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+ the very beginning. The story of adam, the first human to be created by God. According to the story in Genesis Adam was created from soil and was ultimately destined to return to soil.

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+ The Hebrew word ‘Adam’ is closely related to the term ‘adamah’, which in Hebrew means ‘ground’ or ‘earth. For the ancient Hebrews to be human meant to be an ‘earthling’ or ‘from the ground’.

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+ Similarly, in the English language the word human is related to humus.
+ The human being A member of the primate genus Homo, especially a member of the species Homo sapiens.
+ And humus a dark, organic material that forms in soil when plant and animal matter decays.
+ Both in Hebrew and in English, that which defines the human most deeply is the derivation from the ground.

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+ The definition of Ground, with which I started this project, was quite simple.
+ The surface of the Earth.
+ This definition, however, opens further questions as to how thick this ‘surface of the earth’ is, and what lies beneath the surface that we don’t see from the top. The surface itself is comprised of layers. Layers of soil, layers of rocks, layers of gasses and liquids, each with a variety of properties and characteristics. (properties, variety, soil taxonomy)
+ considering the various layers, the Ground is defined by its elevations and depressions, which form the Ground into a distinctive terrain.
+ The Ground further relates to the Territory, a demarcation of a particular section of ground. This opens up themes as property, jurisdiction, governance. The attempt to control a piece of ground by an entity, which is not the ground.
+ And ultimately the Ground describes the planet, that we live in, as a whole. It is used synonymously with the term earth, which can refer to both a particular type of soil or the entirety of the planet.

Caleb Mehari. 2024.
Delft University of Technology
BORDERS & TERRITORIES
Graduation studio 23/24
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+ A term that incorporates all of these different facets of the Ground and more, has been described by Bruno Latour as ’the terrestrial’.

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+ The Terrestrial depicts an entity, which is no longer just a backdrop for human activity. However, the Terrestrial becomes itself a political actor which integrates into human activity.
+ The Territory is no longer just being occupied by the beings that live in it.
+ Now the Territory itself is acting and reacting to the entities that are occupying it., and influences decisions that are being made.
+ The Terrestrial describes a reality, where the roles of the living entities have merged into belonging to a territory, rather than owning it.

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+ This thinking towards the terrestrial, requires a certain change of perspective, in which we see earth.
+ The last centuries were all about exploring the vastness of the globe, and the perceived endlessness of its resources. [That applies to the global north at least]
+ Earth is typically depicted as a sphere floating in an endless universe.
+ In the age of the Terrestrial, the limits of this planet, however, become increasingly apparent.
+ The reactions and the language of the Ground are becoming clearer, which requires a progression of how earth is depicted.
+ This map flips what is inside the ground to the periphery, while the atmosphere is enclosed in the centre. Earth becomes a closed system. emphasising the understanding, that there is no other way but to deal with the Ground.

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+ so how do we deal with the Ground?
+ The questions that this project deals with are:

+ how do we deal with the Ground knowing it has become a political actor itself
+ how do we position ourselves as a human species towards this entity which is becoming more prominent in our lives?
+ Are there ways of communicating? since we are forced to interact with it, regarding that we are tied to its territory through gravity.

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+ the proposal of this project is to establish a diplomatic relationship with the Ground.
+ A diplomatic mission towards exploring potential common interests. Developing a common language to even start negotiating with it.

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+ the Ground of particular interest for this project is central Panama.
+ It is interesting since it is the narrowest stretch of land dividing the the Atlantic from the Pacific Ocean to form the Isthmus of Panama.

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+ The 80km wide stretch of land dividing the two Oceans was particularly interesting in the face of world trade and globalisation, which led to the construction of the Panama Canal in the early 1900s.
+ Panama City is located on the Pacific side, and Colon, a port city, on the Atlantic side, and the Canal in between linking the two sides of the Istmus.

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+ The Canal was constructed through heavy excavations and the displacement of Ground. In the late 1800s the French tried to build a canal by digging through the Istmus on sea level, to literally connect the two bodies of water of the Atlantic and the Pacific.
+ However they failed, due to the difficult terrain on the Pacific side and a lack of knowledge of the Ground properties, which led to landslides burying their equipment and workforce.

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+ In the early 1900s American engineers proposed a system of locks on each side of the canal, in order to reduce the extent of the excavations.
+ So the way that the canal works today is by flooding the Istmus to form an artificial lake, which is 26m above sea level. The three step lock system allows vessels to climb up to the canal level on one side, and down again on the other.

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+ There is a total of 18 lock chambers, 9 on each side. The Dam is located on the Atlantic side, damming the rainwater that flows into the artificial lake Gatun.
+ The narrow part of the canal is the Pacific Access Channel, which was the most challenging part during the canal construction, because of its difficult terrain.
+ It was also the most challenging part for the canal operations, since that was the area most vulnerable to (slope instabilities and) landslides.

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+ Looking at the geology of the Canal Area reveals the vast array of different rock and soil types, which made it challenging during the canal constructions to predict how the Ground would behave during the excavations.
+ It reveals how the Ground operates at a completely different time scale than the human. Some of the volcanic rock formations date back to over a 66 million years ago.

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+ The Ground of Panama, is one that is in continuous movement. There is a lot of tectonic activity in this area, which led to the formation of the isthmus.
+ According to the most recent studies, the land bridge emerged fairly recently, in geologic terms, about 20 million years ago.
+ These Ground movements can be traced when following the Fault lines.

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+ These Faults are traced through excavations to reveal the ground layers which have been displaced. Through the dating of the layers and a measurement of the displacement, the speed at which the Ground is moving can be estimated.
+ Some of the Faults, which are still active, like this one, show a displacement of Ground of up to five millimetres per year.

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+ These slow ground displacements lead to more sudden and quick bursts of earth movement like earthquakes and landslides.

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+ the landslides in particular were a major challenge for the Canal operations to run smoothly.
+ The frequent slides led to frequent interruptions and high costs for dredging the landmass out of the canal.
+ In the 1960s the Canal Authority formed a special Geologic Unit dedicated to mitigating these landslides.
+ Since the ground was highly unpredictable the solution was to implement measuring devices to constantly track Ground movements, and quickly react to whenever a certain speed limit was reached.

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+ All these heavy interventions into the landscape resulted in the emergence of a peculiar space in between the canal and the rain forest. As the ground was increasingly bleeding into the canal, this threshold space started growing, and had to be constantly monitored to prevent further land slides.

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+ This Ground model, which resulted from the Modi Operandi workshop last year, shows my interpretation of how this landscape was formed through a series of natural processes and highly engineered interventions. Especially the traces left by those interventions, in my opinion, create an interesting starting point. It was a starting point of this project. The question of How does one deal with these new landscapes, I think, was a base for new ideas.

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+ The Earth is not a fixed and natural décor, but a body being continually formed and transformed by the actions and reactions of all those who, be they living or nonliving, bring life to it. The Earth is a site of construction common to all material elements and living organisms. The Earth is an architecture.
+ An excerpt from the book ‘The Earth is an Architecture’, which I think emphasises the highly dynamic reality of Panamas Ground. this high level of dynamism however, is often not fully considered, since modernity has led to a very static understanding of space.

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+ the problem with the static is that it disregards the notion of time and all the movements and fluctuations and transformations, that come with it. The static conception of space is set in an absolute ontology of space, where space is a geometrically organised system. There is an absolute grid, with objects that are placed in it.

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+ Whereas actively considering the notion of time reveals all the inconsistencies and changes that come with it.

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+ To escape the confines of the static, one has to revisit the traditional understanding of the singular object. [The object in this case being the Ground of Panama, since it is being treated as such. As a thing rather than a being]

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+ The static understanding of the object starts to open up when the object is seen as a set of relations and forces.
+ Relations to to its immediate surrounding, to its own components and to other objects.
+ The object is no longer only defined by its external attributes, such as form and materiality.
+ These fields of relations can be described as architectures. Micro-architectures, when it comes to the relations within one object and macro-architectures referring to relations, that are larger than the object.

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+ The challenge that arises when considering the dynamism of each individual object is that the world becomes so complex and dense that understanding or grasping the totality of things becomes impossible.

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+ This is why looking at certain specific Key points becomes useful, in order to first grasp the complexity of selected specific points and then their large scale implications. The concept of Key Points describes these places of high density.
+ Gilbert Simondon, who introduced this concept describes them as certain privileged places and moments, which act as figures to the ground that they inhabit.

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+ The Key Points that I used as an entry point in Panama are the Canal Locks on the Pacific side of the Canal, as a way of approaching the complexity of the landscape.

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+ There are two types of locks. The Panamax locks, which were constructed by the Americans in the 1900s. And the Post-Panamax Locks, which were finalised in 2015 for the 100th anniversary of the Canal,

+ The Post-Panamax Locks are intended to accommodate larger vessel dimensions

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+ images showing the construction of the locks, which required a total of 240.000.000m3 of ground being moved.
+ Interventions of the human on the ground, which are reaching a level, that the geologic layer is being permanently affected.
+ So this disconnect of the geologic scale and the human scale are being bridged with the construction of the canal.

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+ here is another result of the modi operandi workshop. This model again reflects how the spaces in and around the canal were formed by holding and carving the ground

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+ returning to the idea of diplomacy, the question now is: how does a diplomatic relationship between the human and the ground start with a history such as in Panama?
+ it starts just like any other diplomatic mission. With an embassy. A designated space within the territory of the other entity, to start establishing communications. The intervention of this project can be understood as an embassy where the Ground, within the structure is assigned a diplomatic immunity.

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+ The main architectural gesture will be to enclose a space with the exact dimensions of one Post-Panamax lock chamber, which are 427m in length, 55m in width and 18m in height.

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+ The enclosed ground will remain untouched and immune of any further human intervention.

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+ The Embassy consists of three departments, which will be positioned outside of the enclosing.

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+ The inside of the enclosing will remain entirely fenced off, with the exception of visual connections from the three departments.

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+ the first department is the department of communications. This where a common language with the ground is explored and developed.

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+ second, the department of legal affairs is concerned with representing the legal rights and interests of the Ground.

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+ lastly the department of informal diplomacy, a space dedicated to further strengthen diplomatic ties in a more informal setting of a gala event.

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+ the site of this embassy will be on the pacific side of the canal, right next to the newly constructed Post-Panamax locks.

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+ The structure is shifted towards the ocean by the length of one lock chamber and will be the first structure which is seen from the ships when entering the canal or the last one, for the ships that are exiting.

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+ The reference to the lock dimensions are significant to the representative function of the embassy. Since the lock chambers are usually flooded, their actual dimensions are never really experienced spatially. By elevating the volume of a lock chamber from the Ground the embassy emphasises the amount of earth that had to be moved during the construction of the canal, especially considering there are a total of 18 lock chambers.

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+ The Department of Communications is concerned with developing a common language with the ground. The first step of the process will be trying to understand the ground thorough listening to or studying its physical, chemical and biological properties.

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+ This department is subdivided into three parts. A grid, which is laid out onto the landscape, where soil samples will be extracted from. These samples will be transported into the Laboratory, to be studied and analysed. For the duration of the study, the samples will be stored in a repository.
+ The rigid Grid will be laid out onto the planes in between the rainforest and the canal, which are already being monitored for landslide mitigation.

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+ As time passes the the grid slowly distorts, because of ground forces, thereby also distorting and tampering with the samples that are extracted.

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+ The assumption at this point is, that the moment the data which is extracted distorts, and becomes less comparable to previous samples. As soon as the human basically starts to loose absolute control over the information, that is being studied, that's when an understanding to the Ground is deepened

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+ The Grid will consist of concrete pillars inserted into the ground. These pillars will serve as long term measuring devices for ground movement themselves.
+ The concave shaped tips of the pillars will gather a certain amount of rain water, which will run over the tip as soon as the pillar slightly inclines, due to ground movement.
+ The resulting patina on the pillars will thereby reveal the ground forces of the site to be experienced by future humans.

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+ The samples which are extracted from the grid will be brought into the laboratory and loaded off.
+ A central elevator grants access into the top levels.

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+ The semicircle shaped half of the department is the repository, which can be accessed by vehicles from the inner corridor, for heavy loads, and the outer corridor can be accessed by the researchers.

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+ The whole department is closed off to its surrounding .The laboratory part is lit through a lighting shaft, whereas the repository has openings towards the enclosed space of the embassy.

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+ Next the department of legal affairs.
+ It is located on the head side of the embassy. An entrance space and three stare cases connect to the intermediary level.

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+ Which will serve as a lobby before going up into the plenary hall.

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+ The hall cantilevers into the enclosing and generously opens up towards it.

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+ The defendant of the ground will have the opportunity to stand on the border of the enclosing,

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+ speaking to the judges and the public while the ground is visible in the back.

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+ Lastly the department of informal diplomacy.

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+ It is a banquet hall , which spans the full length of the enclosing.
+ The hall can be entered on both ends. The guests are led along a narrow corridor, which is lit from the top, allowing the guests to experience the full hight of the enclosing.
+ The corridor leads to the dining hall with a 350m long banquet table. The kitchen is located in the centre, serving out food on both sides.

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+ The dining hall opens up to the enclosing along the full length of the table. The table is seated on one side only, facing the ground on the other.

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+ The lifespan of the embassy is intended to bridge the timescales of the human to that of the ground.
+ Similar to the Lock chambers, which were built to last a hundred years, the embassy is built as a monolithic concrete structure. The climate of the structure is regulated through passive measures in order to minimise the need for maintenance.

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+ The building mass is used to protect the interior spaces through a strategic placement of all glazed surfaces.
+ The building mass also allows the natural ventilation of the interior spaces through the use of wind towers and earth tunnels for fresh air supply. All openings use structural glass in a fixed stainless steel frame.

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+ Meanwhile the ground which is enclosed will have time to regenerate along the lifespan of the embassy. Tropical Soil will regain 90% of its fertility after about ten years, when it is left alone.

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+ This will allow vegetation to repopulate the Ground.

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+ After about 25 years the chemical imbalances of the soil will be restored allowing for further density in the growing population.

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+ It takes 25 to 60 years for the forrest structure and biodiversity to be rebuilt.

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+ The slowest recovery of the rain forrest is that of the humus, the biomass, which is the top layer of the soil.

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+ To allow this regeneration of humus, the enclosed ground has to be allowed to communicate with the exterior ground. The two blank walls of the embassy will therefore also act as microbial exchange gates.

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+ This means through the use of point foundations and a narrow gap between the wall and the soil, microorganisms which populate the humus will be able to traverse the boundary of the embassy. This will allow for those to decompose organic matter to further strengthen the regeneration of the Ground.

Thank you!