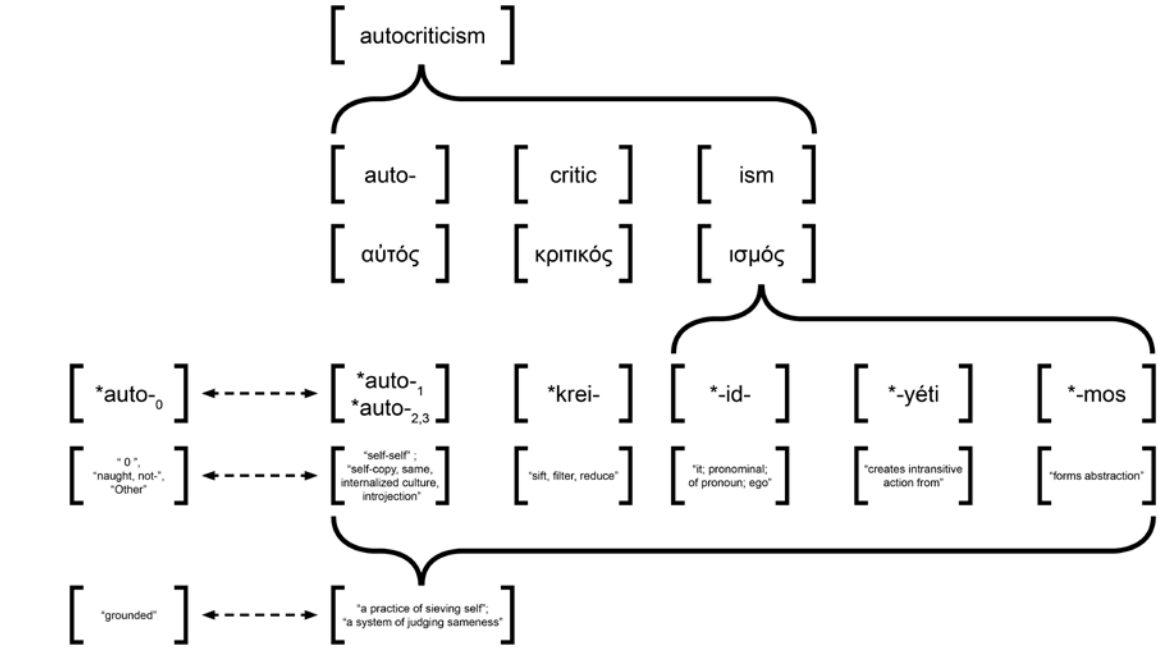
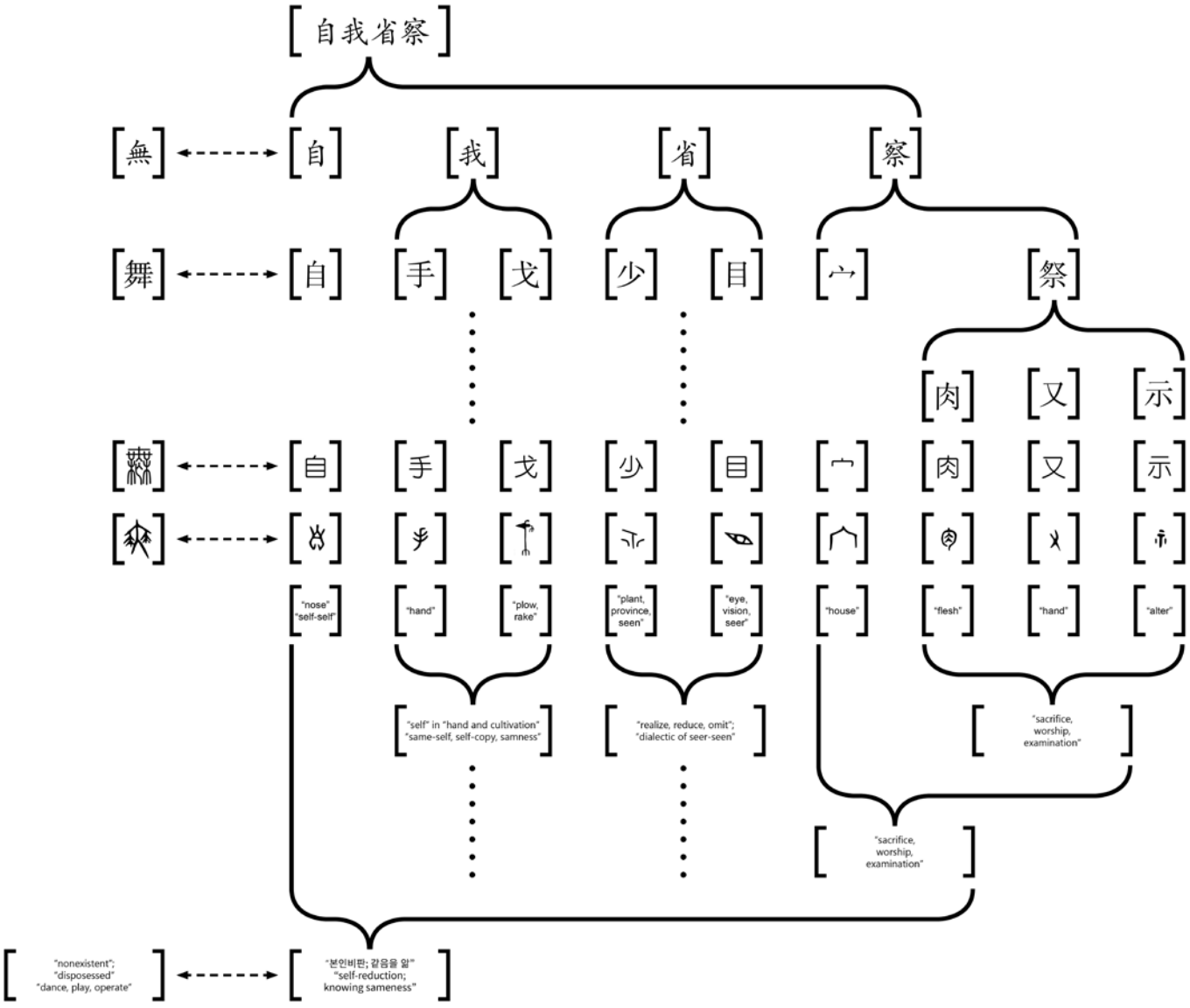

AUTO
CRITIC
ISM

Autocriticism: Architect-neurosis

Thesis, Master of Architecture
Harvard Graduate School of Design, 2023, Advised by Jon Lott

Autocriticism challenges normative boundaries and meanings of 'self'. This thesis reviews primitive self-perspectives that verge on singularity between environment and self, suggesting a certain reciprocity between self-ideation and community-realizations. The theoretical construction is narrativized in script one: "two poets on the meaning of autocriticism". The dialogue incorporates frameworks of psychoanalysis and contemporaneity in literary criticism. Within it, two poets contextualize criticism "-in house, today", effectively reversing the plane of projections and introjections. The phenomena of criticism becoming no-criticism is demonstrated "-in house" for the reviewers of this M. Arch thesis in the second script: "two analysts on architect-neurosis". As a set, the two scripts foreground three "viewings" of 'self' that each actualize its own art of subjectivity: Designer's Block on Kirkland street, Resident's Safe over Cambridge-Somerville, and Students' Sandbox for Blackstone Steam Plant. Individually, the projects cultivate different forms of community-realization at respective sites, but collectively, they produce a patterned body that reflects the voyeur's understanding of the relative environment.


autocriticism
auto-
critic
ism
αὐτός
κριτικός
ισμός
*auto-0
*auto-1
*auto-2,3
*krei-
*-id-
*-yéti
*-mos
" 0 ", "naught, not-", "Other"
"self-self" ; "self-copy, same, internalized culture, introjection"
"sift, filter, reduce"
"it; pronominal; of pronoun; ego"
"creates intransitive action from"
"forms abstraction"
"grounded"
"a practice of sieving self"; "a system of judging sameness"


自我省察
無
自
我
省
察
舞
手
戈
少
目
厶
祭
肉
又
示
"nose" "self-self"
"hand"
"plow, rake"
"plant, province, seen"
"eye, vision, seer"
"house"
"flesh"
"hand"
"alter"
"self" in "hand and cultivation" "same-self, self-copy, samness"
"realize, reduce, omit"; "dialectic of seer-seen"
"sacrifice, worship, examination"
"sacrifice, worship, examination"
"nonexistent"; "dispossessed" "dance, play, operate"
"본인비판; 감음을 앎" "self-reduction; knowing sameness"

Two Poets on the Meaning of Autocriticism

■■■: What is autocriticism?

■■: Autocriticism[1] is the word that recalls the image of "grounded self". There is an exceptional connection between the word and the image. Even when the nominal meaning of the word is pulled farthest apart, the bond is sustained.[2]

■■■: "Grounded self". Within the image, 'self' is explicitly differentiated from the 'ground.' And yet they have come together in the present. What does this image accomplish?

■■: The image of "grounded self" can help people negotiate aspects of self [*auto$_{1}$] and mass-self [*auto$_{2,3}$]. It provides protection against oppression and othering by examining self-deception and societal inequality.

■■■: The proposed discipline is diffuse in both the meter and the meaning of the word.[3] The word-form is sufficient to deliver the differentia of the image. Language is radically powerless against symbolic forces that shift the signified-signifier relationship.[4]

1 [*Autocriticism]
["the practice of sieving self"]
["the teaching of relinquishing same-self"]
["the doctrine of overthrowing given difference"]
2 [Auto – critic – ism]
[auto] – [critic] – [ism]
[αὐτός] – [κριτικός] – [ισμός]
[*auto-$_{1}$ – *auto-$_{2,3}$] – [*krei-] – [*-id-] – [*-yéti] – [*-mos]
[self ; self-copy, same, internalization] - [sift, sieve, filter, reduce] - [practice, system, doctrine]
3 John Crowe Ransom, "Wanted: An Ontological Critic", *The New Criticism*. (Greenwood Press, 1979): 279.
"The poetic discourse must treat what cannot be treated in scientific discourse."
4 Ferdinand de Saussure (1857-1913), "Nature of the Linguistic Sign" and "Immutability and mutability of the sign", *Course in General Linguistics* (Columbia University Press, 2011): 67, 72.
"The real object of linguistics is the normal, regular life of an existing idiom."

■■: To note the antecedence and prevalence of the image, consider the comparative translation between “autocriticism” and “自我省察”[5]. Both the English word and the Classical Chinese Han four-letter idiom are assemblies of ancient characters that connect to the image of “grounded self”. They radically collide the celebration of individual uniqueness in self [αὐτός $_{1}$: 自] and the politics of demonstrating sameness [inflection of cultum[6] : αὐτός$_{2,3}$: 我 : allusion[7] : *ars erotica*[8]].

5 Autocriticism (translation to a four-letter-idiom in Classical Chinese Han)

[自我省察], (자아성찰 ; 自我省察 ; zì wǒ xǐng chá)

[self] – [self] – [omit, reduce, simplify, province] – [[examine, investigate, notice]-in house]

[自] – [手 + 戈] – [少 + 目] – [宀 + [示 + 肉 + 又]]

[Nose] – [hand + plow] – [eye + plant] – [house + [alter × meat × hand]]

[self self] – [self-copy, same, cult, dwell] – [seer and seen] – [examine in house]

6 inflection of cultum

[cultum] : inflection of cultus

[cultus] : perfect passive participle of [colō]

[colō : “cultivate; worship”] : present infinitive of [colere]

[colere: “cultivate; inhabit; practice; guard.”] : future passive indicative of [colō]

[*kʷel-: "to revolve, move round, dwell."] , (Proto-Indo-European root)

7 allusion:

“The strategy behind the opening image thus becomes: "to speak of something else as a way to introduce the subject of the song. [...] Emotion becomes effective against a backdrop of quietude; the incitement of the world reveals itself as creative only through inner availability and reflection”

François Jullien and Hawkes Sophie. “Between Emotion and Landscape: The World is Not an Object of Representation”, *Detour and Access*. (New York: Zone Books: 2000): 148.

8 *ars erotica*:

“In the erotic art, truth is drawn from pleasure itself [...] pleasure is not considered in relation to an absolute law of the permitted and the forbidden, nor by reference to a criterion of utility, but first and foremost in relation to itself”

Michel Foucault. “Scientia sexualis” *History of Sexuality*, Vol. 1, (1978), 73.

In both sets of word-forming elements, cognizance is marked as a product of reduction [κριτικός : 省][9] , while “the display of flesh” [祭 : “I-it” : *-id-] is found as the grounding material[10] of “the source, the genitive singular” [11]. To gather precaution, the examination of the flesh must be hosted “-in house”, an extraordinary separation from the world [察[12]: -ism[13]]. The product of autocriticism, self-knowledge, brings a certain awareness about what have been censored “out of house”.

9 [dialectics of seeing : 省] (access to ground);
[“seer – seen” : “realize; reduce; omit”]
[vīsiō – phantasíā] : [目 + 少] ;
[*weyd- + *bha-] : [目 + 少] ; (Mycenaean Greek syllabic script : Oracle-Bone-Script)
[“to see” + “to shine”] : [“eye” + “plant”]
10 [material]
[materialis] (Latin)
[materia] +[-alis]
[māter]-[-ia] +[-alis].
[“matron of a house”] – [“genitive suffix”] – [“to grow”]
[mother]
[*m-] – [other]
[*m-] – [oþer] ; (Old English)
[*m-] – [anþeraz] – [*-dṓm] ; (Proto-Germanic)
[*m-] – [ánteros] – [*-dem] ; (Proto-Indo-European)
[“source; genitive singular”] – [“one of two; second”] – [“build; arrange; together”].
[☐] – [△] – [⊖]
11 [m : “voiced bilabial sound, consonant using both lips”]
[*m-] : [𐤌]
[m : “em” (alphabet letter)] : [ㅁ ; (Hangul consonant)]
[μ : “mu” (ancient Greek letter)] : [口 (translingual Han character]]
[𐤌 : “mem” ; (Phoenician letter)] : [口 ; (pictogram character)]
[half of 〰 ; (Egyptian Hieroglyph] : [☐ ; (Oracle-Bone-Script)]
[*maʾ- ; (Proto-Semitic)] : [*ku(w) ;(Proto-Sino-Tibetan)]
[“half of water”] : [“opened mouth”]
12 察 : “examine in house”
[宀 + 祭]
[“house” + “sacrifice, worship”]
[宀] + [肉 + 又 + 示]
[“house”] + [“meat” + “hand”+ “alter”]
13 -ism : “a practice, system, doctrine; belief”
[-ismós]
[-ισμός]
[-ízō] – [-μός]
[*-idyéti] – [*-mos]
[*-id-] – [*-yéti] – [*-mos]
[“it ; pronominal; of pronoun; ego”]-[“creates intransitive action from”]-[“forms abstraction”]

■■■: So autocriticism consumes “self-sanctioning subjects” and return “Other-sanctioned objects”. Can you define strategies of power that are immanent in this will to self-knowledge? [14,15]

■■: Yes. Through autocriticism, “sameness in self” becomes “projections of others” rather than “properties of self”. That is, “projective-authorships” are interpreted as “introjective readerships”. Here are five explicit examples:

1. The gendered-author internalized “dominating language”.
2. The empiricist-author internalized “colonizing idealism”.
3. The visionary-author internalized “Romantic dreams”.
4. The poet-author internalized “stage and foolish audience”.
5. The literati-author internalized “pertinence with the external”.

14 Antoine Picon, 2021. “Architecture and Language: An Incomplete Encounter”, *The Materiality of Architecture*. (University of Minnesota Press, 2021): 43.
“What kind of relationship may exist between architectural rules and principles, on the one hand, and the structures of language and thought, on the other?”

15 Michel Foucault, “The Discourse on Language” (L’ordre du discourse), *The Archaeology of Knowledge*, (originally in French, 1971): p219.
"A will to knowledge emerged which, anticipating its present content, sketched out a schema of possible, observable, measurable and classifiable objects; a will to knowledge which imposed upon the knowing subject-in some ways taking precedence over all experience [...].”

■■■: These objects attest to how self-knowledge radically opens up ‘interpersonal experience’ to ‘introspective cultivation and community formation’. What might be key between them?

■■: Horror.[16] Self-knowledge must recite horror for recognition because “introjection”[17] and “the adopting of sameness”[18] are cited by horror. The word “cognition” indicates the symmetric difference in “ablated preposition of the singular-future-passive second-person”.[19]

16 [horror]
“The “Theater of Cruelty” and “Tragic Drama” *present* the “absent void” in full and necessary rigor.”
[*horzēō : “to bristle, shudder”] – [-tōr ; past participle nominative suffix]
[excite-incite]
[cite]
[citare] : frequentative of [ciēre]
[ciēre : “rouse, excite, call”]
[kinein : “to move; to change”]
[*keie- : “to set in motion”]
17 [introjection] : “unreferrable, unseen, censored”
“One part of their personalities [...] got stuck in its development at a level where it was unable to use the alloplastic way of reaction but could only react in an autoplastic way by a kind of mimicry.”
S. Ferenczi, “Confusion of tongues between adults and the child”, *Final Contributions* (1933): 167.
18 [transference] : “the adopting of sameness; repetition and recurrence; re-enactment”
Sigmund Freud, “Remembering, repeating, and working-through” (1914), *Standard Edition* 12: 148.
19 [cognition]
[cognitiō]
[co ; allomorph of con]– [nōscēre ; second-person singular future passive indicative]
[con-, com- ; ablative preposition] – [gnōscō] – [-tiō ; resultative suffix]
[*ḱóm : “next to, at, with, along”] – [*gnō- : “to know”] – [*-tis- : “of result”].
[△]
[“one of two; second” ; “symmetric difference”]

■■■: Who is the theft of the horror-discourse?[20]

20 Derrida, Jacques., *Writing and Difference* (L'écriture et la différence), (1967): p186.
In "The Theater of Cruelty and the Closure of Representation"
"But also in its most hidden sense, this affirmation has not yet begun to exist."
In "La Parole Soufflée":
"The theatre of words, a theater of deviation from the groundwork of a preestablished text, a table written by a God-Author who [wield] the primal word. [...] Now, "We must believe in a sense of life renewed by the theater, a sense of life in which ["self"] fearlessly make "self" the master of what does not yet exists and brings it into being."

■■: “The grounded” is the only exception through the sift. To understand the affect of the doctrine beyond the given examples, consider the semantic prison of autocriticism.[21] The definable linguistic boundaries engender “progressive criticism”, which can range between autocriticism and hypocriticism. Each “projection of criticism” regresses to “allocriticism” as persuasiveness of the given projection deteriorates.

■■■: I see that. Autocriticism cultivates the faculty to design, the ability to make decisions compatible with the psychodynamics[22] of language[23]. However, “truth is not an intent which realizes itself in empirical reality; it is the power that determines the essence of this empirical reality.”[24]

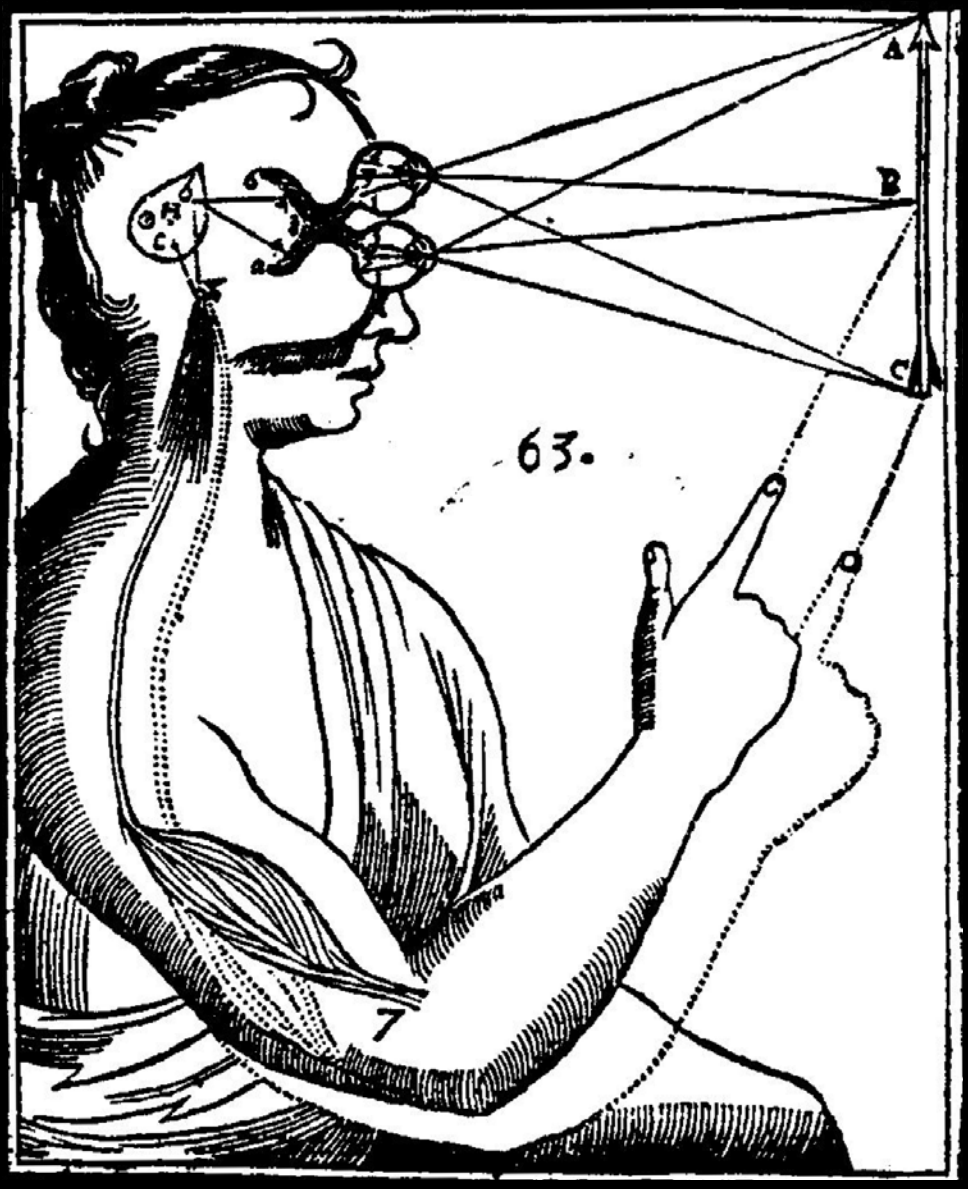
21 [criticism ↔ not-criticism]
[“criticism = allocriticism”] ↔ [“autocriticism = hypocriticism”]
[“seen, scene, authored, othered” – “grounded, environment, cited, partnered”]

22 Heinz Kohut, “Introspection, empathy, and psychoanalysis” (1959): 469.
“How is our faculty of making a choice or of coming to a decision compatible with the law of psychic determinism? [...] We must define the psychoanalytic meaning of the term interpersonal as connoting an interpersonal experience open to introspective self-observation.”

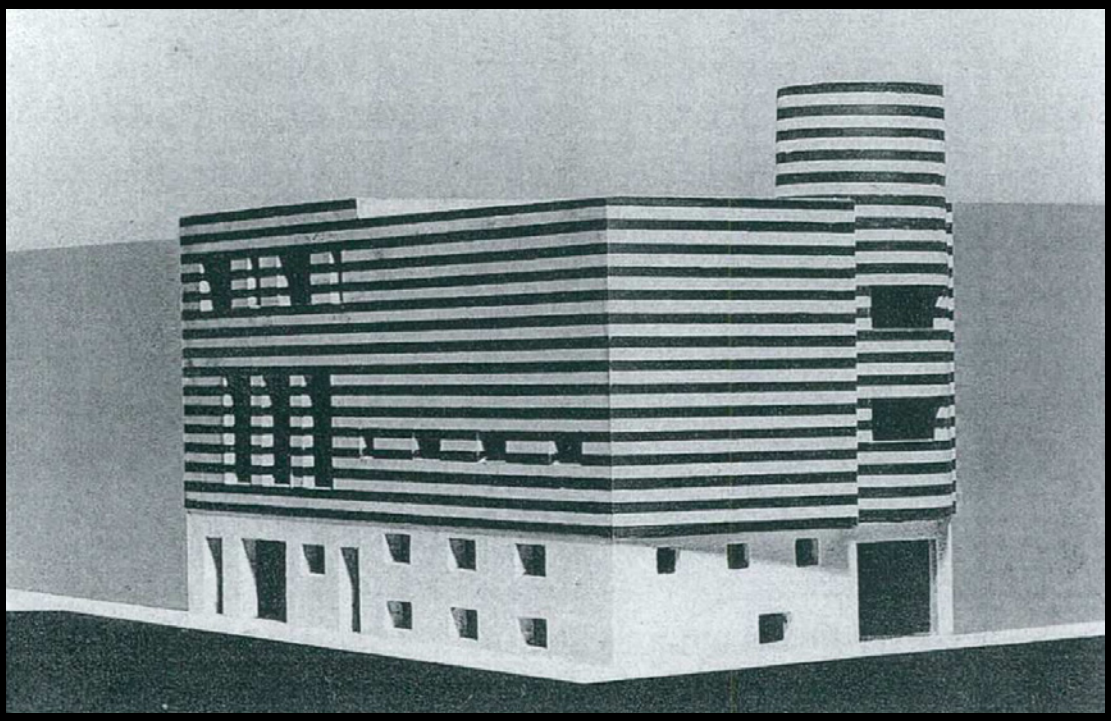
23 K. Michael Hays, Andrew Holder, *Inscriptions : Architecture before Speech*, (Harvard University Graduate School of Design. 2021).
“The act of inscription brings the figural into being. Architecture's inaugural act of opening up that space is inscription: [...] architectural materiality that is anterior to phenomenon but no less real for that. [It reconstitutes] the architectural subject after the demise of the architectural Symbolic [defined by] Architectural inscription [...] to enact a displacement of what precedes figuration : [event, encounter, mnemonic trace, a network of signification, material support]. [...] Architecture developed the theory of the sign to its fullest, and with it came the understanding of architecture as a specific kind of production whose primary task is the construction of cultural meaning and knowledge.”

24 Walter Benjamin, “Epistemo-critical-prologue”, *The Origin of German Tragic Drama* (*Ursprung des deutschen Trauerspiels*), (University of Frankfurt, 1925): 36.
“The essence of truth as the self-respecting realm of ideas [...]. Seductive as long as it wishes to shine forth brilliance, beauty provokes pursuit by the intellect, and it reveals its innocence only by taking refuge on the altar of truth. [Beauty] will always flee in dread before the intellect."

1.
The gendered-author internalized “dominating language”



The Description of the Human Body and All Its Functions
René Descartes, *Treatise on Man* (*L’Homme*), trans. Claude Clerselier (Paris, 1664): La description du corps humain et de toutes ses fonctions.



Adolf Loos, Baker house, Paris 1928

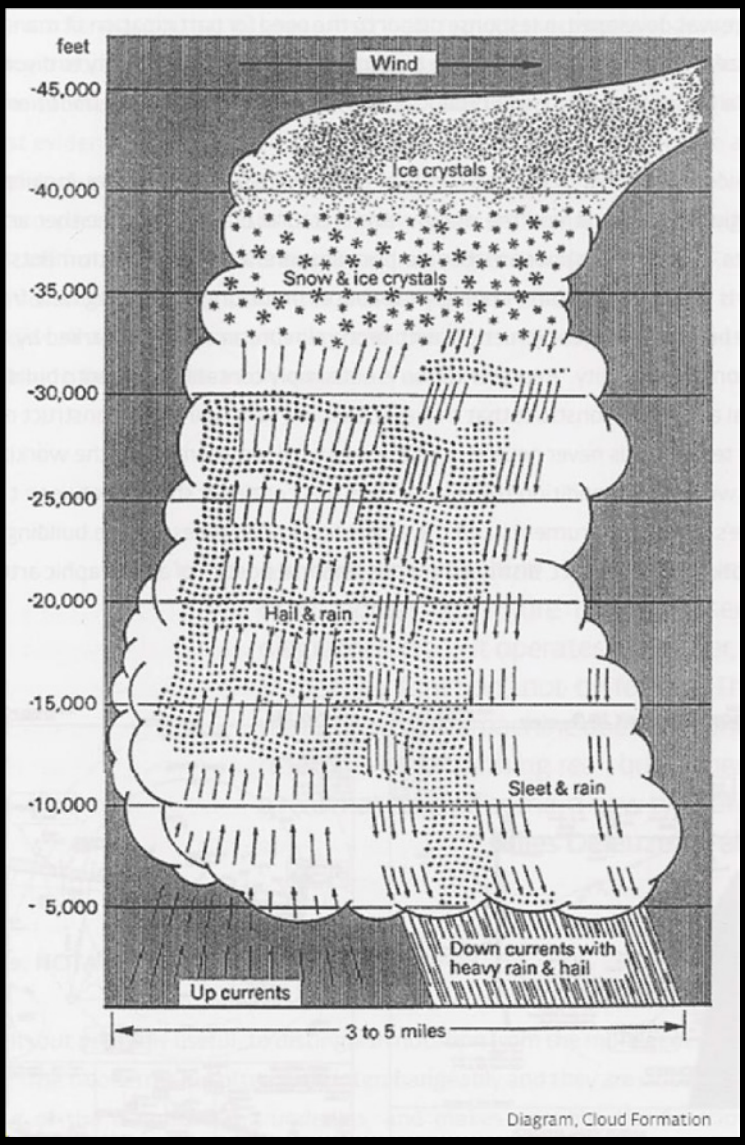
Domestic Voyeurism

Beatriz Colomina, “Intimacy And Spectacle: The Interiors of Adolf Loos”, *Architectural Association File* n.20, (London, 1990).

> “Loos seems to have reversed the Cartesian schism between the perceptual and the conceptual. Where Descartes deprived the body of its status as the seat of valid and transmissible knowledge, Loos privileges the bodily experience of space over its mental construction: the architect first sense the space, then he visualizes it.”
>
> “The spaces in Loos’s interiors cover the occupants as clothes cover the body. [...] It is an ‘architecture of pleasure’, an architecture of the womb’.

2.
The empiricist-author internalized “colonizing idealism”

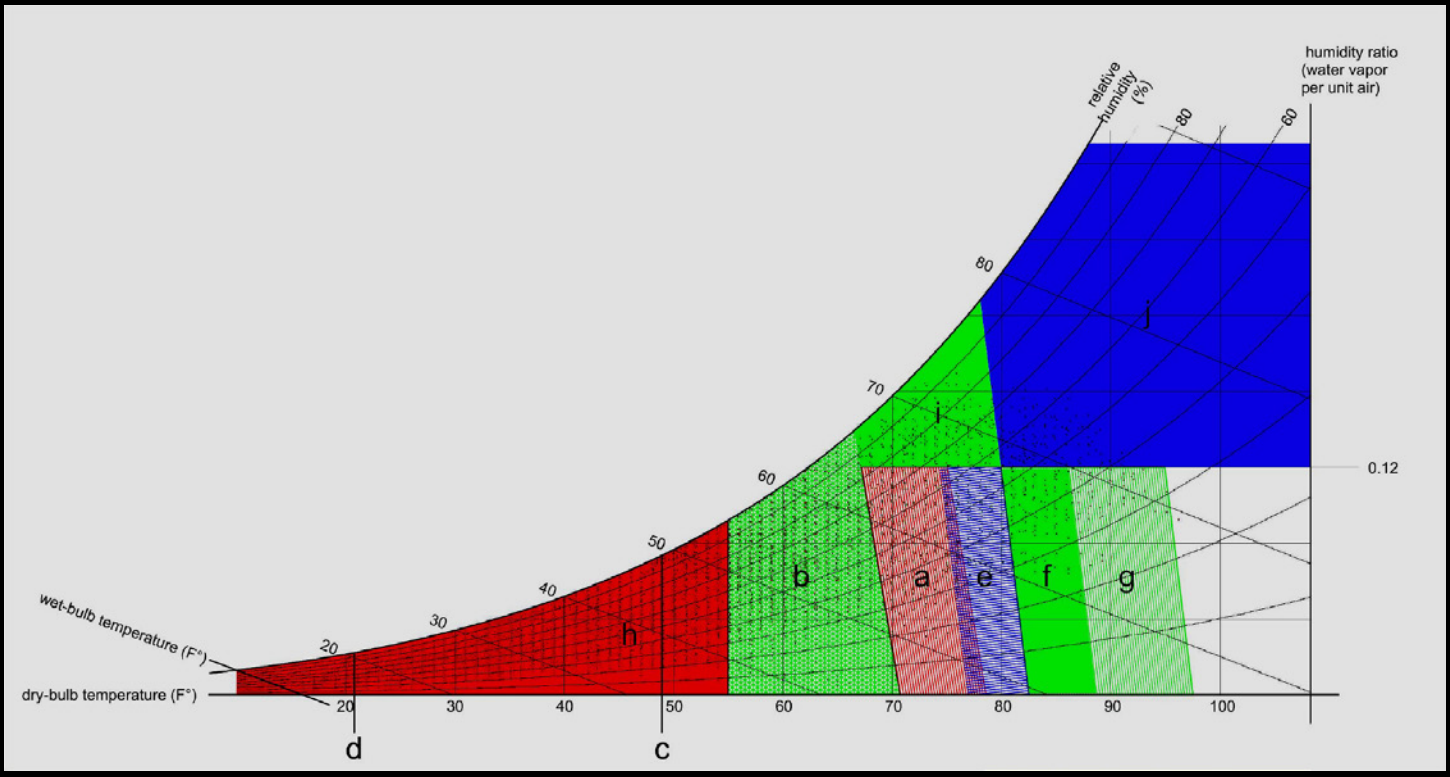
Extant Empiricist:
“Replicate a mirror image of an extant measurement, here.”



Diagram, Cloud Formation

Autographers and Allographers:
Stan Allen, “Notations+Diagrams: Mapping the Intangible”, Practice : architecture, *technique* + *representation*, 2nd ed. London ; New York: (Routledge, 2009).

“An Abstract Machine”, “Matter of Representation”
An abstract machine in itself is not physical or corporeal, any more than it is semiotic; it is diagrammatic [...] it operates by matter, not by substance; by function, not by form. The diagrammatic or abstract machine does not function to represent, even something real but rather constructs a real that is yet to come, a new type of reality.



Willis Carrier, The ASHRAE-style psychrometric chart, *The American Society of Heating*, Refrigerating and Air-Conditioning Engineers, pioneered in 1904.

Passive Heating
Comfortable hours : 905 hours/year; 10.3%)
- a. Winter Clothing
- b. Internal heat gain (2100 hours/year; 24.0%)
- c. Passive solar direct gain high mass (834 hours/year; 9.5%*)
- d. Passive solar direct gain low mass (553 hours/year; 6.3%*)

Total passive heating (3005 hours/year; 24.0%)

Passive Cooling
Comfortable hours : 905 hours/year; 10.3%)
- e. Summer Clothing
- f. Natural ventilation cooling (133 hours/year; 1.5%*)
- g. High thermal mass (163 hours/year; 1.9%)

Total passive cooling (1068 hours/year; 1.9%)

Active Systems
- h. Heating and humidification (4953 hours/year; 56.5%)
- i. Dehumidification only (441 hours/year; 5.0%)
- j. Cooling and dehumidification (198 hours/year; 2.3%)

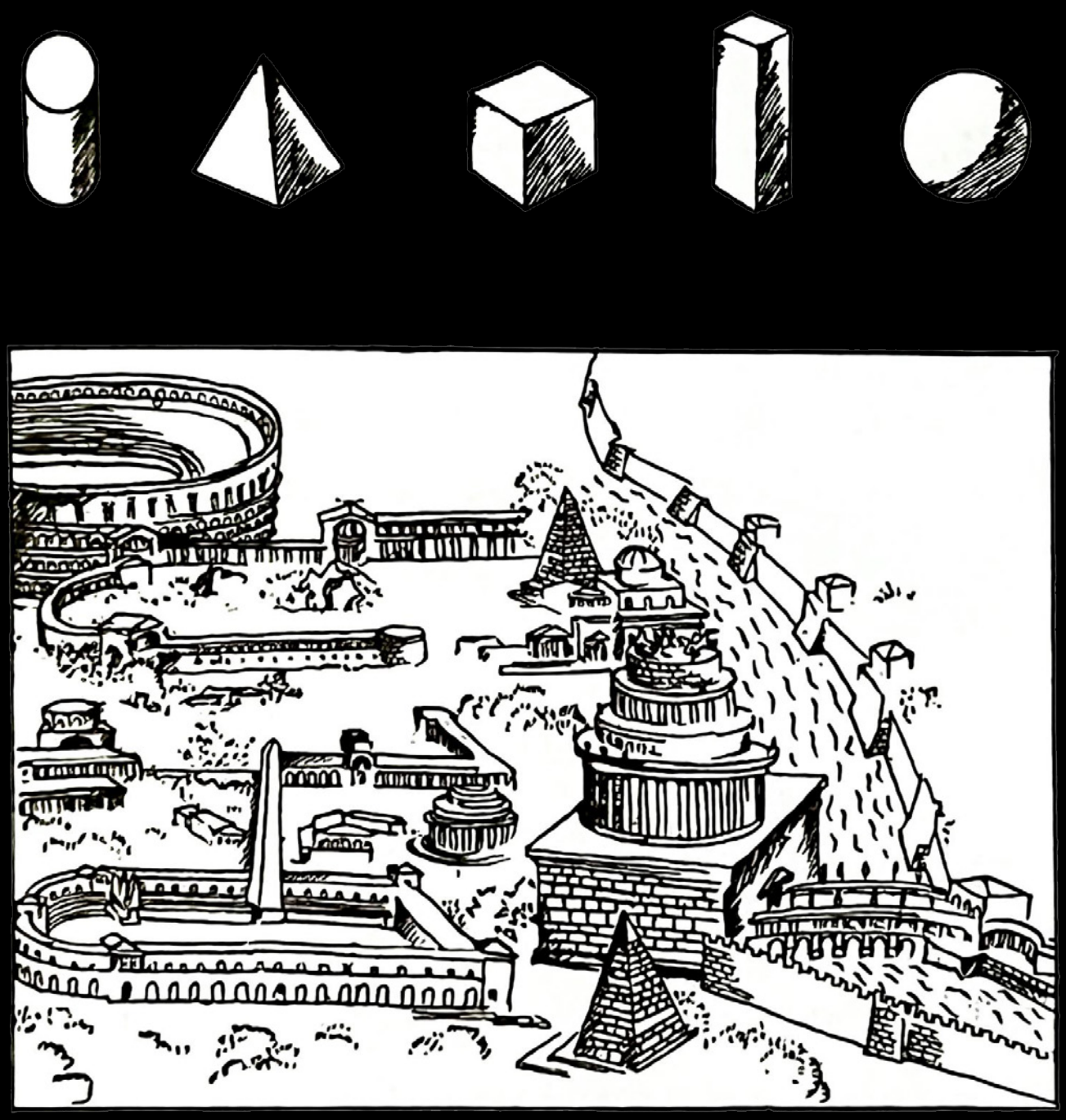
Total active conditioning (5592 hours/year; 63.8%)

3.
The visionary-author internalized “Romantic dreams”

Extant Artist:
“Replicate a mirror image of an extant artifact, here.”

Fitch. “Conceptual Parameters of Historic Preservation.” *Historic Preservation*, (1982): 47.

“Replication in the art field implies the creation of mirror image of an extant artifact. In the case of architecture, it implies the construction of an exact copy of a still-standing building on a site removed from the prototype. In other words, the replica coexists with the original. Physically, the replica can be more accurate than the reconstruction, since the prototype is available as a control for proportion,
polychromy, texture.”



“Memory of a Place”, “Architectural Rome Neurosis”
Le Corbusier, “The Lesson of Rome” Towards A New Architecture, (London : Architectural Press, 1970):159.

4.
The poet-author internalized the stage and foolish audience

“Foolish, Who thinks I am not you”
(Ah ! insensé qui croit que je ne suis pas toi!)

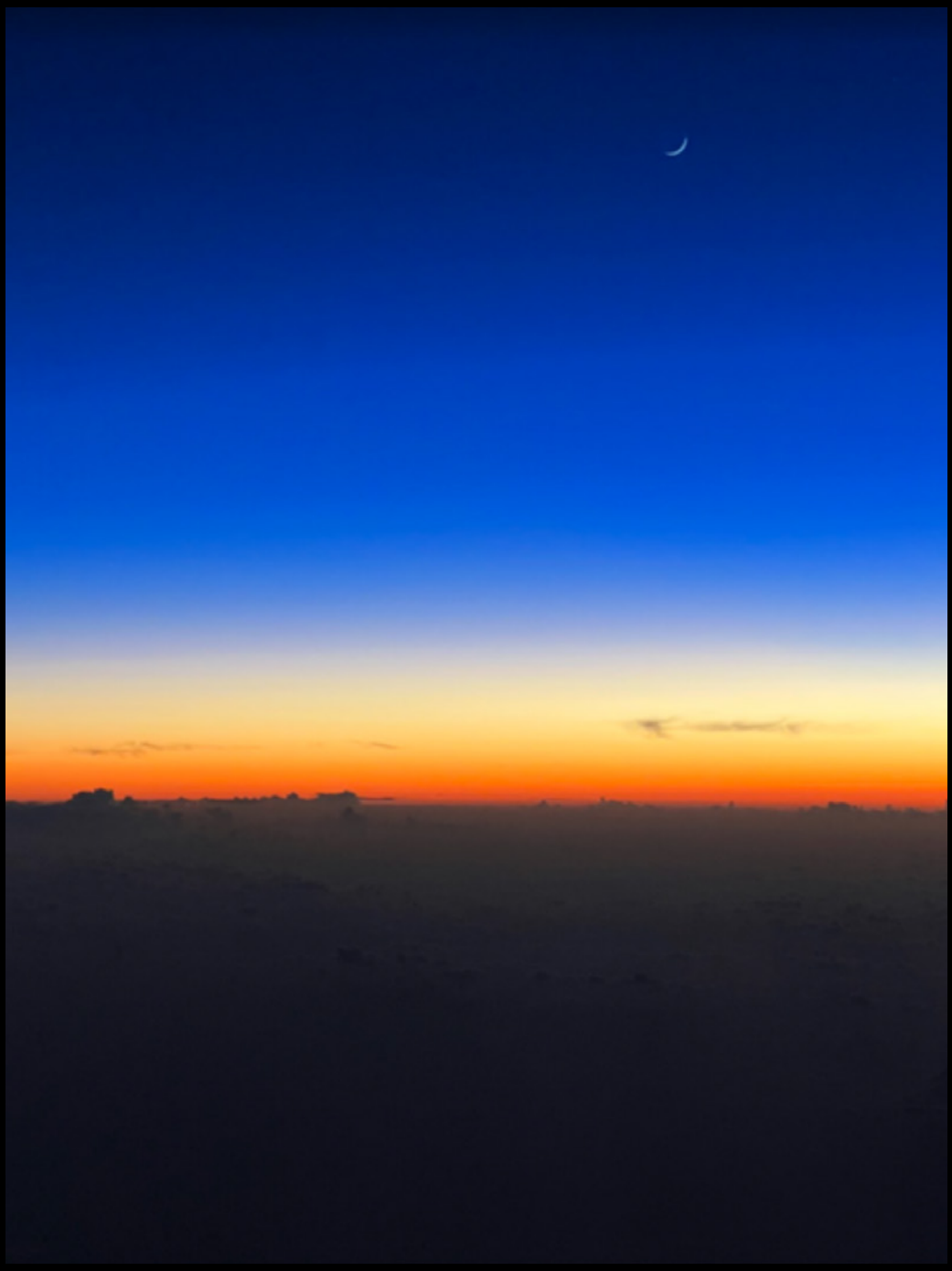
Victor Hugo, (1856) *Les contemplation: extraits*, Univers des lettres, (Paris: Bordas, 1976).

“We are part of the earth”
(Vi er en del av jorden)

Chief Seattle , (1786?-1866), Vi er en def av jorden; (Squamish people, indigenous people of the Pacific Northwest Coast, 1992).

I have lost myself: If you lose yourself, you will forget your body, see everything in the world as one, and no longer know that there is a difference between you and me.)
(吾喪我: 喪我　言忘其身也　忘其身　則視天地萬物爲一　不復知有彼我之分也**)**

Zhuangzi (莊子):, 齊物論; The Adjustment of Controversies, (late 4th CE, 道 : dao: path)



5.
The literati-author internalized pertinence with the external

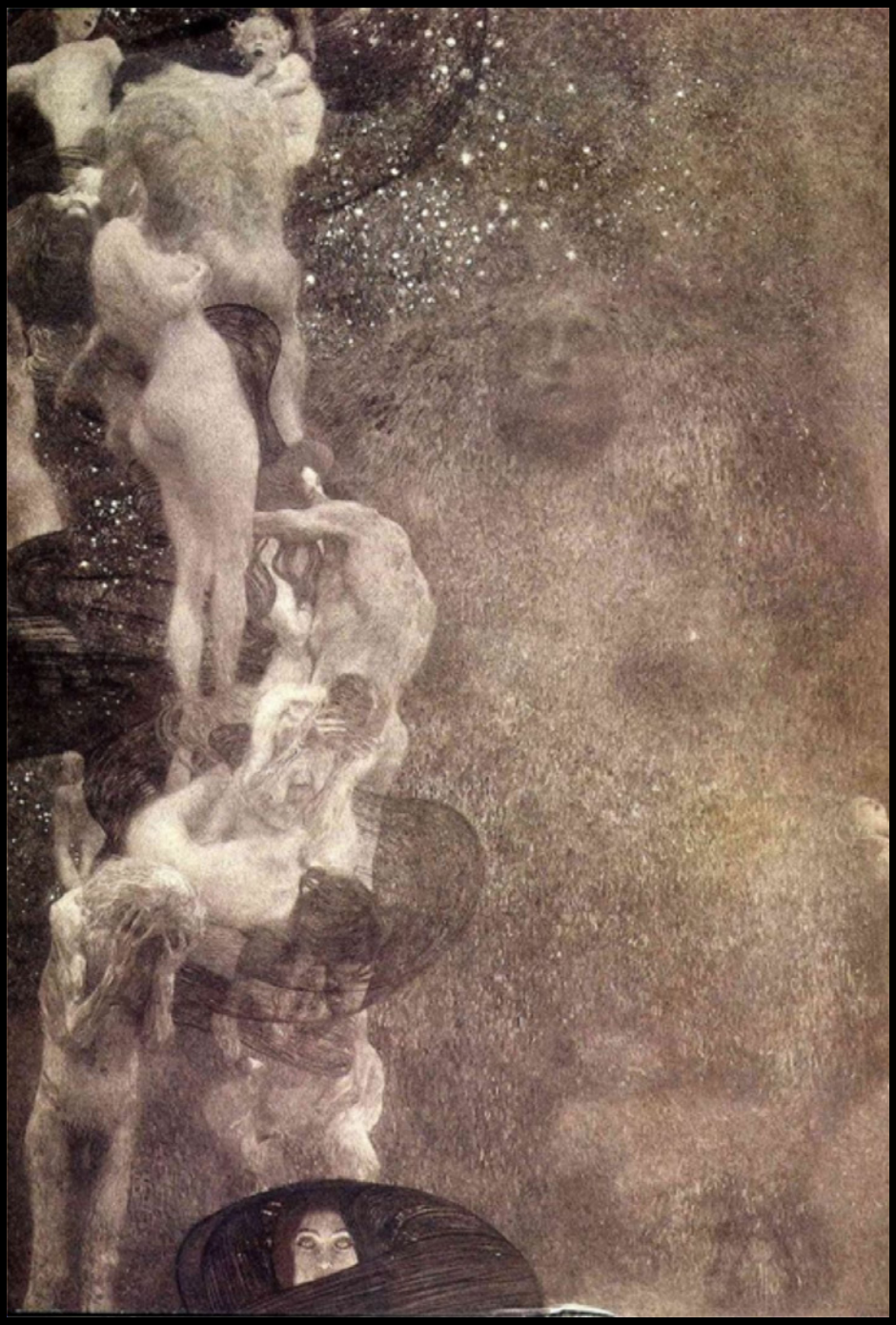
“Bildung” (education, forming, emerging; self-cultivation)

Georg Hegel, “Buildung”, Encyclopedia of the Philosophical Sciences, (Germany, 1817): “the universal, the perfection of the absolute knowledge of philosophy; Absolute Idealism”.

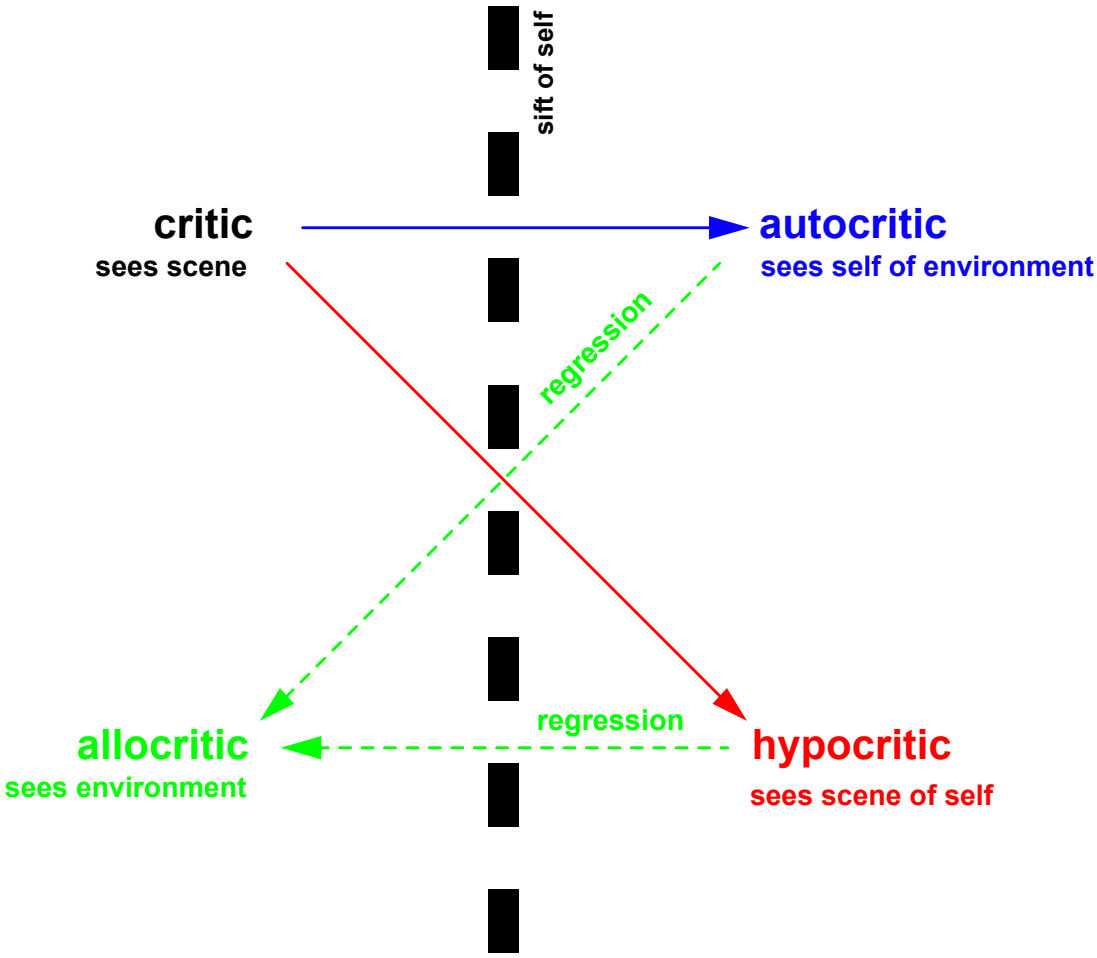
“Bildungsroman” (education novel)

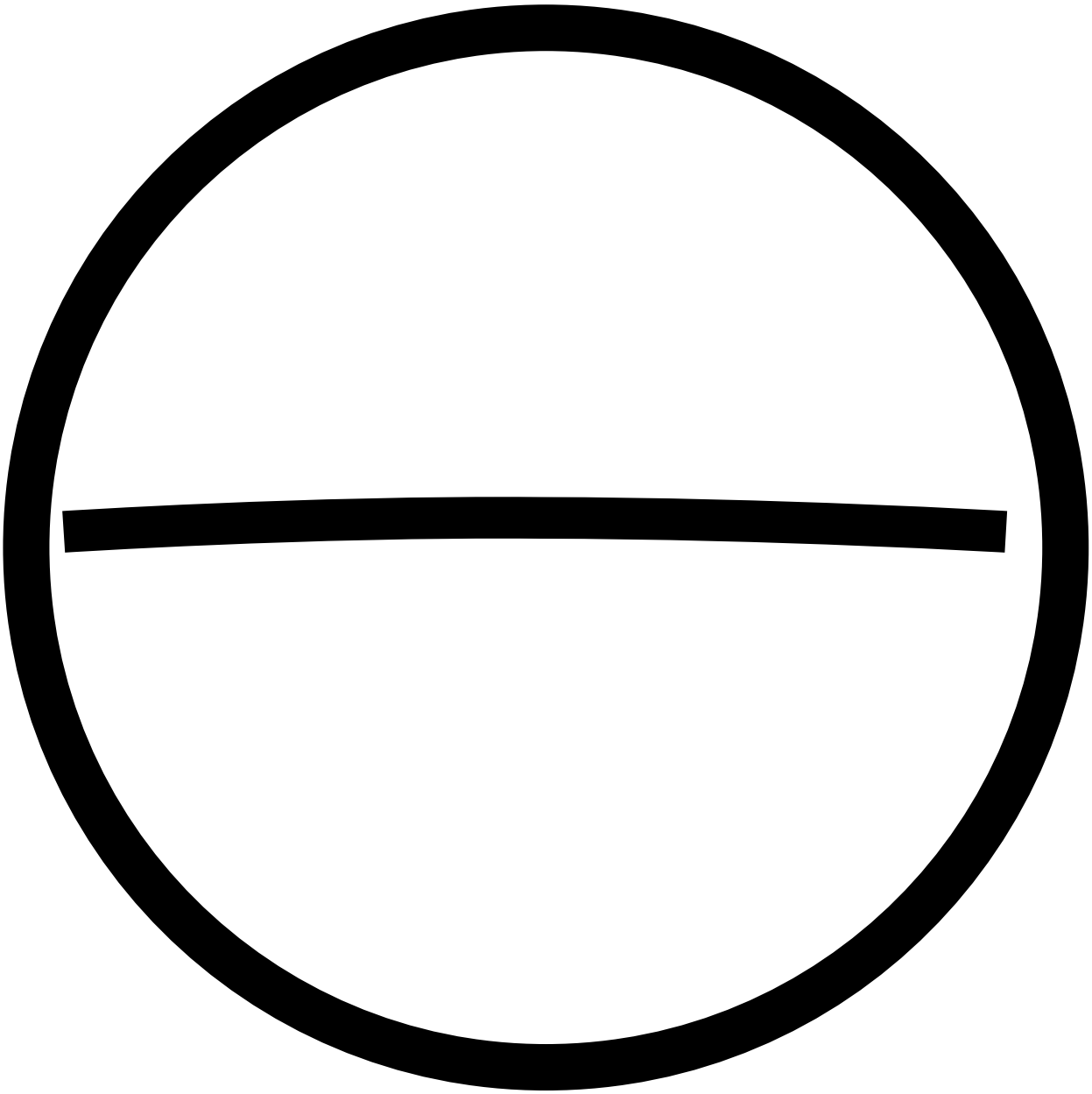
“the fusion of horizons”; a literary genre that focuses on the psychological and moral growth of the protagonist from childhood to adulthood (coming of age)

Zhang Longxi, “The Myth of the Other: China in the Eyes of the West”, *Critical Inquiry*, vol. 15, no. 1, (1988): 131.



Gustav Klimt, *Philosophy*, Klimt University of Vienna Ceiling Paintings, (1899–1907).


sift of self
critic
sees scene
autocritic
sees self of environment
regression
regression
allocritic
sees environment
hypocritic
sees scene of self



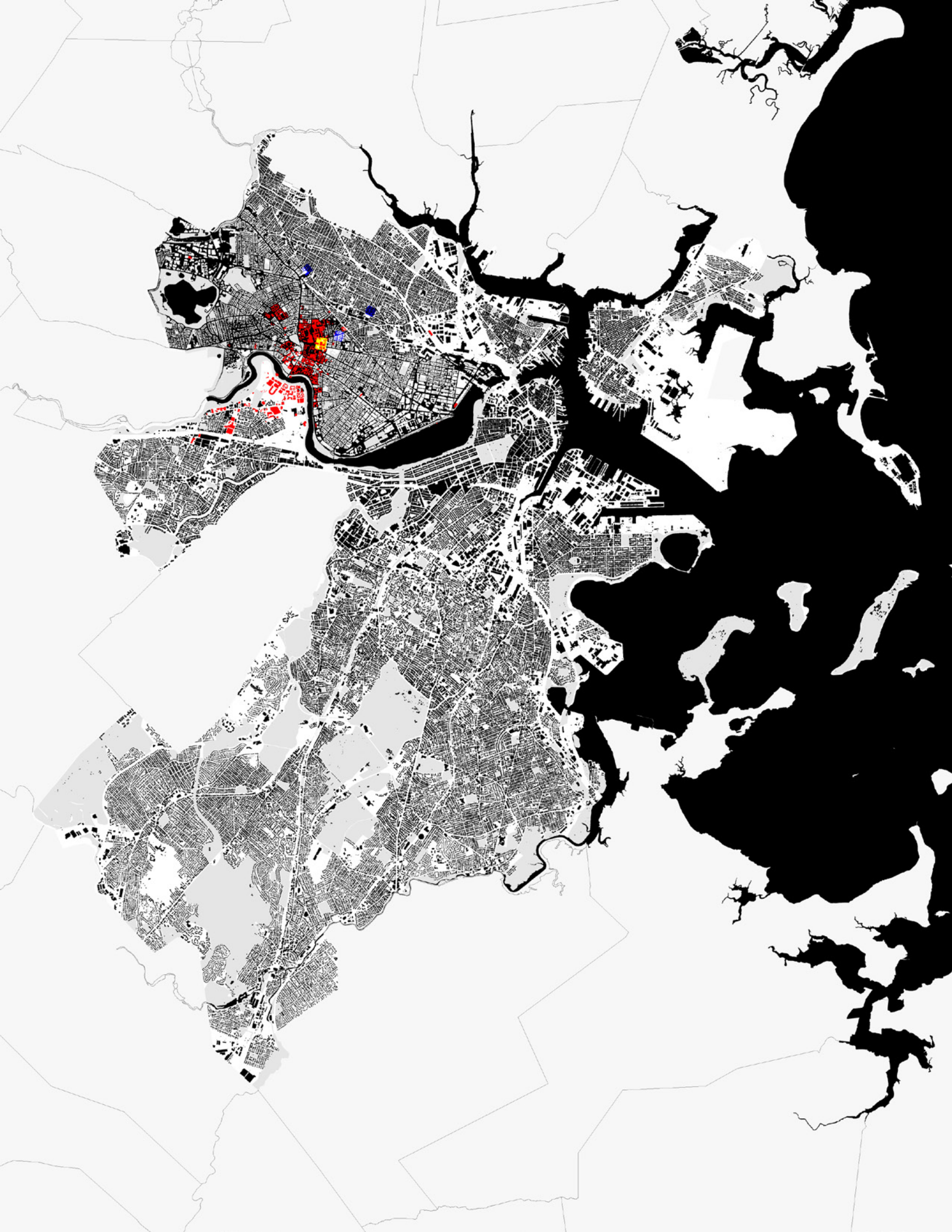
GROUNDED SELF
[place : territory : geography]
[of memory : of exclusion : of atmosphere]
[mimesis : ablation : contemporaneity]
[ϕ] (voiceless bilabial fricative)
[⊖] (intersection; symmetric difference)
[0 – 1]
[O – |]

Grounded Self

Designers' block

Residents' safe

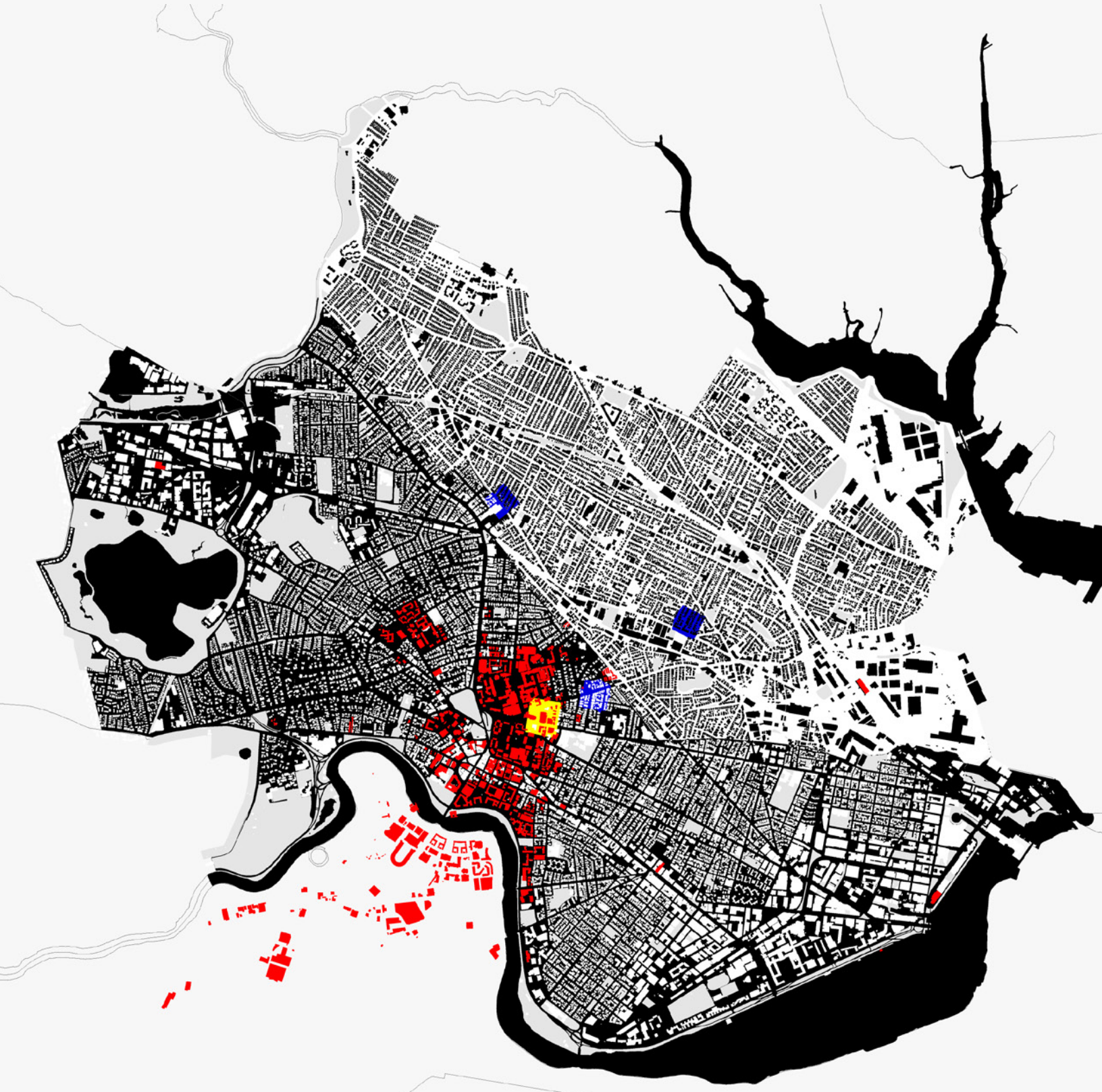
Students' sandbox



Cartographic Selfie : Three Cities

Boston-Cambridge-Somerville

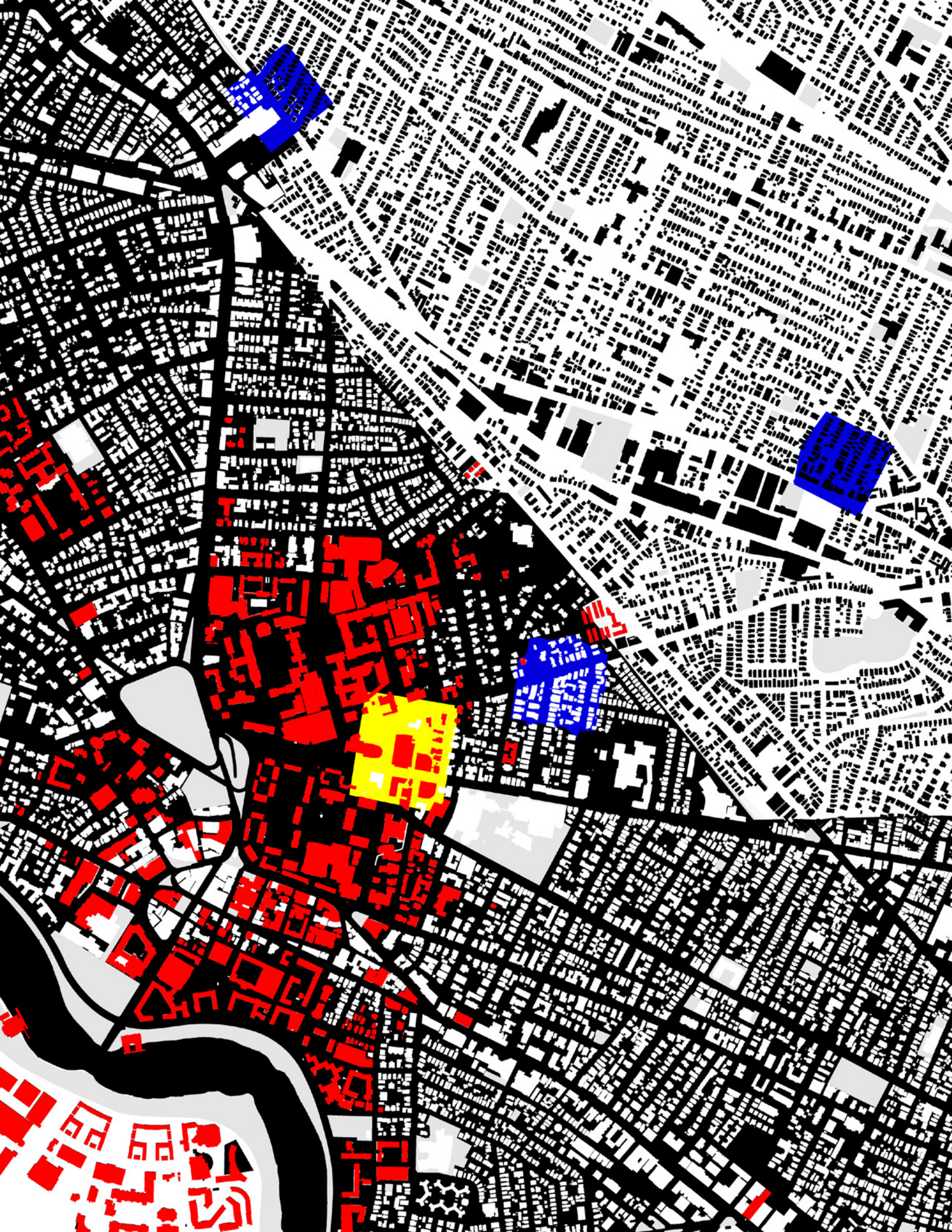
[■ (yellow) : “designers’ block”]
[■ (blue) : “residents’ safe”]
[■ (red) : “students’ sandbox”]



Cartographic Selfie : Two Cities

Cambridge-Somerville

[(yellow) : “designers’ block”]
[(blue) : “residents’ safe”]
[(red) : “students’ sandbox”]



Cartographic Selfie : Three Squares

Harvard Sq.-Porter Sq.-Union Sq.

[■ (yellow) : “designers’ block”]
[■ (blue) : “residents’ safe”]
[■ (red) : “students’ sandbox”]

designers’ block


8
9
10
7
6
5
4
1
2
3

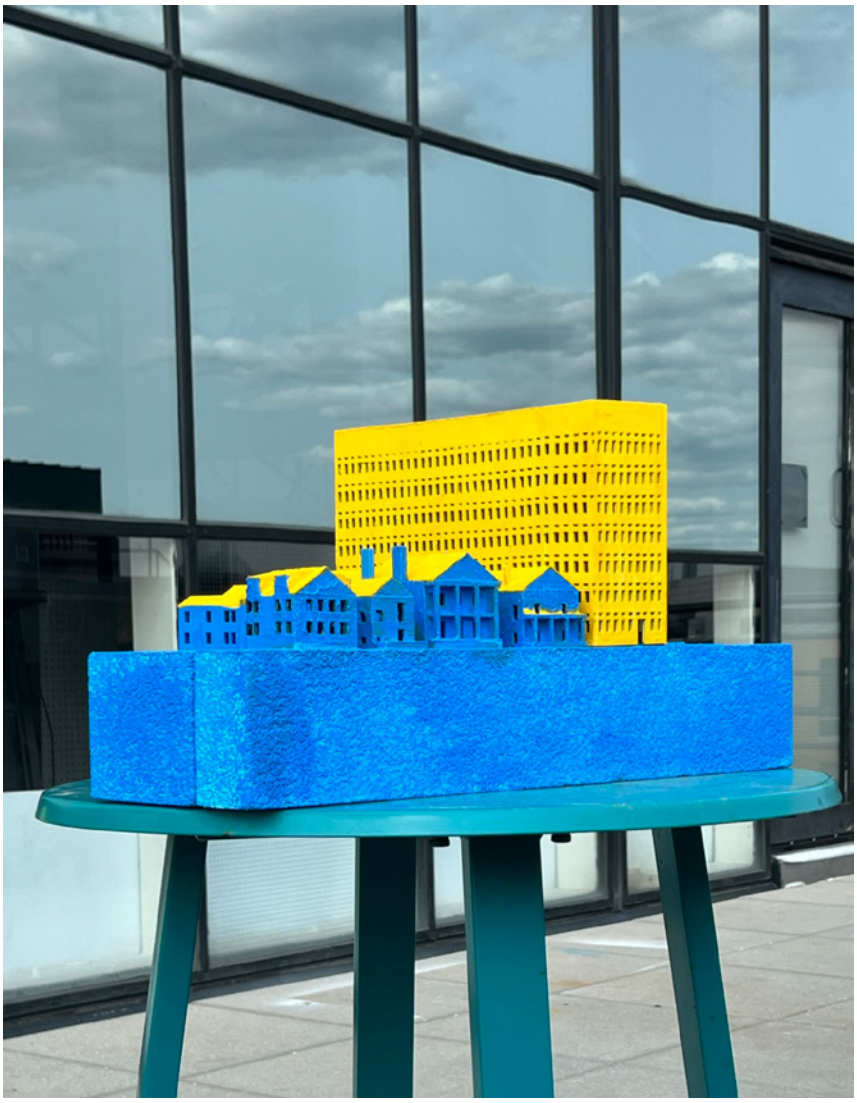
SITE PLAN

1. Gund Hall, 1972, Andrews, Anderson, Baldwin
2. CGIS Knafel Building, 2004, Pei Cobb Freed & Partners
3. 1727 Cambridge St., 1885 (1976), McLean
4. 3 Sumner Road, 1906 (1976), McLean
5. 7 Sumner Road, 1917 (1976), Harlow
6. 11 & 13 Sumner Road, 1844 (1977), Cutler
7. 17 Sumner Road, 1844 (1961), Hastings
8. 38 Kirkland Street, 1842 (1961), Hastings
9. 34 Kirkland Street, 1840 (1969), Hastings
10. Swedenborg Chapel, 1901, Warren


11
10
9
8
7
6
5
4
1
2
3

*SITE PLAN

1. Gund Hall, 1972, Andrews, Anderson, Baldwin
2. CGIS Knafel Building, 2004, Pei Cobb Freed & Partners
3. 1727 Cambridge St., 1885 (1976), McLean
4. 3 Sumner Road, 1906 (1976), McLean
5. 7 Sumner Road, 1917 (1976), Harlow
6. 11 & 13 Sumner Road, 1844 (1977), Cutler
7. 17 Sumner Road, 1844 (1961), Hastings
8. 38 Kirkland Street, 1842 (1961), Hastings
9. 34 Kirkland Street, 1840 (1969), Hastings
10. Office, 2023, Designer’s Block Development
11. Swedenborg Chapel, 1901, Warren



KEY EXERPTS FROM ZONING ORDINANCE
CITY OF CAMBRIDGE, MASSACHUSETTS

1.20 - AUTHORITY
This Ordinance is adopted pursuant to the provisions of Chapter 40A of the General Laws of the Commonwealth of Massachusetts, and amendments thereto, hereinafter referred to as the "Zoning Act". Certain provisions of this Ordinance are also adopted pursuant to Chapter 565 of the acts of 1979, as amended by Chapter 387 of the Acts of 1980.

1.30 - PURPOSE
It shall be the purpose of this Ordinance to lessen congestion in the streets; conserve health; to secure safety from fire, flood, panic and other danger; to provide adequate light and air; to prevent overcrowding of land; to avoid undue concentration of population; to encourage housing for persons of all income levels; to facilitate the adequate provision of transportation, water supply, drainage, sewerage, schools, parks, open space and other public requirements; to conserve the value of land and buildings, including the conservation of natural resources and the prevention of blight and pollution of the environment; to encourage the most rational use of land throughout the city, including the encouragement of appropriate economic development, the protection of residential neighborhoods from incompatible activities and including the consideration of plans and policies, if any, adopted by the Cambridge Planning Board, and to preserve and increase the amenities of the City.

3.10 - DIVISION OF THE CITY INTO ZONING DISTRICTS

Residence C District - Multifamily dwellings

Residence C-3 District - Multifamily dwellings

4.50 - INSTITUTIONAL USE REGULATIONS

4.52 Purpose
[...] to protect lower density residential neighborhoods from unlimited expansion of institutional activities, to reduce pressures for conversion of the existing housing stock to nonresidential uses, to minimize the development of activities which are different from and incompatible with activity patterns customarily found in lower density residential neighborhoods and to provide a framework for allowing those institutions which are compatible with residential neighborhoods to locate and expand there. This Section 4.50 is intended to accomplish these purposes in a manner consistent with the findings and objectives of the Community Development Department's Cambridge Institutional Growth Management Plan (1981).

4.54 Institutional Overlay District
[...] Institutional Overlay Districts are defined in order to identify areas where prior development patterns create a precedent for more flexible institutional use regulation than in areas where non institutional uses predominate. [...]

4.54.1 The Harvard, Radcliffe, Lesley District

5.0 DEVELOPMENT STANDARDS
5.20 - STANDARDS FOR DIMENSIONAL REGULATIONS

District C
Max. FAR: 0.60
Max Height: 35'
Min. Setback Front: (H+L)/4, or at least 10'
Min. Setback Side: (H+L)/5 ≥7.5', sum ≥20'
Min. Open Space Ratio: 36%

District C-3
Max. FAR: 3.00
Max Height: 120'
Min. Setback Front: (H+L)/5, or at least 5'
Min. Setback Side: (H+L)/6
Min. Open Space Ratio: 10%

10.20 - APPEALS

10.21 Any party specified in Section 8, Chapter 40A, General Law, aggrieved by reason of his inability to obtain a permit or enforcement action or by any order, requirement, decision or determination made by the Superintendent of Buildings or other permit granting authority in the enforcement of this Ordinance may appeal to the Board of Zoning Appeal. Within thirty (30) days after the decision which is being appealed, the aggrieved person may file with the City and the Board of Zoning appeal, a notice of appeal specifying the ground thereof and shall thereupon pay a fee of fifty dollars to the City of Cambridge. [...]

Map Change: An alteration to the boundaries of a zoning district, or a change in the zoning designation of a particular district (for instance, from a Business district to a Residence district), resulting in a change to the Zoning Map

10.30 - Variances

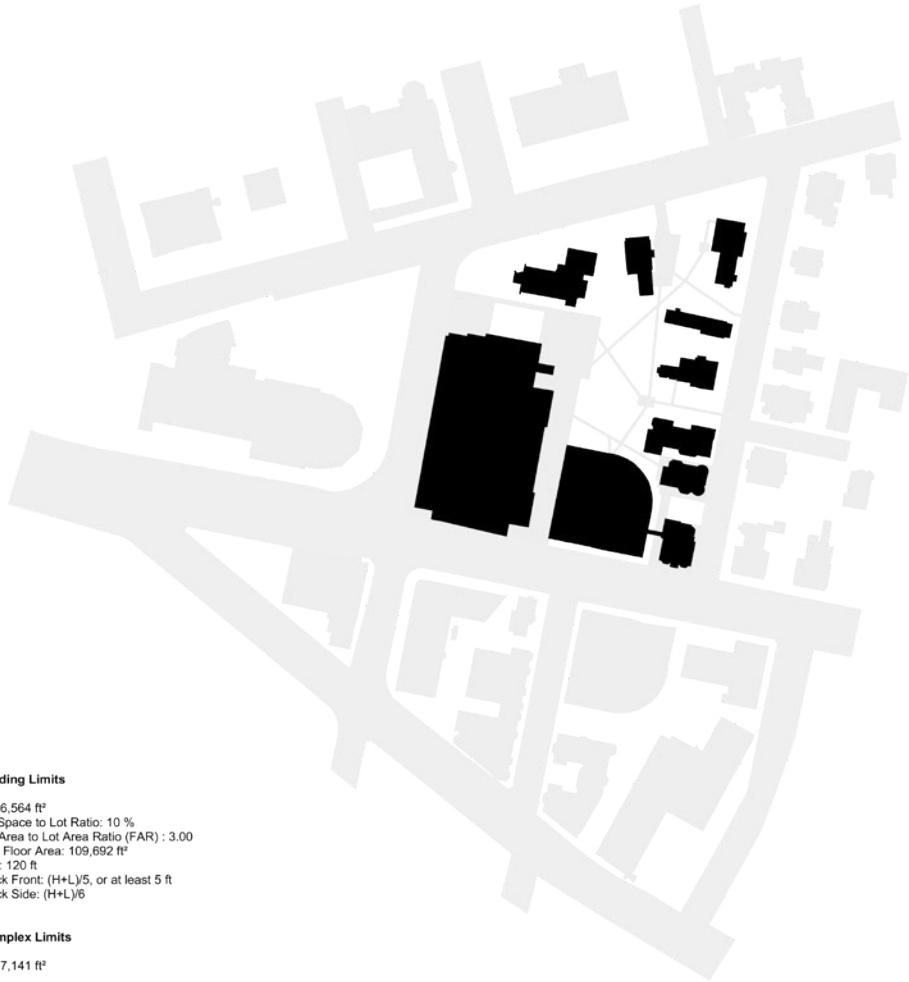
For (Section 20.108), divergence from dimensional requirements, North Massachusetts Avenue Overlay District.

19.40 - CITYWIDE ADVISORY DEVELOPMENT CONSULTATION PROCEDURES

19.41.2 Purpose of the Large Project Review Procedure

In zoning districts designated as Areas of Special Planning Concern, the advisory Large Project Review serves the same purpose as the Small Project Review for somewhat larger changes in the environment with somewhat greater impacts on the public realm. The Large Project Procedure provides the opportunity for abutters and the general public, as well as city staff, to review and make comment on the proposal at the consultation session.

[Any new buildings of 2,000 square feet or more shall be reviewed by the Harvard Square Advisory Committee.]"



I. New Building Limits

Lot Area : 36,564 ft²
Min. Open Space to Lot Ratio: 10 %
Max. Floor Area to Lot Area Ratio (FAR) : 3.00
Max. Gross Floor Area: 109,692 ft²
Max Height: 120 ft
Min. Setback Front: (H+L)/5, or at least 5 ft
Min. Setback Side: (H+L)/6

II. New Complex Limits

Lot Area : 17,141 ft²

Four independent buildings are combined into a complex that can collectively service larger programs. The strategy takes advantage of embodied carbon *and* embodied memories in existing materials on site. The buildings were originally designed for residential use during the 1840s, but have been adopted as classrooms and offices for institutional use.

11 & 13 Sumner Road, 1844 (1977), Isaac Cutler
17 Sumner Road, 1844 (1961), Oliver Hastings
38 Kirkland Street, 1842 (1961), Oliver Hastings
34 Kirkland Street, 1840 (1969), Oliver Hastings

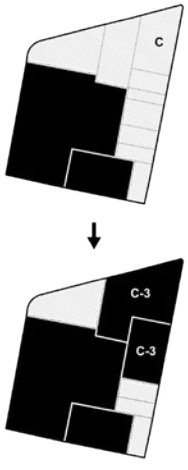
III. New Building Areas

Building Footprint Area : 9,342 ft²
Open Space to Lot Ratio: 74.20 %
Floor Area to Lot Area Ratio (FAR) : 2.99
Gross Floor Area: 109,216 ft²
Building Height: ~70 ft

Underground : 31,253 ft² x 2 floors
Above Ground: 9,342 ft² x 5 floors

IV. New Complex Areas

Building Footprint Area : 10,007 ft²
Open Space to Lot Ratio: 41.62 %
Floor Area to Lot Area Ratio (FAR) : ~1.17
Gross Floor Area: ~20,014 ft²
Building Height: ~35 ft
Above Ground: 10,007 ft² ft² x ~2 floors



THERMAL COMFORT

Passive Heating
Comfortable hours : 905 hours/year; 10.3%)

a. Winter Clothing
b. Internal heat gain (2100 hours/year; 24.0%)
c. Passive solar direct gain high mass (834 hours/year; 9.5%*)
d. Passive solar direct gain low mass (553 hours/year; 6.3%*)

Total passive heating (3005 hours/year; 24.0%)

Passive Cooling
Comfortable hours : 905 hours/year; 10.3%)

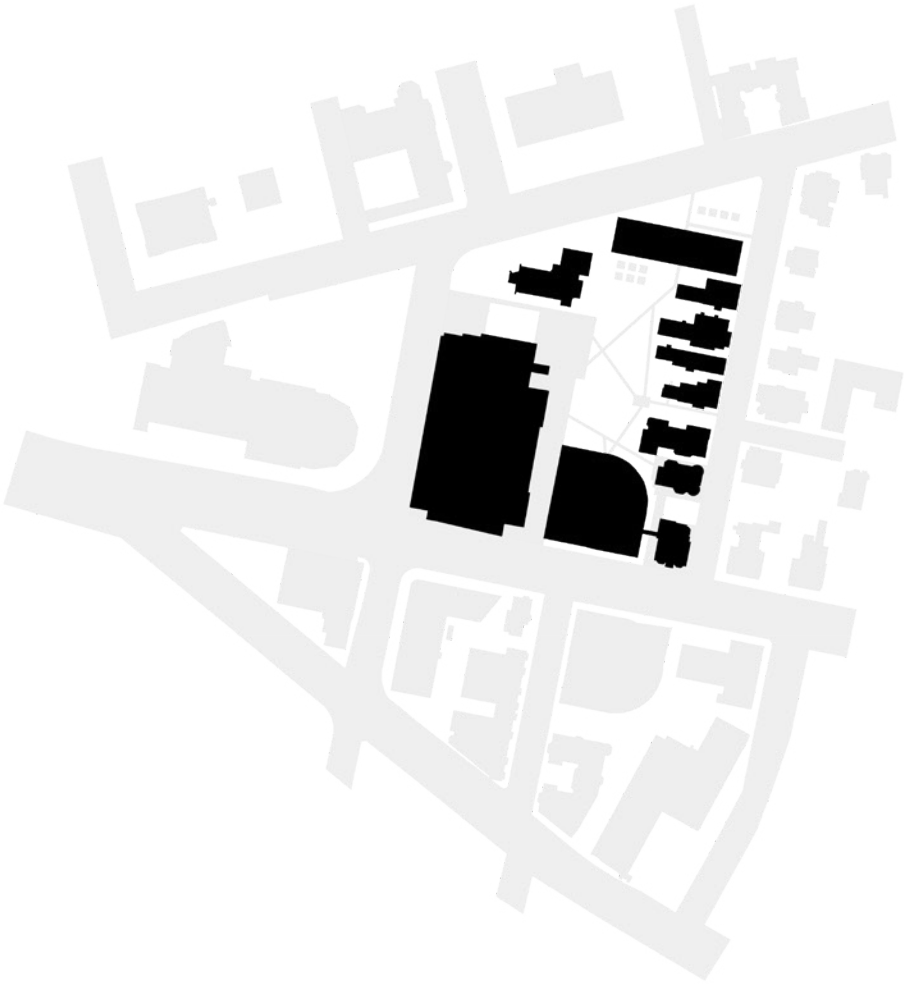
e. Summer Clothing
f. Natural ventilation cooling (133 hours/year; 1.5%*)
g. High thermal mass (163 hours/year; 1.9%)

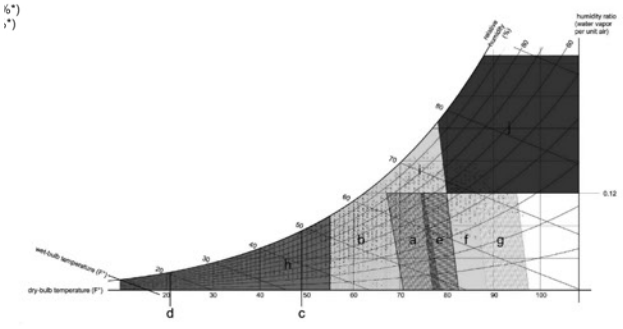
Total passive cooling (1068 hours/year; 1.9%)

Active Systems

h. Heating and humidification (4953 hours/year; 56.5%)
i. Dehumidification only (441 hours/year; 5.0%)
j. Cooling and dehumidification (198 hours/year; 2.3%)

Total active conditioning (5592 hours/year; 63.8%)



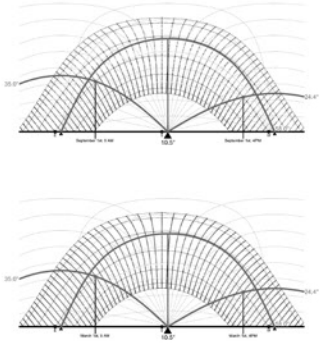


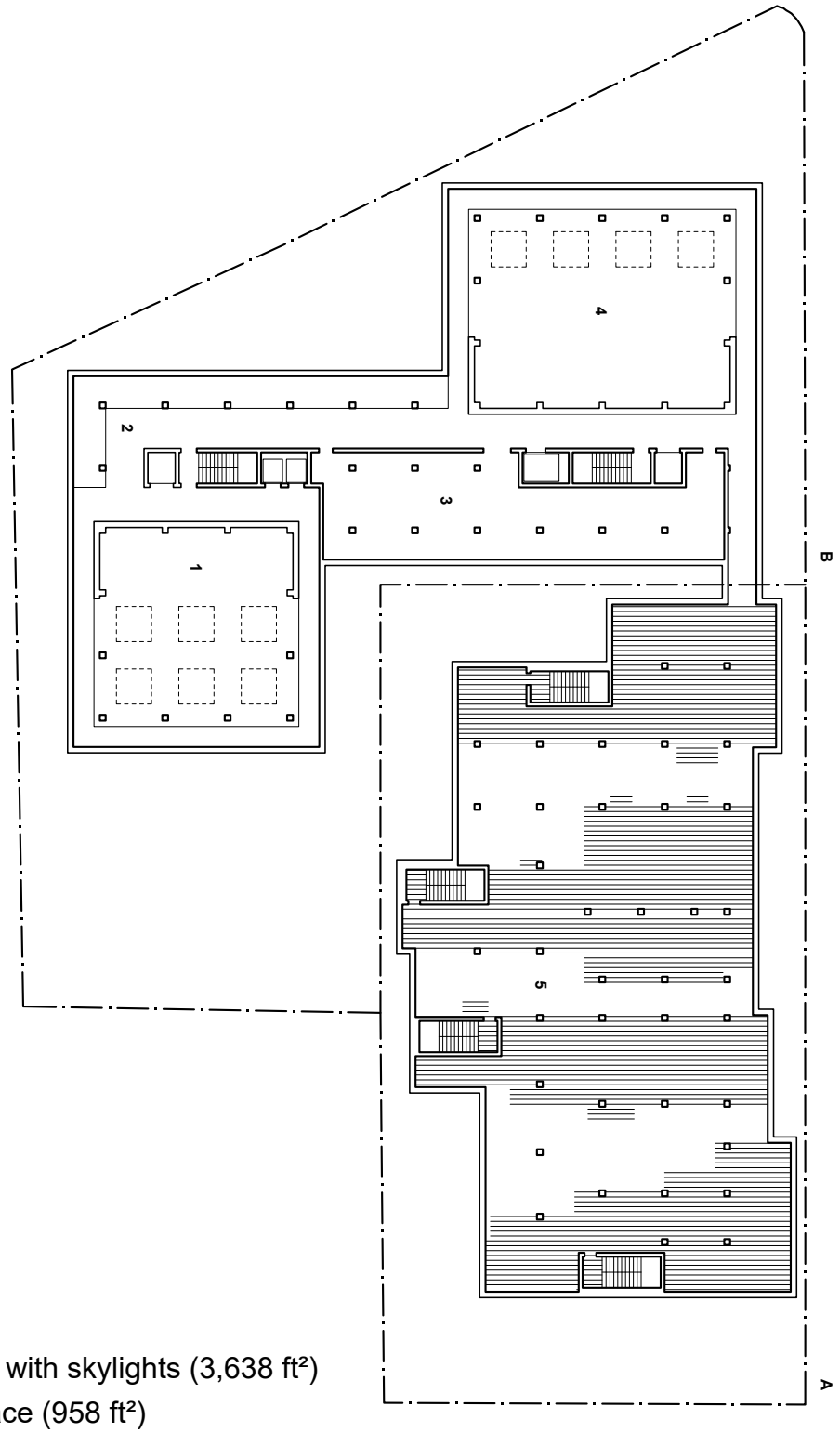
SUN SHADING
building orientation:
10.5° rotated from North

South Facade
Normal : 190.5°
shading threshold: 58.0°

East Facade
Normal : 100.5°
shading threshold: 35.0°

West Facade
Normal : 280.5°
shading threshold: 24.4





PLAN 0

A. parcel (32,539 ft²)

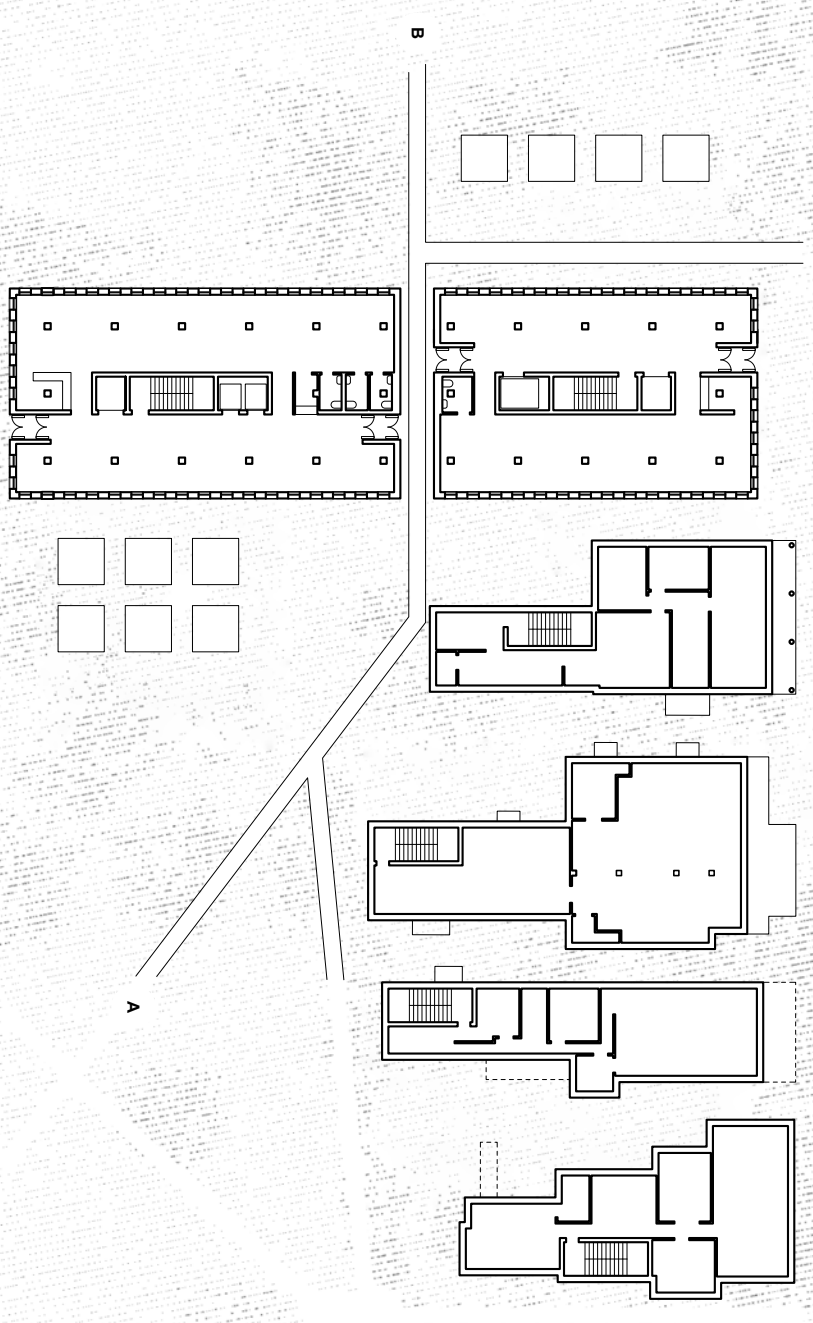
B. parcel ()

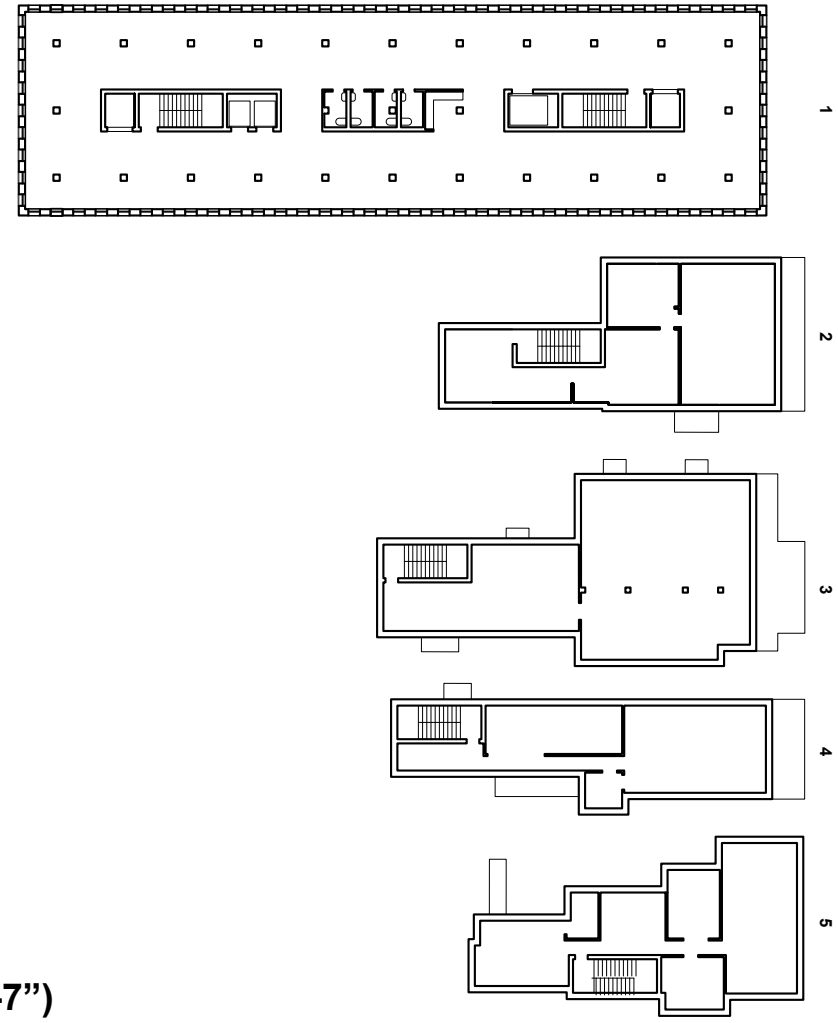
1. 48’ x 48’ open floor with skylights (3,638 ft²)
2. 134’ long wall surface (958 ft²)
3. 48’ x 64’ open floor with skylights (4,562 ft²)
4. storage (2,465 ft²)
5. access to neighboring buildings (45 ft)
6. basement of reoriented buildings

PLAN 1

A. Back-yard

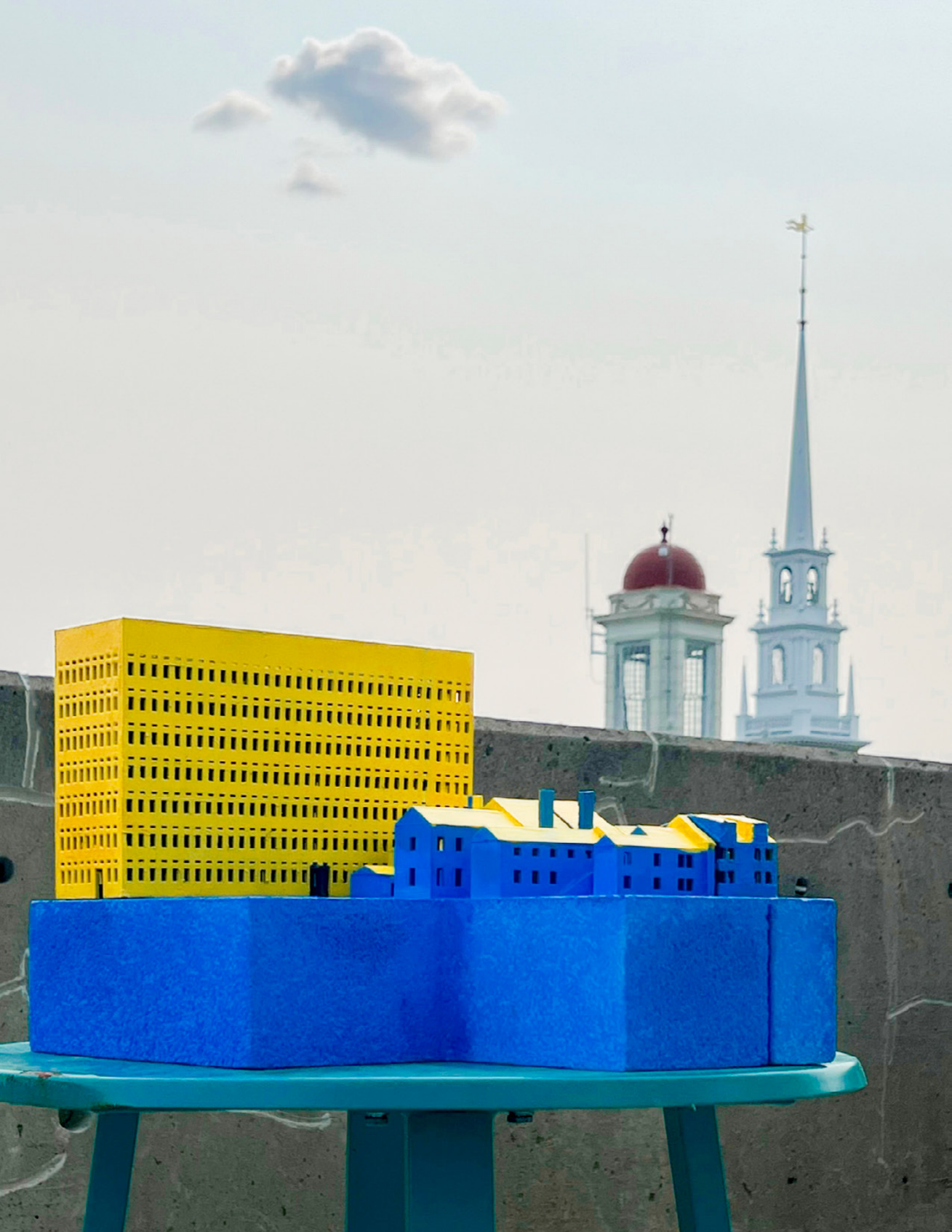
B. Kirkland street

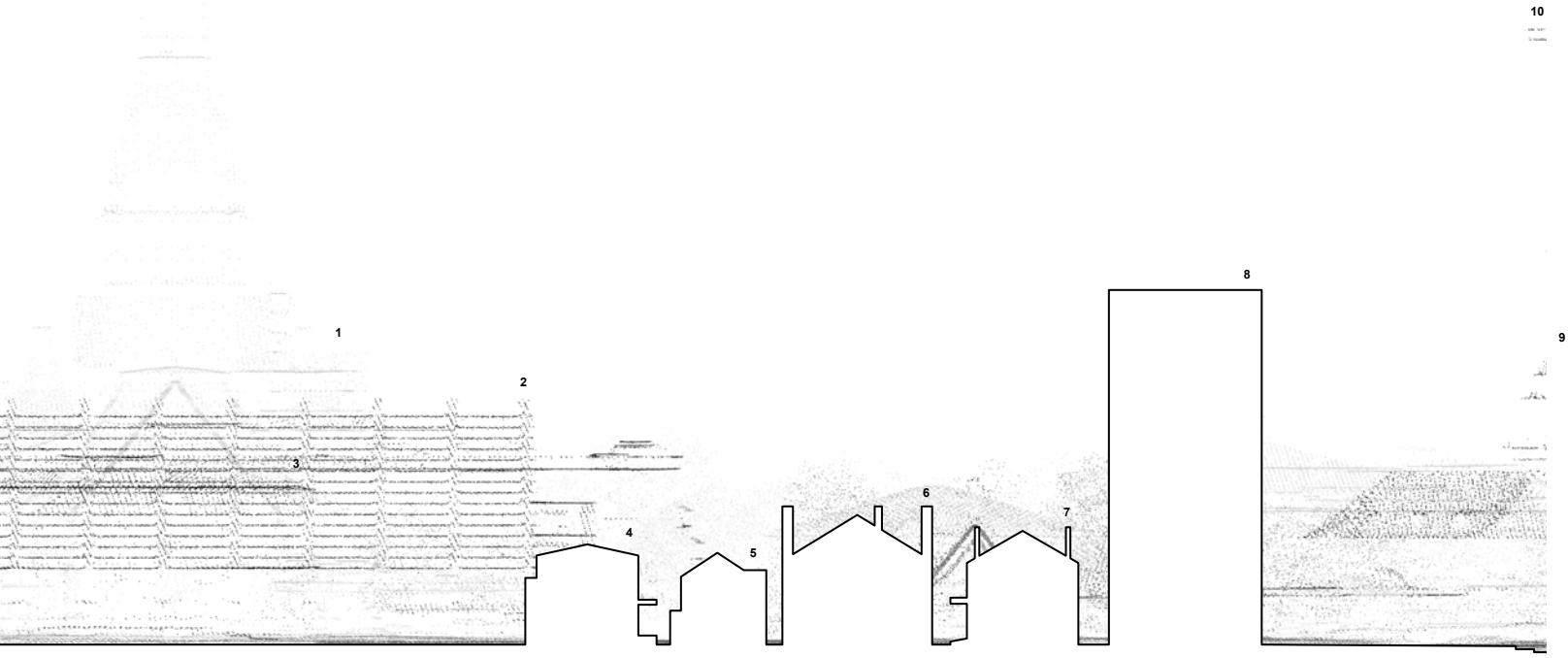




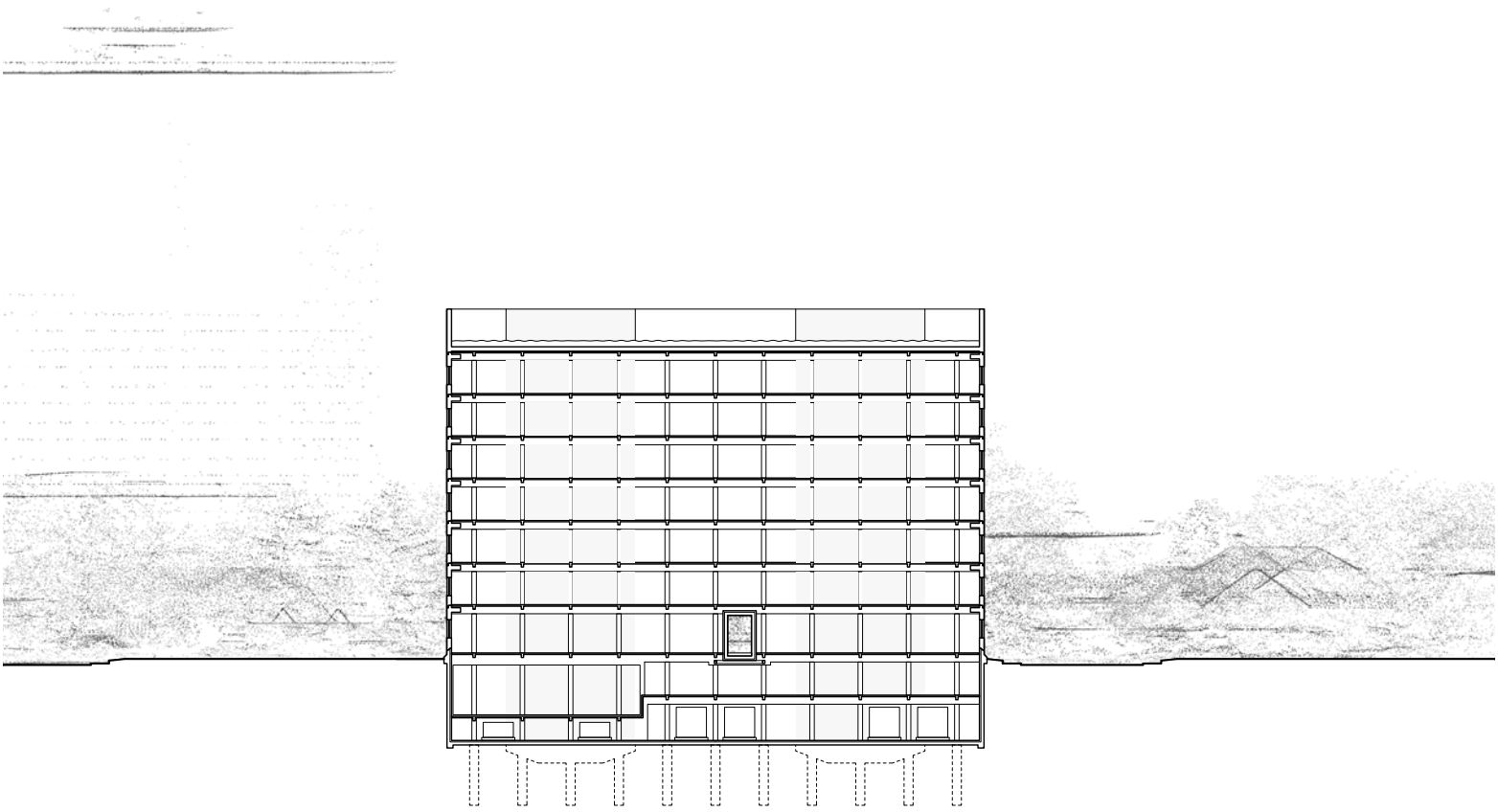
PLAN 2 (~ “PLAN 3-7”)

1. Office, 2023, Designer’s Block Development
2. 11 & 13 Sumner Road, 1844 (1977), Cutler
3. 17 Sumner Road, 1844 (1961), Hastings
4. 38 Kirkland Street, 1842 (1961), Hastings
5. 34 Kirkland Street, 1840 (1969), Hastings





1. Memorial Hall, 1874, Brunts; renewed by VSBA
2. Gund Hall, 1972, Andrews, Anderson, Baldwin
3. CGIS Knafel Building, 2004, Pei Cobb Freed & Partners
4. 34 Kirkland Street, 1840 (1969), Hastings
5. 38 Kirkland Street, 1842 (1961), Hastings
6. 17 Sumner Road, 1844 (1961), Hastings
7. 11 & 13 Sumner Road, 1844 (1977), Cutler
8. Office, 2023, Designer’s Block Development
9. Adolphus Busch Hall, 1917, Warren & Smith Architects
10. William James Hall, 1964, Minoru Yamasaki & Associates



Envelope Detail Section

1” : 3’

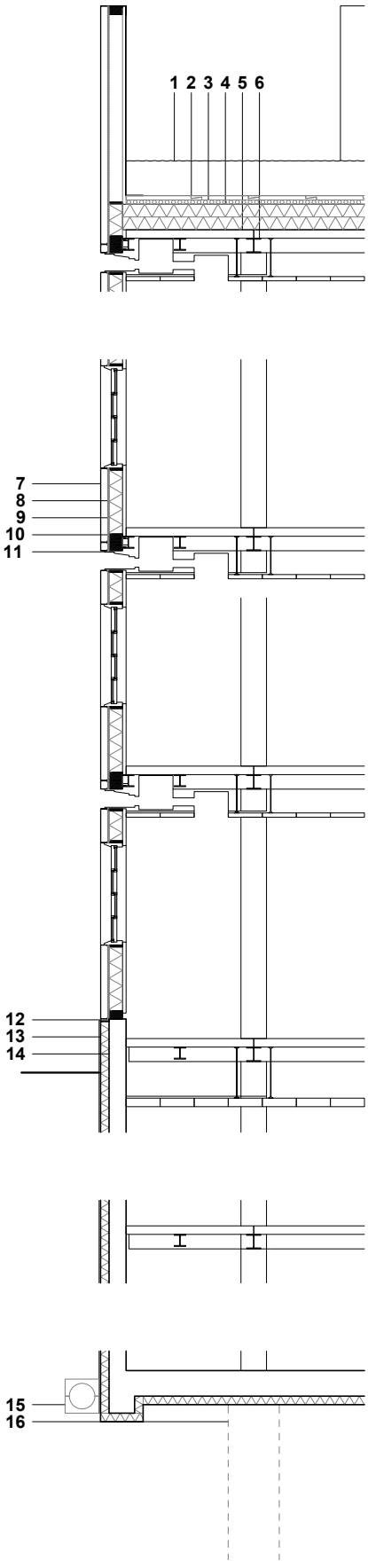
(S,W,E facade assembly, 14’ x 5’ 4” panel)

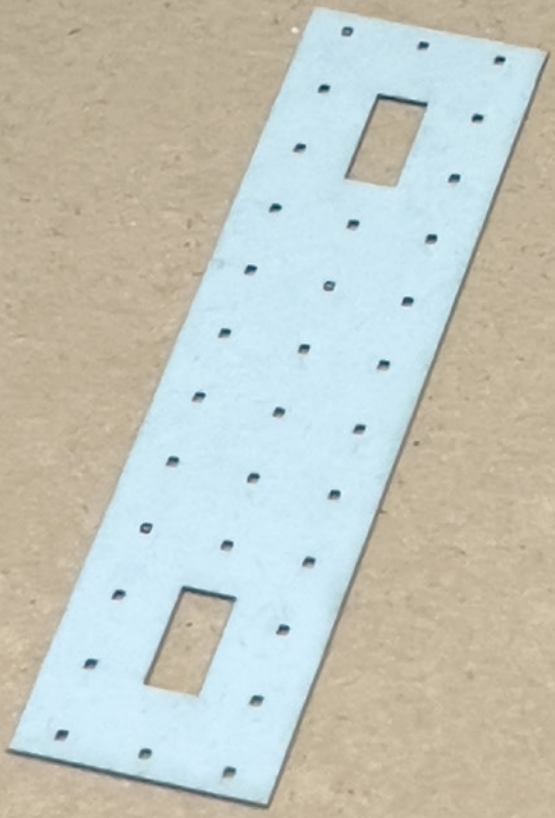
1. soil
2. tile decking
3. drainage mat
4. vapor barrier / insulation
5. composite floor slab: reinforced concrete on metal form deck
6. continuous beam: W10 x 60

7. clay cladding
8. drainage mat
9. vapor barrier / insulation
10. panel structure (3 pin connection)
11. fresh air intake

12. folded steel cladding
13. vapor barrier / insulation
14. reinforced concrete

15. drainage (2’ diameter)





HARVARD FACULTY OF DESIGN
ASSUMPTIONS

LAND			Class 4.1
Purchase Price	$6,622,700		
Site Area (acres)	0.249	$611 per land sf	
Site Area (Sq. Ft.)	10,846		
Density	52.21		

COMMERCIAL OFFICE / RETAIL / INDUSTRIAL			Class 4.1
	#	Sq. Ft.	Tot. Sq. Ft.
L-1 GSD Event Space (Rentable)	2	3,638	7,276
L-1 GSD Gallery	1	958	958
L1 Local Retail	2	1,828	3,656
L1 GSD Café	1	851	851
L1 GSD Exhibition	1	1,532	1,532
Private Clinic	1	3,418	3,418
GSD Clinic	1	3,418	3,418
Incubation Hub/Classroom	1	6,836	6,836
Tech Office	3	6,836	20,508
Total:	13		48,453

COMMON AREAS				Class 4.1
	#		Sq. Ft.	Tot. Sq. Ft.
Common Space	1		5,000	5,000
Kitchen	1		130	130
Multipurpose rooms	0		0	0
Mgmt/Services Offices	1		190	190
Copy Room	0		100	0
Toilet Rooms	10		57	570
Computer Room	0		265	0
Mechanical/Utility	1		20	20
Maint. Shop/Storage	1		800	800
Laundry	0		137	0
Trash & Chute Rooms	4		20	80
Elevator	2		670	1,340
Janitor	1		50	50
Building Efficiency	75%			
Circulation SF	11%	Total Common Areas		8,180
Common & Ancillary sq footage	23%	Circulation		4,000
Commercial sq. footage	134%	Commercial Space		48,453
		Total Building Sq. Ft.		36,273
		Total Parking Sq. Ft.		6,000

PARKING			Class 4.1
Surface Parking	Req. / Ratio	Spaces	
Harvard Dorm Rental	0.50	5	
Tech Office Rental	1	10	
Sq.ft/Parking		400	
Total		**15**	
Total Parking Sq.ft		6,000	
Actual Parking Ratio		1.15	

OPERATING ASSUMPTIONS			Class 4.2
Income Inflation Rate	2.50%		
Expense Inflation Rate	3.50%		
Commercial Vacancy Rate	10.00%		
Operating Expenses	$6	$10/sq.ft	

RESIDENTIAL RENTS				Class 4.1
	#		Net Rent / Month	Total Rent/Month
Harvard Dorm Rental	10		$1,100	$11,000
Tech Office Housing Rental	10		$2,000	$20,000
Total:	20	Monthly Rent		$ 31,000
		Annual Rent		$ 372,000

COMMERCIAL OFFICE / RETAIL / INDUSTRIAL RENTS				Class 4.1
	Sq. Ft.		Rent / Sf	Total Rent/Year
Local Retail	3,656		$30	$109,680
Event Space	7,276		$20	$145,520
Clinic	3,418		$50	$170,900
Incubation Hub/Classroom	6,836		$15	$102,540
Tech Office	20,508		$40	$820,320
Total:	41,694	Monthly Rent		$ 112,413
		Annual Rent		$ 1,348,960

Resource
Operating Expense ial-real-estate.html

Cash Flow & Project Exits

Class 5.1

Year	Infl./Vacancy				1	2	3	4	5	6	7	8	9	10	11
Calendar	Factors	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		Acq + Predev	Construction		Completion										
GSD Faculty of Design Rents	2.5%				405,590	415,730	426,123	436,776	447,695	458,888	470,360	482,119	494,172	506,526	519,189
Retail and Commercial	2.5%				280580	287,595	294,784	302,154	309,708	317,451	325,387	333,521	341,859	350,406	359,166
Tech Office Rents	2.5%				486,096	498,248	510,705	523,472	536,559	549,973	563,722	577,815	592,261	607,067	622,244
Other Income	2.5%				0	0	0	0	0	0	0	0	0	0	0
Scheduled Gross Income					**1,172,266**	**1,201,573**	**1,231,612**	**1,262,402**	**1,293,962**	**1,326,311**	**1,359,469**	**1,393,456**	**1,428,292**	**1,464,000**	**1,500,600**
Commercial Vacancy	10.0%				(40,559)	(41,573)	(42,612)	(43,678)	(44,770)	(45,889)	(47,036)	(48,212)	(49,417)	(50,653)	(51,919)
Tech + GSD Vacancy	15.0%				(115,001)	(117,876)	(120,823)	(123,844)	(126,940)	(130,114)	(133,366)	(136,701)	(140,118)	(143,621)	(147,212)
Effective Gross Income					**1,016,706**	**1,042,123**	**1,068,176**	**1,094,881**	**1,122,253**	**1,150,309**	**1,179,067**	**1,208,543**	**1,238,757**	**1,269,726**	**1,301,469**
Operating Expenses	3.5%				(290,718)	(300,893)	(311,424)	(322,324)	(333,606)	(345,282)	(357,367)	(369,874)	(382,820)	(396,219)	(410,086)
Replacement Reserves	3.5%				(48,453)	(50,149)	(51,904)	(53,721)	(55,601)	(57,547)	(59,561)	(61,646)	(63,803)	(66,036)	(68,348)
Net Operating Income					**1,849,801**	**1,892,654**	**1,936,460**	**1,981,238**	**2,027,009**	**2,073,792**	**2,121,608**	**2,170,479**	**2,220,426**	**2,271,470**	**2,323,635**
Net Available Cash					**1,849,801**	**1,892,654**	**1,936,460**	**1,981,238**	**2,027,009**	**2,073,792**	**2,121,608**	**2,170,479**	**2,220,426**	**2,271,470**	**2,323,635**
Debt Coverage Ratio					0.19	0.19	0.20	0.20	0.20	0.21	0.21	0.22	0.22	0.23	0.23

CAP RATES - ASSUMPTIONS				Class 5.1
	Cap Rate	Size	Proportion of Bldg	
Institution	4.25%	14,035	29%	
Commercial	6.00%	34,418	71%	
Blended Cap Rate	5.49%			

EXIT 1: RENTAL PROJECT SALE @ Yr 11		Class 5.1
GSD Flex. Space, Retail + Tech Rental		
Blended Cap Rate - Yr 1 Sale	5.49%	
NOI - Yr 1 Sale	$ 1,849,801	
Value - Yr 1 Sale	$ 33,675,039	

RETURNS EXIT 1	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
Cash Flow From Operations	$ (9,919,462)	$ -	$ -	**1,849,801**	**1,892,654**	**1,936,460**	**1,981,238**	**2,027,009**	**2,073,792**	**2,121,608**	**2,170,479**	**2,220,426**	**2,271,470**	**2,323,635**
Construction Debt Payment				$ (41,821)	-$59,745	-$59,745	-$59,745	-$59,745	-$59,745	-$59,745	-$59,745	-$59,745	-$59,745	-$59,745
Savings on Permanent Loan Costs														
Project Payout	**$ (9,919,462)**	**$ -**	**$ -**	**$ 1,807,980**	**$ 1,832,909**	**$ 1,876,715**	**$ 1,921,493**	**$ 1,967,264**	**$ 2,014,047**	**$ 2,061,863**	**$ 2,110,734**	**$ 2,160,681**	**$ 2,211,725**	**$ 2,263,890**

ROE	-81.77%
Equity Multiple	0.18
IRR	11.04%

HARVARD FACULTY OF DESIGN

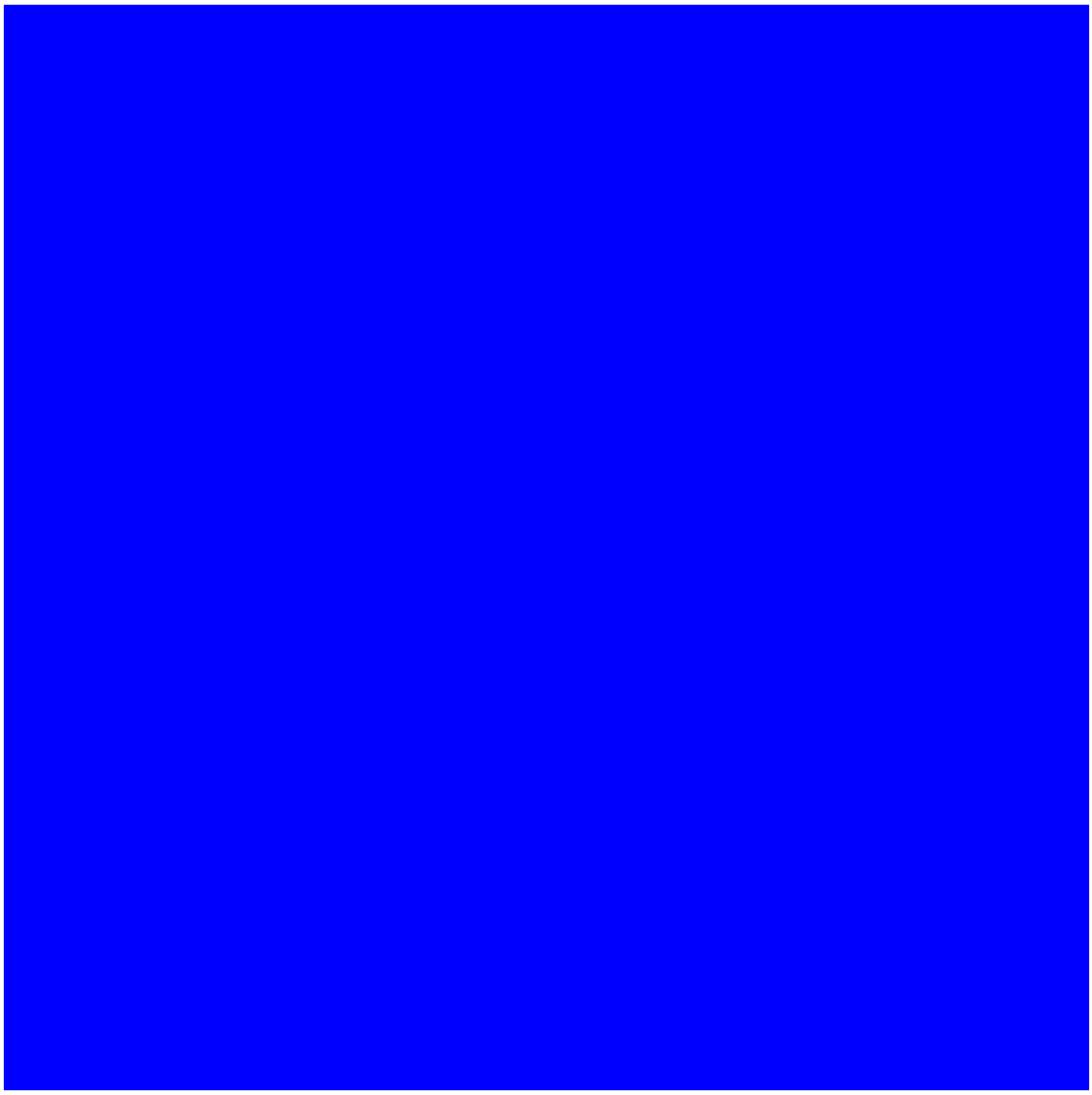
Development Budget

Sackler Building Costs = 24 million

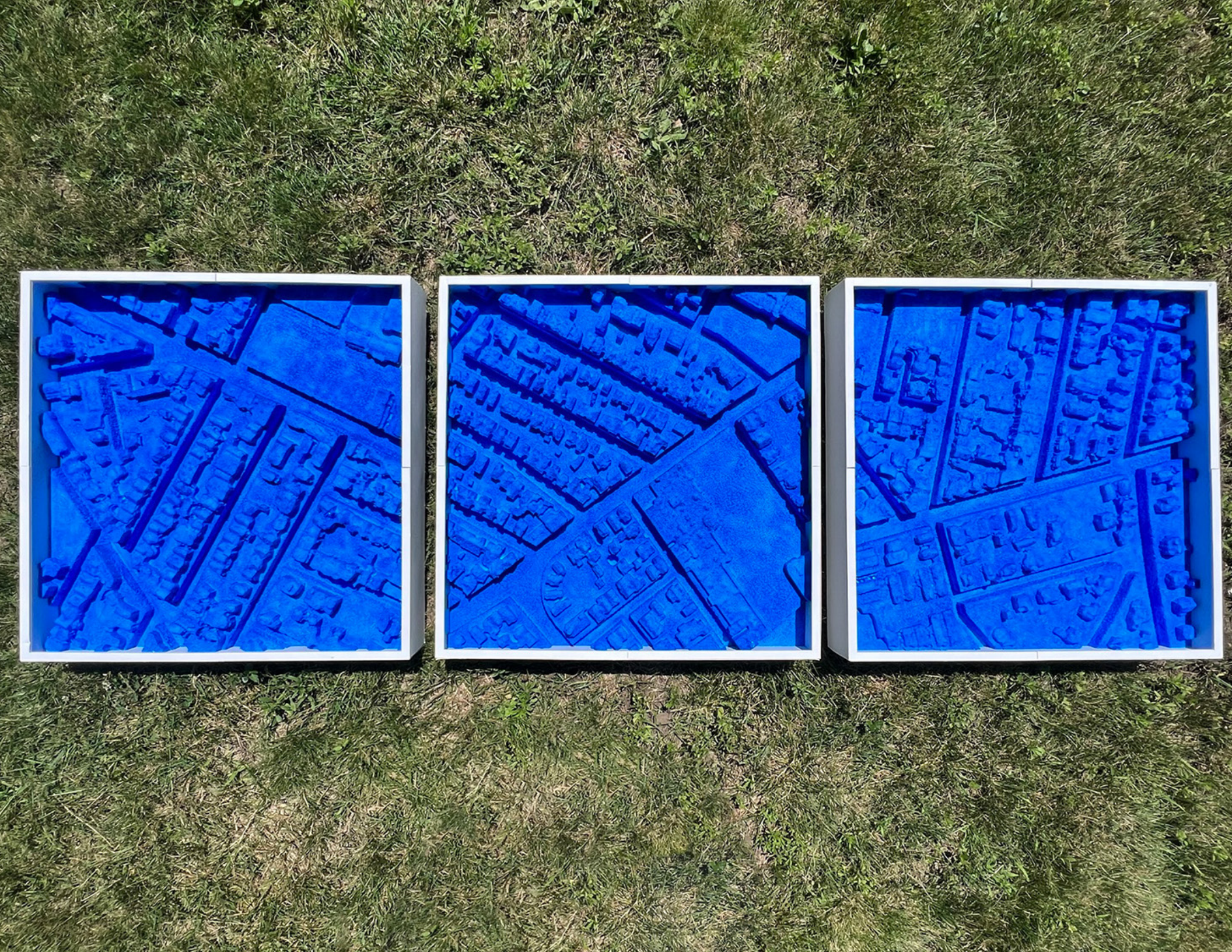
Class 4.1 & 4.2

SOURCES of FUNDS	TOTAL	Assumptions	Comments	Construction Loan LTC
Developer Equity	$ 3,000,000		25% equity could go to 20%	
Harvard Equity (Endowement)	$ 11,000,000			
Middlesex Savings Bank	$ 10,000,000			
Construction Budget (Sackler Reference)	$ 24,000,000			
				Check
TOTAL SOURCES	**$ 24,000,000**			**OK**

USES of FUNDS	TOTAL	Assumptions	Comments	Cost/SqFt
LAND & IMPROVEMENTS:				
Acqusition Cost	$ 1			$ 0
Relocation	$ -			
Permanent Relocation	$ -			$ -
Environmental Remediation	$ 20,000		Rough Estimate	$ 1
Site Maintenance (i.e. Security, Clean-Up)	$ 5,000			$ 0
Holding cost - real estate taxes	$ 25,806	$ 12,903	/year from City of Boston Tax Parcel Viewer	$ 1
Title & Escrow - Land Acquisition	$ 10,000			$ 0
Purchaser Legal - Land Acquisition	$ 20,000			$ 1
Total Land & Improvements	**$ 80,807**			**$ 2**
DESIGN & CONSULTING:				**Cost/SqFt**
Architect/landscape architect	$ 200,000		Could save by doing in house	$ 6
Engineering (civil, joint trench, geotech)	$ 350,000			$ 10
Construction Management Services	$ 200,000			$ 6
Engineering Reports (i.e. Topo, Noise, Traffic, Biology)	$ 50,000			$ 1
Environmental	$ 20,000			$ 1
Testing & Inspection	$ 80,000			$ 2
Total Design & Consulting	**$ 900,000**			**$ 25**
CONSTRUCTION:				**Cost/SqFt**
Demolition	$ -	$ 5.00	/sf	$ -
Off-Site Improvements	$ -	$0		$ -
On-Site Improvements	$ -	$0		$ -
Offhaul/rough grading	$ -	$0	Need to estimate this number	$ -
Construction	$ 9,600,000	$ 300.00	/sf cost per construction market analysis	$ 265
Commercial Construction		$ 300.00	/sf cost per construction market analysis	$ -
Podium/Garage	$ -	$ 150.00	per SF	$ -
General Requirements	$ -	6.00%	in /sf construction budget	$ -
Contractors Bond	$ -	1.00%	in /sf construction budget	$ -
Contractors Insurance	$ -	0.50%	in /sf construction budget	$ -
Contractor Overhead & Profit	$ -	5.0%	in /sf construction budget	$ -
Contractor Pricing Escalation/Design Contingency	$ -	1.5%	in /sf construction budget	$ -
Personal Property in Construction Contract	$ -			$ -
Solar PV/Thermal	$ 250,000			$ 7
Furniture, Fixtures & Equipment (common area)	$ 19,500	$ 1,500.00	/unit This number will most likely be higher than $200sf	$ 1
Construction Contingency	$ 985,000	10.0%		$ 27
Total Construction	**$ 10,854,500**	**299**	per GSF	**$ 299**
INDIRECT COSTS:				**Cost/SqFt**
Permits & Fees	$ 130,000	10,000	/unit	$ 4
Borrower Legal Fees - Organization	$ 6,000			$ 0
Syndication GP Legal Fees	$ 10,000			$ 0
Syndication LP Legal Fees	$ 10,000		Typically paid for by the LP	$ 0
Audit Fees	$ 20,000			$ 1
Sponsor Administration / Developer Fee	$ 1,200,000	5.00%		$ 33
Appraisal	$ 6,000			$ 0
Market Study	$ 5,500		$4500 study + $1000 update	$ 0
Rent/Up Marketing		1250	/unit	$ 0
Reserves:	$ 16,250			$ -
Replacement Reserve	$ 48,453	1 Months	/months of cashflow. Includes op ex, repl res, debt serv	$ 1
Additional Reserves				$ -
Soft Costs Contingency	$ 25,220	10%		$ 1
Total Indirect Costs	**$ 1,477,423**			**$ 40**
CONSTRUCTION LOAN FINANCE & CARRYING COSTS:				**Cost/SqFt**
Liability/COC Insurance	$ 120,000	0.5000%		$ 3
Real Estate Taxes	$ 25,806		This number will change if we adjust the loan amount	$ 1
Predevelopment Loan Interest (Equity)	$ -	3%		$ -
Borrower Legal Fees - Constr. Loan Closing	$ 40,000			$ 1
Construction Loan Fee	$ 120,000	0.50%	of loan amount for origination	$ 3
Construction Lender Costs (appraisal, due diligence)	$ 30,000			$ 1
Construction Lender Legal	$ 45,000			$ 1
Construction Loan Interest during construction	$ 2,700,000	50% AOB		$ 74
Construction Loan Interest post construction	$ 4,500	0 Months	Assumptions tab 3 months for lease up	$ 0
Mezzanine Loan/ Other Loan Fees	$ -			$ -
Title & Escrow - Construction Loan	$ 30,000			$ 1
Lender Inspections	$ 14,400	$400	/month during construction	$ 0
Total Construction Loan Finance & Carry Costs	**$ 3,129,706**			**$ 86**
PERMANENT LOAN FINANCE & CARRYING COSTS:				**Cost/SqFt**
Borrower Legal Fees - Perm. Loan Closing	$ 20,000			$ 1
Perm Loan Fee	$ 0	#REF!	for origination	$ 0
Perm Lender Costs (appraisal, DD...)	$ 20,000			$ 1
Perm Lender Legal	$ 35,000			$ 1
Title & Escrow - Permanent Loan	$ 15,000			$ 0
Total Permanent Loan Finance & Carry Costs	**$ 90,000**			**$ 2**
TOTAL DEVELOPMENT EXPENSES	**$ 16,532,436**			**$ 455**

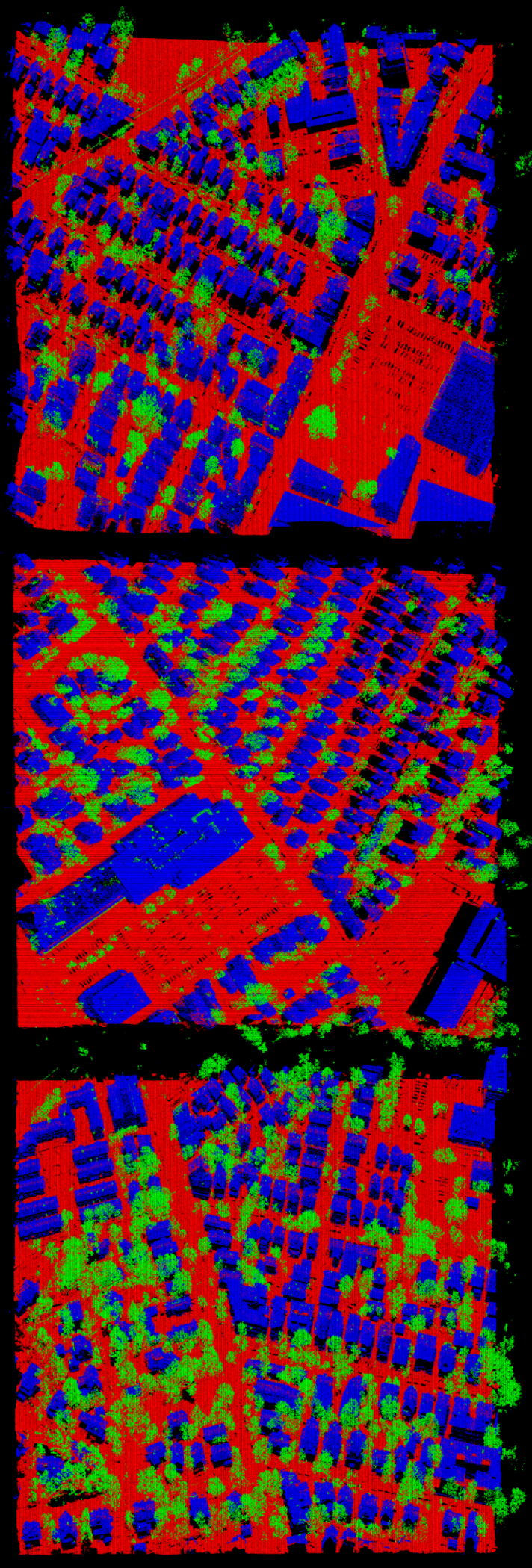


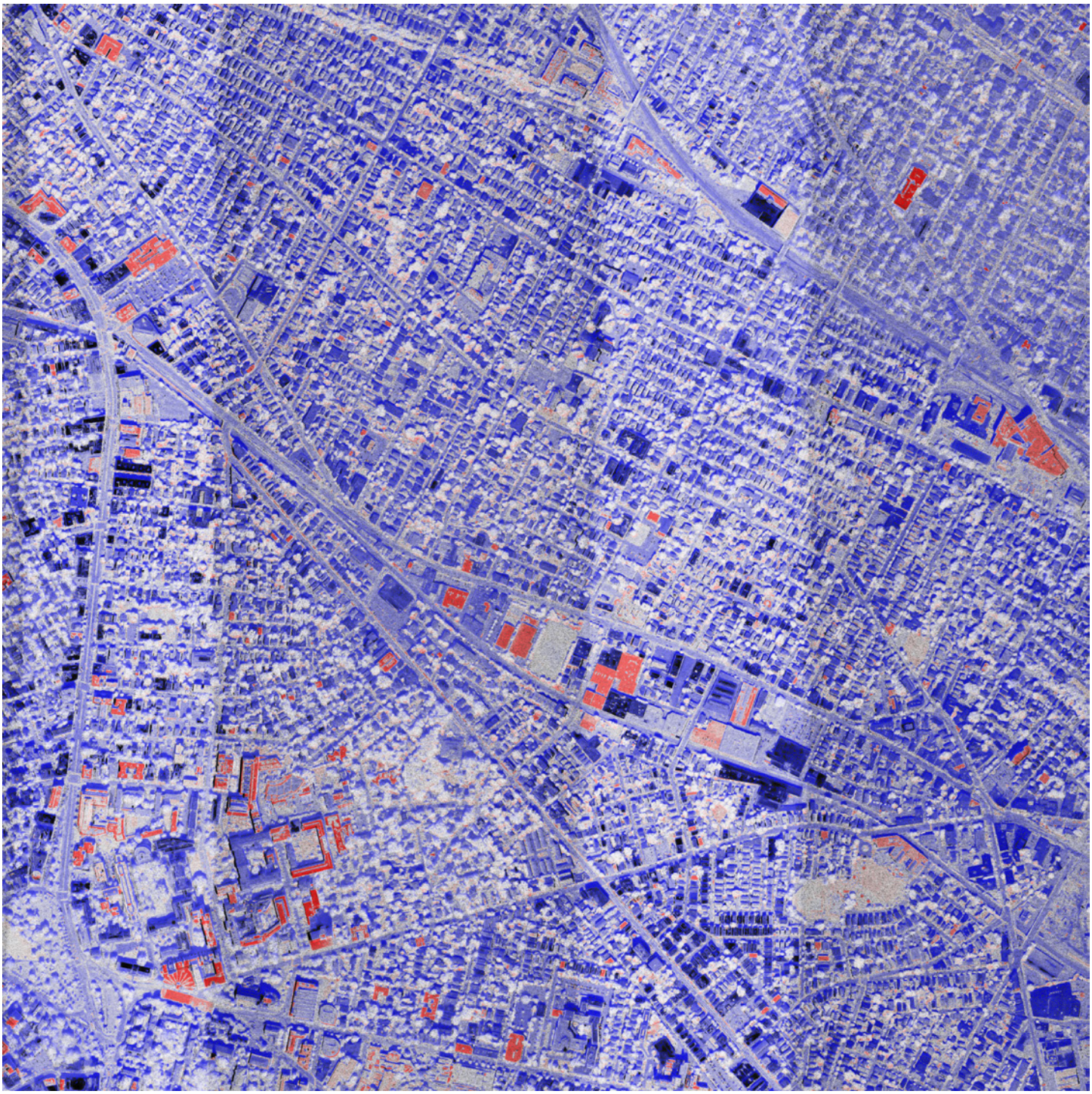
residents’ safe

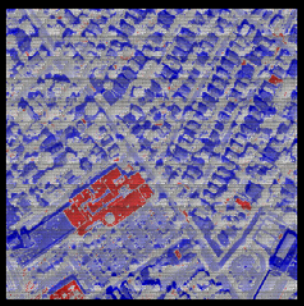


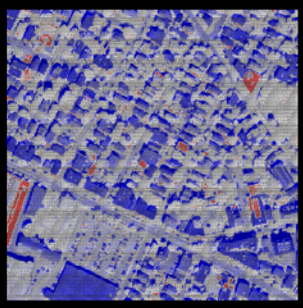

AUTO - ON
Robertshaw

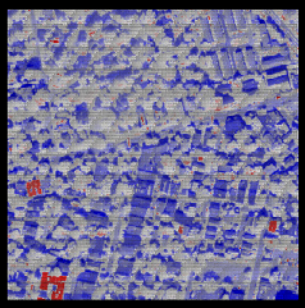

IF YOU COULD NOT TOUCH THE THERMOSTAT
THAT WOULD BE GREAT...
makeameme.

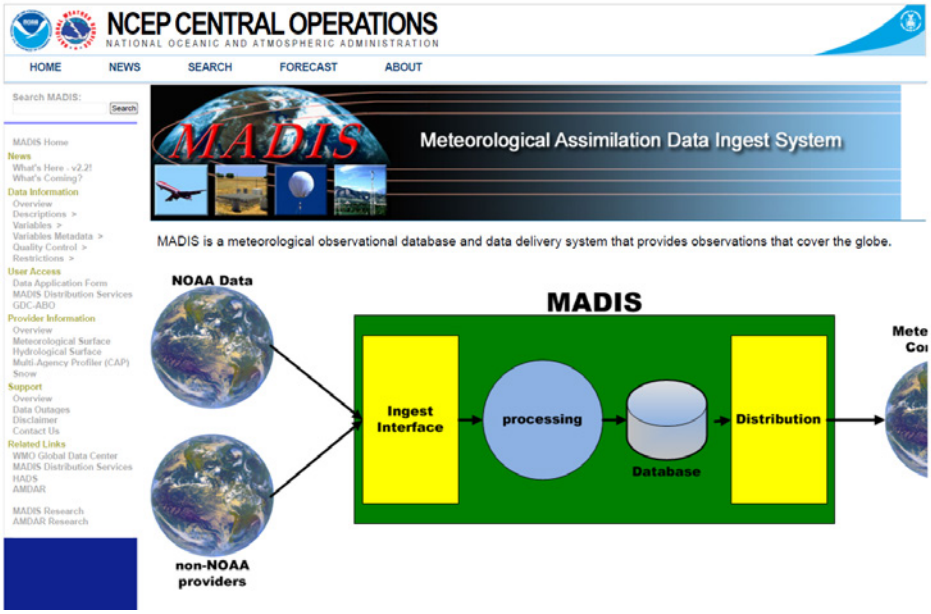












×

esri

https://www.esri.com/en-us/home

Storing lidar data

ArcGIS Pro 3.0

In this topic

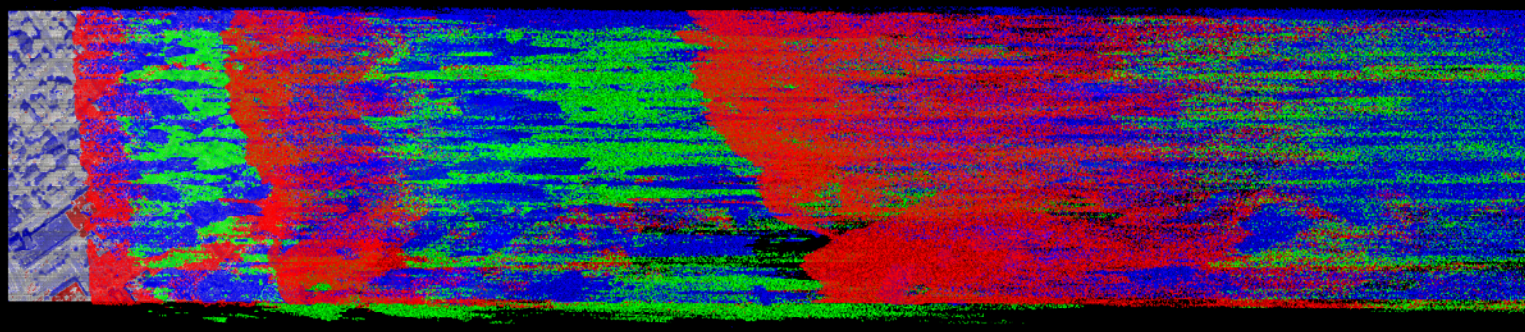
1. Lidar point classification

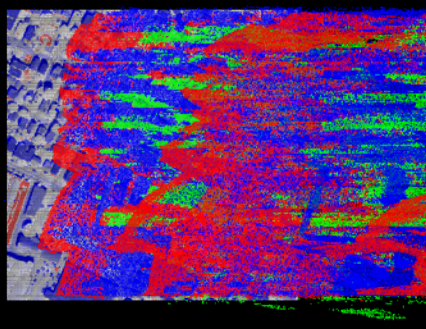
Originally, lidar data was only delivered in ASCII format. With the massive size of lidar data collections, a binary format called LAS was soon adopted to manage and standardize the way in which lidar data was organized and disseminated. Now lidar data is commonly represented in LAS. LAS is a more acceptable file format, because LAS files contain more information and, being binary, can be read by the importer more efficiently.

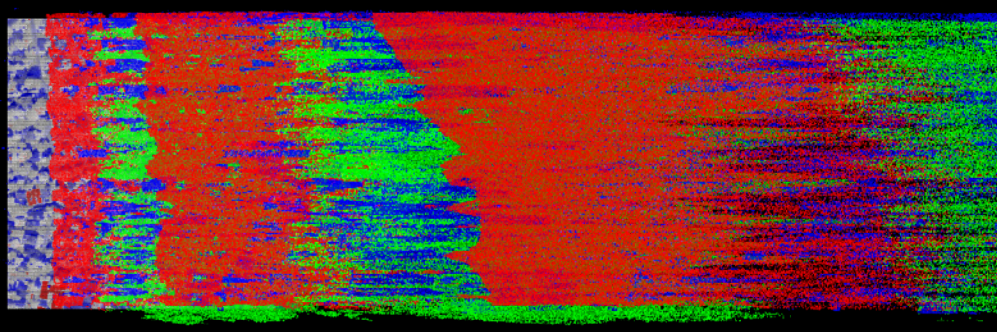
LAS is an industry format created and maintained by the American Society for Photogrammetry and Remote Sensing (ASPRS). LAS is a published standard file format for the interchange of lidar data. It maintains specific information related to lidar data. It is a way for vendors and clients to interchange data and maintain all information specific to that data.

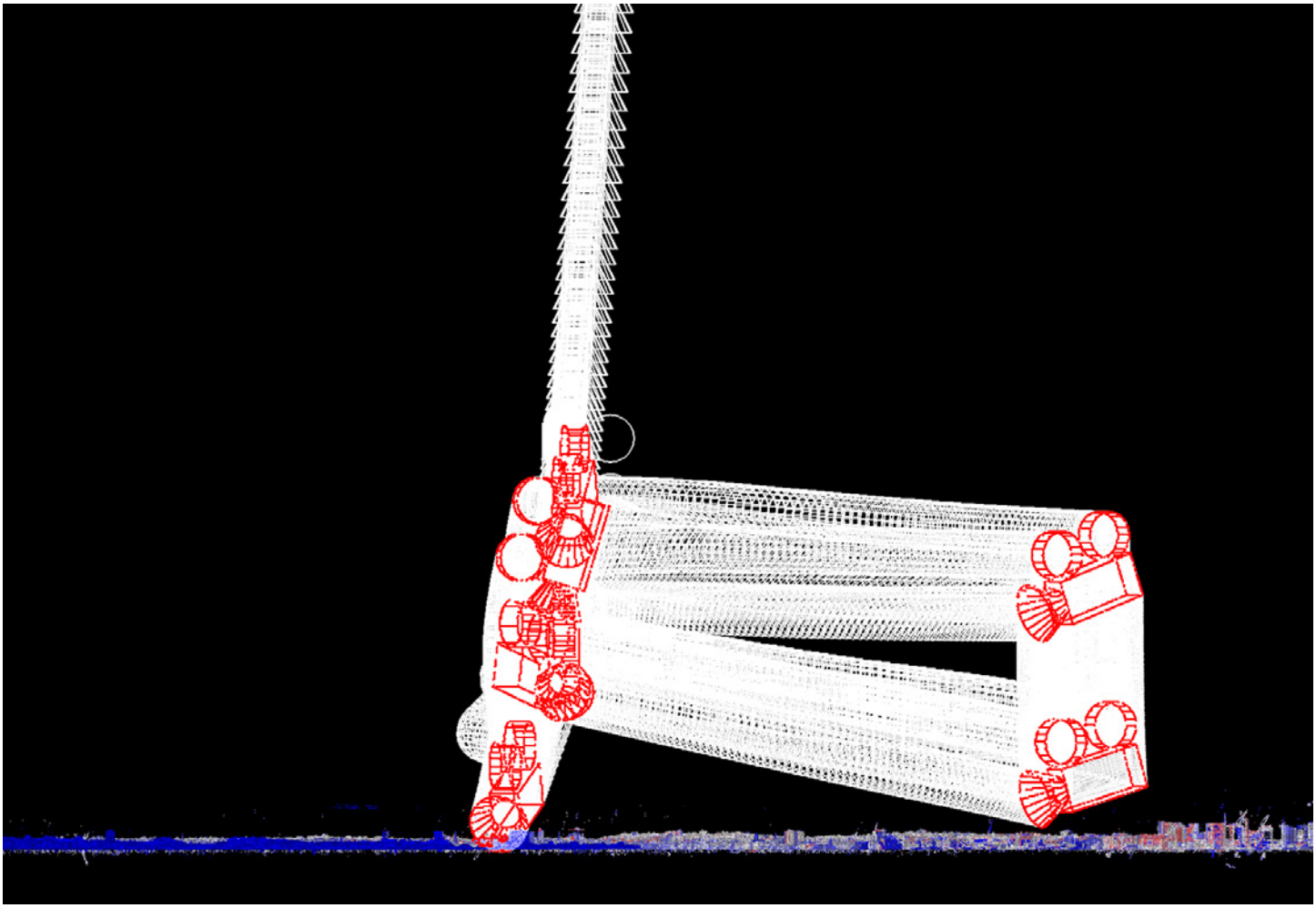
Each LAS file contains metadata of the lidar survey in a header block followed by individual records for each laser pulse that is recorded. The header portion of each LAS file holds attribute information on the lidar survey itself: data extents, flight date, flight time, number of point records, number of points by return, any applied data offset, and any applied scale factor. The following lidar point attributes are maintained for each laser pulse of a LAS file: x,y,z location information, GPS time stamp, intensity, return number, number of returns, point classification values, scan angle, additional RGB values, scan direction, edge of flight line, user data, point source ID, and waveform information.

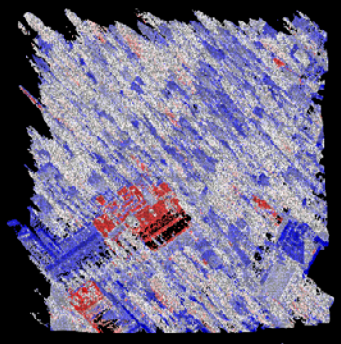
ArcGIS supports lidar data that is provided in either ASCII or LAS file format. The attribute information is maintained in ArcGIS for further analysis. ArcGIS Pro supports lidar in many ways; see Use lidar in ArcGIS Pro for more information.

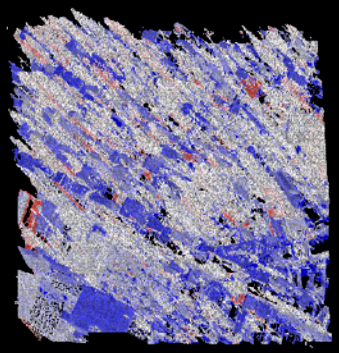


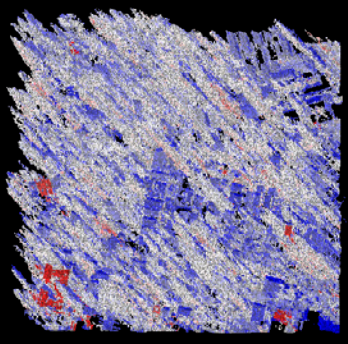


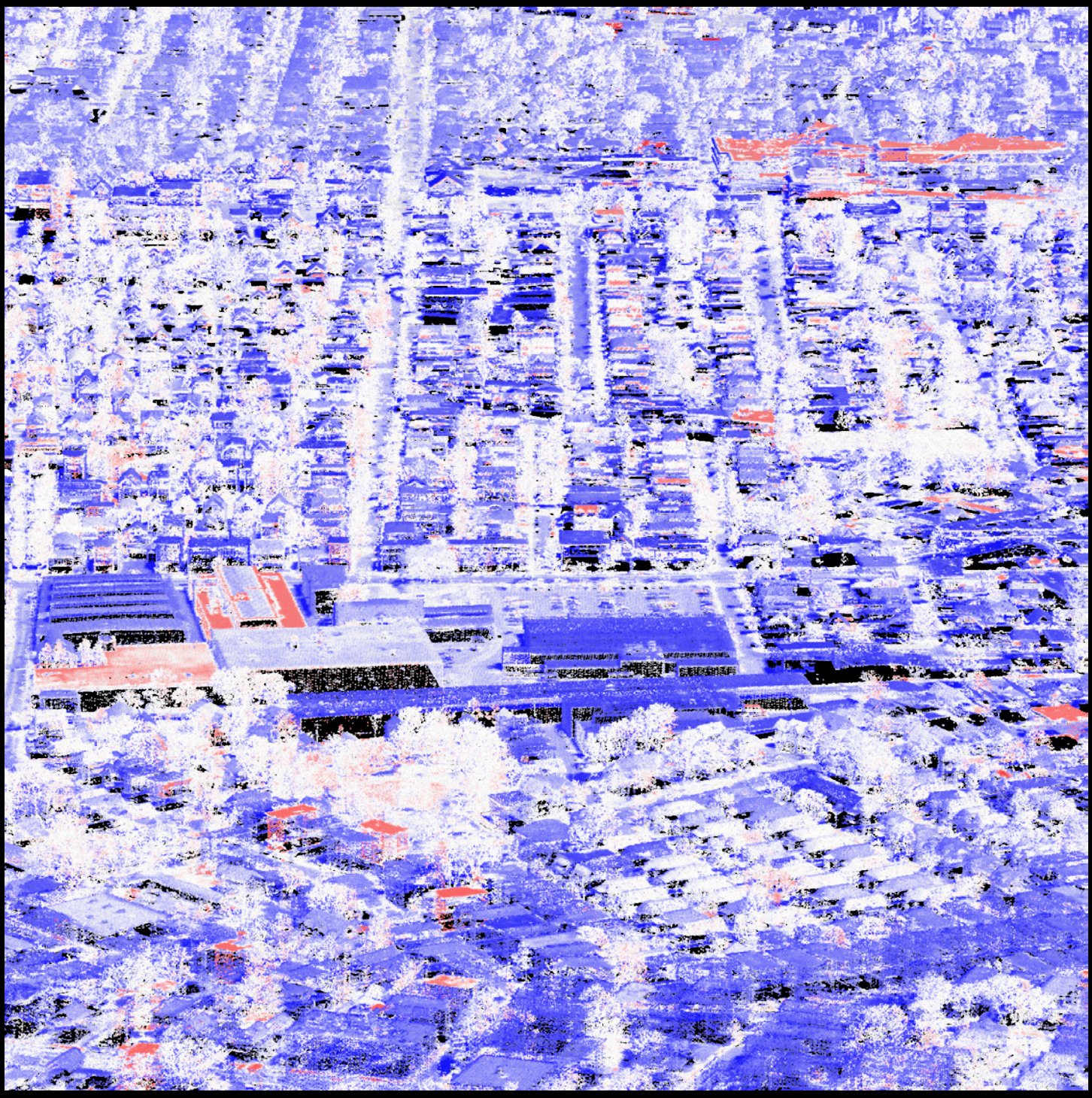


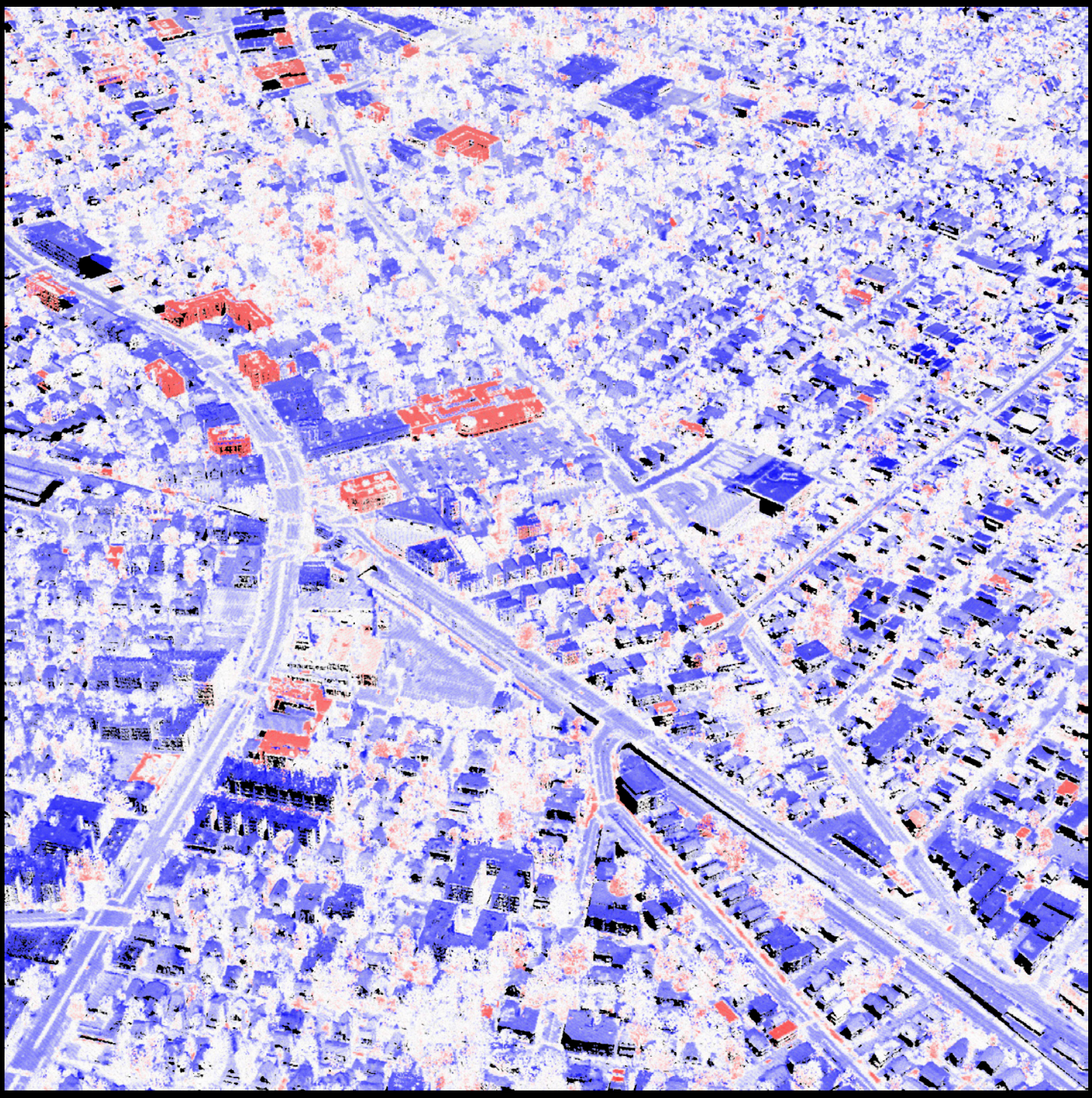


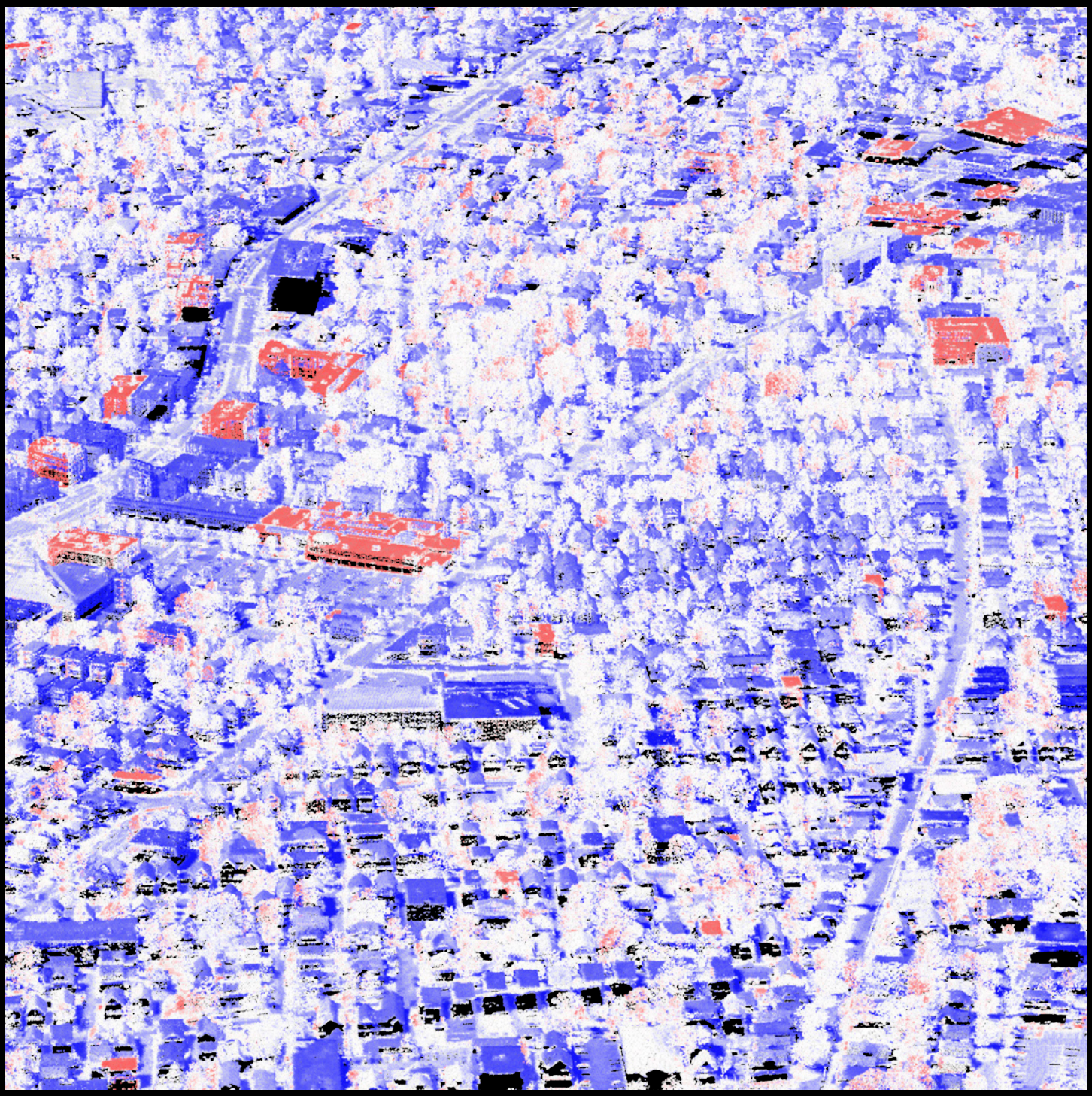


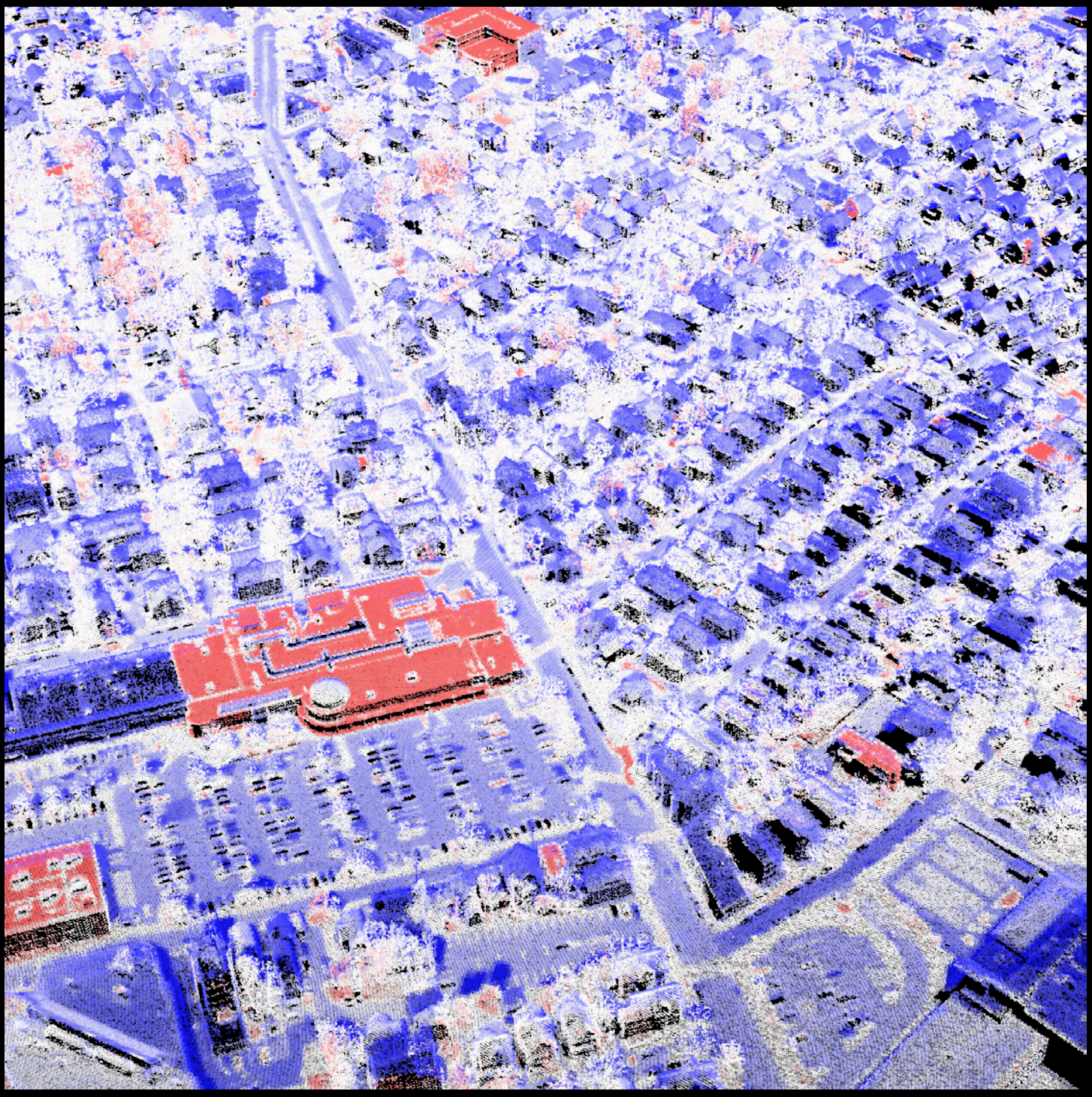


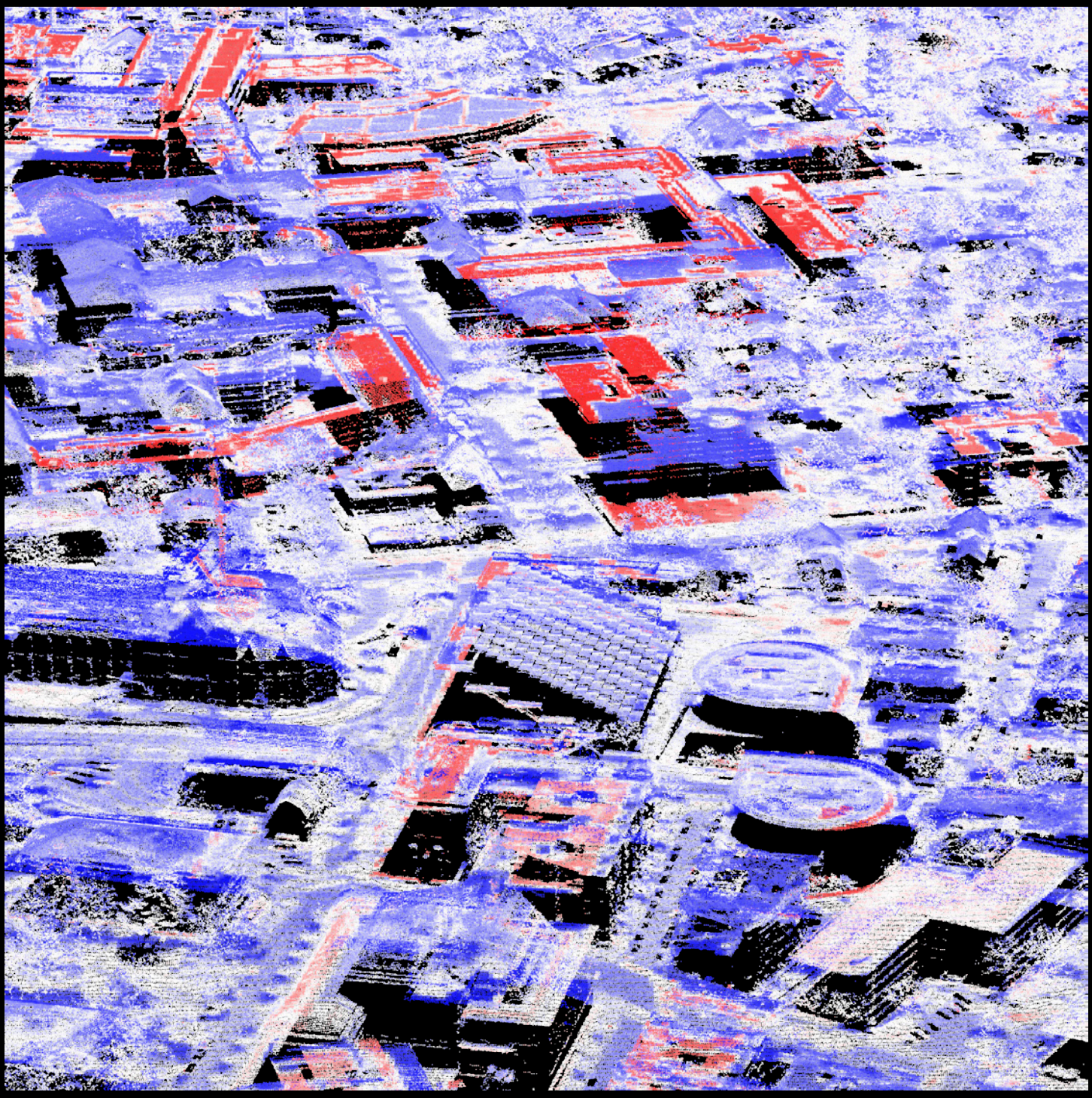


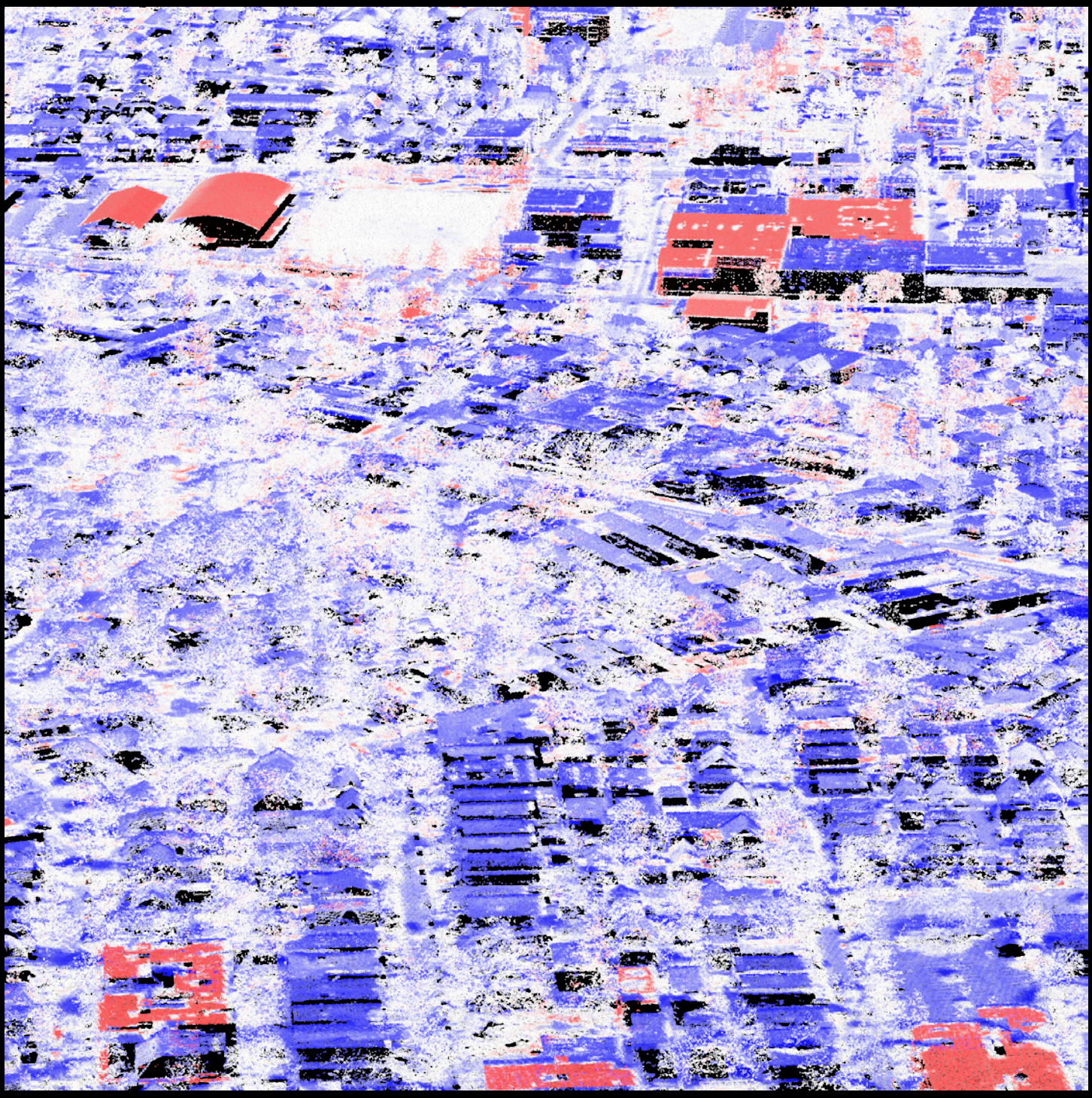


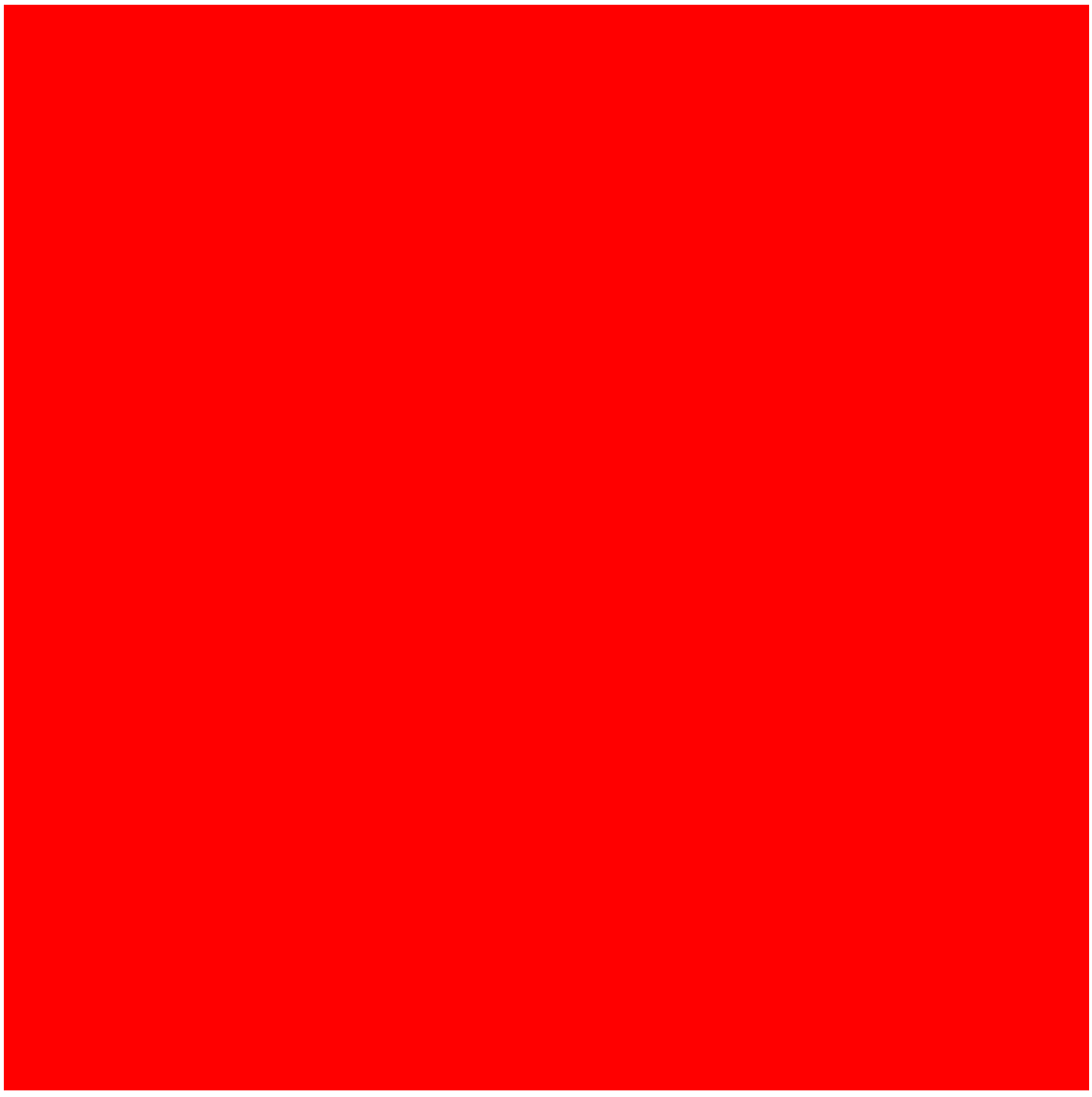












students’ sandbox

The Harvard Crimson

Sunday, April 23 — The University Daily Est. 1873 — VOLUME CL

TOP NEWS >

Inside the Harvard Law School Clinic Advocating for Animal Rights

BY NEIL H. SHAH • 3 DAYS AGO

Harvard Law School's Animal Law & Policy Clinic will enter a new chapter after the departure of its director at the end of this semester.

New Student Group Aims to Unite Pro-Palestine Advocates Across Harvard's Graduate Schools

BY JO B. LEMANN AND ASHER J. MONTGOMERY • 3 DAYS AGO

Graduate students across Harvard launched a new pro-Palestine activism group called Graduate Students 4 Palestine with an event Wednesday.

'The Spirit of Radcliffe': Weld Boathouse Reopens to a New Generation of Rowers

BY JACKSON C. SENNOTT • 3 DAYS AGO

Majority of Surveyed Harvard Faculty Object to Embattled Professor Comaroff's Return to Classroom

BY RAHEM D. HAMID AND ELIAS J. SCHISGALL • 3 DAYS AGO

More than 50 percent of Harvard faculty who responded to The Crimson's annual survey of the Faculty of Arts and Sciences indicated they felt Harvard should not have allowed professor John L. Comaroff — who has been publicly accused of sexual harassment and professional retaliation — back into the classroom.

Clerical, Technical Workers Grow Frustrated Over Yearlong Contract Negotiations with Harvard

BY CAM E. KETTLES AND JULIA A. MACIEJAK • 3 DAYS AGO

As negotiations between Harvard's clerical and technical union and the University pass their one-year mark, union employees have now gone more than a year and a half without a pay raise. The slow pace of negotiations has caused frustrations to mount within the union.

Student Activists Call on University to Dename Sackler Buildings at Harvard Art Museums 'Die-In'

OPINION >

LETTERS

An Open Letter from 45 Black Student Organizations and Supporters

BY BRIAN A. CROMWELL JR AND EBONY JOY JOHNSON • 3 DAYS AGO

OP EDS

How Harvard Careerism Killed the Classroom

BY ADEN BARTON • 3 DAYS AGO

COLUMNS

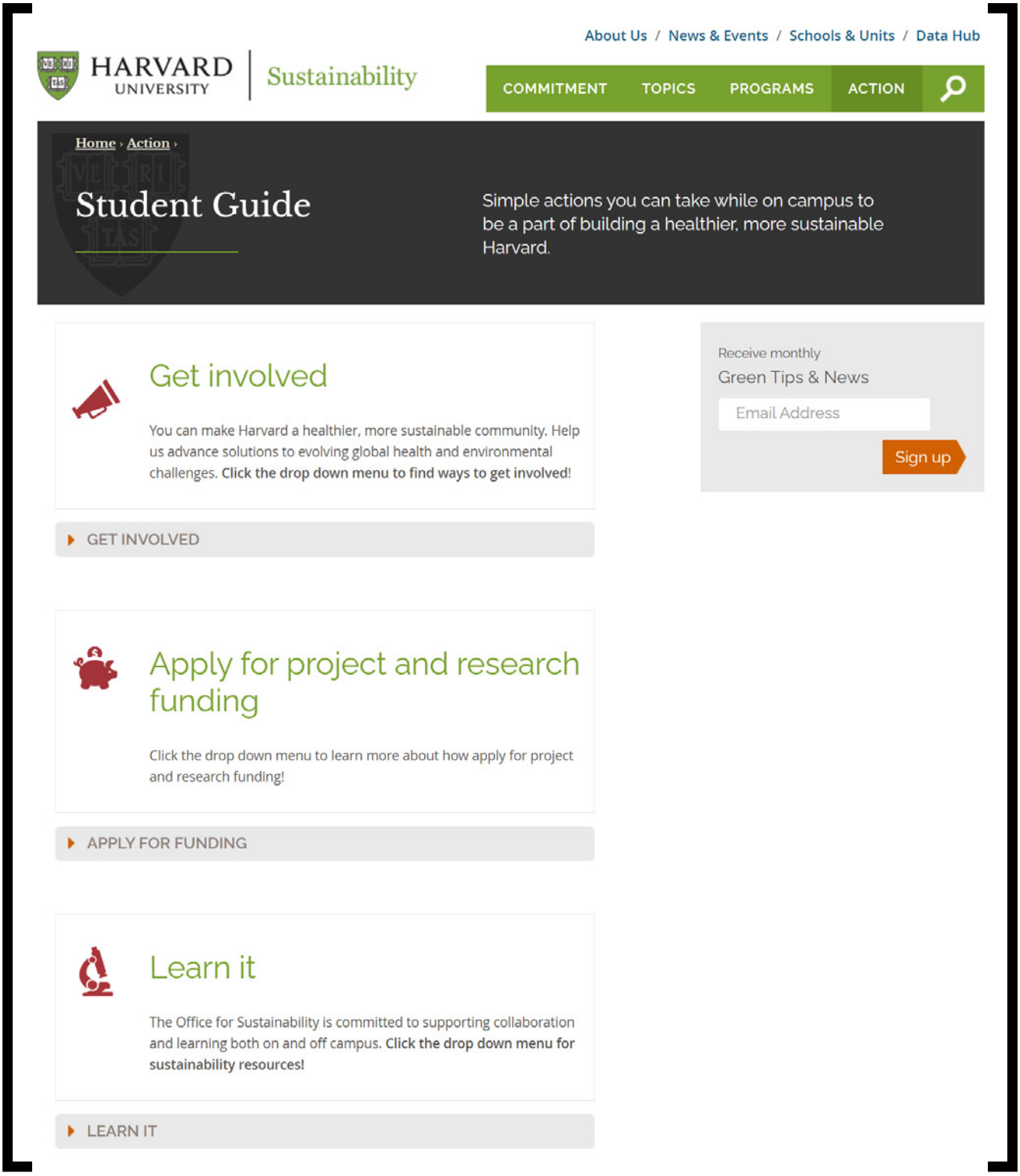
What Harvard College Can Learn From Longwood

BY MANUEL A. YEPES • 3 DAYS AGO

EDITORIALS

Take the Money Without the Values

BY THE CRIMSON EDITORIAL BOARD • 4 DAYS AGO


About Us / News & Events / Schools & Units / Data Hub
HARVARD UNIVERSITY | Sustainability
COMMITMENT TOPICS PROGRAMS ACTION
Home › Action ›
Student Guide
Simple actions you can take while on campus to be a part of building a healthier, more sustainable Harvard.
Get involved
You can make Harvard a healthier, more sustainable community. Help us advance solutions to evolving global health and environmental challenges. Click the drop down menu to find ways to get involved!
GET INVOLVED
Receive monthly
Green Tips & News
Email Address
Sign up
Apply for project and research funding
Click the drop down menu to learn more about how apply for project and research funding!
APPLY FOR FUNDING
Learn it
The Office for Sustainability is committed to supporting collaboration and learning both on and off campus. Click the drop down menu for sustainability resources!
LEARN IT

HARVARD UNIVERSITY | Sustainability

The science is clear. We're taking action.

As a University community, we have a responsibility to act on the research and insights from our faculty and students.

Our climate action plan will build on our past progress and use the campus to confront the difficult questions posed by climate change and test promising new solutions that move Harvard, and the world, toward a fossil fuel-free future.

FOSSIL FUEL-FREE BY 2050

FOSSIL FUEL-NEUTRAL BY 2026

> These ambitious goals will be challenging to reach, but the grave risks climate change poses to our health and our planet's future require essential action. Harvard must remain vigorous in supporting students, faculty, and staff who are championing ideas, expertise, and action related to climate change.
>
> – HARVARD PRESIDENT DREW FAUST

Read President Faust's statement

Artist David Buckley Borden discusses his climate change-themed installation at Harvard Forest. Photo by Maggie Janik

Short-term goal: Fossil fuel-*neutral* by 2026

By 2026, we will prioritize aggressive reductions of our campus energy use and strive to offset or neutralize any remaining greenhouse gas emissions by investing in off-campus projects such as renewable energy. Harvard will engage its researchers and industry climate leaders to identify and, where feasible, invest in projects that credibly reduce emissions while providing other positive benefits for human health, social equity, and ecosystem health.

As part of our climate strategy, our facilities leaders and building managers aggressively pursue energy efficiency. EXPLORE OUR PROGRESS ▸

How are we addressing Scope 3 emissions?

We are continuing our work to track and quantify the fossil fuel emissions associated with our supply chain for purchased goods or services that support campus operations. Once the magnitude of these so-called Scope 3 emissions are better known for areas such as food, air travel, and commuting, the University will set targets for purchasing externally-provided services or activities that rely as little as possible on fossil fuels.

Why fossil fuel-free instead of carbon-free?

A focus on only carbon, or greenhouse gas emissions, is restrictive because it leaves out the full scope of impacts on human health and ecosystems from other pollutants and wastes associated with the sourcing, production, and burning of fossil fuels.

Harvard has advanced these goals by establishing a Presidential Committee on Sustainability to oversee progress and by launching cross-disciplinary working groups that research and provide recommendations in key areas including maximizing on-campus energy efficiency, exploring development of a carbon price or surcharge on on-campus fossil fuel energy use, evaluating off-site emissions reduction projects, and developing guidance for addressing the University's Scope 3 emissions.

Leverage new research opportunities by using our campus as a living lab

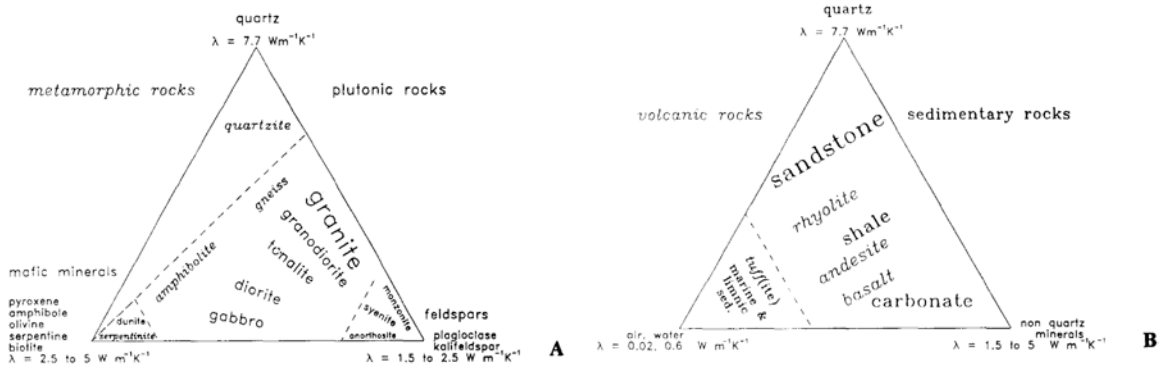
Students and faculty will continue to collaborate on **living lab projects** that have the potential to inform the strategy for transitioning away from fossil fuels, and, more importantly, serve as examples for more effective responses to climate mitigation and preparedness across society.

Material	From Literature Review				Directly measured					UNIPD-Cheap GSHPs database		
	λ W m^{-1} K^{-1}		ρ c_p MJ m^{-3} K^{-1}	ρ in 10^3 Kg m^{-3}	λ W m^{-1} K^{-1}			ρ c_p MJ m^{-3} K^{-1}	ρ in 10^3 Kg m^{-3}	λ W m^{-1} K^{-1}		
	min	*max*	[a]	[a]	*min*	*max*	*REC*			*min*	*max*	*rec.*
Sedimentary rocks	0.59	7.70			1.03	5.62				0.59	7.70	
conglomerate	1.50	5.10	*1.8-2.6*	*2.2-2.7*						1.50	5.10	1.94
sandstone	0.72	6.50	*1.8-2.6*	*2.2-2.7*	1.03	4.54	2.00	2.06-2.28	2.43-2.66	0.72	6.50	2.60
clay-mudstone	0.59	3.48	*2.1-2.4*	*2.4-2.6*	1.47	3.21	2.54	1.80-2.23	2.70	0.59	3.48	2.13
limestone	0.60	5.01	*2.1-2.4*	*2.4-2.7*	2.42	4.41	2.88	1.81-2.22	2.35-2.80	0.60	5.01	2.50
dolomite	0.61	5.73	*2.1-2.4*	*2.4-2.7*	1.96	5.22	3.65	2.03-2.34	2.47-2.78	0.61	5.73	3.58
marlstone	1.78	2.90	*2.2-2.3*	*2.3-2.6*						1.78	2.90	2.04
gypsum	1.15	2.80	*2.0*	*2.2-2.4*						1.15	2.80	1.60
anhydrite	1.50	7.70	*2.0*	*2.8-3.0*						1.50	7.70	4.77
Igneous rocks	0.44	5.86			0.86	3.29				0.44	5.86	
granite	1.49	4.45	*2.1-3.0*	*2.4-3.0*	2.02	3.68	3.13	1.80-2.12	2.66-2.73	1.49	4.45	2.74
diorite	1.38	4.14	*2.9*	*2.9-3.0*	1.99	3.04	2.50	1.75-2.10	2.60-2.71	1.38	4.14	2.40
syenite	1.35	5.20	*2.4*	*2.5-3.0*	2.20	2.66	2.41	2.02-2.06	2.69	1.35	5.20	2.51
gabbro	1.52	5.86	*2.6*	*2.8-3.1*	2.41	2.79	2.60	2.08-2.04	2.84	1.52	5.86	2.41
rhyolite	1.77	3.98	*2.1*	*2.6*	1.89	3.29	2.61	1.95-2.09	2.11-2.5	1.77	3.98	2.96
dacite	2.00	3.91	*2.9*	*2.9-3.0*						2.00	3.91	2.60
andesite	0.64	4.86	*2.3-2.6*	*2.6-3.2*	0.96	1.39	1.16	1.38-1.57		0.64	4.86	1.43
trachyte	2.20	3.40	*2.1*	*2.6*	1.86	1.95	1.91	1.87-2.00	2.33-2.63	1.86	3.40	2.48
basalt	0.44	5.33	*2.3-2.6*	*2.6-3.2*	0.86	2.69	1.78	1.89-2.07	2.13-3.02	0.44	5.33	1.82
tuff/tuffstone	1.10	2.59								1.10	2.59	1.10
Metamorphic rocks	0.65	8.15			1.98	4.43				0.65	8.15	
quartzite schist	1.89	8.15	*2.1*	*2.5-2.7*						1.89	8.15	5.18
micaschist	0.65	5.43	*2.2-2.4*	*2.4-2.7*	1.98	4.43	2.83	2.09-2.26	2.72-2.76	0.65	5.43	2.53
gneiss	0.84	4.86	*1.8-2.4*	*2.4-2.7*	3.04	3.89	3.70	2.19 - 2.2	3.03	0.84	4.86	2.95
phyllite	1.50	3.33			1.45	2.94	2.59	1.41-1.95	2.76-2.82	1.45	3.33	2.45
amphibolite	1.35	3.90	*2.0-2.3*	*2.6-2.9*						1.35	3.90	2.90
serpentinite	2.41	4.76			2.01	3.72	2.62	2.1-2.2	2.63-2.82	2.01	4.76	2.52
marble	0.98	5.98	*2.0*	*2.5-2.8*						0.98	5.98	2.50
nconsolidated sediments												
clean gravel, dry	0.13	0.9	*1.3-1.6*	*1.8-2.2*	0.14	0.55	0.33			0.14	0.9	0.4
heterometric gravel with sand, wet	0.18	3.00			0.94	1.33	1.08			0.2	3.00	1.08
medium sand, dry	0.15	0.90	*1.3-1.6*	*1.8-2.2*	0.15	0.68	0.26	0.41-1.48		0.15	0.9	0.4
medium sand, wet	1.00	2.60	*2.2-2.8*[b]	*1.9-2.3*[b]	1.44	2.45	1.86	1.53-2.27		1.0	2.6	1.9
silty sand/sandy silt, wet	1.20	2.25			1.24	2.06	1.56	1.85-2.48		1.20	2.25	1.62
silt, dry	0.26	1.09	*1.5-1.6*	*1.8-2.0*	0.25	0.82	0.50	1.37-1.52		0.25	1.09	0.55
silt and clayey silt, wet	0.82	2.60	*2.0-2.8*[b]	*2.0-2.2*[b]	0.93	1.76	1.32	1.84-2.43		0.82	2.60	1.45
clay, dry	0.25	1.52	*1.5-1.6*	*1.8-2.0*	0.25	1.22	0.64	0.49-1.38		0.25	1.52	0.64
plastic clay, wet	0.60	1.90	*2.0-2.8*[b]	*2.0-2.2*[b]	0.87	1.39	1.03	0.62-2.67	from slurry to OC	0.60	1.90	1.10
organic materials: peat	0.2	0.7	*0.5-3.8*	*0.5-1.1*	0.30	0.66	0.51	0.32-0.78		0.2	0.7	0.51

[a] The listed values of density and thermal diffusivity are extracted from VDI 4640 as reference for each category.
[b] The values are reported for water-saturated conditions.

Dalla Santa, G., Galgaro, A., Sassi, R., Cultrera, M., Scotton, P., Mueller, J., Bertermann, D., Mendrinos, D., Pasquali, R., Perego, R., Pera, S., Di Sipio, E., Cassiani, G., De Carli, M., & Bernardi, A., "An updated ground thermal properties database for GSHP applications", *Geothermics*, 85, (2020): 101758.

Table of data obtained from experimental measurements:
thermal conductivity, volumetric heat capacity, and density ranges



Clauser, C., Huenges, E., "Thermal conductivity of rocks and minerals", *Rock Physics and Phase Relations*, A Handbook of Physical Constants (Am Geophys Union 1995): 124.

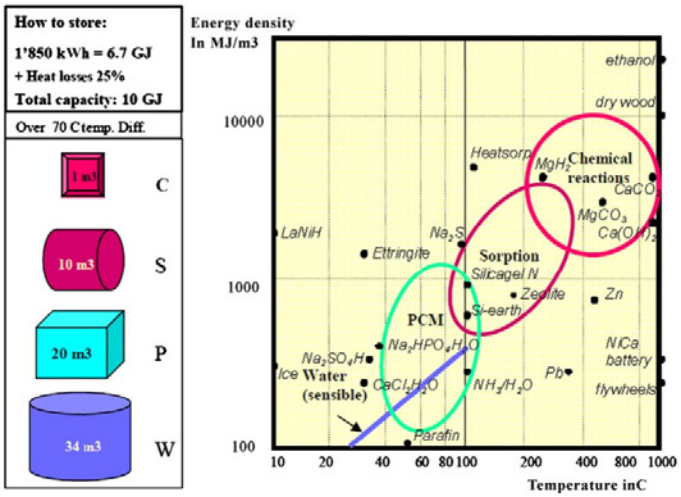
Thermal conductivity of rocks over phase relations

Material	T (°C)	ρ (kg·m^{-3})	c_p (kJ·kg^{-1}·K^{-1})	λ (W·m^{-1}·K^{-1})	$10^6 \times a$ (m^2·s^{-1})	$10^{-3} \times b$ (J·m^{-2}·K^{-1}·s$^{-1/2}$)
Water	20	998	4.183	0.598	0.142	1.58
Silicone oil (AK250)	25	970	1.465	0.168	0.118	0.49
Transformer oil	60	842	2.09	0.122	0.069	0.46
Molten salt (K/$NaNO_3$)	230	1950	1.57	0.50	0.16	1.24
Paraffin (liquid)	20	900	2.13	0.26	0.14	0.71
Sodium	100	927	1.385	85.84	66.85	10.50

Material	T (°C)	ρ (kg·m^{-3})	c_p (kJ·kg^{-1}·K^{-1})	λ (W·m^{-1}·K^{-1})	$10^6 \times a$ (m^2·s^{-1})	$10^{-3} \times b$ (J·m^{-2}·K^{-1}·s$^{-1/2}$)
Aluminum 99.99 %	20	2700	0.945	238.4	93.3	24.66
Copper (commercial)	20	8300	0.419	372	107	35.97
Iron	20	7850	0.465	59.3	16.3	14.7
Lead	20	11340	0.131	35.25	23.6	7.24
Brick (dry)	20	1800	0.84	0.50	0.33	0.87
Concrete (aggregates)	20	2200	0.72	1.45	0.94	1.52
Granite	20	2750	0.89	2.9	1.18	2.67
Graphite	20	2200	0.61	155	120	14.41
Limestone	20	2500	0.74	2.2	1.19	2.02
Sandstone	20	2200	0.71	1.8	1.15	1.68
Slag	20	2700	0.84	0.57	0.25	1.13
Sodium chloride	20	2165	0.86	6.5	3.5	3.5
Soil (clay)	20	1450	0.88	1.28	1.0	1.28
Soil (gravelly)	20	2040	1.84	0.59	0.16	1.49

T. Bauer, W. -D. Steinmann, D. Laing, R. Tamme, "Thermal Energy Storage Materials and Systems", Ch.5, Annual Review of Heat Transfer, Vol. 15: (Begell House Inc, 2012): 141, 149.

Thermophysical properties for sensible heat storage



N'Tsoukpoe, K. Edem, et al. "A Review on Long-Term Sorption Solar Energy Storage." *Renewable & Sustainable Energy Reviews*, vol. 13-9, (Universite´de-Savoie,Polytech'Savoie 2009): 2386.

Volumes of thermal-energy-storage types and material energy-density-constants

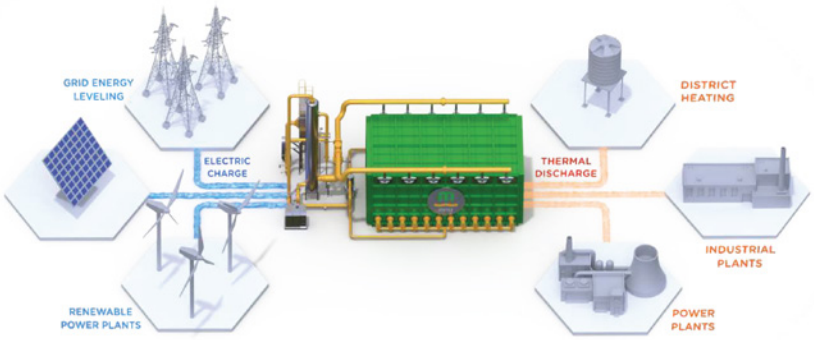
No.SHS material	Heat capacity ($J \cdot kg^{-1} \cdot K^{-1}$)	Density ($kg \cdot m^{-3}$)	Thermal conductivity ($W \cdot m^{-1} \cdot K^{-1}$)	Energy density ($kJ \cdot m^{-3}$)
1. Water	4163	998.3	0.609	4175
2. Molten salt (Nitrate based)	1542.3	2240	0.5	1.28×10^6
3. Engine oil.	1880	888	0.152	36×10^6
4. Iron	465	7850	59.3	3650
5. Aluminum	945	2700	238.4	2551.5
6. Copper	419	8300	372	3477.7
7. Sand	710	1631	1.8	1562
8. Concrete	879	2400	1.28	1933.8
9. Graphite	609	2260	155	13,339.8
10. Granite	892	2750	2.9	2453
11. Limestone	741	2500	2.2	1852.5
12. Brick	840	1800	0.5	1512
13. Lead	131	11,340	35.25	1485.5
14. Sodium chloride	860	2165	6.5	–
15. Clay	880	1450	1.28	–

Sadeghi, G. “Energy storage on demand: Thermal energy storage development, materials, design, and integration challenges”, *Energy Storage Materials*, (2022): 199.

Thermophysical properties for sensible heat storage at 20 °C.

SAND AS A STORAGE MEDIA

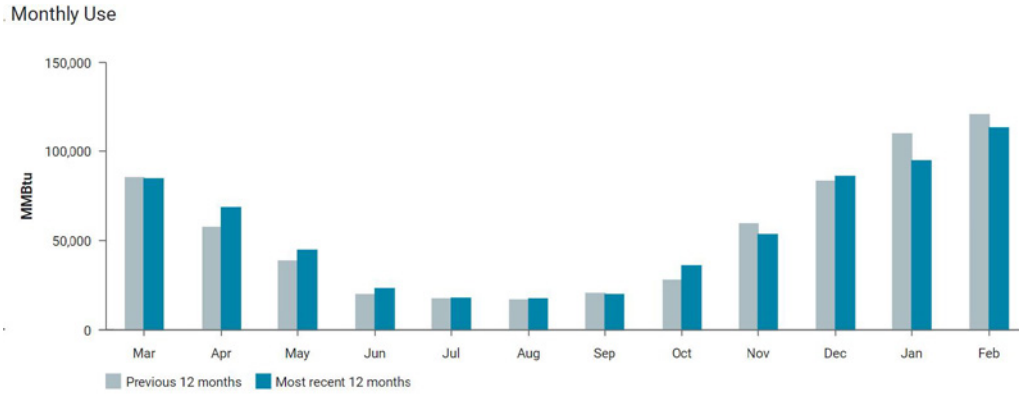
As a storage material, fluidizable solid silica sand particles are used. Silica sand particles are stable up to over 1000°C.



MGTES power to heat configuration

Commercialized Technology:
Magaldi Green Thermal Energy Storage

Steam Monthly Unit Cost



Month	Previous 12 months (MMBtu)	Most recent 12 months (MMBtu)
Mar	85,141	84,738
Apr	57,040	68,518
May	38,914	44,520
Jun	19,831	23,507
Jul	17,114	18,163
Aug	16,843	17,042
Sep	20,393	20,118
Oct	28,099	35,987
Nov	59,629	53,279
Dec	83,134	86,317
Jan	109,688	94,765
Feb	120,580	113,319

$$Q = \frac{\text{“Feb. steam use”}}{1\text{ month}} \times \frac{1\text{ month}}{28\text{ days}} \times \frac{1\text{ day}}{24\text{ hours}} = 179{,}434{,}523\text{ Btu}$$

$$V = \frac{Q}{s(\Delta T)} = \frac{\text{“heat”}}{\text{“volumetric heat capacity”}}$$

$$V_{sand} = \frac{179{,}434{,}523\text{ Btu}}{1480.49\text{ Btu}\cdot\text{m}^{-3}} = 203{,}728\text{ m}^3$$ *(614 acre of sand surface)

$$V_{iron} = \frac{179{,}434{,}523\text{ Btu}}{3459.53\text{ Btu}\cdot\text{m}^{-3}} = 54{,}866.7\text{ m}^3$$ *(DEF chilled water tank capacity = 4,921 m^3)

$$m = \rho V$$

$$m_{sand} = 1.570\text{ t}\cdot\text{m}^{-3} \times 230{,}728\text{ m}^3 = 360{,}243\text{ t}$$

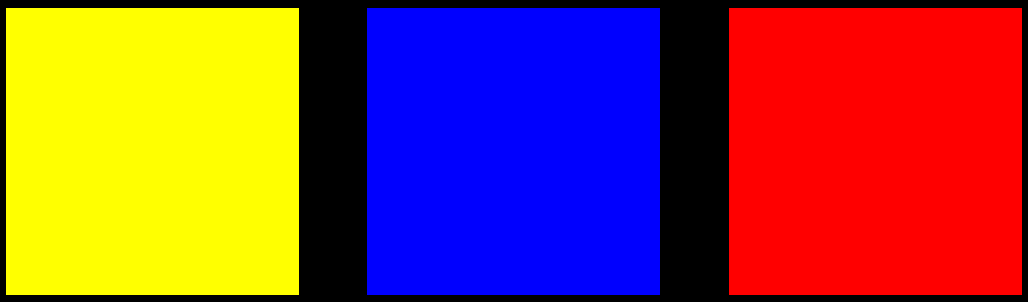
$$m_{iron} = 7.874\text{ t}\cdot\text{m}^{-3} \times 51{,}833.7\text{ m}^3 = 408{,}398\text{ t}$$ *(0.9% of iron ore mined in US, 2022)

$V_{sand} = 203{,}728\text{ m}^3$

$v_{cube} = l^3$; $l_{cube} = 61.33\text{ m} = 201'\ 3''$

$v_{r.r.pyramid} = \frac{1}{3} l^3$; $l_{r.r.pyramid} = 84.86\text{ m} = 278'\ 5''$

$v_{hemisphere} = \frac{2}{3} \pi r^3$; $r_{hemisphere} = 45.99\text{ m} = 150'\ 11''$



Two Analysts on Architect-neurosis

■■■ ■■: Are you ready?

■■ ■■: Yes. How many discontents do we have for the analysis?

■■■ ■■: We have three of architect-neurosis, the affective disorder in review.[1,2]

1 Sigmund Freud, “Infantile material as a source of dreams”, *The Interpretation of Dreams*, (1955): 211-239.

> On Rome-neurosis: “I have in mind is a series of dreams which are based upon a longing to visit Rome. [...] the dreams in which ‘the wish to go to Rome’ had become a cloak and symbol for a number of other passionate wishes. [....] Hannibal and Rome symbolized the conflict between the tenacity of Jewry and the organization of the Catholic church.”

2 Carl E. Schorske, “Politics and Patricide in Freuds Interpretation of Dreams,” *Fin-de-Siècle Vienna: Politics and Culture*. 1st ed., (Random House, 1979): 193-203.

> “Freud actually entered the Eternal City in nearly five years 1901, after his father's death, not "to take vengeance on the Romans," but as intellectual pilgrim and psycho-archeologist, in the footsteps of Winckelmann. He wrote, "It was an overwhelming experience for me, and, as you know, the fulfillment of a long-cherished wish.””

■■■ ■■: Great. Let's play the first discontent:

> ***"In reality, I'm childish. But in public, I don't dare admit it. I have to play the role of a staid, controlled person. This role is a confoundedly artificial one for me."*** [3]

■■ ■■: The role of the internal conflict is evident in its effect. Initially, the claim of being childish constructs a facade of humility and innocence for the responsible adult. Eventually, the claim establishes a myth around the analysand, advantaging the individual to wield socio-cultural contracts that define available roles and ways of being. As a whole, the confession signals the longing for self-representation in creative acts.[4]

3 Richard Neutra, "letter to his wife", (1930): from Mark Wigley, "How Old is Young?", *Perspecta*, 37, (2005): 75.
4 Otto Rank, *The Trauma of Birth*, (1907): 73. & "Microcosm and Macrocosm", *Art and Artist: Creative Urge and Personality Development* (New York: 25, Norton, 1989): 141-157.

> "[...] the Christian ideology democratized the immortal soul, which before had been prerogative of kings, heroes, or creative people (artists). The democratization of the soul-concept had a great share in the flowering of Christian art, which expanded over more than a thousand years, and this was because it had become essential to objectify the human substrate of this abstraction for the world at large."

■■■ ■■: We got underlying psychomechanism driving the delusion. Let's move on to the second discontent:

> ***"I am haunted by the irresistible urge to be an architect. The love for architecture overrides every warning sign about the profession."***

■■ ■■: Obsessive "search for identity" expresses the need to seek truth about self.[5] The general act of speaking creates a sense of commitment and truth that is essential to development of healthy ego.[6] The "talking cure"[7] must account all other signs as lost and reified to meaningless symbols.[8] In this case, the unconscious speaks the 'language of environment modification'. The select form of speech reflects

5 Elizabeth Lunbeck, "Identity", *The Americanization of Narcissism* (Harvard University Press, 2014), 224.
The word identity, [or] the ideal of a robustly conceived and fully realized self, were soon everywhere, the holy grail of selfhood prompting countless quests and searches as well as the publication of popular books with titles such as *Man's Search for Himself*, *On Being a Real Person*, and several dozen more offering variations on the "search for identity" that collectively made the case that Americans no longer knew who or what they were.

6 Erik H. Erikson. "The Problem of Ego identity", *Journal of the American Psychoanalytic Association* 4, (1956): 70.
On the autoerotic enjoyment of speech: "the process of identity formation emerges as an evolving configuration —a configuration which is gradually established by successive ego syntheses and resyntheses throughout childhood; it is a configuration gradually integrating constitutional givens, idiosyncratic libidinal needs, favored capacities, significant identifications, effective defenses, successful sublimations, and consistent roles."

7 Sigmund Freud, "Recommendations to physicians practising psycho-analysis" (1912), *Standard Edition* 12: 116.
Anna O., the famous patient of Breuer and Freud coined the term 'talking cure': a process of psycho-archeological dig that clears out mental inhibitions.

8 Mari Ruti. "The Dignity of the Thing." T*he Singularity of Being*, (Fordham University Press, 2012): 121.
"We are haunted by the sadness of having lost the Thing that we are driven to try to reincarnate it through our various eff orts to make meaning."

the repression particular to architect-neurosis. The analysand considers environments as narcissistic extensions of those who projected them.[9,10] The silent walls, floors, ceilings, and other surrounding objects exert significant repressions against the architect-id[11,12].

9 Heinz Kohut, “Extending Empathic Understanding, Sharing an Attitude”, (1987): 51.
“Some seemingly inanimate environment is really animate environment if it has been placed there by somebody who is animate. It becomes an extension of that individual.” Kohut recommended analysts to extend such an empathic understanding and share an attitude with their patients. “[...], as an auxiliary ego to him, by understanding, you can add insight, giving him greater mastery over present tensions and allowing him greater ease in working himself out of a rather circumscribed problem.”

10 Sylvia Lavin, “The New Mood or Affective Disorder.” *Assemblage*, no. 41: (2000): 40.
Architecture is an “affect machine designed to produce particular feeling-states.[...] Since buildings were busy creating emotion, and critics were busy having emotion, architects themselves were deprived from emotional life. [...] Richard Neutra, who deliberately fashioned himself as a psychoanalyst, to the wider phenomenon of using architecture to ensure mental hygiene, to the establishment of environmental psychology, the discipline of architecture structured a world of object relations in which inanimate buildings assumed key roles in the emotional lives of the nonprofessional public while architects mediated this psychic organization.”

11 Antoine Picon, *The Materiality of Architecture*, (University of Minnesota Press, 2021): 20.
“Pledged to silent materiality, architecture is a way to understand how matter and materials, as well as the things and objects that are made from them, are actually constitutive of humans.”
See also, James C. Scott, “Zoonoses: A perfect Epistemological Storm”, *Against the Grain: A Deep History of the Earliest States* (New Haven: Yale University Press, 2017): 95.
“We, of course, are hardly the only species to modify the environment to our advantage. [...] virtually all mammals, in fact- engage in “niche construction,” which changes the physical properties of the landscape and the distribution of other species of flora, fauna, and microbial life around them.”

12 [id]
[“the it”], [das Es], [~~Ucs~~]
Sigmund Freud, ed. James Strachey, “Editor’s Introduction” & “Das Ich und das Es” *Group Psychology and the Analysis of the Ego*, *SE*, 17, (1921): 7; 14-17.
“The id was eventually decided upon in preference to 'the it', so as to be parallel with the long-established 'ego'.”
“We have two kinds of unconscious- the one which is latent but capable of becoming conscious, and the one which is repressed and incapable of becoming conscious. [...] the idea that in each individual there is a coherent organization of mental process; and we call this ego. The ego controls the discharge of excitations into the external world; it is the mental agency which exercises censorship. [...]

■■■ ■■: Great. We have got the symbolic system.
Now, here is the third and last discontent:

> ***"I die embittered because I feel that my best ideas were ignored, compromised, or stolen."*** [13]

13 [Le Corbusier, 1887];
Mark Wigley, "How Old is Young?", *Perspecta*, 37, (2005): 64–77.
"The threshold of master-apprentice relationship sets the common stage for the romantic stories of young architects surviving difficult professional conditions before emerging into the light.

■■ ■■: The discontent speaks to the inheritance of the “unresolved psychological task” [14], and the transmission of the affective disorder across generations”.[15] Handing off the burden of repression to the following group, the old apprentices never escaped as they only re-enacted the incarceration. Even within the ideal scenario of “establishing one’ s own master practice”, the available roles and relations remain the same. The permanent-apprentices are trapped in a misprison[16].

14 [Louis Sullivan, 1856 -- Frank Lloyd Wright, 1867 -- Richard Neutra, 1892]; ibid.

> “To begin my career, I had to work anonymously, becoming the master’s "alter ego", or "the pencil in the master’s hand" that made my master, a master. My master was unable to distinguish his own work from mine. Not only did I do master's work better than the master, but also developed the new signature work of the master, which the master agreed to adopt.”

15 Christopher Lasch, “The Awareness Movement and the Social Invasion of the Self”, *The Culture of Narcissism : American Life in an Age of Diminishing Expectations*, (1978): 8.

> “The contemporary narcissist bears a superficial resemblance, in his self-absorption and delusions of grandeur, to the “imperial self” so often celebrated in nineteenth-century American Literature. [...] The break from Europe, the abolition of primogeniture, and the looseness of family ties gave substance to their belief that Americans, alone among the people of the world, could escape the entangling influence of the past.”

16 [misprison]

> [Apprentice complex]; ibid.
>
> > “The paradox of signature is that signs of originality can be copied: mastering signature work is established through the mastery of the copy.”
>
> [Shakespeare complex];
>
> > Bloom, Harold. “Preface”, *The Anxiety of Influence : a Theory of Poetry.* (New York: Oxford University Press, 1996): xiii.
> >
> > > “Real multiculturalists accept Shakespeare as the one indispensable author, so much that he becomes different in kind. Shakespeare is not only the Western canon; he is also the world canon. That his appeal is equal to audiences of all continents, races, and languages (always excluding the French) seems to me an absolute refutation of our currently fashionable views, prevalent particularly in Britain and America, that insists upon a Shakespeare culture-bound by history and society. As Emerson rightly concluded, no context, not even the theatrical, confines Shakespeare.” But,
>
> [audience complex];
>
> > François Jullien, Hawkes Sophie, “Between Emotion and Landscape: The World is Not an Object of Representation”, *Detour and Access: Strategies of Meanings in China and Greece*. (New York: Zone Books: 2000): 152.
> >
> > > “Inspired by the gods and possessing enthusiasm, the Greek poet became a seer. [...]The Greek poet’s objective was to feel, to make felt, by bringing “before one’s eyes.” [...] the Chinese conceived of poetic phenomena in terms of incitement, the Greeks conceived of poetic creation in terms of representation. Originating in philosophy, where it was first used to distinguish levels of being, *mimesis* served as a general perspective for *poiesis*. For this reason, it was linked to the evolution of the poetic genre in Greece, leading from the epic in theater to more direct representation of *muthos*.”

■■■ ■■: Any final recommendations?

■■ ■■: In addition to being “healers” of the analysand, we must help administer “preventive medicine” to the discipline recovering from large-group trauma.[17] The release of the built-up pressure is inevitable, so the analysand and the respective discipline must be aware of the volatile nature of the inheritance and plan the release of its pressure toward good use.[18]

17 V. Volkan, “Traumatized societies and psychological care: Expanding the concept of preventive medicine” (1999): “In traumatized societies, affected individuals may, mostly unconsciously, oblige their progeny to resolve the directly traumatized generation’s own unfinished psychological tasks related to the shared trauma. The impact of trauma is shared across large groups, which can extend across thousands or millions of people, most of whom will never meet one another, but shares a sense of national, religious, or ethnic *sameness* [...].”

18 Donald W. Winnicott, “The use of an object,” *International Journal of Psychoanalysis*, 50 (1969): 712. “Object-relating is an experience of the subject that can be described in terms of the subject as an isolate. [...] it follows that discussion of the subject of relating is a much easier exercise for analysts than is the discussion of usage, since relating may be examined as a phenomenon of the subject, and psychoanalysis always likes to be able to eliminate all factors that are environmental, except in so far as the environment can be thought of in terms of projective mechanisms. But in examining usage there is no escape; the analyst must take into account the nature of the object, not as a projection, but as a thing in itself.”