Interpreting the Landscape through Layers of Mapping

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Abstract

The ways in which landscapes are represented, through maps, paintings, and photographs, influence the interpretation of a particular site. By investigating these different methods of representation, the landscape can be understood on a deeper level. Layering these various maps and images creates a variety of diagrams that can then be used to determine what are the most important qualities and how to utilize these qualities in an architectural intervention.

“Maps make visible what is otherwise invisible”
– J Corner
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Introduction

There is a disconnection between how one experiences the landscape and how one represents the landscape. The site is the foundation on which all architectural projects begin. There are physical objects and quantitative data that define the site. However, there are also ethereal impressions and representative abstractions that define the site with equal influence. Although a proxy for actual and substantive information, maps have become abstract and purely systematic methods for ordering the site in an understandable format. Defining political boundaries, property lines, trade routes, and natural and built environs only gives a partial interpretation of the landscape. Similarly, the way in which these constructs are symbolized lends a hand in how the landscape is understood and managed. Mapping more theoretical topographies, such as the culture or economy, of a site becomes the new challenge. Not only in how it is defined and quantified for visualization, but also in how those visualizations take shape. Unlike rivers or railroads, there are no graphic standards for how to map the emotional response that one feels when standing in a space.

Challenging these common cartographic standards creates a methodology by which a site can be understood on a variety of levels to influence how a designer might choose to intervene. Due to the uniqueness of individual sites and the qualitative nature of spatial and material decisions, designs must be tailored to its own particular site in order to avoid being unfit or improper. What is too steep versus what is too shallow on one site becomes a null argument on another. This is true of both the physical and metaphysical site. If one is attempting to understand the cultural landscape of a site, one’s personal experience on one site will be completely different from that same individual’s experience on a different site. Even if one were to theoretically occupy both sites at the same time, their emotional response would be directly related to the space they occupy.

In departing from some of these cartographic norms, it remains impossible to avoid the underlying purpose for each map that is created. While a hydrological map of a river may be abstracted to show general curvature and normal vectors outward from the center (a decidedly artistic interpretation of the river), the conventions of a planar map still hold true and present the landscape in a certain light, whether intended or not. Decisions to be made about scale, color, symbology, and context can severely alter the reading and interpretation of the map. Like novels, maps adhere to a set of conventions to construct a narrative about the place. Presenting or withholding information impacts how the space is read and the narrative interpreted. In this way, the landscape may be more similar to a photograph or painting of itself than a map, which is commonly considered to be more descriptive.

One strategy employed by this study was to eliminate context for the map whenever possible. By plotting one set of information at a time, the emphasis is placed on what that particular map communicates. Separating this information also allowed for a fairly restrictive graphic convention. Because they were being marked on individual layers, differing maps could be created with a limited line style and color pallet to reduce the perceived interpretation by the viewer and display the information with slightly less bias than a more traditional map (however, it can be conceded that a truly apolitical map is impossible to achieve). Then, through a systematic process of overlaying varying degrees of information, inferences can be made about the overarching story of the site. Even with a relatively small sample of maps, a large variety of combinations can be created to analyze and fully understand the landscape in great detail. By producing this catalogue of mappings, one can begin to analyze and infer certain characteristics of the site.

Through this process, a systematic and built order was created. This development of a hierarchy can then start to be thought of in architectural terms. Architecturally, there are several ways to begin analyzing the maps: interactions, spatial operations, and program. Through these three design functions, in coordination with the physical and metaphysical reading of the landscape, the architectural need and space begin to take shape. The process included creating sets of formal patterns that could develop over a continual process of abstraction and recomposition.

01
The research in this thesis is presented on a nondescript, residential site in Knox County, Nebraska - along the banks of the Missouri River. Selected for the range of topographic features in the region surrounding the site, a promising existing condition in the form of a freestanding, 19th century, stone fireplace and chimney, and a vested personal connection, the site proved successful in producing the analysis that was expected.
To begin to understand the layers of information that could be extracted, it was important to start with a foundation from which to pull. Geographic information system maps provided this base and defined important empirical knowledge about the site such as soil type, vegetation cover, and historical climate data.
The standard mapping techniques and geological information were supplemented with cultural ideas and memories that represented the site. These generalizations informed how the site is further represented and created a rubric through which design decisions could be made.

In addition, there were some decisions that were made without outside influence from the site analysis or cultural analysis. While these tools were necessary and useful in establishing the problem and creating steps towards solving it, there are inherent biases that informed decision making as well. These pre-established idea about the site created a bubble in which the landscape could be moved aside and decisions made without it.
Precedent

Movement No. 1
Christian Truscinski, 2013

Taking Measures Across the American Landscape
James Corner, 1996

Mapped Mobility
Vere van Gool, 2012

S32
Emma McNally, 2013

S32
Emma McNally, 2013
By deconstructing the landscape into a series of mapped layers, the site can be rebuilt in a variety of configurations to get a truly representative image.

Satellite
A basic and easy way to represent the landscape. Satellite imagery has become a standard in understanding geographic regions.

Missouri River
A defining feature in the landscape and one that became central in establishing the frame of reference it interacts with the site.

River Normal Vectors
An organizing principle used to establish hierarchy around the river. These vectors provide a frame of reference for referring back to the river.

Roads + Highways
Core transportation system around the site. The existing infrastructure has major implications on the current buildings in the area.

Sections + Townships
From the Public Land Survey System - a structured grid to organize the landscape. This grid became important in the cultural studies.
The surrounding buildings were vital to the contextual condition. Reference points were based on nearby structures and key details were based on vernacular architecture.

A constructed order for considering the cultural implications of the site. This was a first pass at visualizing the core ideals of the region.

Similar to the Base Cultural Rubric, this study applied elements from the geometric analysis to further illustrate the cultural dimensions of the site.

An understanding of the effects that the river and floodplain have on the larger landscape.

It was then important to reevaluate these elements as restructured layers, as well as at a variety of scales to understand the larger implications.
Layers

These deconstructed layers were then reordered to build back a structured system of information. By reorganizing the layers, new ways of interpreting the site could be revealed and areas of intersection could be identified. As the process of interacting with the site through design began, the layering method became cyclical. As new design ideas emerged, new questions about how these layers of information interacted with each other required answers.

Reorganizing this information also created a hierarchy of what elements were most important in describing the site. Some layers were inherently more descriptive and these had greater influence over the final design. Some layers were inconsequential in the design of the building, but posed new questions that led to a deeper investigation of the landscape.

In an interview by Places Journal, Anuradha Mathur and Dilip da Cunha stated:

"...revealing and probing lines of demarcation and categories, lines which can be literal or conceptual - such as the lines between city and river, urban and rural, formal and informal, infrastructure and landscape, land and sea, among many others. And we question the tendency to understand and visualize these categories as separate before they are related, distinct before they are united."

This series of distinctions must be made in order to fully understand the context in which they work together. That is not to say to keep them separated and distinct from each other, but to consider the full capacity in which they exist independent of each other before attempting to combine and muddle the image. Once this is done, the categories can be combined in order to get the full picture and understand more fully the multitude of combinations and patterns.
Cultural Mapping

As the mapping becomes more abstract the layers of information, necessarily, must become more detailed. The reduced reliance on standard topographic representation requires a deeper understanding of the culture and history of the site.

The map becomes a four-sided rubric that organizes a way of thinking about the site and how to being designing for the landscape. The geometric relationships found in earlier studies become iconography to represent important intersections in the rubric and mark where core ideas about the site exist. The breakdown of the rubric is as follows:

- **Interaction**
  - Surface
  - Service
  - Organization
  - Structure
  - Repetition
  - Anticipation
  - Sequence
  - Movement
  - Function

- **Spatial Operations**
  - Expand
  - Branch
  - Bend
  - Overlap
  - Compress
  - Embed
  - Split
  - Taper
  - Merge

- **Culture**
  - Society
  - Customs/Traditions
  - Religion
  - Language
  - Arts/Literature
  - Government
  - Economy
  - Food/Clothing
  - Music/Dance

- **Program**
  - Classrooms
  - Office Space
  - Lobby
  - Auditorium
  - Deck
  - Study Rooms
  - Labs
  - Restrooms
  - Mechanical

This rubric allows for a close study of the cultural dimensions of the site - that is - the visual representation of cultural strengths and weakness of the individuals who live in or have frequent interaction with the site. Rather than simply mapping ethnic or racial background, this method lends itself to extracting the true core values of the individuals, and therefore, of the site.
Jeff: Vising the farm chicken/coop where mom dad used to live when first married. I think her name was Mrs. Murray. We said our quick hellos and then ran down the lane out to the road where we swam in the creek while Mom visited with Mrs. Murray.

Dan: There were also all those summer day outings. A trip to swimming in the creek up north a day riding to work with Dad, often including fishing at various farm ponds, picnics at many different locations.

Laurie: We would all pile in to the back of the pickup after supper and ride down the country roads. I suppose looking at job sites if a vehicle was coming we would duck. On a good night we would stop at Sky Hi drive inn and have soft ice cream cones.

Joan: This was long before the shop was built. I remember growing up in a bedroom that looked out over the sunrise with nothing but a shelterbelt, pasture, and sky to interrupt my thoughts. And I recall vaguely seeing on the horizon more deer frolicking about than I could count. I’d tell Mom all about it over breakfast.

Carol: We grew up in the country where we spent 50% of our time outside. Slides, swimming, bikes and kites. Huge wooden spoons and picking mulberries.

Jeff: Driving out in the country with mom and digging cedar trees out of shelterbelts and replanting them at home.

Nancy: Picking strawberries in our garden, there was always an abundance to pick.

Jeff: Going in to town and buying a sheet of glass to replace a broken window. Brought it home and took it out of the car, wind caught it and broke it against the car. The look on Mom’s face – priceless.

Anna: As a child I had a really hard time waking up before noon, at the river by that time the people who had gone fishing were usually back and cooking the mornings catch for lunch but I really wanted to be ‘one of the guys’ and join them. One summer I finally told one of the uncles that I wanted to go and they of course were excited for me to tag along. Grandma made me one of her chopped beef and mayo sandwiches and I actually managed to wake up at the unimaginable early hour people go fishing. Being out on the quiet river while everyone else was asleep, fishing with uncles, made me feel like such an adult even if a refused to touch a simple fish.

Susan: We used to mark staks with big black markers for Dad when he was leveling land. Mom would drive down the field, and yell the numbers to write on the stake. With my limited hearing, the wind, and the rustling of her plans as she looked at them over the steering wheel, I am completely confident, I was at least 50% accurate.

Nancy: I loved getting to climb the tree piles that dad was getting ready to burn and then would all be there when he had a huge fire going.

Susan: It was always a treat to go where Dad was burning trees. I still like the smell of burning trees and diesel fuel. I also like the smell of Old Spice, which Dad would put on for bowling night.

Carol: We visited Dad’s job site so we could stand on the dirt road while he felled huge trees to feel the earth shake. After, the 20 foot pile of downed trees were our playground.

Mark: Going with Phil and George, to the pond just south of Jenkins’ farm on Highway 13 to fish for snapping turtles. It might have been for an Easter holiday. I remember that we captured two huge turtles and one took a bite out of George or Phil’s leg as he was carrying it up to the car.

Jeff: Grandpa Thompson taking us to the river and giving a ride in Manion’s houseboat. Dan had his arm in a sling (broke his collar bone I think) and when we pushed the boat way from the dock, Dan fell in the river. Getting the boat high centered on a sand bar and Grapping stripping down to his long Johns and pushing us off.

Mark: We would go to the cliffs near their home. I remember how steep they seemed, especially at the top.

Mark: I remember a family trip to Lake Okoboji probably hosted by Bill and Marg. I remember us out on a boat all day and how my legs got so sunburned that I got nauseous that evening. But it was a great time out on the water.

Mark: Playing baseball when Dad would bat the ball and we would be spread out either in front of the Hoffman’s barn or beside it. We would play for hours.

Mark: Mom would drive along the country road past the Hoffman’s place and we would fan out on each side to look for asparagus in the trees in the road ditch.

Mark: I remember walking bean fields that were half a mile long on hot summer days and running out of water mid-afternoon. I thought those days would never end. I actually started to look forward to the start of a new school year then.

Mark: Out on a tube with Tony Bivens and then diving in to the water when other friends tossed Silver Salutes and other big fire crackers at us. I have a memory of seeing some of them explode on the water surface while we were under water, but I am not sure water was clear enough for that to really happen. The memory, however, is pretty clear.

Cathy: Sunset – one of my “quiet” happy memories is spending one on one time with Darrell and Claire in their living room in Plainview. With so much family, it is a treat to be able to find quiet time and share stories, upcoming plans, the paper, and especially the sunset. I love the view from the big picture windows, the farm landscape, and the vastness of the sky. The beauty and relaxed setting say, “slow down and enjoy!”

Luke: I will never forget the time we painted Grandpa and Grandma’s house. There is nothing better than painting a house with red oil-based paint in the middle of the summer. I believe Paul and I both got sick that day.

Laurie: In the 1990s Sara, Paul, Luke and I helped Mom and Dad plant the tree out front. Sara took Mom’s camera and used the whole roll of film to take pictures step by step. Mom was upset at first. But she says now she loves to look at the whole process. Everybody told Dad the tree would never live. It is beautiful today.

Michelle: Grandpa always goes to the back porch to wave to you when you are leaving.

Paul: I remember taking walks in the cornfields during the summer and checking the irrigation lines with Tony and Grandpa with the three wheeler.

Danielle: I loved to play outside on the swing set, climbing trees, running around the dump, and crawling up on Grandpa’s equipment.

Leah: We loved playing out back in and around the shop, picking sweet corn, and checking the pivot with Grandpa on the 4-wheeler.

Nicole: Laying down and rolling down the hill in the front yard.

Justin: I remember sitting outside with Grandpa in the evenings with our bird books and binoculars watching birds, and the one time we saw a woodchuck running by the shop.

Michelle: We used to climb Grandpa’s old garage. There was a mulberry tree at the top you could reach from the roof. We used to pick them and throw them which was a lot of fun until we had to clean up the mess afterwards. Grandma caught us.

Paul: I also remember the countless days that all of us grandchildren spent climbing on all the big cement rings near the shop.

Danielle: I loved to play outside on the swing set, climbing trees, running around the dump, and crawling up on Grandpa’s equipment.

Mark: Meg’s wedding – we had the wedding out on a Lincoln Lake, Oak Lane. It was a beautiful day (thank goodness); again family did a wonderful job of coming to the tent.
Sentiment Analysis

The Hoffman Family memories were assessed using the NRC Word-Emotion Association Lexicon. Words associated with the eight basic emotions - anger, fear, anticipation, trust, surprise, sadness, joy & disgust - were selected to determine what types of emotions members of the Hoffman family associated with the site.

Positive | Negative Analysis

The memories were also analyzed using Opinion Mining and Sentiment Analysis by Bing Liu at the University of Illinois. Using this method, word counts based on positive and negative emotions were established to gauge general emotion towards the site.
Building Context

According to author J.B. Jackson, there are two distinct individuals who shaped our understanding of the American landscape: Thomas Jefferson and Henry David Thoreau. Both critical of urban societies, Jefferson and Thoreau praised rural and suburban living conditions for the American citizen. The distinction between the two comes in the form of their views on the relationship between society and nature. While Jefferson believed that a rural society (and a rural citizen) was a more natural living condition, Thoreau believed society itself was the issue and a pure connection between man and nature was ideal. The point of contention between these two ideas is how to define the individual and the individual’s connection to their environment. Jackson states, “Coherent, workable landscape evolves where there is a coherent definition not of man, but of man’s relation to the world and fellow men.” An individual’s relationship to the world comes in the form of the landscape, the culture, and objects that define and coexist with both of these things.

The surrounding context can be defined by one of six basic geometric forms. These were established by the Nebraska Historic Buildings Survey of Knox County. These six forms became a guideline for the envelope of the programmatic elements. Identifying where these forms could be found around the site provided context for the design decisions made in developing the project.
Diagramatic Process

Base Geometry

Extruded Geometry

Programmatic Connection
Programmatic Splits

Circulation + Ventilation

Structure + Covering
Elevations

East Elevation

West Elevation
Exploded Axonometric

During the process of understanding the framework in which the memories and folklore of the site could inform the final design, the project became a question of space versus place. Yi-Fu Tuan provides definitions for each: a space is a location with no social connections for a human, while a place is a location created by human experiences. The maps of the physical and existing objects on the site treated the landscape as a place, while the memories and cultural rubrics represented the landscape as a place.

This distinction became an important aspect in the final design of the structure. The goal was to create a space for education and understanding, not just a place that referred back to its context. In studying the culture and history of the site, the idea of the horizon stood out as a defining feature that represented the landscape as a whole in some way. The question that arose from using the horizon as a catalyst was: how does the structure meet the ground, how does it meet the sky, and how does it treat the existing horizon line beyond it?

As a built object, the structure works to allow views around and through the site to see the extending landscape. By creating voids shaped that are shaped by the programmatic elements, there are remaining spaces that expose the exterior space and frame the landscape and horizon. This allows the site to become an extension of the building and an object that works with the space in order to enhance the understanding of its surroundings.

Corner, James, and Alex S. MacLean. Taking Measures Across the American Landscape. New Haven, Conn.: Yale Univ. Pr., 2000.


