DEEP DUST | THE KILLING DARK

Winter 2021
ARCS 5106
1st Half / [Divided Cities M.Arch Options Studio]
MWF: 13:35 - 17:25
Ozayr Saloojee | ozayr.saloojee@carleton.ca

Zoom & Figma | Synchronous
Beneath a plateau in southern Africa, late in the nineteenth century, miners crawl through miles of narrow tunnel – cut deeper underground here than anywhere else on Earth at this time – lugging ore from a sunken reef of gold. Some of these men, who have migrated to the area in their thousands to work, will die soon in rockfalls and accidents. More will die slowly of silicosis from breathing the rock dust down there in the killing dark, year after year. Here the human body is largely disposable in the view of the corporations that own the mine and the markets that drive it: a small, unskilled tool of extraction to be replaced when it fails or wears out. The ore the men bring up is crushed and smelted, and the wealth it yields lines the pockets of shareholders in distant countries.

-Robert Macfarlane. Underland

Down you go alive // The cage is falling // Like a comet in the night // Beads of sweat glisten // In the underground light // Smoulder boulder // Rock reeks // ...Ten thousand men below // Bleed the burning womb // Make the sun-rock show // ...In a mine song // I shake the world beneath your feet

STUDIO DESCRIPTION

DEEP DUSTS | THE KILLING DARK is the first studio of the Divided Cities Sequence for the Winter 2021 term.

This studio engages with the earth - with the grounds beneath our feet, with the grounds that our architecture engages, sits on, interfaces with, turns away from, is rooted in, shores itself up against, retains, rejects, cores and excavates. Sited in Johannesburg, South Africa, this studio takes the geological, elemental and mineralic (diamonds, gold, platinum...) histories of Johannesburg's "Elusive Metropolis"1 as a provocation to thoughtfully and curiously explore (through mapping, technical and narrative representation) the spatial implications of an extractive terrain through drawing as a medium of conceptual and critical inquiry.

Studio themes will include (but are not limited to): questions of the ground, of site, of labour, of how we look (on, through plan and at, through section), of representing and representation, of superfluity, of excess and paucity, of moving above, below, on and through the grounds, of particles and sediments, of resource (in)justices, extraction and resource capitalism, of a re-claiming of the earth as a restitutive, and reconciliatory act. Projects will be situated in the geologic, as well as in the socio-cultural, and fraught, history of this post-apartheid city.

INTRODUCTION + CONTEXT

Johannesburg is built on gold and diamonds and dust.

The city rests on the Witwatersrand ("Ridge of White Waters) Basin - known locally as the "Rand" - an almost 60 kilometre long north-scarp that also forms a Continental Divide, draining northern waters into the Indian Ocean and southern waters into the Atlantic. This divide is both an index and a threshold. It is a geological line that, with the Crocodile, Limpopo, Vaal and Orange rivers, marks a large portion of the hydro-geography and geo-morphology of South Africa. It is also a geological threshold separating the surfaces of cities, urbanity, people, and commerce above a ground beneath which an auric and diamantine terrain of reefs, seams, veins and "deposits" exist. The city, on this divide, was also (and still is), the site of other divides - some as vast and bitterly enduring as its geological one.

Apartheid, formally established in 1948, attempted to create another plateau of separations between white and black, described by Dr. Nic Coetzer in his PhD dissertation, where he writes:

> There was a hierarchy of Otherness that ranged from Afrikaans to Greek, Portuguese, Jewish, and other, "dark" Europeans being closest to the idea of Englishness, followed by the predominantly Muslim "Malays," the creole "Coloureds," and Indians, whilst "Natives" were considered so distant... Natives were further categorized as Christian "married Natives," or the "better class of Natives" as compared to the "migrant worker" or "raw kafr."2

The discovery of diamonds and gold, more than half a century before the Afrikaaner National Party established their "policy of good neighbourliness"3 has irrevocably marked the physical geography of the

---


2 N.R. Coetzer, "The Production of the City as White Space: Representing and Restructuring Identity and Architecture, Cape Town 1892-1936" (PhD. Diss., University College London, 2003), 21.

3 Hendrik Verwoerd, the leader of the South African National Party (and last Prime Minister of the Union of South Africa from 1958-1961) is often described as the "Architect of Apartheid," and described it in these terms.
city. More than buildings and roads (the M2 highway what wraps around Johannesburg was constructed on top of a series of old, yellow-sanded mining overburden piles and dumps), the legacies of colonial extraction that defined the “Elusive Metropolis” were the precurvise logotype of the Apartheid city and of the Deep City: mining-dormitories and hostels (for African labourers who were to dig with pickaxe and hammer), a bureaucratic, highly ordered system of passbooks and papers to regulate and identify miners, while also used to limit their access to the white city - the city of gold - “Egoli” in isiZulu. The physical (geology and architecture) and the infrastructural (systems and processes) drew Apartheid’s map: both its planometric urban design reality of zones, districts and neighbourhoods and its vertical realities: the physical and non-physical processes of deep extraction and of colonial capitalism. Both of these conditions however are not seamless binaries of exclusion, but resulted rather in constant migrations and movements: “people moving between the fragments of their lives.” Water seeps from ground to earth, minerals and contaminants leech from rock and mining machines, miners move from daylight to underlands, money and capital move from transnational corporations to holding companies, banks and deposit boxes.

The South African architect, academic and writer, Lindsay Bremner, in Border/Skin writes:

Any attempts it [apartheid] made to draw boundaries were fluctuating, porous, and ill defined. Its most concerted attempts to do so—the establishment of “Bantustans” (or “homelands,” as they were otherwise known) as self-governing or independent black labor reserves for white industry or “townships” and as temporary accommodation for those

---

working in urban areas—produced nothing more than vague and constantly morphing blobs on land surveyors’ maps and an incessant migration of people moving between the fragments of their lives. Instead it was the countless instruments of control and humiliation (racially discriminatory laws, administration boards, commissions of inquiry, town planning schemes, health regulations, pass books, spot fines, location permits, police raids, removal vans, bulldozers) and sites of regulation and surveillance (registration offices, health clinics, post offices, recruitment bureaus, hostels, servants rooms, police cells, courtrooms, park benches, beer halls) that delineated South African society during the apartheid years and produced its characteristic landscapes.⁵

Keeping the city *white* was paramount. Miners and labourers lived and were forced to live, settled, and were re-settled, near mines, with the constant swirl of mine-dust onto clothes, into mouths and into lungs. The artist and writer Heather Davis writes that:

> Every time we breathe, we pull the world into our bodies: water vapor and oxygen and carbon and particulate matter and aerosols. We become the outside through our breath, our food, and our porous skin. We are composed of what surrounds us. We have come into existence with and because of so many others, from carbon to microbes to dogs. And all these creatures and rocks and air molecules and water all exist together, with each other, for each other. To be a human means to be the land and water and air of our surroundings. We are the outside. We are our environment.⁶

The earth itself becomes weaponized. Particles of quartz and sedimentary rock are now dust, in the air, in lungs, on clothes, a constant drape of aerosolised earths and contaminants over those who must live and work in the swirls and vortices of this re-constituted ground/air, away from the shaded and green landscapes of white only gated suburbs: Rosebank, Hyde-Park and other leafy environs.

This is a studio about the ground and about our relationship to it, through the minerals and elements we pull out of it, to the water table that rushes to fill the voids we leave, through the equipment and infrastructure that we use to pump that water out, to dig those tunnels deeper, to move us in and through the killing dark. It is a studio through and with the particles of gold and acid in our lungs; the scars on the earth in tailings ponds and overburden piles and crushers, excavators, dynamite. It is a studio situated in the hyper-flows of money and capital in and through banks and stock-markets and safety deposit boxes and off-shore-bank accounts; through the architecture and spaces created by resource extraction itself: The Johannesburg Chamber of Mines Building, the global headquarters of De Beers in Ormonde (designed by VDMMA - local architects also responsible for the Zeitz MOCCA, with Thomas Heatherwick, in Cape Town), and so on, as far as one is willing to go.

The structures and tools of extraction are myriad and multi-scalar, and this studio investigates the productive and critical roles and positions that representation - that is, image making, and architectural (read: spatial) image-making in particular - can take on in this context. How do we “build” drawings that help uncover, identify, and propose reconciliatory relations, that enable an ethical reclamation of architectural grounds?

After all, Johannesburg was built on gold and diamonds. And it was built by, with and on the bodies of the miners who moved through - and continue to move in - the deep dust and the killing dark.

---

⁵ ibid.

ASSIGNMENTS + PROJECTS

There are 3 [distinct] assignments in this studio, and a 4th that overlaps with Assignments 01, 02 and 03.

Assignment 00: LOCALITIES

Each of you will be assigned a photograph by the South African Photographer, Santu Mofokeng to investigate, sit-with, and explore, over the course of the studio, producing 5 micro-drawings as part of each of the major assignments - resulting in 15 micro-drawings by the end of the term. The micro-drawings are keyed to studio days, and are indicated in the schedule below with the notation MD1, MD2, MD3, and so on.

These micro-drawings (each is 7.5 inches long by 5 inches high, centred in portrait format on an 8.5 x 11 sheet of paper) are meant to serve as immediate and local counterpoints to the meta-scale of the maps; as intimate and textured counter-drawings to the Atlas, and as an affirmation of the human scale of your final Deep Section. Where Assignment 01 and 02 ask you to consider large scales (the geologic, the infrastructural and so on), the Localities Project looks to bracket that scale with a closer, fine-grained, blurred (but not imprecise) series of reflections, musings and thoughts. Here, you can and should review the work of the South African artist, William Kentridge as a muse for this running assignment.

These localities drawings should be contextualised by the work of the photographer, by the associated relationships that you uncover from your readings and interpretations of them, by your dive into the world of the image. Each micro-drawing must be in graphite, charcoal (including their dusts), and/or other mono-tone particle based media that you opt to work with. Does it record your fingerprints? Eraser marks? Do you mask the drawing with frisket or masking fluid? Do you cut through the paper? The localities project is way to foreground the analogue as a constant zone in the studio work. The Micro-drawings are a way to develop a daily habit of intense study on a single image as a space of immediacy and humanity.
Assignment 01: SEEING, AKA Maps (3 maps + MD1-5, due: January 13th)
Begin with critical and exploratory research of and about Johannesburg - particularly its geological and founding histories. Readings will be regularly assigned and will form an essential part of our desk-critiques and project development.

This is a studio that focuses on the earth(s) beneath our bodies, cities and our daylight-bathed architectures, and so, the physical material and matter of the ground (its expression in and through drawings) are a required part of the mappings due at the end of this assignment. In your mapping research: consider, study and be inspired by geological drawings, geo-languages and geo-terminologies (a glossary is appended to the end of this text); geo-imagery and geo-imaginations...

Consider the earth, ground, mineral, environmental, labour and geologically based implications of this focus. You may situate your maps at any point in Johannesburg's time or history. You may elect to produce three different maps, each exploring a particular topic or curiosity of your interest, or you may pursue a theme across all three maps, testing out ideas at multiple scales or time-zones or consequences.

Do you map the politics and implication of labor? The movements of minerals and materials? Do you map wind patterns of aerosolised dust and sand and earth? Do you produce a many-temporalized map of Johannesburg's mining infrastructure through its ages? The movement of capital? Of industrial exchange?

Given the context of our studio - the "underland" as described by Robert Macfarlane, the “Frightened land” as described by Jennifer Beningfield, the "disreferred land" as described by William Kentridge, or the “underbelly" as expressed by Douglas Darden, please note that this is not just representation or imaging, but the active transformation and interpretation of information into the following deliverables:

Deliverables:
Each student will produce 3 maps (standard size across the studio group: 18 x 24” each). Maps can be oriented either in landscape or portrait format, but must engage with the questions, language and cartography of geology and depth, of mining and its discontents, of seams, reefs, inclines, overburden, tailings ponds, strata, acid mine-water drainage, excavating, depositing, pumping, crushing, sorting, labor, textures... What might the Witwatersrand range, with its quartz and metamorphic rocks, its banded ironstone and lava, suggest as something to explore, to study? Be careful and deliberate in thinking of the map as a medium and as a delivery system with particular ontologies and epistemologies. What does this map communicate in its expression? What does it exclude or include? Does it have a frame? A legend-why? A north arrow? Does it have surveyor marks? Notational devices such as latitude/longitude, grid coordinates? Depth Markers? Indicators of topography? Is time referenced in the image? Maps, as James Corner, notes,

...present only one version of the earth's surface, an eidetic fiction constructed from factual observation. As both analogue and abstraction, then, the surface of the map functions as an operating table, a staging ground or a theater of operations upon which the mapper collects, combines, connects, marks, marks, relates...

"Mining Landscapes of the GCR" is an excellent pdf resource for Assignment 01 and is located in our shared Google folder (link to be provided at our first class).

---

Traces of historic extraction awkwardly intercept the city's freeways, human settlements, and ecological systems. 
https://scenariojournal.com/article/gold-mining-exploits/
Assignment 02: SYSTEMS, aka Machine Atlas (9 pages + MD6-10), Due February 3rd

Historical fact: people stopped being human in 1913. That was the year Henry Ford put his cars on rollers and made his workers adopt the speed of the assembly line. At first, workers rebelled. They quit in droves, unable to accustom their bodies to the new pace of the age. Since then, however, the adaptation has been passed down: we’ve all inherited it to some degree, so that we plug right into joysticks and remotes, to repetitive motions of a hundred kinds.8

The movements and excavations of, on, in, below and above the earth require augmentation through systems and machines; through processes and proxies. Our hands and basic tools however, are no longer enough for these kinds of extractive processes. Although we may still use sifting pans and metal detectors, picks and hammers, the scale of our extractions necessitate more and so we require proxies and processes beyond the simple: diggers, bucketwheels, excavators, smelting and processing infrastructures, conveyor belts, refining systems for gold, smelters, trucks, computers, pumps, lines and...

We need both the physical extension - the augmentative prosthetic that the tool affords our extended digging, sorting and carrying capacities - as well as the processual, spatial and infra-spatial augments of markets and events (the wedding, the anniversary, the "gift"...) Our machines and tools of extraction are also flows of capital and ideas, particularly in this odd project of the Anthropocene. The understandings of the many grounds and earths of the first assignment are to be contextualised by the tools and machines (broadly, critically and creatively understood) that characterise the functions, toolpaths (ways in which the tools move physically - the marks, radii, carrying capacities, limits) of the processes and proxies that engage/interrupt/extend the ground.

Using Theo Deutinger’s Handbook of Tyranny as a prompt, this next project is the development of a studio-wide machine-atlas: a compilation of the tools, systems and infrastructures deployed in service of mobilizing (and moving) earth materialities. The studio will generate - using a standard template of representation (technical line-drawings of machines, their relevant plans, elevations or perspectives, always in conversation with a standard human scale figure) the Machine/Tool Atlas. Each image should include indications of capacity (how much stuff, or volume, can this thing carry, move, shift?); an articulation of its range of motion (like the indicated swing of a door in plan, or the arm of the Hitachi ZAXIS drawing by Deutinger); its scale (the varied kinds of shoring strategies to retain earth, or to hold up mining tunnels); its velocity or speeds (elevator cages or conveyor belts…). The template will be uploaded to our Google folder.

Interpret and challenge the term “Machine” and “Tool,” for this exercise. Other, perhaps unconventional examples of machines and tools may include the following: A bank teller’s kiosk, an ATM, a diamond ring, a Stock Exchange, a local commodities market, a safety deposit dox, gold-leaf appliqué tools; the mine’s human resources book... More conventional (and important) tools could be: hammers, buckets, dredge machines, slurry pumps, tailings pond membranes, conveyor belts, dormitory rooms, lockers for mining equipment, for a miner’s clothes, a breathing unit, a gas-mask, a flashlight, the physical infrastructure of refining equipment... Machines and Tools (as processes) could include more “meta” level definitions of the term. What is an ideological (geological) tool? An epistemological (geological) tool? A (geologic) ontological tool?

Deliverables:
Each student in the studio, in dialogue with the studio at large, will produce 9 sheets (11 x 17”) that articulate 9 tools (both proxies and processes); tools can be described over multiple sheets if needed. InDesign templates for the tool sheets have been uploaded to our shared google drive. Each student will standardise their respective sheet set. All drawings should be oriented in landscape format.

8 Jeffrey Eugenides. Middlesex (Toronto: Vintage Canada, 2003), 93.
Assignment 03: Mine (1 drawing + Short text + MD11-15, Final Review on February 25th/26th TBD)

Assignment 3 is a synthesis, extension and (depth) projection of Assignments 01 and 02. Each student will propose a critical conceptual, architectural program of inhabiting (“filling”) the “cut,” the seam, the reef, the cavity, the void, the pocket, the chamber, the ground.... Visually Inspired by Douglas Darden’s “Condemned Building: An Architect’s Pre-Text,” and William Kentridge’s process of thinking through a changing landscape, each student will develop a mine drawing as an architectural proposition for moving in and out of the ground on a mining site (of your choosing) in Johannesburg. This architectural proposition is a spatial response to above grade, at-grade, below-grade inhabitations. Douglas Darden’s pre-text was, with his drawings in the Condemned Building series, to invert the canon, which is analogous to this studio’s position on reclaiming the material - and matter of - the earth. Darden’s titled drawings in this series were inversions of a particular canon or assumptive way of thinking. In the “Musem of Impostors” for example, where the canon was “Architecture posits the authentic,” Darden’s drawing asserted, rather, that “Architecture posits the fake.” Where the canon was “a house is for living,” the inverted dictum in his “Oxygen House,” declares rather, that “a house is for dying.” What is your mine? What is the canon that it inverts?

You may use your maps as provocations and prompts and the Machine Atlas as an open-source toolkit of possible programs and spatialized interventions that engage with the critical themes of the studio - and in particular, the intellectual frameworks offered by our many studio muses: William Kentridge, Jennifer Beningfield, Lindsay Bremner, Mary Sibande,, Pamela Sunstrum, AbdouMaliq Simone, Sarah Nuttall, Achille Mbembe, Guy Tillim, Billie Zangewa, Durant Sihlali, Santu Mofokeng, and by our affiliated readings, films and contexts noted the optional reading/viewing lists. You may employ multi-scalar methods of working, inspired again by Douglas Darden's process of "Dis/continuous genealogies," where 4 overlaid inspirational images formed the essential basis of the design that followed. Each project will be thoughtfully reflective, and must articulate a position. While polished drawings are expected, drawings should also unsettle, pose questions and relate a narrative. Tell us an architectural story about the ground. Your source material is the studio work to date and the intellectual and theoretical grounding of the work in response to the stated studio themes. Your drawings are acts of construction as well as representation, agents of change as well as narrative images.

Deliverables:

(A) 1 Deep Drawing, an architectural section (37 inches wide, max; by 60 inches long - max of 72 inches). This drawing is to be a rendered, grey-scale architectural section. This drawing may, of course, include elevational aspects. No colour is allowed except to represent gold, silver, or bronze appliqué for seams and mineral deposits/depositions, and appropriate colours for water/acid-mine-water and contaminants. You can and should strategically employ geo-imaging visual language as needed to contextualise your drawings. You can, and should, strategically deploy machines and tools (and where appropriate, their toolpaths and temporal stations); proxies and processes, systems and inhabitants.

(B) 1 short abstract text of 300 words with (1) an informative title, and (2) a clear description that says what you designed, and the prompt, provocation and context for your proposal. A template will be provided for the text. Each of you will have a Figma space assigned for set up (see Page 16 for layout).
WEEK 01

Readings:

- James Corner: The Agency of Mapping (1-21)
- Tom Burgis: The Looting Machine (Introduction, 1-8)
- Simon Njami: A Silent Solitude
- Patricia Hayes: Santu Mofokeng, Photographs: the Violence is in the Knowing (Article)

CLASS 01: Monday, January 11th, 2021
- Class Introduction: Syllabus overview, Project Introduction and student introductions
- Project 01 issued: SEEING / Map
- MD1

CLASS 02: Wednesday, January 13th, 2021
- 3:00-5:30: Desk critiques
- MD2

CLASS 03: Friday, January 15th, 2021
- 1:30-3:45: Desk Critiques
- 4:00-5:00: Reading Discussion (01)
- MD3

WEEK 02

Readings:

- Lindsay Bremner, Buildings are Geological Agents (14pp)
- Lindsay Bremner, Border/Skin (8pp)
- Tom Burgis: The Looting Machine, Chapter 9 (209-218)

CLASS 04: Monday, January 18th, 2021
- 1:30-5:30: Desk Critiques
- MD4

CLASS 05: Wednesday, January 20th, 2021
- Project 01 Reviews: SEEING Critics: Piper Bernbaum, Connor O’Grady
- Project 02 Issued: SYSTEM/ATLAS
- MD5

CLASS 06: Friday, January 22nd, 2020
- Long Weekend (1 of 2)

WEEK 03

Readings:

- Achille Mbembe, Aesthetics of Superfluity (Article)
- Jason Larkin, After the Mines (Essays + Photo-essay)
- Nadine Gordimer: The Witwatersrand: A Time and Tailings
- (Optional) John Peffer, Art at the End of Apartheid (Chapter 9)

CLASS 07: Monday, January 25th, 2020
- 1:30-5:30: Desk Critiques
- MD6

CLASS 08: Wednesday, January 27th, 2020
- 1:30-5:30: Desk Critiques
- MD7

CLASS 09: Friday, January 29th, 2020
- 1:30-3:30: Twin Lecture: Heinrich and Ilze Wolff (Cape Town)
- HW: Mining Architecture (Title TBD)
- IW: Landscapes of Erasure/Removal
- 4:00-5:00: Reading Discussion (02)
- MD8
SCHEDULE, continued

WEEK 04

- Reference: Douglas Darden: Condemned Buildings
- Burkholder and Lustky: Curious Methods

CLASS 10: Monday, February 1st, 2020
- 1:30-5:30: Desk Critiques
- MD9

CLASS 11: Wednesday, February 3rd, 2020
- 1:00-5:00: Project 02 Reviews: SYSTEMS
  Critics: Heinrich and Ilze Wolff, Mpho Matsipa + Piper Bernbaum
- Project 03 Issued: SENSING/MINE
- MD10

CLASS 12: Friday, February 5th, 2020
- Long Weekend (2 of 2)

CLASS 8th: Monday, February 8th, 2020
- 1:30-5:30: Desk Critiques
- MD11

CLASS 10th: Wednesday, February 10th, 2020
- 1:30-5:30: Desk Critiques
- MD12

CLASS 12th: Friday, February 12th, 2020
- 1:30-3:45: Desk Critiques
- 4:00-5:00: Reading Discussion (03)
- MD13

WEEK 05


CLASS 8th: Monday, February 8th, 2020
- 1:30-5:30: Desk Critiques
- MD11

CLASS 10th: Wednesday, February 10th, 2020
- 1:30-5:30: Desk Critiques
- MD12

CLASS 12th: Friday, February 12th, 2020
- 1:30-3:45: Desk Critiques
- 4:00-5:00: Reading Discussion (03)
- MD13

READING WEEK

- Robert McFarlane: Underland
- Film 01: District 9 (2009), Directed by Neil Blomkamp

WEEK 06

CLASS 13: Monday, February 22nd, 2020
- 1:30-5:30: Desk Critiques (by Sign-up)

CLASS 14: Wednesday, February 24th, 2020
- 1:30-5:30: Final Production

CLASS 15: Friday, February 26th, 2020
- 1:00-5:00: Final Review
  Critics: Heinrich + Ilze Wolff, Thiresh Govender, Mokena Makeka, Jenn Low, Jill Stoner

NO CLASSES - FEBRUARY 15TH-19TH

READINGS + AFFILIATED SOURCES
A Google folder has been set up for the studio with access to these readings, as well as to additional texts and links that you may find useful in your research. Please populate the appropriate folder with texts, images and links that might be beneficial for the studio at large. The readings are an essential part of the studio. They will provide additional context as well as open up new avenues for exploration, thinking and making.
SCARP: An escarpment, or beastledge, is a steep slope or long cliff that forms as a result of faulting or erosion and separates two relatively level areas having different elevations. Usually scarp and scarp face are used interchangeably with escarpment. Scarps are generally formed by one of two processes: either by differential erosion of sedimentary rocks, or by movement of the Earth’s crust at a geologic fault. The first is the more common type: the escarpment is a transition from one series of sedimentary rocks to another series of a different age and composition. Escarpments are also frequently formed by faults. When a fault displaces the ground surface so that one side is higher than the other, a fault scarp is created. This can occur in dip-slip faults, or when a strike-slip fault brings a piece of high ground adjacent to an area of lower ground. A fault scarp is a small step or offset on the ground surface where one side of a fault has moved vertically with respect to the other. It is the topographic expression of faulting attributed to the displacement of the land surface by movement along faults. They are exhibited either by differential movement and subsequent erosion along an old inactive geologic fault (a sort of old rupture), or by a movement on a recent active fault.

FAULT: In geology, a fault is a planar fracture or discontinuity in a volume of rock across which there has been significant displacement as a result of rock-mass movement. Large faults within the Earth’s crust result from the action of plate tectonic forces, with the largest forming the boundaries between the plates, such as subduction zones or transform faults. Energy release associated with rapid movement on active faults is the cause of most earthquakes.

SEDIMENTARY ROCKS are types of rock that are formed by the accumulation or deposition of small particles and subsequent cementation of mineral or organic particles on the floor of oceans or other bodies of water at the Earth’s surface.

REEF: A “reef” is another term for a vein of some mineral or ore, and has nothing to do with biological reefs (bioherms), such as coral reefs. Quartz is one of the most common minerals in the earth’s crust, and most quartz veins do not carry gold, but those that have gold are avidly hunted by prospectors.

VEIN: In geology, a vein is a distinct sheetlike body of crystallized minerals within a rock. Veins form when mineral constituents carried by an aqueous solution within the rock mass are deposited through precipitation. The hydraulic flow involved is usually due to hydrothermal circulation. Veins are classically thought of as being the result of growth of crystals on the walls of planar fractures in rocks, with the crystal growth occurring normal to the walls of the cavity, and the crystal protruding into open space. This certainly is the method for the formation of some veins. However, it is rare in geology for significant open space to remain open in large volumes of rock, especially several kilometers below the surface. Thus, there are two main mechanisms considered likely for the formation of veins: open-space filling and crack-seal growth. In many gold mines exploited during the gold rushes of the 19th century, vein material alone was typically sought as ore material in most of today’s mines, ore material is primarily composed of the veins and some component of the wall rocks which surrounds the veins. The difference between 19th-century and 21st-century mining techniques and the type of ore sought is based on the grade of material being mined and the methods of mining which are used. Historically, hand-mining of gold ores permitted the miners to pick out the lode quartz or reef quartz, allowing the highest-grade portions of the lodes to be worked, without dilution from the unmineralised wall rocks. Today’s mining, which uses larger machinery and equipment, forces the miners to take low-grade waste rock in with the ore material, resulting in dilution of the grade. However, today’s mining and assaying allows the delineation of lower-grade bulk tonnage mineralisation, within which the gold is invisible to the naked eye. For this reason, veins within hydrothermal gold deposits are no longer the exclusive target of mining, and in some cases gold mineralisation is restricted entirely to the altered wall rocks within which entirely barren quartz veins are hosted.

LODE: In geology, a lode is a deposit of metalliferous ore that fills or is embedded in a fissure (or crack) in a rock formation or a vein of ore that is deposited or embedded between layers of rock. The current
meaning (ore vein) dates from the 17th c - an expansion of an earlier sense of a “channel, watercourse” in late Middle English, which in turn is from the 11th-century meaning of lode as a ‘course, way’.

ORE is natural rock or sediment that contains desirable minerals, typically metals, that can be extracted from it. Ore is extracted from the earth through mining and refined, often via smelting, to extract the valuable element or elements. The grade of ore refers to the concentration of the desired material it contains. The value of the metal an ore contains must be weighed against the cost of extraction to determine whether it is of sufficiently high grade to be worth mining. Metal ores are generally oxides, sulfides, silicates, native metals such as copper, or noble metals such as gold. Ores must be processed to extract the elements of interest from the waste rock. Ore bodies are formed by a variety of geological processes generally referred to as ore genesis.

SEAM: In geology and related fields, a stratum (plural: strata) is a layer of sedimentary rock or soil, or igneous rock that was formed at the Earth’s surface, with internally consistent characteristics that distinguish it from other layers. The "stratum" is the fundamental unit in a stratigraphic column and forms the basis of the study of stratigraphy. A stratum can be seen in almost every single country in the world.

PLACER MINING: Placer mining is the technique by which gold that has accumulated in a placer deposit is extracted. Placer deposits are composed of relatively loose material that makes tunneling difficult, and so most means of extracting it involve the use of water or dredging.

PANNING: Gold panning is mostly a manual technique of separating gold from other materials. Wide, shallow pans are filled with sand and gravel that may contain gold. The pan is submerged in water and shaken, sorting the gold from the gravel and other material. As gold is much denser than rock, it quickly settles to the bottom of the pan. The panning material is usually removed from stream beds, often at the inside turn in the stream, or from the bedrock shelf of the stream, where the density of gold allows it to concentrate, a type called placer deposits. Gold panning is the easiest and quickest technique for searching for gold, but is not commercially viable for extracting gold from large deposits, except where labor costs are very low or gold traces are substantial. Panning is often marketed as a tourist attraction on former gold fields. Before large production methods are used, a new source must be identified and panning is useful to identify placer gold deposits to be evaluated for commercial viability.

SLUICING: Using a sluice box to extract gold from placer deposits has long been a very common practice in prospecting and small-scale mining. A sluice box is essentially a man made channel with riffles set in the bottom. The riffles are designed to create dead zones in the current to allow gold to drop out of suspension. The box is placed in the stream to channel water flow. Gold-bearing material is placed at the top of the box. The material is carried by the current through the volt where gold and other dense material settles out behind the riffles. Less dense material flows out of the box as tailings. Larger commercial placer mining operations employ screening plants, or trommels, to remove the larger alluvial materials such as boulders and gravel, before concentrating the remainder in a sluice box or jig plant. These operations typically include diesel powered, earth moving equipment, including excavators, bulldozers, wheel loaders, and rock trucks.

HARD-ROCK MINING: Hard rock gold mining extracts gold encased in rock, rather than fragments in loose sediment, and produces most of the world’s gold. Sometimes open-pit mining is used, such as at the Fort Knox Mine in central Alaska. Barrick Gold Corporation has one of the largest open-pit gold mines in North America located on its Goldstrike mine property in north eastern Nevada. Other gold mines use underground mining, where the ore is extracted through tunnels or shafts. South Africa has the world’s deepest hard rock gold mine up to 3,900 metres (12,800 ft) underground. At such depths, the heat is unbearable for humans, and air conditioning is required for the safety of the workers. The first such mine to receive air conditioning was Robinson Deep, at that time the deepest mine in the world for any mineral.
David Goldblatt (South Africa): Gang on Surface Work, Rustenburg Platinum Mine, South Africa (1971)
EVALUATION + GRADING
1. Assignment 00 15%
2. Assignment 01 20%
3. Assignment 02 20%
4. Assignment 03 35%
5. Reading Discussions 10%

For the grade in the "A" range, the instructor will have judged the student to have satisfied the stated objectives of the course in an outstanding to excellent manner; for the "B" range, in an above average manner; for the "C" range, in an average manner with C- being the lowest acceptable grade in the BAS - Design Core courses; for the "D" range, in the lowest acceptable manner in non-Core courses, and for "F", not to have satisfied the stated objectives of the course. Grades will be assigned as A+ (90-100%), A (85-89%), A- (80-84%), B+ (77-79%), B (73-76%), B- (70-72%), C+ (67-69%), C (63-66%), C- (60-62%), D+ (57-59%), D (53-56%), D- (50-52%), F (0-49%) and ABS. Each grade will be based upon a comparison (1) with other students in the course and/or (2) with students who have previously taken the course and/or (3) with the instructor’s expectations relative to the stated objectives of the course, based on his/her experience and expertise. Refer to the Graduate Calendar for regulations concerning grades and other program requirement information: http://calendar.carleton.ca/grad/.

COURE LEARNING OBJECTIVES
As an advanced options studio, this course will expect students to draw thoughtful, creative, novel and critical connections between architecture, landscape and geo-critical thinking. Learning objectives for the course include the following:

1. To situate, emphatically, the intersection, always, of architecture with spatial politics, spatial equity and spatial, environmental and social justice.

2. To develop and refine critical and conceptual skills in advanced graphic representation through the crafted and rigorous development of architectural drawings. These skills include: the ability to develop and pursue a methodology of construction (assembling the drawing), of representation (the craft of the drawing) and agency (the communicative capacity of the drawing).

3. To investigate, synthesize, and integrate relevant site, historical and theoretical research into a critical position on architecture and its relationship to site and landscape through studio drawings; to do this in part through an engaged multidisciplinary effort that works across the disciplinary boundaries of architecture and landscape.

4. To establish a critical framework in which a student can position and develop their own design/research interests and agendas, in relation to the stated themes and problems of this half of the Divided Cities Studio studio. For the Deep Dust/The Killing Dark Studio, this is tied to Johannesburg as a site, and to drawing as a method of inquiry; To (re)locate spatial explorations of architecture, landscape and drawing in a broader terrain of ideas, socio-cultural, non-western, and politico-historical and contemporary circumstances.

5. To articulate their critical positions on drawing, site and studio themes through drawing, weekly desk-critiques and final project reviews.

6. To demonstrate the development and refinement of stated and investigative positions through evidenced, interactive work, making, drawing prototyping.

7. To develop and refine critical and conceptual spatial responses to the stated themes of the studio in described assignments; to position architectural design/research (through multiple modes of drawing: mapping, technical drawing and narrative constructions) as a mode of intellectual and spatial inquiry.
ACADEMIC ACCOMMODATION
You may need special arrangements to meet your academic obligations during the term because of disability, pregnancy or religious obligations. Please review the above course outline carefully. Should you require special accommodation, please contact the course instructor during the first two weeks of classes. In cases where the need for accommodation develops during the term, please contact course instructor promptly. Reviewing each request and arranging accommodations where necessary takes time: your cooperation is appreciated. Please make sure to respect the above notification timelines, particularly for in-class tests, midterms and final exams, as well as any change in due dates for assignments. For more detailed information on the University's academic accommodation policies students may visit the Equity Service website. http://carleton.ca/equity/accommodation.

As a community, Carleton University is committed to maintaining a positive learning, working and living environment where sexual violence will not be tolerated, and where survivors are supported through academic accommodations as per Carleton’s Sexual Violence Policy. For more information about the services available at the university and to obtain information about sexual violence and/or support, visit: www.carleton.ca/sexual-violence-support

Carleton University recognizes the substantial benefits, both to the individual student and for the university, that result from a student participating in activities beyond the classroom experience. Reasonable accommodation must be provided to students who compete or perform at the national or international level. Please contact your instructor with any requests for academic accommodation during the first two weeks of class, or as soon as possible after the need for accommodation is known to exist. For more details, see: https://carleton.ca/senate/wp-content/uploads/Accommodation-for-Student-Activities-1.pdf

Knowing and applying the names and pronouns that students wish to use is a crucial part of developing a productive learning environment that fosters inclusion, and personal dignity. Please let me know if you have a preferred name or pronouns which you would like to share with me, and which you would like me to use. Please do so at any time during the course and note that our student records indicate legal names used on admission to the program. My intention is to create a classroom that is conducive to everyone’s learning. Along with the expectations for coursework, I have an expectation that we will treat each other with respect and collegiality, and that we will be open to conversations and perspectives that challenge our perspectives.

ACCESSIBILITY
Students with disabilities requiring academic accommodation in this course must register with the Paul Menton Centre for Students with Disabilities (PMC) for a formal evaluation of disability related needs. Documented disabilities could include but are not limited to mobility/physical impairments, specific Learning Disabilities (LD), psychiatric/psychological disabilities, sensory disabilities, Attention Deficit Hyperactivity Disorder (ADHD), and chronic medical conditions. Registered PMC students are required to contact the PMC, 613-520-6608, every term to ensure that course instructor receives your Letter of Accommodation no later than two weeks before the date of first assignment hand-in or in-class test. If you only require accommodations for your formally scheduled exam(s) in this course, please submit your request for accommodations to PMC by the deadlines published on the PMC website: http://www2.carleton.ca/pmc/new-andcurrent-students/dates-and-deadlines/

ACCREDITATION AND PROFESSIONAL EXPERIENCE
In Canada, all provincial associations recommend a degree from an accredited professional degree program as a prerequisite for licensure. The Canadian Architectural Certification Board (CACB), which is the sole agency authorized to accredit Canadian professional degree programs in architecture, recognizes two types of accredited degrees: the Bachelor of Architecture and the Master of Architecture. A program may be granted a five-year, three-year, or two-year term of accreditation, depending on its degree of conformance with established educational standards. Master degree programs may consist of a pre-professional
undergraduate degree and a professional graduate degree, which, when earned sequentially, comprise an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree. Student Performance Criteria, as defined in the most current CACB Accreditation requirements are as follows


D: Comprehensive Design: D1. Comprehensive Design

E: Professional Practice: E1. The Architectural Profession; E2. Ethical and Legal Responsibilities; E3. Modes of Practice; E4. Professional Contracts; E5. Project Management

Specifically, this course meets the following criteria: A1, A2, A3, A5, A8, B1, B2, B3, B4

ZOOM ATTENDANCE
Attendance during noted course hours is mandatory and an essential part of a student’s contract with the School and their instructor. It is a student’s responsibility to be informed of decisions and announcements made during these hours.

COPYRIGHT
Student or professor materials created for this course (including presentations and posted notes, labs, case studies, assignments and exams) remain the intellectual property of the author or authors. These resources are intended for personal use and may not be reproduced or redistributed (e.g. on websites such as Course Hero) without prior written consent of the author or authors.

E-MAIL POLICY
E-mail is not a substitute for meeting with the course instructor. Schedule an appointment, come by during office hours, or speak to the instructor during the course break. E-mail is not a good format for lengthy discussions about course-work, assignments, or readings. E-mail is a formal record of instructor and student conversation so please be mindful of language and tone. I will try to respond to course related e-mails as quickly as possible but within reason - and usually within 48 hours.

RETENTION OF WORK
The School requires that each student document their term’s work with high resolution scans of manual drawings, photographs of models, and saved files of work produced digitally. The following will be required at the end of the semester:

- A well organized digital folder containing all produced course writings, as well as:
  - Individual full scale (18x24” 300 DPI .jpg and .pdf) and reduced scale (9x12” 150 DPI .jpg and .pdf) files of each Map panel from Assignment 01
  - Individual full scale (11 x 17” 300 DPI.jpg) files of the each page from your Machine-Atlas
  - A combined, flattened pdf of your Machine-Atlas Pages
• Individual full AND reduced scale images of your Deep Section drawing from Assignment 03 (as jpg and pdf), as well as Individual full scale (11 x 17" 300 DPI.jpg) files of your site plans + plans + a word copy of your project text.
• Individual images of each of your micro-drawings (scanned at full-size, 300 DPI)

All material should be submitted via e-mail to the instructor through a we-transfer link. This is due on Friday, March 5th at noon. The School reserves the right to use the images for the following: retrospective exhibitions of work, accreditation, publications and references for pedagogic purposes. Original work is the property of the students, but the School retains the right to keep work of merit for up to two years after the date of submission. The School will make every effort to preserve the work in good condition, and will give authorship credit and take care of its proper use.

STUDENT CONDUCT
Please refer to https://calendar.carleton.ca/grad/gradregulations/administrationofthereregulations/#11 for information regarding academic standards. Familiarise yourself with the Academic regulations: https://calendar.carleton.ca/grad/gradregulations/

ACADEMIC INTEGRITY
The University Senate defines plagiarism as “presenting, whether intentionally or not, the ideas, expression of ideas or work of others as one’s own.” This can include:

• reproducing or paraphrasing portions of someone else’s published or unpublished material, regardless of the source, and presenting these as one’s own without proper citation or reference to the original source;
• submitting a take-home examination, essay, laboratory report or other assignment written, in whole or in part, by someone else;
• using ideas or direct, verbatim quotations, or paraphrased material, concepts, or ideas without appropriate acknowledgment in any academic assignment;
• using another’s data or research findings;
• failing to acknowledge sources through the use of proper citations when using another’s works and/or failing to use quotation marks;
• handing in “substantially the same piece of work for academic credit more than once without prior written permission of the course instructor in which the submission occurs.

Plagiarism is a serious offence that cannot be resolved directly by the course’s instructor. Penalties are not trivial. They can include a final grade of "F" for the course, withdrawal from the course, suspension from the program of study. Please see the Academic integrity link here: https://carleton.ca/registrar/academic-integrity/

STEWARDSHIP
Architecture, urbanism and conservation are about stewardship, awareness, and thoughtful habitation. Even though we are away from the building due to COVID-19, please exercise consideration for the physical and social environment around you. Although we will not be in the building for our studio, if you need to go into the building (after obtaining all the necessary approvals, permissions and COVID-19 clearances as indicated by FED and the university), we ask you to respect custodial staff and their mandate to clean the building's public spaces only (and not the studios). To demonstrate that you've fully read the syllabus and for extra points, e-mail me a picture of cat before noon tomorrow.
SECURITY AND SAFETY
For your health and safety and in keeping with the School’s commitment to environmental stewardship, the School insists on responsible practices when in our building, including care and safety with tools, materials and assembly. Although we will not be in the building for our studio and conducting our classes online, Please do be careful when working at home, as well!

- No Smoking
- No Flammable or Combustible Solvents, Paints, Gases or other Products
- No Aerosol or Pressurized Containers
- No Power Tools (except as authorised and approved for use in the shop an assembly rooms)
- No Soldering
- No Bicycles
- No Open Flames
- No Toxic Chemicals
- No Vandalism (as defined by the Municipality of Ottawa)
- Avoid Creating Tripping Hazards
- Avoid Creating Fire Hazards
- Keep Aisles, Walkways, Corridors, Doorways, Stairwells and Fire Hose Cabinets clear at all times
- Avoid Working Alone After Hours Avoid Creating Excessive Dust and Noise

For additional information, please refer to the Carleton Environmental Health and Safety website: http://www.carleton.ca/ehs/

REMOTE LEARNING AND COURSE LOGISTICS

OUT OF CLASS COMMITMENTS + WORKLOAD
There are no required outings or field trips for this studio. Typical studio expectations apply with respect to workload. The course has built in two long-weekends as an additional buffer space.

COURSE MATERIALS AND COSTS
Course costs will be limited to materials purchased for the Micro-Drawings (paper and drawing materials) Assignment, or for materials used in any analogue manipulations of project assignments, as well as the purchase of Robert McFarlane’s book: Underland. The expectation is that Assignments 1,2 and 3 will result in digital visualisation and drawings with no physical output. There will be no physical modelling in this studio. Students may be expected to document local sites (only under proper health and COVID-health guidelines) with camera-phones or cameras. Typical studio materials will be required - pens and pencils for sketching, notebooks and trace-paper for drawing. In-progress and final presentations will be conducted online, through zoom and FIGMA, and possibly, MIRO (if agreed upon by the studio group at our first meeting). You all have a membership to LinkedIn Learning - www.linkedin.com - (formerly lynda.com). This is an excellent site to find tutorials on software - including Creative Suite, Rhino and more. Rhino tutorials can also be found at: www.rhino3d.com. We will not be conducting software tutorials in our studio sessions. Readings will be uploaded as PDFs, or be publicly available, as will many of the films. Anything not publicly or freely available will be optional.

TEACHING STRUCTURE
- Course communication will primarily be through e-mail (either directly) or through e-mail. We will use your Carleton e-mail addresses. Please note that e-mail is an official record of communication between students, faculty and teaching assistants. You may wish to set up a WhatsApp, Telegram or Facebook chat for the studio.
- Zoom will be used for class meetings, guest lectures, and, in tandem with Figma (and possibly, MIRO) will be used for desk reviews and critiques. Please do ensure that you have accounts for Zoom and for Figma.
• The studio will share a Google Drive (you will be invited to the folder on the first day of class). This, will be a central repository for readings, reference material, syllabi, assignments, templates. Important: we will have sign-up sheets on google drive for desk reviews. We will share zoom links here, and will be using Google Sheets and Google Docs.
• You will be asked to upload final assignment deliverables to our Google Drive for grading and for sharing as a studio.
• Please do NOT share our google drive link or course materials with anyone outside the class. As we are remote-learning this year, I would like to make sure that we observe good protocols in protecting your work and intellectual property.

GRAPHIC + TEXTUAL RESOURCES

IMAGES AND EYE-CANDY:
• Mapping: @act.of.mapping (Instagram)
• Eye Candy: The RIBA Presidents Medals (http://www.presidentsmedals.com/) // the Kenneth Roberts Memorial Delineation Competition (krobarch.com)

EQUITY BASED READING RESOURCES
• The Space/Race Reading List: https://docs.google.com/document/u/1/d/1p2GvScemyghCaQVkuA3fDTsgtprk7CPORyZv5-YUTkk/mobilebasic?usp=gmail
• Race/Architecture/Decolonization Design Resources (The Architecture Lobby - Toronto): https://docs.google.com/spreadsheets/d/1CUoiIFaGcBSWUP_fRaTL3ovDflM2UpaRTPyjzM08VTI/edit#gid=0
• The Decolonizing, or Puncturing or de-Westernizing Design Reader: https://bit.ly/DecolonizeDesign
• Decentering Whiteness in Design History Resources: https://bit.ly/decentering
• Harvard Library Race and Design: https://guides.library.harvard.edu/raceanddesign
• Harvard Library anti-racist List: https://guides.library.harvard.edu/antiracism/lists
• The Architectural League: https://archleague.org/article/the-architectural-leagues-statement-on-racial-justice/

*This syllabus is subject to change.