

On asphalt;
readings of the city's surface

Paraskevi Ntini

master thesis in landscape architecture

fall semester 2018

AHO

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“Asphalt is a landscape. In principle it is endless, for it leads us to the most distant parts..”

Hans Van Dijk, 1998

“Sense of the city, an alternate approach to Urbanism”
ed. Mirko Zardini, Lars Müller Publishers

The topic of this project is asphalt as the dominant material of the urban grounds. Ubiquity of these surfaces is under discussion and Oslo is the case of study. This is a project that does not attempt to modify or cancel the characteristics of the landscape that describes but a project that explores questions of description and representation on divergent readings of a single material within the Norwegian context.

Looking at the paved surfaces of Oslo, asphalt's omnipresence is unquestionable. What is distinct of those surfaces is that asphalt appears on sidewalks. That is very characteristic of the city's image, and probably a shared practice in Nordic countries. It does though, stand out as an exception to how asphalt is commonly perceived as the paving material used for roads and parkings.

Yet, in spite of the fact that asphalt is omnipresent in daily living we fail to really see it, but we tend to look upon it. Unravelling the narrative of a material as a catalyst for the urban and territorial transformation, this project by means of descriptio aims at transforming the perception of the ordinary everyday surface.

The narrative of this diploma project is unfolded through scales that examine asphalt into to three different areas:

the common ground

mineral; geological stratum

physical surface

Starting from the 'unit', a typical pavement, as is observed as the daily support that binds together different fragments of living that reach the city scale and the region. Next chapter explores the international, national and regional processes and material flows that asphalt is related to, as it's extraction operation trigger political and environmental concerns. Lastly, the observation lens zooms into the physical aspects of asphalt and the life of it's own.

In each of these chapters, short stories and mappings, supported with photographical documentation, are unfolding the narrative of asphalt and it's impact in the Norwegian culture.

common ground

the everyday surface

one size fits all; materialisation of the welfare state

black vs white; rollerskiing on asphalt

the blue, the green and asphalt in between

all asphalt leads to Oslo

mineral; geological stratum

the mountains of Norway spread in thin layers

Swedish agent; infrastructural glue

material flow in the regio

physical surface

.under the thin pink carpet

asphalt pathologies

summertime!infrastructural face lift

wear and tear

precious stones

ruderals; the underclass of the plant world

Below you will find some experts from the book that is part of this project, along with the exhibition and a video.

common ground

the everyday surface

A typical sidewalk in an Oslo street is two meters wide. It is wide enough for four to five adult steps to walk over it, for a couple to cross one coming from the opposite direction, for a parent to push a twin stroller along. Different trajectories that are regularly planned are randomly intersecting.

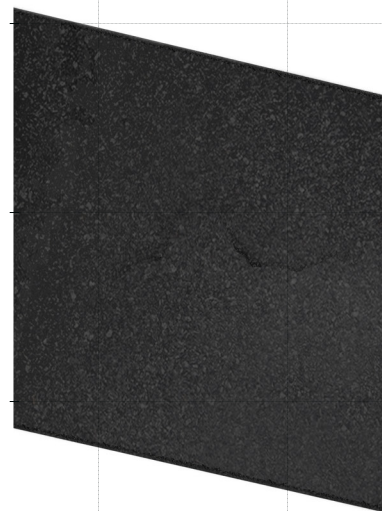
From the sidewalk, asphalt spreads into the courtyard. It covers the distance between the building facades and defines the spaces for social encounter. Footsteps and wheel strokes are laid with comfort on the surface that enters the courtyard. Asphalt generously strokes around the perimeter of the housing block. It spreads until the doorsteps to support the feet and daily routines of its residents.

On this surface daily life happens. The first step outside lands on an asphalt surface. The morning drizzle

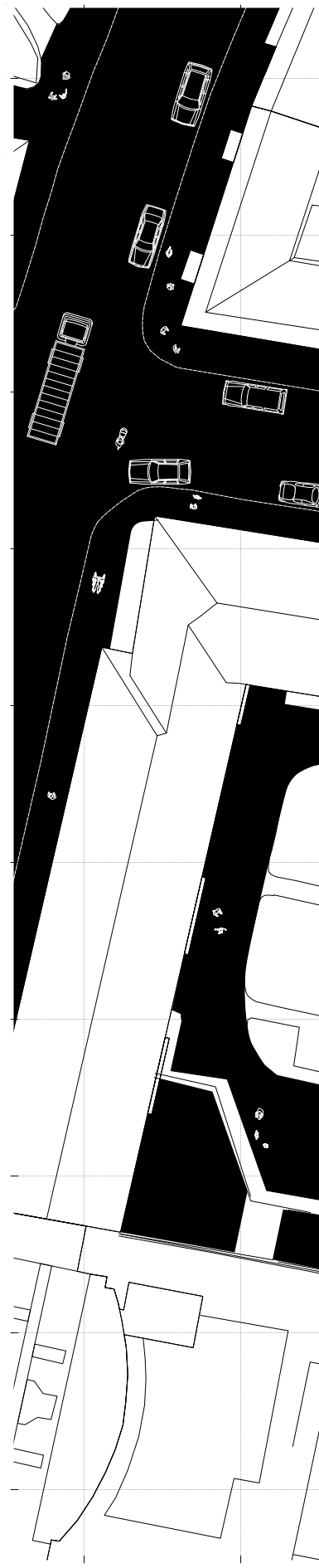
didn't wash off yesterday's chalk drawings. Asphalt paves the way to the garbage disposal shed, to the bike stand inside the courtyard, to the new shared bikes the municipality recently added in the street, to the bus stop around the corner. A few meters next to the wooden benches, stands the bicycle parking. But the neighbor today, decided to try the to the neighborhood next to the bus station. He sees the postman pushing the red wheel cart with the same easiness that himself rides on the smooth surface.

Asphalt transcends the mobility network and conquers playgrounds, courtyards, schools and platforms. The dark layer of matter binds these dispersed fragments of evryday living into a single unit and ensures homogeneous conditions of access for all activities, across scales.

Asphalt is the common ground.



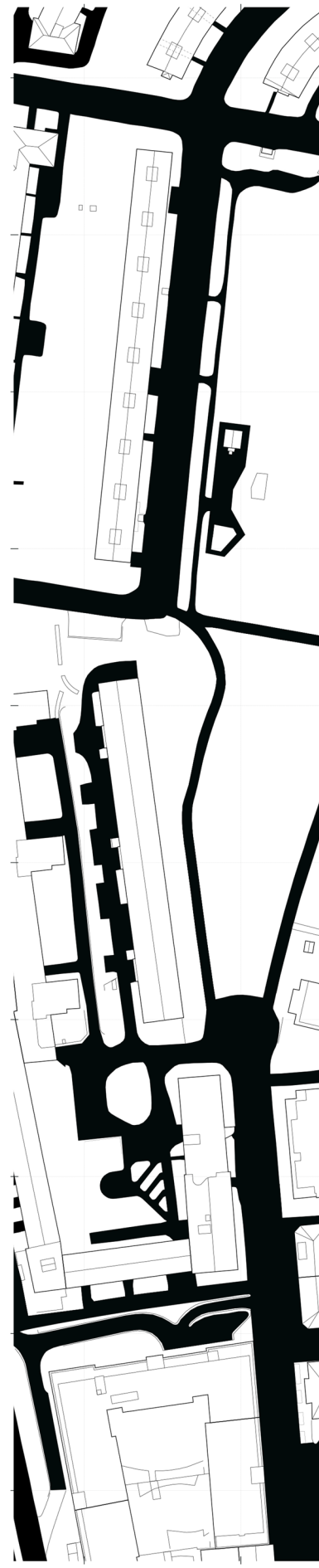


















Holmenkollen skyjump, in
Winter Olympics, 1952

Completion of the new City
Hall, 1950

Sagkrakken pedestrian bridge,
completed in 1959 over E18

all photos are found in the
photographical archive
www.oslobilder.no

one size fits all; materialisation of a welfare state



In the modern city, asphalt meant the surface that could be easily maintained, washed, plowed, drained from rain and melting snow. It was a stable surface that sealed the ground and cleared the way from resistance. Noise, mud and dust could finally be replaced with a durable and smooth surface. Asphalt primed the way for speed and progress.



The early 1950's brought the Winter Olympics and the new City Hall, better pavings in the city center around the Royal Palace. Sagkrakken bridge offered a cross over the Drammensveien, that is now a two-lane motorway along the coastline. Car import was released, and in the late 1960's offshore drilling started. Oil brought money and growth. It brought more cars that needed better roads, which in turn meant more asphalt and parkings. And growth brought a welfare state.





from viscous mud,
Bjerregaards gate 1902



to even, smooth and clean,
Oslo 1959 - location not
specified

Every new housing block has an asphalt patch. New schools and kindergardens have smooth surfaces, leveled and free from tripping joints. Spaces for sports, activities in the open air, spaces for education and health institutions are built, to support and provide for the new population.

Asphalt proved to be the remedy for all urban needs. All practical necessities, all different movements and identities were absorbed as they unfolded on top of an asphalt stage.



Heavy infrastructural armature,
Bispeløkket 1979

black vs white; rollerskiing on asphalt

Rising over the city's skyline and sitting on the foothills of Marka, the 64 meter tall ski jump is the symbol of Norwegian love for winter sports. Ever since the end of the 1800s, Holmenkollen and the surrounding area have drawn large crowds of Norwegians every winter.

But now, the national pride is under threat by warming winter that shorten the cross-country skiing season. Shorter winters and decline in snow coverage reduced the number of days that one could slide on the white slopes of Holmenkollen.

Roller-skiing on asphalt is the closest experience to cross-country skiing. Asphalt's ability to reduce friction, coupled with its draining properties allow for ski enthusiasts to practice their sport even when the snow is gone.





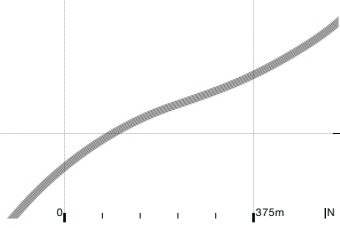
The Ministry of Culture in collaboration with the Norwegian Ski Federation provides a design and construction manual for roller-ski lanes that safeguards the national sport and extends training days whole year round.

A five kilometre long asphalt lane is unrolled on the hilly terrain of Holmenkollåsen. It loops around the undulating topography that allows for the controlled descent, the glide on a gentle hill, the climbing to steeper grades. Gravity and momentum are worked out almost as a physics experiment.

On dry summer days, skiers enjoy training their skills and techniques on highly engineered and designed surface for endurance and competence. It is a game of control, an oscillation between acceleration and resistance.

Asphalt comes to the rescue supporting and extending the practice and interest of skiing whole year round.







Screenshot taken from the video: "Opplev Oslo - rulleski i Holmenkollen" published by The Agency for Urban Environment in YouTube, 3 July 2015



Pictue as found in the gallery colection "Opplev Oslo - rulleski i Holmenkollen" published by The Agency for Urban Environment



*“We all want heaven , and we all want to get
there smoothly and comfortably”*

*Douglas Coupland**

*as found in “Sense of the
city, an alternate approach to
Urbanism” edited by Mirko Zardini,
Lars Müller Publishers (1 October
20059) page 208

common ground

the blue, the green and asphalt in between

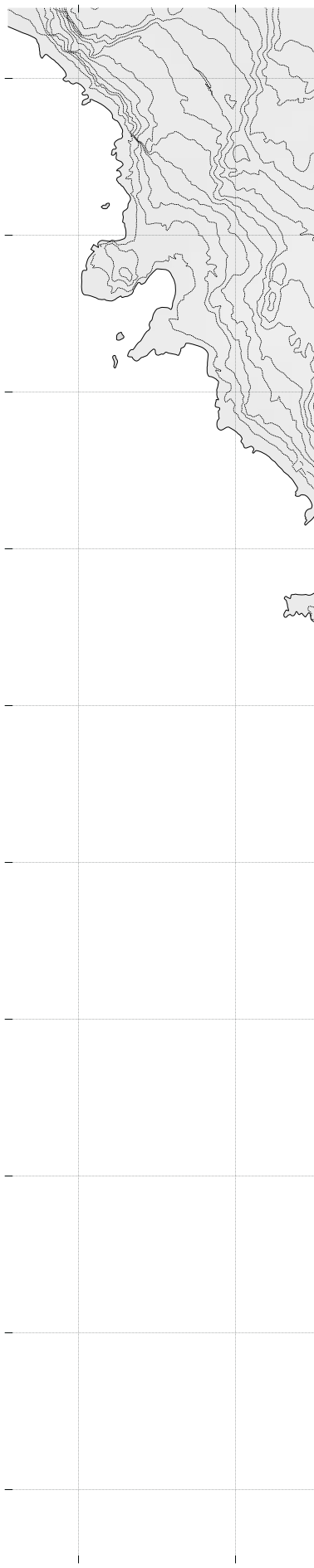
A parallel line to the coast, a line of movement made of asphalt, looks like a strong border on the map. It suggests where the land separates from the sea. At the same time this asphalt line allows freedom of movement, to approach the coastline and walk on the city's new waterfront, to 'catch' the sunset on the go.

If this is the coastline, what we also observe on the map is an interconnected network of thinner lines, that weave and turn, straighten and twist. This black netted mesh expands inland and covers almost the whole surface of the paper, the lead the way to Marka.

Few lines are thickened, plenty continue and lose their width, they almost disappear. Some end like black stains. It is as if ink blotted from a brush that just stopped flowing on paper. These must be the parking lots, sheets of asphalt that expand on the landscape.









They look like runways for the takeoff, the beginning of graveled trails, cabin routes and open air where life thrives every weekend. When adventure is over, all mud and sea sand is wiped off the hiking boots and summer sandals on a piece of asphalt.

Wheels bring you back to the city.





*“...it is asphalt that defines and characterizes
the surface, the void, the interval, the distance, the real
concepts on which the territory is configured.”*

*Mirko Zardini**

“The Second Crust”, [https://
www.cca.qc.ca/en/issues/24/
into-the-material-world/41279/the-
second-crust](https://www.cca.qc.ca/en/issues/24/into-the-material-world/41279/the-second-crust)

all asphalt leads to Oslo

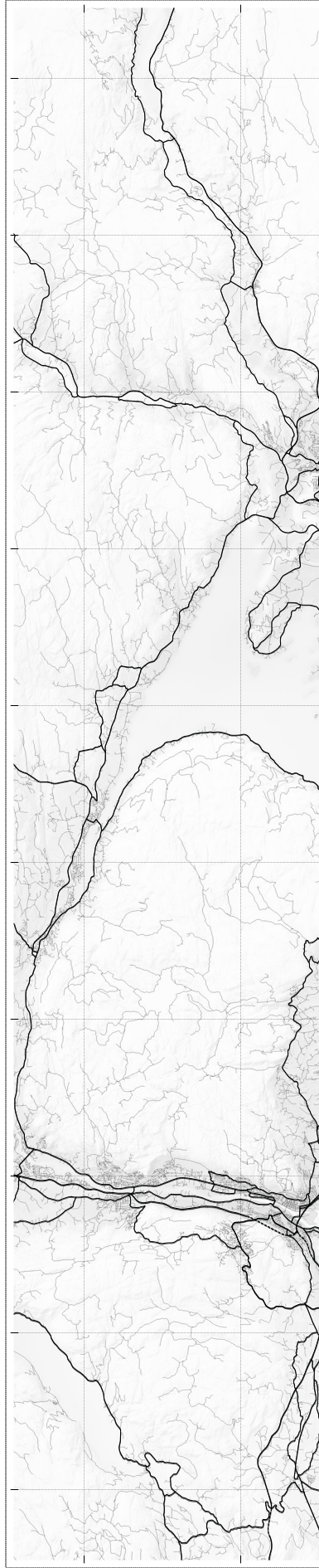
The actual form and scale of asphalt is hard to grasp in its totality. But its success is based on continuity and flexibility. Asphalt expands on the horizontal plane ignoring obstacles and topographic barriers, connecting places that were distant before.

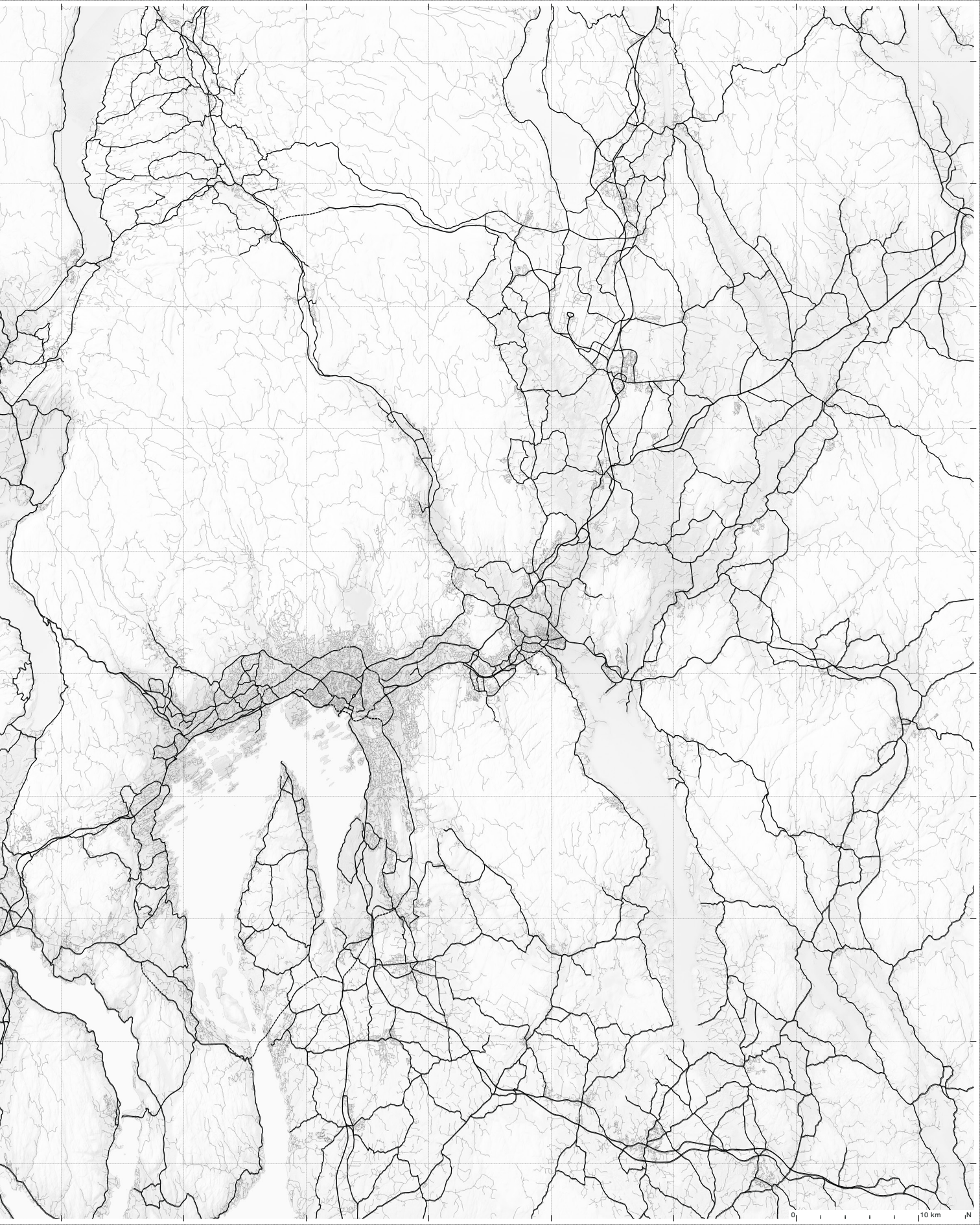
But the way for asphalt to become the most liberating material innovation for the modern city was anything but smooth.

Every traverse across the landscape would involve unstable surfaces and hostile roadways. It meant complications imposed by topographical unevenness and lack of machinery that were essential to overcome them.

Statens Vegvesen was the reflexive actor that took responsibility. Technologies and policies were developed to dismantle the resistance and enhance regional mobility and communication.

This urge to connect and bind, to provide access to places that were distant before grows mechanisms that advanced in time. Asphalt allows for a multitude of programmes and the support of regional processes where different hierarchies are binded together into a single unit.





mineral;
a geological stratum

Seen from the spectrum of landscape
architecture that has

*“traditionally been defined as the art of
organised horizontal surface [...] distinguished by its
material and performative characteristics”*

asphalt’s mineral ubiquity on the horizontal
plane gains greater attention.

* Stan Allen in “Mat Urbanism:
The thick 2-D”, in Hashim Sarkis,
(a cura di), CASE: Le Corbusier’s
Venice Hospital, Munich: Preste,
2001

mineral; a geological stratun

the mountains of Norway spread in thin layers

The mineral and mining industry comprises companies involved in the extraction and processing of minerals, metallic ores and rocks, from both bedrock and superficial deposits.

The largest mineral industry in Norway is construction materials. Sand, gravel, clay, rock and hard-rock aggregates are used either as end-product, for example railway ballast, or as raw material for the manufacture of other products, such as asphalt or concrete. Together with secondary and recycled aggregates, construction materials are the foundation of the transport infrastructure.

95% of asphalt's consistency is aggregates of mineral origin; crushed stone and gravel. In 2016, 85Mt of aggregates were produced. That equals to a revenue of 6 billion kroner, 59% of the total revenue*.

In Norway one person alone unknowingly generates around eleven tonnes of gravel and sand mining**. The associated transformation processes are based on a network of transport, energy and social infrastructures and are symbols of the progressive urbanization of the landscape.

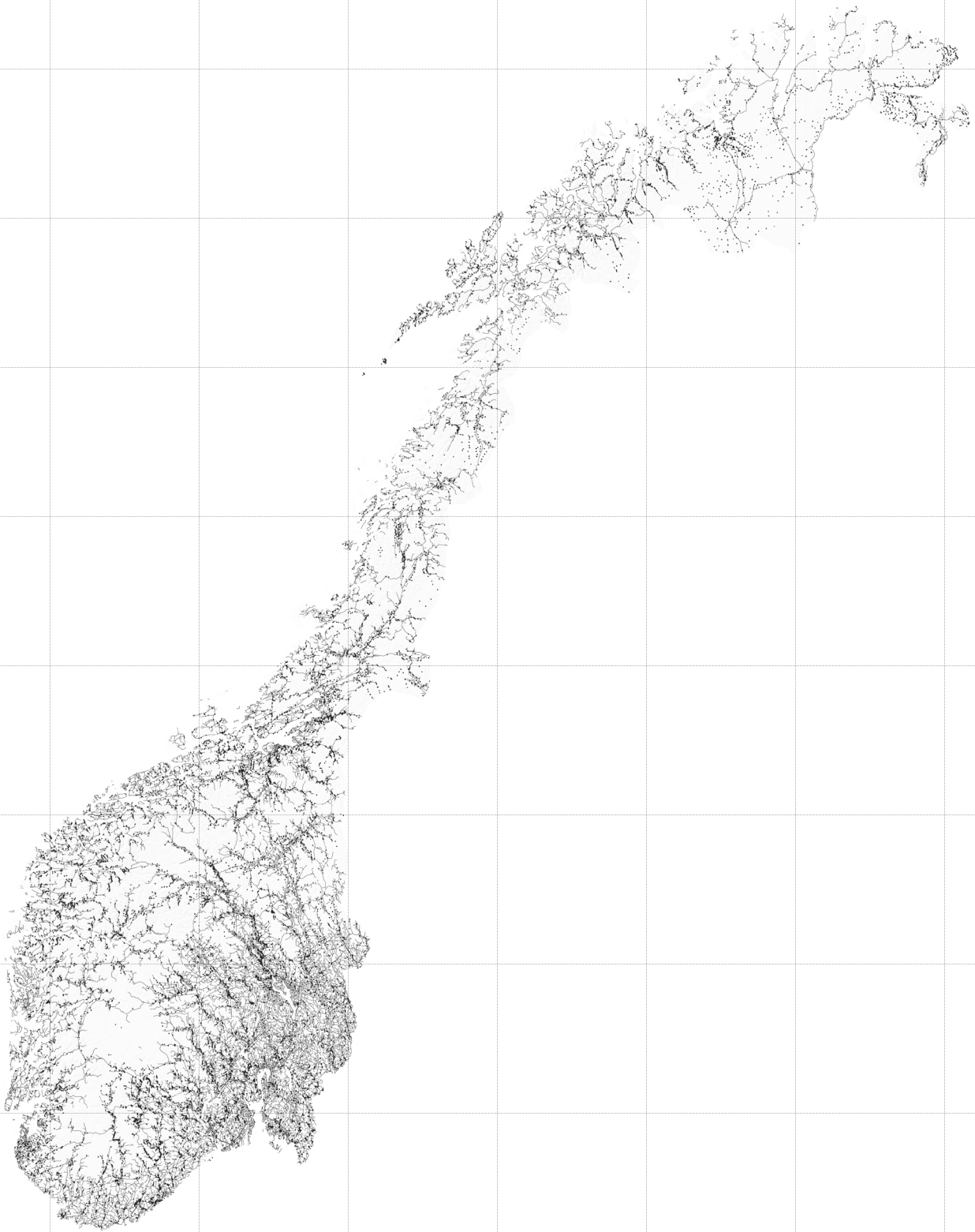
*** Hard facts about the mineral industry 2016, Directorate for Mineral Management, Aug 2017

Extraction sites of sand, gravel and hard rock aggregates.



“Man is a ‘Geomorphic Agent’. As the most important factor in the shaping processes of the Earth, nowadays we move all together far more material than all natural geological processes combined.”

*excerpt from the study
Geomorphic Agent, by Prof.
Günther Vogt and Daia Stutz,
Landscape Architecture ETH, 2014



mineral; a geological stratun

Swedish agent; the infrastructural glue

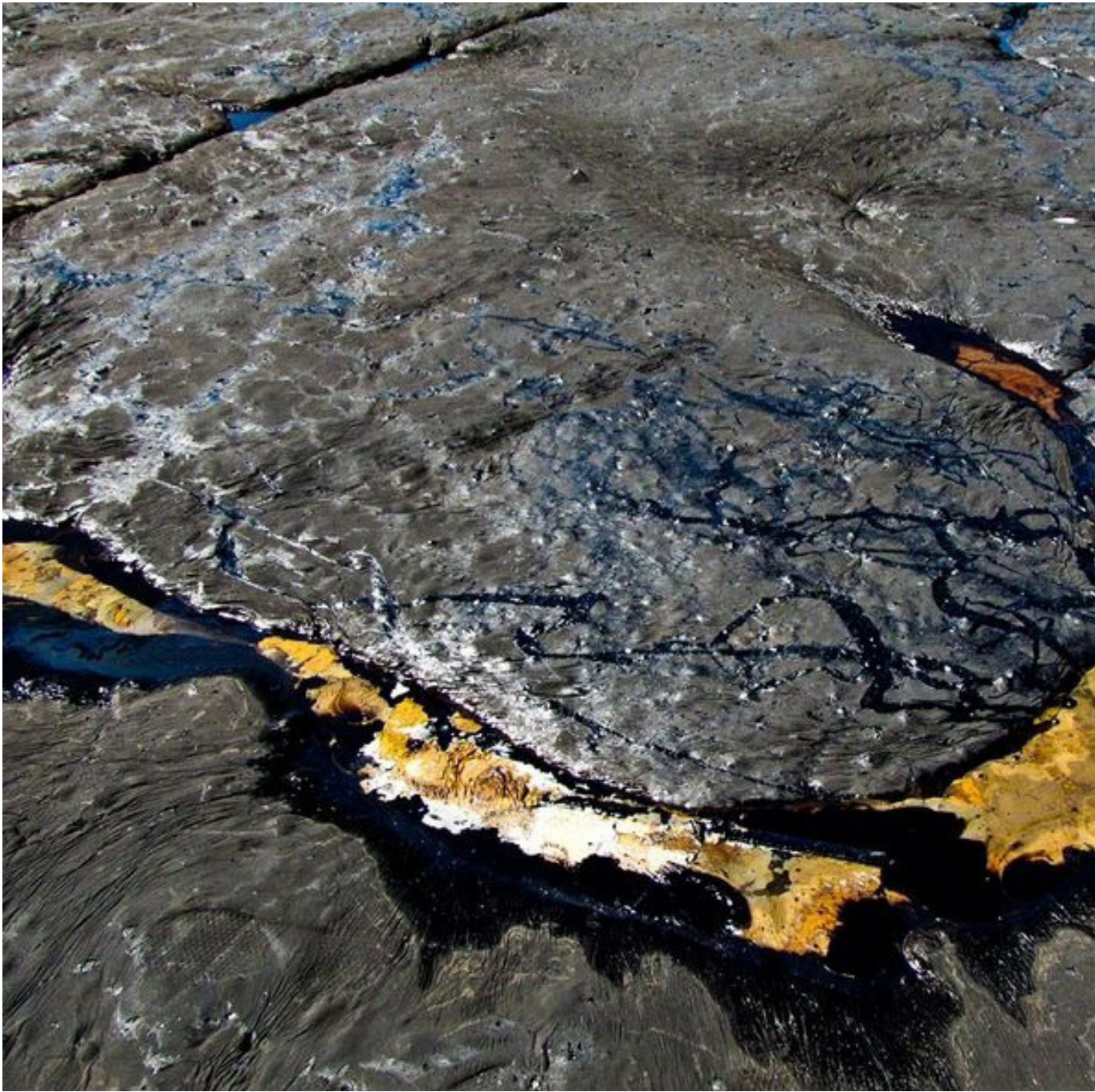
The other 5% of asphalt's consistency is bitumen, a black viscous mixture of heavy hydrocarbons obtained naturally or as the residue of fractional distillation of crude oil. It provides consistency and elasticity*, it holds the aggregates together and enables the surface to adapt to changes in substrate, temperature and climate.

Asphalted surfaces that first paved the European and American cities were obtained from natural deposits**. Over millions of years, organic matter decomposed under heat and pressure to form a mixture of carbon and hydrogen, mixed with oxygen, nitrogen, sulphur.

Its adhesive, sealing, flammable properties have been known and used for thousands of years. The sticky black mixture would erupt from terrestrial sources and appear in liquid pools or hardened as stone that was quarried in caves and mountains.

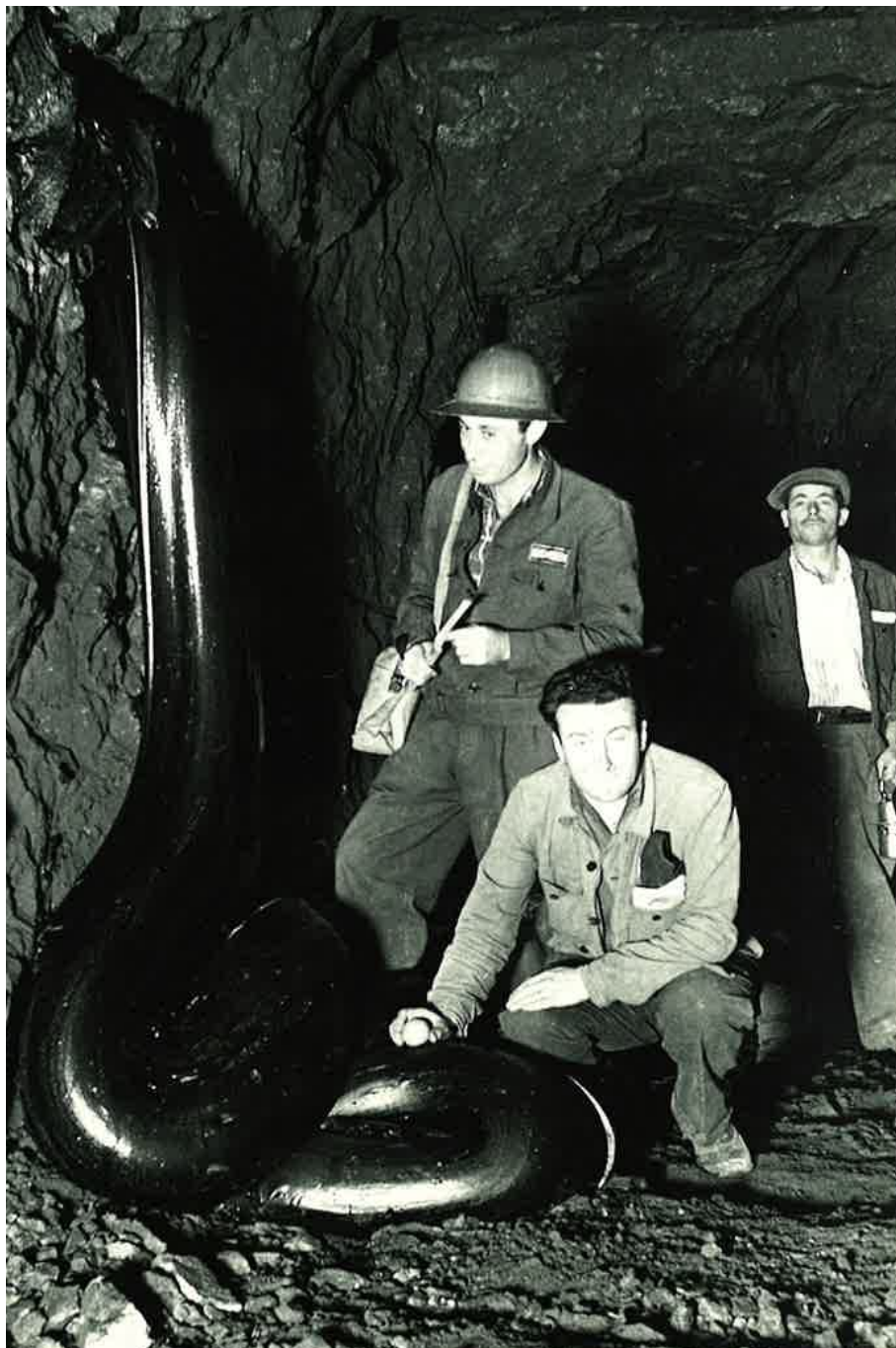
*it has the ability to change with temperature: rigid and brittle in lower temperatures, flexible at room temperature while at higher temperatures bitumen flows.

** Trinidad's Pitch Lake, La Brea Tar Pit in California, Dead Sea, Venezuela, Switzerland, Albania, Italy are all notable resources



Trinidad pitch Lake

photo credit: Shiram
Rajagopalan



Flowing bitumen in Scafa
mining, Abruzzo, Italy 1956

source: Asphalt: The
Character of the City. Ed. by
Mirko Zardini, catalog of the
Triennale di Milano, Milan, 2003

In Norway, asphalt would arrive in wagons loaded with blocks of bituminous porous limestone, and “essenasfalt” bituminous sandstones imported from in Germany,

But the moment that revolutionised the way we move into the landscape, was not possible until the end of the nineteenth century. It was then that bitumen started to be commercially produced from the industrial refining of crude oil.

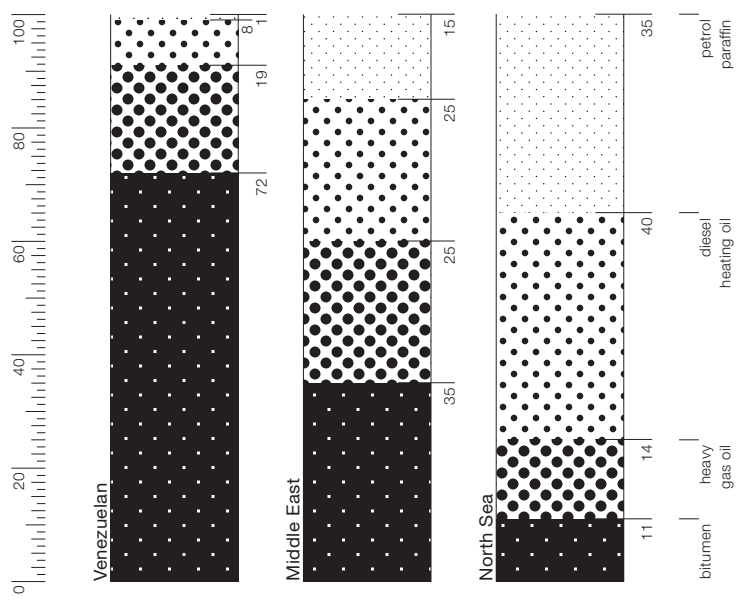
The “Pedrolite” method^{**}, named after the Swedish road engineer Pedro Hellström was the Swedish know-how for the first asphalted surfaces that systematically started to cover the streets of Oslo.

All bitumen used in Norway for road construction today is the by-product of the same refining processes and mastered techniques.

One could think that the offshore drilling that has been fueling the national economy since the early 1960s, is more than enough to provide the precious material. But not all crude oil is suitable; density and viscosity classify heavy and light crude oil. Northern Sea oil is of high quality and not used for bitumen production, as it contains a lot of fuel.

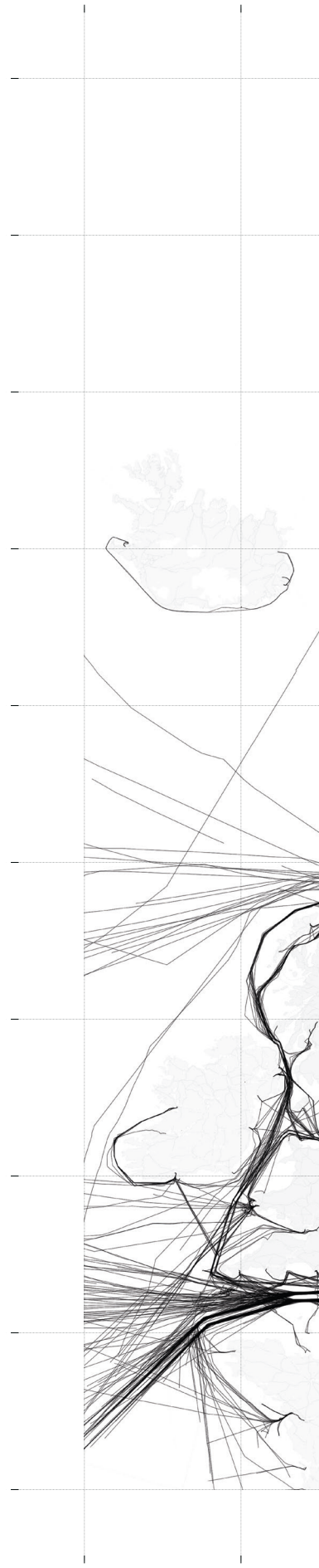
*Essenasfalt was initially produced in a factory located to Nydalen. Rail wagons and boats would distribute asphalt across the country

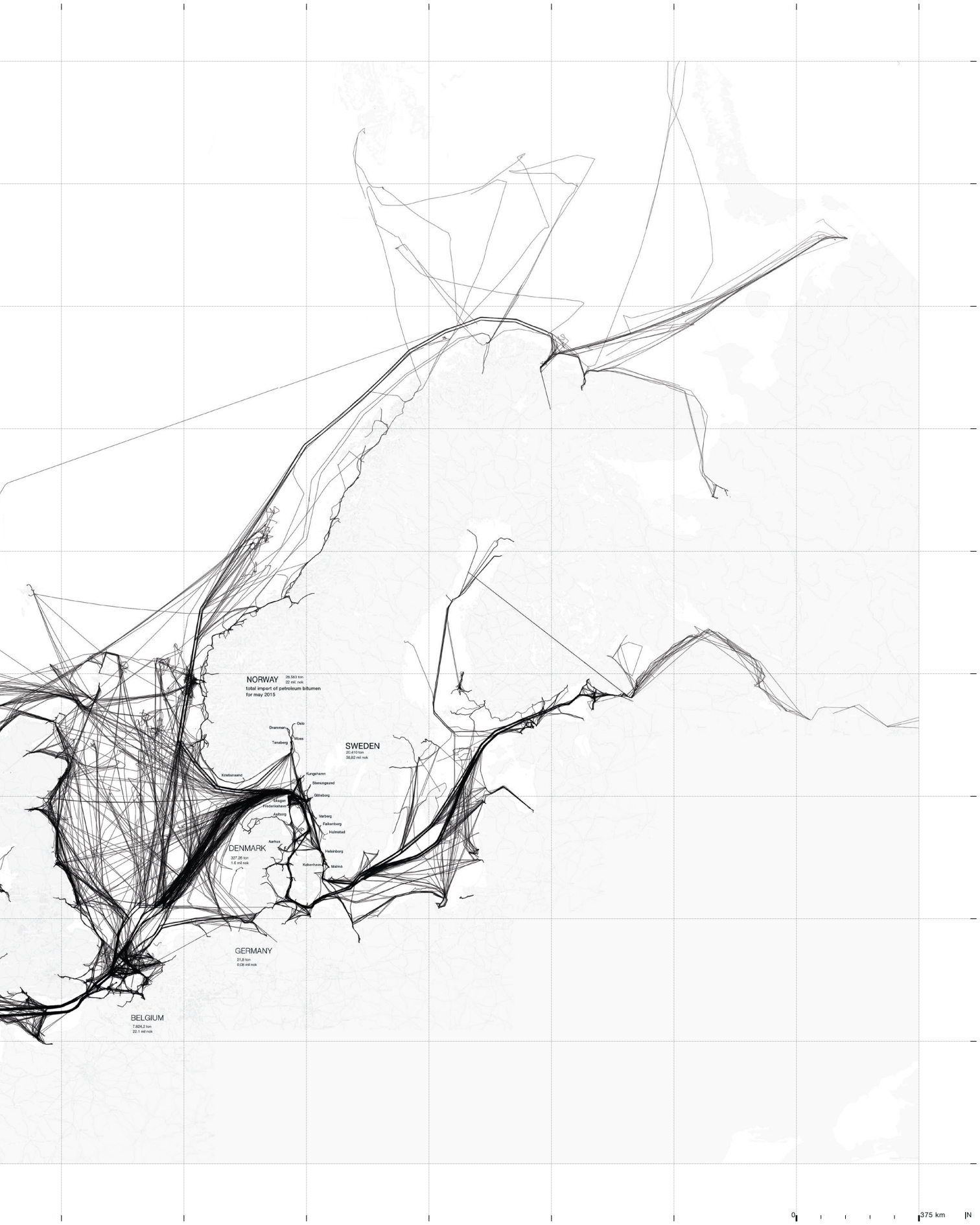
**similar to today’s penetration road surface; a coat of gravel, sprayed tar or bitumen if affordable, and a top cover of single or double surface treatment



Statens Vegven, Håndbok 246, Asfalt 2005 Materialer og utførelse

The scarce substance arrives in Norwegian ports by sea vessels, imported from countries of Northern Europe. Sweden has been consistently shipping throughout the years the precious binder that glues local rocks into a seamless operating surface.





NORWAY
26 543 kt
32 mil ton
total import of petroleum bitumen
for may 2015

Drammen
Oslo
Tvedestrand
Molde

SWEDEN
10 437 kt
12.82 mil ton

Kungälv
Stenungsund
Örebro
Västerås
Falun
Hälsjöberg
Hälsjö

DENMARK
32 26 kt
3.9 mil ton

Vindbjerg
København
Ålborg
Aarhus

GERMANY
21.2 kt
0.06 mil ton

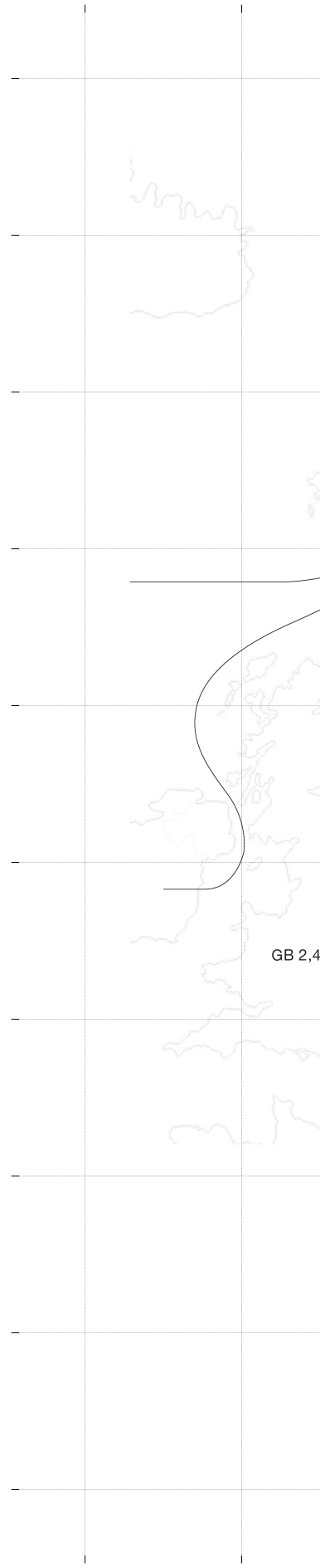
BELGIUM
7 804.2 kt
22.1 mil ton

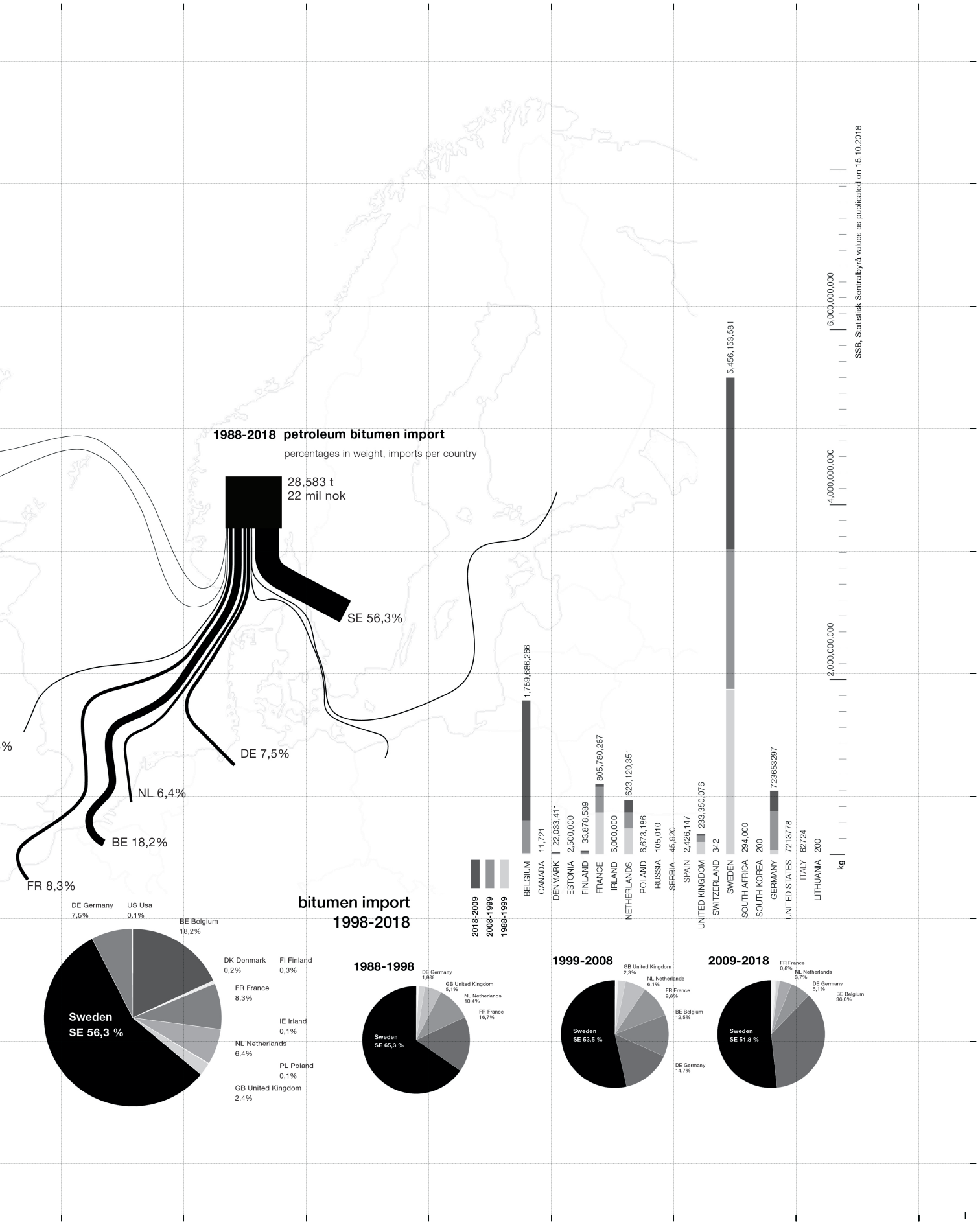
Almost 60% of the total imported bitumen of the past three decades*, is refined in Gothenburg, from crude oil that arrives in Sweden from other countries. Pumped directly from the refinery and via a network of heated pipes in 170°C, bitumen easily flows on board.

The vessel carries in its 110-meter long heated body 6000 m³ of cargo. It sails at 12 knots and within 12 hours it arrives in Drammen and Oslo, ready to deliver through the same ritual of heated pipes the flowing bitumen to the depots sitting on land.

The same repetitive patterns bind Norway and Sweden with bonds of material dependence and economy. They are not unconfined in form and shape as liquids, neither rigid and defined as solids. They are as viscous as the bituminous cargo in vessels that flow in the heavily trafficked waters of Skagerrak. They add cohesion on the economical and cultural network that has been connecting these countries for years.

*Percentages extracted from data received by SSB, Statistics Norway, about bitumen import for the past three decades.





mineral; a geological stratun

material flow in the region

Extraction sites, asphalt plants, waste treatment facilities and transport are spatial processes that take place within reach; they are operations that are challenged by long distances.

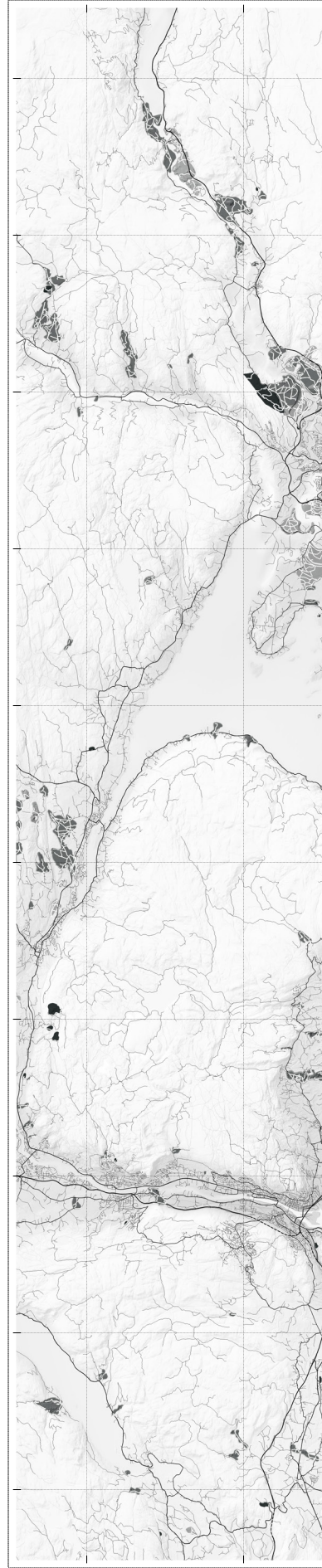
Aggregate resources, whether quarries, open pits, or facilities of recycled materials and industrial by-products, are more sustainable when in proximity. Asphalt plants are usually located nearby extraction sites, together with waste disposal for storing and treating masses from demolition or excavation processes. Bitumen arrives from the coastal depots.

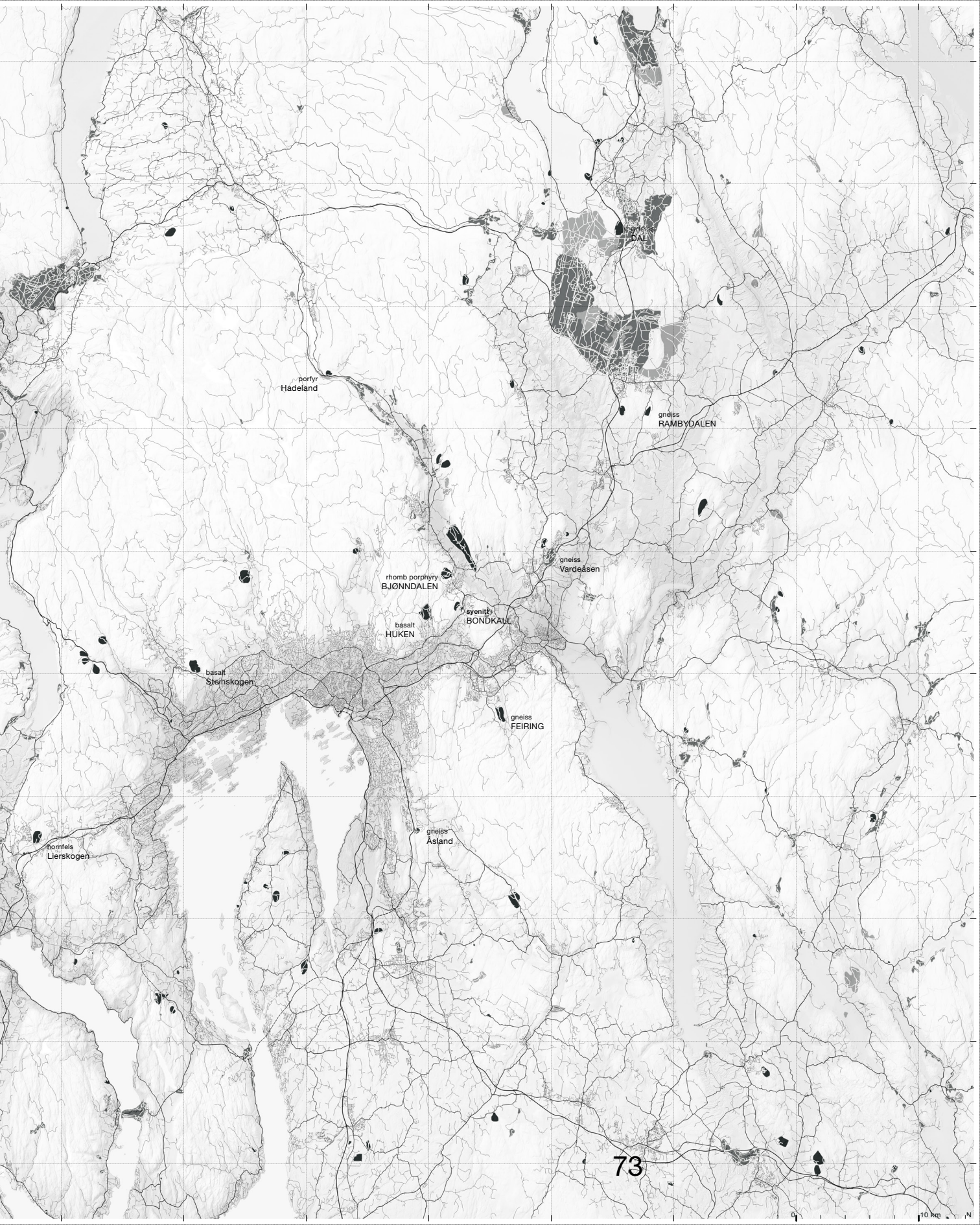
Shorter distances of crushed stone, gravel and sand reduces energy consumption, traffic and carbon dioxide emissions. If the distance is more than 30-40 kilometres from the extraction site, then transportation cost of those heavy masses is higher than their actual price.

Current growth Oslo sees together with population projection increases the need for construction materials and better management of building masses. It is estimated that 340 Mt of aggregates will need to be extracted, processed and transported in order to sustain the population projection until the year 2040.

Oslo's own capacity in gravel, sand and hard rock extraction cannot sustain its growth which makes it materially dependent on the neighbouring regions of Reducing them into territories of extraction increases political pressure in the region.

A mapping project of resources was initiated by NationalGU (open up the acronym?) to ensure access to local aggregates. This provides information about the capacity of deposits and their qualities, and for what building purposes those masses are suitable. This registration can offer better planning when it comes to building processes and can be used to prepare an analysis of future needs for building materials.





porfyr
Hadeland

gneiss
DAL

gneiss
RAMBYDALEN

rhomb porphyry
BJONNDALEN

gneiss
Vardeåsen

syenitt
BONDKALL

basalt
HUKEN

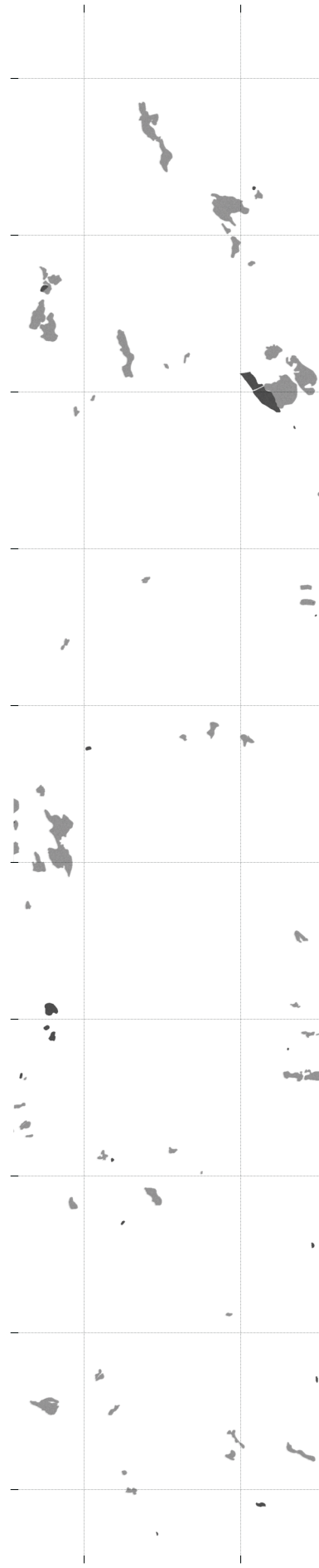
gneiss
FEIRING

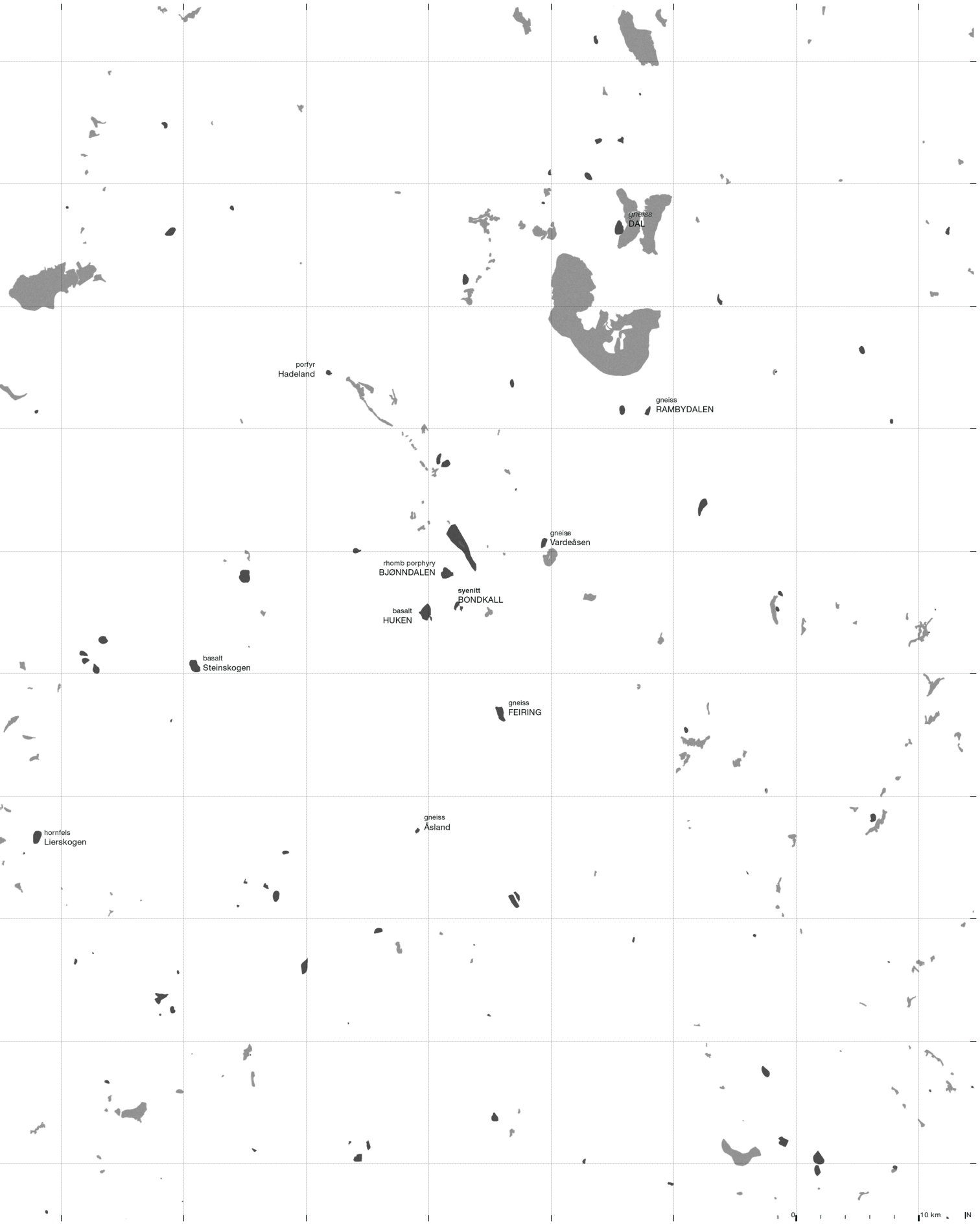
basalt
Stjernskogen

gneiss
Åsland

komfjels
Lierskogen

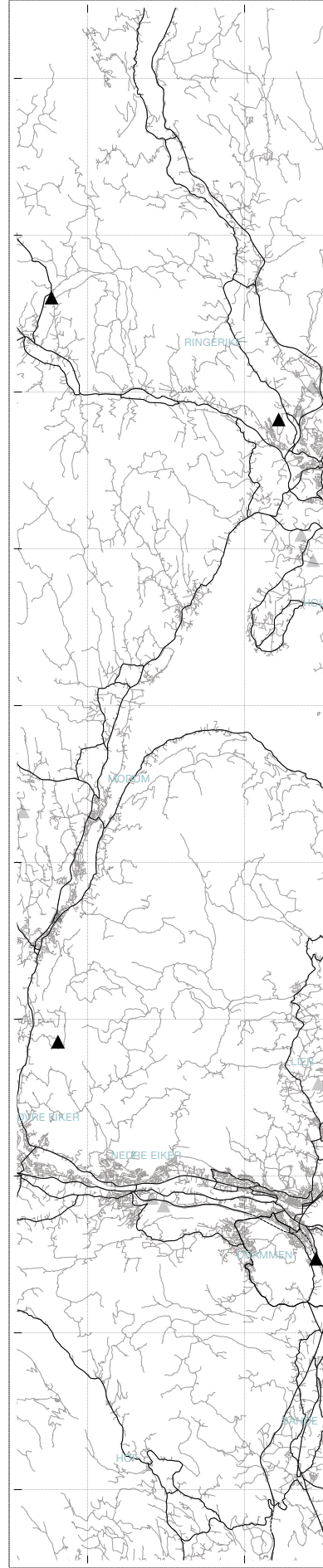
Resources of sand, gravel and
hard rocks with the most important
sites and stones.





sources: NGU Rapport
2012.009, Ressursutfordringer for
byggeråstoffene pukk og grus i
Oslo og Akershus 2010

Hard rocks, material flows in
the region of Oslo and Akershus.





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88

90
81

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40
288
36

5
15

HURDAL 6

EIDSVOLL 37

NANNESTAD 275

473
NITTDAL

100
GJERDUM

svenskt
BONDKÅP

16
16
ENEBAKK

26

RYGGE

SPYDEBERG

9
NES

79
36

9
RAMSDALEN

274
SKEDAMO

50
274
FET

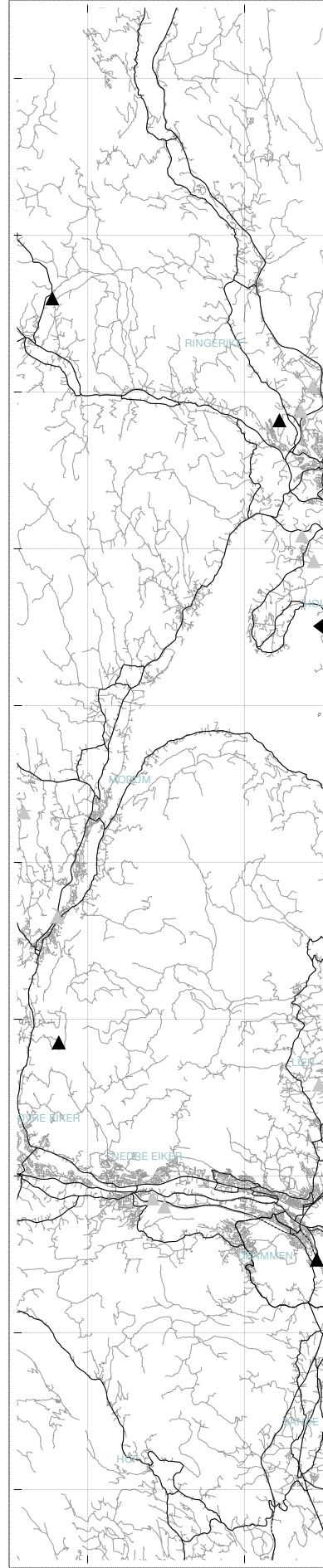
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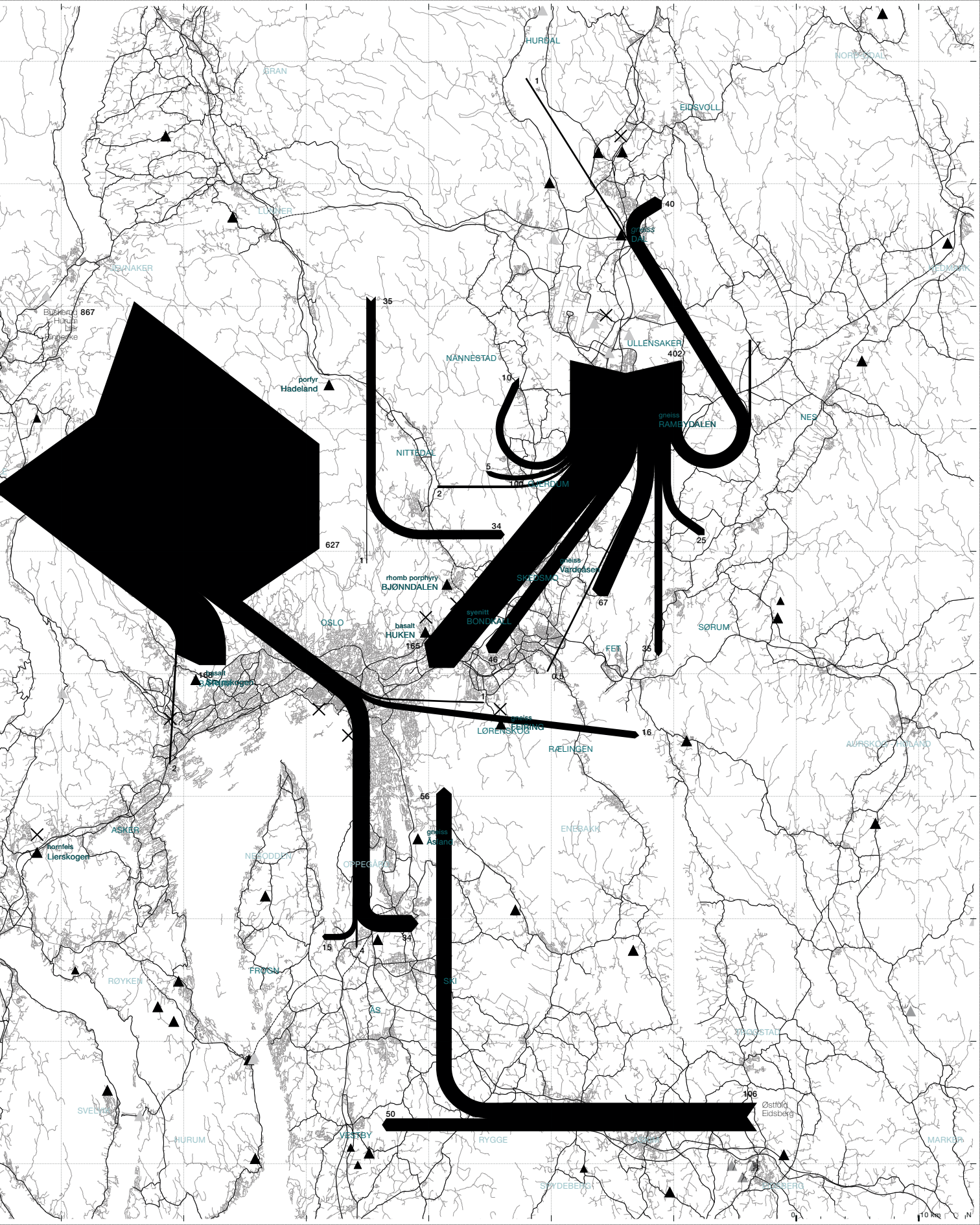
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TØGSTAL

OSBERG

sources: NGU Rapport
2012.009, Ressursutfordringer for
byggeråstoffene pukk og grus i
Oslo og Akershus 2010

Sand and gravel, material
flows in the region of Oslo and
Akershus.





HURDAL

NORPESDAL

ERAN

EIDSVOLL

BLUNTER

ULLENSAKER

Blyberg 867
Hukem
Lier
Toske

porfyr
Hadeland

NANNESTAD

ULLENSAKER

NES

NITTEDALE

gneiss
RAMEYDALEN

top
ÅKERØY

627

rhomb porphyry
BJØNNDALEN

gneiss
Vårdeåsen

OSLO

basalt
HUKEN

granitt
BONDØLEN

FET

SØRUM

100
Sørmarken

gneiss
LØRENSKJØING

RÆLINGEN

AURSKOGLAND

10
Lierskogen

ASKEE

NEBODDIN

ORPEKVI

ENESAKH

66
gneiss
Asang

15

FRYSN

ROYKEI

SKI

ØSTRETTAL

SVELSK

HURUM

VIKREY

RYGGE

10
SØYDEBERG

Østfold
Eidsberg

ØSTBERG

MARKA

physical surface

Under the pink thin carpet

The most common mental image of asphalt is its pitch black colour, inherited from bitumens' dark looks. And that was exactly the topic of a national discussion that took place more than seventy years ago on the grounds of the Royal Palace Courtyard.

2011 was a record year for Norway. Precipitation reached 130% above normal levels, and the debate resurfaced along with the asphalt that lies in front of the Palace. On rainfalls, the reddish gravel would flow down to Karl Johans gate and fill the streets around. Almost 150 tonnes of aggregates were annually needed to colour the asphalted royal courtyard.

Today, no asphalt can be seen; neither does a pink dusty cloud rise from the thousands of feet that every 17th of May walk up Slottsparken hill to watch the national parade marching in front of the Royal family. A 15mm

thin film of reddish gravel from Åros is glued on top of two layers of asphalt. That put an end to an issue that holds its origin back in to October 1848, when the King's residence was completed.

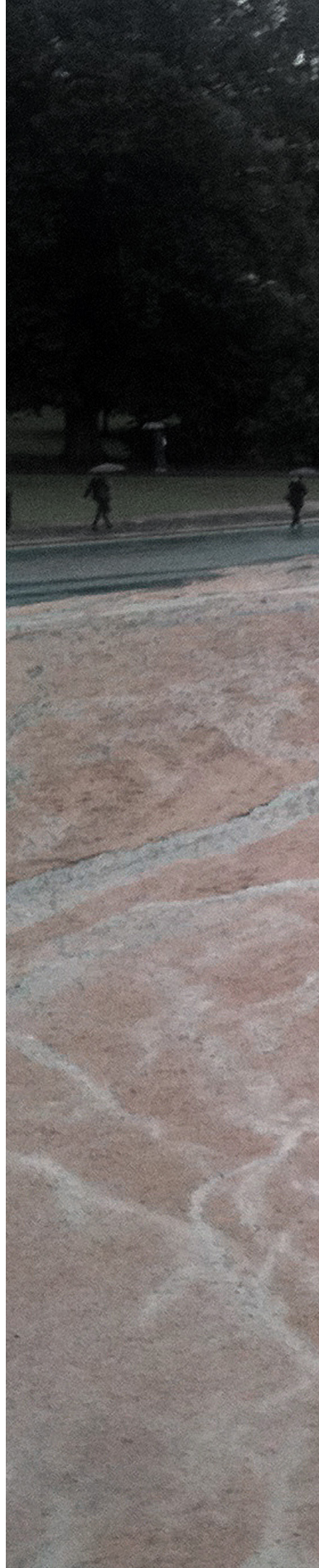
The Royal Palace and Courtyard were designed on the top of a hill, as an extension of today's Karl Johans gate, connecting the palace with the city. Linstow, the architect, proposed a classicist rectangular militaristic form. Gravel, instead of cobblestones covered the courtyard. The humble material was the cheapest solution for this instance as the allocated sum for constructing the courtyard was exhausted.

Romanticism brought a seventy meters circular flowerbed, and later big grass lawns. In 1875 King Karl Johan's statue was added. A double alley of trees in the interwar underlined the functionalistic style of that period. In 1938, a pedrolit asphalt surface bound literally the gravel in tar for almost seventy-five years. Ever since then, new layers of gravel were systematically recovering the bituminous looks of the Royal Palace Courtyard.

In 1995 the debate over noble aesthetics and cost was back again. Several private attempts proposed to fundraise money as a gift Royal Courtyard out of stone. The emphasis was given to the prestigious aesthetics

Hans Ditlef Linstow

Frants (1787-1851)







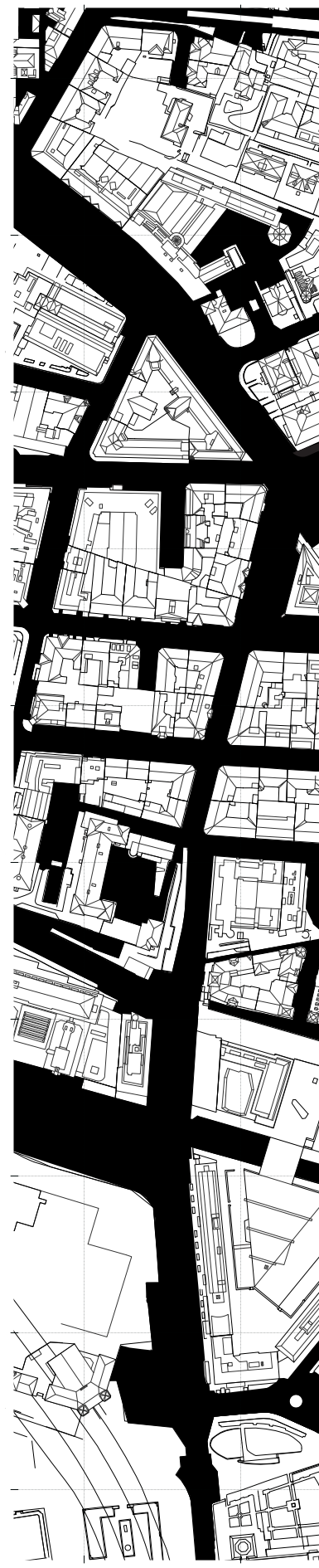


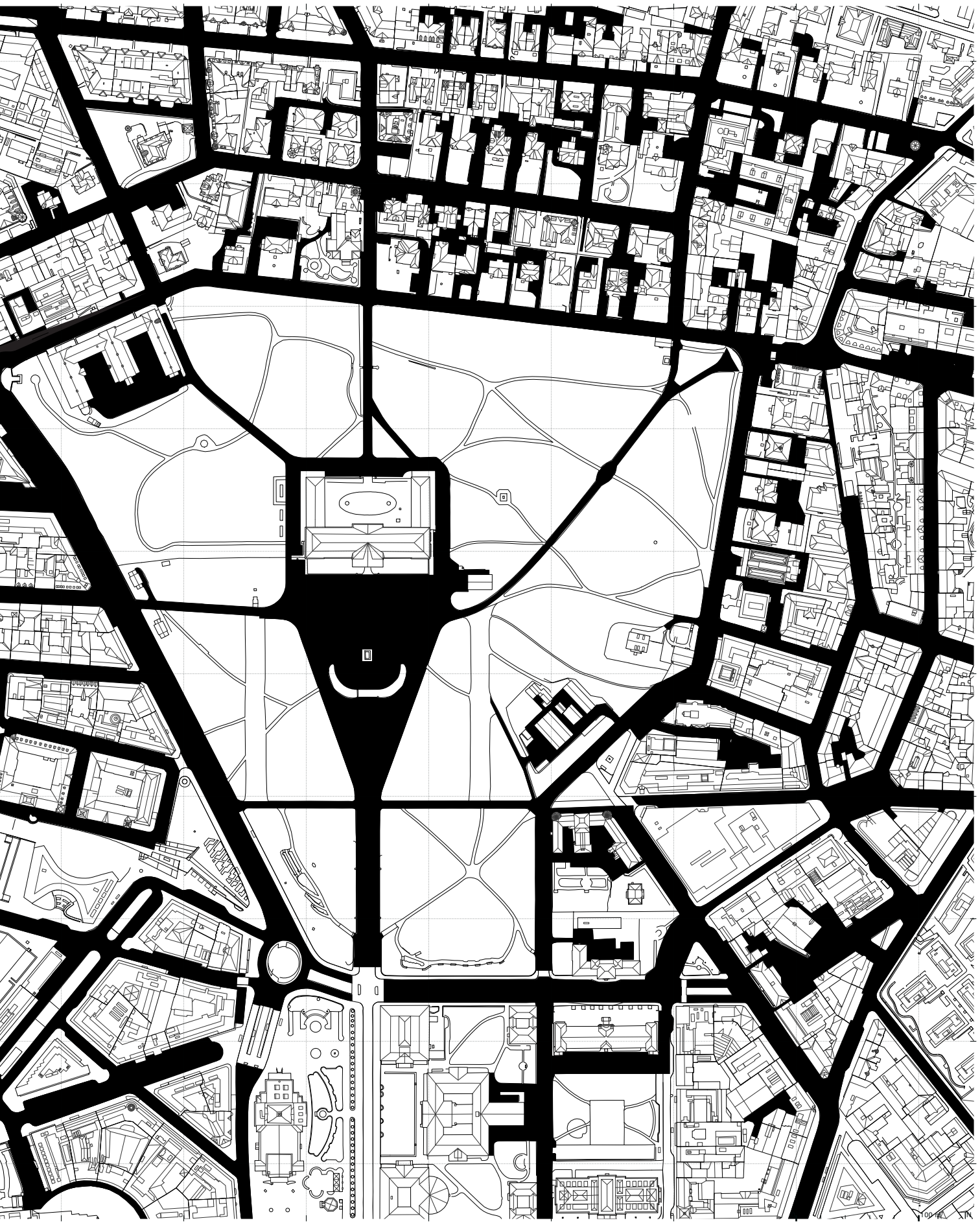
Picture of model, to be
completed after digital delivery



Picture of model, to be completed after digital delivery

physical surface





of cobblestones that was coupled with draining and clearing the dust. The low aesthetics of bituminous mixtures and gravel could no longer contemplate what the nation wished for his greatness. Landskapsarkitekt 13.3* that won the competition in 1995 said: “The idea of laying cobblestone [...] as a uniform cover [...] can be best characterized as an answer to the lack of Norwegian people’s soul for pomp and splendor. Our proposition is so modest that it can’t even be called flashy”.

In the period 2008-2011, the Directorate of Cultural Heritage, the Royal House and Statsbygg** collaborated towards the reservation and restoration of form and aesthetics. Previous tar layers were removed. The new grounds consists of non-woven fabric, a 260 mm aggregate subbase, a top layer of 100mm aggregates. On top of the foundation layers there is a 40 mm of asphalt, and a layer of 40 mm asphalt of colorless bitumen and gravel from Åros. The top last layer consists of colorless vegetal adhesive with the same reddish gravel.

This pink carpet laid on top of the rising topography is the scenographic frame around the nation’s official events and pride.

Asphalt is well hidden under it.

*members of the office that later as Link Landskap AS realised the winning proposal of 1995

**the government’s key advisor in construction and property affairs, building commissioner, property manager and developer





asphalt pathologies

Asphalt is known for its durability and resilience. It is its strength, low-cost and ease of maintenance that proved asphalt the perfect product for most urban requirements.

But asphalt suffers; the surface composition and underlying substrates are continuously exposed to different forces and variations in climate, traffic loads and ground conditions. Sunlight, oxidation, rain, snow, differences in temperature and precipitation, repetitive cycles of frost and thaw, are some climatological strains that asphalt needs to sustain.

It must also endure loads; lorries, buses, cars, bikes, kick scooters and skates. All rolling mobility and hundreds of feet are performing on a surface that must be durable enough to bear and sustain the hectic choreography of metropolitan living.

Ground conditions in this sense are very crucial. Oslo sits upon a marine sedimentary basin, mostly clay, formed of glacial structures. The thickness of this layer varies from 0 up to 100 meters until the bedrock. What needs to be prevented is subsidence; loads pressing the asphalt surface into the soil before it sinks in the terrain.

Asphalt needs to be ready for all the weight that it carries. A well prepared and layered compacted substrate of different aggregate fractions and drainage can ensure stability on the surface, that asphalt will not distort.

Many times, this is not the case. Asphalt came very fast to replace or just cover previous material surfaces, such as cobblestones. And in those cases where the finer inner network of the city is private, cost of a properly laid substrate and maintenance can prove unbearable.

Maintenance period starts in the summer and it lasts





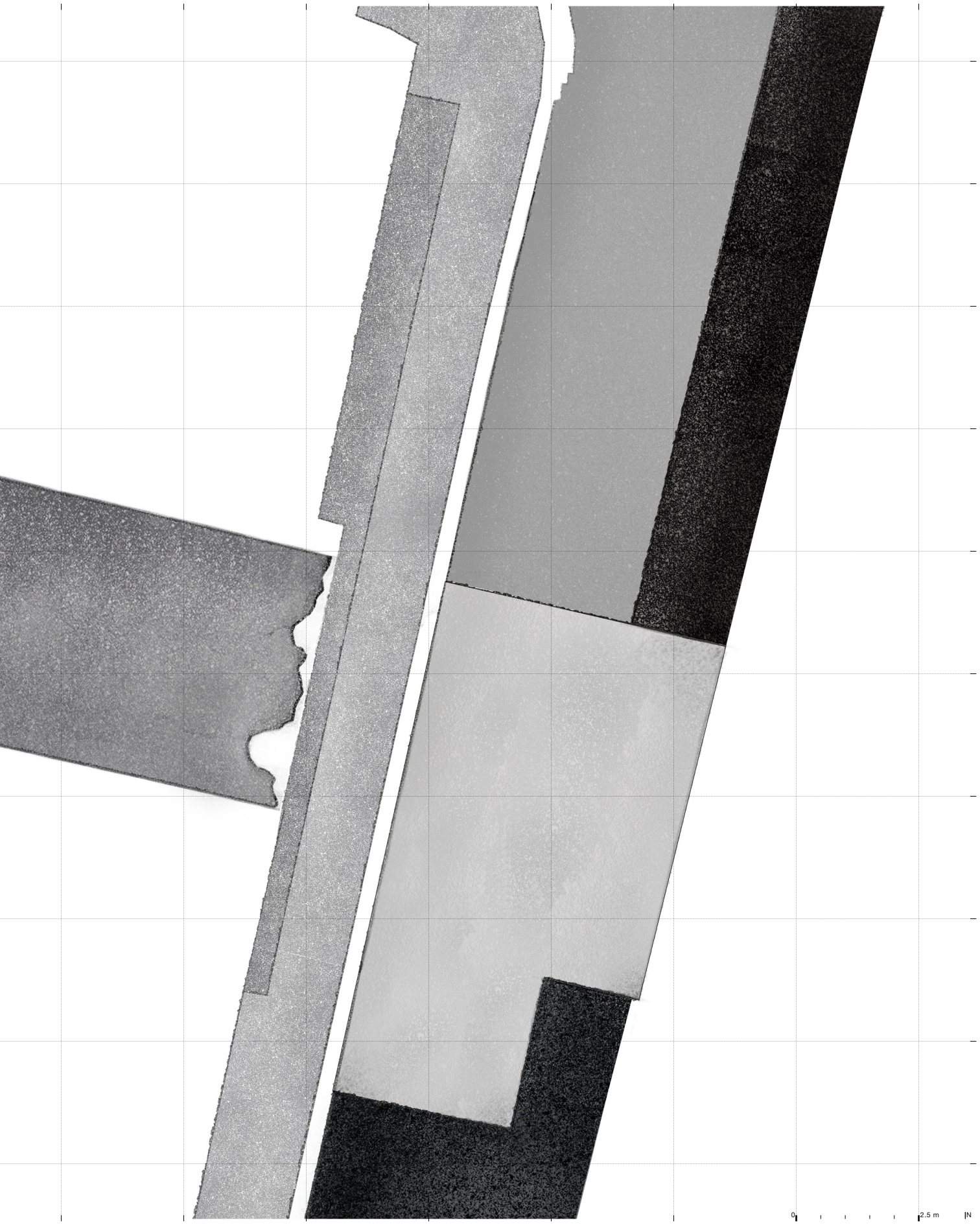
summertime! infrastructural face lift

from May until October. Asphalt workers with heavy garments and machine take over the city's covers. When the snow is gone and the ground is thawed, all surface failures and broken underground systems will be fixed. Asphalt will be milled, cut and removed to repair all leaking water pipes, outdated phone lines, power cables and underground steel heating pipes. Deteriorated surfaces that can no longer support loads will be replaced with new ones. Safety and functionality are ensured.

The hot dark mixture is gently poured down from the heavy truck. It steadily spreads on the even ground as the wheels slowly roll the load away. Workers follow up the noisy machine to examine; they meticulously remove all excess material from the sides. It is important to fine tune the edges before the heavy drum of the roadroller

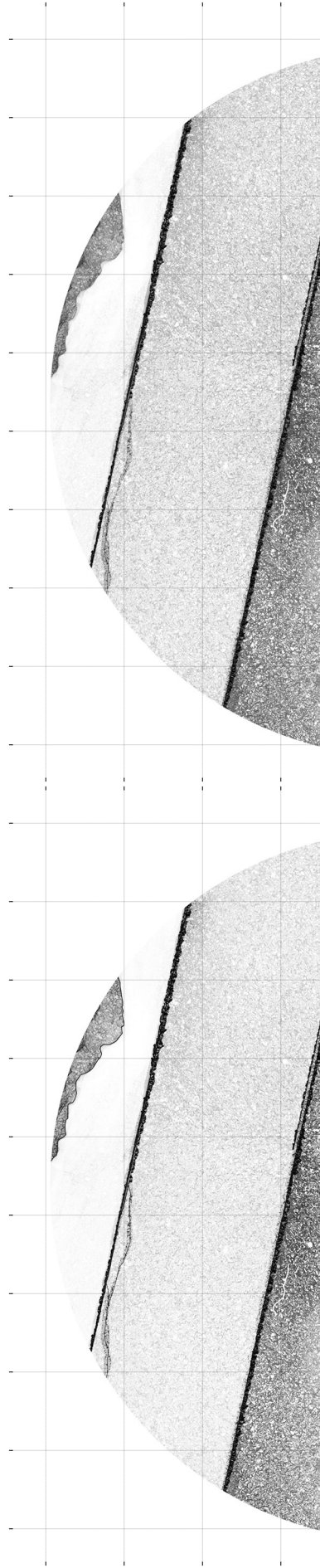
starts to compress the warm layer. Next morning, it looks as if a new black carpet has been carefully unrolled next to the old one. This contrast gradually fades in time.

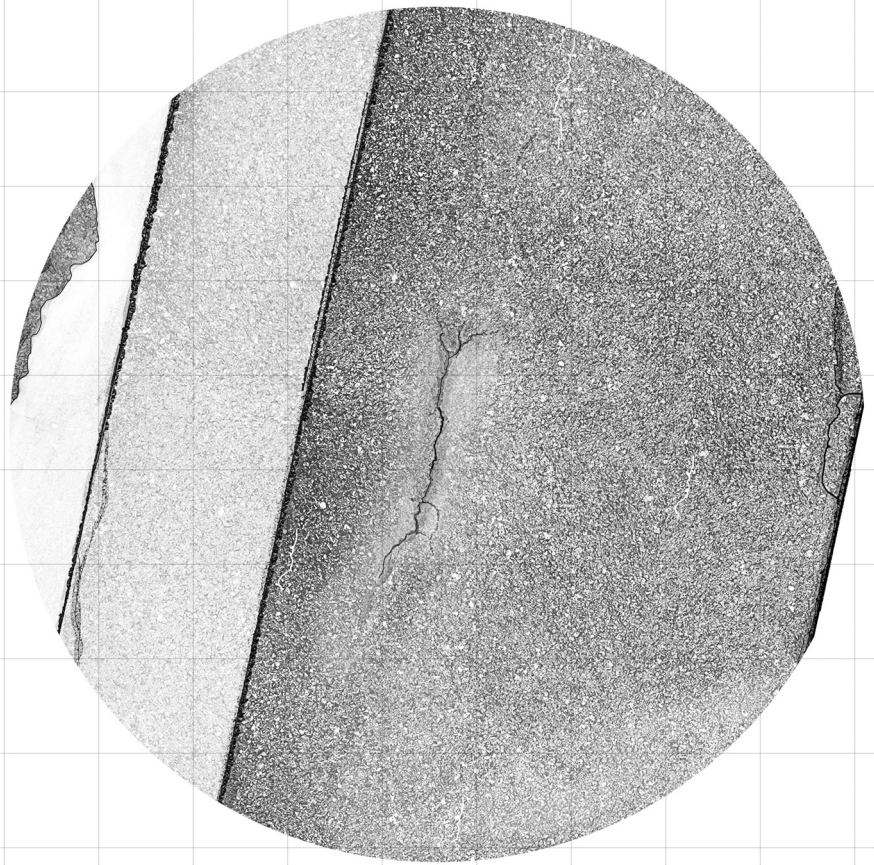
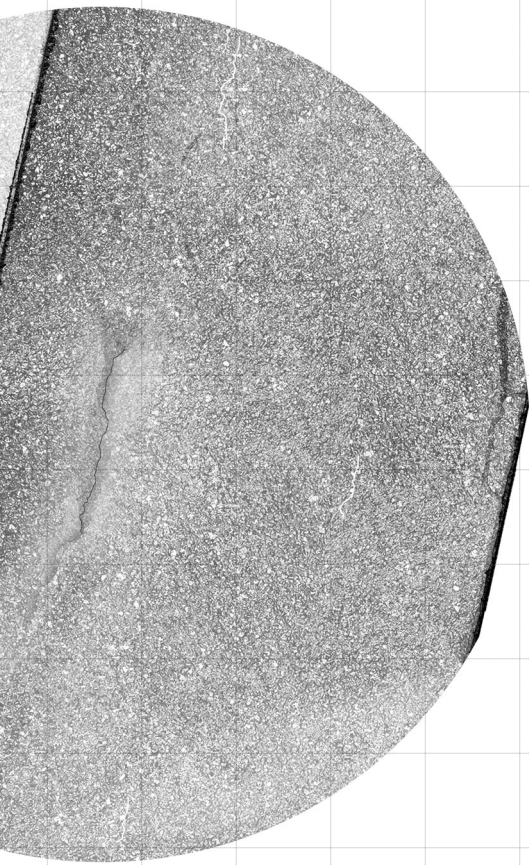




wear and tear

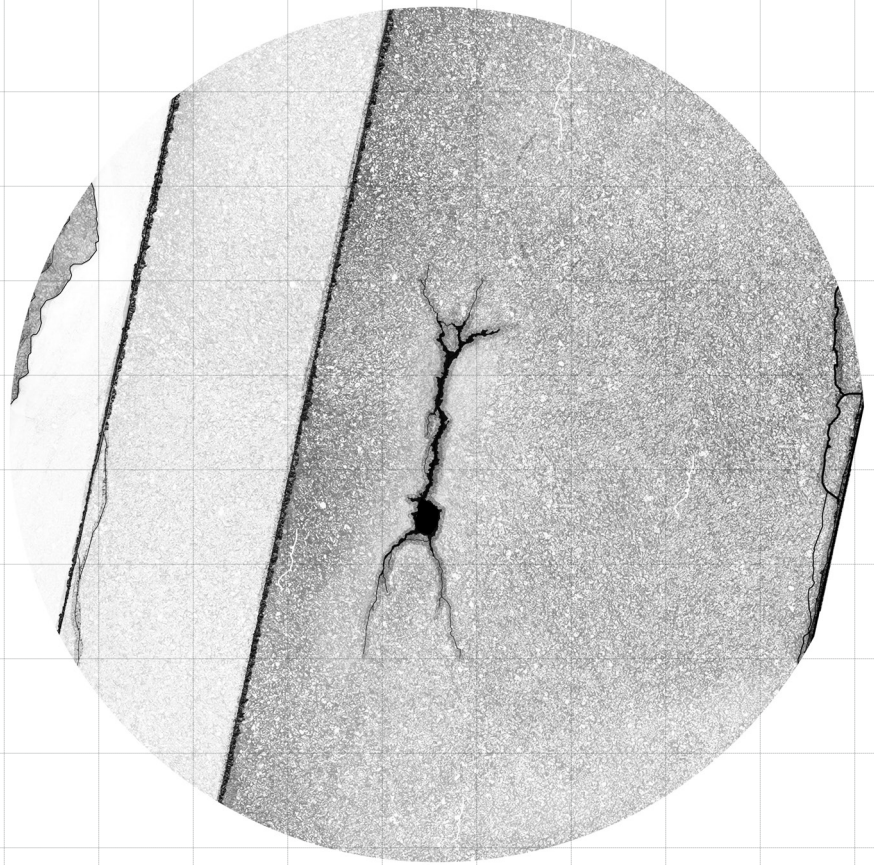
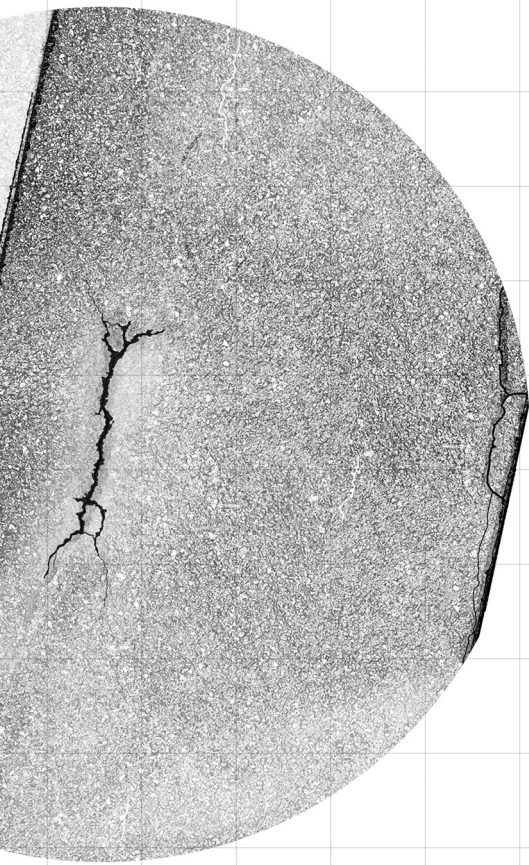
In normal wear and tear, sunlight and oxidation bitumen's properties start to be affected. The surface colour fades from black to grey and adhesive qualities become weaker. Daily friction, heat and moisture on the surface accelerate this process. The asphalt starts to crack. In the beginning this is not visible, but as water flows into the cracks, freezes and expands, it tears bigger fractures into the surface. These fractures are noticeable and tangible. If not fixed at an early stage, and due to heavy loads, a pattern of interlaced cracking in the asphalt layer occurs that resembles the hide of a crocodile. This leads to loss of particle interlock and subsequent loss of large chunks of asphalt, creating potholes on the surface.





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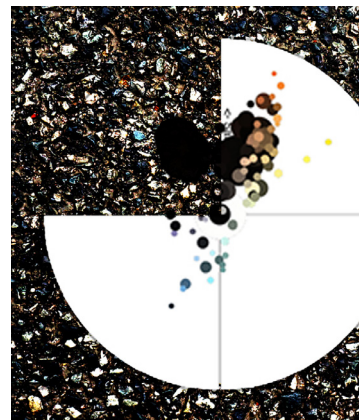
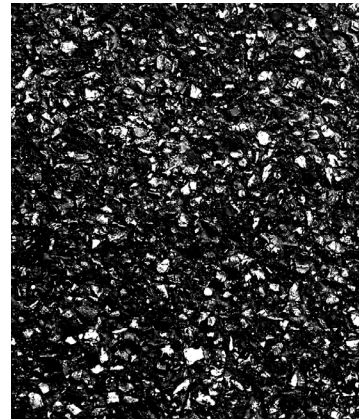
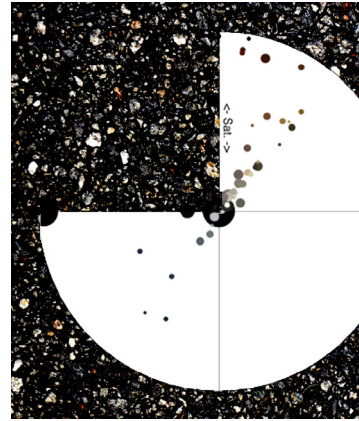
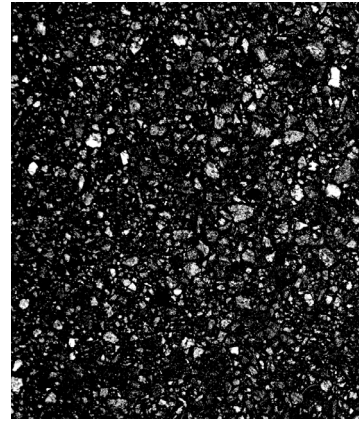
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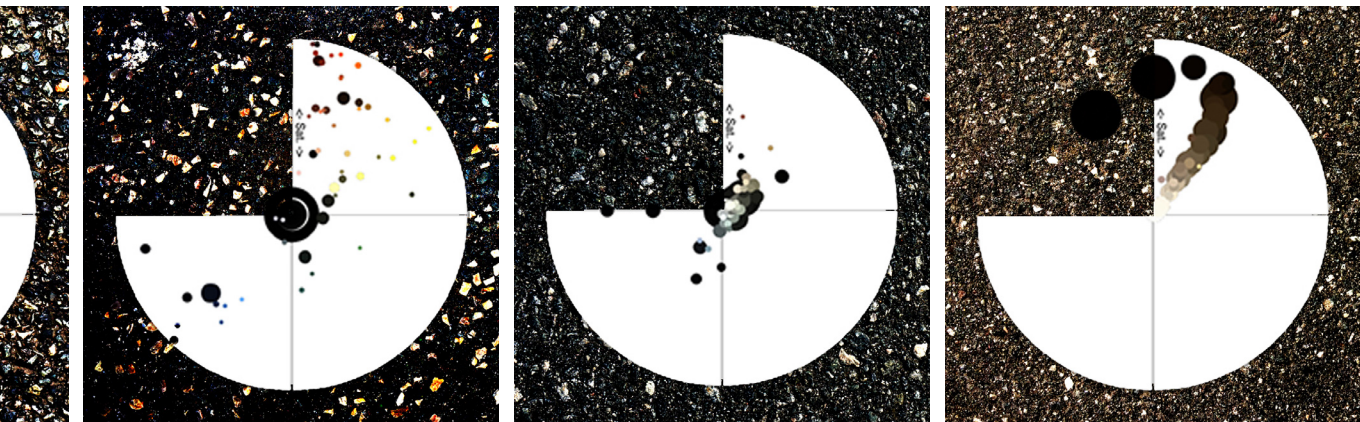
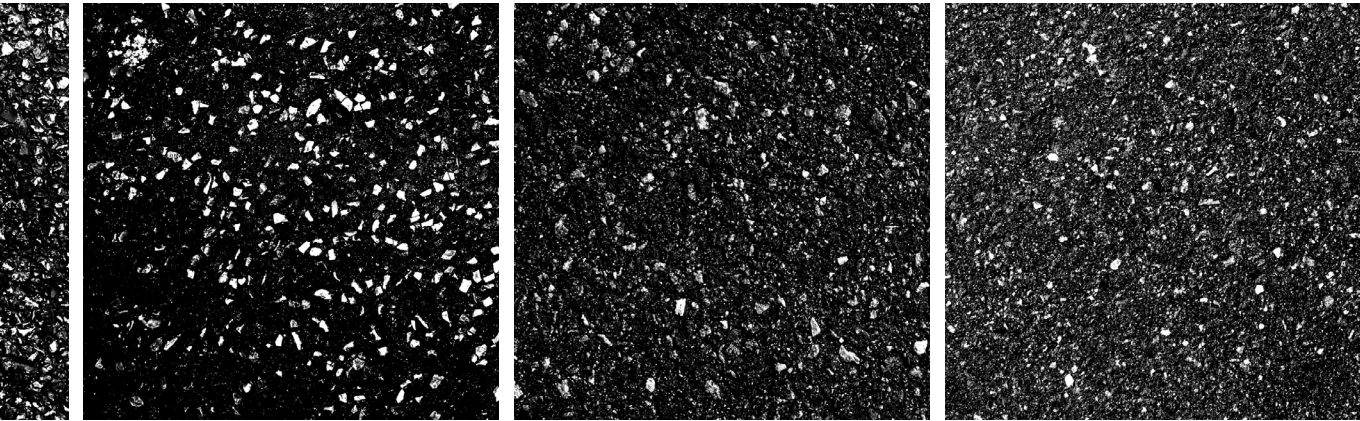
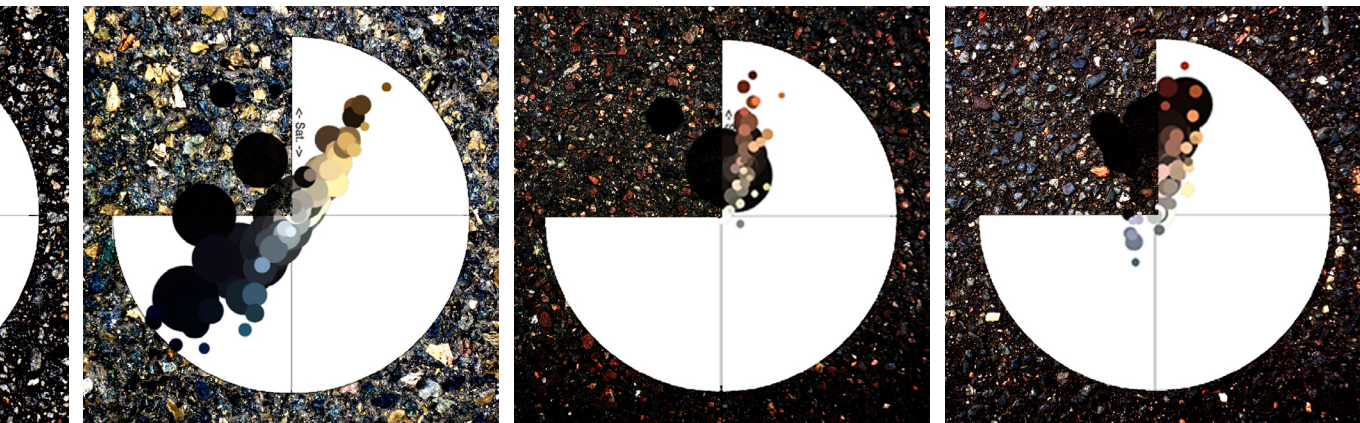
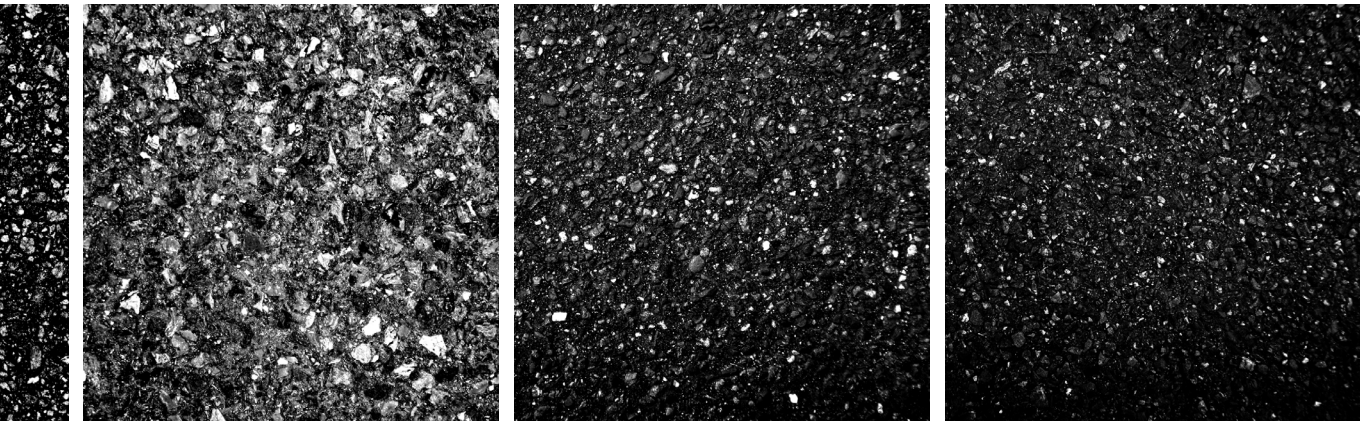
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precious stones

The texture of the surface alters gradually. Flakes and loose material are displaced. Sharper edges, shapes and sizes of aggregates start to reveal. Observing from this distance the texture is rough, not smooth. It is an irregular microtopography, of hollow and convex, composed from the smallest granulate up to thirty millimetre grain. In sunlight, these cavities are dry. In the shadow, morning mist slowly turns into moss and lichen that grow on dark edges and expand on undisturbed surfaces.

On faded greys get irregular spots of brown, red, dark greens, lighter greys and more glimmer. Aggregates of different origin can be identified and an expert eye could probably trace them back to the sites of extraction, or even in the exact geological strata of Oslo Grabe they belong to.





ruderals; the underclass of the plant world

Larger fractures, patchwork seams, surface edges and joints of juxtaposed material reveal the fragility of asphalt. This is where water can seep laterally through the subgrade meeting moisture from the water table that reaches through capillary action.

In spring and summer period, these crevices that reach deep into the soil under the hard rock subgrades, flourish. Plants grow but they aren't planted (flip?). It is flying seeds that find shelter in the slits. They are spontaneous, strong, untamed and competitive. They are called weeds, or ruderals and *ugress*, plants growing in unwanted places. They are defined not by their species/family but by the context they grow in.

Ruderals are the ###underclass of the plant world, ready to grow through the city's surface at any opportunity, breaking the veneer of human order and stability.

If this is the latest tectonic artefact of our latest culture then i'read' the history of the material on the streets, its wounds and healing.

