



Matter, Making and the Six Bells Paradox
Mark Vas | Explore Lab 41

Matter, Making and the Six Bells Paradox

Matter is physical substance.

Material is matter given a role.

Value is assigned by the systems around it.

Architecture is one of the systems through which matter acquires that role.

When does matter become material?

What happens when architecture enters before that role has settled?

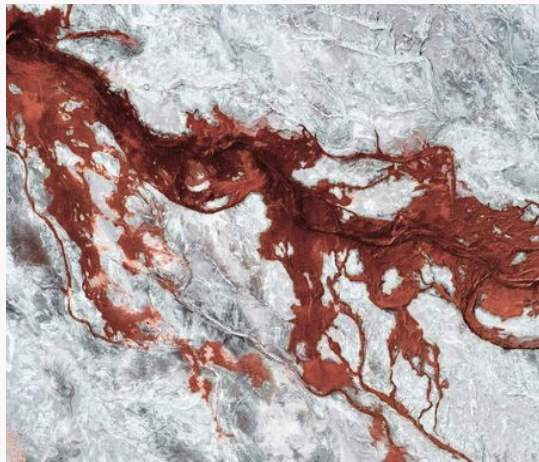
This thesis occupies that interval. Value remains contingent, relational and open to negotiation. No substance is inherently waste, resource, evidence or cultural material. These identities emerge through the technical, economic, ecological and social systems that receive it. Architecture participates in the production of value. Space is one of the means through which matter is recognised, organised and brought into public life. This project enters before meaning has been resolved, giving spatial form to the conditions through which value is assigned, contested and transformed.

This argument is situated in Six Bells, a former coal village in South Wales where the value of matter has undergone a profound territorial reversal. Coal organised the valley as an economic, spatial and civic system. When mining ceased, that system collapsed, yet its consequences remained in the ground, in the movement of water and in the ongoing work required to manage what extraction left behind.

Ochre is one of those remains. Separated from coal's former economy, the residue can enter new practices, acquire new meanings and become part of public life. For a village largely understood through industrial decline, it offers another way for the community to encounter its material history through knowledge, making and exchange. Its economic value remains modest. Its cultural and civic significance lies in how people understand, use and represent what remains.

The same residue can be read as environmental burden, cultural material and ecological substrate. Its value shifts according to the system through which it is encountered. This is the Six Bells paradox.

Architecture mediates between environmental maintenance, material transformation and civic life. It gives public presence to a material afterlife that would otherwise remain concealed, and considers what becomes of that architecture when the process it accommodates eventually changes or ends.



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Act i Value Transformation
Matter assigned value

Act ii Landscape Transformation
Matter in transition

Act iii Architectural Transformation
Matter spatialised

Act iv The Second Afterlife
Matter released



Act i

Value Transformation

Matter assigned value

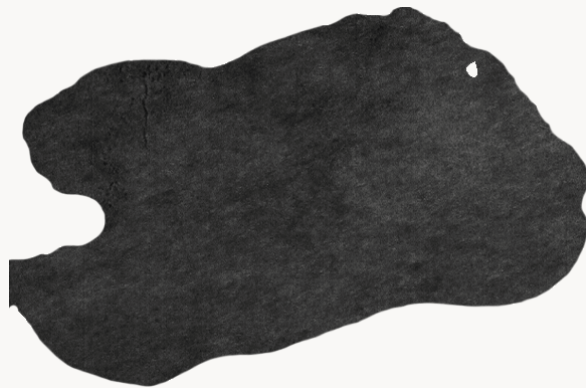
Architecture, Value and Matter

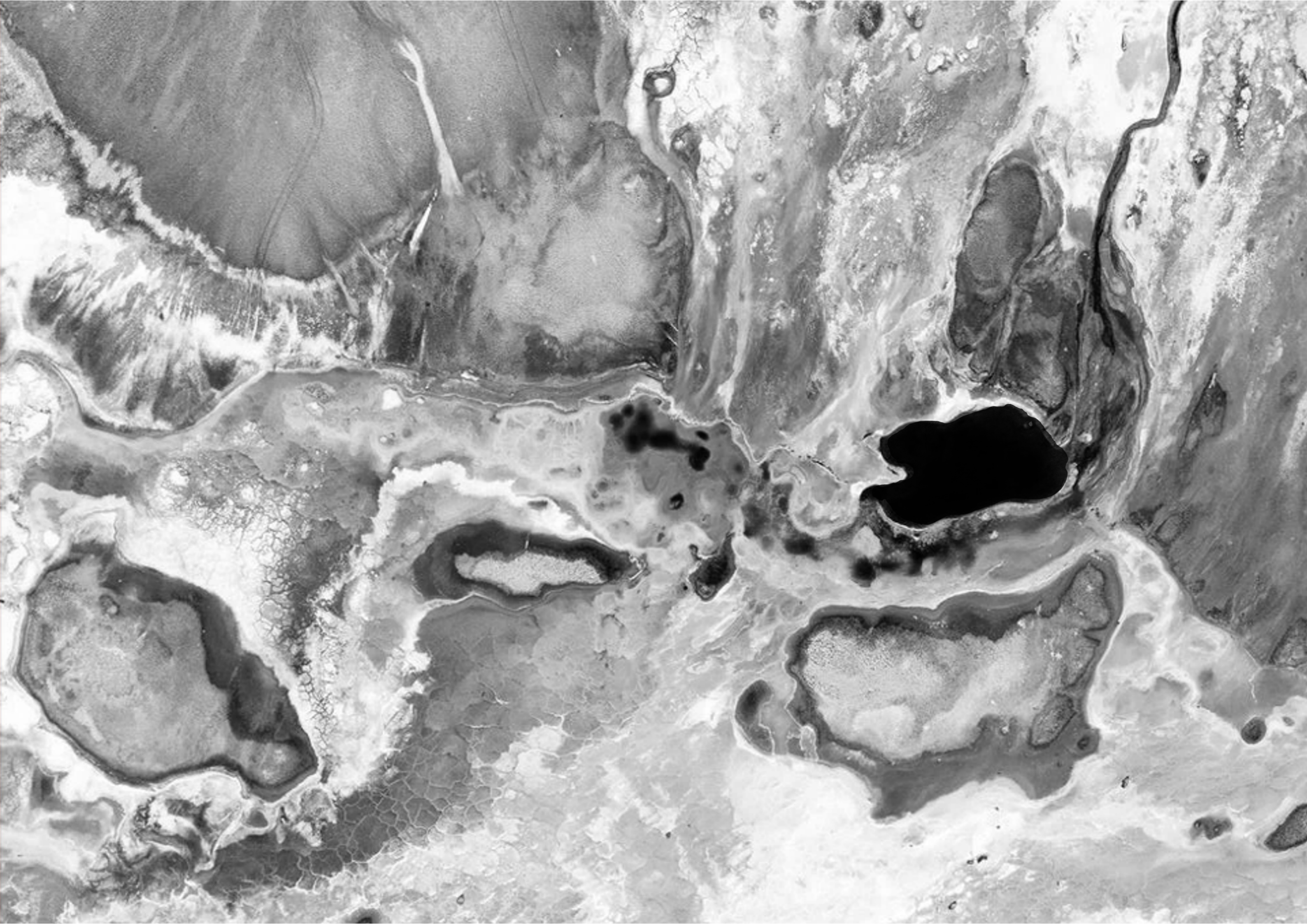
Value is relational, not inherent

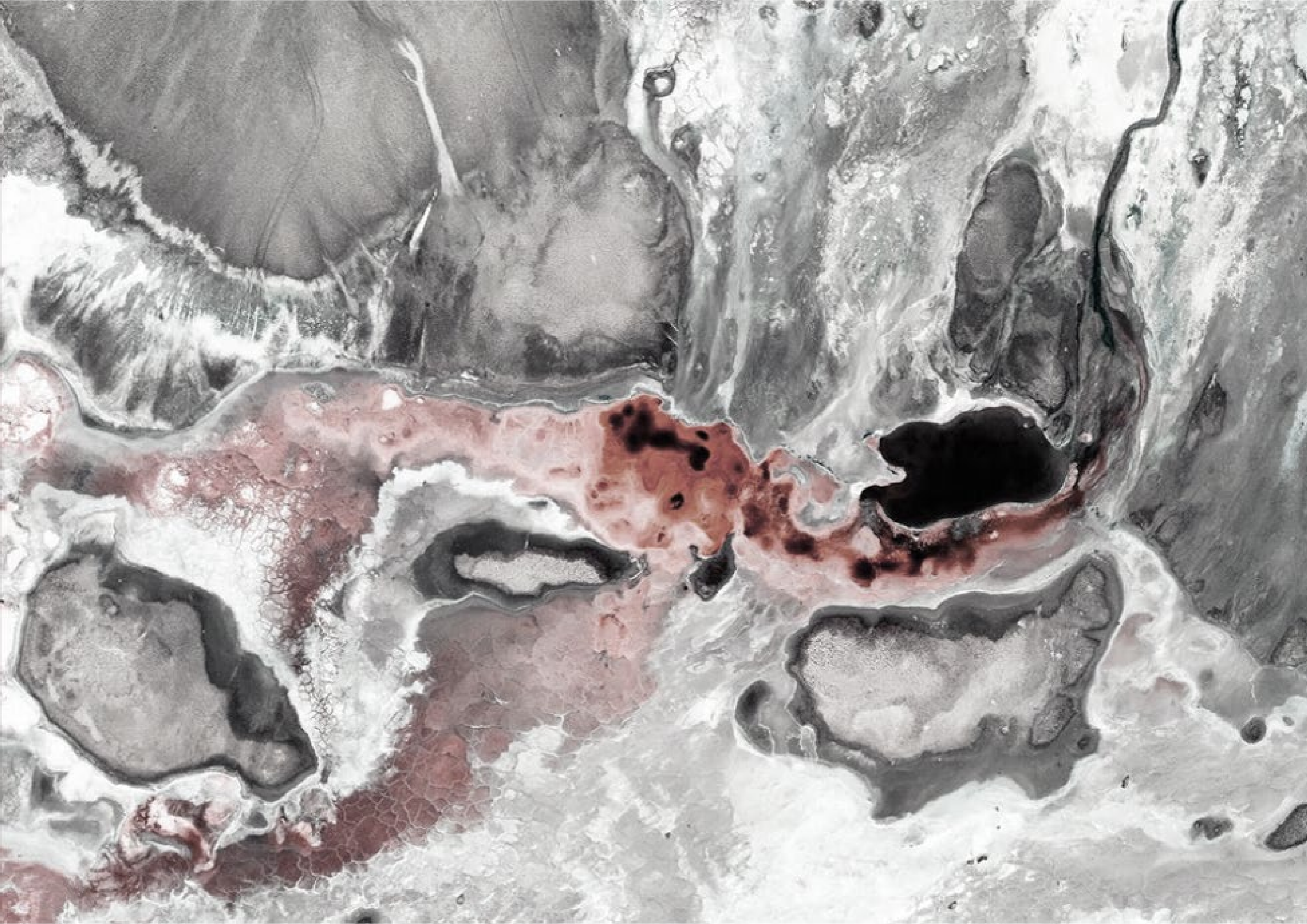
Matter enters architecture after many decisions have already been made about what it is, what it is worth and how it may be used. A substance becomes waste or evidence through systems of extraction, classification, labour, regulation, maintenance and exchange. By the time it appears in an architectural setting, those systems are usually compressed into a specification.

This project begins earlier, while the role of matter is still unsettled. It treats value as relational rather than inherent. The same substance may be read as environmental burden, technical residue, usable pigment, cultural artefact or ecological substrate depending on the system that receives it (Appadurai, 1986; Kopytoff, 1986). Architecture is one of those systems. It can separate these readings, or it can bring them into spatial relation.

The thesis therefore asks how architecture can operate while value remains under negotiation. It gives form to the transitions through which matter is contained, processed, interpreted, exchanged and eventually released.







Architecture enters after

Architecture usually encounters matter after its role has already been stabilised. Materials arrive dimensioned, certified, transported and ready to specify. The disturbed ground, labour, contamination, regulation and maintenance through which they acquired that status are held elsewhere (Gissen, 2009).

This distance makes assigned value appear inherent. Matter is encountered as structure, enclosure, finish or waste, even though these roles are produced through particular technical, economic, ecological and social systems. By the time a substance enters architectural practice, the processes through which it was classified and valued have often been compressed into a specification.

This thesis begins before that moment of resolution. It examines the interval in which matter has not yet acquired a single, stable role and may still move between competing classifications, uses and meanings. Architecture is approached as one of the systems capable of organising those transitions, making them visible and bringing them into spatial relation.

The project begins with the conditions through which matter is recognised, classified, transformed and assigned value. Architectural form emerges later, through the spatial organisation of these changing relationships.

Coal as spatial order

Coal shaped South Wales as a territorial, economic and civic system. Mining concentrated settlement within the valleys and organised the relationship between pits, railways, workshops, workers' housing and public institutions. The movement of coal determined where infrastructure was built, where communities expanded and how everyday life was structured. Its value extended beyond fuel and employment. It supported collective identity, labour organisation, welfare networks and forms of public life closely tied to the industry (Francis and Smith, 1980; Baber and Thomas, 1980).

When mining declined, the economic system built around coal contracted, while the territory it had produced remained. Settlements continued to occupy narrow valleys organised around former extraction sites. Housing, transport routes, memorials and disturbed ground preserved the spatial order of the industry. Abandoned workings also continued to influence water and ecological systems below the surface.

The decline of coal therefore produced an uneven condition. Its former economic value diminished, yet the spatial, social and environmental systems shaped by extraction continued to structure the region.

South Wales as a coal territory



Enter Six Bells

Six Bells is a former coal village in the Ebbw Fach valley of South Wales. The colliery once organised employment, settlement, infrastructure and collective identity across the village. When mining ended in 1988, the economic system built around coal disappeared, while many of its spatial, social and environmental consequences remained.

The narrow valley geography that had supported extraction offered limited opportunities for economic diversification after closure. Housing, roads, former industrial ground and the memorial landscape continued to reflect the order established by coal, while the village experienced the longer-term effects of unemployment and deprivation.

Below this visible landscape, the former mine workings remained materially active. Groundwater continued to move through disturbed geological strata, carrying dissolved iron toward the surface. The Vivian minewater treatment scheme was constructed to manage this hydrological afterlife and protect the Ebbw Fach from iron-rich discharge.

One village, two afterlives

The two afterlives of coal occupy the same valley but are experienced differently.

The village carries the social and economic aftermath of extraction through its housing, memorial landscape, collective memory and continuing deprivation. These conditions are publicly visible and form part of everyday civic life.

The Vivian treatment scheme manages the material and hydrological aftermath through ponds, channels, monitoring systems and maintenance operations. Although this infrastructure remains active, it is largely concealed from the public paths and settlements around it.

Residents can encounter the memory of mining through the village and the Guardian memorial, but they have little contact with the material process that continues below. Coal is publicly remembered as history while its ongoing hydrological consequences are managed as restricted technical infrastructure.

The proximity between these conditions, combined with their experiential separation, establishes the spatial context in which the ochre residue later acquires new meanings.

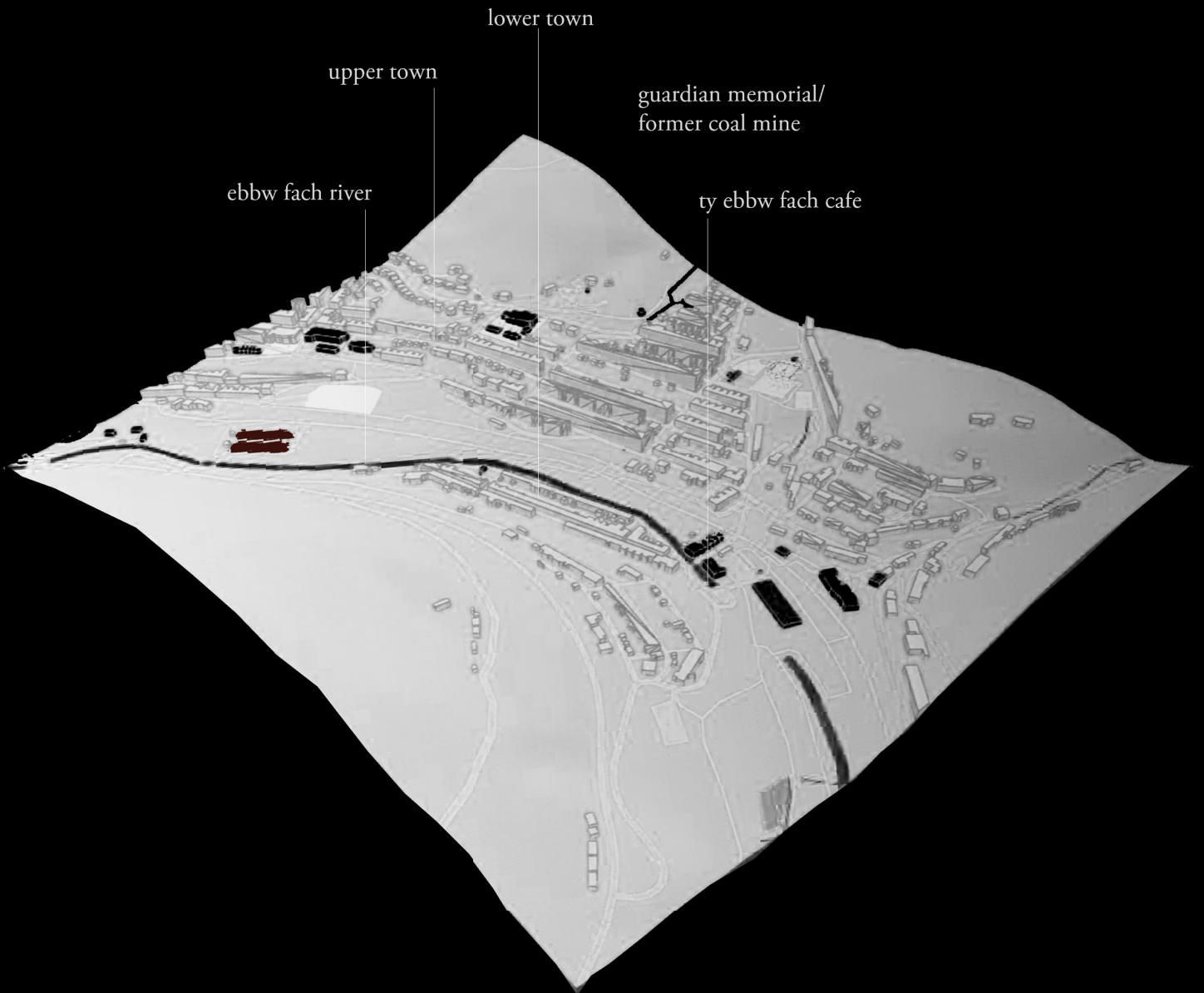
A view of Six Bells Colliery and the Ebbw Fach valley. From Six Bells, Abertillery, South Wales, by L. S. Lowry, 1962, National Museum Wales





Labour within the coal economy





Six Bells as a valley settlement
The former coal-mining town of Abertillery in Wales, by A. Kirk,
2008



Ebbw Fach River
@ Mark Vas, 2026

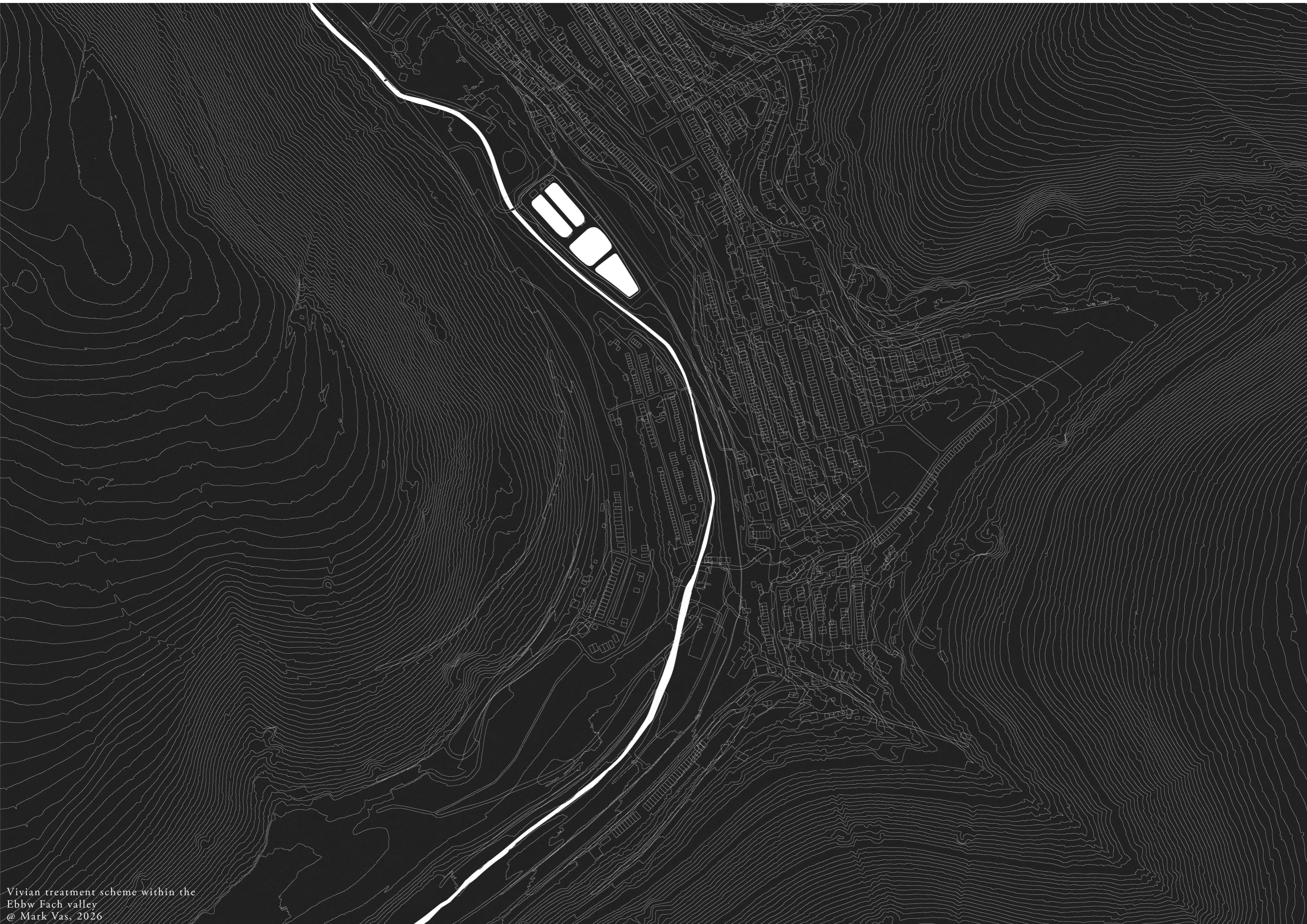


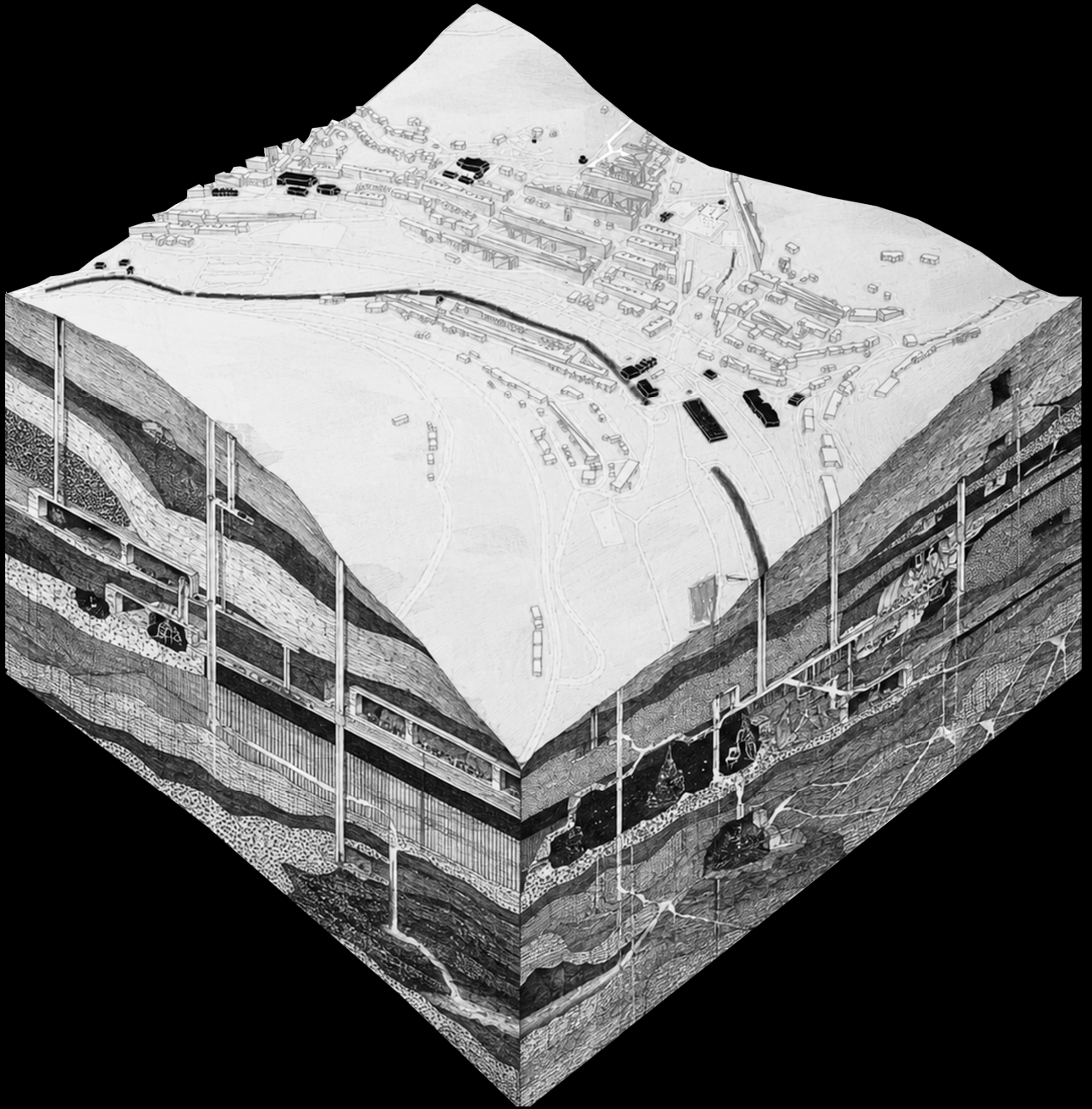
Tylerian3. (2012). Guardian – Six Bells Mining Memorial [Photograph]. Wikimedia Commons.





Six Bells town
@ Mark Vas, 2026





The active ground below Six Bells.
© Mark Vas, 2026



Extraction becomes hydrological

Extraction Became Hydrological

Mine closure did not end material transformation. Abandoned workings filled with groundwater, water moved through disturbed strata and iron was carried back toward the surface. Extraction continued in another form: as hydrology, contamination, maintenance and long-term environmental obligation.

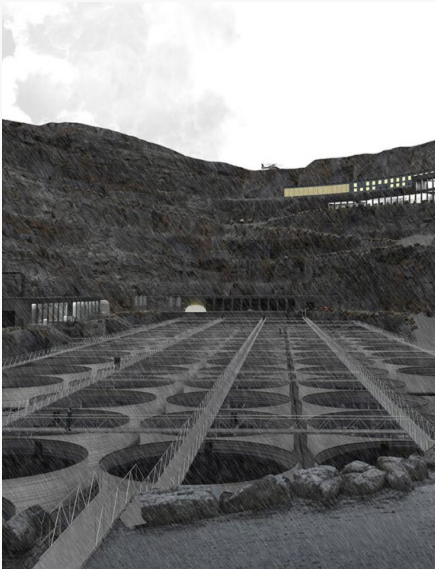
This condition changes the meaning of the post-extractive landscape. It is not an inactive landscape waiting for repair. It is a managed landscape in which subterranean processes continue to produce water, sediment, staining and risk. Vegetation and reclamation can make the surface appear recovered while the ground remains operational below.

At Six Bells, the contemporary material process is therefore not coal extraction but minewater treatment. The architecture responds to that active afterlife rather than treating the site as a completed ruin.

The Ground Remains Active

The former mine continues to shape the site through water. Rising minewater carries dissolved iron from the abandoned workings. When it reaches oxygen, the iron oxidises and precipitates, affecting rivers and aquatic life. The landscape is visibly green, yet its hydrology remains tied to extraction.

This active ground establishes the first design condition: the project must work with a process that is ongoing, uncertain in duration and largely concealed from public life. The task is to make its consequences legible without turning technical maintenance into spectacle.



Aeration within a minewater treatment scheme.

Minewater Treatment and the Production of Residue

In parts of the United Kingdom, former coal mines continue to affect water systems long after extraction has ended. Abandoned workings gradually fill with groundwater, which moves through disturbed geological strata and carries dissolved iron toward the surface. When this iron-rich minewater enters rivers untreated, iron precipitates, coats riverbeds and damages aquatic ecologies (Natural Resources Wales, 2019).

The Coal Authority manages a national network of minewater treatment schemes in response to this continuing environmental liability. These schemes intercept minewater, introduce oxygen through aeration and allow dissolved iron to oxidise and settle before cleaner water is released into surrounding watercourses (Coal Authority, 2023).

Treatment reorganises contamination into a concentrated and manageable form. Iron that was previously dispersed through minewater accumulates within settlement ponds as orange-brown ochre sludge. The process therefore produces a secondary material condition: a wet, unstable residue that must be monitored, removed, transported, stored, reused or disposed of.



The Coal Authority and aerial mapping

The Vivian Minewater Treatment Scheme

At Six Bells, the Vivian minewater treatment scheme manages iron-rich water rising from the former colliery workings. The scheme intercepts the minewater, aerates it, allows the iron to oxidise and settle, then releases cleaner water toward the Ebbw Fach.

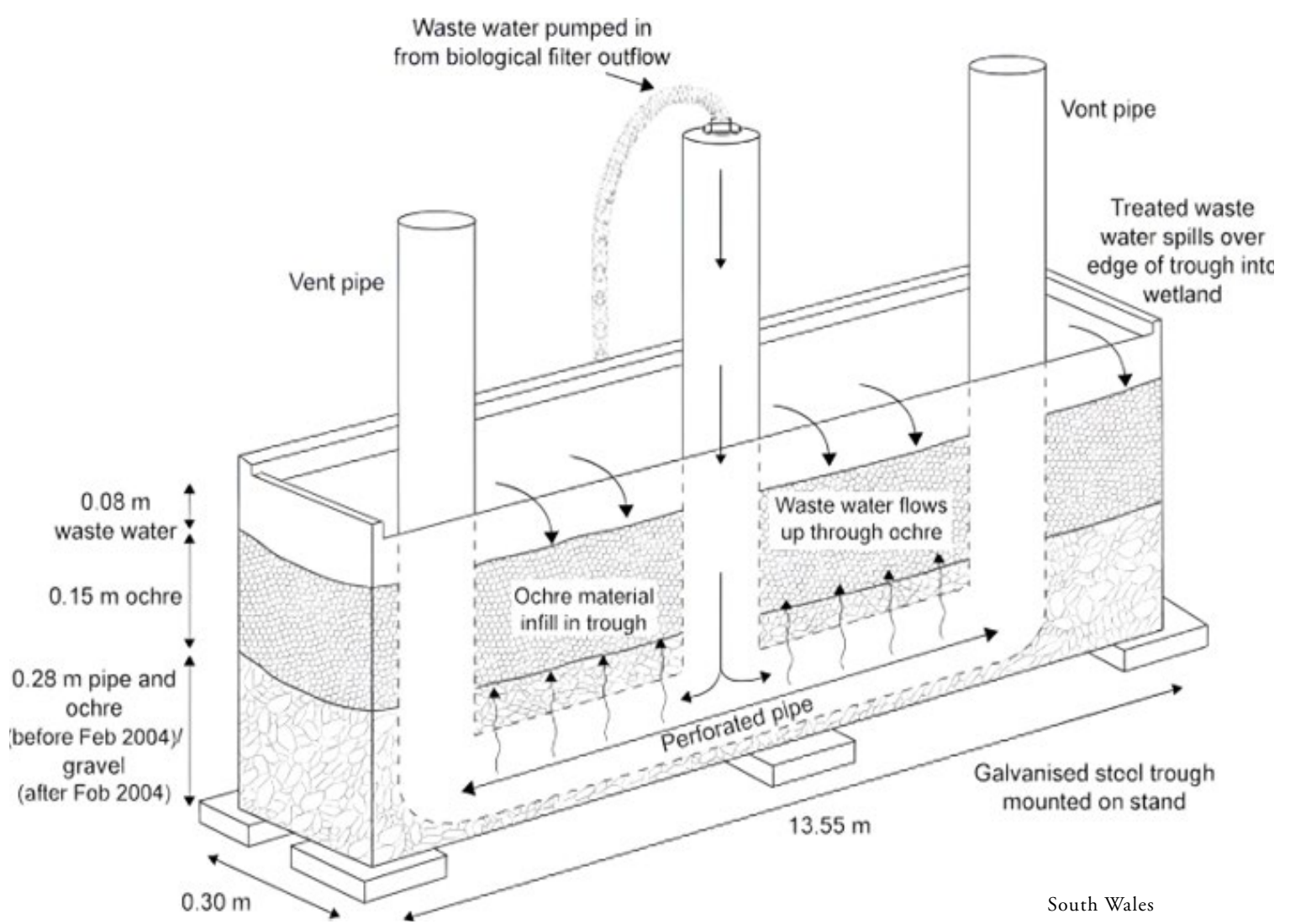
The plant performs an essential ecological function by protecting the river. At the same time, it concentrates the material afterlife of mining into ochre sludge. For the Coal Authority, this residue is primarily a maintenance burden. It remains part of an operational system of monitoring, removal and environmental management.

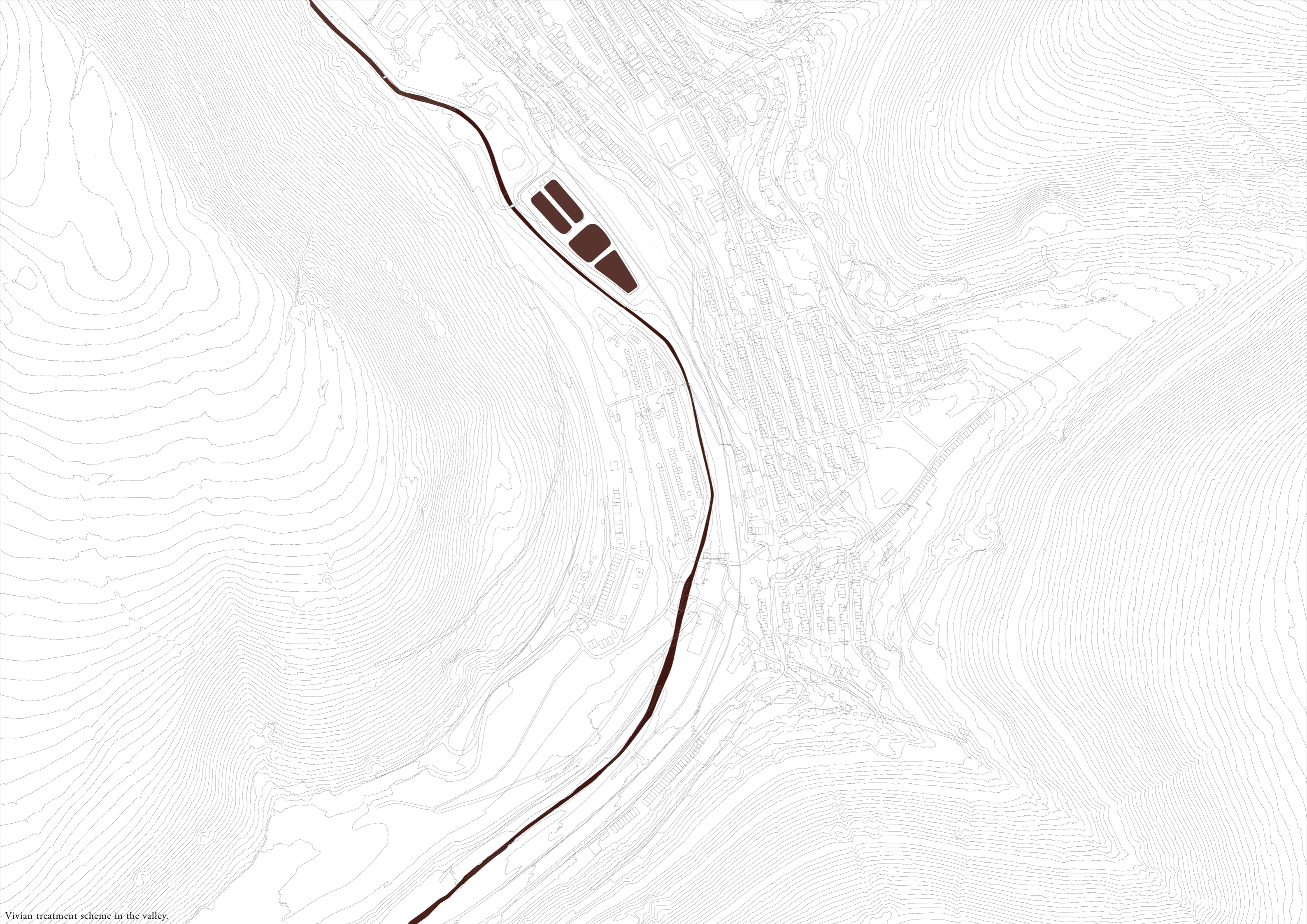
The same process that repairs one environmental condition therefore produces another material question. Once separated from the water, the ochre can be collected, handled and classified. Within the treatment system it remains a maintenance residue. Outside that system, its role is no longer fixed.

This instability creates the possibility of a second trajectory, in which the sludge enters material and cultural practice.

Vivian treatment scheme







Vivian treatment scheme in the valley.



Ochre settlement ponds



Turning Landscape: a second value chain

The next shift is cultural and material.

Dr Onya McCausland, an artist and researcher associated with the Slade School of Fine Art at UCL, has worked with ochres recovered from minewater treatment systems through Turning Landscape. Her work demonstrates that the iron-rich sludge produced through remediation can be processed into pigment. The material is collected, washed, settled, dried and ground. It can also be heated to alter its colour and mixed with different binders to produce paint (McCausland and Turning Landscape CIC, 2020).

This transformation changes the trajectory of the residue. It does not deny its origin in contamination or resolve the environmental consequences of mining. It introduces another system through which the material can be understood and valued. A byproduct of remediation becomes pigment. A pollutant becomes a medium. A maintenance burden becomes something that can be held, named, applied, displayed and exchanged.

In *Six Bells*, this transformation is inseparable from the landscape and the social condition of the former coal village. Onya's account of the place made clear that the pigment mattered beyond its colour.

It offered residents another relationship with a residue of extraction. In a village frequently understood through closure, deprivation and loss, the pigment created a basis for material knowledge and local recognition without erasing the damage from which it emerged.

The difference in scale remains important. Pigment production cannot replace coal as an economic base or address the structural causes of deprivation. Its value operates at another scale: cultural, civic, educational and material. It can make an otherwise concealed residue tangible and allow it to enter practices of making, representation and exchange.

Two value chains now operate in parallel. In the first, coal becomes minewater, contamination, treatment and ochre residue. In the second, ochre sludge becomes pigment, paint, cultural material and eventually an object of public exchange.

The same matter therefore moves between two systems: one concerned with environmental maintenance and another with material and cultural practice. Its physical continuity remains, while its classification, use and value change.



Six Bells ochre pigment and paint
Courtesy of Onya McCausland / Turning Landscape



Display of minewater pigments.
Courtesy of Onya McCausland



Pigment samples and colour variations.
Courtesy of Onya McCausland



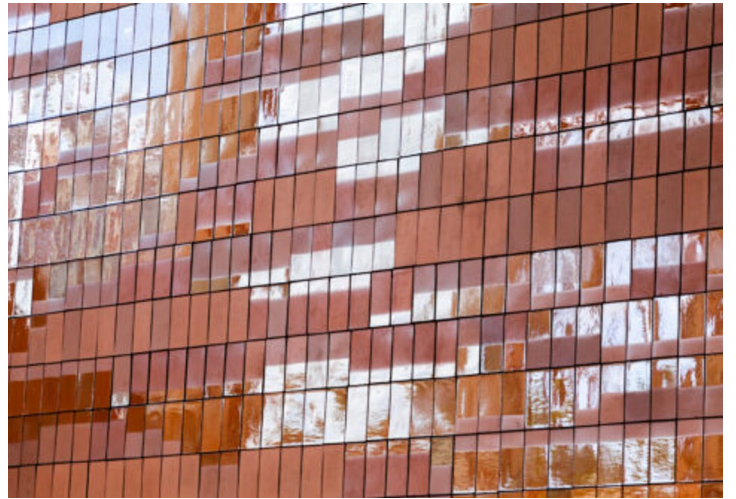
Painting produced from Six Bells Ochre
Artist: Onya McCausland at the Close Gallery,
Somerset, UK



Small informational card on the wall to the left of the painting.

Architectural surface painted with minewater
ochre
Courtesy of Onya McCausland / Turning
Landscape.





Ochre applied to different surface and products
Van Noort, K., & De Raadt, L. (n.d.). OER tiles
Russet [Photograph]. Kirstie van Noort Studio.

The Six Bells Paradox

The same matter is governed by several systems at once. The Coal Authority reads ochre sludge as a maintenance burden. A hydrologist reads it as evidence of minewater chemistry. Onya McCausland processes it as pigment. A resident may encounter it as a material connected to place. Over time, untreated residue may also become an ecological substrate.

The substance remains materially continuous while its role changes according to the system through which it is encountered. This simultaneous condition constitutes the Six Bells paradox.

The architectural question follows:

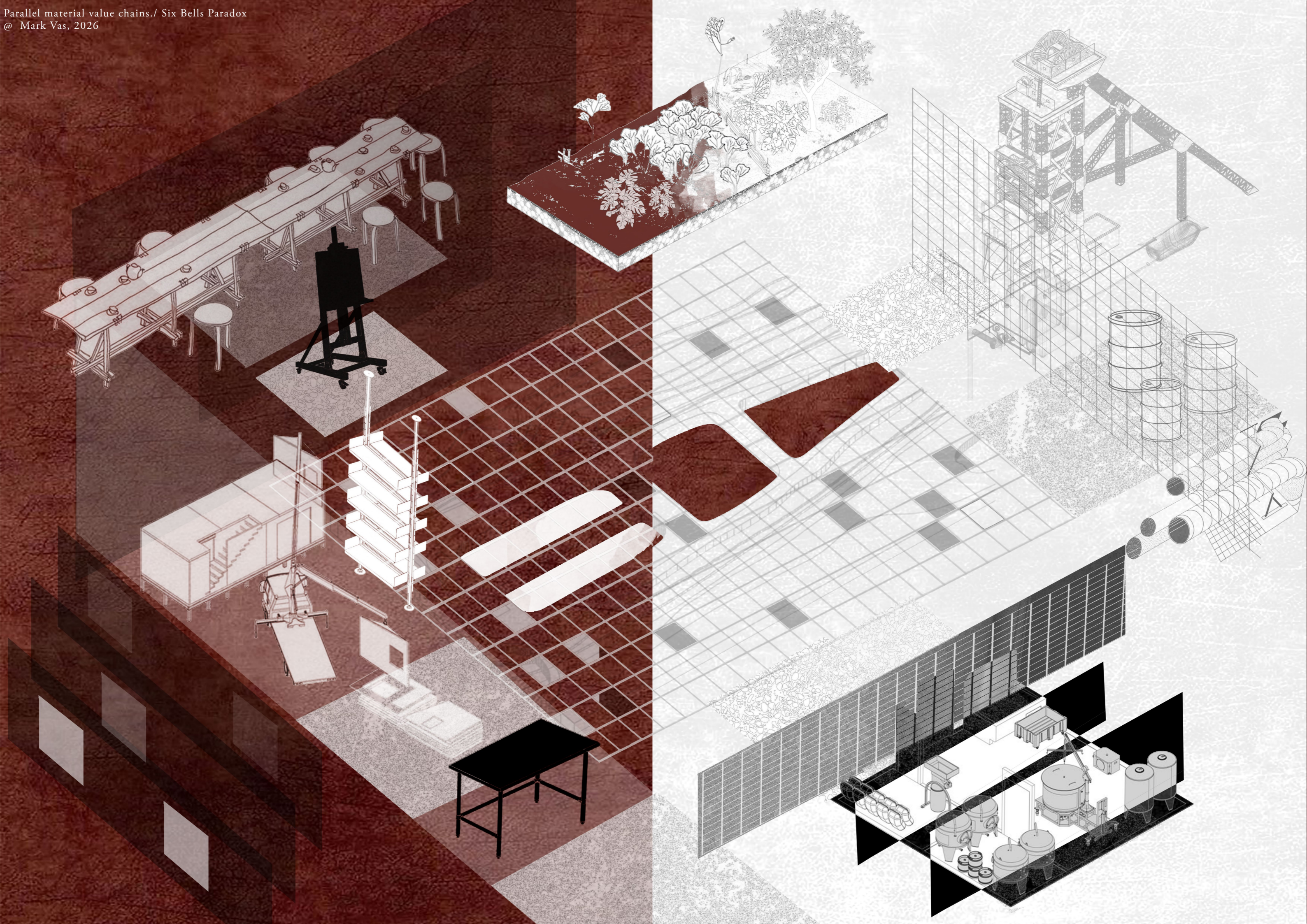
What role can architecture play in mediating how matter is classified, valued and transformed over time?

Interactions with ex-mine workers
Courtesy of Onya McCausland / Turning
Landscape



Ochre applied to different surface and products
Van Noort, K., & De Raadt, L. (n.d.). OER tiles
Russet [Photograph]. Kirstie van Noort Studios







Act ii

Landscape Transformation

Matter in transition



Pigment workshop with Onya McCausland
CLOSE Gallery, Hatch Beauchamp, Somerset, UK

Material Experiments: understanding the process

Onya's work proved the value shift at the scale of practice. These experiments attempt to understand it at the scale of the hand.

Before the architecture can spatialise the ochre process, the process has to be physically understood. What does wet sludge weigh? How long does it take to dry? What happens to the colour when it is fired? These are not questions that can be answered from a description. They require handling the material at each stage of its transformation.

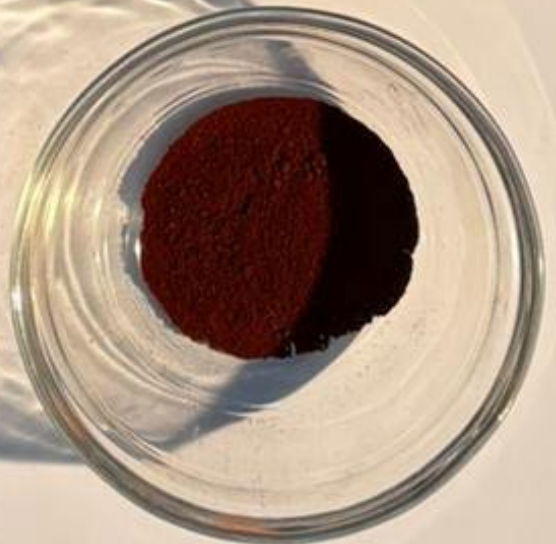
The material experiments translate the value argument into physical evidence. Each operation changes the ochre's weight, moisture, colour, particle size, temperature, stability and capacity for use. These changes generate both spatial and environmental requirements.

Raw sludge requires containment, drainage, robust floors and controlled access. Washing and settling require level basins, still water and separation. Drying requires airflow, shelter from rain, solar exposure and time. Grinding requires enclosure, dust extraction and collection. Calcination requires controlled heat, fire separation and exhaust. Binding requires clean work surfaces, storage and stable light. Application requires testing space and washable surfaces. Display and exchange require interpretation, diffuse daylight and public access.

The process diagrams should therefore be read through four linked categories: material state, assigned value, environmental requirement and spatial consequence. Together they form the first direct translation from research into programme, orientation and architectural form.



From residue to applied material
@ Turning Landscape





raw sludge



washing



decanting



drying



grinding



grinding



mixing/binding



mixing/binding



Matter in Transition

The paradox becomes spatial when the material begins to change state.

Ochre moves from wet sludge through washing, settling, drying, grinding, heating, binding, application and display. Each transformation changes its moisture, particle size, temperature, stability and assigned value. It also changes the environmental conditions that space must provide.

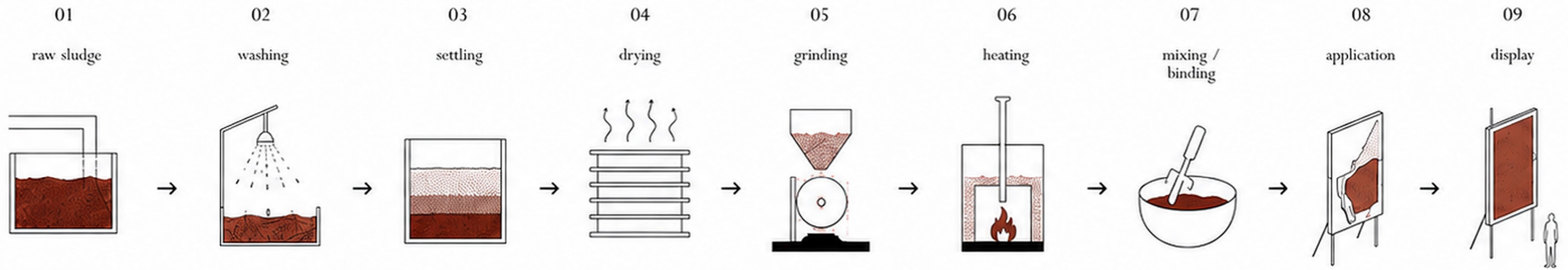
Wet matter requires containment, drainage and robust ground. Settling requires stillness, level surfaces and protection from disturbance. Drying requires moving air, shelter from rain and daylight without uncontrolled heat. Grinding requires enclosure and dust extraction. Calcination requires fire separation, controlled heat and exhaust. Binding and application require stable light, washable surfaces and clean working conditions. Gallery and exchange spaces require diffuse daylight, interpretation and public access.

These requirements influence more than the enclosure of individual rooms. They determine where each stage sits on the slope, how it is oriented toward wind and light, how roofs open or close and how courts, walls and frames direct air, water and movement.

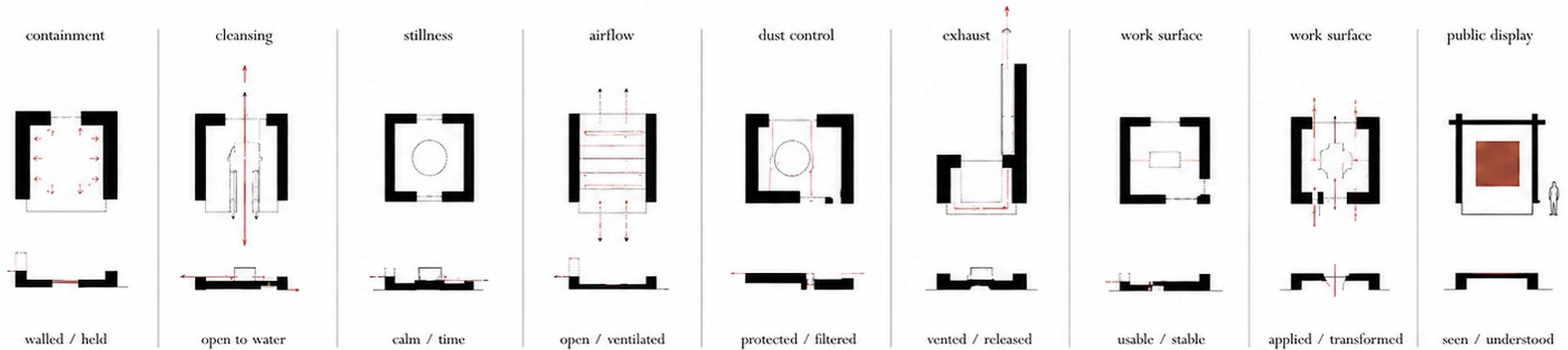
Act II therefore moves from the value conflict established in Act I toward the spatial and environmental consequences of material transformation:

What conditions are required for each state of matter to operate, and how do those conditions organise form on the site?

01 material transformation



02 spatial implications



each state requires a condition.
architecture gives form to transformation.



Proximity between village and treatment landscape.
@ Turning Landscape

Six Bells is part of Abertillery, a town compressed into a narrow valley where streets, terraces and former colliery sites follow the river and the slope. The village retains the spatial logic of extraction after the visible industrial structures have disappeared. Coal once provided an economic structure, a rhythm of work and a basis for collective identity. No equivalent productive system replaced it after closure. The post-extractive condition is therefore economic and civic as well as environmental.

The Guardian memorial holds one register of memory: labour, disaster, loss and collective identity. The minewater treatment landscape holds another: continuing hydrological maintenance. These two conditions occupy the same valley without a spatial relationship. The project does not claim that pigment production can replace coal or reverse structural deprivation. It proposes a smaller and more credible form of value-making based on knowledge, material practice, civic exchange and the public recognition of what remains.

Visible and Invisible Systems

The central site condition is the separation between what is publicly visible and what remains materially active. The village, roads, memorial and walking trails are visible. Minewater flows, ochre sediment, drainage systems and maintenance work are largely concealed behind fencing, vegetation and restricted access.

The largest continuing process in the landscape is therefore its least legible feature. Public paths pass close to the treatment ground, creating proximity without encounter. The village can remember extraction through the memorial landscape while remaining detached from the hydrological process that continues below.

This condition becomes a design requirement rather than another introduction to the site. The project must create controlled contact between technical maintenance, material transformation and civic life while preserving the safety, access and environmental separations each requires.

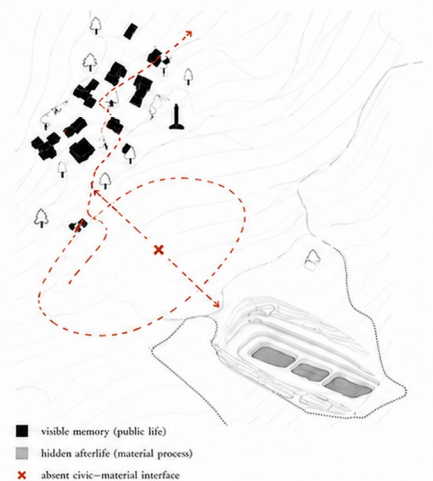
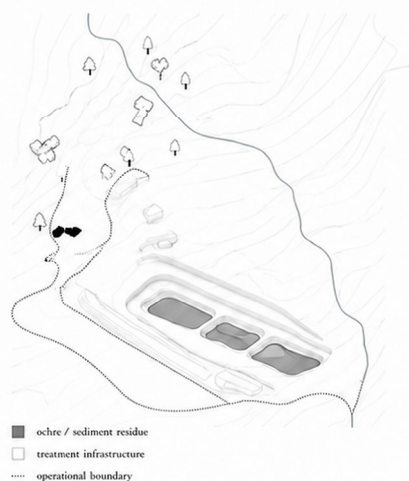
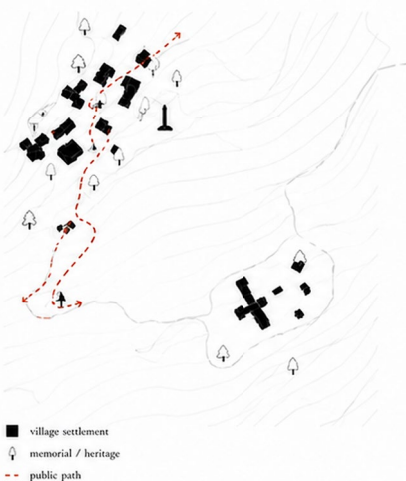
Visible memory, hidden afterlife.



01 visible memory
publicly visible elements

02 hidden afterlife
materially active elements

03 the missing interface
two systems in proximity



From Site to Brief

The research first establishes a set of architectural requirements.

The material research identifies the environmental conditions needed by each state of ochre. The site research identifies the slope, wet ground, vegetation, existing paths, wind exposure, daylight, service access and restricted treatment boundary that determine where those conditions can occur. The social research identifies a separation between public memory and the concealed material process below. Architecture must create controlled contact between them without dissolving operational, environmental and safety boundaries.

The programme is therefore derived from the changing states and values of ochre.

The **Processing Unit** accommodates physical transformation: Raw Sludge Handling, Infill Preparation, wet processing, settling, ventilated drying, heated storage, grinding, calcination, binding and mixing, product storage and application. It occupies the lower slope, close to the treatment landscape, drainage routes and service access. Wet rooms remain tied to robust ground, drying courts occupy exposed and ventilated positions and grinding and calcination are enclosed where dust, heat and exhaust can be controlled.

The **Making Court** accommodates interpretation and collective practice. The Matter Gallery presents the residue before refinement. The Ochre Gallery presents pigment, artworks and applied material after transformation. The workshop, Display Court, Public Forum and Spiral Court bring making, observation and discussion into the same middle ground. Their placement uses controlled daylight, sheltered courts and visual contact with both the processing landscape below and civic spaces above.

The **Civic Threshold** accommodates the point at which transformed material enters everyday life. It occupies the upper edge, where it meets the village, existing public path and familiar patterns of occupation. The market is the culmination of the value sequence: ochre-derived paints, objects, textiles and experimental products arrive from below, while vegetables, prepared food and everyday goods arrive from the Kitchen Garden, Community Kitchen, pub and local community. Their exchange places industrial residue alongside ordinary civic production rather than isolating it as an art object.

The three fragments follow a value and environmental gradient: matter is processed in robust and controlled conditions below, interpreted through variable light and shared courts in the middle and exchanged in open civic conditions above.

Hidden treatment plant



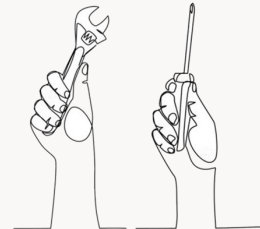
Threshold between community and process



Ochre sludge removed as waste



Collection, processing, cultural use

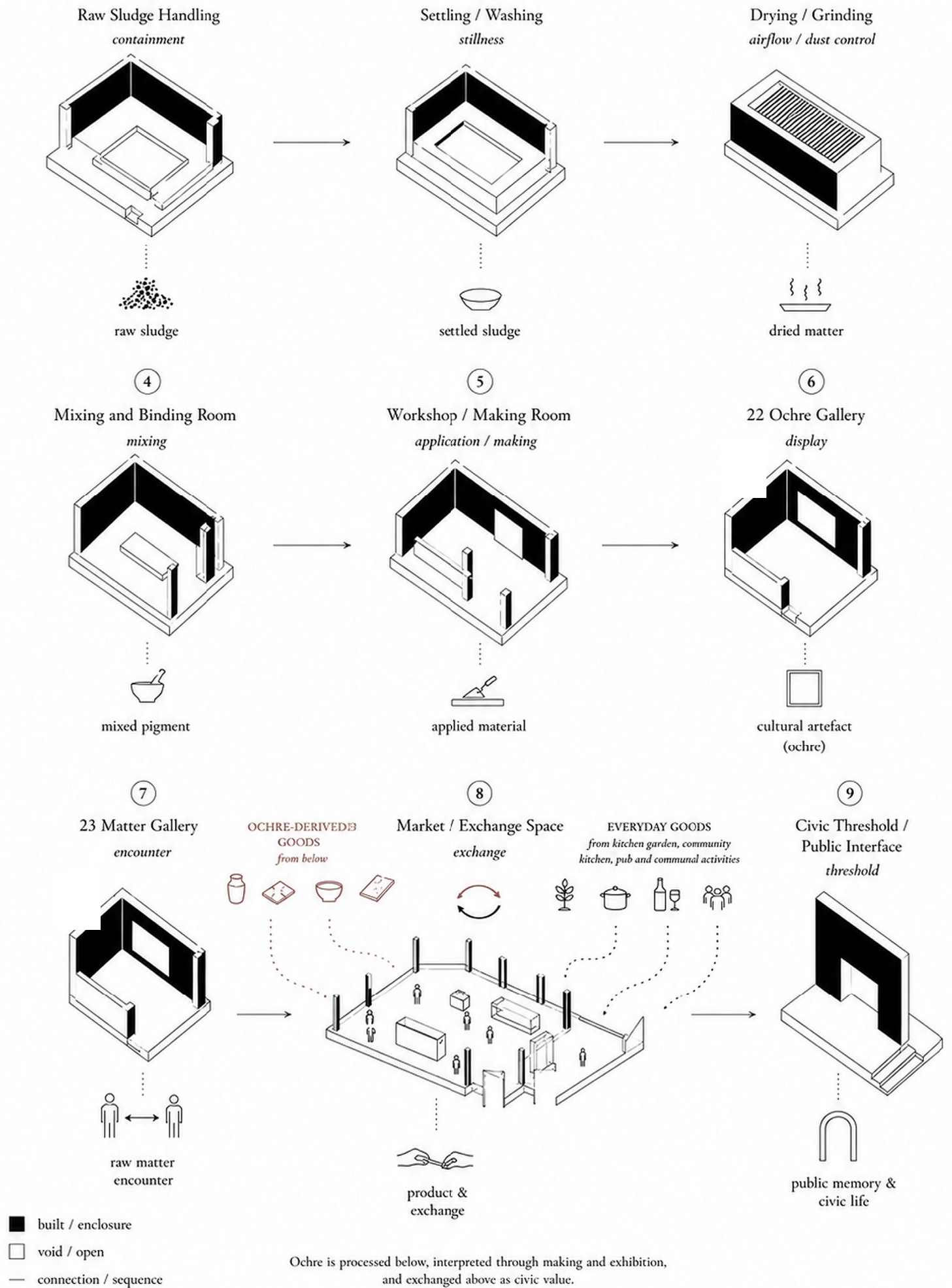


No productive civic anchor since 1988



programme for local value-making





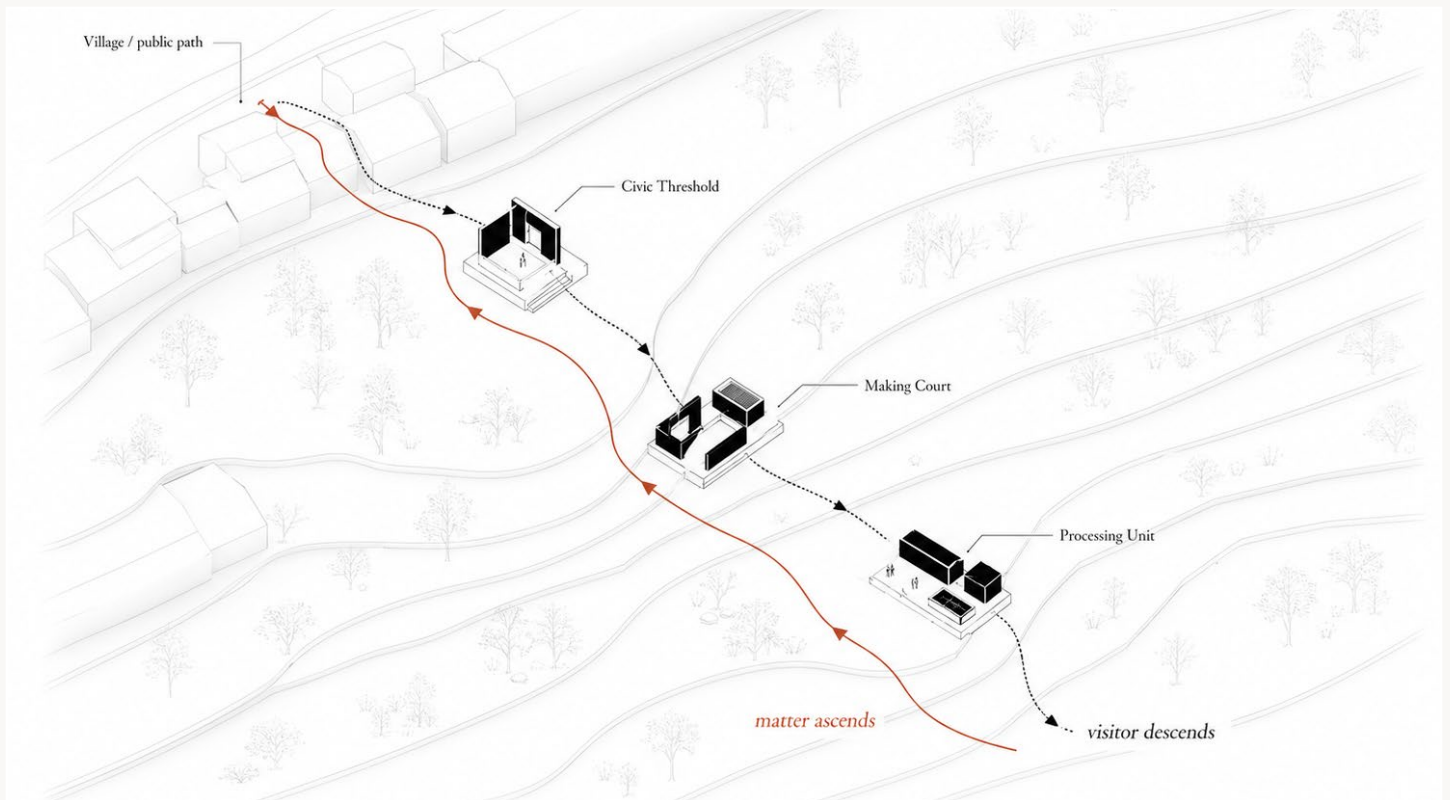
Programme derived from missing relationships.



Act iii

Architectural Transformation

Matter spatialised



Matter ascends, user descends.

Sequence, Space, Theatre

The material experiments established what ochre is physically. The site reading established what is missing spatially. The architecture follows from the relationship between them: a material that transforms through specific environmental conditions, on a slope that already contains those conditions.

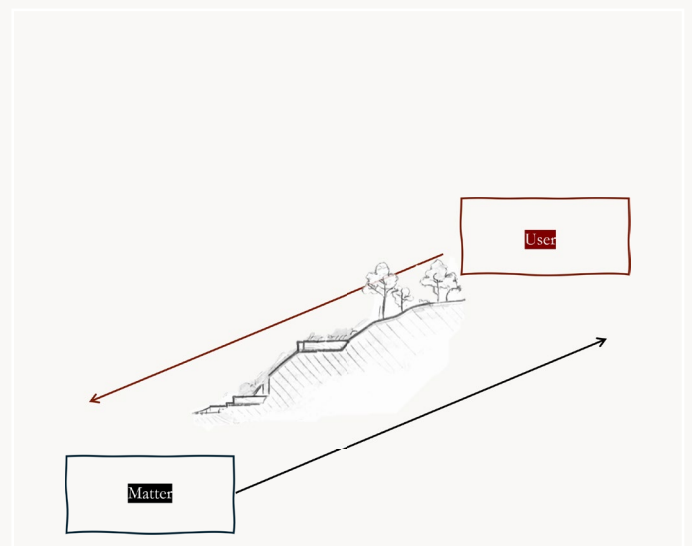
Three principles organise the proposal.

Architecture as sequence: the project unfolds through successive spatial and material conditions encountered along the slope, each one staging a different relationship between public life and process.

Space as narrative: the three spaces. The Civic Threshold, the Making Court and the Processing Infrastructure. Each one holds a different condition of matter and demands a different kind of presence.

Landscape as theatre: the daily rhythms, the slope, the wet ground, the treatment lagoons below make the scenography. The architecture frames them rather than replacing them.

The sectional logic that holds all three together: the visitor **descends** from civic life at the upper edge toward the hidden treatment landscape below, while matter **ascends** in the opposite direction, from minewater residue at the lower edge upward into processing, making and public exchange. Two flows running counter to each other, meeting in the Making Court at the middle of the slope.





Herman Schaal and the spatial method

Herman Schaal's distinction between resistance, field, path, passage and fragment provides the method through which these requirements become architectural form (Schaal, 1993).

The hillside is first read through its resistances: steep contour bands, wet ground, existing vegetation, water movement, treatment boundaries, public paths, service access, prevailing exposure, daylight and long views. These conditions identify where occupation is possible, where the ground must remain open or controlled and which locations can support wet, ventilated, heated, sheltered or public programmes.

Three programme fields are positioned along the usable bands of the slope: civic at the upper edge, making in the middle and processing closest to the treatment landscape below. Their placement is shaped simultaneously by access, material sequence and environmental performance.

The organisation is then structured by two opposing movements. Matter ascends. Ochre enters at the Processing Unit as raw sludge and moves upward through wet processing, drying, grinding, calcination, binding, application, exhibition and finally exchange at the Civic Threshold. The user descends. Visitors arrive from the village above and move downward through the Civic Threshold, Making Court and viewing spaces toward the hidden treatment landscape.

These movements do not merge into one route. The stone public path is slow, grounded and experiential. The lighter steel material and service path is direct, operational and reversible. They approach, cross visually and separate again at courts, galleries and thresholds.

Fragments form where resistance, programme, movement and environmental conditions overlap. Paths compress through passages, widen into courts and open into ensembles where public occupation, making or processing requires more space. Form emerges from the coordination of process, environment and movement rather than from a single imposed object.

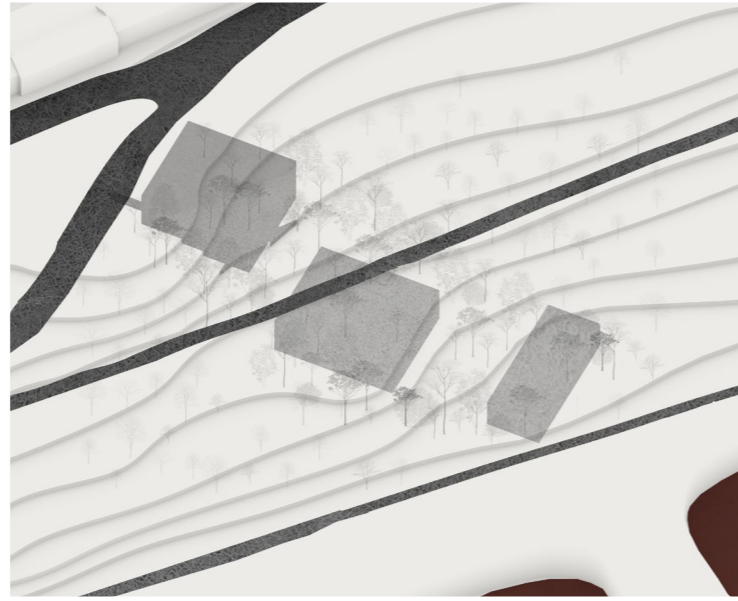
The project therefore works through difficulty. It creates a sequence where movement is shaped by material conditions.

Form-generation sequence following Schaal's logic.



01 Reading the given

The existing slope, vegetation, roads, treatment ponds and village edge are read as active conditions rather than empty ground.



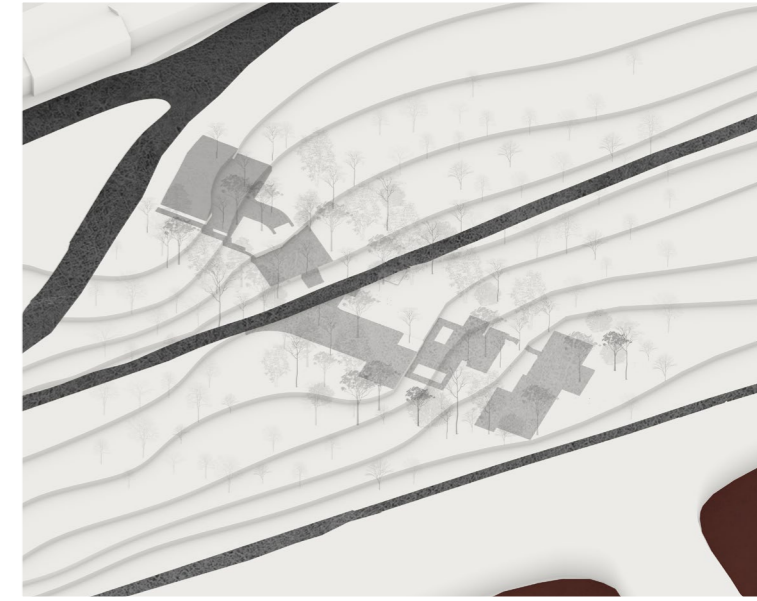
02 Locating occupiable fields

Three buildable fields are identified within the terrain: civic ground above, making ground at the centre and process ground below.



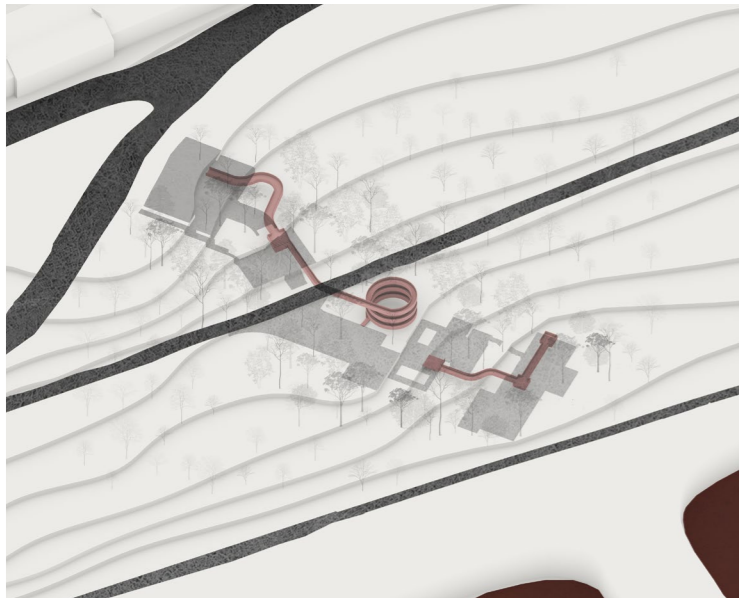
03 Weaving the steel path

A lighter elevated path moves around the fragments and existing vegetation, creating places to pause, observe activities below and frame views across the site.



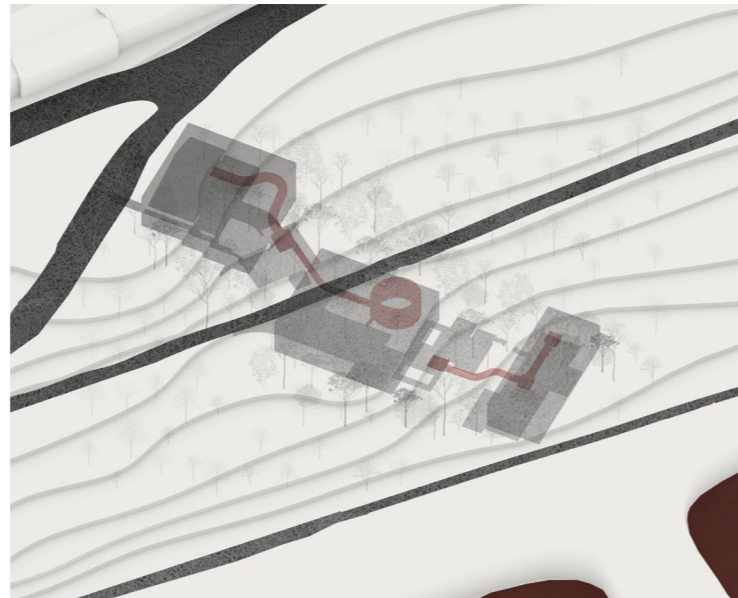
04 Establishing the stone sequence

A permanent stone route descends through the three programme grounds, linking buildings, courtyards and thresholds into a continuous architectural journey.



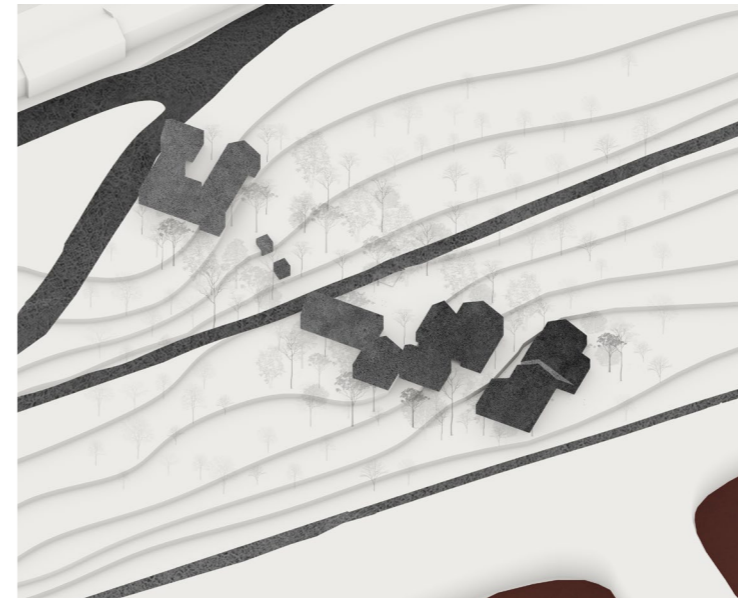
05 Opening passages

The routes bend, cross and widen in response to slope, access and existing vegetation, creating passages between the three fields.



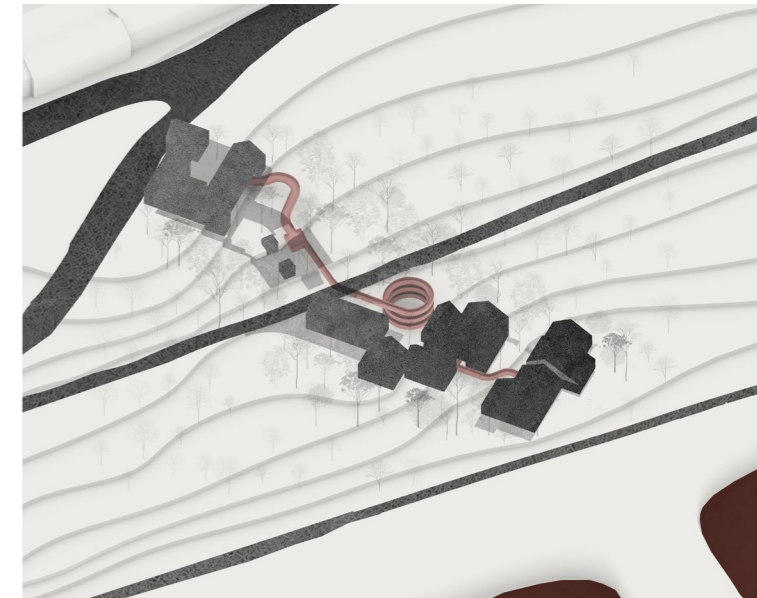
06 Forming fragments

Programme is divided into smaller fragments placed beside the paths rather than consolidated into one continuous building.



07 Thickening the ensemble

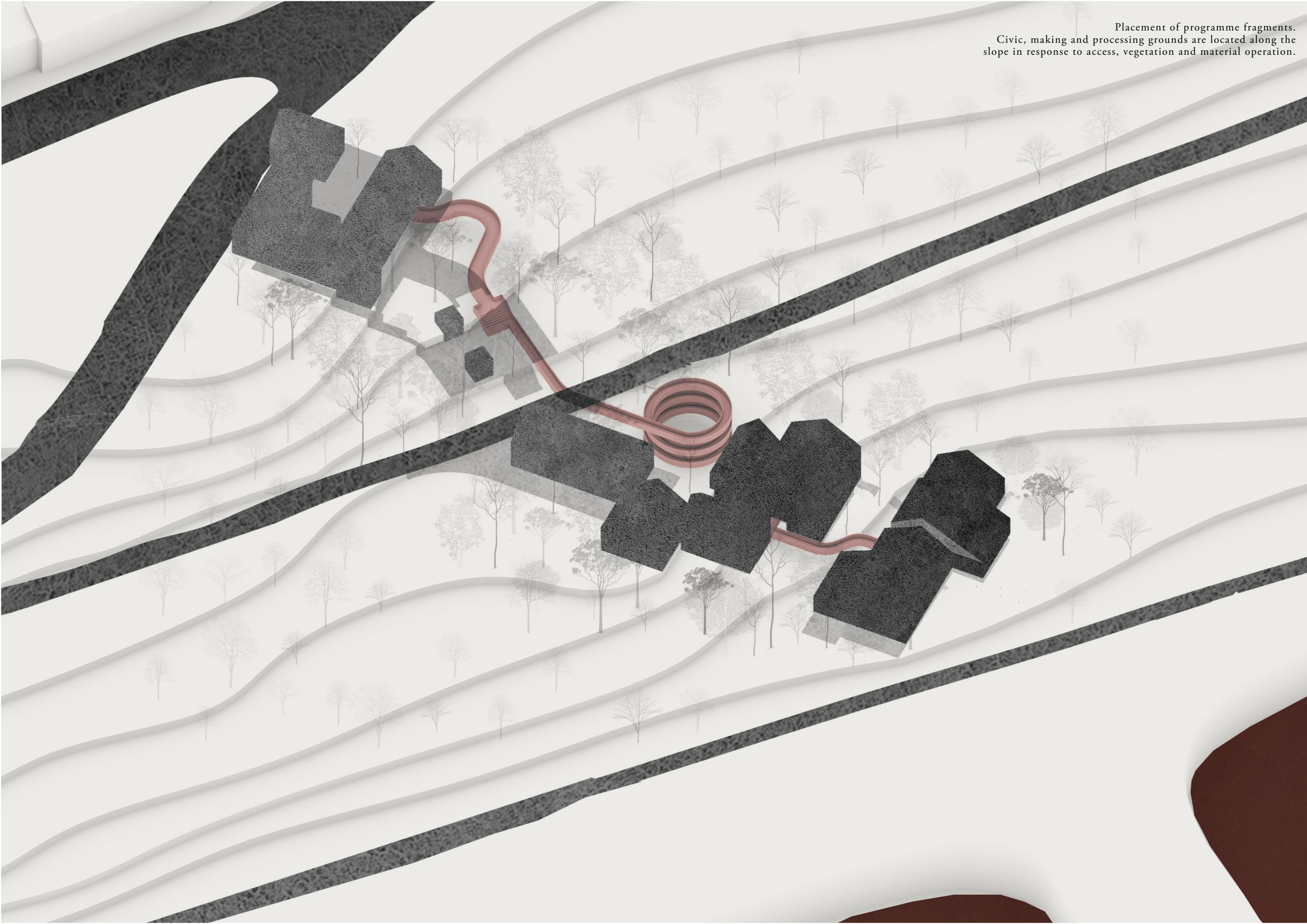
Fragments expand around courts, thresholds and working spaces as the paths open into wider collective rooms.

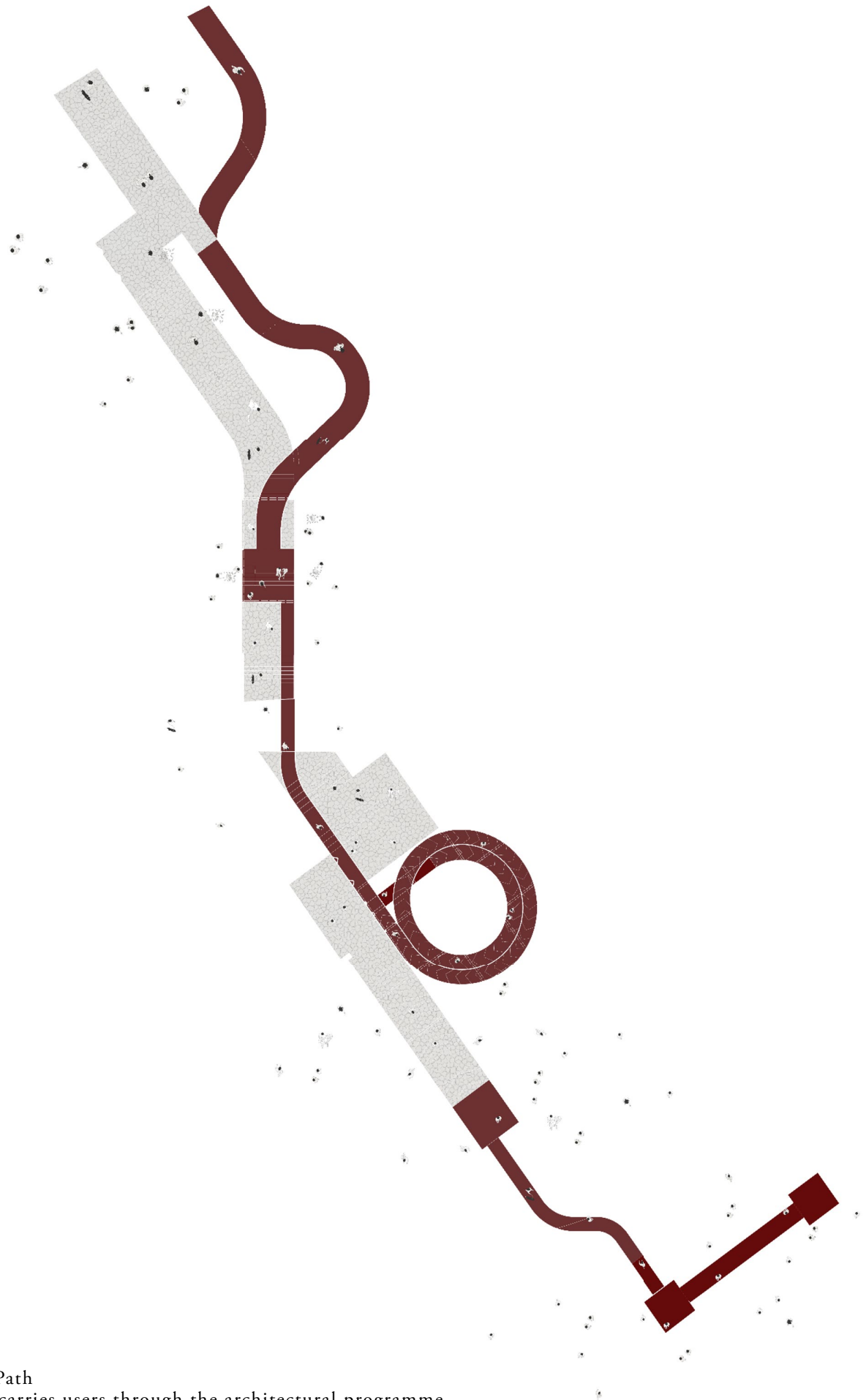


08 Linking matter and public movement

The final ensemble is organised by two opposing sequences: matter ascends through processing, making and exchange while visitors descend from civic life toward the active treatment landscape.

Placement of programme fragments.
Civic, making and processing grounds are located along the slope in response to access, vegetation and material operation.





Stone and Steel Path

The stone route carries users through the architectural programme while the lighter steel route bends around ground resistances and creates opportunities for pause and observation.



Steel path

The steel path provides a lighter and more informal route through the landscape for the everyday users of Six Bells. It moves independently around and above the architectural fragments, bending in response to existing trees, vegetation, changes in level and other resistances in the ground.

Its route is shaped by movement, pause and observation. It slows where activities below become visible, widens where people can stop and turns to frame views across the valley, treatment landscape and internal courts. The raised path allows people to encounter the work of the project without necessarily entering every room.

The steel structure remains visually and physically distinct from the stone architecture. It creates proximity between public movement and the activities below while maintaining a clear boundary between observation, participation and controlled working space.

Stone path

The stone path forms the primary architectural sequence through the project. It descends from the Civic Threshold through the Making Court toward the Processing Unit, connecting rooms, courtyards, passages and thresholds in a continuous top-to-bottom journey.

Its movement is direct and grounded. The path belongs to the permanent architecture, guiding users who enter the buildings and move through the programme in sequence. Stone walls retain the slope, define enclosure and create moments of compression before opening into courts and collective spaces.

The Masterplan

The masterplan is organised as three ensembles distributed along the slope. Their positions follow existing terraces, vegetation, wet ground, access and microclimatic conditions rather than a single imposed axis.

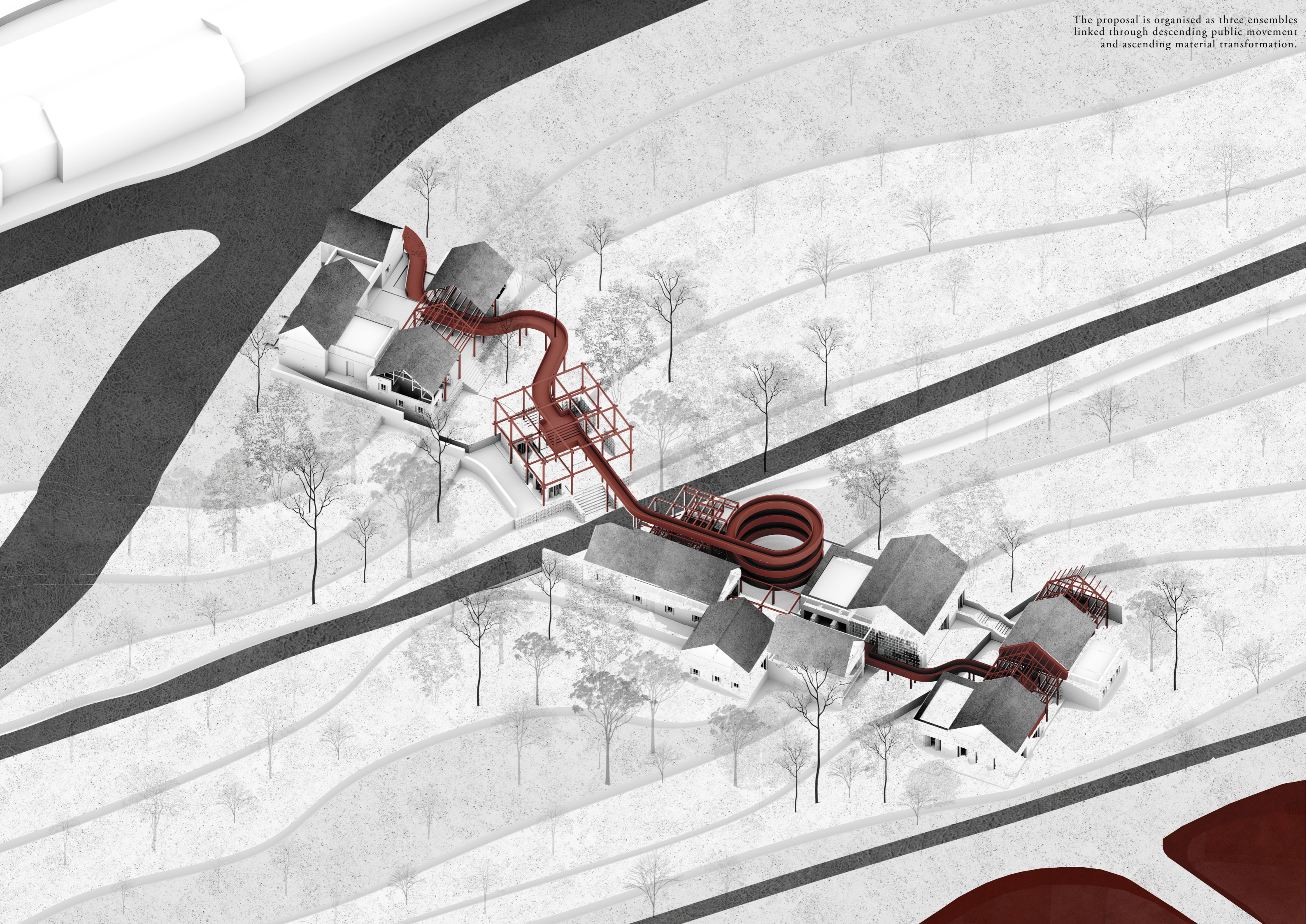
The Civic Threshold meets the village and public path at the upper edge, where open courts, the market, garden and community spaces can receive daylight and ordinary public occupation. The Making Court occupies the central terrace around the spiral, using sheltered and semi-enclosed conditions for galleries, workshops and collective making. The Processing Unit sits closest to the minewater treatment landscape, drainage routes and service access below. Its wet processes remain grounded, its drying courts open toward moving air, and its dusty or heated rooms are enclosed and oriented for controlled extraction.

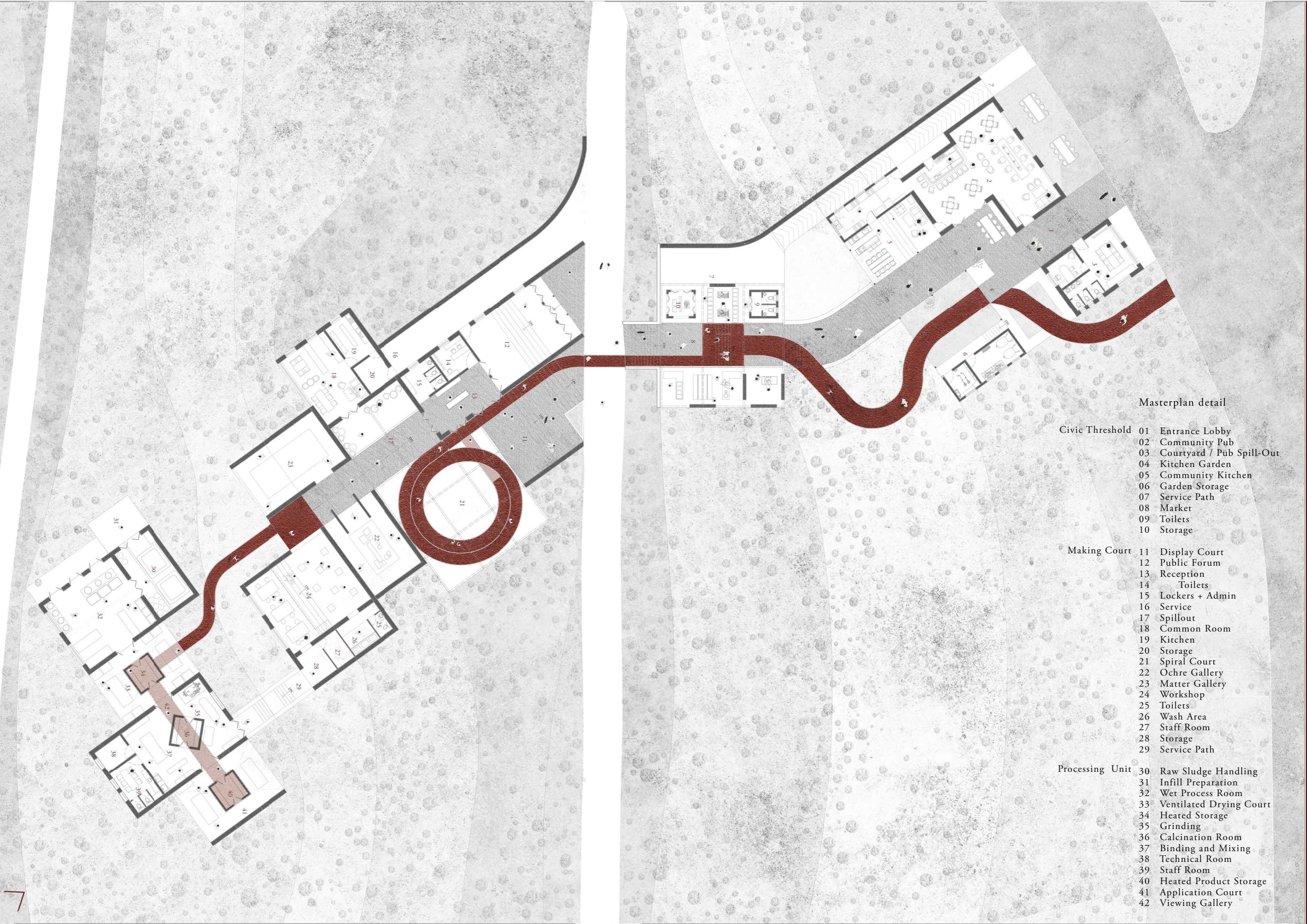
The project is organised by two opposing movements. The stone public path carries visitors downward from civic life toward the hidden material process. The steel material and service path carries ochre upward from Raw Sludge Handling through processing, making, display and exchange. Matter ascends while the user descends.

The two routes remain distinct but repeatedly enter visual and spatial relation. At the Civic Threshold, transformed products arriving from below enter the market and everyday exchange. In the Making Court, visitors encounter the material through galleries, workshops and the Spiral Court. At the Processing Unit, the Viewing Gallery allows observation from above while workers and material remain on the operational route.

Smaller room fragments sit beside these routes. Their dimensions, orientation and degree of enclosure respond to the matter they contain: open and ventilated where drying is required, robust and drained where sludge is handled, enclosed where dust and heat must be controlled, and daylit where making and display occur. Open space is treated as programme through courtyards, widened landings, spill-out terraces and working yards.

The proposal is organised as three ensembles
linked through descending public movement
and ascending material transformation.





Masterplan detail

- Civic Threshold**
- 01 Entrance Lobby
 - 02 Community Pub
 - 03 Courtyard / Pub Spill-Out
 - 04 Kitchen Garden
 - 05 Community Kitchen
 - 06 Garden Storage
 - 07 Service Path
 - 08 Market
 - 09 Toilets
 - 10 Storage

- Making Court**
- 11 Display Court
 - 12 Public Forum
 - 13 Reception
 - 14 Toilets
 - 15 Lockers + Admin
 - 16 Service
 - 17 Spillout
 - 18 Common Room
 - 19 Kitchen
 - 20 Storage
 - 21 Spiral Court
 - 22 Ochre Gallery
 - 23 Matter Gallery
 - 24 Workshop
 - 25 Toilets
 - 26 Wash Area
 - 27 Staff Room
 - 28 Storage
 - 29 Service Path

- Processing Unit**
- 30 Raw Sludge Handling
 - 31 Infill Preparation
 - 32 Wet Process Room
 - 33 Ventilated Drying Court
 - 34 Heated Storage
 - 35 Grinding
 - 36 Calcination Room
 - 37 Binding and Mixing
 - 38 Technical Room
 - 39 Staff Room
 - 40 Heated Product Storage
 - 41 Application Court
 - 42 Viewing Gallery

Material dialogues: stone receives, steel inserts, ochre records

The tectonic language of the project is a dialogue between two materials that operate at fundamentally different timescales.

The long section reveals a construction system organised by duration. Stone forms retaining walls, plinths, thresholds and rooms tied to the slope. It establishes the permanent ground of the project and receives load, water, staining and repeated occupation.

The steel frame is lighter, bolted and reversible. It spans courts, carries roofs and walkways and supports screens, viewing galleries, drying racks, exhibition rails and service elements. Its role changes across the three fragments while its structural rhythm remains continuous.

Ochre is neither decorative colour nor a uniform finish. It appears where the process leaves evidence: on work surfaces, drainage edges, drying elements, application walls, grating and exchanged objects. These traces allow the architecture to record use and time.

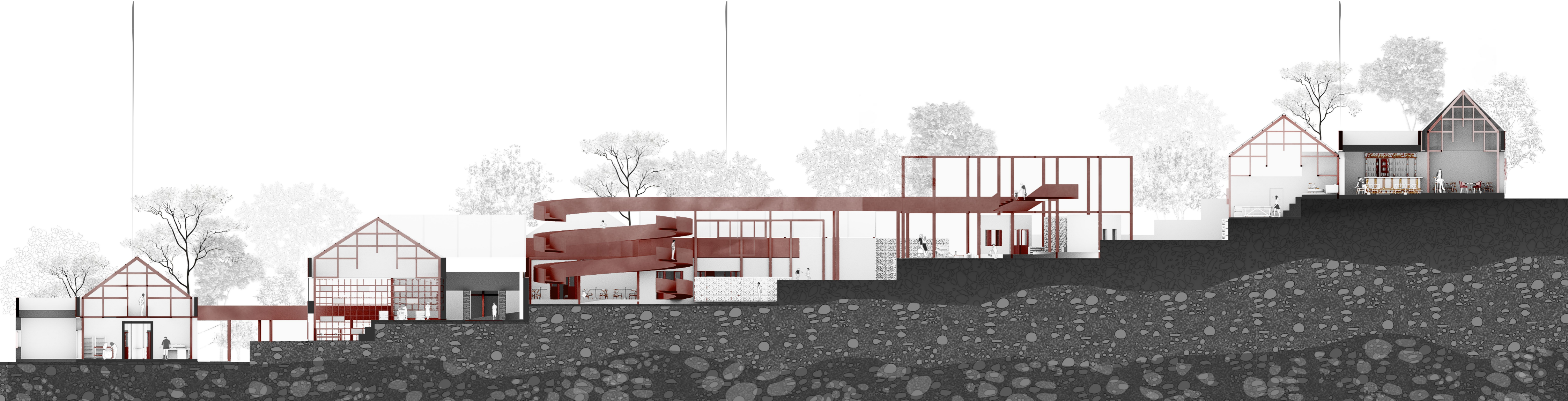
In section, the permanent ground and adaptable frame remain distinct. Stone establishes terraces and passages. Steel crosses and connects them. The system can therefore change as treatment declines without erasing the material history held by the ground.

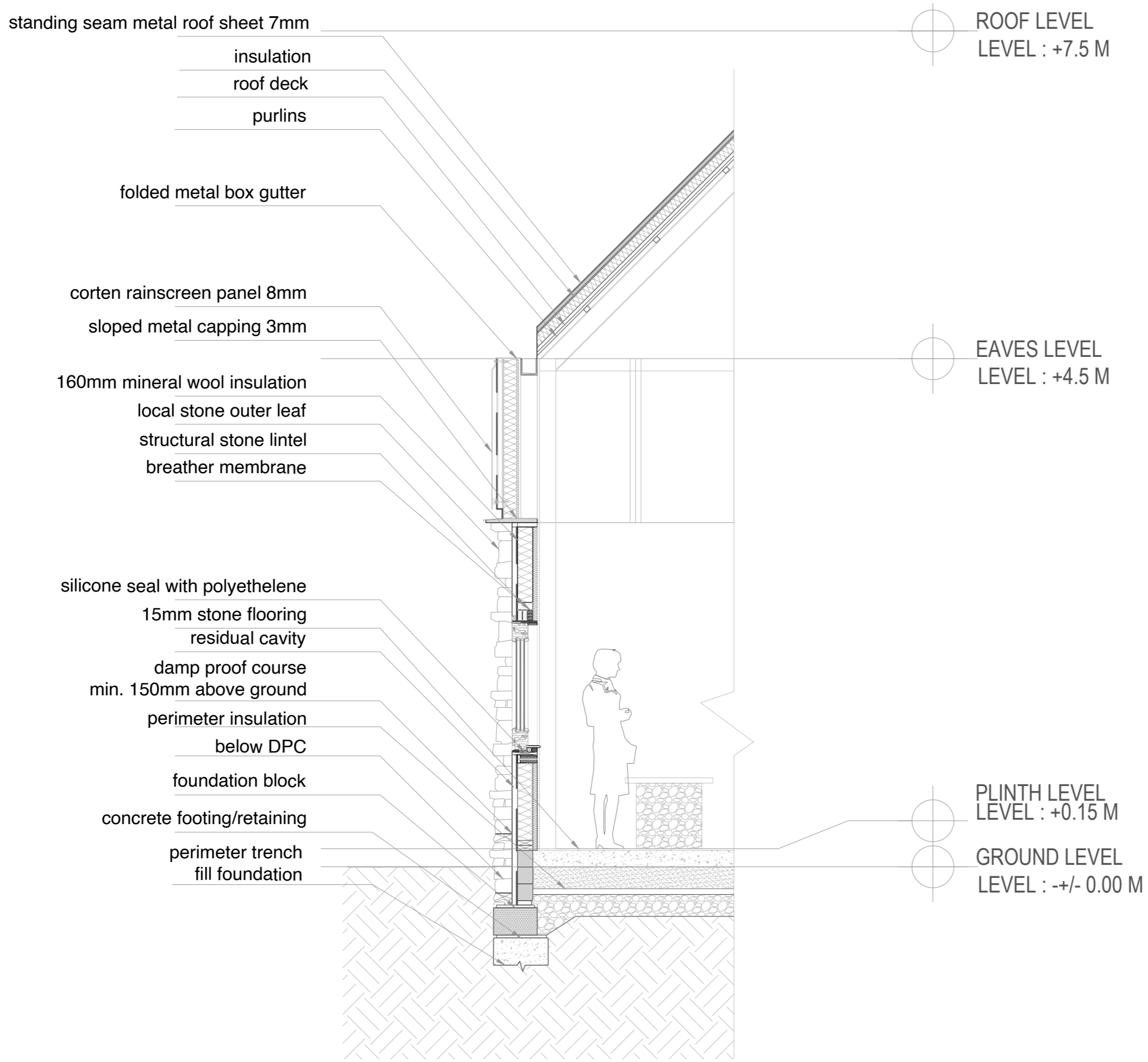
Long section through the three programme grounds along with the material dialogue

Processing Infrastructure
matter remains in operation

Making Court
matter becomes practice

Civic Threshold
matter enters public life





1:20 construction detail



Elevation

Structural and environmental junctions
Retaining walls, bolted steel frames, roof build-ups, corten
screens, drainage and adaptable enclosure systems are
coordinated through a common tectonic logic.

Environmental enclosure across the process

The environmental strategy follows the material process and the specific exposure of each part of the slope rather than applying one envelope across the project.

Fully enclosed rooms protect clean, heated, dusty or contamination-sensitive work. Grinding and calcination require controlled ventilation, extraction and exhaust. Sheltered courts allow robust making and handling under rain protection. Translucent enclosures provide diffuse daylight for workshops and galleries while maintaining separation. Open frames support circulation, drying, exhibition and seasonal use. Exposed ground accommodates wet processes, kitchen gardens and future ecological occupation.

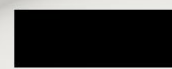



Wind and light become form-generating conditions. Ventilated drying courts are placed where air can move through the frame, with roofs and screens preventing direct rainfall while allowing evaporation. Galleries and application rooms use diffuse light to reveal colour without excessive glare or heat gain. High-level openings support stack ventilation in enclosed workspaces. Calcination exhaust is separated from public routes and directed above occupied levels.

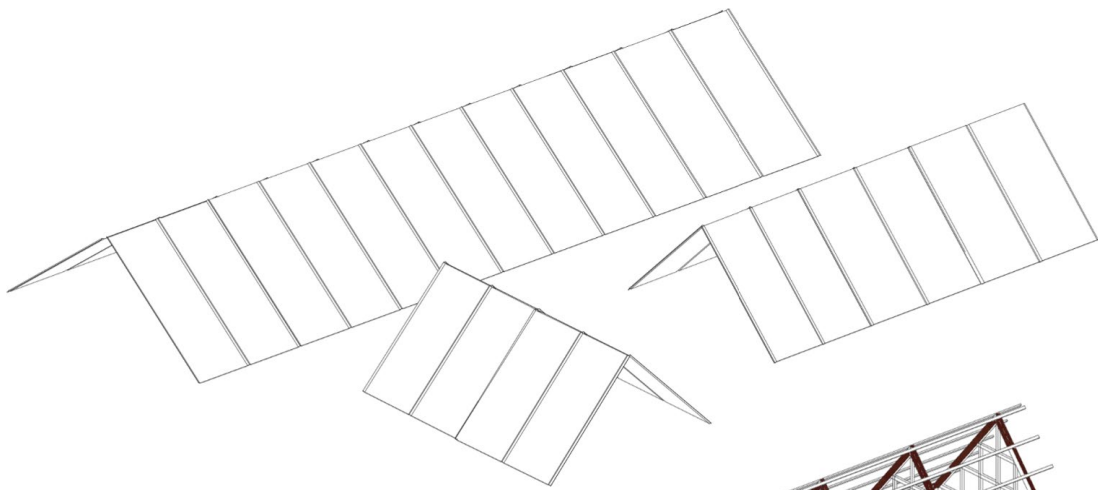
Water is treated as part of the same system. Roofs collect rainwater and direct it toward channels, basins and the treatment landscape. Sloped floors and drainage edges contain wet residue. Grated walkways allow air, light and water to pass while keeping visitors above operational areas. Stone bases tolerate moisture, impact and staining, while replaceable steel, screens and roof panels can adapt as the process changes.

Environmental performance is therefore embedded in the value sequence: each material state generates a particular orientation, enclosure, section and relationship to the site.

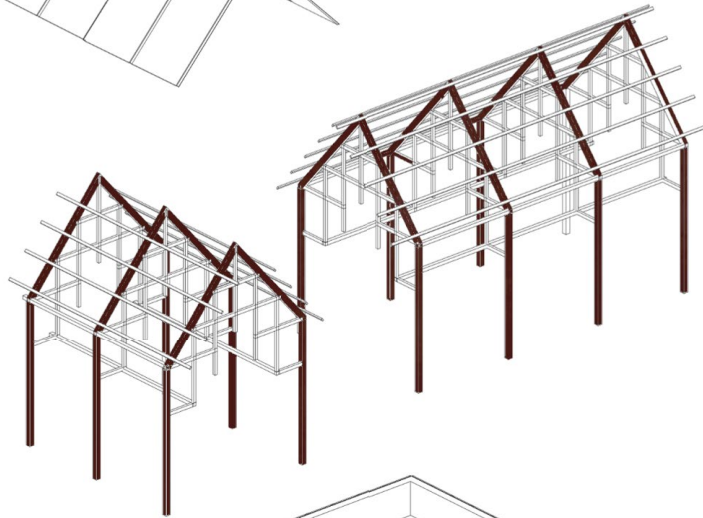


Environmental Conditons

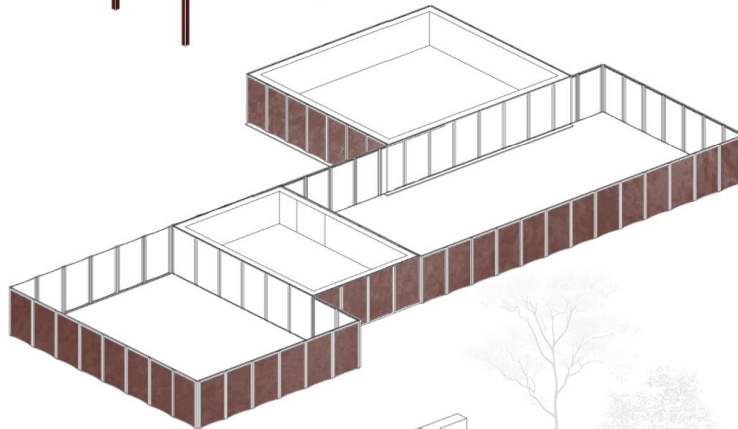
-  Fully enclosed
-  Semi-enclosed with solid roof
-  Semi-enclosed with translucent roof
-  Open frame



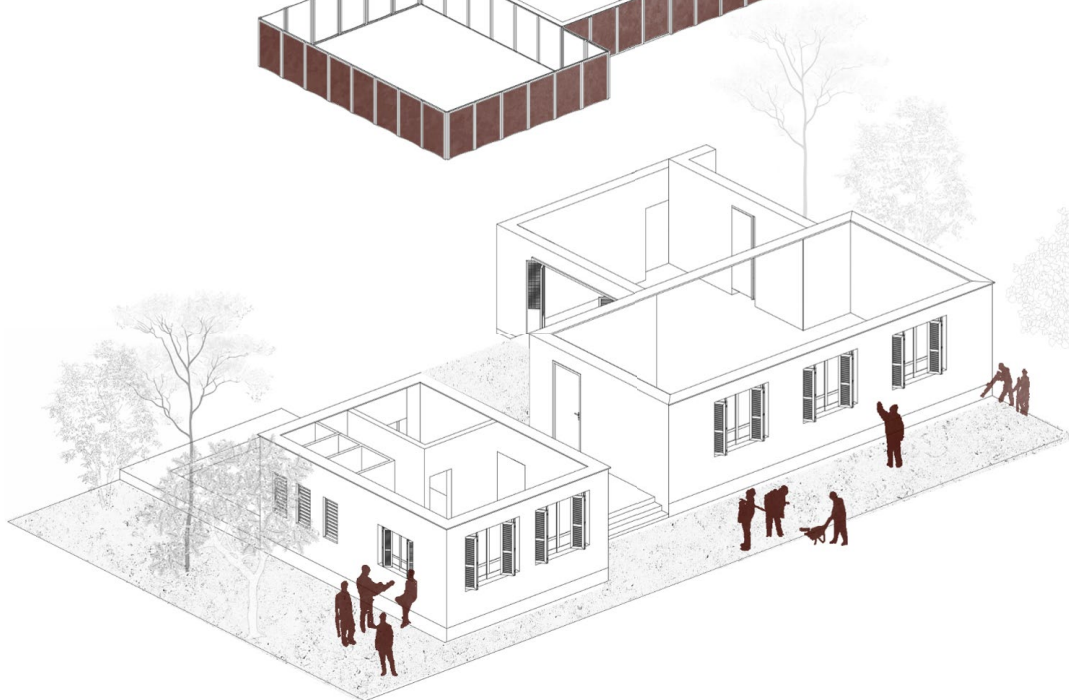
lightweight roof



reversible steel frame



corten rainscreen



stone enclosure

grounded stone base

Assembly of the tectonic system
Exploded axonometric showing the relationship between the retained stone rooms, perimeter walls, steel portal frames, secondary roof structure and external enclosure. The sequence separates permanent ground-bound elements from lighter and more adaptable construction layers.

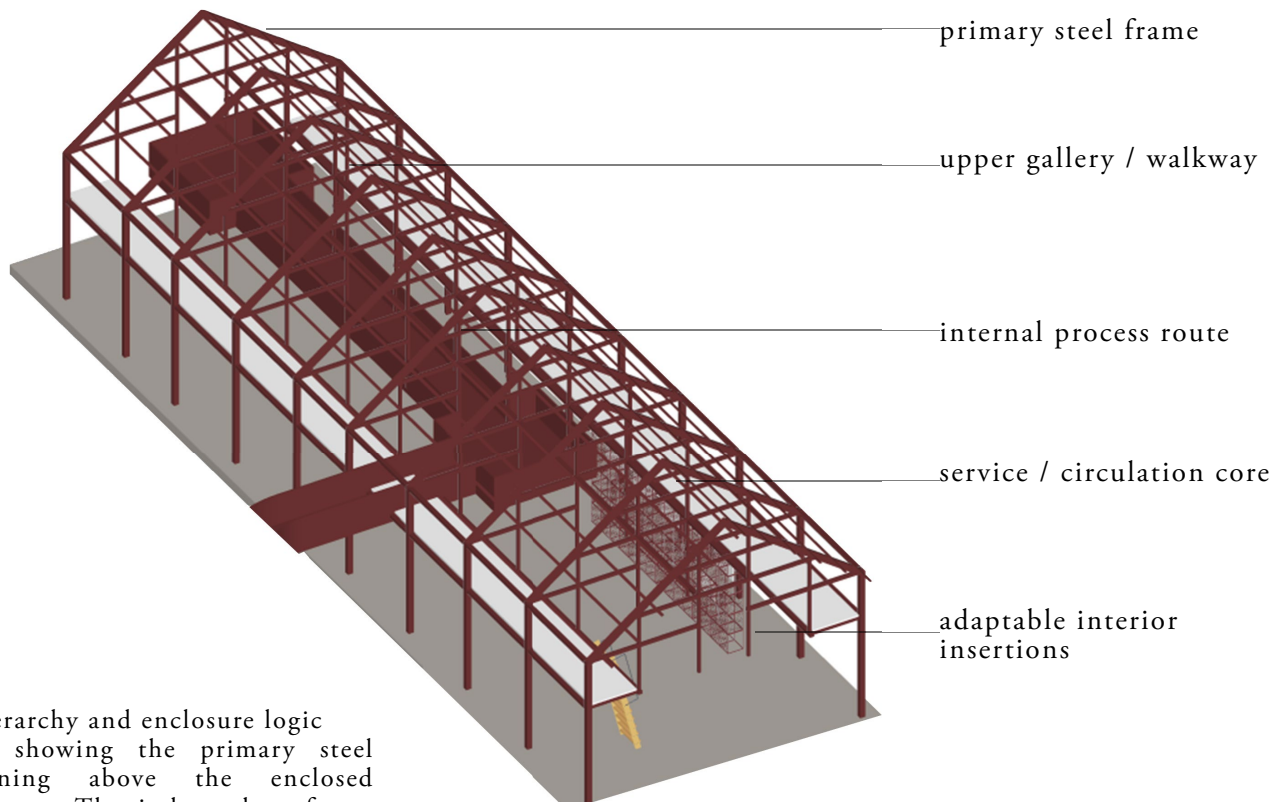
One frame, three roles

The project is structured by a single steel frame system that runs the full length of the slope and performs differently at each position along it.

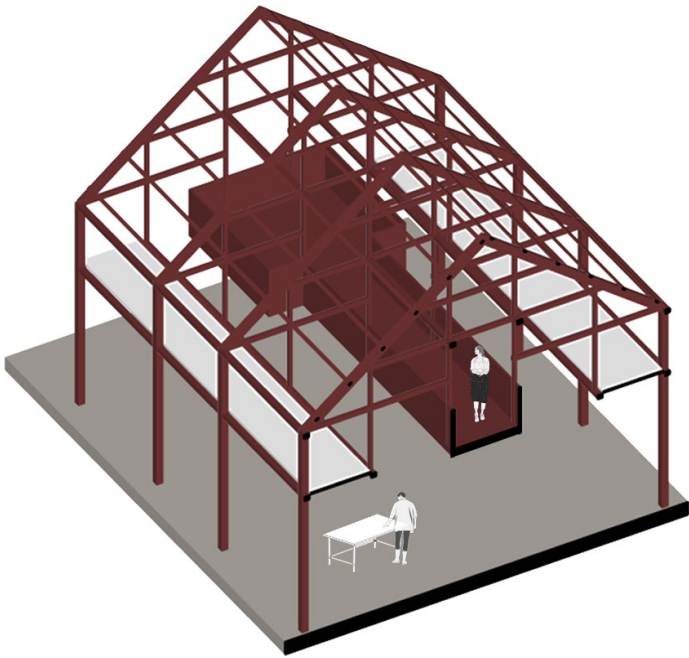
At every level the hierarchy is the same. Primary steel columns and rafters carry loads, support the roof and define the main spatial volumes. Secondary rails span between primary members and carry roof sheets, corten panels, display systems, drying racks, lighting and hanging elements. Tertiary brackets, slotted plates and removable hooks allow the secondary system to be reconfigured as the programme changes: a drying rack becomes a display rail, a panel system becomes a screen, a storage loft becomes a lighting point.

At the Civic Threshold the frame carries the roof over the enclosed spaces and supports the floating ramp moving through and above the market. At the Making Court it becomes the scaffold enclosure of the courtyard, the primary rafters carrying the translucent canopy roof and integrating the spiral descent within the same structural volume. At the Processing Infrastructure it extends as the bridge gallery above the operational zone, roof and gallery deck both carried by the same primary and secondary logic.

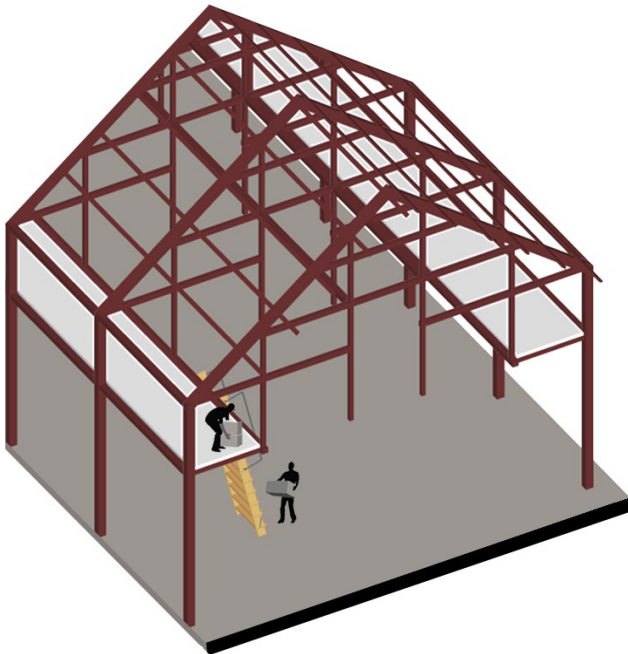
The same connection appears at every position: bolted plates, slotted holes, removable rails. Nothing is welded that does not need to be permanent. The frame is designed to be taken apart.



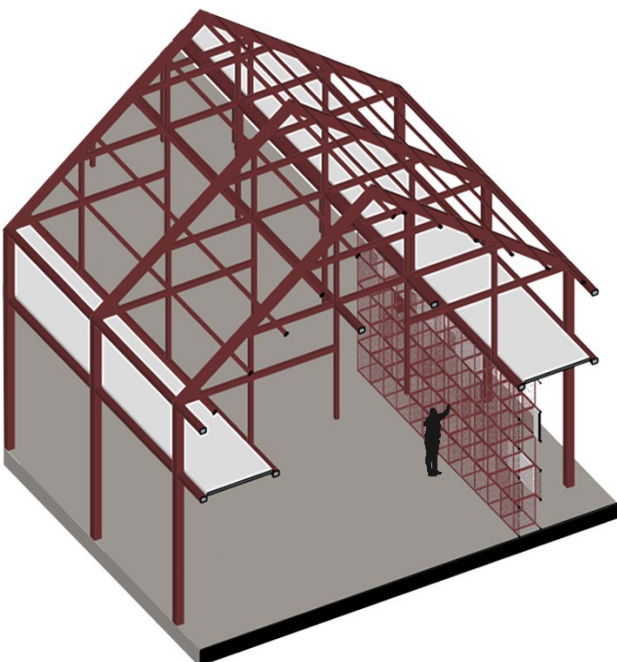
Structural hierarchy and enclosure logic
Axonometric showing the primary steel frame spanning above the enclosed processing rooms. The independent frame supports the roof, environmental screens and future alterations while the heavier internal volumes remain tied to the ground.



holds the gallery above



creates service/loft spaces



adaptable interior
insertions/ display
shelves

Adaptable occupation within the steel frame. Three axonometrics demonstrate how internal rooms, screens and circulation elements can be inserted, modified or removed without dismantling the primary structure. The frame accommodates changing operational and public uses over time.



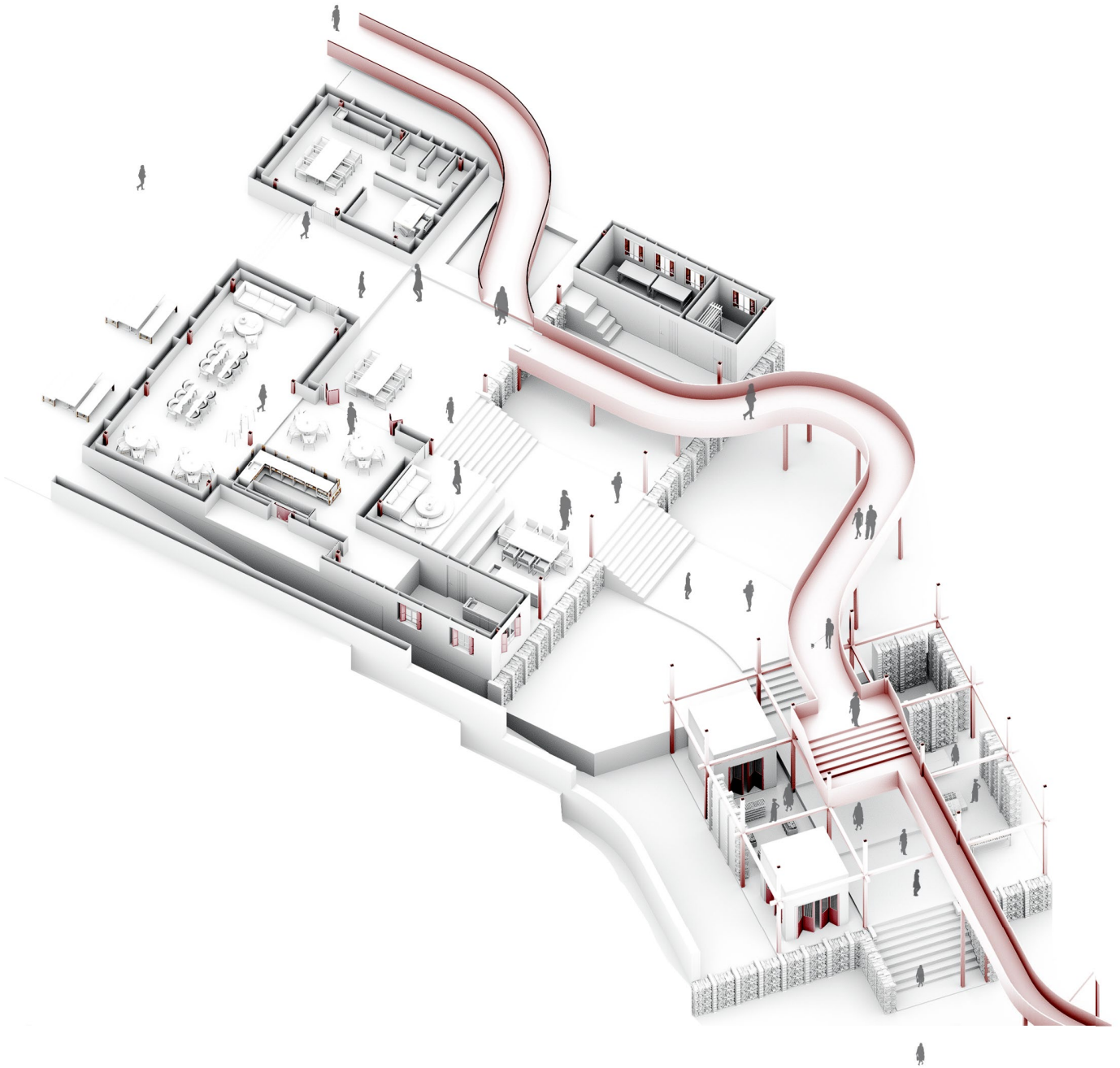
Civic threshold: matter enters public life

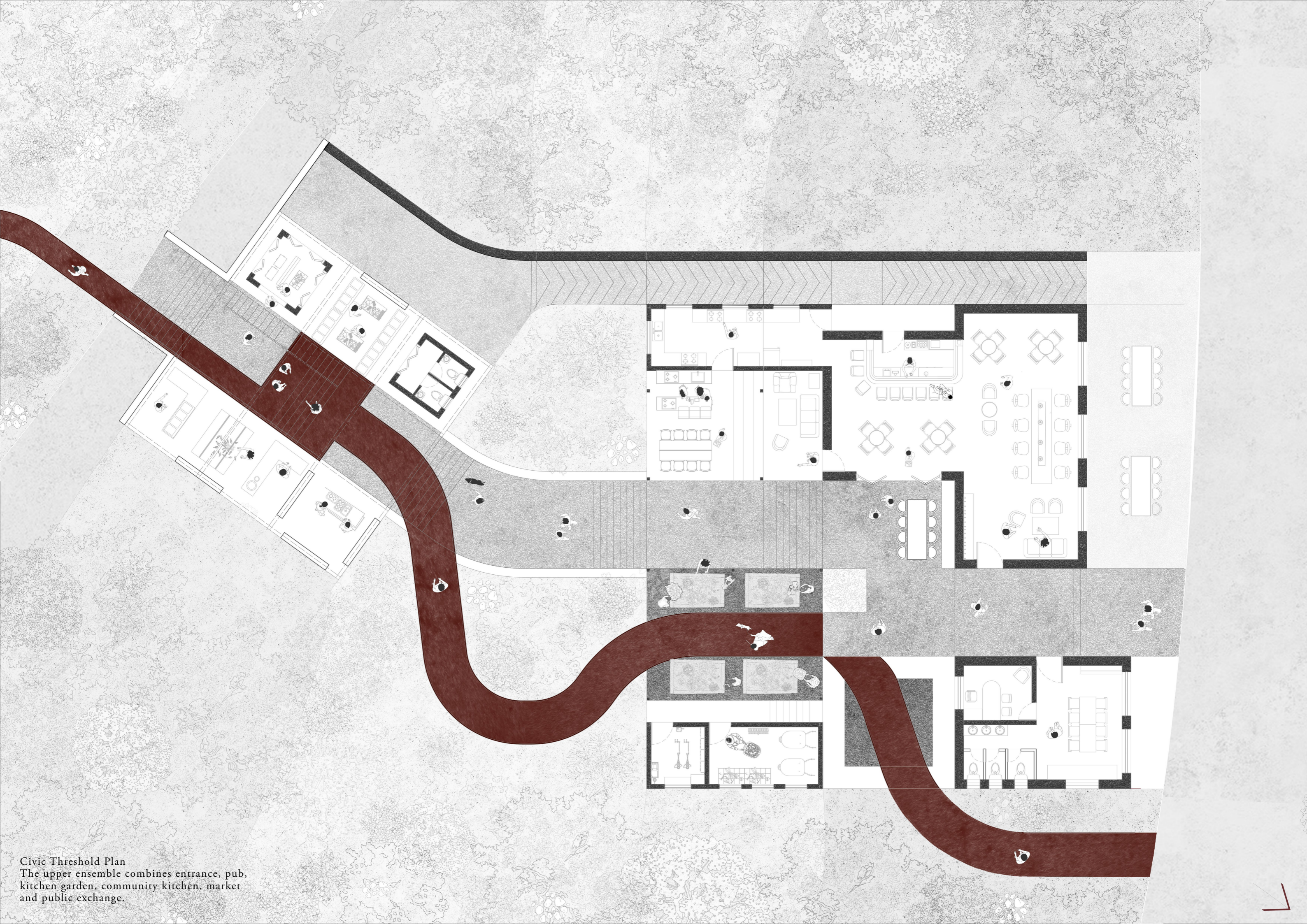
The Civic Threshold occupies the upper edge of the project, where the village path first meets the architecture. Its programme combines the Entrance Lobby, Community Pub, Courtyard and Pub Spill-Out, Kitchen Garden, Community Kitchen, Market and supporting spaces. These uses create reasons to enter that are independent of the ochre process and keep the threshold active as part of ordinary village life.

The market is the culmination of the material journey. Ochre-derived goods arrive from the Processing Unit and Making Court below: pigments, paints, applied objects, textiles, samples and experimental products. They are exchanged alongside vegetables, prepared food and everyday goods produced through the Kitchen Garden, Community Kitchen, pub and local initiatives.

This mixture is deliberate. It places transformed residue within a broader economy of making, food, care and daily exchange. The ochre is neither isolated as an artwork nor presented as a substitute for the former coal economy. It becomes one product among several forms of local production.

Architecturally, the descending public path widens into a porous court where market stalls, garden edges, communal rooms and views toward the process below overlap.





Civic Threshold Plan
The upper ensemble combines entrance, pub,
kitchen garden, community kitchen, market
and public exchange.





Market
The public space brings communal activity and the exchange of ochre-derived and everyday goods into one civic setting.

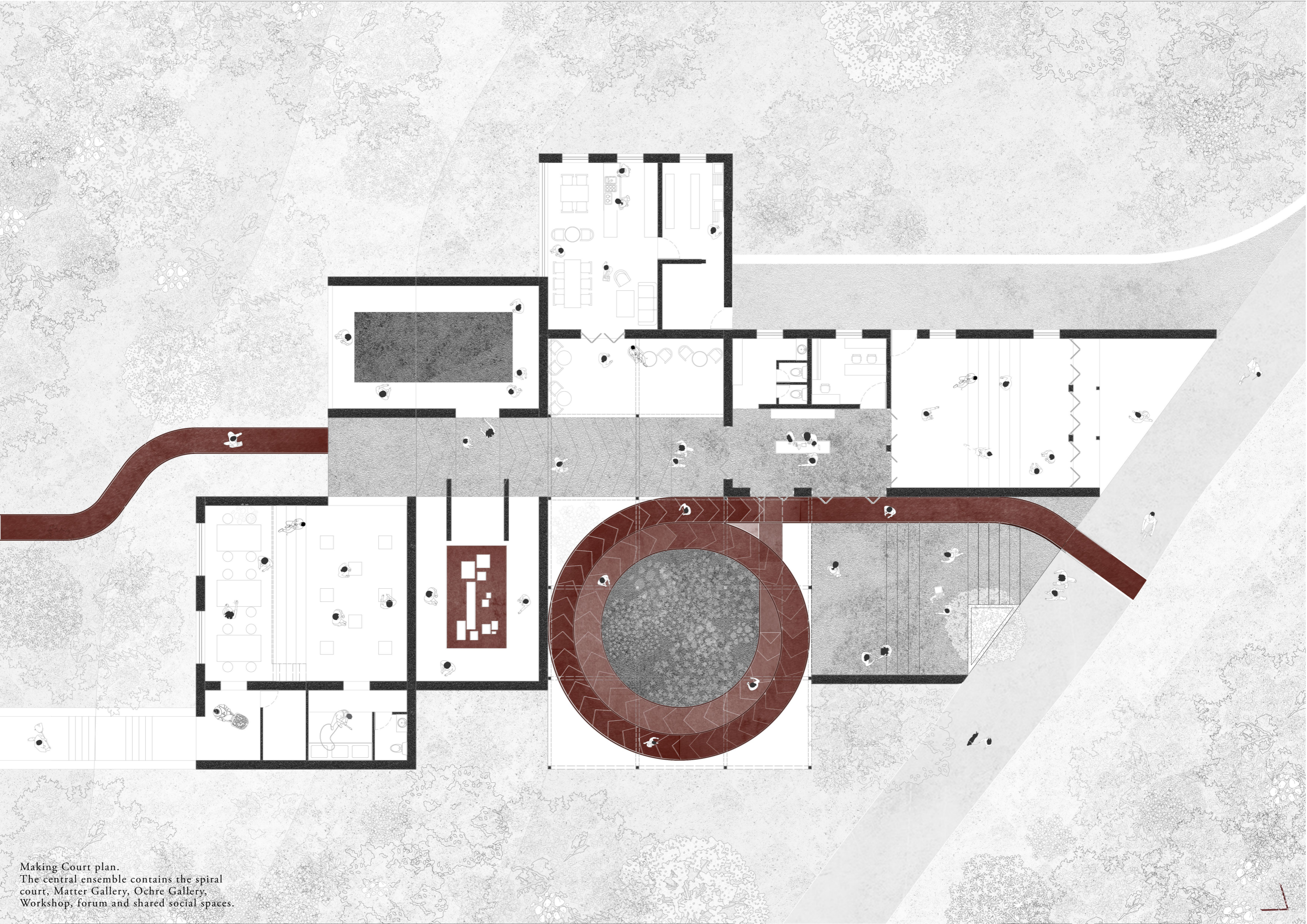
Making court: matter becomes practice

The Making Court occupies the middle of the slope between civic exchange above and physical processing below. It contains the Display Court, Public Forum, reception, spill-out spaces, Common Room, Spiral Court, Ochre Gallery, Matter Gallery, workshop and supporting facilities.

The Spiral Court slows public movement and creates repeated visual contact between levels, hanging displays, gallery rooms and the operational landscape. The Display Court and Public Forum extend this interpretation into collective discussion and public representation, while the Common Room, kitchen and spill-out spaces allow the institution to be socially inhabited.

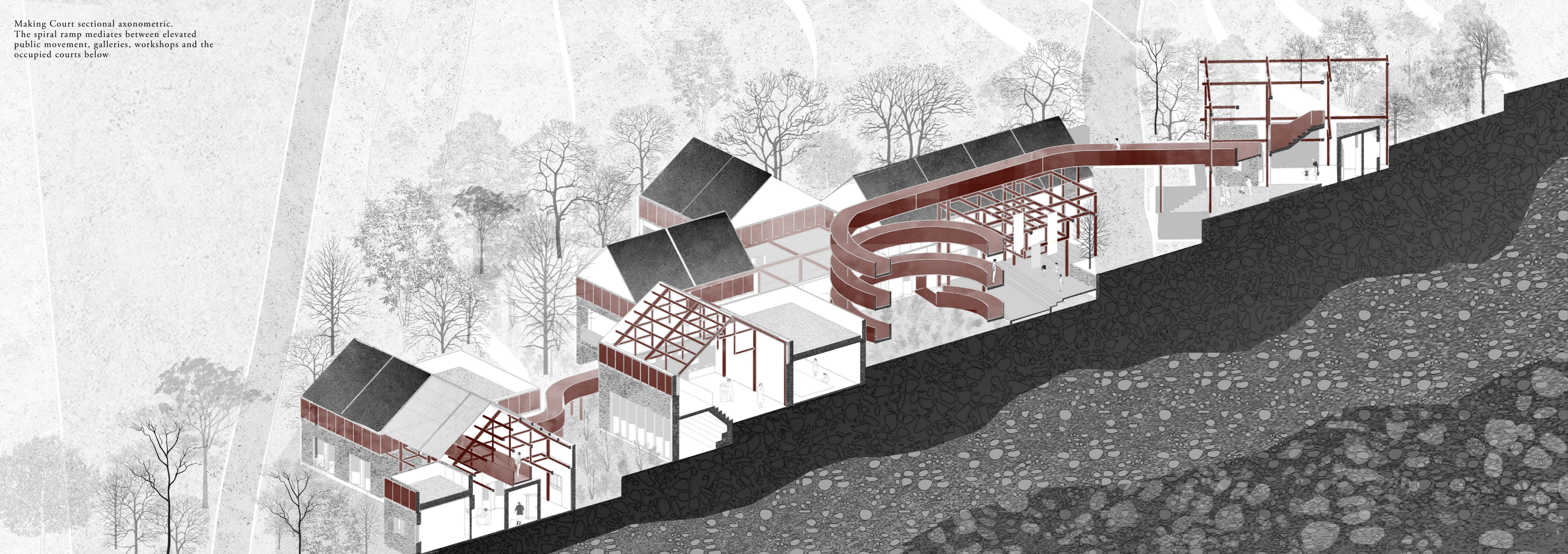
The Matter Gallery presents ochre as unstable residue before its value has been resolved. The Ochre Gallery presents pigment, artworks and applied material after transformation. The workshop occupies the interval between them, allowing visitors, artists and residents to test how matter becomes practice.

The court acts as an interpretive hinge. It converts technical process into shared knowledge while controlled thresholds preserve the distinction between public observation, making and the Processing Unit below.



Making Court plan.
The central ensemble contains the spiral
court, Matter Gallery, Ochre Gallery,
Workshop, forum and shared social spaces.

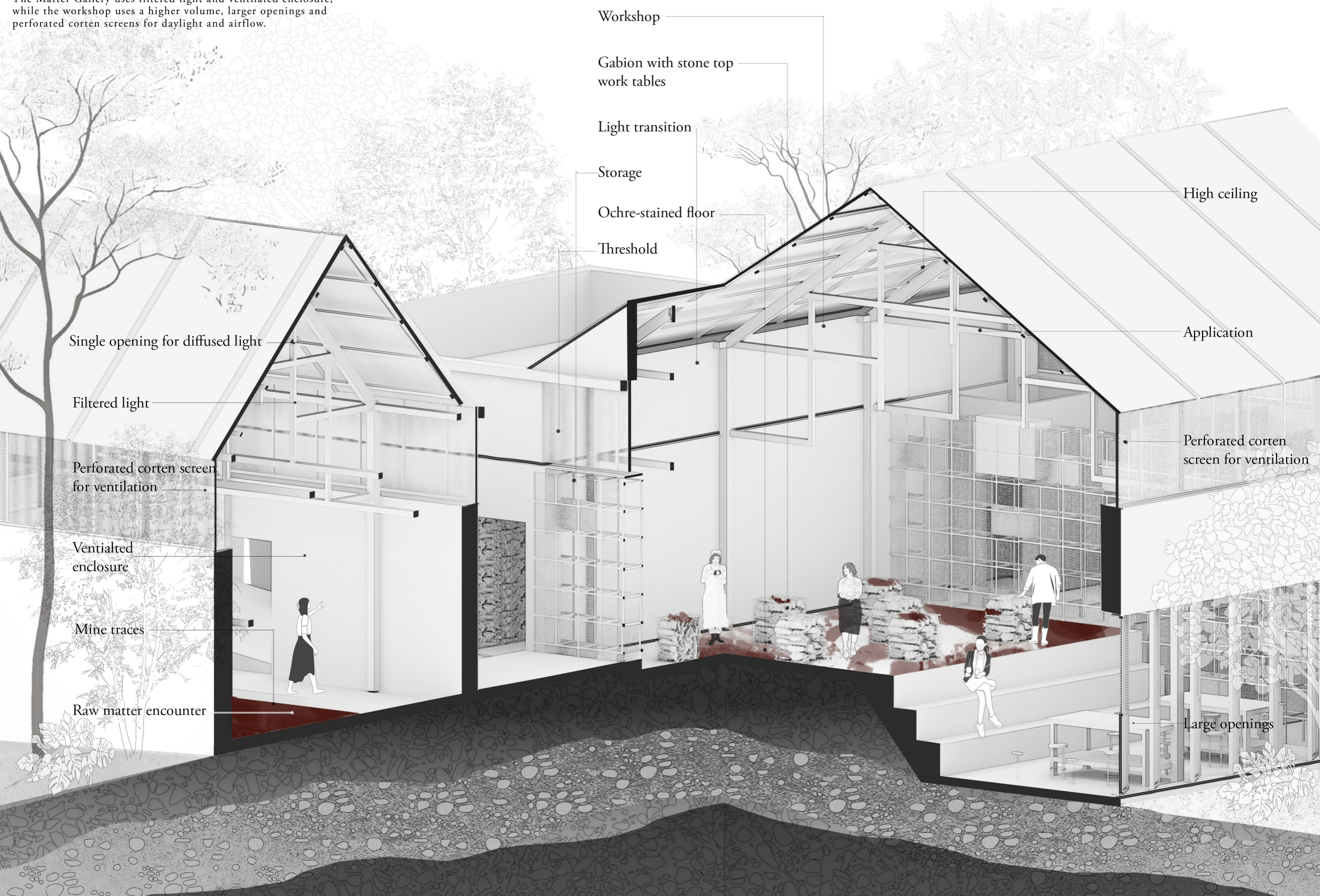
Making Court sectional axonometric.
The spiral ramp mediates between elevated
public movement, galleries, workshops and the
occupied courts below





Ochre Gallery interior.
Raw residue, site traces and material memory
are displayed within a darker and more
controlled environment.

Matter Gallery and workshop environmental section. The Matter Gallery uses filtered light and ventilated enclosure, while the workshop uses a higher volume, larger openings and perforated corten screens for daylight and airflow.



Workshop

Gabion with stone top work tables

Light transition

Storage

Ochre-stained floor

Threshold

High ceiling

Application

Perforated corten screen for ventilation

Single opening for diffused light

Filtered light

Perforated corten screen for ventilation

Ventilated enclosure

Mine traces

Raw matter encounter

Large openings

Processing infrastructure: matter in operation

The Processing Unit occupies the lower edge of the project, closest to the Vivian treatment landscape, drainage routes and service access. Its rooms follow the physical sequence of ochre transformation: Raw Sludge Handling, Infill Preparation, Wet Process Room, Ventilated Drying Court, Heated Storage, Grinding, Calcination Room, Binding and Mixing, Technical Room, Staff Room, Heated Product Storage. The plan separates wet, dusty, heated and clean operations while maintaining a legible chain of material movement. Their placement also follows environmental requirements. Raw sludge handling and wet processing remain on robust, drained ground. The Ventilated Drying Court occupies an exposed position where air can pass through the frame while a roof protects the material from rain. Grinding is enclosed for dust extraction. Calcination is isolated for heat, fire safety and exhaust. Binding, storage and application use cleaner, more stable and daylit conditions.

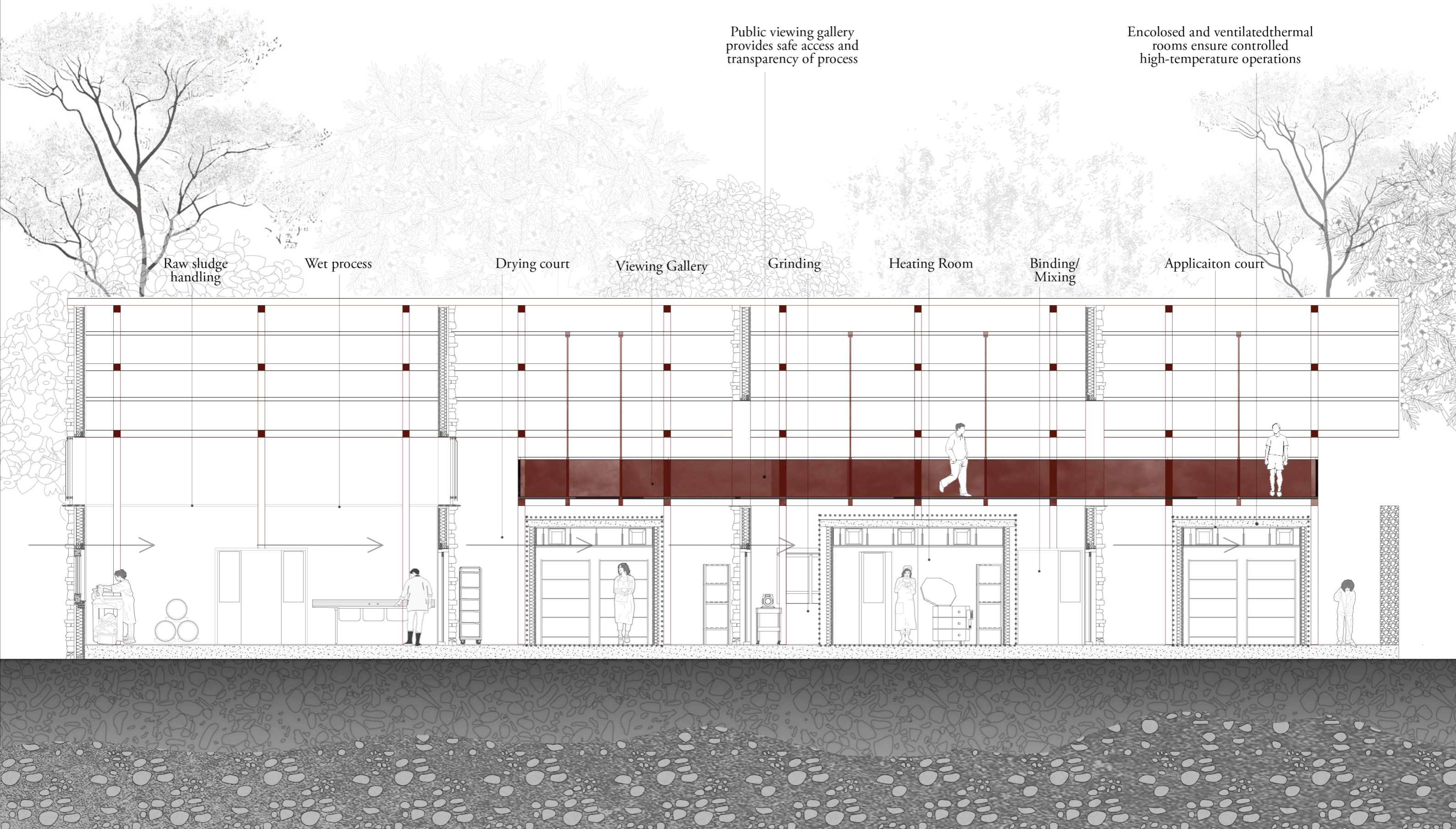
Service access and the steel material path carry sludge, equipment and finished products through the unit. Roof openings, screens and high-level vents regulate airflow and daylight without compromising operational control. Stone floors and walls receive moisture, impact and staining, while lighter steel elements support racks, ducts, roofs and viewing infrastructure.

The Viewing Gallery allows the public to observe selected stages from above without entering the operational route. The architecture makes work perceptible while preserving safety, hygiene and the distinction between visitor and worker space.



Processing Unit plan.
The lower ensemble accommodates sludge handling,
wet processing, drying, grinding, calcination, binding,
storage, application and viewing.

Processing Unit Section.
A public gallery occupies the upper level while working areas remain operational below. Open courts provide light and airflow, while thermal and dust-producing processes remain enclosed.





Processing Unit interior. Stone enclosures and steel frames organise the transition between controlled rooms, open work areas and public observation.



Act iv

The Second Afterlife

Matter released

When the process ends

When the ochre stops, what remains?

Minewater treatment schemes are not permanent infrastructure. The Coal Authority operates 82 active schemes across Britain, each commissioned in response to a specific hydrological condition: a particular shaft, a particular geology, a particular rate of iron-bearing water emerging at a particular point. As underground voids slowly stabilise over decades, flow rates change. Water chemistry shifts. The conditions that made treatment necessary gradually resolve. Some schemes will operate for over two hundred years. Others will reach obsolescence within a generation.

The Vivian scheme at Six Bells was commissioned in 2006 after contaminated discharge from the Vivian shaft caused significant ecological damage to the Ebbw Fach river. It was refurbished in 2023. Its operational lifespan extends decades further but it is not infinite. When the minewater flows diminish and the underground system finally equilibrates, the plant will be decommissioned. The pumps stop. The cascade runs dry. The lagoons begin their ecological succession. The ochre flow ends.

This project was designed in light of that condition from the beginning, though it has not been stated until now. A building organised around an active material process must have an answer to what it becomes when that process ends. The answer is embedded in every connection detail, every material choice and every decision about what is permanent and what is not.

The Reuse position

The steel system is designed to be dismantled and removed when the process it supports has ended. Bolted connections throughout. No structural welding beyond what is necessary. Slotted holes in the secondary rails so they can be detached without cutting. The frame hierarchy is also a dismantling hierarchy: tertiary elements come off first, then secondary, then primary. Each level is independently removable without affecting the levels below it.

When the steel is extracted, what remains is the stone. Retaining terraces, bench tops, basin edges, anchor pedestals, stained archive walls. These are the permanent landscape infrastructure that the building was always organised around. The civic route threading through the whole project, from the main road at the settlement above to the treatment facility at the bottom, remains as a path through a landscape whether the steel is there or not.



Treatment pond after active use.
@ Turning Landscape

Three states: Active, Transitional, Released

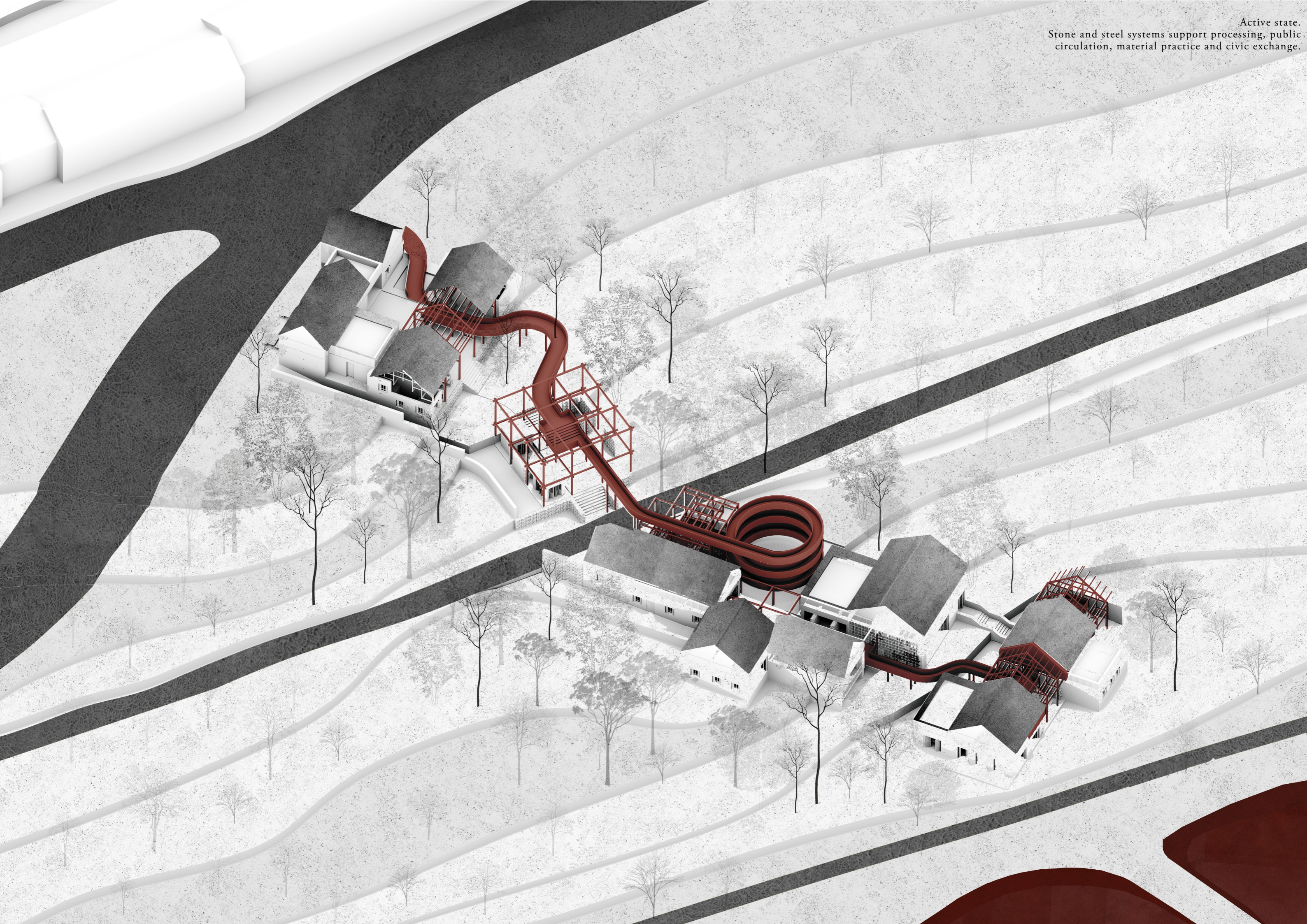
Every element in the project is designed across three states: active, transitional and released. They determined material choice, structural logic and spatial organisation from the beginning, so that the building has an answer to what it becomes when the ochre stops, not just when it flows.

Active: The full sequence operates. Minewater ochre is collected at the Processing Infrastructure, dried, ground, calcined and transferred upward to the Making Court where the pigment is applied, experimented with and becomes object, surface, archive and public exchange. The Civic Threshold generates the everyday footfall that makes the whole sequence feel inhabited. The floating ramp moves visitors through the site. The spiral descent deposits them into the making court. The gallery gives them the processing operations to observe from above.

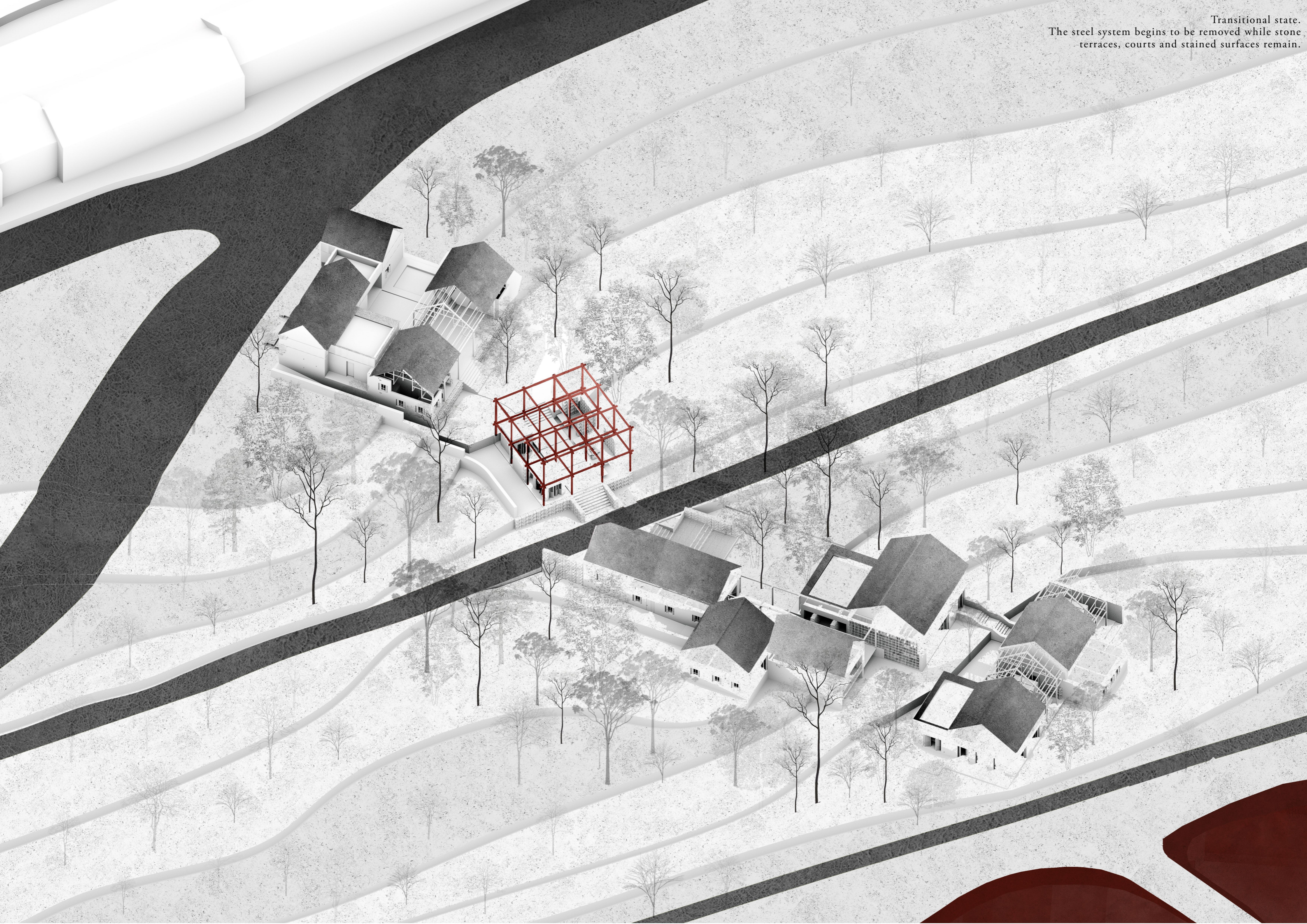
Transitional: Ochre flows diminish. The processing operations reduce in frequency. The drying courts are used seasonally. The Making Court shifts from production toward archive: the ochre transformation gallery becomes a permanent collection of what the site produced. The application workshop continues as a community space for craft and material practice. The civic spaces above remain as they were. The floating ramp and spiral descent remain as spatial experiences even when the making court below is quieter. The court below becomes quieter as ecology begins to take over.

Released: Treatment ends. The steel is unbolted and removed, beginning with the tertiary elements and working back through secondary and primary. Retaining terraces become planting terraces. The wet basins become shallow wetlands. The civic buildings at the upper edge remain fully operational. The floating ramp is removed with the steel. The entrance to the Making Court becomes a threshold into an open stone courtyard. The spiral is gone but the courtyard and the gallery rooms it once led to remain: stone floors, stained walls and the pedestals where the frame once stood.

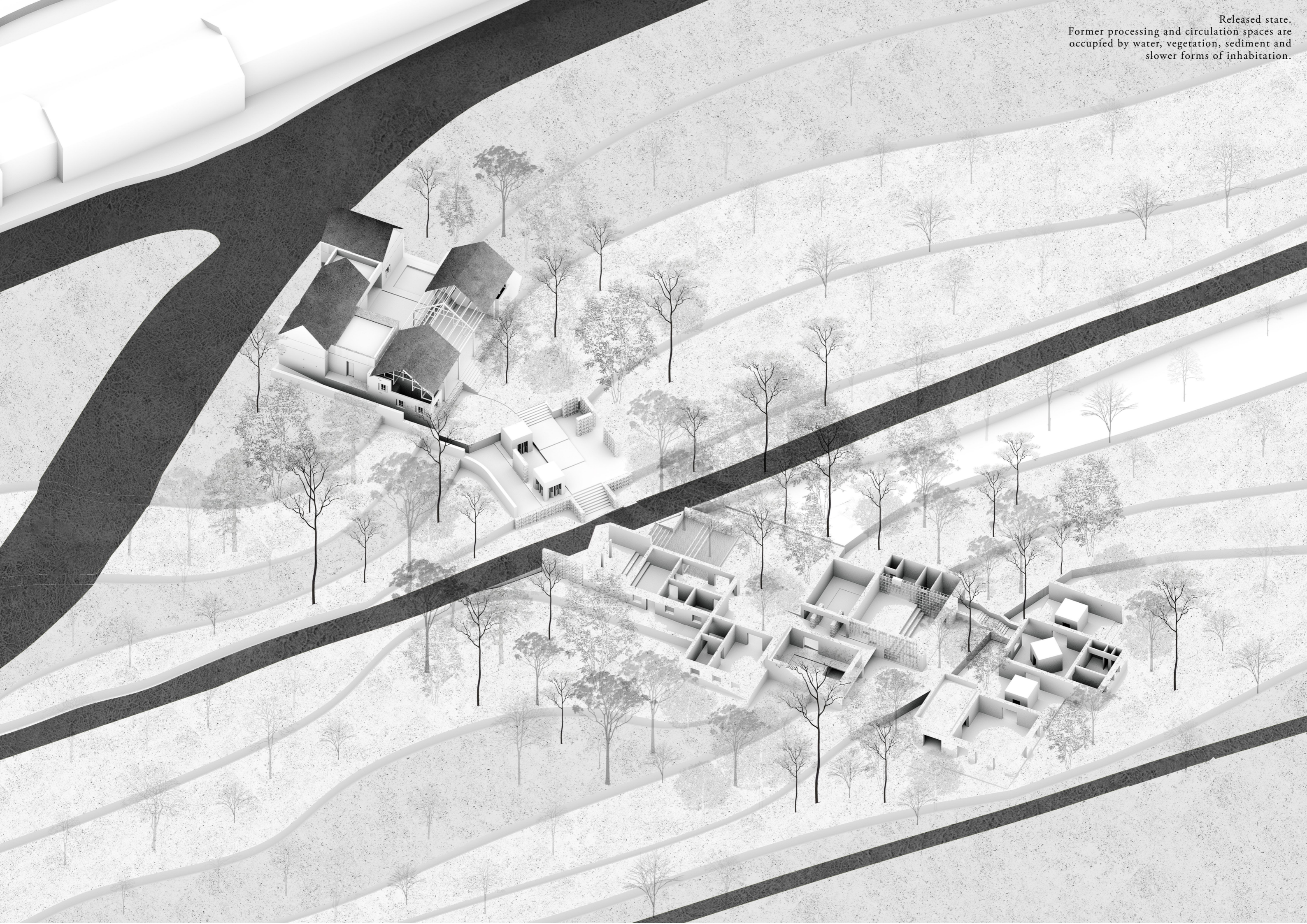
Active state.
Stone and steel systems support processing, public
circulation, material practice and civic exchange.



Transitional state.
The steel system begins to be removed while stone
terraces, courts and stained surfaces remain.



Released state.
Former processing and circulation spaces are
occupied by water, vegetation, sediment and
slower forms of inhabitation.



Ecological succession

The released phase is not empty. It marks a shift in occupancy. Spaces that once hosted workers, visitors and material practice begin to host water, sediment, plants, birds, insects and slower forms of inhabitation.

At the wet lower margins of the Processing Infrastructure, the drainage logic and accumulated ochre create mineral-rich conditions that may support spontaneous colonisation. Iron-tolerant mosses could establish within the cracks between ochre-stained stones, while reeds and sedges may occupy the former wet basins. Stone walls may gradually receive lichen and other forms of slow biological growth. If parts of the grating walkway remain after the steel structure is reduced, they can continue to provide access above the wet ground.

Matter released does not mean matter disappears. The systems governing it loosen and the ground continues doing what it has always done: accumulating, staining, settling and growing.

Final proposition

The project spatialises the instability of value at Six Bells. The same ground is legible as maintenance burden, cultural resource, civic setting and ecological substrate depending on where you are standing, which space you are in and which phase of the system is currently operating.

Six Bells once produced coal that organised work, settlement and infrastructure across the valley while contributing to a much wider industrial economy.

Matter, Making and the Six Bells Paradox gives spatial form to what extraction leaves behind and designs that form to outlast the process it was built around.



Conclusion

Matter does not stop when the economy that valued it moves on. It continues, in other forms, through other systems, under other names. Coal became minewater. Minewater became ochre. Ochre became pigment, maintenance burden, ecological substrate, architectural material. The ground at Six Bells has been producing value continuously for over a century. The economy that extracted it lasted about a hundred years. The ground will outlast all of it.

The project gives spatial form to these transitions. It connects the hidden operation of minewater treatment to public practices of making, interpretation and exchange. The architecture does not claim that pigment production can replace the former coal economy or resolve the structural deprivation of Six Bells. It creates a civic setting in which the material afterlife of extraction can be encountered, worked with and understood.

The proposal is organised through materials with different temporal behaviours. Stone retains the slope and remains as a durable ground. Steel supports circulation, processing and enclosure while allowing alteration and removal. Ochre records use through staining, accumulation and weathering.

When active processing declines, the lighter systems can be dismantled. Stone terraces, courts, water and stained surfaces remain, available to ecological succession and future occupation. The project moves from active infrastructure toward a released landscape.

The Six Bells paradox lies in the coexistence of several values within the same residue. Architecture makes the conditions that produce these contradictions spatially legible.

Value is relational, contingent and temporary. The project builds around that instability and prepares for the moment when matter is assigned another role.

Reflection

This project started much earlier than Six Bells.

Long before I knew the name of the village, I was caught on a more abstract question: how does a thing acquire the status of being real, valuable or significant?

Constructivist thought first opened this for me, the idea that reality is assembled through the categories, institutions and habits that surround an object rather than given in advance. Arjun Appadurai's writing on the social life of things gave the question a sharper edge. An object moves through different regimes of value over the course of its existence. The same substance can be resource, commodity, waste or cultural material, and what determines which one it is at any moment is the system that happens to be looking at it, not the substance itself.

I started looking at architecture through that lens.

We typically inherit materials after these decisions have already been made elsewhere. Stone arrives as cladding. Steel arrives as a structural section. Their histories have been compressed into a specification and a price. Cooking Sections showed me that a design practice could follow an already active material process directly, working through ecology, food, infrastructure and labour together. My Name Is Red showed me that pigment carries power, trade and violence depending on where it came from and who controlled it. Both pushed me toward post-extractive territories, places where an industry has vanished while its material consequences remain active in the ground.

Six Bells gave the research a specific ground to stand on. Coal had organised the settlement, its employment, its housing and its collective identity. The mine closed, and the ground continued to react. Water moved through the abandoned workings, carrying iron to the surface. The ochre sludge produced through this process became the material through which the larger question could be tested: vivid, physical, resistant to easy classification. Within the treatment system it was a maintenance burden. Through Onya McCausland's work, the same sludge became pigment.

Meeting Onya changed the project. Before that visit I understood the transformation through diagrams. Seeing the material, handling it, listening to how she spoke about drying, grinding, particle size and application made the process precise in a way no description had managed. It made me aware of how much knowledge sits outside conventional architectural practice, and it moved the project from representing extraction toward following the actual movement of matter through different systems

It also changed how I understood the community's role. Six Bells has already absorbed many external narratives about decline and regeneration, and I was careful not to add another one. The civic programme grew from that concern: a market, a pub, a kitchen, a workshop, galleries and a public route that allow different forms of participation, without requiring everyone to engage with the ochre in the same way.

The architectural form followed from the material process itself. Wet matter needed containment. Drying needed airflow. Grinding needed enclosure. The stone path belongs to the building and holds its rooms and courtyards. The steel route is lighter, bending around the existing ground, slowing movement, letting people observe without entering every space.

What I take from this project is a stronger interest in material histories, maintenance and the kinds of knowledge usually kept outside architectural design, and a sense of architecture as one temporary system within a longer material process rather than a finished object.

The stone remains. The steel can change or disappear. The ochre records what happened between them.









Acknowledgments

This project owes much to the generosity of Onya McCausland, who gave her time, her knowledge and her commitment to Six Bells in ways that no bibliography entry could capture.

Thank you to Georg Vrachliotis and Roel van de Pas for always making me think critically, for pushing me and for trusting in me.

To the BK Public Programs team, Tineke Meerman and all my friends, thank you.

To the people of Six Bells who shared their insights during my visit.

To my family in Goa and London, without whom this would not have been possible.

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- Six Bells residents (2026) Informal fieldwork conversations conducted by Mark Vas, Six Bells, South Wales.
- All drawings, diagrams and material experiment photographs are by Mark Vas, 2025–2026, unless otherwise stated.
- Site photographs are by Mark Vas, Six Bells fieldwork, South Wales, 2026.
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