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## Details as Evidence: Architectural Extractivism and the Politics of Provenance

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## Details as Evidence Architectural Extractivism and the Politics of Provenance

We see the details of form as innocuous and seldom give them a second thought.

—Langdon Winner, “Do Artifacts Have Politics?” (1980)

Visiting the Musée du Quai Branly (Jean Nouvel, 2005) in Paris, designed to host largely art and artifacts from former French colonies, the friend I was perusing the rooms with concluded that the building was decent but that the details were *degeulasses* (gross).<sup>1</sup> My architect friend meant that the finishing of the building’s small-scale arrangements was poorly executed. It was not the architecture’s function and use, nor what its details were made of, that was at fault, but how these materials were assembled. When I visited the Walt Disney Hall in Los Angeles (Frank Gehry, 2003) to research its maintenance protocols and see how it had aged, another architect friend recommended me to “check the impressive detail of how the slates are hung.”<sup>2</sup> Architects often look to details as a sign of building quality. Details are obsessed over, whether one marvels at how a colleague solved a corner or how a detail was poorly executed.

What remains conspicuously absent from these conversations is the material provenance of the building details: the conditions of their extraction, installation, maintenance, and the norms and legal frameworks that define them. Instead, our focus is often on their aesthetic render or technical capability, in accordance with their structural purposes, sealing properties, or economic efficiency, and perhaps on how skilled those who designed and assembled these elements were. Take the architecture magazine *Detail*. It has a large following, a run of thirty-five thousand copies per issue, and devotes its content to “building details in architecture . . . documented with beautiful photographs and comparable drawings at a scale of 1:20.”<sup>3</sup> Understanding how one has reached a visually pleasing solution is a technical accomplishment associated with design and constructive craft. It speaks to a culture of approval in architecture that values the technical resolution of a detail over the social or ecological lives of the materials used to accomplish it.

In his 1980 essay “Do Artifacts Have Politics?” Langdon Winner identified how neutral components bear political meaning and embody the “material conditions under which we produce and make products circulate.”<sup>4</sup> While architectural

details are not his explicit focus, Winner's critique holds true to them. He provides a framework for arguing that seemingly innocent components of our built environment can encode systemic violence and exploitation. Even though architectural details are now often standardized components or industrial ready-mades, the prestige of the beautiful detail remains. But there is a paradox in fetishizing details as markers of architectural mastery, with little regard for *how* they are made or what they demand materially. What if our fascination with details shifted from their aesthetic appeal to the material conditions of their production?

This essay argues that architectural details function as records of the extractive processes underpinning architecture.<sup>5</sup> Every joint, connection, and assembly embodies and visualizes resource extraction, processing protocols, labor conditions, and socioecological impacts. By critically examining details, I build upon the concept of “architectural extractivism” as a framework for understanding how the exploitation of materials, labor, and cultures shapes our built environment.<sup>6</sup> Using architectural extractivism as a lens for understanding these relationships means positioning all types of extraction as foundational aspects of construction. While extractivism as a concept originated in 1990s South American scholarship about the mining industry and its devastating impacts, its application to architecture represents an emerging and largely uncharted terrain of research—one that has become urgent given accelerating climate change and mounting concerns about its social and material impacts. By attending to details as evidence, we can develop new modes of critical practice that reconsider the connections between minute technical decisions and large-scale environmental and social impact. This is a call for the discipline to pay attention to its reliance on and compliance with destructive industries and then to move toward post-extractive protocols and systems for life that are regenerative rather than extractive, as called for by voices from various realms such as Arturo Escobar, Paula Serafini, or Alton Kreinak.<sup>7</sup> The architectural detail represents a scale of accountability between the material fact of extraction and the larger political economy.

### **Anatomy of a Standard Roof Detail: Evidence of Extraction**

One could begin with the exceptional detailing of architectural masterpieces since these occupy much of the disciplinary spotlight. Yet politicizing architectural details and tracing their material provenance requires a reorientation—one that begins with a standard detail, since the replicated assemblies of ordinary detailing constitute much of the built environment at scale. What is at stake is not just the celebration of prestigious details but a deeper understanding of the ordinary ones. The

banal roof assemblage in a suburban, North American home is replicated across millions of buildings, making its environmental and social footprint exponentially more significant than the minutiae of architectural icons.

A wooden truss or rafter framework provides structural support for the roof. They are commonly made from dimensional lumber sourced from regions such as Pacific Northwest forests. These beams exist thanks to enduring and ongoing deforestation practices including the clear-cutting of old-growth forests, the displacement of Indigenous communities, and the disruption of complex ecosystems. Further investigation into material histories like those documented in James Farmer's story of Californian logging, reveals that architectural details embody the matter, territories, and entire legal frameworks that enable their existence.<sup>8</sup> As argued by Jane Bennet, these wooden beams are active characters in material stories, with their own geological and biological agency.<sup>9</sup> These beams are not simply technical objects that support suburban living; they are living archives of forest ecologies, weather patterns, soil conditions, and tree species that have sometimes grown over centuries before being harvested, transformed, and installed. This material vitality continues even after the tree is transformed into lumber—expanding, contracting, and responding to humidity and temperature changes with cracks and changes in color that transgress the permanence of the drawn detail.

When the material provenance of a beam is traced, it evidences a broader and more complex host of relations, mechanisms, and infrastructures of power. The beam can be directly traced to forest harvesting facilitating mechanisms following a chronological chain of events, starting from the dispossession of Indigenous territories through genocidal violence and colonial land tenure systems. The compendium of federal laws and regulations that govern forest practices on federal lands in the United States, such as the National Forest Management Act, includes state environmental regulations that determine which forests may or may not be exploited and where wood can be harvested, facilitating timber extraction. Thus, the beam can be seen as condensing centuries of industrial legislation that has prioritized extraction over preservation. Critical examination of nearly any architectural element will similarly expose the legal frameworks that made extraction permissible.

Decking, typically plywood or Oriented Strand Board (OSB), is laid over this framework. OSB is made by bonding together wood strands (i.e., aspen, poplar) with a waterproof, formaldehyde-based adhesive (such as synthetic resin) and pyrethroid termiticides into the wood under the application of heat and pressure.<sup>10</sup> The OSB industry has cultivated a virtuous image, portraying the misleading narrative of an efficient

product that utilizes forestry waste. However, logging residues today have been reduced to less than 10 percent, which means regular logging occurs to feed the demand of OSB.<sup>11</sup>

A petroleum-based, asphalt-saturated felt underlay—commonly produced by companies such as Tarco, Mid-States Asphalt, GMC, Fontana Paper Mills—is then applied to the OSB as a moisture barrier. The felt connects directly to asphalt manufacturing industry, including producers like Owens Corning’s Trumbull™ division, which sources materials from major oil companies such as ExxonMobil. In turn, these oil companies rely on extensive networks of crude oil extraction: from offshore drilling platforms like the Baldpate oil rig in the Gulf of Mexico to fracking operations in towns such as Penn, Pennsylvania, where XTO Energy (an ExxonMobil subsidiary) remains active. The contaminating effects of such sites is well documented, yet the enrollment of new extraction projects is still happening—despite resistance by local communities.<sup>12</sup>

Shingles, the visible component on the top of the roof, are made from a fiberglass mat, coated with asphalt and ceramic granules. They are installed in overlapping rows, from the bottom edge of the roof to its top, to ensure water runoff. Asphalt is connected to broader geopolitics of oil extraction: from destabilized Middle East countries to Alberta’s tar sands, where Indigenous land rights are routinely violated.<sup>13</sup> The ceramic granules contain crushed rock colored with mineral oxides mined through extensive pit operations that permanently alter landscapes and deplete aquifers.<sup>14</sup>

Galvanized nails fix the shingles to the structure. In North America, most nails are manufactured in one of the petrochemical plants in the so-called “Cancer Alley,” a 137-kilometer-long corridor along the Mississippi River. The manufacturing corridor continues a long history of exploitation and extraction along the river. Before the chemical plants, this land was occupied by plantations worked by enslaved people. These sites later became home to disenfranchised African American communities directly suffering from the pollution caused by these industries. This connection between building materials and environmental racism is documented in the work of Kathryn Yusoff and Imani Jacqueline Brown, who trace how extractive landscapes disproportionately burden communities of color with toxic legacies of industrial production.<sup>15</sup>

Flashing of aluminum or galvanized steel is used to seal joints and penetrations, such as chimneys and vents, to prevent leaks and ingressions. Flashing embodies the energy-intensive processes of metal mining, smelting, and manufacturing. Aluminum production alone ranks among the most power-hungry industrial processes, often powered by coal plants or hydroelectric dams that have flooded Indigenous territories.<sup>16</sup>

The roof is finished with ridge cap shingles. Drip edges of metal strips run along the eaves to guide water away from the fascia. Fascia boards and soffits made of wood, aluminum, or vinyl complete the edges, providing ventilation and protection against the elements. These too are made through resource extraction, chemical processing, and global shipping networks, all before the first raindrop has fallen on the finished roof.

The assemblage of this roof detail relies on labor arranged in hierarchies of value, risk, and reward. Roofing labor operates through a stratified system in which contractors and supervisors manage projects, skilled roofers handle specialized tasks, and often legally undocumented workers under precarious labor conditions perform the most dangerous jobs with minimal protection. Assembling a detail on a roof requires operating at heights—a work with disproportionate casualties.<sup>17</sup> The physical toll includes fall risks, exposure to extreme temperatures, repetitive motion injuries, toxic material inhalation, and long-term health impacts rarely documented or compensated.<sup>18</sup> This extraction of value from workers' bodies remains as invisible in architectural detailing as the ecological devastation embedded in the materials themselves.

Rather than treating the materials in an ordinary roof detail as incidental or neutral, this quick investigation centers its material origins. The mundanity of the mass-produced detail often belies the global networks of exploitation it represents. The careful execution of this detail to ensure durability, weather resistance, and aesthetic appeal simultaneously obscures its material pedigrees, labor extraction, and the harm embedded in each component. This scale is typically only discussed in the event of a failure, but in centering material origins, the detail becomes an artifact of the extraction and destruction that lays in its wake.

### **Vanishing Act**

Has the architectural profession developed a value system that relies on the aesthetics of concealing? A seamless joint, a flush transition, a concealed fixing mechanism—these are some hallmarks of architectural sophistication. The disappearance of the detail is what Edward Ford might categorize as “abstract” detailing.<sup>19</sup> The mark of a “good” detail is where material connections are purposely subordinated. A detail that calls attention to itself through its visibility is often deemed less successful than one that disappears into the overall composition: *degeulasse*. Ford's examination of the detail in his respected 2011 book *The Architectural Detail* remains distant from the profound questions of the political economy of the detail—namely its material origins, production, and value generation. The book, according to Mark Burry, values formal

abstraction over material reality.<sup>20</sup> Burry calls for us to examine the detail through its production and construction, arguing that “to detail effectively is to understand not only what the building ‘is,’ but how it will be made.”<sup>21</sup> This critique begins to draw a connection between aesthetics and production, though it still stops short of confronting the extractive nature of architectural detailing.

Let us nevertheless return briefly to iconic details with Mies Van der Rohe’s onyx wall in his Barcelona Pavilion (1929)—the stuff of architects’ wet dreams. A smooth surface with symmetrically arranged patterns, described by Robin Evans as “most exotic, improbable and expensive.”<sup>22</sup> According to Mies, the choice of the onyx was inspired by a visit to a marble show room in Hamburg: “I found an onyx block of a certain size and since I only had the possibility of this block, I made the pavilion twice that height and then we developed the plan.”<sup>23</sup> If one takes this post-rationalized explanation at face value, then it is not the raw stone that is central to the architecture, but an already processed object with defined dimensions and conditions.

Evans’s critique of Mies’s onyx wall reinforces rather than challenges the distance between architectural discourse and the extraction processes on which they depend. While he offers an admiring litany of the wall’s effects, describing how “panels of blue, yellow and red on a white ground would turn into panels of dark green verd-antique marble; filigreed grey-green Tinian marble; and grotesquely varicose orange onyx doré, on a ground of creamy, pock-marked travertine,” his attention remains fixed on the object’s visual properties and makes no mention of its provenance—that the onyx stone was mined in the Atlas Mountains of what was then the French colony of Morocco, not to mention the labor force mobilized to cut, transport, and secure it into place.<sup>24</sup> By focusing on the wall’s formal “paradoxical symmetries” and aesthetic qualities, Evans perpetuates the very erasure he seems positioned to critique. His analysis reproduces the problem of architectural discourse’s distancing from the violent realities of material production.

The extractive reality of the material was not of interest to Mies, nor to those admiring the building afterward—including Evans himself. This scholarly omission reveals how even critical architectural discourse fails to account for the colonial context and exploitative labor that enabled such “exotic” materials to appear in European modernist projects. Evans’s critique stops short of examining how the wall’s very “improbability” stems from networks of imperial extraction that made Moroccan stone available for a German architect’s temporary pavilion in Barcelona. Those who visit or read about Mies’s onyx wall rarely understand this violence, materialized by the stone’s origin.

Well-designed details often conceal their extractive genes. The concealment represents what Peggy Deamer identifies as architecture's refusal to acknowledge its position within networks of production and labor. In "Details: The Subject of the Object," Deamer argues that architectural details exist at the intersection of design intent and construction reality, where the abstract labor of design confronts the material labor of building.<sup>25</sup> To paraphrase Jennifer Bloomer, the details reveal architecture as an archive of material and labor.<sup>26</sup> An argument can be made that patterns of concealment emerge across architectural history. Modernist architecture is revealing: Its rejection of ornament in favor of the "honest" expression of materials ironically obscures the extraction processes necessary to produce these. This perpetuated the illusion of architectural autonomy—our view of the building as a self-contained object rather than a node, or even a propeller, within global networks of resource extraction and labor exploitation. By presenting materials as abstract and smooth, modernist detailing participated in the broader cultural project of separating consumption from production, and matter from its sources.

In *Detailing Worlds* (2021), architecture historian Eric Bellin breaks down the disciplinary concept of the detail into its various aspects of construction. In his attempt to write the history of detail, Bellin comes closer to addressing the political economy of architectural production. Still, he stops short of a full examination of the extractive nature of detailing.<sup>27</sup> Perhaps simply exposing the hidden detail is a first step in uncovering the networks of extraction and production that make every building possible. When Andrés Jaque exhibited the contents of the Barcelona Pavilion's basement in the installation "Phantom: Mies as Rendered Society," he revealed the maintenance infrastructure usually kept out of sight and the social relations that maintain the building's pristine appearance.<sup>28</sup> The cleaning supplies, replacement marble tiles, and maintenance tools exposed the ongoing labor required to sustain the building's apparent timelessness—a small but significant step toward making visible what architecture often conceals.

### **The Leak Reveals the Failure of the Detail**

In his 1983 essay "The Tell-the-Tale Detail," architect Marco Frascari is dithyrambic about how essential this scale is. He writes that "careful detailing is the most important means of avoiding building failure, on both dimensions of the architectural profession—the ethical and the aesthetic. The art of detailing is really the joining of materials, elements, components, and building parts in a functional and aesthetic manner."<sup>29</sup> Yet this is Frascari's only mention of ethics. Architects have long been aware of our contribution to capitalism's accumulation

enterprise and the harms of building: namely, a contribution of 40 percent of global CO<sub>2</sub> emissions yearly, including 9 percent just for the materials used in the construction of buildings. Still, this number excludes the often unaccounted-for harms, such as the ecological and social damage produced through mining, deforestation, displacement, and gentrification. Perhaps our apathy toward the ethics of the detail is simply a reflection of the attitudes of the architecture and construction industries, more generally—namely carelessness and negligence.

Nothing is as revealing of an architectural detail than its failure. What is more embarrassing than a leak, which sometimes exposes technical inadequacy, material malfunction, or the hubris of architectural control? Architect Katherine Shonfield paved the way for this discussion in her seminal contribution “Why Does Your Flat Leak?”<sup>30</sup> Shonfield breaks down the Greater London Council’s GLC Good Practice Details through language and medium, by showing how leaks expose the failure of critical joinery details, speaking not only about the detail but giving it a voice. Describing the job of the mastic joint, she anthropomorphizes it: “In this way, someone whose role should be incidental, merely a means of introducing two others, becomes overwhelmingly decisive. In his role as a flexible mastic joint, the host is subjected to an intolerable level of stress trying to keep two panels together. He does the constructional equivalent of retiring to the kitchen and getting drunk.”<sup>31</sup> With this riotous feminist metaphor, Shonfield tackles what is at stake in designing joinery and construction details: control and liability.

Shonfield’s argument on the impossibility of control—through real impermeability—points to the fallacy that architects can design the world down to its tiniest detail. Architectural theorist Francesca Hughes shares this perspective and in *The Architecture of Error* alerts us to the absurdity of architectural control. The architect’s dream of retaining command over the construction process is simply that, yet nothing turns out as planned on a construction site.<sup>32</sup> Shonfield and Frascari agree that the most challenging details are joints that deal with a fundamental task of architecture: keeping moisture out of the building.

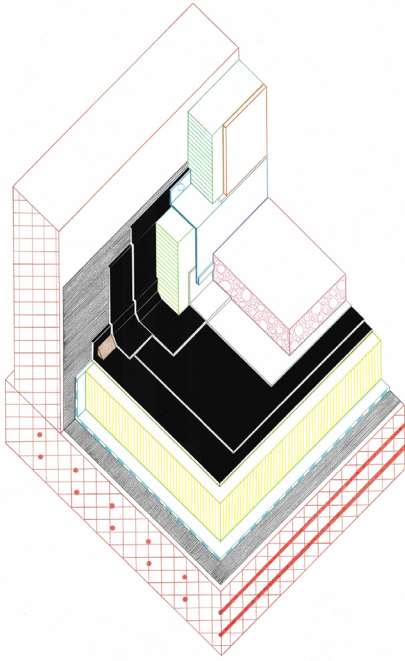
We might begin by scrutinizing iconic buildings that are also famous for their failures, from the leaks of Villa Savoye (Le Corbusier, 1929) to the Ray and Maria Stata Center (Frank Gehry, 2004) and on to standardized details and everyday solutions. These technical failures represent a collapse of our aesthetic ambitions and material realities. Water finds its way into a building through the detail, just as extraction, labor exploitation, and environmental harm can find their way into even the most aesthetically refined building. The architect’s

failure to keep water out parallels the discipline's failure to keep the messy realities of production out of its pristine discourse. A history of failed details would reveal its politics, addressing unacknowledged realities in the production of spaces (something akin to Howard Zinn's *A People's History of the United States* (1980), but for the architectural detail).<sup>33</sup> Better yet, more in-depth knowledge on the political economy of construction details might shift how we design them: Our awareness of power structures, material cultures, normative systems, and value generation, as well as flaws and successes in assembly and materials performance, should change how we source materials, connect them, and replace them.

### **Toward Post-extractive Details**

If the task is to “politicize” details within past and present buildings, then how can accounting for the extractive aspects of a detail's materials and arrangements become part of architectural practice? In revealing how components are combined, produced, and sourced, designers can direct the production of architecture toward less damaging processes. It is urgent that the still prevailing view of architectural details as a neutral, strictly performative entity for building assembly, as described by Ford, is challenged.<sup>34</sup> Kenneth Frampton offers another path forward in his investigations of tectonics, arguing that architectural details can be evidence of nonalienating forms of labor and craft. His tectonic approach positions the detail as a site where material intelligence can resist the abstracting forces of capitalist production. However, like Evans's critique of Mies's onyx wall, Frampton's nostalgia for craft traditions stops short of addressing the violent extraction that underpins even the most carefully crafted detail.<sup>35</sup> A new approach to the architectural detail, drawing on critical perspectives from ecofeminist, queer, and other radical counterpoints, would speak for unheard voices—humans and more—behind the production of these spaces.

What would a post-extractive roof detail look like? Such a brief is not calling for a greenwashed solution but for a fundamental reconsideration of the materials we use, how they are sourced, who installs them, and how they might eventually be disassembled. This is not abstract speculation but an urgent practical challenge for contemporary architecture. But such a shift also requires new forms of documentation and representation, such as a reinvention of the technical drawing and its norms. Today, technical detail drawings show materials in abstract form: Hatched and checkered patterns denote layers of polystyrene foam, asphalt, or concrete without any required thought toward their origins or impacts. Conventional architectural drawings neutralize the chains of extraction that precede



### Flat Roof Waterproofing System: Warm Roof Detail

1. Concrete slab
2. Bonding compound : bituminous lacquer
3. Vapor barrier
4. Thermal insulation : polyurethane foam
5. Two-layer waterproofing in bitumen-based membrane
6. Polypropylene protective veil
7. Gravel protection layer
8. Elastomer shim
9. Two-layer bitumen-based shrug
10. Thermal insulation XPS
11. Sheet metal clamping band
12. Silicone seal
13. Wall EPS insulation
14. Exterior plaster

Figure 2. Lydia Genecand and Raul Hansra Sartorius, RIOT Design Studio 'Halt Extraction,' Episode 02: 'Normatted Matter,' EPFL; *Dear Modernism, It's Still Leaking Inside*, 2025. Courtesy of Genecand- Hansra Sartorius.

it. But what if architectural detailing included more than its typical descriptions of dimensions and material specifications? What if it included material provenance information, labor, and the impacts of its specified materials' extraction? What if plans for the standard roof detail included annotations about the source of its lumber, the labor conditions of its harvesting, or how much heat and carbon its insulation panels have emitted through production and transportation

An accountable detailing practice that is more dependable than current metrics (such as the Life Cycle Assessment/ LCA) could infuse technical drawings with provenance data and construction documents that would convey how each material layer carries its full extractive context: the emissions generated during manufacture, the communities displaced by resource extraction, the health impacts on installation workers, and the chemical persistence in soil and water.

As Shonfield revealed in her reading of the humble mastic joint, even the most mundane elements of construction embody relations of power and control. Her anthropomorphizing of the joint that was "subjected to an intolerable level of stress trying to keep two panels together," offers a method for giving voice to the silent aspects of architecture.<sup>36</sup> Similarly, our post-extractive detail might speak for the humans and more-than-humans involved in its creation and maintenance. This approach to detailing would require architects to extend our practices beyond ordinary standards of quality assessment. Instead, our methods could include the social and ecological

contexts of materials and engage with questions such as: Where did this material come from? Whose land was it extracted from? Under what labor conditions? With what ecological consequences? There is a potential in rethinking the detail to bring together technical performance, aesthetic concerns, and ethical accountability in a single scale of design attention. By embedding provenance research directly into the practice of detailing, architects can transform a key site of professional knowledge into a tool for accountability.

### **Detail as Tools for Change**

Every material in a building carries a direct extractive footprint (mining, harvesting, manufacturing) and an indirect one (digital tools for design, prospection technologies, labor systems, ecological impacts, and cultural displacement). This essay argues that the politics of provenance are most clearly revealed at the scale of the detail, where single and disparate components with complex histories assemble and converge. By reading details as evidence, we can trace these extractive relationships in both directions. Tracing backward reveals their origins in colonial land appropriation, labor exploitation, and environmental destruction. Tracing forward tracks their ongoing implications for maintenance workers, building occupants, and ecosystems. The evidence contained in the details challenges architecture's tendency to present itself as autonomous from these material realities. The most celebrated details—such as invisible joinery or perfect waterproofing solutions—achieve their apparent simplicity through a complex network of extraction and exploitation that remains conveniently out of frame. As architects, we admire the precision of a glass curtain wall meeting a stone floor with minimal visual interruption; yet we are not trained to see the global supply chains, resource depletion, and labor conditions that made such a junction possible. The aesthetic refinement of the detail distracts us from its material reality.

Failure of the detail is also an important moment of truth. When a leak exposes the hubris of control or when maintenance reveals the hidden labor that sustains architectural appearances, it tells us that architecture cannot keep its pristine discourse separate from the messy realities of its production. By attending to the detail as both a technical composition and as documentary evidence, architects can begin the work of repairing disciplinary aspirations with their material realities. This work has argued that architectural details function as material evidence that documents extractive relationships between humans, environments, and economies. It has also explored how applied, politicized processes to detailing might answer to past and present problems of construction in more

accountable, post-extractive ways. To politicize architectural detailing is to question how a detail is brought into being. What materials is it assembled from? Which solutions does it answer to? And at what cost?

As a framework for critical practice, architectural extractivism provides a lens through which details can be understood as both technical achievements and political artifacts. The scale of accountability begins at the scale of the detail. It is the point where intent meets material reality, where abstract labor confronts physical labor, and where the most intimate decisions about material combinations unravel global systems of production and extraction. This recognition creates the possibility of a different kind of detail, one that does not conceal extraction but seeks to mitigate and account for it. It makes visible what architecture renders invisible: the accumulation of seemingly innocuous decisions that, when aggregated across millions of buildings, reveal the true scale of extractive violence.

#### Biography

Charlotte Malterre-Barthes is an architect, urban designer, and assistant professor at the Swiss Federal Institute of Technology-EPFL, where she leads the laboratory RIOT. Malterre-Barthes's interests relate to urgent aspects of contemporary urbanization, material extraction, climate emergency, and social justice. While assistant professor of Urban Design at Harvard University, she started the initiative "A Moratorium on New Construction," interrogating current development protocols (2025, Sternberg Press / MIT Press). Malterre-Barthes holds a PhD (ETH Zurich) on the political economy of commodities and the built environment and is a founding member of the Parity Group (Meret Oppenheim Prize 2023) and the Parity Front, activist networks dedicated to equality in architecture. She serves on the scientific board and is an ambassador for the initiative "House Europe," against demolitions.

#### Notes

<sup>1</sup> "Paris's Quai Branly Museum Hosts Final Show in France for Looted Benin Treasures," *France 24*, October 26, 2021, <https://www.france24.com/en/africa/20211026-paris-s-quai-branly-museum-hosts-final-show-in-france-for-looted-benin-treasures> (accessed June 13, 2025).

<sup>2</sup> Two percent of the 833 stainless steel slates had to be sanded off because of the reverberation causing heat to the neighboring buildings. Ten thousand tons of structural steel were used for the construction. See F. Gehry et al., *Symphony: Frank Gehry's Walt Disney Concert Hall* (Harry N. Abrams, 2003); Jamie Wetherbe, "Cleaners Make Walt Disney Concert Hall's Curves Sparkle," *Los Angeles Times*, September 20, 2013.

<sup>3</sup> "Review of Architecture and Construction Details," *Detail Magazine*, [https://www.detail.de/de\\_en/detailshop-detail-magazin](https://www.detail.de/de_en/detailshop-detail-magazin) (accessed March 6, 2025).

<sup>4</sup> Langdon Winner, "Do Artifacts Have Politics?," *Daedalus* 109, no. 1 (Winter 1980): 121–36. Reprinted in Langdon Winner, *The Whale and the Reactor: A Search for Limits in an Age of High Technology* (University of Chicago Press, 2020), 30.

<sup>5</sup> I have addressed architectural details in Charlotte Malterre-Barthes, "The Devil Is in the Details- Who Is It That the World Belongs To?," in *Non-Extractive Architecture: On Designing without Depletion*, ed. Space Caviar (Sternberg Press, 2021); and Charlotte Malterre-Barthes, *A Moratorium on New Construction* (Sternberg Press, 2020), 30.

<sup>6</sup> For more on architectural extractivism, see Charlotte Malterre-Barthes, "Architectural Extractivism in Times of Post-Accountability: A Restorative Approach," in *Abundance Not Capital: The Lively Architecture of Anupama Kundoo*, ed. Angelika Fitz and Elke Krasny (MIT Press, 2025).

<sup>7</sup> See Arturo Escobar, *Designs for the Pluriverse: Radical Interdependence, Autonomy, and the Making of Worlds* (Duke University Press, 2018); Paula Serafini, *Creating Worlds Otherwise: Art, Collective Action and (Post)Extractivism* (Vanderbilt University Press, 2022); and Ailton Krenak et al., *Life Is Not Useful* (Polity Press, 2023).

<sup>8</sup> Farmer, *Trees in Paradise*.

<sup>9</sup> See Jane Bennett, *Vibrant Matter: A Political Ecology of Things* (Duke University Press, 2010).

<sup>10</sup> E. Benetto et al., "Life Cycle Assessment of Oriented Strand Boards (Osb): From Process Innovation to Ecodesign," *Environmental Science & Technology* 43, no. 15 (2009).

<sup>11</sup> Yue-Sheng Hou et al., "Global Estimation of the Climate Change Impact of Logging Residue Utilization for Biofuels," *Forest Ecology and Management* 462 (2020).

<sup>12</sup> See Max Liboiron, *Pollution Is Colonialism* (Duke University Press, 2021).

<sup>13</sup> See Carola Hein, *Oil Spaces: Exploring the Global Petroleumscape* (Routledge, 2022); "Sanctions on Venezuela Mean More Expensive American Roads" Bloomberg, 2019: <https://www.bloomberg.com/news/articles/2019-07-26/paved-in-black-gold-rains-and-sanctions-spawn-500-u-s-asphalt> (accessed June 18, 2025).

<sup>14</sup> Nina I. Buravchuk et al., "Use of Technogenic Raw Materials in Ceramic Technology," *Open Ceramics* 18 (June 2024).

<sup>15</sup> Kathryn Yusoff, *A Billion Black Anthropocenes or None* (University of Minnesota Press, 2018); Nina Wexelblatt et al., "Round Table: Landscapes and Logics of Extractivism," *Thresholds* no. 49 (2021): 21–28; Imani Jacqueline Brown, "Black Ecologies: An Opening, an Offering," *MARCH International* (2021).

<sup>16</sup> Daphne Bakker et al., "Submerged Heritage," in *Thursday Night Live!*, ed. Ine Apapoe (Nieuwe Instituut, 2022). See Richard and Sally Price, *Rainforest Warriors: Human Rights on Trial* (University of Pennsylvania Press, 2011).

<sup>17</sup> Xuanwen Wang et al., "Fatal Falls from Roofs Among U.S. Construction Workers," *Journal of Safety Research* 44 (February 2013).

<sup>18</sup> Swarnabh Ghosh, "Toward a Critique of Labor-in-Construction," in *Non-Extractive Architecture: On Designing Without Depletion*, ed. Space Caviar (Sternberg Press, 2021); E. Boadu et al., "Work-Related Respiratory Health Conditions Among Construction Workers: A Systematic Narrative Review," *BMJ Open Respiratory Research* 10 (2023); A. Sussell et al., "Health Risk Behavior Profile of Construction Workers, 32 States, 2013–2016," *Journal of Occupational & Environmental Medicine* 67, no. 2 (May 2020).

<sup>19</sup> Edward R. Ford, *The Architectural Detail* (Princeton Architectural Press, 2011), 125.

<sup>20</sup> Mark Burry, "The Architectural Detail and the Fear of Commitment," *Architectural Design* 84, no. 4 (2014).

<sup>21</sup> Burry, "The Architectural Detail."

<sup>22</sup> Robin Evans, "Mies Van Der Rohe's Paradoxical Symmetries," *AA Files*, no. 19 (1990).

<sup>23</sup> Quoted from Dietrich Neumann, ed., *The Barcelona Pavilion by Mies Van Der Rohe: One Hundred Texts Since 1929* (Birkhäuser, 2021), 70.

<sup>24</sup> Evans, "Mies Van Der Rohe's Paradoxical Symmetries."

<sup>25</sup> Peggy Deamer, "Craft and Design; "Detail: The Subject of the Object," in *Architecture and Labor*, ed. Jane Rendell (Routledge, 2020), 8.

<sup>26</sup> Jennifer Bloomer, "Pale Houses, Silenced Shadows," *Assemblage*, no. 37 (1998).

<sup>27</sup> Eric Bellin, *Detailing Worlds: A Conceptual History of Architectural Detail* (Bloomsbury, 2025).

<sup>28</sup> Andrés Jaque, *Phantom: Mies as Rendered Society: Intervention in the Mies Van Der Rohe Pavilion* (Fundació Mies van der Rohe, 2013).

<sup>29</sup> Marco Frascari, "The Tell-the-Tale Detail," in *Semiotics 1981*, ed. John N. Deely and Margot D. Lenhart (Springer US, 1983).

<sup>30</sup> Katherine Shonfield, *Walls Have Feelings: Architecture, Film and the City* (Routledge, 2000).

<sup>31</sup> Shonfield, *Walls Have Feelings*, 14.

<sup>32</sup> Francesca Hughes, *The Architecture of Error: Matter, Measure, and the Misadventures of Precision* (MIT Press, 2014).

<sup>33</sup> Howard Zinn, *A People's History of the United States, 1492–2001* (HarperPerennial, 2005).

<sup>34</sup> Ford, *The Architectural Detail*, 125.

<sup>35</sup> Kenneth Frampton and John Cava, *Studies in Tectonic Culture: The Poetics of Construction in Nineteenth and Twentieth Century Architecture* (MIT Press, 1995).

<sup>36</sup> Shonfield, *Walls Have Feelings*.