

THE REGENERATION OF POST-INDUSTRIAL LANDSCAPES:

the role of industrial lands as we envisage our future cities

Anne-Marie Mitchell
C17477162
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And to my friends that I have made since first year, this journey would not have been the same without all of the love, laughs and tears that we shared. I am so lucky to have met such amazing, creative and caring people that I am proud to call my bestfriends.

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INTRODUCTION:

With the need for urgency with climate change increasing day by day, a look into the part played by the construction industry on this topic is crucial now more than ever. The world is at the edge of breaking point due to climate change. According to the United Nations High Commissioner for Refugees there will be an estimated 1.2 billion people displaced by 2050 as a direct result of climate change disasters. The threat of displacement is imminent and as we look forward and re-imagine our cities of the future we must change the way we think about how our cities can function for us.

The world urgently needs a radical change in how it approaches the construction industry. For a sustainable future we must make use of what built fabric is already here and retrofit our buildings to suit our needs as a society. The carbon that is released each year as a direct result of new buildings is a staggering 39% of our overall carbon emissions. It is our responsibility as architects to take immediate action to minimize this figure as we are the ones tasked to design these structures. Does this in turn imply that we need to change how we determine what buildings are suitable for retrofit? Do we need to be more open-minded and more creative in our approach to retrofit?

The purpose of this thesis is to demonstrate the importance of maintaining these industrial lands in the urban setting. This thesis will examine industrial estates as a suitable typology for retrofit while putting sustainable Irish industries on display.

“Together, building and construction are responsible for 39% of all carbon emissions in the worlds, with operational emissions (from energy used to heat, cool and light buildings) accounting for 28%”. (Irish Green Building Council, 2019, par.2)

I will start by defining what I mean by the industrial estate and examining its emergence stemming from the industrial revolution. I will outline why these landscapes become redundant and abandoned and the consequences of this. I have chosen three case studies which display the value and flexibility that these buildings and landscapes can have when an alternative approach is taken. I will first look at the Ruhrgebiet – an industrial landscape in Germany that has faced near extinction only to be brought back to life by its remaining occupants and now strives as a valuable architectural asset both historically and socially. I will then show how the idea of Interim Use is displayed in a post-industrial context in the RAW Gelände Berlin. The final case study that I will examine is that of MIT’s Building 20 as described by Steward Brand in his book “How Buildings Learn: What Happens After They’re Built” and his views on the use of “Low Road Buildings”. The aim of this research paper is to draw attention to the ideas from these case studies and see how these methods could be applied in an Irish context and more specifically in Tolka Valley, Dublin in aid to reduce the carbon footprint of the construction industry and improve this area of Dublin for the better.



Figure 1: Merchant and Makers Irish Linen- 19TH CENTURY (Katebirdk, 2015)

“Industrial estate” means an area of land used mainly for industrial purposes and purposes ancillary or incidental thereto and having on it at least two factory buildings.

-The Irish Industrial Development Act 1986

The industrial revolution began in Britain in the early 1730's. This meant the change from an economy of hand crafted manufacturing of goods to mechanical and industrial manufacturing. These new technological advances changed the lives of humans indefinitely. Up until then goods were produced primarily by hand, by people. The following were some of the technological advancements that took place at the time:

“(1) the use of new basic materials, chiefly iron and steel, (2) the use of new energy sources, ... (3) the invention of new machines, ... (4) a new organization of work known as the factory system, ... (5) important developments in transportation and communication”.
(The Editors of Encyclopaedia Britannica, 2022, par. 2)

A second industrial revolution occurred between 1870 and 1914. This was when industrial manufacturing took over most of the global economy. Although Ireland being a new country was bypassed by the most well-known industrial revolutions, we can still today see traces of the impact this revolution had on Irish Industrial Architecture. With new advancements in electricity and power, industrial architecture took a new form. Coal was the primary source of fuel that was used to power factories. A growing large-scale economy also meant that the architecture in which the manufacturing of goods took place also changed. This led to much larger spanning structures needed to house these new manufacturing processes.

The effects of this revolution are now being felt by the entire world. At the time, the building and construction industries were booming, creating the cities and connecting the nations that we have today while little was known about the effects these processes had on our climate. Our dependence on fossil fuels and the earth's finite resources is worse now than ever. As architects we must now consciously choose how we design and construct our buildings and cities of the future to limit the impact on our climate.

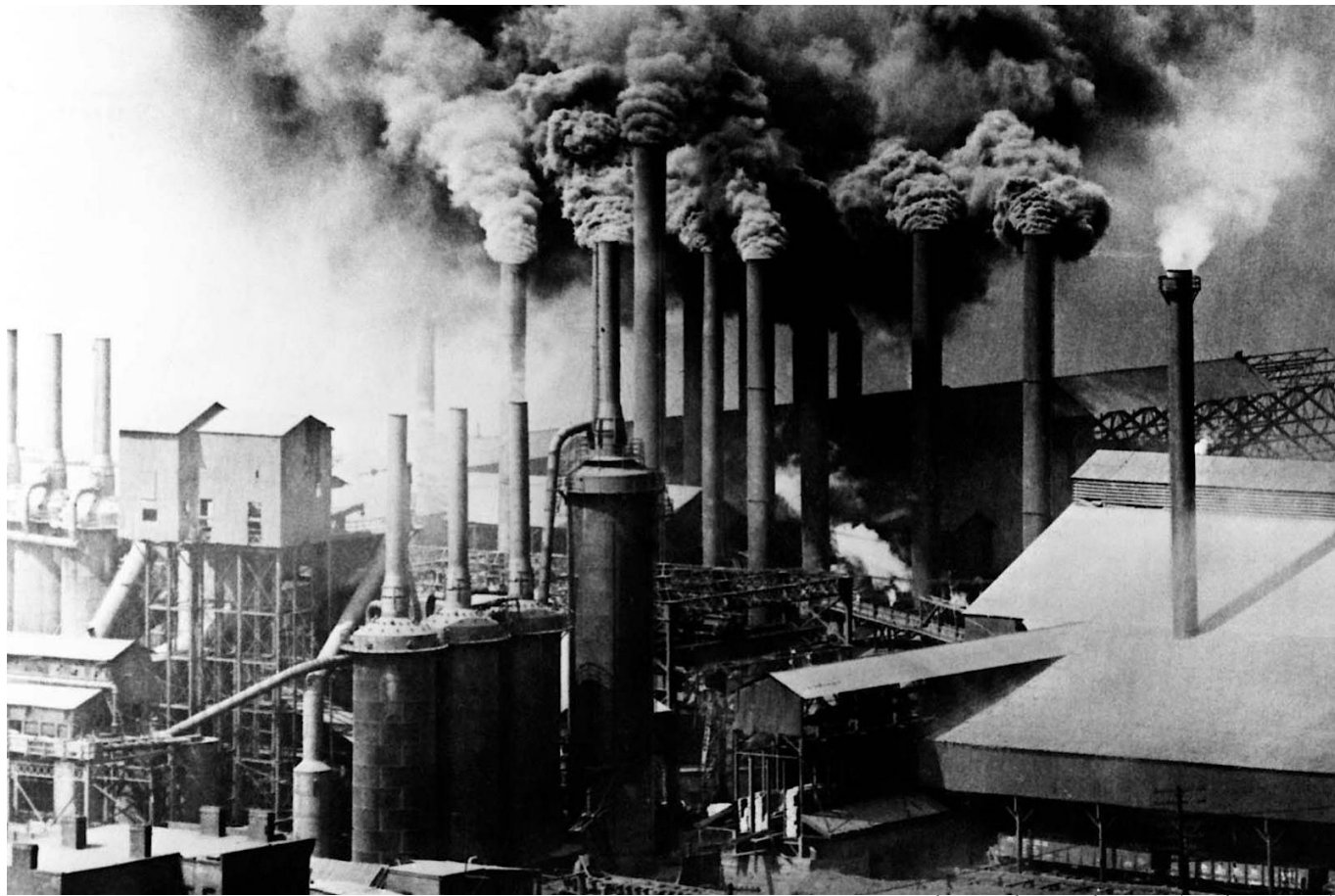


Figure 2 Industrial Revolution (Niiler, 2019)

In Ireland when we think of an Industrial estate we think of a place we bypass on the way to something else, large spanning buildings in urban locations with little to no architectural worth. We may visit them rarely when in need of something specific but they are never places we feel relaxed or comfortable in. A get in, get out approach while paying little to no attention to your surroundings. A monotonous rhythm of grey and white boxes surrounds us in these vast concrete landscapes.

As we move rapidly into the future what can these landscapes hold for us?



Figure 3 Raheen Industrial Estate Limerick, (Garland,2007)



Figure 4 Ruhrgebiet 1949 (Stachelscheid, 1949)

The de-industrialization of the Ruhrgebiet, located in West Germany is a prime example of the transformations that areas went through during technological and industrial advances. These industrial sites usually popped up in areas of land that were vast with plenty of room for expansion, generally rural towns on the edge of cities.

“What in the 1750’s was a pastoral landscape of small old towns, farms and cottages, industries transformed in a few small decades by steam engines and manpower into an unfathomable agglomeration of city, settlement, and industry”. (Polini, 2021, p. 8)

This statement demonstrates the changes that occurred in these rural areas as a result of the introduction of industry in the area. In the late 1900’s technology began progressing and developing rapidly. The older generation of industrial sites could not keep up with these new advances and these areas of industry began to shut down, this was the case at Ruhrgebiet. In this instance the outcomes were that the industrial areas were either left to rot and fall into disrepair or to be hollowed out and replaced with the newest version of industrial architecture. The legacy of the industrial heritage is something that symbolizes the changes an area went through at a specific point in time. This is something that holds value in a historical educational sense. These were the views of the people in Ruhrgebiet.

“The grassroots groups that first claimed and defended workers’ housing settlements 40 years ago has lasting effects, not only paving the way for widespread acceptance of conservation of the industrial heritage but also ultimately helping to establish this as an integral element of regional planning”. (Polini, 2021, p. 9)

The plan for the people spearheading this movement was to attract people to the area with new prospects of employment and education. Since the industry had shut down in the area the local people felt there was no longer a purpose for them to live in Ruhrgebiet. The industries decline led to social and economic issues in the area; however, they saw the remnants of the past as an opportunity to invite new industries to the area while also conserving the history of the area.



Figure 5 Workmen in the Ruhr region c.1928 (Baker, 2019)

“Providing better prospects for workers and solving social problems. In the Ruhrgebiet, conservation, specifically conservation of the remains of industry, is a creative tool for democratic and social progress, rather than a way to simply memorialise the past.”

(Polini, 2021, p. 9)



Figure 6 Ruhrgebiet – Surrounding Land Use (Oberhäuser, 2019)

The plan for Ruhrgebiet was to introduce a new wave of industry to the site. The chemical industry was first attracted to the area due to the scale of the industrial infrastructure left behind. The speed at which the chemical sector progressed meant that this sector was a suitable, economically sustainable choice for the area. With new education and employment in the area there came a need for the supporting elements of these sectors. A reuse masterplan was put in place to house the new facilities needed to support the chemical industry in the buildings that were already on-site. The approach of reuse in this instance had many benefits including: Protecting existing carbon in the buildings, maintaining the existing urban fabric of the area and enhancing the culture and history of the area. The “glue” that held the area together was a network of bicycle and pedestrian paths that meanders along the entire site.

“In this way, the image of the industrial city can change, enhancing the history of the place and creating spaces to concentrate the cultural life of a city that increasingly needs an identity”. (Polini, 2021, p. 94)

The success of Ruhrgebiet was down to the overall masterplan that was created for the site: 1. The invitation of new industry 2. The reuse of existing buildings 3. The sustainable transport network on the site that connected the users to every element of the area.

Another case study that deals with the retrofit of buildings through the idea of “Interim Use” is RAW Gelände, central Berlin. At its core RAW is a collection of abandoned and derelict buildings in Berlin. What was originally a train repair station from 1867-1994 is now a host of a variety of subcultural activities. The area is a free space for creatives of all kinds that is host to and indoor skate park, a wall climbing space, Sunday markets, night clubs and bars. The program of this area grew organically in the derelict spaces, leftovers of urban planning and what took place was an underground growth of natural development of the area which was micromanaged by the people that found solitude in these spaces.

“Besides stimulating the development of the immediate vicinity, the temporary appropriations suggested a typology that could be integrated in a new formal proposal for the area. In this way, communities and users found themselves actors in the regeneration of this new place. A hybrid morphology emerged, generated by a bottom-up process merging with a top-bottom approach.” (Nisenbaum, 2008, p. 56)

This approach was supported by businesspeople as well as the local authorities. The local authorities supported these business owners by allowing for short term planning permissions or in some cases their planning permissions were not at all necessary. “The reform of German federal building legislation in 2004 made possible to grant planning permission for a limited period”. (Nisenbaum, 2008, p. 57) This allows a trial period in which the business owner can see success or failure in the business idea or amenities they propose which allows for an organic growth of the area. This removed the lengthy wait for planning permission for change of use of a building.



Figure 7 RAW Gelände (Berlinaffin, 2019)

“They find alternative ways of dealing with the lack of money by recycling, exploiting local materials and so forth”.

(Nisenbaum, 2008, p. 56)



Figure 8 Derelict Train Repair Station now used as Climbing Wall (Herde, 2017)

At RAW they created a successful sustainable system of using the existing resources, readily available on the site. This maintains a strong architecture of place by not interfering with the existing building fabric but by occupying the space as it stands.

“They begin from the principle of what is already there, not what they would like to be there. Temporary users appropriate space using minimal capital, exploiting as much as possible local resources, dealing with small time frameworks, working with local specifics, and considering community’s need”. (Nisenbaum, 2008, p. 56)

This raises the question as to whether we need to be more open-minded when it comes to retrofitting existing buildings and force ourselves to do more with the sustainable materials we have here in Ireland. One of the key factors when discussing RAW is that there was a severe lack of funding and capital used to create this area. When they could not rely on expensive new materials they were forced to make do with what they had in the vicinity. An example of this is the volleyball courts in Tier Garten that used left over materials from building construction that went on previously in Berlin.

The key to the success at RAW was their reliance on local materials. If there was a more resourceful approach taken in sourcing materials this would greatly reduce the impact of construction on the environment. Ireland as a country has something to learn from this. In 2022 we imported €317.68 million worth of building materials such as stone, plaster, cement, asbestos, mica or similar materials according to the United Nations COMTRADE database on international trade.



Figure 9 MIT's Building 20 (Schaffer, 2012)

Steward Brand wrote about a building typology called “Low Road” buildings in the book “How Buildings Learn”. Low Road buildings are the most suitable typology for comparison to the buildings that occupy industrial estates across Ireland. These buildings were often old manufacturing spaces, sheds, or storage areas. They were medium to large scale buildings with a lot of room for flexibility. The reason for the attraction to these buildings was that they are not precious pieces of architecture but rather the occupants could essentially do what they want to them and reconfigure them to suit their needs. “They are shabby and spacious”. (Brand, 2012, p. 24). The key fundamental characteristic of these buildings is that were unprogrammed and unrestricted.

MIT’s building 20 is described by Steward Brand as a Low Road building. This building was designed during World War II. It was a framed building made from large timber elements. At the time steel was in scarce supply due to the ongoing war and to meet the fire code standards it was intended that this timber building would be a temporary structure. The horizontal layout of the interdisciplinary building meant that it was suitable for a variety of uses. This building gives the occupant “The ability to personalize your space and shape it to various purposes”. (Brand, 2012, p. 27) Morris Halle said when speaking to Stewart Brand about Building 20 “One never needs to worry about injuring the architectural or artistic value of the environment”. (Brand, 2012, p. 28)

Scarcity of materials is something that affects the construction industry to this day. As we rely on supply chains that are unpredictable and often affected by world events such as wars or the global pandemic of Covid 19. The construction industry has seen material prices sky rocket over the past number of years for imported goods. This highlights Ireland’s need for self sustainable industries but also in how we view suitability of buildings for retrofit. The program at MIT’s building 20 was constantly evolving and is a clear display of the capabilities of buildings for retrofit and reuse.

“Low Road buildings are low-visibility, low rent, no-style, high turnover. Most of the world’s work is done in Low Road”.
(Brand, 2012, p. 24)

Throughout history the rezoning of industrial areas has led to the gentrification of areas. The reason for this is that people often find themselves taking refuge in these abandoned and run-down industrial areas. Using these low value places as a place to experiment and progress their work. An example of this can be seen at So Ho in Manhattan. What are now known as loft apartments were originally manufacturing spaces. These units were wide open spaces with large windows – perfect for large scale canvases and creating art pieces. The new technology of cast iron in the 1800’s allowed for the large windows providing endless natural light to rooms. The artists in the community then lobbied for the areas to be rezoned so that the artists could live there. The result of this rezoning was a vibrant arts community filled with creatives and art galleries. “Eventually it becomes fashionable, with trendy restaurants, nightclubs, and galleries. Real estate values rise”. (Brand, 2012, p. 28)

“Economic activity follows Low Road activity”. (Brand, 2012, p. 28) The problem arose when the upper-class people then saw these units in a different light, they had great open plan space and natural lighting. This led to the gentrification of the area. The rich moved in, and the local artists could no longer afford to live in the area.

It is important to acknowledge the issue of gentrification associated with this approach. The rezoning of industrial lands across Dublin has not always bore fruit to a more progressive city. We have already seen this occur with the rezoning of lands increasing the value of land with the false promise of housing developments being placed there. There is also the issue of the effect this rezoning had on the local people in the area of Manhattan, suddenly social class divisions became evident and the people that created the area to be what it was were displaced.



Figure 10 So Ho Loft Apartments (New York Times, 2018)

In Ireland, we are currently at a junction in which we could draw some ideas from case studies like the ones mentioned previously. In particular we have many industrial estates across the country that are at the brink of redevelopment. There are a few lessons to be learned from analysing these case studies both in terms of success as well as some reasons as to why some methods may night be applicable to Ireland.

Overall, the Ruhrgebiet is a very successful and interesting case study. While several elements of this case study could be used in Ireland, I believe that the retention of industry and enterprise in the area is a the most relevant one to the location in Tolka Valley. Dublin Industrial Estate is home to several industries and businesses. In order to meet Number 9 of the Sustainable Development Goals: Industry, Innovation, and Infrastructure we must sustain the industry in the area and develop new, sustainable industries such as Irish building materials production. This will create employment and education opportunities in the area which is key to a sustainable community.

The difference however between Ruhrgebiet and Dublin industrial Estate, Tolka Valley is that the Ruhrgebiet was in its day a large-scale heavy industrial production site while Dublin Industrial Estate is light industry. This difference leads to a vastly different architectural landscape to work with. In reality, the Dublin Industrial Estate is made up of rows of similar sheds with little to distinguish them from one another, as opposed to the grand, eye-catching chimneys from factories, enormous mills, or “monuments” of the past. One must wonder whether these asbestos lined sheds are worth keeping and retrofitting. We need to strike a balance between embracing the ugly and accepting these “Shabby and spacious” (Brand, 2012) sheds, and producing high quality environmentally sustainable architecture that is resilient.

The success of Raw Gelände is due to a number of reasons but it cannot be denied that leniency of the local authorities with regards to planning for interim use is a key factor of its success. As mentioned above people were able to apply for short term planning and in some cases did not need any planning at all for their use of the site. The elements that are holding Ireland back from successfully achieving something like RAW Gelände is the planning processes and regulations. Ireland could learn something should it look at the systems in Germany that allow for this temporary use. If you walk by any town in Ireland, you will see building after building on the street-scape derelict and dilapidated.



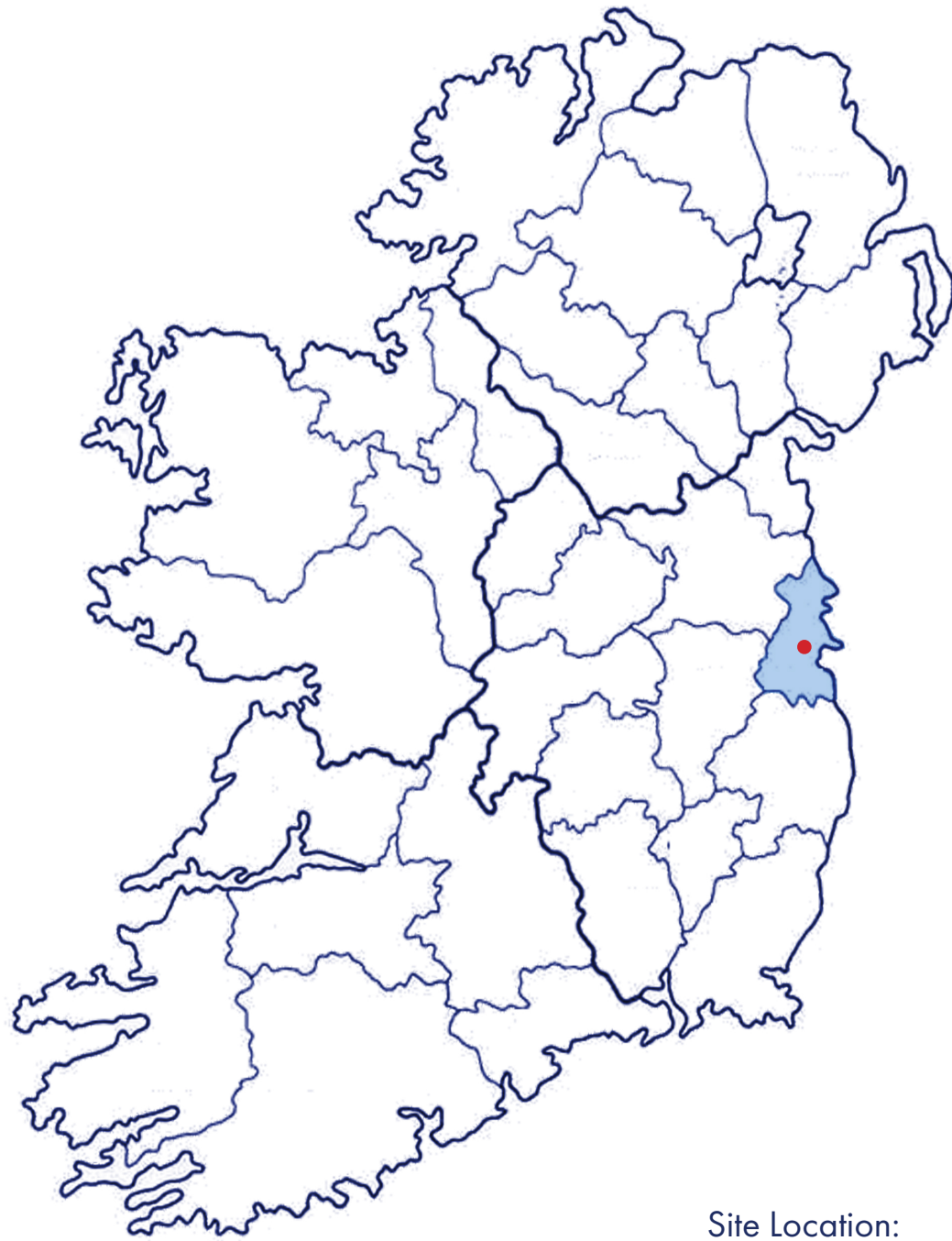
There are of course some downsides to this idea of temporary use, one being that without proper construction methods and quick off the cuff assembly a sustainably built architecture does not evolve.

Number 8 of the Sustainable Development Goals of the United Nations is Decent Work and Economic Growth. We must plan our cities with working class employment opportunities in mind to support the suburban working class areas that we see across Dublin. The introduction of sustainable Irish industries would not only increase employment but also improve Ireland's economy.

The success of MIT's Building 20 lies really in the flexible design of the building. The large horizontal floor plans brought a building that could change to suit each users needs. The lessons that could be learned from this is when we as architects are in the design phase that we are thinking also about the possibilities for retrofit in the future and how this building could be easily changed to accommodate something else. Building after building is being torn down in Ireland and replaced. Our cities are losing their identity and their street-scape. Dublin is on the verge of being unrecognisable to people that may have been here less than 20 years ago. With how fast the demands of our economy are changing these days we must build an architecture that is flexible in order to build a resilient city.

The use of the sheds that currently lay idle in industrial estates across Ireland also should be re-imagined. The result of this could see a new industrial revolution in Ireland with class and social divisions being broken down as people from multidisciplinary backgrounds work together.

Tolka valley is an inner city suburban area located around Finglas, Glasnevin, Cabra, Ashtown and Pelletstown. Notably the area contains Tolka Valley Park, a large public park of nearly 300 acres, Dublin Industrial Estate, Glasnevin Cemetery and the Broombridge transport node. These areas are framed by the Tolka River and the Royal Canal.



Site Location:
72-74 Bannow Road,
Cabra West, Dublin
53°22'08"N
6°17'19"W

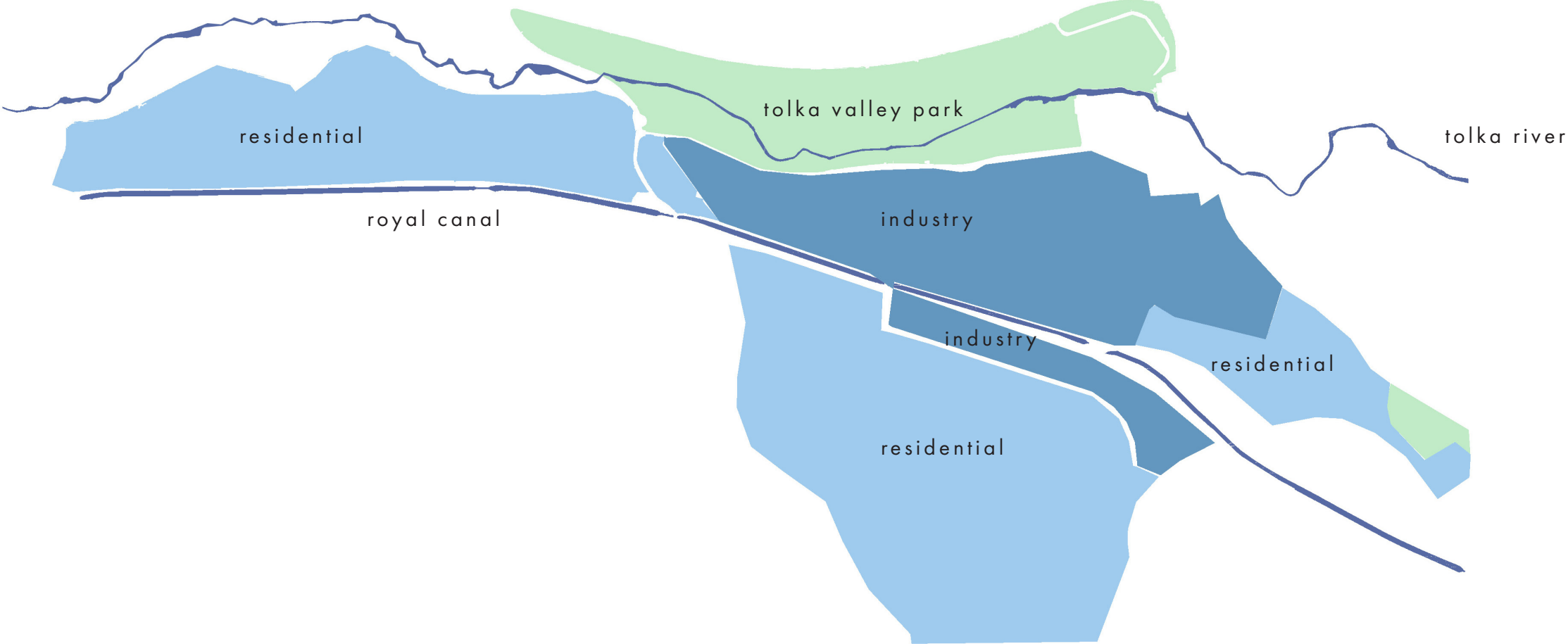
tolka valley aerial view - Figure 11 (Google Earth,2023)



tolka valley rezoning

The subject of rezoning is ongoing at present for many industrial estates around Dublin. In first semester our group project looked at the topic of Future proposals and current discourse. We learned about The City Edge Project is arguably the largest scale rezoning of Industrial lands that Ireland has seen at present. What was highlighted to me during this research was the issue of rezoning industrial lands across Dublin. The Dublin City Council has already rezoned areas of industry previously zoned as employment and enterprise to sustainable residential neighbourhoods.

land use in the tolka valley:





www.independent.ie

Glasnevin industrial unit will present a range of prospects

Dublin Industrial Estate in Glasnevin has long been identified as being suitable for rezoning from industrial to residential development, due to its proximity to the city centre. A property that has come for sale there may appeal - not alone to possib...

Figure 12 (Buckley, 2021)



dublininquirer.com

Council Is Preparing to Rezone Lands Across the City for Housing, But Waiting a Bit Might Bring More Benefits

A new law due to come in by the end of this year would mean when councils rezone land for homes and its value shoots up, they'd get 30 percent of the increase.

Figure 13 (Neylon, 2022)



IT www.irishtimes.com

Plans lodged for mixed-use development in Broombridge

Proposal aims to replicate Grand Canal Square in city docklands

Figure 14 (Deegan, 2022)

After Lobbying to Get Coolock Site Rezoned to Build Homes, Landowner Instead Looks to Sell It at a Steep Markup

"We chose to buy this site to try to create affordable housing for normal people," wrote the developer in a letter to a local councillor in

Upvalue of rezoning of the land in Coolock

2016 - €2.55 million

2021 - €25 million

Figure 15 (Kapila, 2023)

I am a final year Architecture student at Technological University Dublin. As part of my final year thesis project I have been studying the Tolka Valley and more specifically the Dublin Industrial Estate. I am writing to you in reference to Chapter 14: Land-Use and Zoning from the Dublin city Development plan 2022-2028

I wish to highlight some issues around the rezoning of Industrial Land Z6 Employment/Enterprise that is ongoing across industrial zones throughout Dublin. With the current housing crisis that Ireland faces the rezoning of land to residential use is of utmost importance. However I strongly believe that protecting the location of Irish industries within the urban context plays a vital role in the bid to build a sustainable inclusive city.

Industrial areas provide employment for low skilled labour. According to the Dublin city Development plan Chapter 6: Economy and Enterprise these low skilled trades make up 60% of the workforce in Dublin with “40% of people educated to third level or higher”. This labour intensive employment is critical in areas of deprivation which includes areas in the Tolka Valley and Cabra West. The importance of industries to Dublin’s economy cannot go unnoticed with industries such as “manufacturing and construction making up a total of c.19% of Dublin’s Economy” according to Chapter 6: Economy and Enterprise of the Dublin City Development Plan 2022-2028.

For decades, the Dublin Industrial Estate and surrounding residential areas have had a symbiotic relationship dependent on local employment and labour intensive workforce. The Dublin Industrial Estate, Broombridge Business Centre and adjacent industries on Bannow Road are part of a critical employment node that supports the surrounding suburban residential areas of Cabra, Finglas and Ashtown. Residential settlements across Dublin such as the Cabra housing scheme were strategically planned to go hand in hand with industries such as Bachelors Beans on Bannow Road that employed up to 3000 people at once in the past. The Cabra housing schemes were built under the belief that housing schemes must be supported by industry. This created a socially inclusive workforce in the area that was attainable to the working class.

To my surprise when analysing the Dublin City Development Plan 2022-2028 the area previously zoned as Z6 Employment/Enterprise on Bannow road has now been rezoned to Z1 Sustainable Residential Neighbourhood. It is my strong opinion that working class areas such as Cabra West are at the cusp of gentrification similar to inner city areas such as Ringsend which was once a bustling industrial area supported by the working class. According to Chapter 6: Land Use and Zoning “the remaining Z6 lands constitute an important land bank for employment use in the city, which is strategically important to protect.” Should this be the view of Dublin City Council the rezoning of Bannow Road to residential in my opinion is strategically the wrong move. The area as of now is suffering due to social deprivation.

The protection of Irish sustainable industries would address the issues surrounding unemployment, social exclusion, anti-social behaviour and gentrification. Industrial areas across Dublin are in need of some revision and intervention however wiping out their existence in the urban setting and placing them to the fringes of the city only encourages urban sprawl and segregation of the working class.

The remedy for this in my opinion is to take a fresh look at the structure of Irish industries and their position in society to succeed in forming sustainable cities. A re-imagined look at industries, upskilling, trade based labour and the working class would reap a world of benefits to the Irish economy.

Thank you for taking the time to read this observation.

area zoned as employment and enterprise



highlighted in blue / area rezoned to sustainable residential neighbourhood



“you cannot re-house a population of 15,000 people...without providing for the other necessities and amenities of life.”

- Herbert Simms (Fallon, 2021)

the social divisions of west and east cabra

As one walks through Cabra East to West there is a strong sense of social divisions, deprivation and degeneration as you move further West. Cabra West is the area that is linked more closely with the Tolka Valley. The area suffers from social issues and antisocial behaviour. The area was originally council houses and was planned with the idea that the areas would be supported by employment by industries such as Batchelor's Beans. The working class area was dependent on this industry for employment opportunities however nowadays the area suffers from unemployment which leads to anti social behaviour. Right now Cabra West is very much on the verge of gentrification with local people suffering due to rent increases and displacement. Similar to Ruhrgebiet we must find a solution to offer these working class people new prospects in order to solve these social issues before the Cabra we once knew is long forgotten.

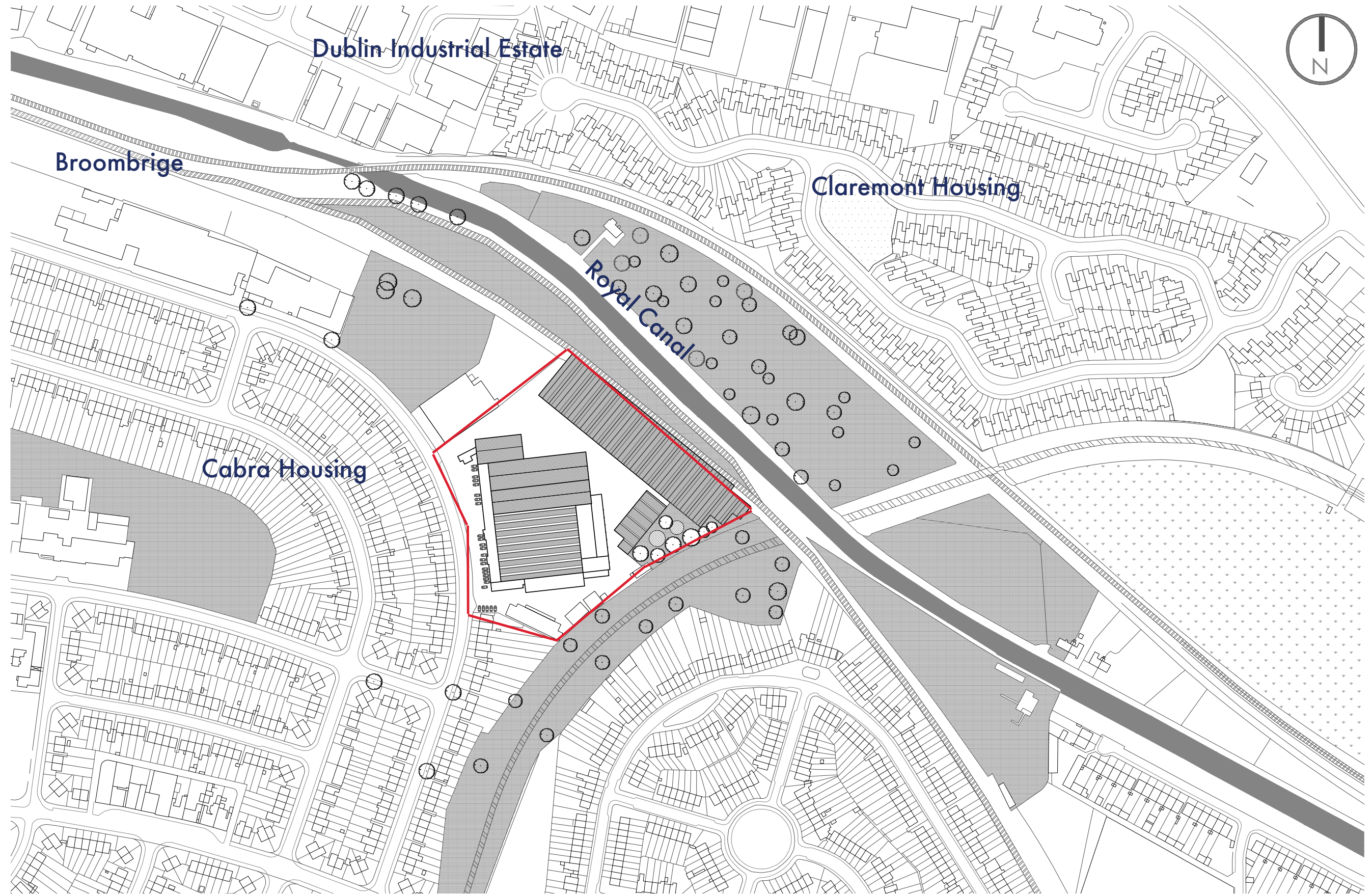


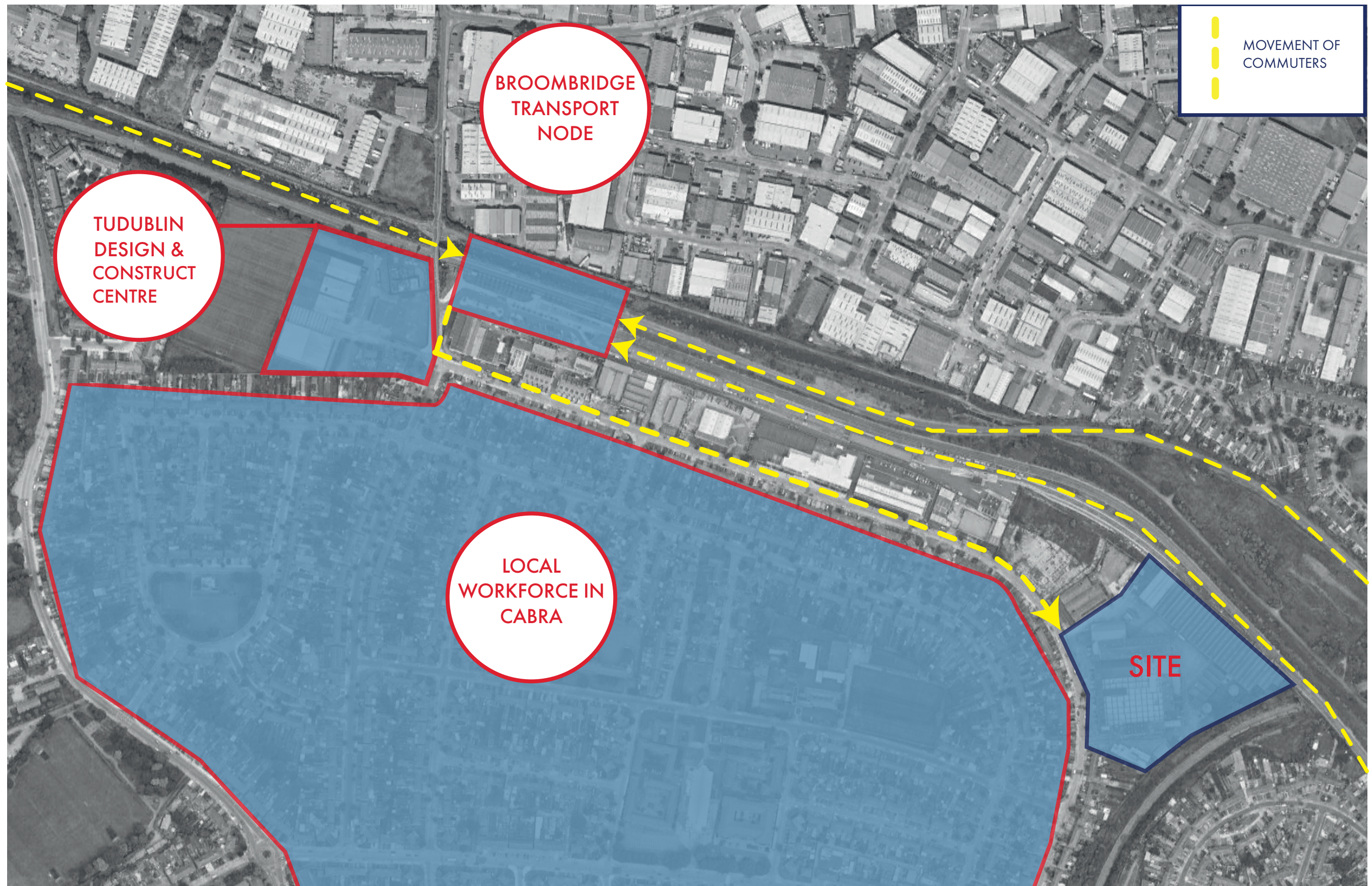
Figure 16 (Batchelors 2021)



Figure 17 (Curran, 2019)



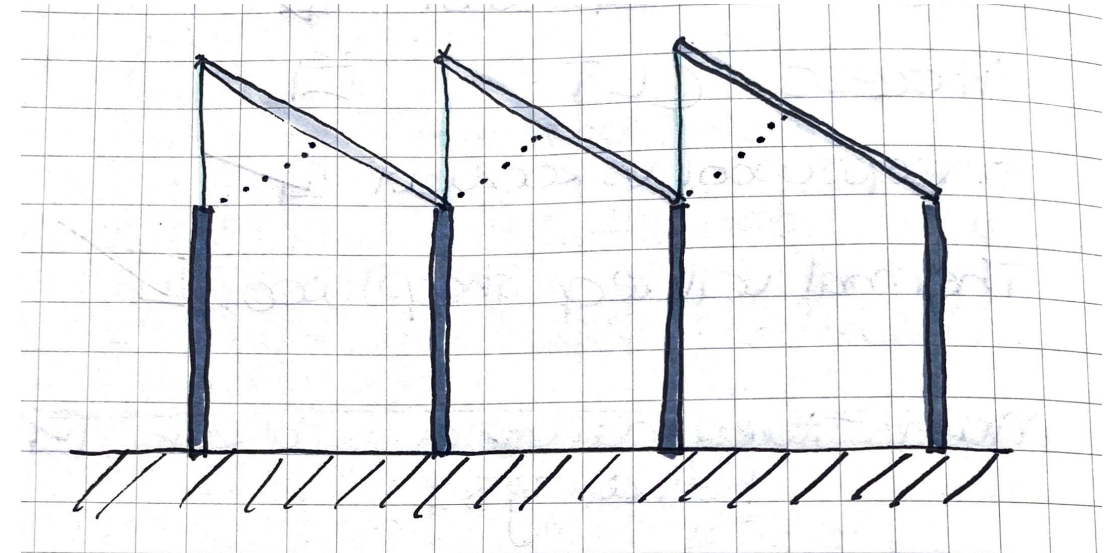




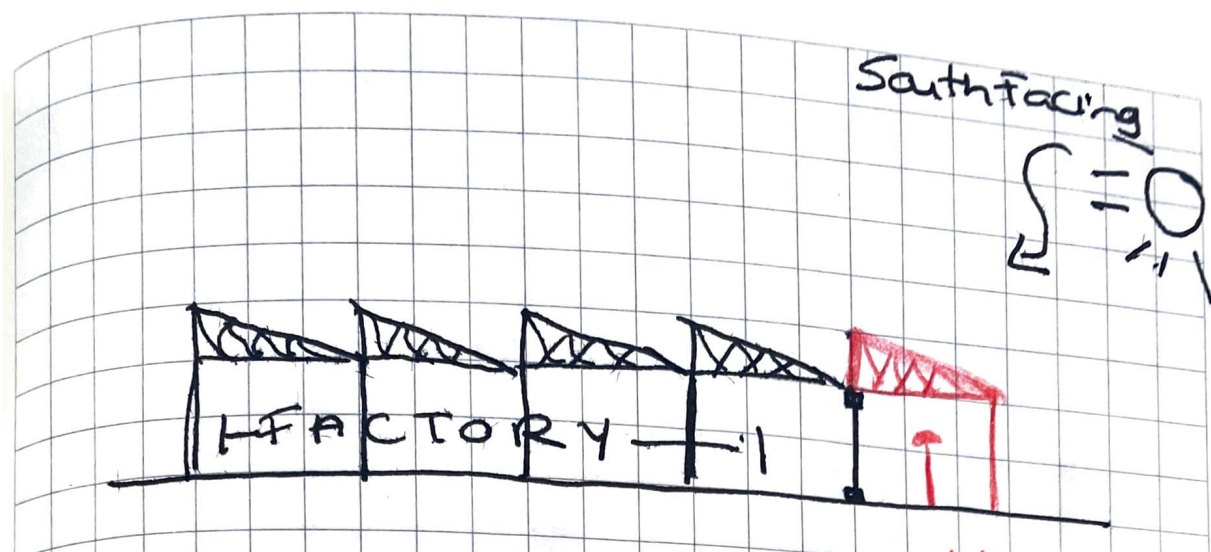
existing site and context

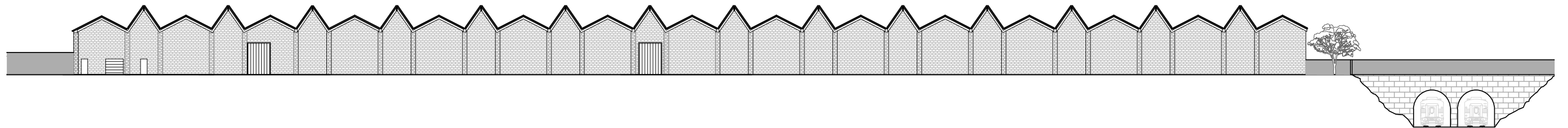
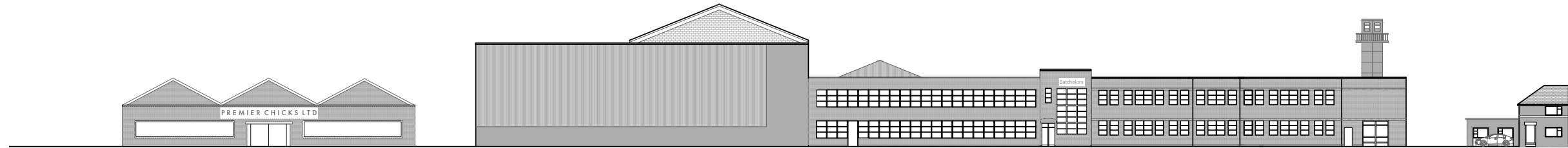


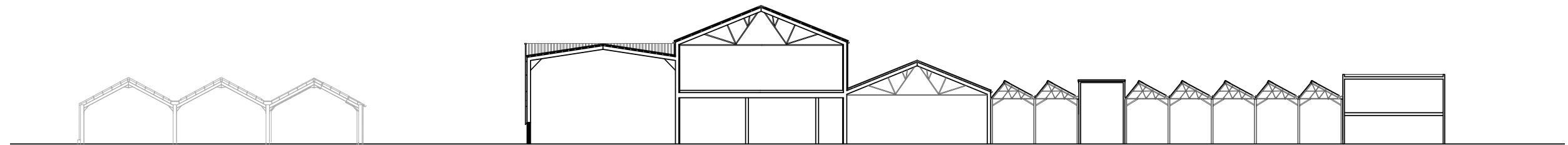
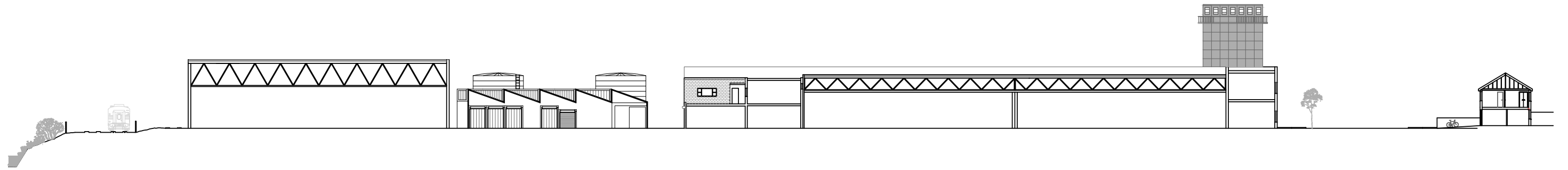
Figure 18 (Google Earth, 2023)



existing saw tooth roofs



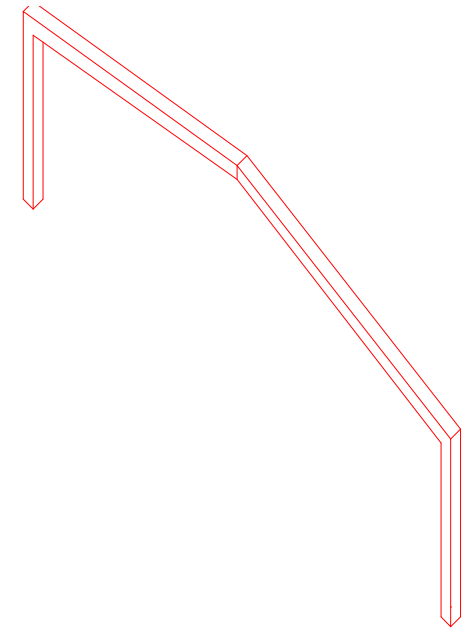




audit of existing structure

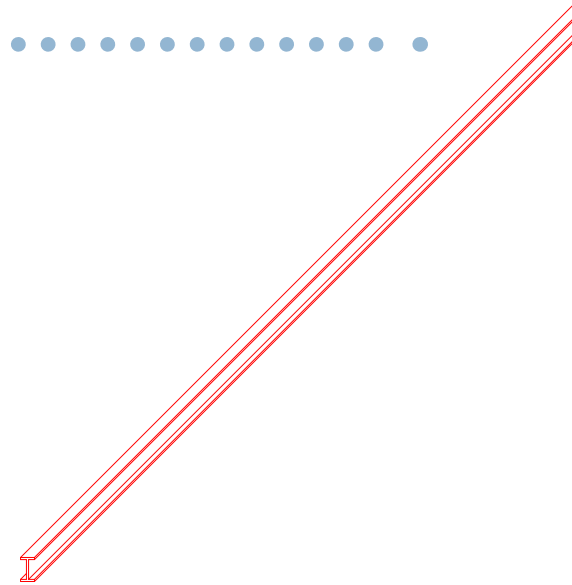
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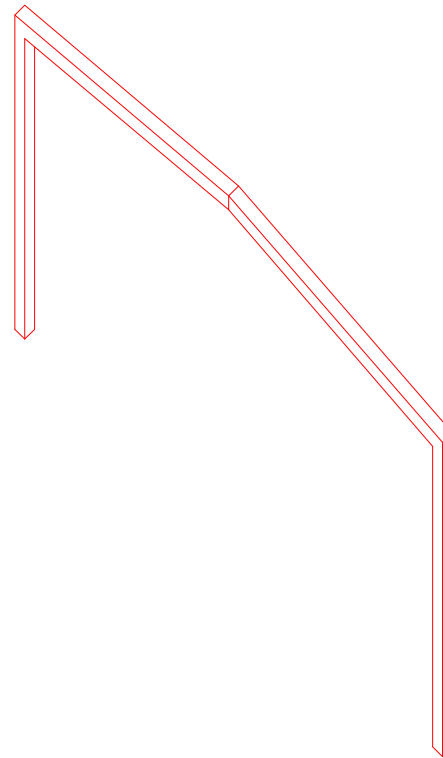
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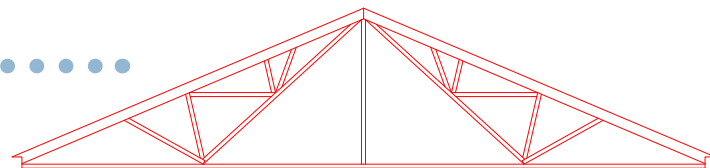
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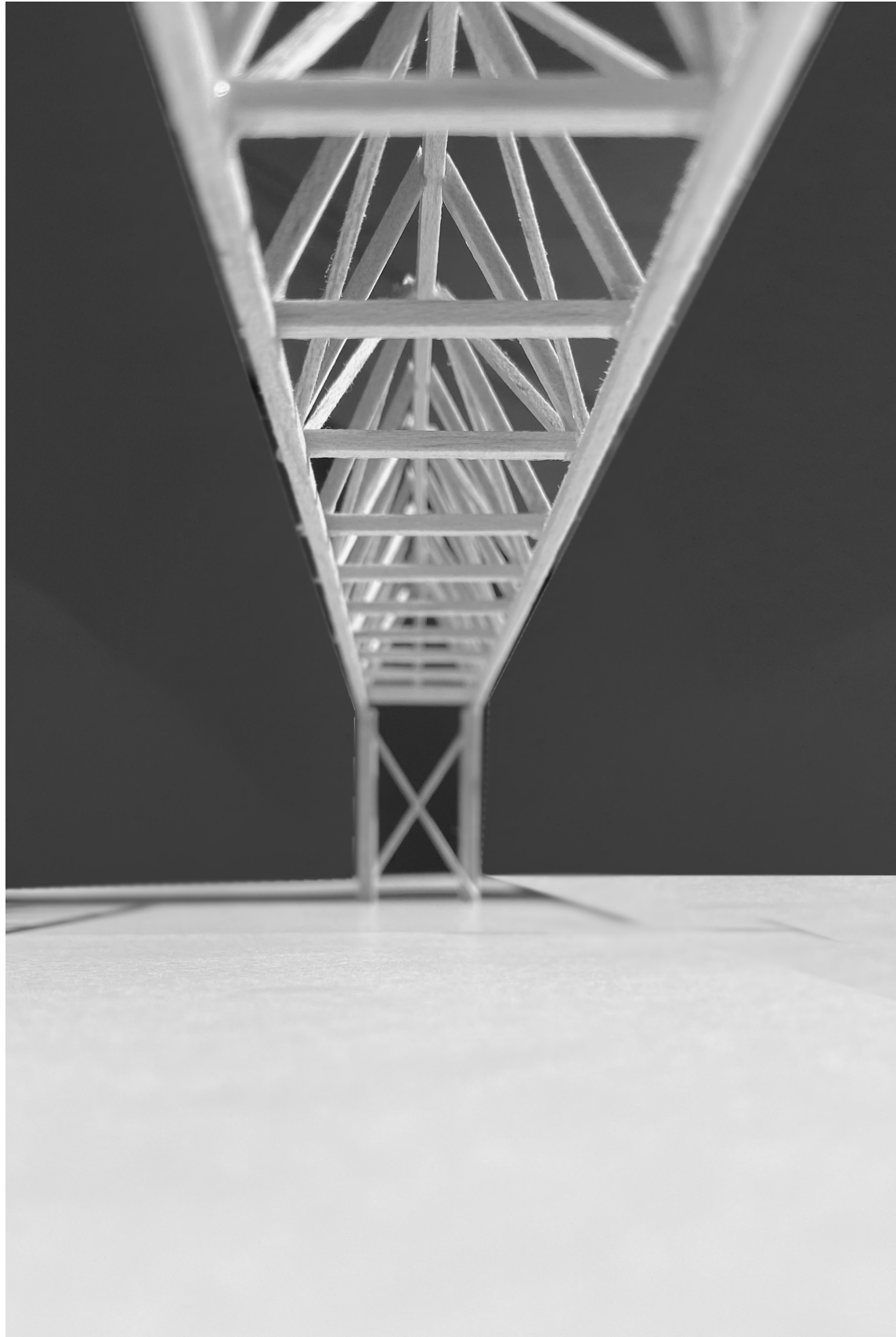


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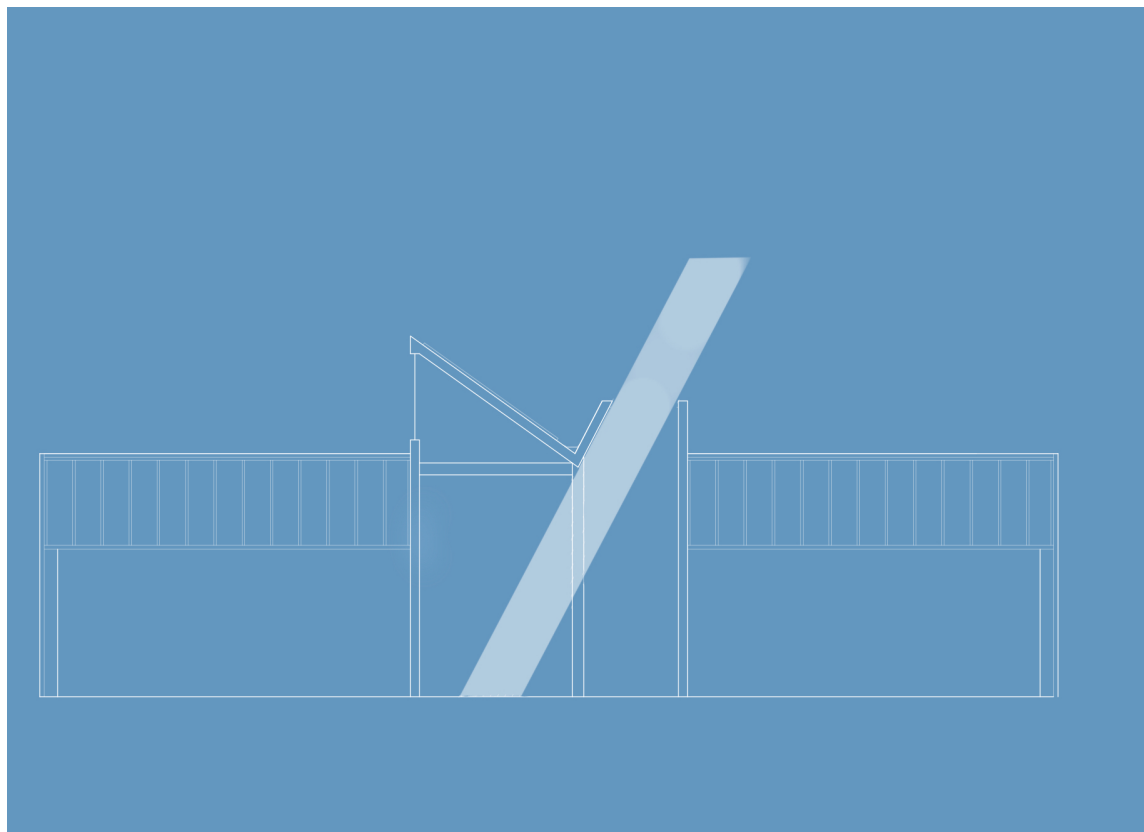
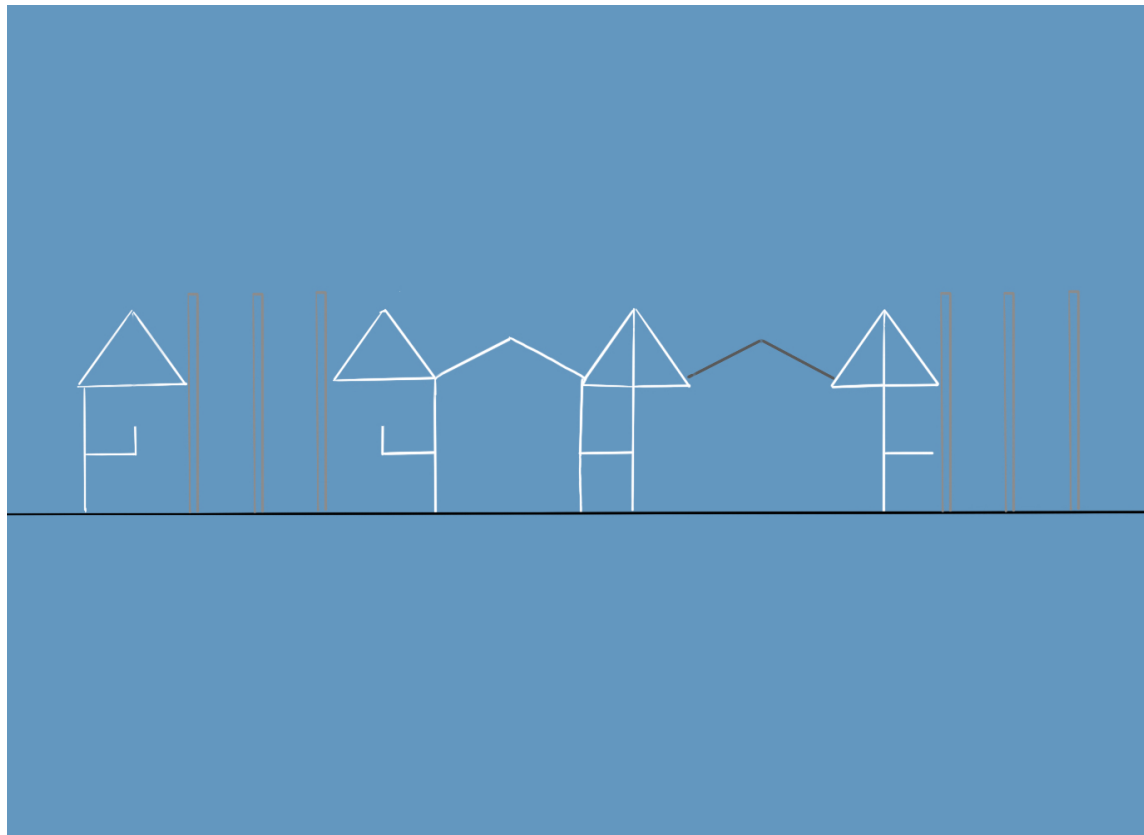
Quantity:
12



understanding the existing roof-scape



experimenting with the existing roof-scape



experimenting with the existing roof-scape

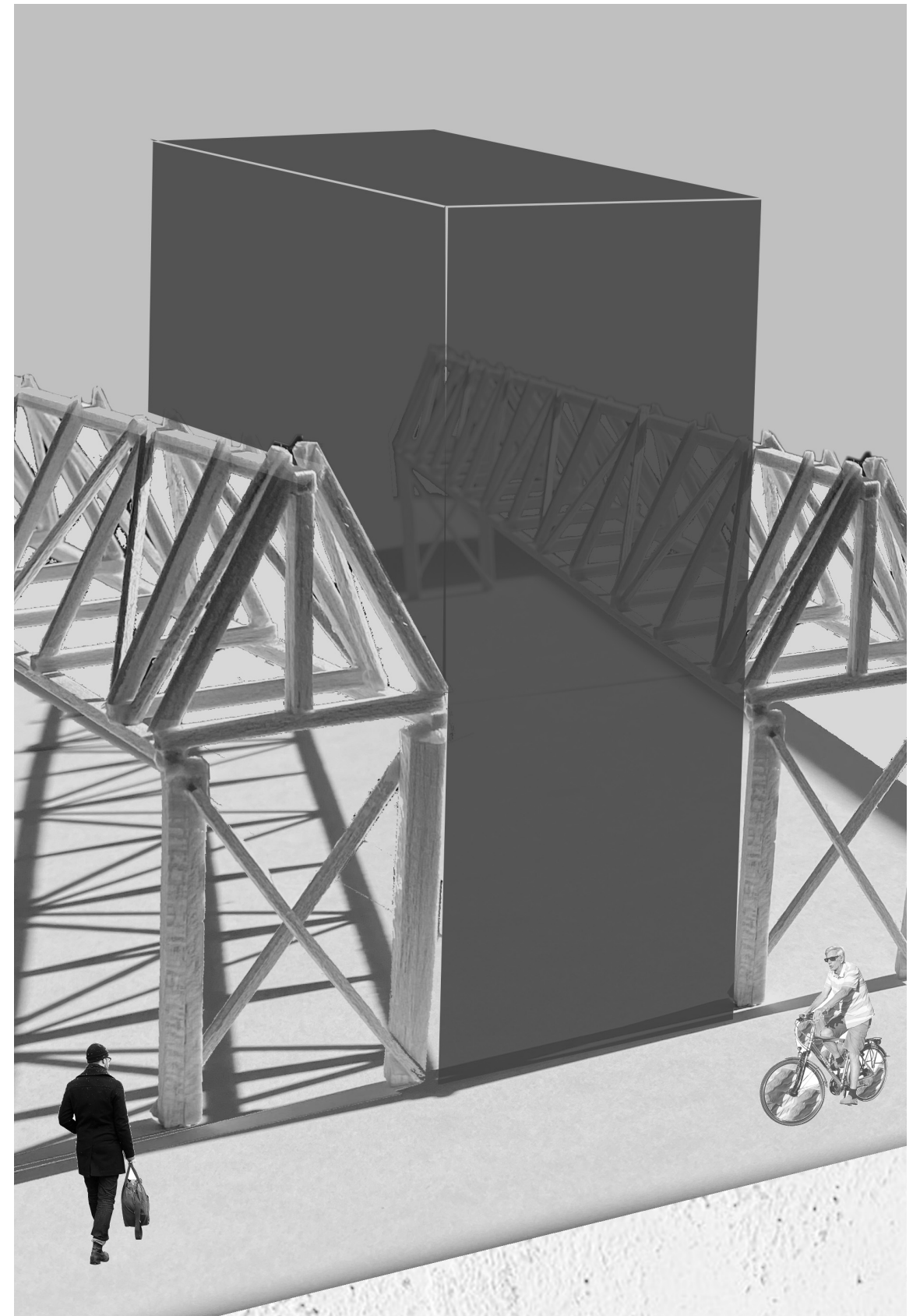
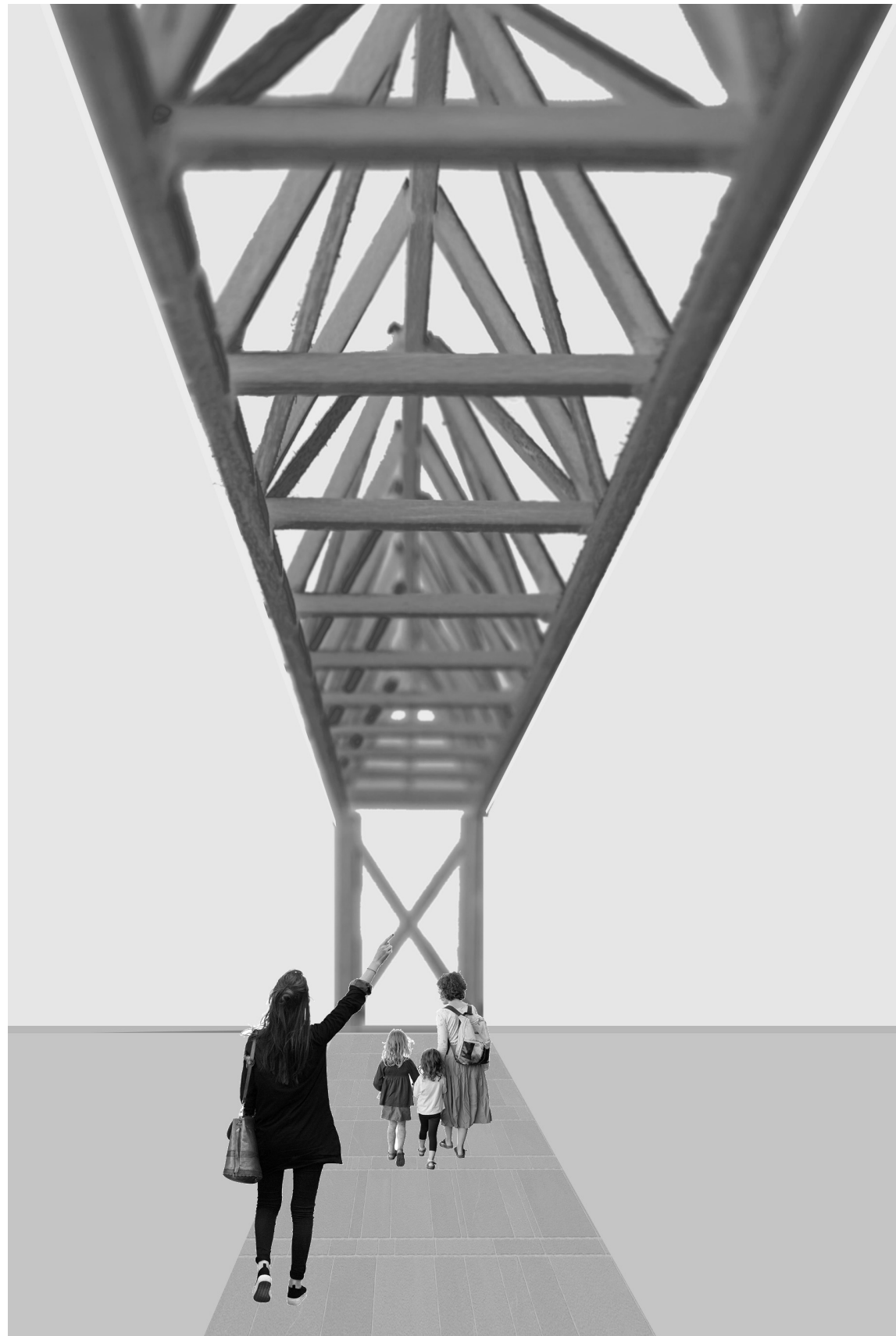




Figure 19 (PICRYL - Public Domain Media Search Engine, 1922)

Precedent - Lemon Packing Factory



Figure 20 (PICRYL - Public Domain Media Search Engine, 1922)

Precedent - Lemon Packing Factory

At one point in time the Batchelor's Beans Factory employed up to 3000 people. These people formed strong friendships that lasted a lifetime. Going forward in order to restore a sense of community in West Cabra a workplace that promote a strong sense of social inclusion is crucial. The workers of the past were proud to work in their local area and establish an industry that lasted until present. They felt a strong sense of pride and belonging in their work.



Figure 21 (Pinterest, 2019)

As I began to research sustainable industries in Ireland I felt that right place to focus my attention was on the building and construction industry. As mentioned previously 39% of the worlds carbon output is associated with the building and construction sector. In semester 1 we learned about the use of CLT in Ireland and its high importation carbon costs.

While there is currently no timber produced for CLT in Ireland with the right plans in place there could be. Across Ireland ash plantations are being cut down due to a disease called ash die back which is destroying ash trees in Ireland. Ash die back is a fungal disease that has been the cause of high mortality rates in ash trees in Ireland. It is expected that this disease will wipe out all ash trees in Ireland over the next two decades. Should there be a replanting strategy put in place there is an opportunity to plant timber such as sitka spruce which has a quick growth rate and is suitable for use in CLT manufacturing.

This would reduce Ireland's dependency on international supply chains, improve our local economy, urban and rural employment and improve our overall carbon sequestration . The introduction of sustainable Irish building materials to the market such as CLT also allows for quicker building assembly times and prefabrication which is of high importance as we face the current housing crisis that Ireland finds itself in.

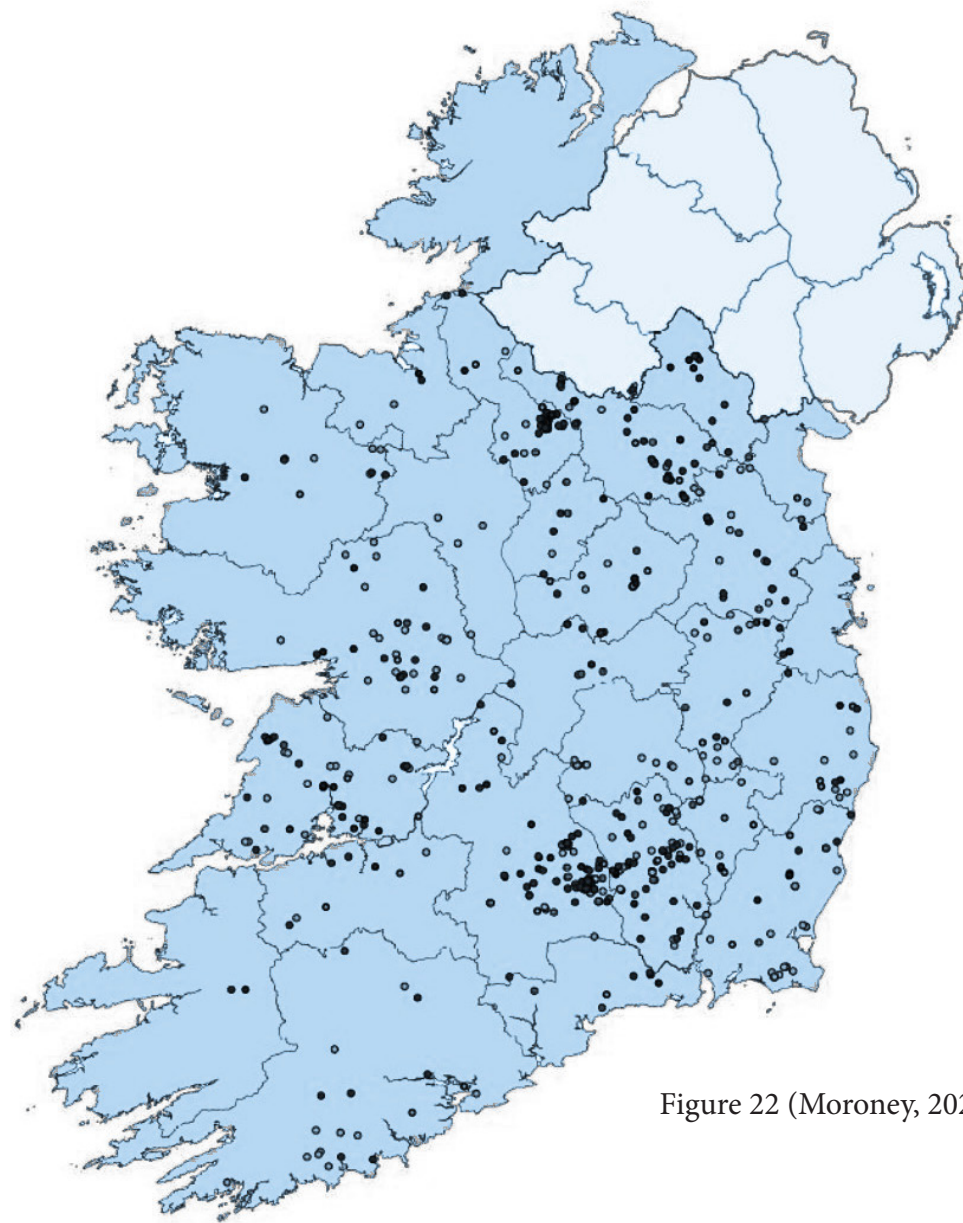


Figure 22 (Moroney, 2022)

map of plantations across Ireland affected by ash dieback

Load bearing timber panel

Sequesters CO2

Made from sustainably managed forests

Taller construction achievable vs. timber frame

Prefabricated elements reduces building time

Sustainable building material

Demountable



Figure 23 (Admin, 2017)

My intention was to make the site as productive as possible, with the area of the site being 27000sqm I felt it necessary to introduce another sustainable building production factory on-site.

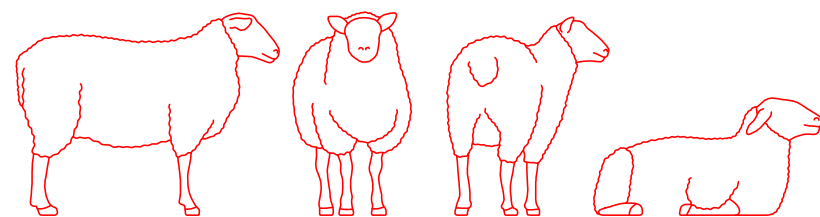
I learned about sheep farmers in Ireland and the fact that they are now paying more to shear their sheep than they get in return for the wool. As I looked further into sheep wool as a building material, I learned from an Irish sheep wool insulation company that they ship their wool to Scotland and then to Austria for processing as we do not have the facilities here in Ireland to do so. This transportation greatly increases the costs of the sheepswool insulation as well as a very negative effect on the climate.

 www.irishexaminer.com

Irish wool prices 'ridiculously low'

"As it stands, farmers will not even be able to cover the cost of shearing again this year."

Figure 24 (O'Sullivan, 2022)



47123 Sheep farmers in
Ireland
(2021 Census)

Natural biodegradable building material in abundance in Ireland

Outstanding insulator: thermal conductivity of 0.042W/m²k

Chemical free production

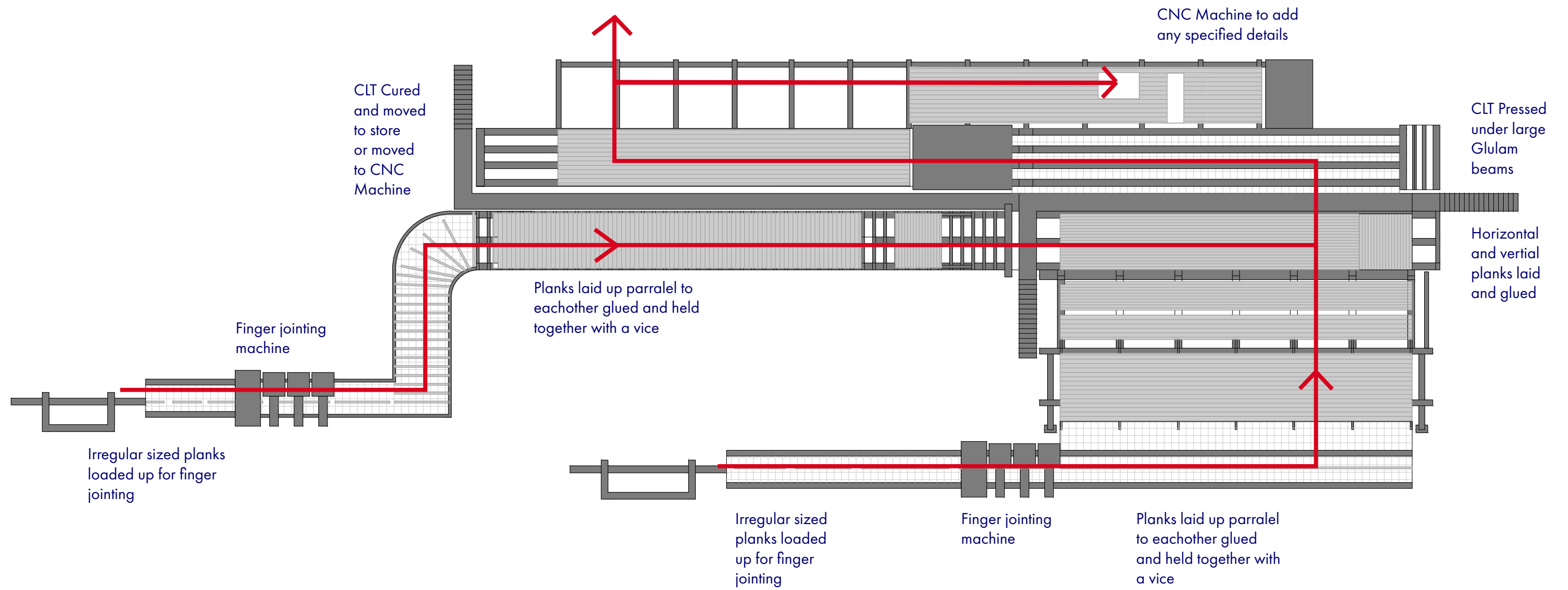
Wool can absorb moisture : Wool fibres are hygroscopic by nature, meaning they can absorb up to 35% of their own weight from the surrounding atmosphere, helping to preserve the surrounding timbers

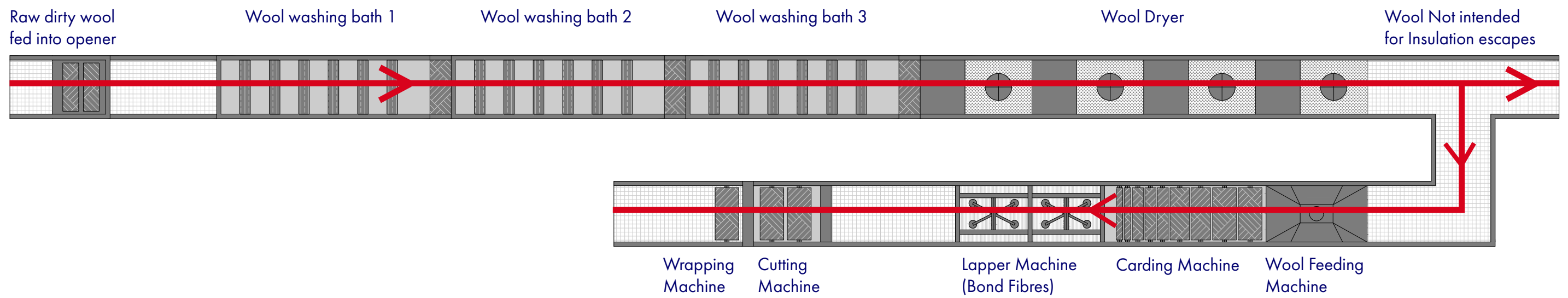
Wool will extinguish itself in event of fire: It does not burn, but instead singes away from fire and extinguishes itself.

Safe for end user as well as environment

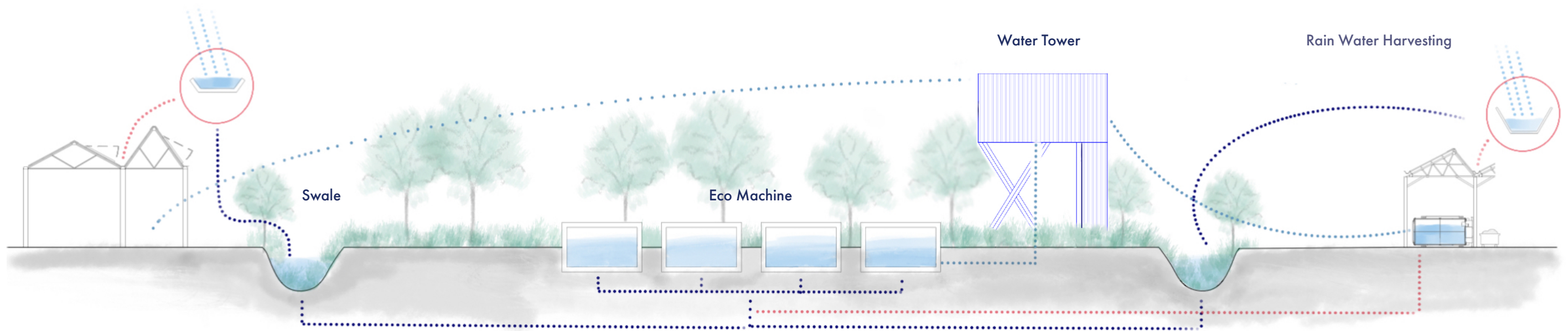


Figure 25 (Elefteria, 2018)





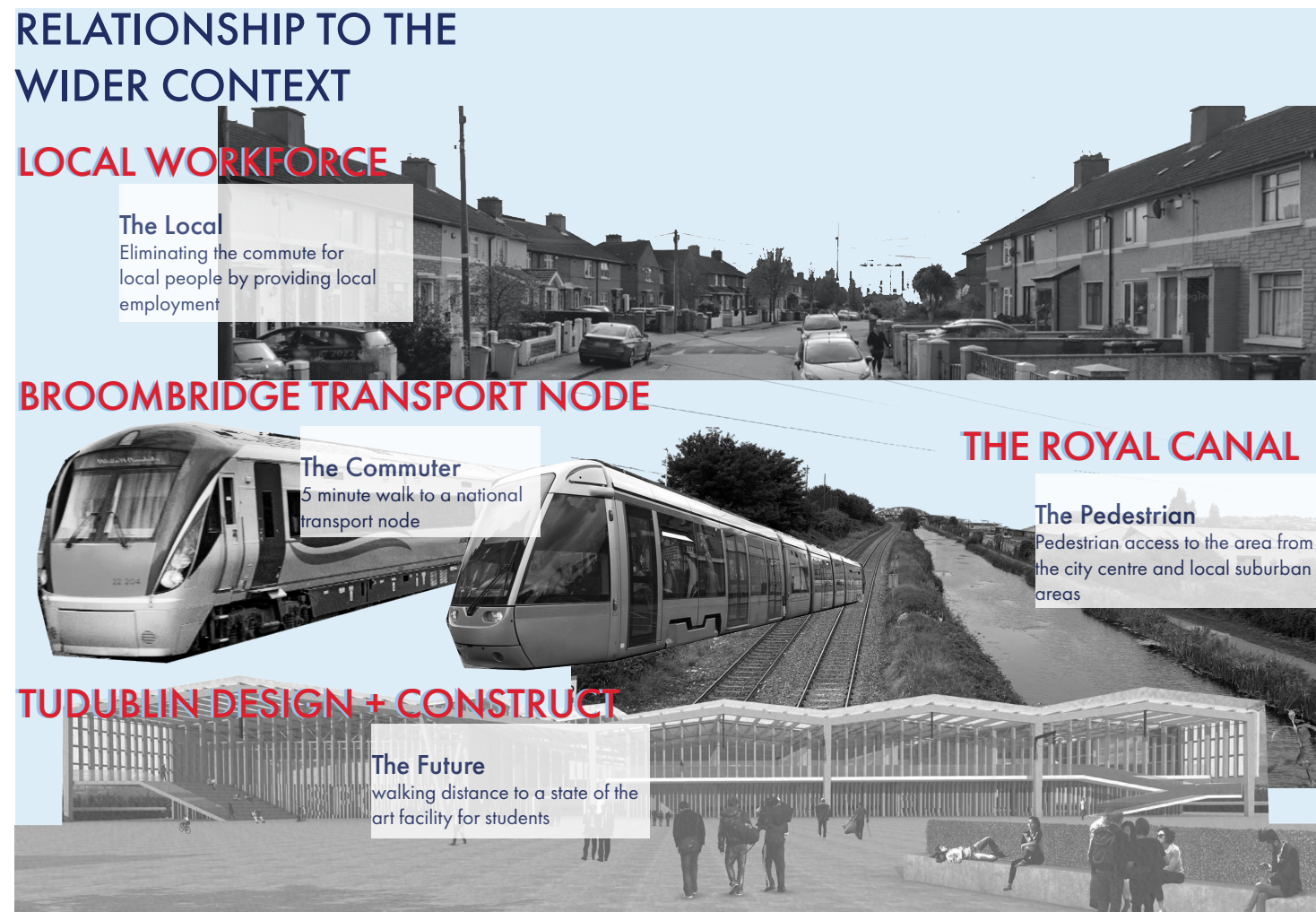
The sheep's-wool insulation production process is a very water intensive process. My objective was to not drain the local water sources. I implemented swales for surface water run off to prevent surface water from entering the canal as well as rainwater harvesting. The water that would be leaving the sheep wool baths would be brought into a system called an Eco machine that is a method of organically cleaning water which I learned from John Todd the Canadian Biologist. The eco machines ecologically treats the water to remove dirt through a series of natural filters and bacteria. All this water would then be stored in an on-site water tower that would act as the sites water reserve and recycle water through the site.

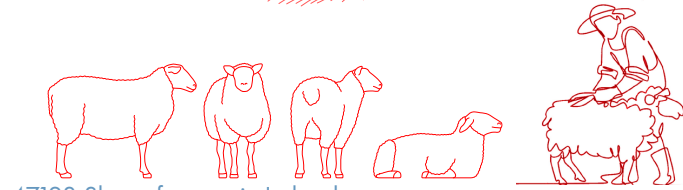
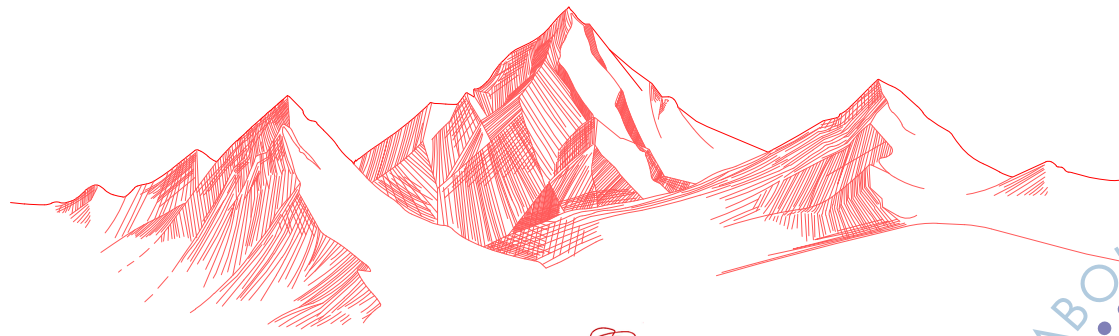


Onsite Water Recycling
High Water Demand Process
Closed Loop Circuit

My intention was to create a place of work that promotes social inclusion through building diverse work relationships. I wished to break down the social divisions in this area by encouraging the interactions of people of all backgrounds to work symbiotically on the site. With TUDublin Design and Construct due to arrive just down the road from this site in Broombridge I felt a sustainable materials research and innovation centre would also go well on this site to encourage people of all levels of education and backgrounds to interact.

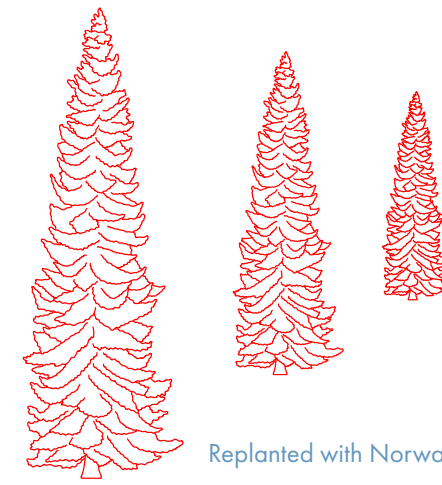
Having a wealth of knowledge from the trade and labour-based employees and the scientific researchers would create a place of innovation and help to future proof these industries going forward through research carried out in the material laboratories provided. The aim was to create a relationship with the local working-class people through an adaptive industry that responds to progress.



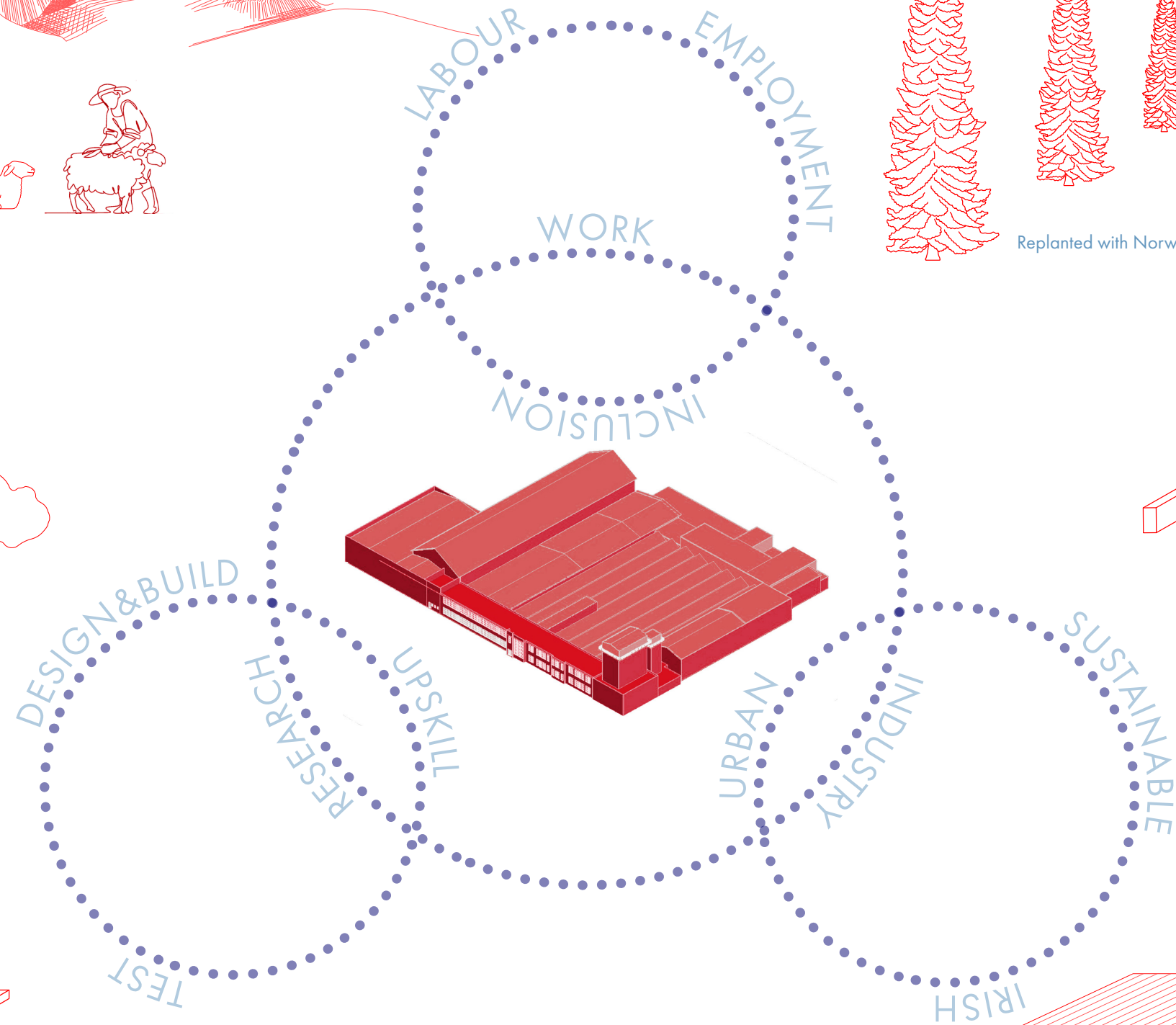
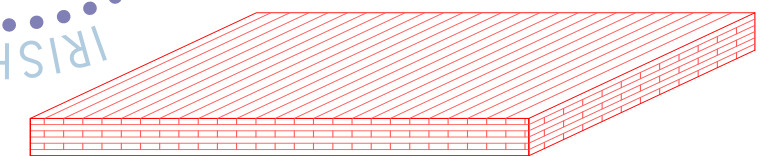
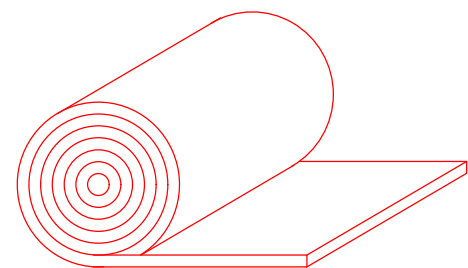
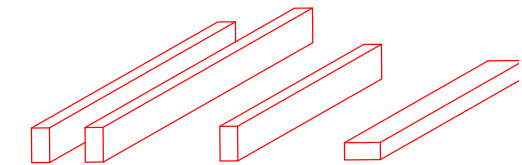
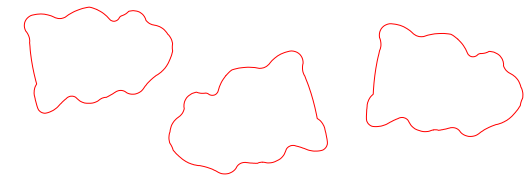
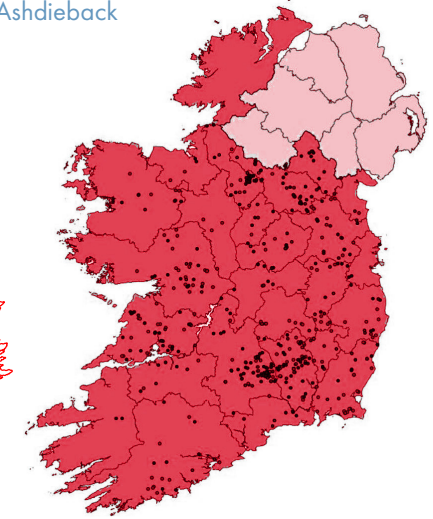


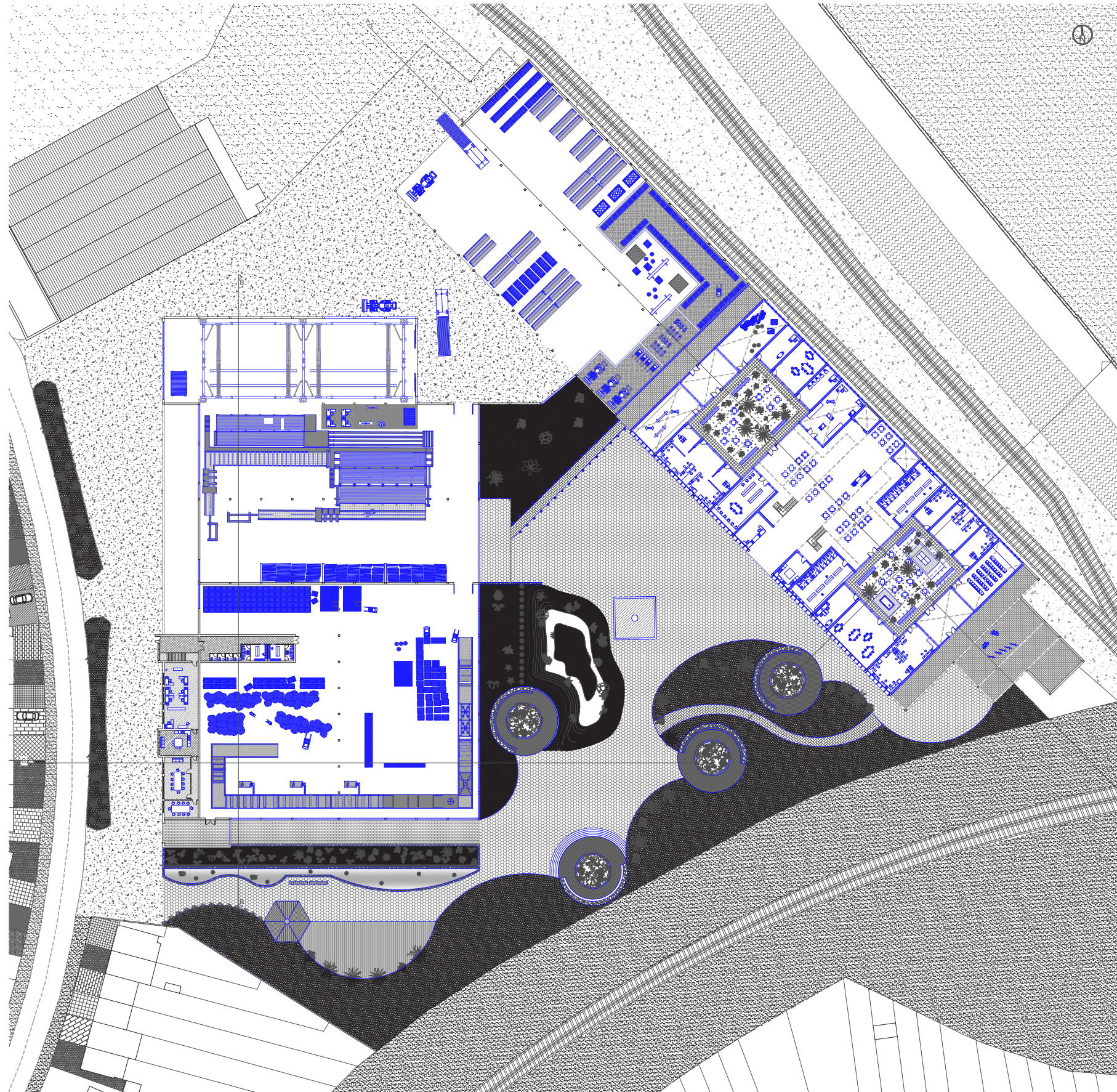
47123 Sheep farmers in Ireland (2021 Census)

Forestries affected by Ashdieback

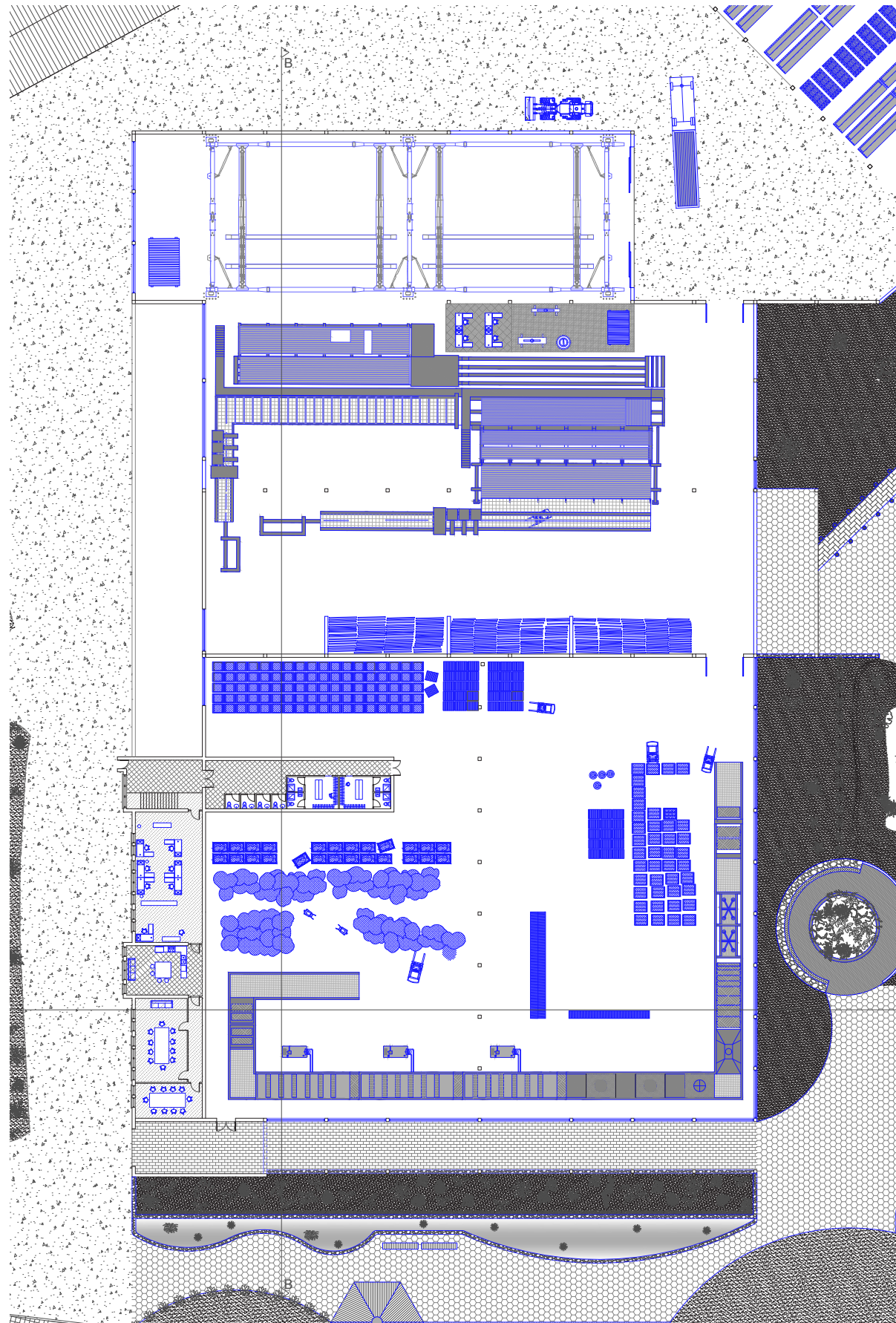


Replanted with Norway Spruce

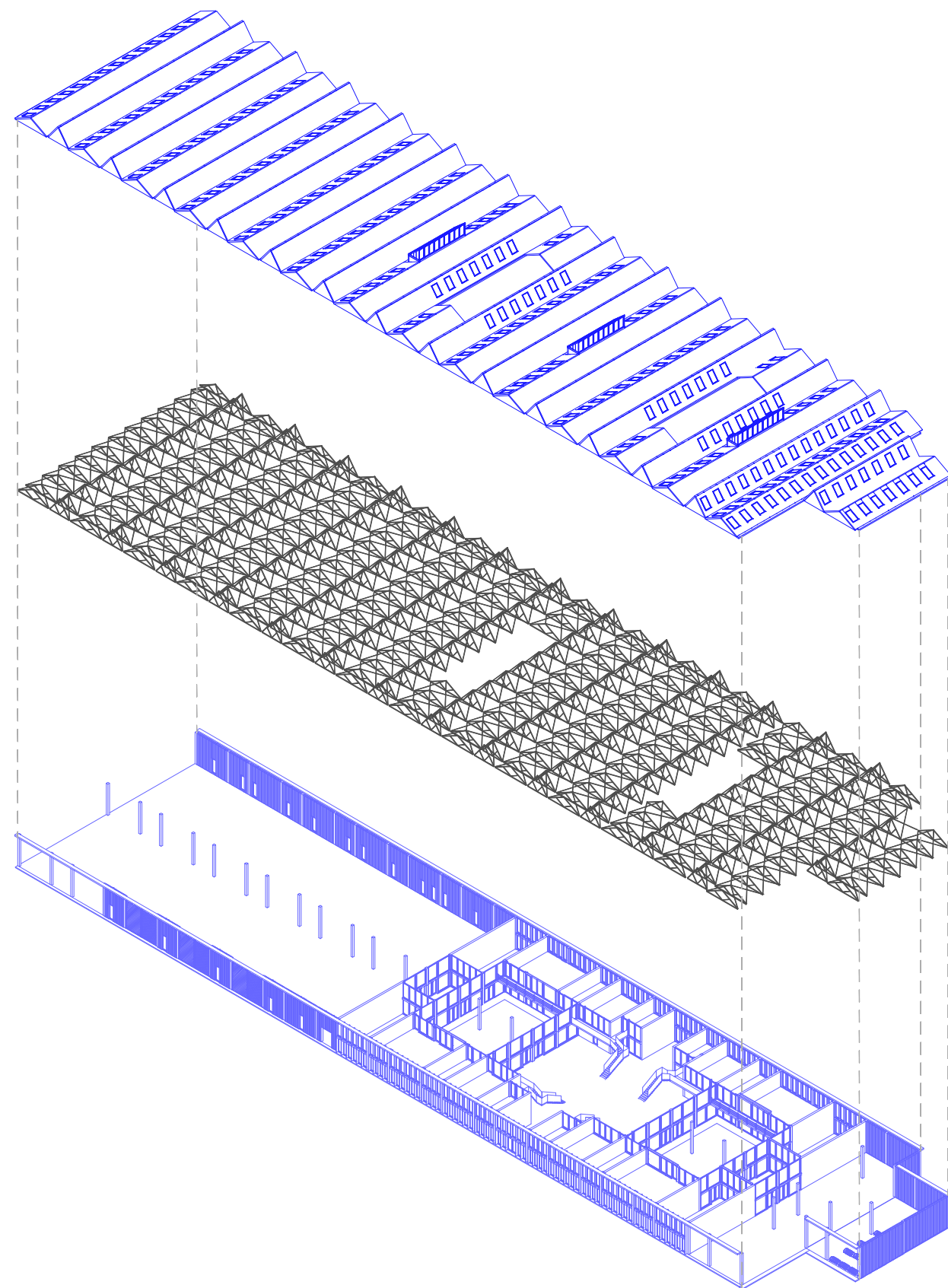




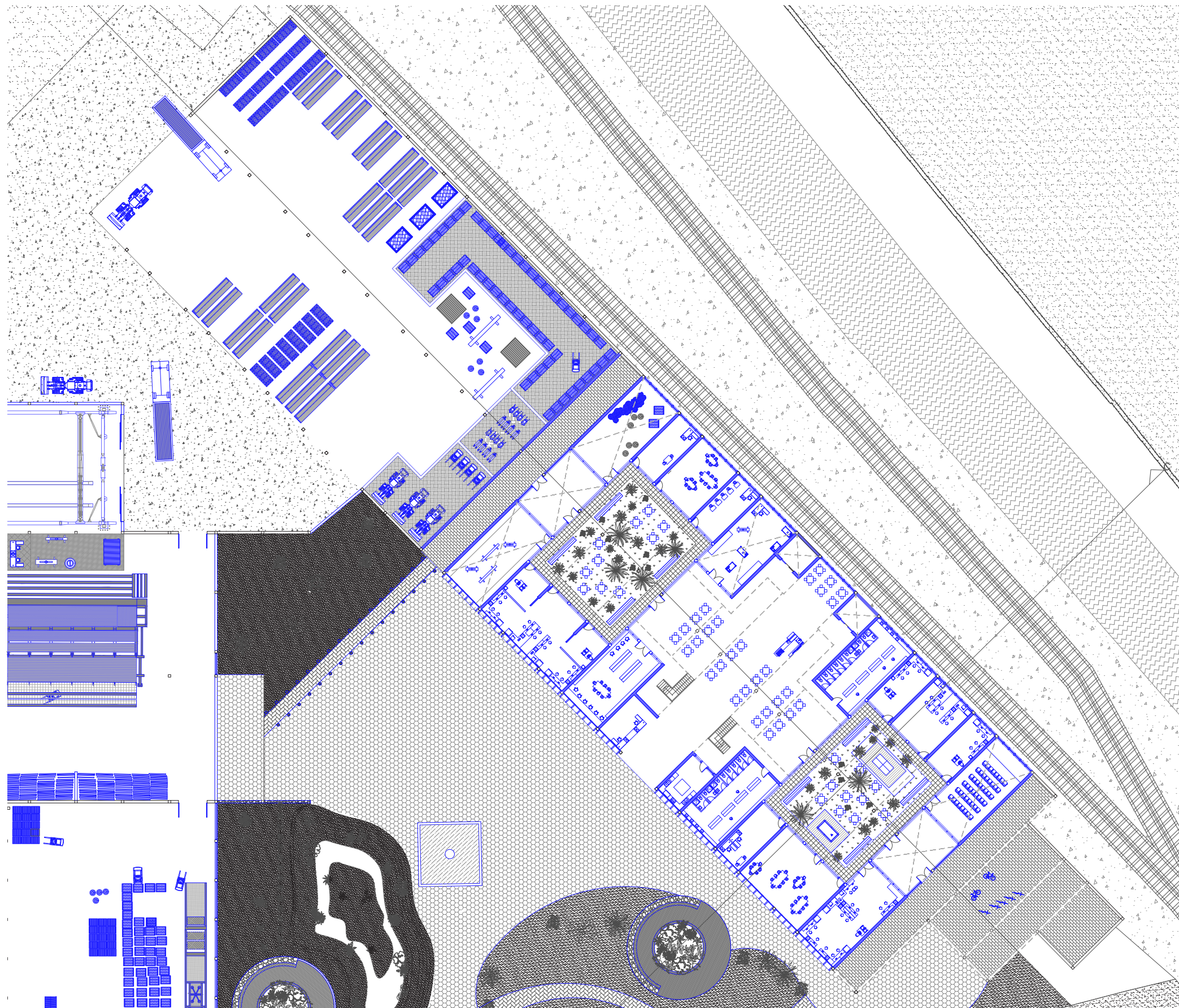
* new additions shown in blue



As this is a retrofit project, I aimed to densify the site as much as I could with activity. As I tackled the retrofit of the existing factory I worked with the space, and I learned about the processes that go into making clt and sheep wool insulation that informed my layout of the factory. I figured out the space needed for the machinery and worked out a movement of goods path that allowed for a division of the site for heavy machinery and a recreational outdoor space for users. The existing saw tooth roofs of the factory allowed me to implement north light onto the factory floor space.



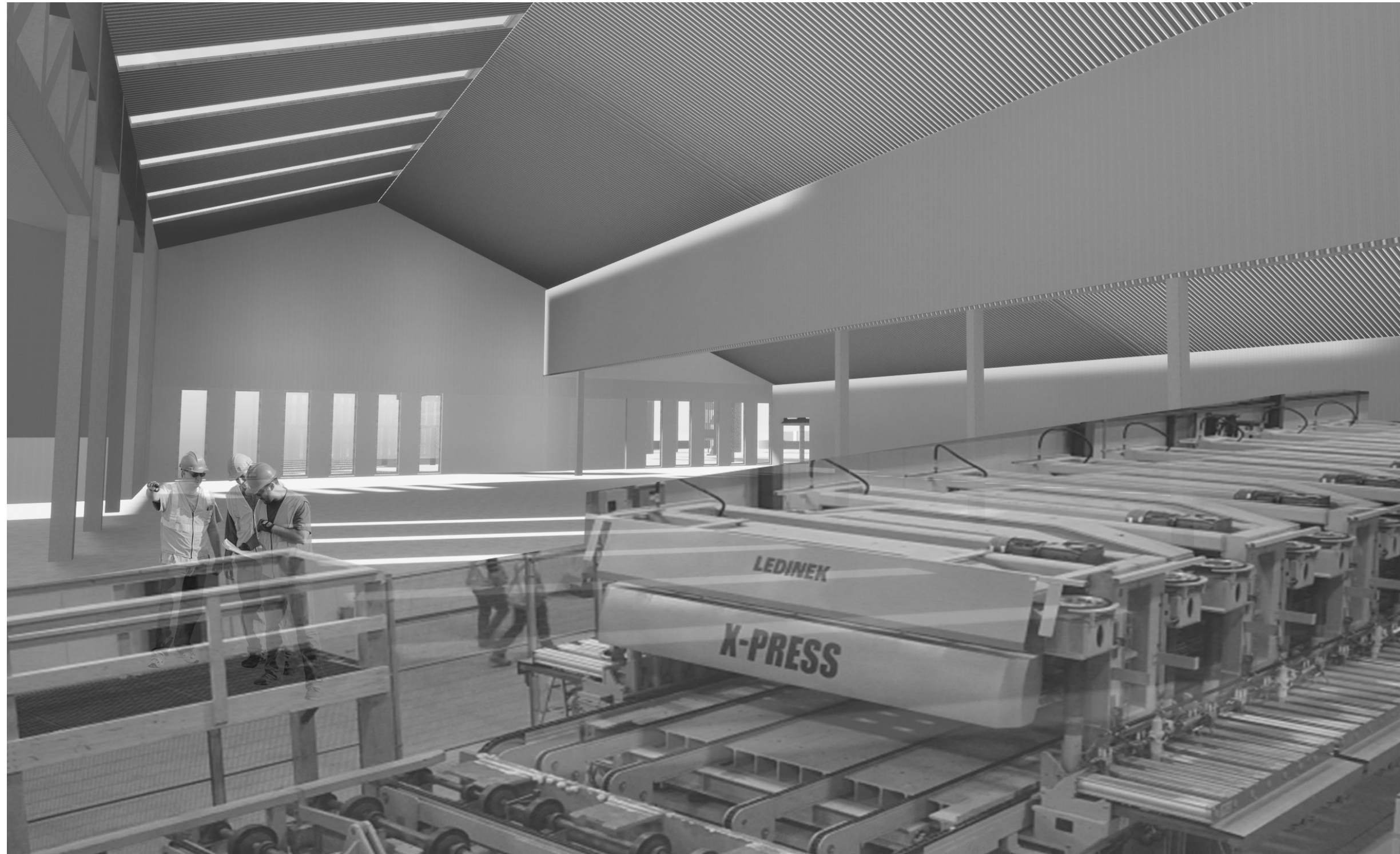
The design was driven around creating comfortable working environments through light and ventilation in both the research centre and the factory. I opened up the façades of both buildings to allow for passive learning and interaction of people as they went by their workday. In the research centre to create a more pleasant working environment I allowed a series of courtyard to supply light as well as acting as the circulation zones through the building and as flexible spaces for the user. I set rules of puncturing the trusses at different points and adding a series of roof lights and light wells. I was mindful to maintain the existing character of the roof-scape.



Due to the depth of the existing building which is 40 metres I set rules of ensuring that a room that is 10 metres in depth had light from both sides. The courtyards supplied this light on the one side and the open facade supplied the light on the other side.

The nature of goods production meant that a large area of hard standing space was needed for storage of goods. This is located to the North west of the research centre building.

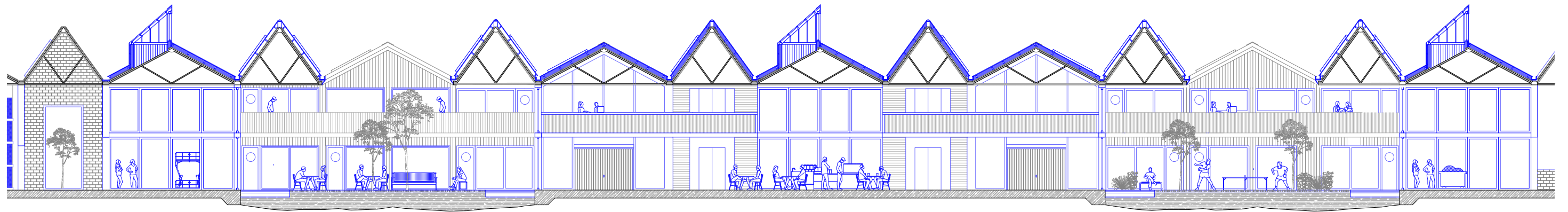


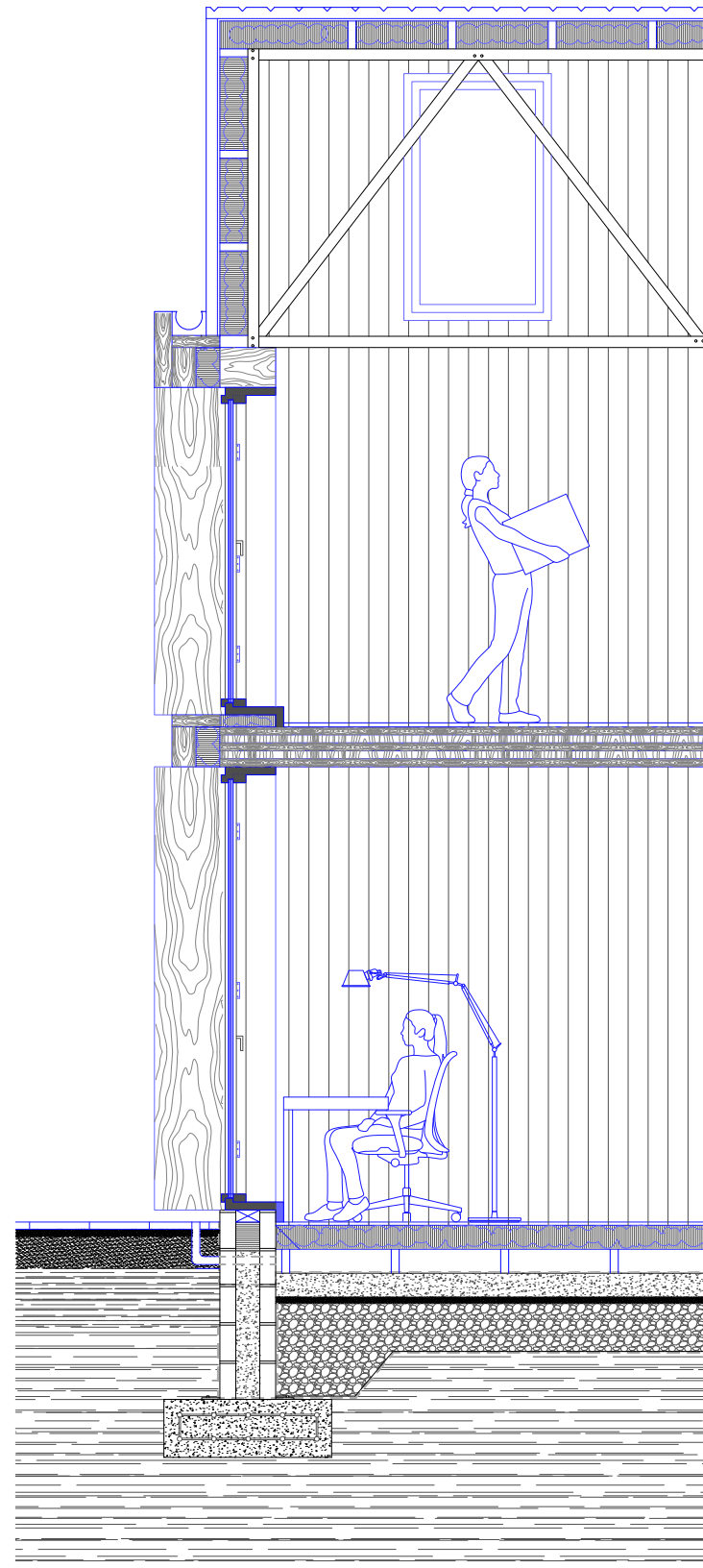


final section through research centre and factory store

DESIGN / maintaining the existing roof-scape



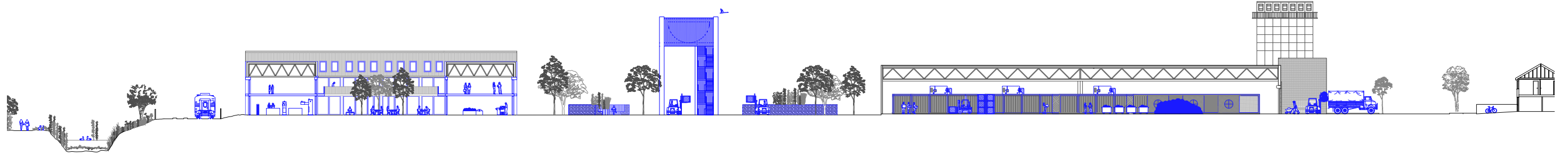


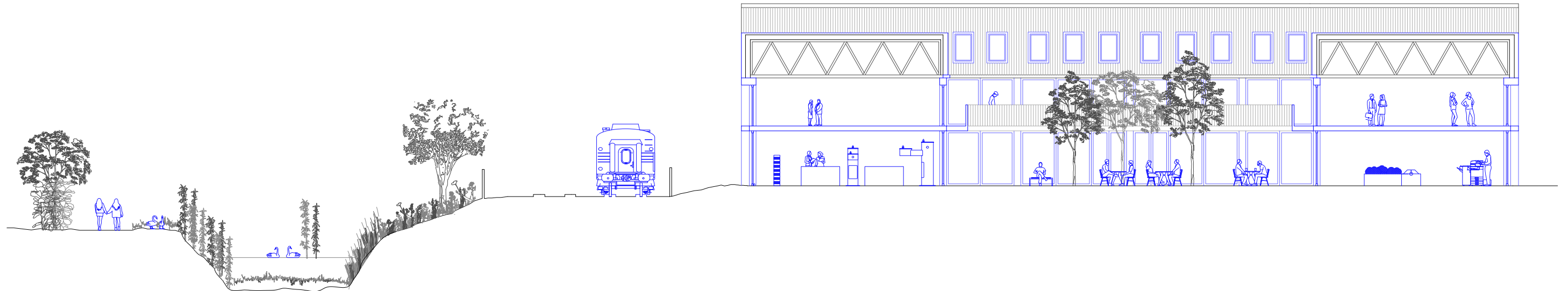


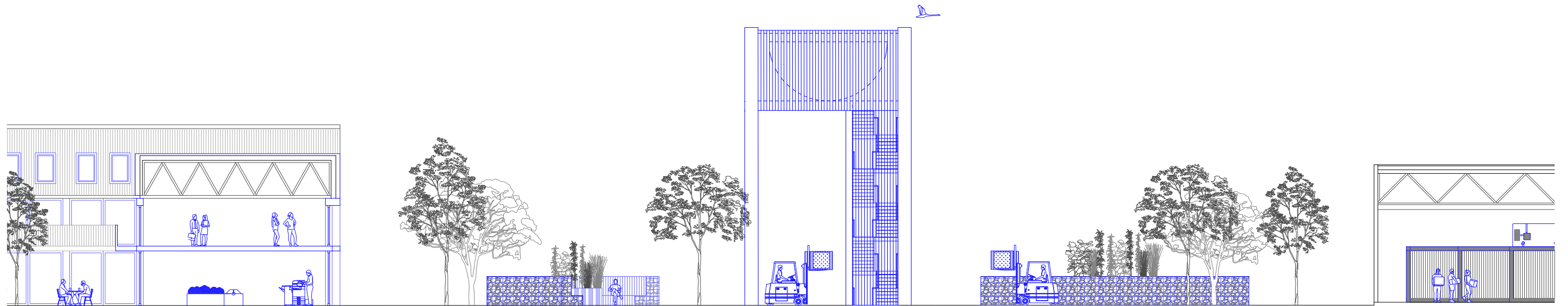




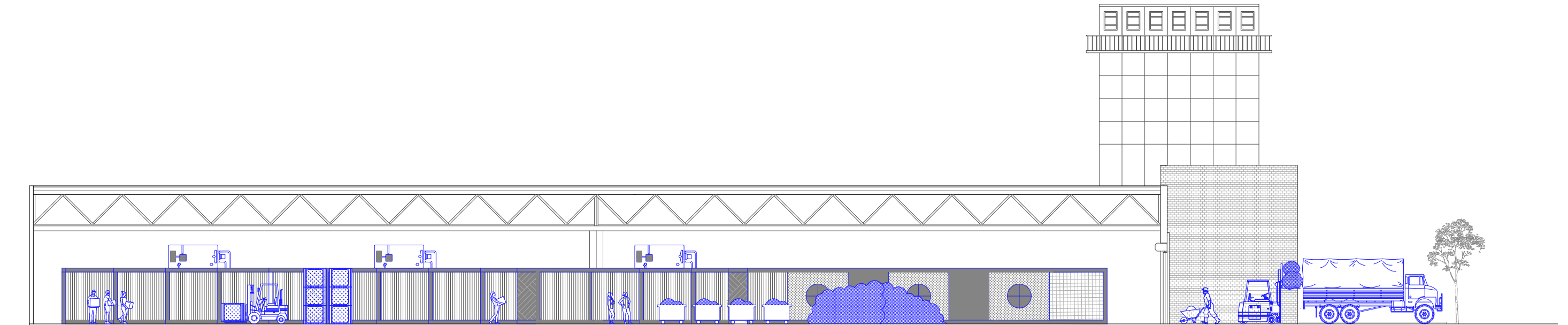






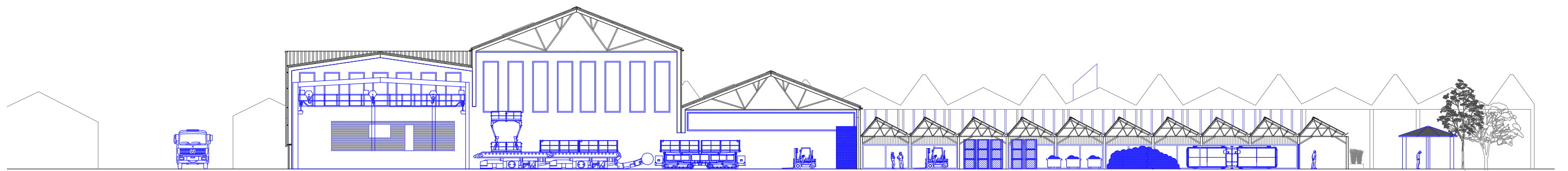


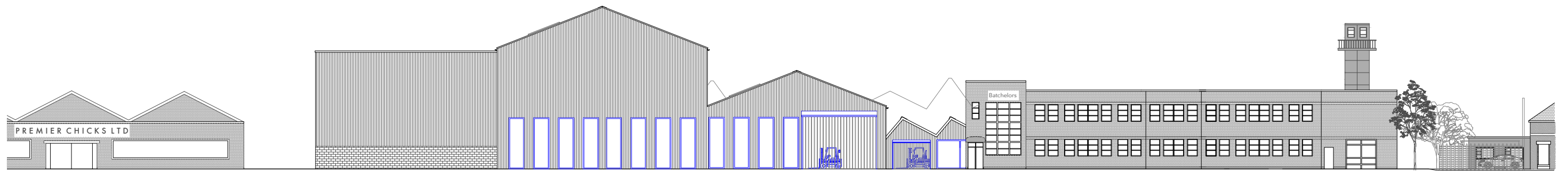
DESIGN / section through sheepswool insulation factory



I intended the outdoor landscape area to be recreational but also to be productive for the site.. The landscaping was to draw people in from the street through a path that is highlighted with biodiversity and eco machines. I incorporated these Eco machines into the landscape to also act as spaces in which users could eat lunch or take breaks and interact with one another.



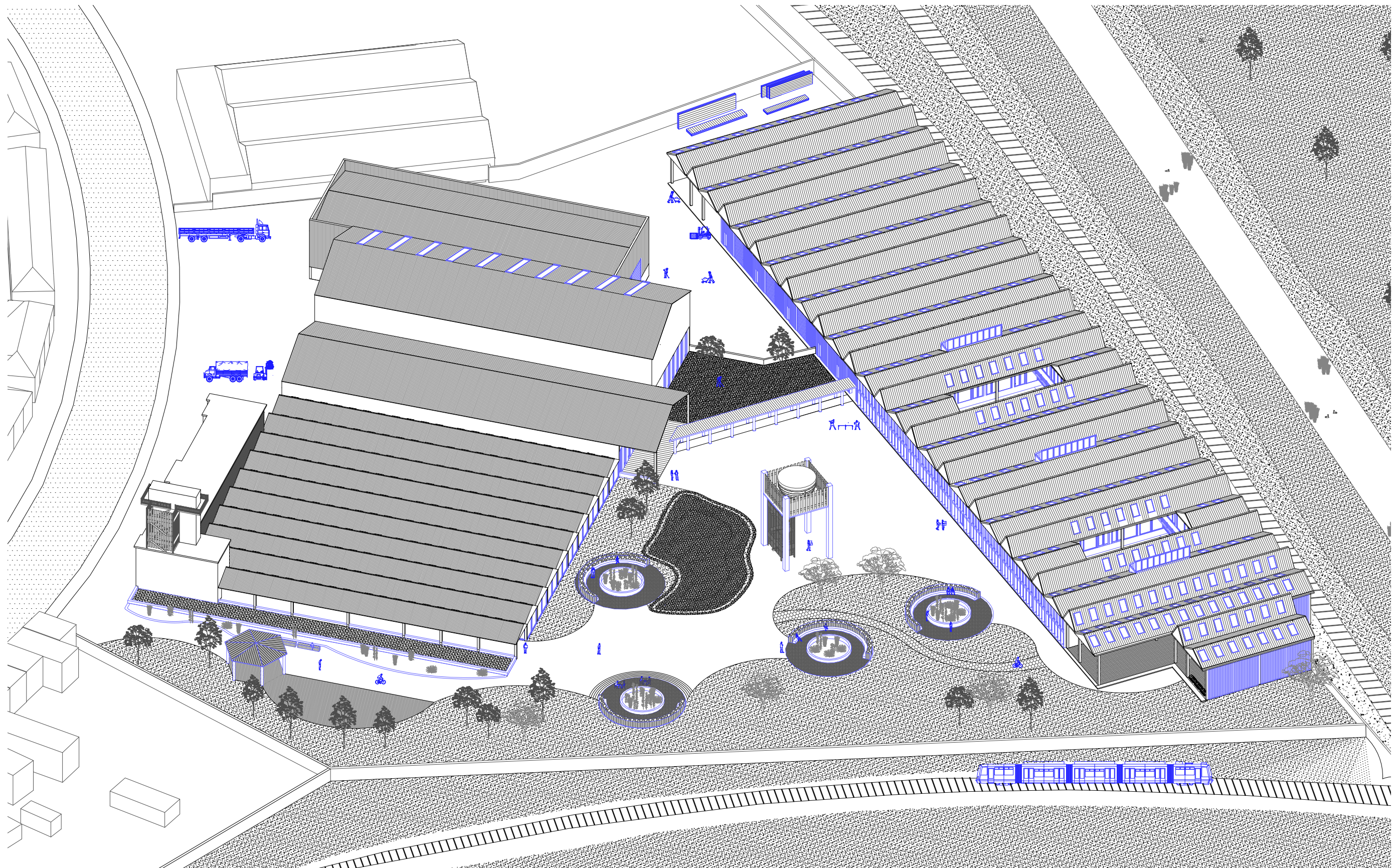




DESIGN / activating the street-scape

The opening up of the front façade was to activate the street-scape by putting the industry on the site on display and to encourage people to explore it from the street





To conclude, Ireland as well as the rest of the world is at tipping point due to climate change. It is our duty as architects to take a position right now, to tackle this climate emergency head on and find solutions to the issues that face us in the future. The importance of these sustainable industries in Tolka Valley and the wider context of Ireland is crucial in providing employment, improving the local economy, reducing our dependence on the importation of building materials and in the reuse of existing industrial lands across Dublin. Overall, I wished to re-imagine what industrial estates could look like and what part they could play in the urban setting as we re-imagine our cities of the future.

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