether the work in which one will intervene has a value of historical testimony or belongs to a lesser lexicon*, i.e. the selection of the object that has a memorial value with a lexicon proper to a tertiary destination with territorial derivation, immediately identifiable.
- *What new relationship scenarios does the place suggest*, in relation to the proximity of settlements, or of the landscape.
- *If the insertion of new needs is possible in relation to the existing structure/space*, an admissible opportunity both as a residence and as a receptive activity insofar as the dimensions of the rooms maintain the spaces required today, and are configured for additive actions, support and extension of the same or as spaces for events of a public nature or in/training paths.

These characteristics are also compared with the proposals for mutation that may be imagined, including architectural actions, intersections of paths, equipment to be inserted and activated, hypothesising scenarios, needs and internal-external relations, recorded in a dedicated part of the sheet.

The aptitude to actuate this approach of knowledge translation, will be operating in superimpositions and contaminations, aimed at creating a landscape based on additive syntagmatic architectural overwriting, which is activated with the ecosystemic synthesis between relations present in the environment and the formal idea. An approach of reprogramming the existing good will be used, since the material we are now called upon to manipulate is no longer primary “[...] It is no longer a question of the elaboration of a form on the basis of raw material, but of the processing of objects already in circulation in the cultural market, that is, objects already informed [...]. The concepts of originality (being at the origin of) and creation (creating something from nothing) slowly fade away in the new cultural landscape [...]”¹⁶.

This is also mindful of the integration of nature, as no city can live without the interspecific encounter of women, men, plants and animals celebrated by each

16. Bourriaud N (2004) *Postproduction. Come l'arte riprogramma il mondo*. Milano: Postmedia Books, p.7.

dwelling, as each city also lives off the “[...] body of plants and animals that are necessary to give life to all the men and women who live there, to provide shelter, tools, furniture, energy, oxygen. [...]”¹⁷. This will create a social reserve comprising all that is natural and unnatural that we want to subjugate, generating a new relationship, which includes not only the human being and his mineral products, but also all living beings in the ecosystem.

Immersed in the landscape context, we will concretise a vision of nature no longer dominated by architecture and human¹⁸, but an entity in which the anthropic and organic complexity of life on earth comes together, in which the archetypal structures lend themselves to continuous integration with the organic nature of the environment in the awareness of incompleteness within the evolution that through changes and adaptations, leads us to conceive the present as a continuous mutation no longer based on deterministic rules but in permanent connection with the course of events that authorises the coexistence of inclusive relations of different levels of reality.

Figurative Metamorphosis, of Destinations and Network Grafts

Focusing on the individual buildings, the metamorphosis based on syntagmatic overwriting will lead us to the prefiguration of the new as a post-natural combination, because it does not envisage a radical substitution of the existing, but a mutation of it in which the small human stories and the extraordinary evolution of nature that surrounds and penetrates it are intertwined. Faced with the three archetypes, composed of thought and type, each located in a particular site, one must trace the new thought to be formulated adaptable to the given type, which by reason of this will change its connotations through specific thinking tactics. The open, free works, predisposed to this regenerative reconditioning, will produce metamorphoses, which refer to situations present in nature:

- *Graft metamorphosis*, through landmark tactics, the box in the box and urban marker;
- *Parasite metamorphosis*, through the action of additive prostheses;
- *Boundary and edge metamorphosis*, through the provision of the porous margin or the thickness of the threshold or a new skin;
- *Metamorphosis of the interstitium*, through the tactic of infill or pocket park;
- *Metamorphosis of the ground level*, i.e. the plane where relations are born and germinate, through the tactic of the platform plane in the form of the void or fabric, and of the social condenser.

17. Coccia E (2022), *Metamorfosi. Siamo un'unica, sola vita*. Torino: Einaudi Editore.

18. Morton T (2016) *Dark Ecology: For a Logic of Future Coexistence*. Columbia University Press.

We are faced with a design strategy that is expressed in a symbolic temporal vision of the “poetics of relationships”¹⁹ by capturing the specificities of the place, of the surroundings, through a reduction to a single idea.

The architectures and their relations with the landscape context, will therefore be autonomous in form but will contain something that belongs to the context, emphasising the uniqueness of the architectural project designed according to the topography, climate and local resources, reducing the use of non-renewable resources and using design and technical knowledge in relation to traditional local constructions and innovation, resulting in something autonomous. This will determine their relational efficacy as a system of point sections, and cross-sections in situ that control wide landscapes and urban-natural lengths, imagining spatial interactions resulting from permissible destinations in them.

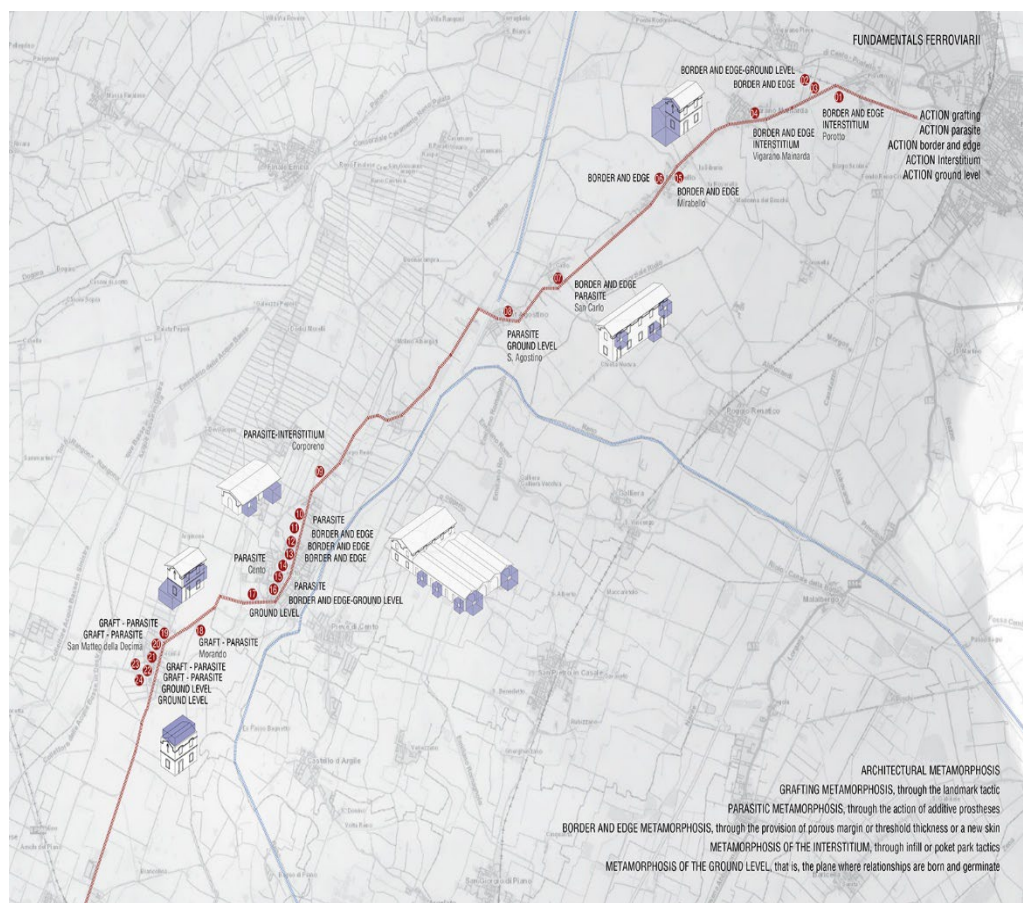


Figure 9. *Architectural Metamorphosis in the Railway line of Post-Naturality*

Source: Valentina Radi & Alessandro Gaiani 2024.

19. Glissant É (2019) *Poetica della relazione. Poetica III*. Macerata: Quodlibet.

Transitive and Functional Metamorphosis of Architectures

A design in which the assets gravitating on the virtual track of the railway, free and unencumbered, will be ready to accommodate new functions also linked to the characteristics of the places, transitive activities, effective in the self-determined time that every mutation requires, and at the same time capable of favouring inclusiveness with the new permissible mobility. In particular, in the passenger buildings, toll booths and loading floors, with warehouses and services we will find:

- *Metamorphosis of culture*, integration of libraries, multi-ethnic cultural centres, temporary exhibitions that characterise local creativity or intercept external brands;
- *Metamorphosis of sport*, spaces for walking, cycling, horse riding, canoeing, storage facilities;
- *Metamorphosis of receptivity*, unique or integrated activities, diffuse hotel, catering, gastronomy;
- *Metamorphosis of production*, enhancing food and pharmaceutical excellence,
- *Metamorphosis for innovation*, linked to products and investment sectors;
- *Metamorphosis of botany*, vegetable gardens, preservation of naturalistically protected areas, study, research and knowledge.

These functions may be mixed, hybridised, coexist or leave space alternately for one or the other, for the temporariness the place needs, allowing it to remain active, vital and productive.

The garrisons will all be points of passage and rest where one can find the pleasantness of a shelter, outdoor and indoor shaded spaces, with a drinking fountain and bench, for short stops for recharging bicycles, electric, outdoor or closed comfortable places, in all the stations, integrated in the context and with specific services or attractions, fixed or transitory. The fixed equipment of the facilities, with temporary destinations will be related to the character of the given asset and to community demands.

Additive Metamorphosis of Networks

These archetypes alone will be receptors of horizontal grafts, places of relational, inclusive and topographical design narratives generative of post-natural visions that will have to include in the metamorphic processes, the use of open systems, ecosystems in which to insert architecture, starting from the model of *greenways*²⁰ that connect the agricultural land, watercourses, buildings, a soft mobility at different levels of speed, integrating people from the different cultures that populate these lands, histories, traditions. As the infrastructures become an integral and load-bearing system in the relationships, for access to goods, new uses, and virtual connections between the different sites, which as road axes change with respect to the current state of affairs, incorporating what has been imported from the PTCP and PTVA of the

20. Rovelli R (2022) *Il riutilizzo delle ferrovie dismesse come greenways in Italia*, in Maggiorotti I (by) *Atlante delle greenways su linee FS: Dal disuso al riuso*. Rete ferroviaria italiana.

region, and develop their linear consistency of stretches, to integrate with the natural context and the reconditioned architecture:

- *Active and additive metamorphosis of cycle-pedestrian routes*, integrated from the current local, provincial and regional project consistency, intended for walking and sport.
- *Directional metamorphosis of bridleways*, adduction and additive for rehabilitative living species.
- *Metamorphosis of waterways*, for canals used in tourism, to enhance the agricultural fabric.
- *Metamorphosis for virtual connectivity routes*, between fundamentals, off-axis and global locations.
- *Metamorphosis of energy routes*, creating routes composed of level crossing rods and lighting systems integrated with panels and solar collection systems, for bicycle and mobile phone searches.

Functional enrichment of interactions, connectivity of existing and new networks combined with the re-functionalisation of architectural assets, post-natural *greenways* modelled in symbiotic form with nature and new opportunities for living.

Results

The method introduced, through the archetypes, will be able to put in place the valorisation of memory, and a territorial system, in the punctual work on places, rereading nature as places in which to fuse and open unprecedented relational interweavings with man, expressed in the regenerated form of architecture. The project will ensure that the original consistency of the railway infrastructure of 1906, an impenetrable and insurmountable line of caesura in the countryside decommissioned in 1956, will become a freed axis a widespread system of labile and open garrisons, constituting a corridor of porosity and passage between areas of the landscape. A dissolution in which the archetypal and memorial remnants are places always available for connection, inclusive towards the potential of neighbouring territories and provinces.

Una A built and relational consistency that is reversed, because it is no longer turned in on itself, but outwards, integrating a physical and virtual system predisposed to social and productive interchange. Passages of mutation in which each element may be seen as a whole reunited in unison, or separated punctually, sites in which the attribution of uses, integration paths and tactics applied to architecture, according to an open section trend may determine those overlaps, generative of conflictual and propulsive plurality. A set of small autonomous, shared and inclusive centres that form the *Post-naturality railway*. Let us take the case of *Fundamental Railways 18*, near Morando, to describe the mutation of an abandoned asset located near the State Road, at the irrigation canal, on green areas, which let us imagine:

- Uses receptive-production-botanical.
- Architectural action graft and parasite action.
- Integrative infrastructure Bicycle-Pedestrian-Canoe-Energy.

An effective system of interweaving in which all existing matter, ongoing and realised projects are included and a territorial and global interaction is visualised that takes place on the inclined planes where “[...] there are the broken segments of the fields stretching into the valley and in the broken lines of the hills that limit the horizon. Here the landscape is transformed into partial fragments that connect with the gestures of men. Like an editing machine, the garden dissects movements and reassembles them into new, unimaginable sequences. [...]”²¹. Active surfaces where the gestures and actions of bodies intertwine with the manipulation of materials and landscape segments in unpredictable constellations.

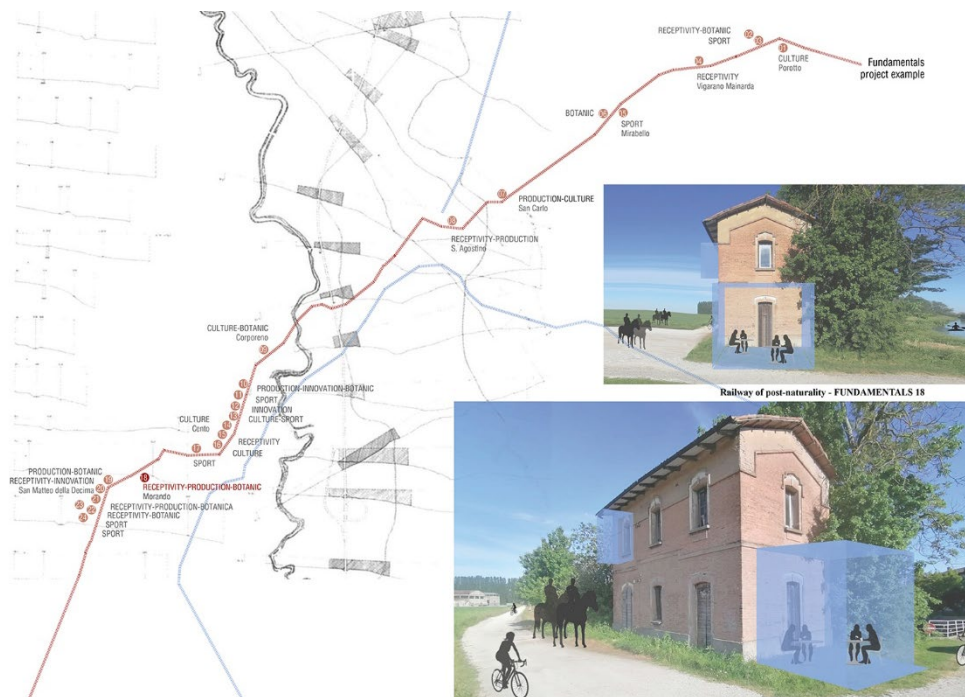


Figure 10. Architectural Metamorphosis in the Fundamental Railways 18

Source: Valentina Radi & Alessandro Gaiani 2024.

A methodological and planning approach that looks at large-scale planning and integrates the objectives of the Piano provinciale, improving the growth in presences²² compared to the post-covid crisis, which in 2020 recorded 319,099 presences in Ferrara and 396,622 in Modena, focusing on the landscape and cultural enhancement of the cities.

Choices corroborating the PTCP and PTAV, with the integration of nature trails in the cycle-pedestrian axes created in Porotto and in the municipalities of

21. As prefigured in Marco Navarra's exercise.

22. Annual report on tourist movement and hotel and complementary accommodation in Emilia-Romagna, year 2021, dated 15 November 2022.

Vigarano Mainarda, Mirabello, on the disused route, to complete the F1 Ferrara centre²³ route. Respecting and enhancing the areas of documented historic bumps and areas of environmental landscape value that wind along the former Ferrara-Cento-Modena axis and the area of the Reno river, cohesive with the 2025 PRIT for intermodality of station points. Going back to the 2023 transport white paper with the redevelopment of waterways²⁴, and inclusion of bridleways.

The proposed approach, the result of the research "Study aimed at the knowledge, recovery and enhancement of landscapes along the routes of disused railway branches" currently being developed at the Osservatorio per la qualità del paesaggio of the Emilia-Romagna region and the Department of Architecture of Ferrara, today sees the involvement of the Province of Ferrara, and seven municipalities pertaining to the entire area, which in the face of a choral planning, are making available all the programs, calls for proposals, projects in progress, pertaining to the different aspects of the work, hoping for a connectivity and inclusiveness of integration as broad and systemic as possible. In order to adhere to the determination of shared scenarios and shared coordinated design actions at the scale of architecture and landscape, to redefine the manipulation of materials and segments of existing landscape in constellations of effective, adaptive and changing communities, resources and productivity over time.

The Post-naturality railway will be a unique vector trajectory of quality and productive opportunity, sustainable, a pulsating union of human and economic energies, capable of systematizing local administrations that will find mutual benefit in the exchange between small villages and settlements, enhancing and bringing back into play the available building heritage, man and nature. The new links will allow an annual vitality and liveability of the places bringing circular benefits. Through the thematic routes a sense of belonging to larger territories will be created, and aimed at the present in a post-natural vision.

Bibliography

- AA.VV. *We? Postnatural Independent Program (PIP) 2023*. Madrid: Cthulhubooks, 2023.
- Bourriaud, N. *Inclusioni. Estetica del Capitalocene*. (Inclusions. Aesthetics of the Capitalocene). Milano: Postmedia Books, 2020.
- Bourriaud, N. *Postproduction. Come l'arte riprogramma il mondo*. (Postproduction: How Art Reprograms the World). Milano: Postmedia Books, 2004.
- Cerutti, M., and F. Bellusci. *Abitare la complessità*. (Inhabiting complexity). Milano: Mimesis edizioni, 2020.
- Coccia, E. *Metamorfosi. Siamo un'unica, sola vita*. (Metamorphosis. We are one, single life). Torino: Einaudi Editore, 2022.
- DeLanda, M. *A new philosophy of Society: assemblage Theory and Social Complexity*. Londra: Continuum, 2006.
- Dionigi, I. *Osa sapere. Contro la paura e l'ignoranza*. (Dare to know. Against fear and ignorance). Milano: Solferino, 2019.
- Dionigi, I. *Eredi. Ripensare i padri*. (Heirs. Rethinking the Fathers). Milano: BUR Saggi, 2012.

23. PTCP Provincia di Ferrara, Quadro Conoscitivo, punto 2.5, p.43.

24. Libro bianco dei trasporti 2023. Regione Emilia-Romagna. Riunione del 20/02/2024.

- Enza, S. A. *Il recupero dei tracciati ferroviari dismessi quale opportunità di valorizzazione paesaggistica e territoriale*. (The recovery of disused railway lines as an opportunity for landscape and territorial enhancement). Tesi di Laurea, Milano: Università degli Studi di Milano, 2019.
- Glissant, É. *Poetica della relazione. Poetica III*. (Poetics of Relationship. Poetics III). Macerata: Quodlibet, 2019.
- Goethe, J. W. *Metamorfosi degli animali*. (Metamorphosis of animals). Milano: SE piccola enciclopedia, 1986.
- Gros, P. *Vitruvio. De Architectura I e II*. (Vitruvius. Of Architecture I and II). Torino: Einaudi editore, 1997.
- Ingold, T. *Siamo linee, Per un'ecologia delle relazioni sociali*. (We are lines, For an ecology of social relations). Milano: Treccani, 2020.
- Koolhaas, R. *Fundamentals catalogue. 14° Mostra internazionale Biennale di Venezia*. Venezia: Marsilio, 2014.
- Morton, T. *Dark Ecology: For a Logic of Future Coexistence*. Columbia University Press, 2016.
- Muratore, G., and M. Vittori. *Angiolo Mazzoni (1894-1979) architetto futurista in Agro Pontino*. (Angiolo Mazzoni (1894-1979) futurist architect in Agro Pontino). Milano: Novecento, 2000.
- Navarra, M. *In walk about city 2.0. Architetture geologiche e faglie del tempo*. (In walk about city 2.0. Geological architecture and faults of time). Siracusa: Letteraventidue, 2024.
- Panconesi, M. *Quando lungo il Reno fischiavano le vaporiere. La Ferrara-Cento-Modena della Società Veneta e la Tramvia Bologna-Pieve di Cento*. (When steam locomotives whistled along the Rhine. The Ferrara-Cento-Modena line of the Società Veneta and the Bologna-Pieve di Cento tramway). Cento: Pavé, 1993.
- PTCP Piano Territoriale di Coordinamento per la Provincia di Ferrara 1997-2005.
- PTAV Piano territoriale di area vasta per la Provincia di Ferrara 2020.
- Purini, F. *L'architettura didattica*. (Educational architecture). Roma: Gangemi editore, 2002.
- Rovelli, R. *Il riutilizzo delle ferrovie dismesse come greenways in Italia*. (Reusing abandoned railways as greenways in Italy). In *Maggiorotti I* (by) *Atlante delle greenways su linee FS: Dal disuso al riuso*. Rete ferroviaria italiana, 2022.