a space for processing

paper laboratory and research center tistedalen, norway



Located in a former pulp mill, the Tistedalen Paper Laboratory forms a space in which material is processed - in this case, paper - from raw material to resultant product. Through investigations of material, time, and place, this diploma forms a study of the role in which continual processing and reprocessing has the capacity to form the foundation of an architectural investigation – one that coexists with physicality, fragmentation, and memory.

As a laboratory for experimentation, the project forms a space that can tie into the current paper mill downstream. Norske Skog Saugbrugs AS is located approximately two kilometers down the Tista River and is the owner of the site. As it is one of Norway's few remaining paper mills, the mill stays relevant in such a highly competitive industry due to its specialization - something that must be continually tuned throughout the years. Focusing primarily on supercalender (SC) magazine paper, the Norske Skog produces approximately 550,000 tonnes of paper per year in Halden, with most of it being shipped abroad for use in a variety of publications and media types. The proposed paper laboratory will allow for small scale testing and experimentation, assisting with new breakthroughs and methods in the production of paper.

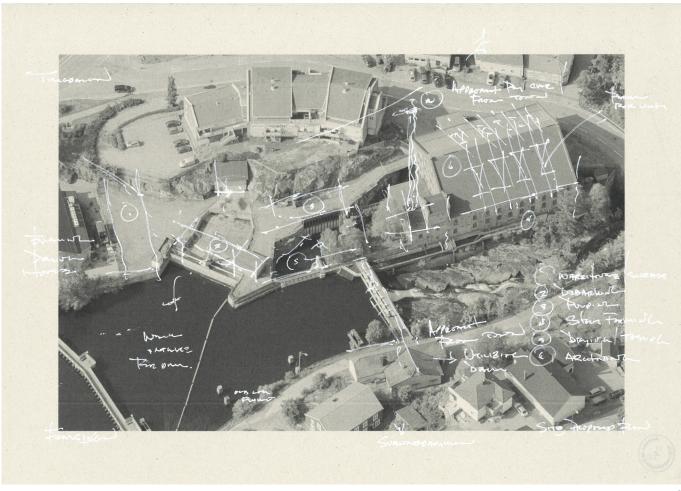
The project frames itself as a search for the discovery of the fiber. From initial material studies to later investigations of site and program, the continual search to uncover the underlying essence has been at the forefront. The following text will discuss two of the studies undertaken during the semester and how these uncovered and crafted a method of approach for the architectural investigation.

study no. 1 – papermaking Paper is a material that As stated by Kenya Hara, "The essence of paper lies in the fact that it is easily dirtied and easily damaged. Indeed, paper's charm is its ephemeral nature; with its thinness and tautness it seems to be barely holding on to existence, and, its tensile delicacy heightens our senses." (100 Whites, Kenya Hara, 2019, p. 6-7)

This robust delicacy is something that starts to hint at this fiber - composite relationship. In order to investigate paper further, I undertook the process of creating my own paper sheets to physically test, experiment, and experience.

In the papermaking process, wood (or other materials such as cotton, bamboo, and jute) are physically ground and turned into a pulp slurry. In the case of wood, lignin must be removed so that the fibers can break down. This is achieved through either chemical or physical means, but since I didn't want to use harsh chemicals in my experiment and didn't have access to large mechanical grinding equipment, I made my pulp from recycled process material from the semester.

After a pulp slurry is made, a screen is dipped into the mixture and with the excess water filtering out until a sheet of paper emerges. It is then transferred out of the screen with the water being pressed out and the resulting paper being left to dry. The process is simultaneously tedious and quick, but through the process of making paper, I started to experience the essence of paper that Kenya Hara was referring to. The physical dipping 1



and movement to get just the right amount of pulp in the screen for the desired thickness became and an art form, with the resultant sheet showing its traces of origin – through remnants of coarse pulp, to thick and thin spots resulting from technique, to surface textures and scars showing from the pressing and forming.

In order to understand the pages further, I scanned each sheet produced, zooming in to try to uncover the fiber in more and more detail.

study no. 2 - woodblock prints

During the prediploma, investigations into the site and its history were undertaken. In both the site and the surrounding region, timber was heavily processed for both paper and the building industry. Historically, timber was floated down the river, a point made evident through the remaining log flume footings remaining in the river. Incredible photos show this tumultuous journey the wood takes as it makes its way downstream, a series of events that leave traces and impart moments of dynamism in a material that appears otherwise static.

Given this rich history that occurs along the journey, as well as the initial stages of processing the timber for paper production, I set out to create a series of woodblock prints that attempted to understand these scars imbued within the material.

Plates were created from a variety of cross sectional cuts, each displaying its own character and substance. The plates were then inked and ran through an etching press, transferring this set of patterns and relationships onto a sheet of paper. These prints were scanned and studied in both part and whole, then given the chance to simmer for some time prior to reintroducing them to the study. As the project started unfolding, the prints were brought back out and sketched over to serve as generators. These sketches led to abstract visions of spatial relationships that I then tested and explored in model – independent of site, yet rooted in the study and nature of the project.

Through these acts undertaken on the wood, as well as the continual processing of artifact and remnant, a set of architectural relationships emerged to be introduced to the site. This friction – from material study, to abstract spatial idea, to specific site constraints – served as the necessary driver for finding the ways in which the site and its remnants could be utilized to give a lending hand to the architecture, while allowing the architecture to find its own language and exist as autonomous entity.

continual processing

These two studies, as well as the others, led to a process that gained increasing momentum as the semester progressed. Something was created – from a drawing, a photograph, a model, etc. – and then was scanned and documented. I then took the documented artifact and looked at it in more depth. Primarily, this involved zooming in and printing that fragment, sketching and thinking through that material, and then documenting the resulting artifact. This process became second nature, with each subsequent move or gesture forming one more thread of inquiry into a particular topic, facet, or moment.

processed nature

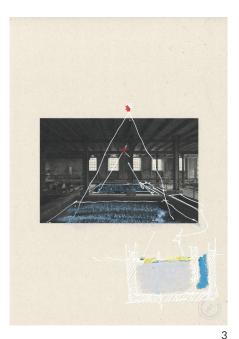
The architectural project situates itself within the remnants of former site infrastructure. These come in the form of both unused or decommissioned machinery and water works, as well as a spatial vessel that stands more or less abandoned. Every moment of the site has been physically altered in some way throughout its many occupations, and this emerging 'landscape' forms the site for the architecture.

Two areas of the site form the basis for the primary architectural investigations: the former water intake for the pulp mill and the existing building itself, a modified and adapted structure from 1888 that shows traces of every occupation and use over the past 130 years.

In both, the architecture has sought to both establish and reestablish the flow on site. This takes place through the movement of material throughout the site, as well as in creating the ways in which the human experience of the various remnants can take place. Dramatic moments such as the cut rock faces that once formed the water intake juxtapose the delicate and precise architectural insertions. Together, a new whole is created – one that will undoubtedly be processed and re-calibrated over the next 130 years.

experiencing material

In the architecture, the paper physically modifies and forms its surrounding spaces, showcasing the various phenomena that are present within such a rich media. In one moment, the space for drying, its thinness allows it to flutter in the breeze, with



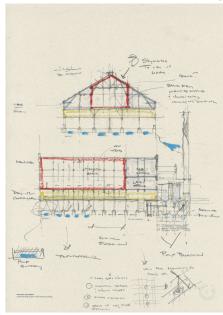
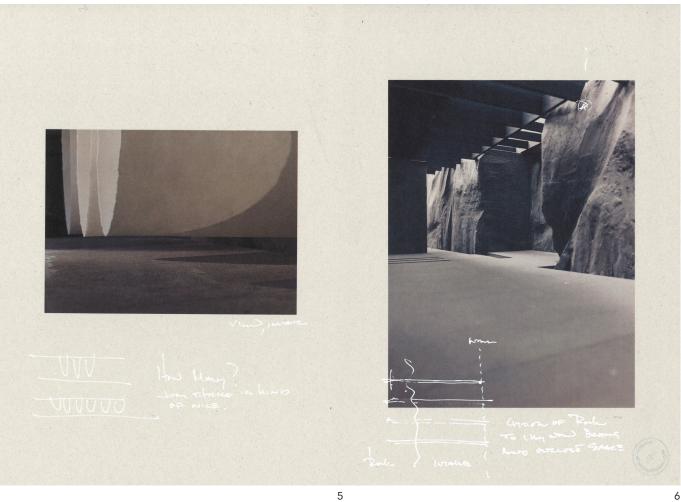


fig. 3 Sketch, Existing Building Reinterpreting Existing Moments

4

fig. 4 Sketch, Existing Building Understanding Structure and Space



the ways in which it hangs showing the strength and mass of something that is simultaneously robust and solid. The coexistence of these opposites, much like that of the new and existing architecture, searches for that delicate tension inherent within their composition. It's through this discovery of the fiber, as well its resultant structure and composition, that I can uncover layers of memory, mystery, and place. It's simultaneously isolated yet part of a larger totality.

This study has served as a way in which I have personally sought to understand various moments - from material, to process, to site - uncovering their fiber and finding the ways to express these occurrences. In a similar manner, the architecture exposes and celebrates these moments, allowing for a space in which a bodily experience of material can take place - a space in which we truly process - both in terms of material production but also through human perception.

fig. 5 Photograph, Proposed Building Physical Experience of Paper

fig. 6 Photograph, Proposed Building Inhabiting Remnants

6