

500 feet of sunset

By
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and State University in partial fulfilment of the requirement for the
degree of

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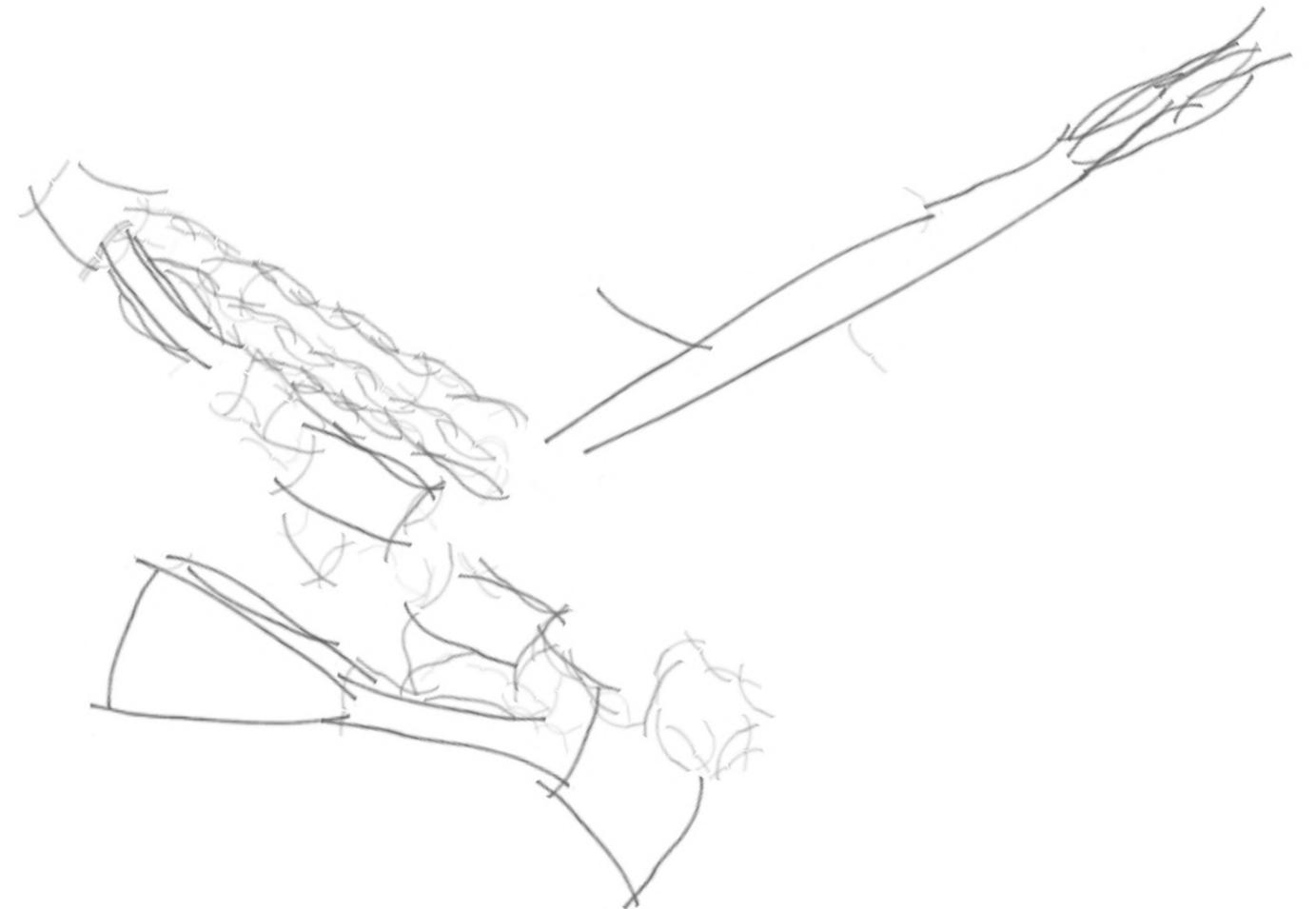
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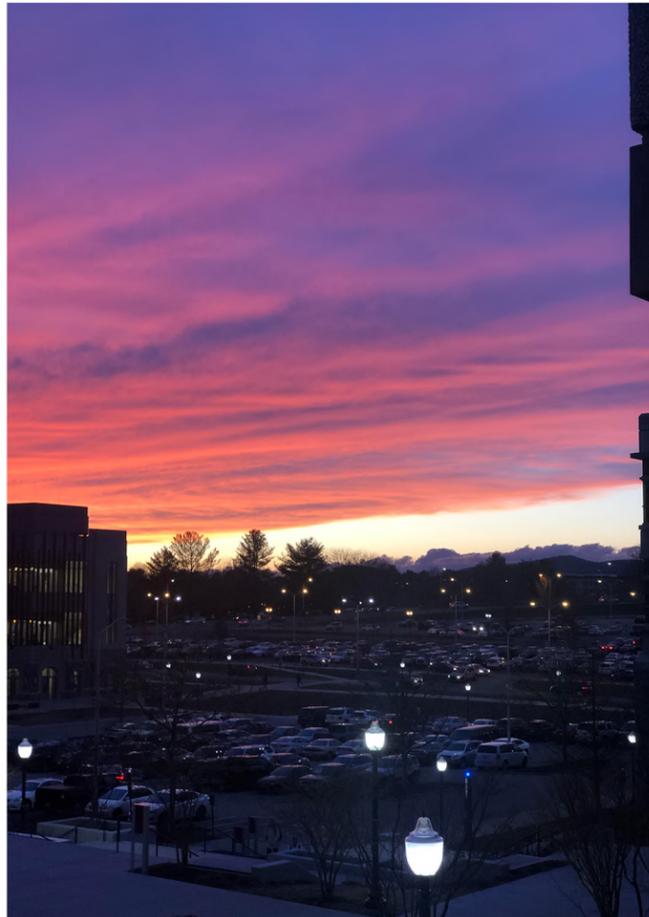
500 feet of sunset



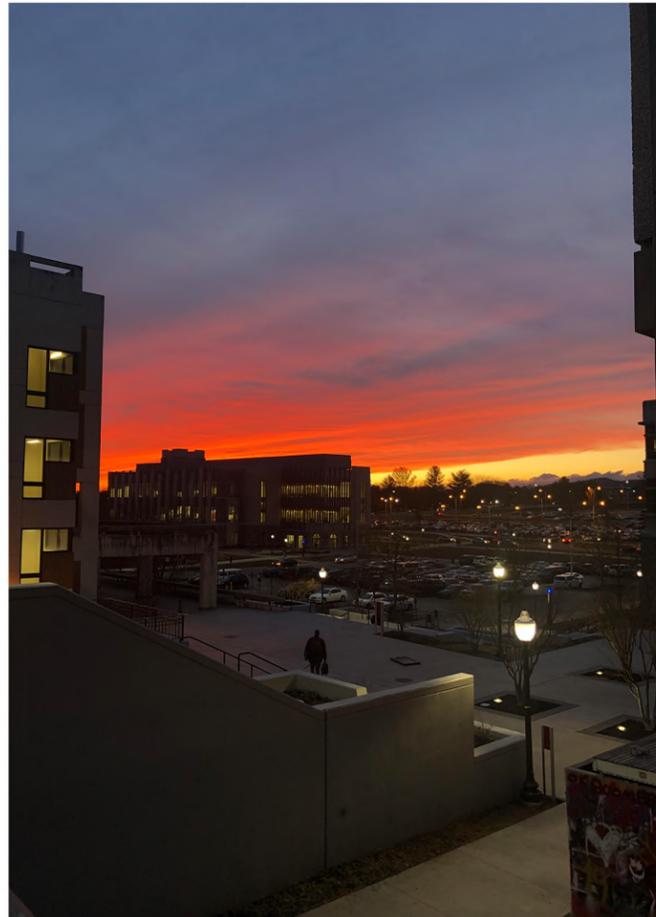
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abstract



An event of Sunset - 5 minutes apart. Early February at Blacksburg, Virginia



The Sunset is a natural phenomenon that occurs every single day. Arguably, the sunset is one of the most romanticized natural events in all forms of art. In this wider context, the hypothesis posits architecture as an instrument to amplify specific visible aspects of the setting sun. The guidance for development relies on deconstructing and intensifying a specific spatial condition that interacts with effect the rays of the evening sun.

Set in focus are three particular elements of the sunset, color, light, view and the subsequent darkness. In this architectural array, the chosen aspects of sunset are awarded a specific presence in their dedicated spaces. The spaces presenting those specific aspects of the sunset are organized as a sequence in the architectural construct of a long tunnel-like pathway. A culminating moment of totality emerges after the encounter of the specific aspects.

acknowledgements

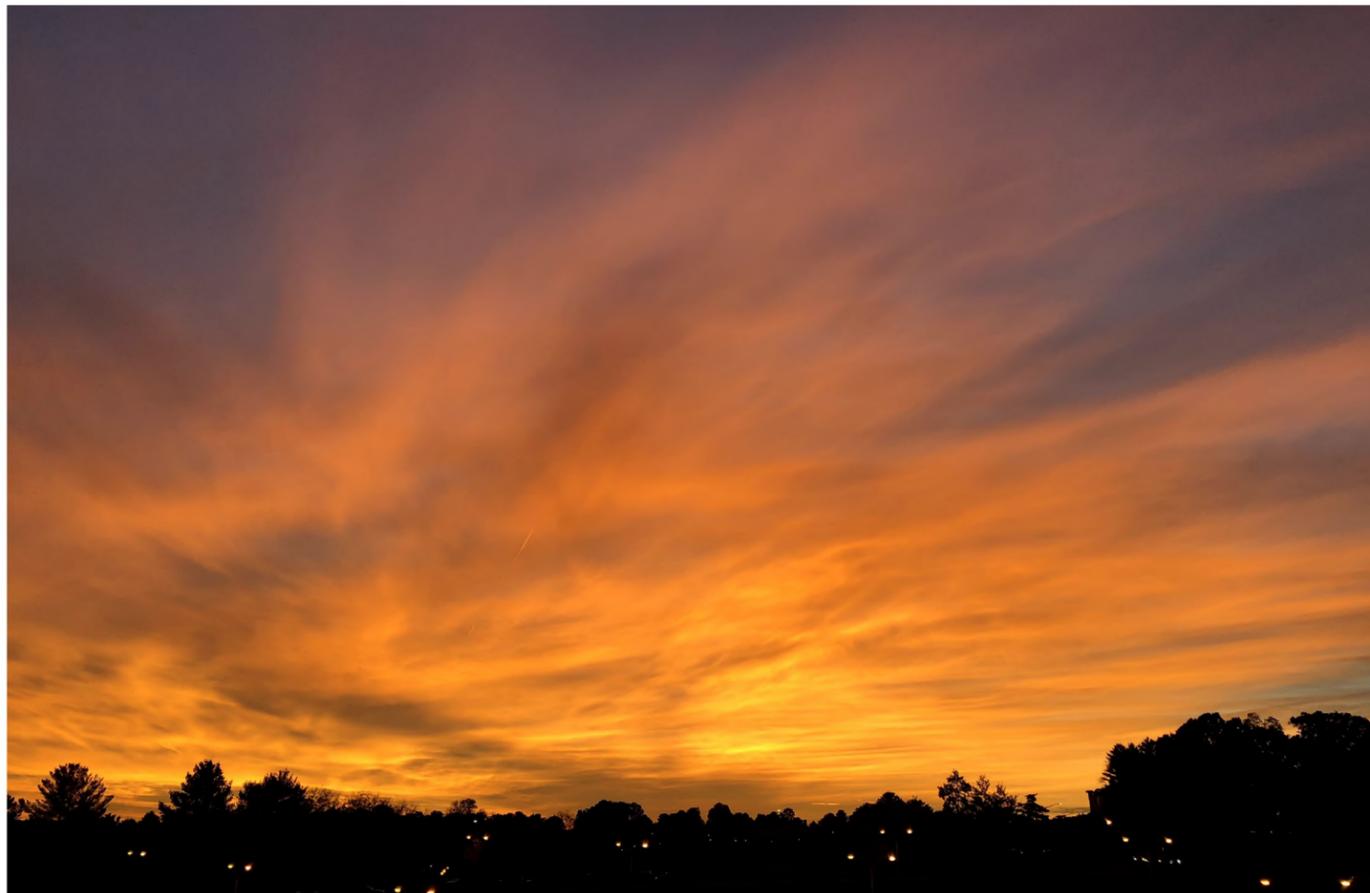
I would like to thank all my friends in the studio who have always encouraged me to learn and supported me through all my explorations.

I would like to thank Heiner, my committee chair for his critique, suggestions and immense encouragement not just in thesis but also throughout my time at Virginia Tech. I would also like to thank my committee members Jim Jones, who inspired me to explore this topic and Jim Bassett for his valuable suggestions. I would also like to thank Kay Edge for her early inputs.

To Rahul, thank you for your constant support throughout this past year. Your help made this journey possible.

To Appa and Amma, I could not have done this without you. Your love and constant support kept me going through this year. Thank you for always believing in my dreams.

introduction



October Sunset in Blacksburg, Virginia

Sunsets have been one of the most mystical and romanticized phenomena in human history. Even though they occur every day, they continue to generate awe and surprise in every generation. Sunsets have always been a frequent muse for artists, poets and photographers, and considered sacred for those seeking spiritual awakening. From Asian to native American cultures, sunsets on certain days have always been a cause for celebration as they mark the end of a season and a beginning of another. This timeless and ethereal event has often been associated with a transcendent spirit that can have a healing, creative and restorative effect in one's soul. Aside from individual beliefs, the sunset as a phenomenon invites a moment for pause, a moment for retrospection and a moment that signifies the end of one day and a signal for a new beginning.

This architecture emerging from this thesis engages the warm colors of a sunset that signify the beginning of nightfall, the long shadows that makes one think the sun is asking to be looked at, magnificent views and the darkness that follows.



Willows at Sunset, Vincent Van Gogh



Sun Tunnels - Nancy Holt

"The idea for Sun Tunnels became clear to me while I was in the desert watching the sun rising and setting, keeping the time of the earth. Sun Tunnels can exist only in that particular place—the work evolved out of its site."

The artwork consists of 4 concrete cylinders that are oriented to summer and winter solstices. A series of small apertures are punctured into the cylinders based on different constellations. Shadows cast by these apertures trace the Earth's rotation.



Rainbow Panorama, Olafur Eliasson

"If you look at the city through red glass, your eyes develop a green afterimage. If you maintain a quick pace, the colours remain vibrant. But if you pause in one colour zone, the hue around you grows pale while the colours in your peripheral vision, where the walkway curves, intensify. Colour intensities depend on your speed."

Eliasson talks about the spectator being the resonator of colors in Rainbow Panorama. The different colors of this space provide shifting narratives of the city of Aarhus. By using colors to interact with its spectators, Eliasson drives home the point that museums will always be "vision machines".



Roden Crater, James Turrell

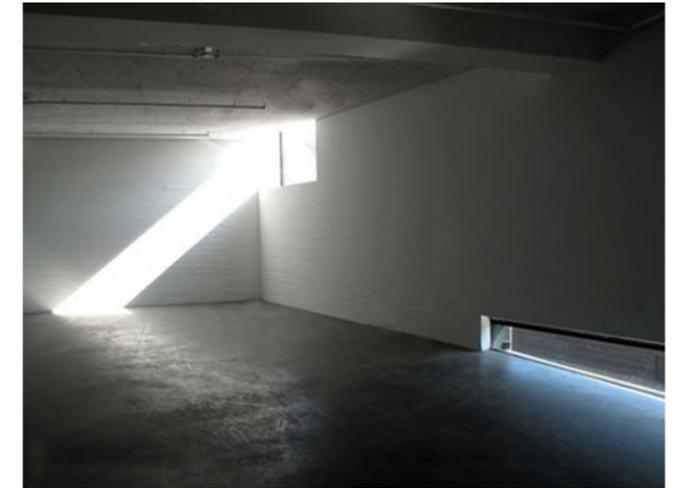
"My desire is to set up a situation to which I take you and let you see. It becomes your experience."

This large scale artwork located in a dormant volcanic crater directs its spectators to the open skies. During day, there is direct daylight and during night, the artwork frames celestial bodies. Themes of long dark paths leading to a singular view, like the image in the left are compelling and breathtaking themes in the project. Each opening is framed to be painting, rather than a window.

The Knut Hamsun Center, Steven Holl

"The time experience of the physical spaces of an architecture include the time of day and the time of season with all its subtle variations. The glowing light of Sunrise, an aerial blast of light at noon, or an orange wash at sunset: all are diurnal celebrations via architecture. Vernal equinox, autumnal equinox, or solstice drawn into space fills architecture with the zeal of seasonal time,"

With unique sun conditions, The Knut Hamsun center is located in Norway where the sun never sets and never rises for a period of time. Steven Holl studies these sun conditions to create experiential spaces to amplify the movement of light due to these unique conditions.



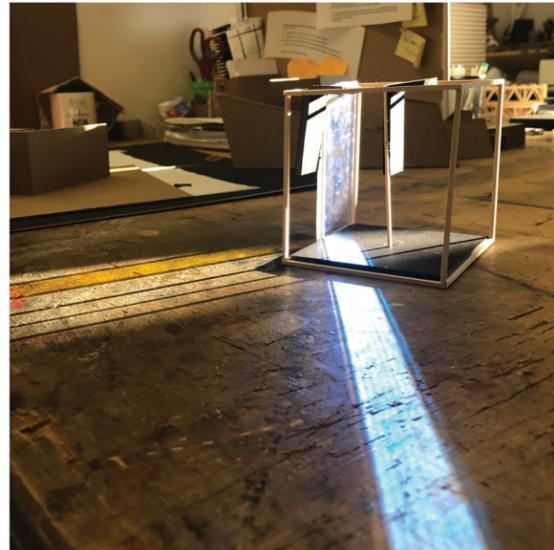
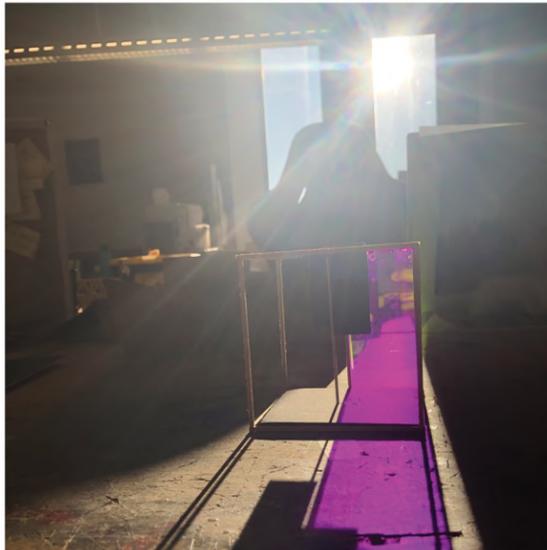
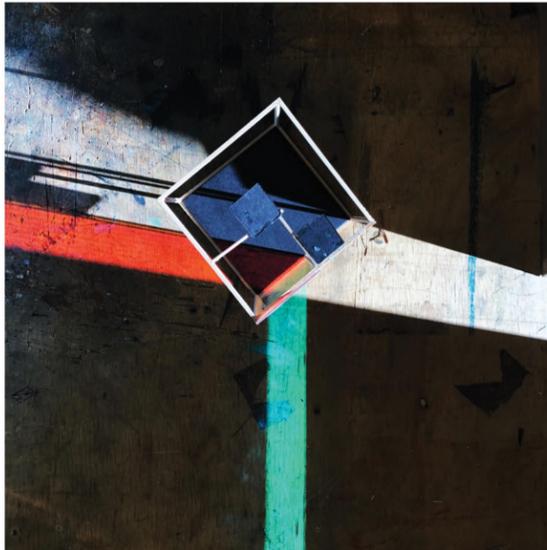
My exploration started as an obsession towards Sunset watching in Blacksburg. Every time I looked out of my studio in Cowgill Hall during evenings, I was always amazed at the colors, light and atmosphere of Sunsets. The vibrant hues of pinks, violets and blues, the fiery orange light that bounced off the glass windows of Randolph hall and the long streaks of light that found its way into my desk through the long windows never stopped surprising me. I set out to investigate why this had such an effect on me and found that I was not alone. Architects and artists have always taken advantage of this amazing phenomenon to create memorable experiences for anyone who walks into their space.

Based on selected precedence in art and architecture, I concluded that there are four major components that continuously emerged:

1. Color of Light - Chromatic Experiences
2. Orientation - Direction of Light
3. View
4. Darkness - to amplify the effect of the above.

These four elements of the sunset are the basis for my hypothesis of amplifying a phenomenon through architecture.

chromatic experience



Shifting and changing colors of a sunset is the most mystical aspect one can experience. It refreshes the spirit of the spectator and makes them look forward to a new beginning.

In his *Theory of Colors*, J.W.v. Goethe distinguishes between three types of color:

1. Physiological Colors - the effects produced by the retina
2. Physical colors - chromatic effects that change and are associated with the diffusion or reflection of light, shadows of light
3. Chemical Colors - such as paint, belonging to surface of things.

Sunset colors belong to the second category, where they are observed only through reflection and diffusion of atmospheric particles. I identified the sources of physical colors that change their appearance based on external circumstances.

Dichroic glass blurs the physical space making a spectator a part of its chromatic phenomenon. In a way, the spectator not only views the object but becomes a part of its composition. The dichroic film is engaging the rays with optics. This kind of intensity cannot be generated with paint and surface colors. The dichronic film abstracts the rays of the sunset in both colors and properties.

Without the orange hue of sunset light, the mystery and awe of sunset would not exist.

Intangible colors are interwoven with the materiality of the place, stimulating diverse phenomenological experiences during the seasons and times of the day.

Horizontality of Light



Seasonal Time - Newgrange stonehenge passage tomb



Diurnal Time

*"Time is dying on the moon
I hear the minutes limping
round and round.
Forgive me this minute;
the hours are creaking
past these midnite bones"*

-Theodore Roethke, "Straw for the fire"

"We can imagine space as a clocking, timekeeping paradigm. Our experience of foreground, middle ground, and distant view merge with the quality of material and light in a measure of time."

Steven Holl writes that Architecture can be measured several times, which are:

Diurnal Time

Seasonal Time

Linear Time

Duration of Conception

Experiential Time

In this thesis, to amplify the effect of horizontality of light, I will be focusing on Diurnal Time and Seasonal Time.

Darkness and View

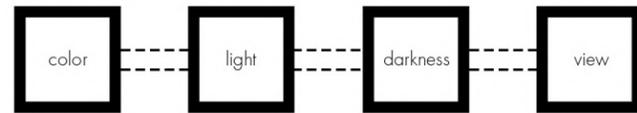


Nightfall signifies an important moment in the daily cycle. While darkness engulfs the atmosphere, there is an anticipation of another day. Darkness can be made a significant part of architecture. In this work, darkness is used to refresh the capacity of perception in order to intensify the play of light that follows.

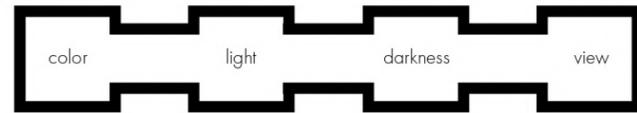


The organization of the linear architecture choreographs the spatial array in which individual light phenomena are presented. Before a direct view of the sunset is offered, the sunset acquires a presence through selected isolated elements normally not seen.

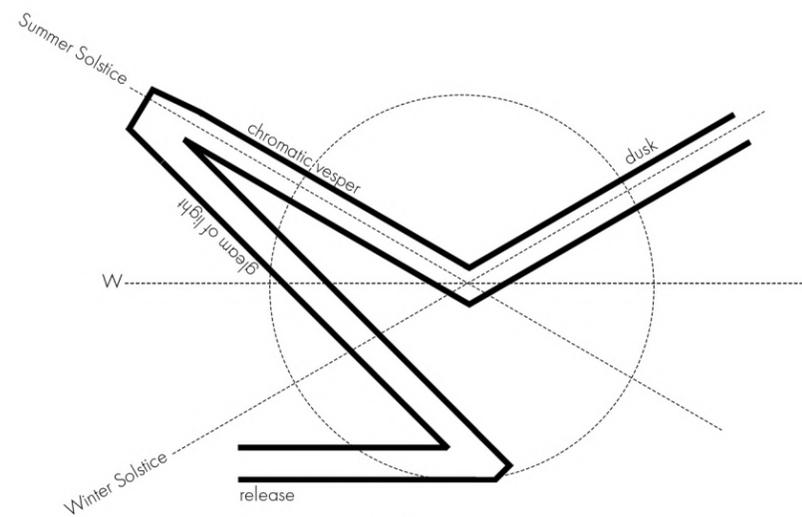
evolution of the path



Elements as isolated rooms with connecting paths.
Too many moments of pause. Lacks continuity.

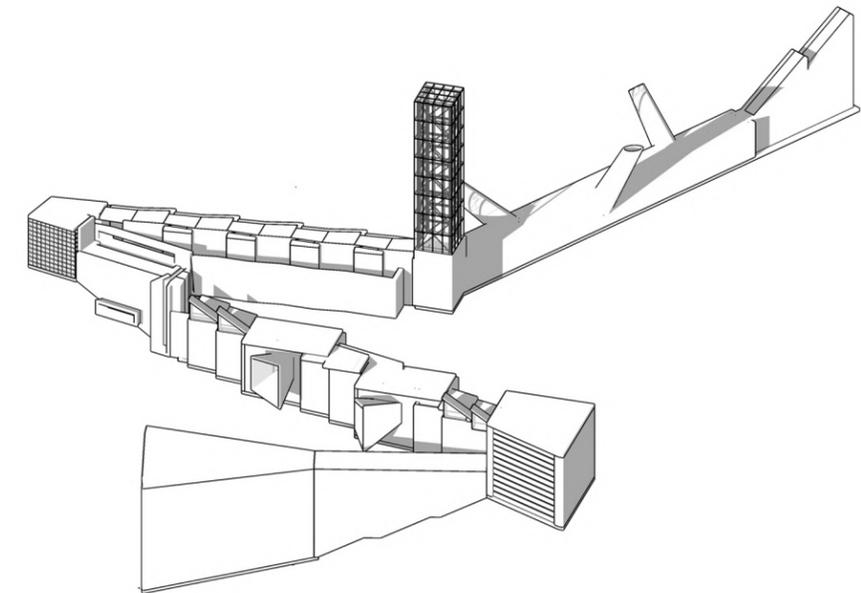
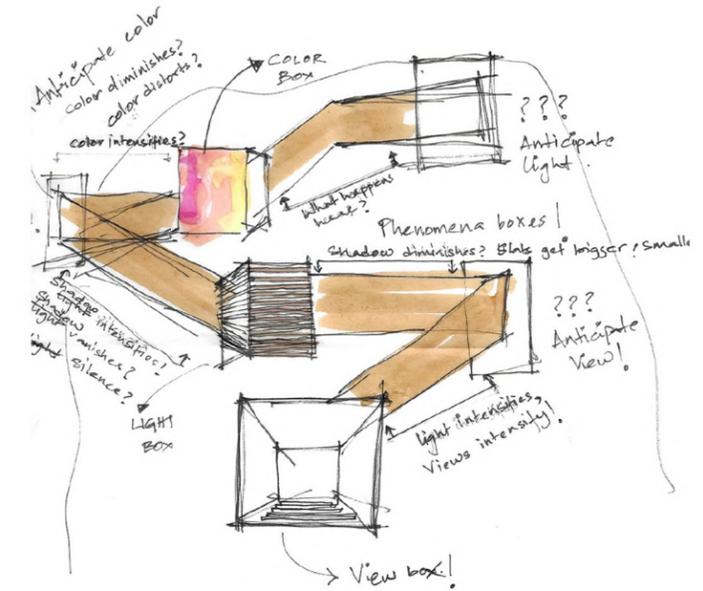


Elements as isolated events with a common path.



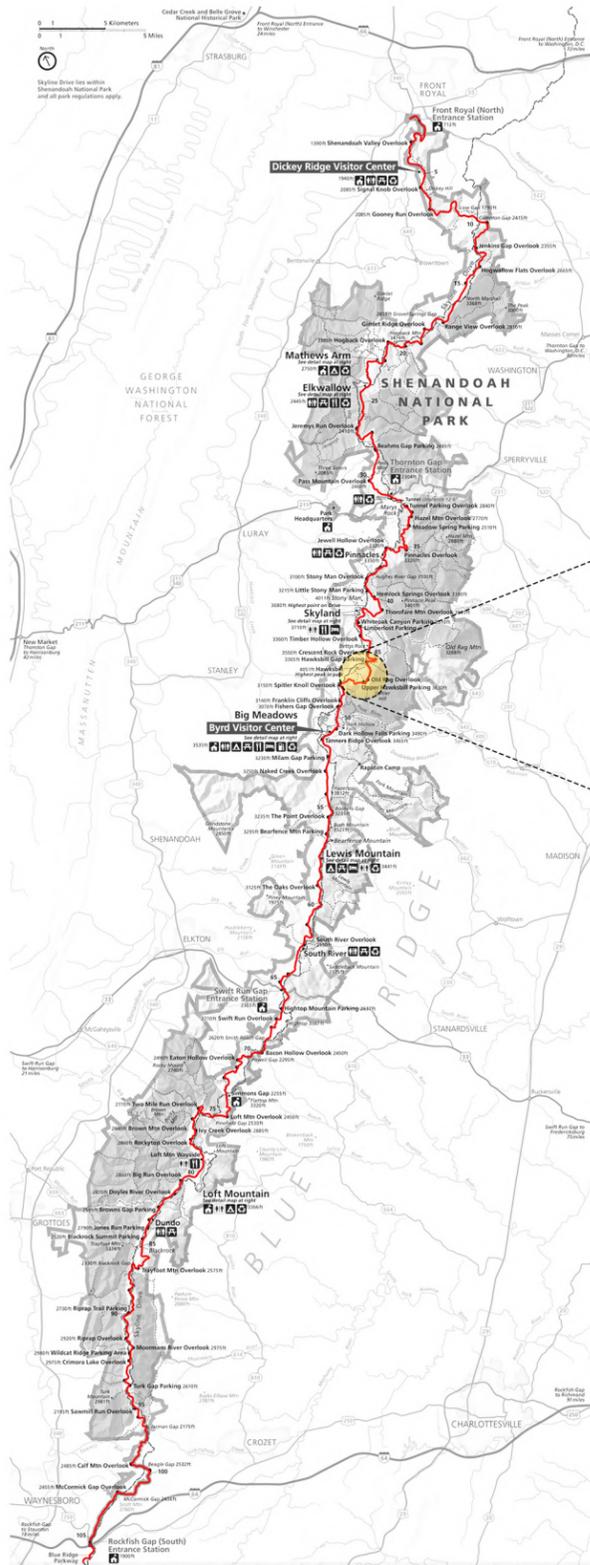
Elements as path. Aligning elements to solstices to capitalize on light, views and contours.

Framing a direct view of the sunset is the most obvious anticipated event, but here it constitutes the end of the underground path. The serpentine-like path leading to the culminating space emerged with dedicated wings where each bend presents a fragmentary surprising aspect of the sunset and creates anticipation for the complete immersion.



500 feet of Sunset without Hawksbill Summit.

Skyline Drive



“Changes in seasons, time of day, light, weather and temperature - all of these changes and more affect what you see when you gaze out from any viewpoint (in Shenandoah). You could stand in the exact same spot at different times of the day and never see the same things twice.

Its similar to how colored glass beads inside a kaleidoscope can never land in precisely the same arrangements twice; the view never repeats itself because there will never again be the combination of sunlight, humidity, temperature, precipitation or fog there is in the one moment you stand here and take your picture, mental or real (of the landscape below)”

- Shenandoah Valley National Park

Even though my amazement for Sunsets began in Blacksburg, I found my ideal site conditions in Skyline Drive. It is a 105-mile-long road that meanders through Blue Ridge Mountains in Shenandoah Valley National Park. It gets its name from the 50 pitstops each containing amazing views of the Sky and Blue Ridge Mountains. It is known for its hiking and camping. The selected site is atop the Hawksbill Summit, which is the highest point in Skyline Drive. Visitors should Hike up a mile to reach 500 feet of Sunset.



Hawksbill Summit

Skyline Drive

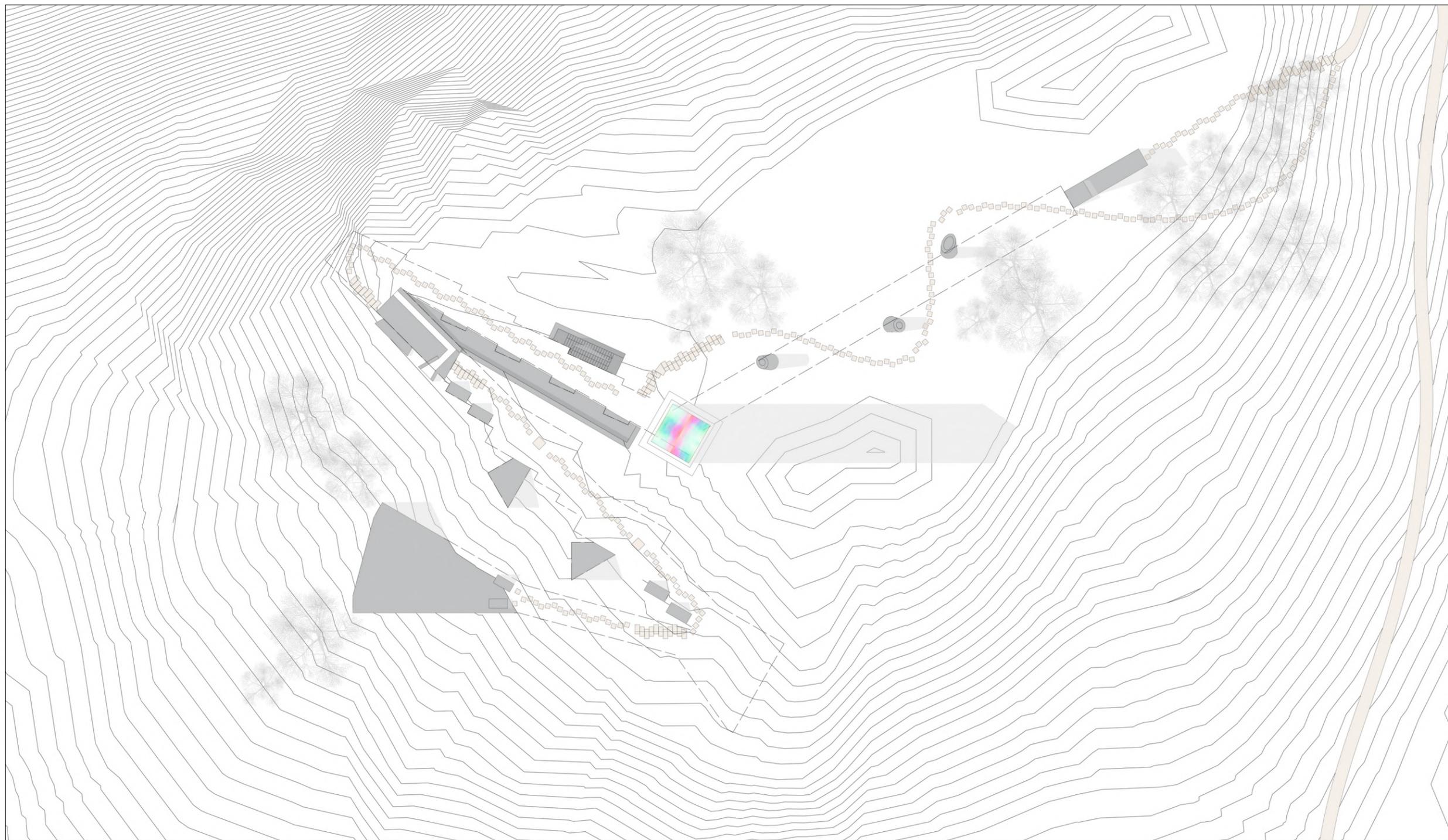


Spitzer Knoll Overlook - a mile south to Hawksbill Summit

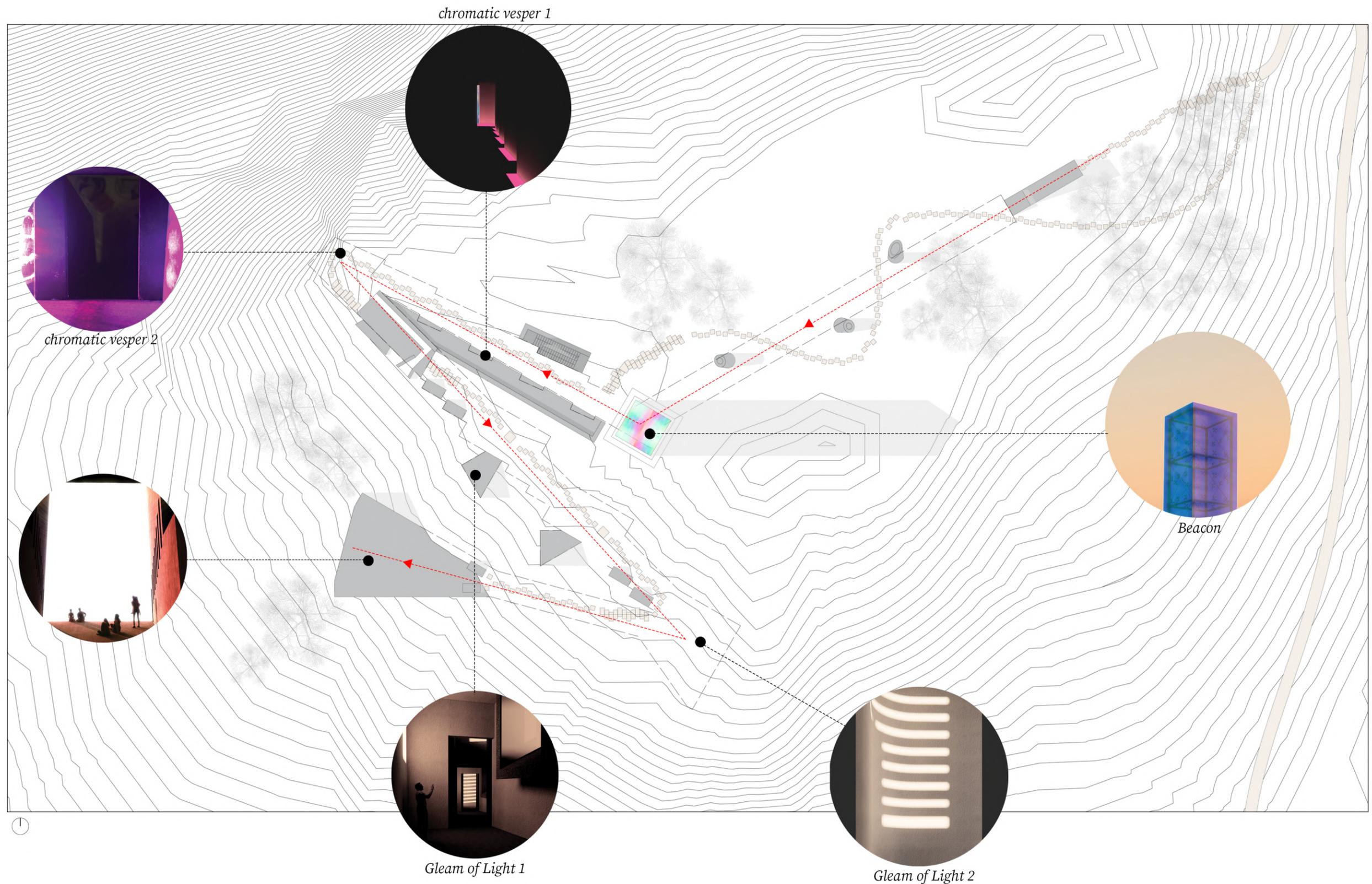


Old Rag Overlook - a mile south to Hawksbill Summit

Skyline Drive



1



chromatic vesper 2

chromatic vesper 1

Beacon

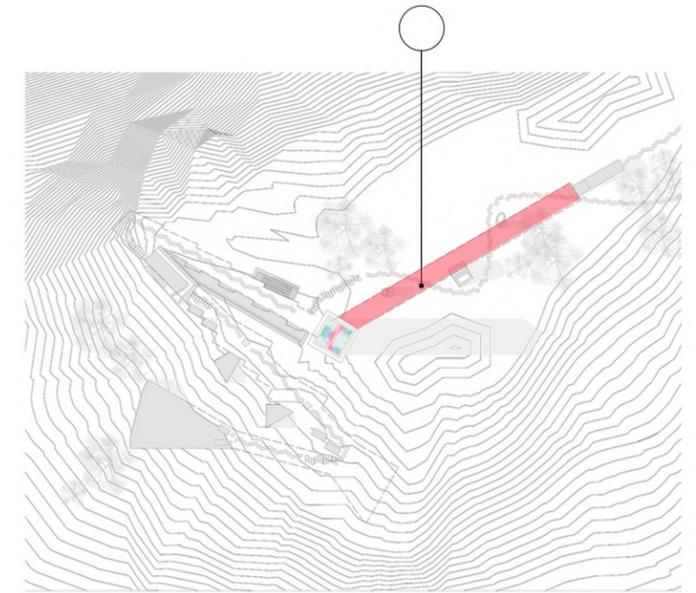
Gleam of Light 1

Gleam of Light 2



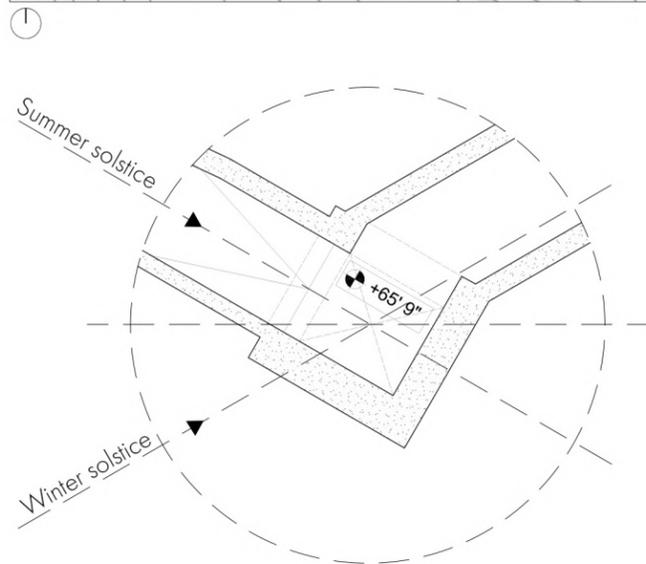
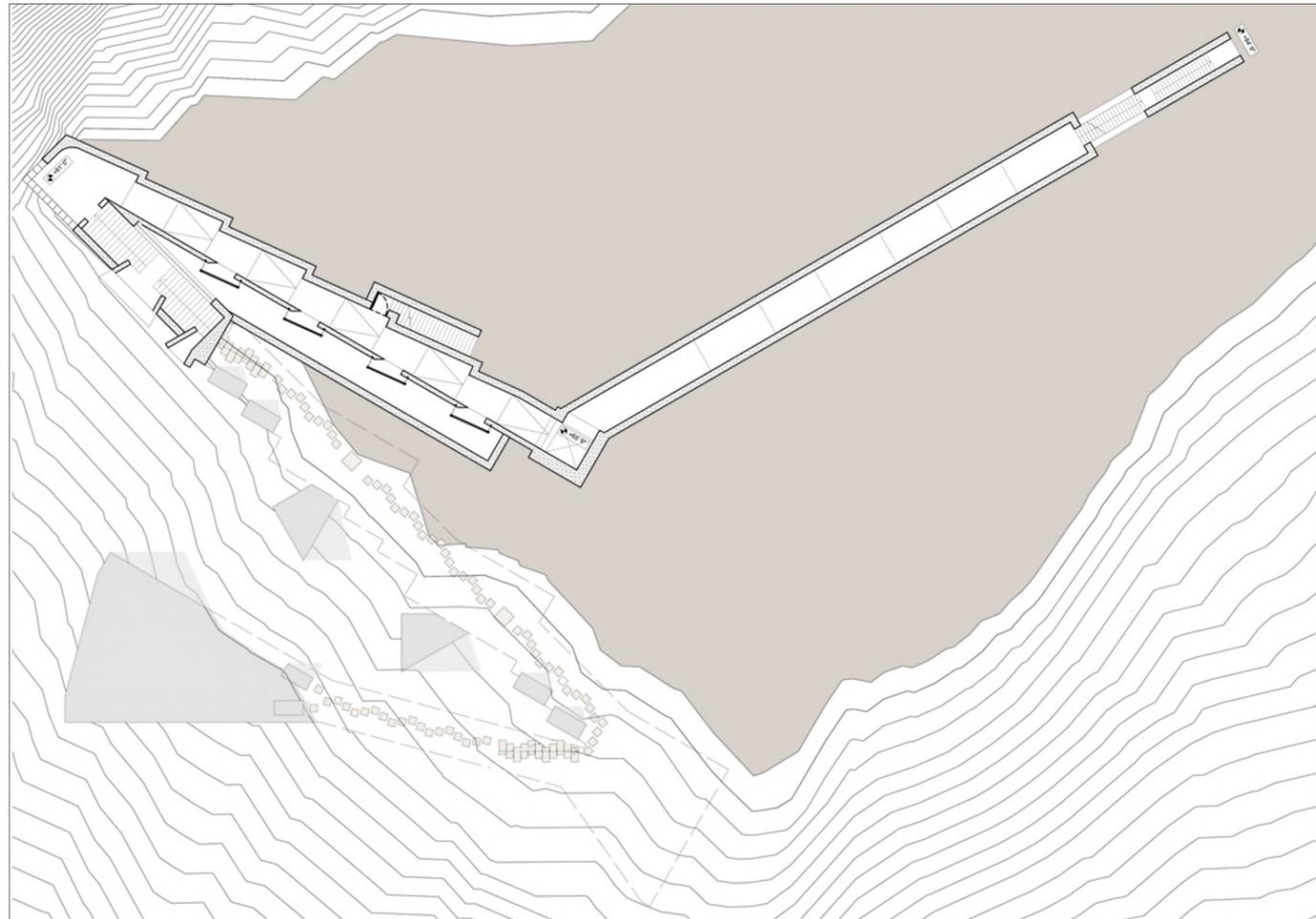


This wing is the entry to 500 feet of Sunset. It is named after the darkness that follows a sunset. After hiking up Hawksbill Summit, the spectator discovers a small opening with descending stairs that lead to a dark tunnel dotted with 3 light wells. Once his eyes adjust to the darkness, a sense of direction arises from the light of the Beacon. In reality, darkness comes after sundown, in 500 feet of sunset it is essential to have this dark space to adjust one's eyes for the visual sensations that follow.

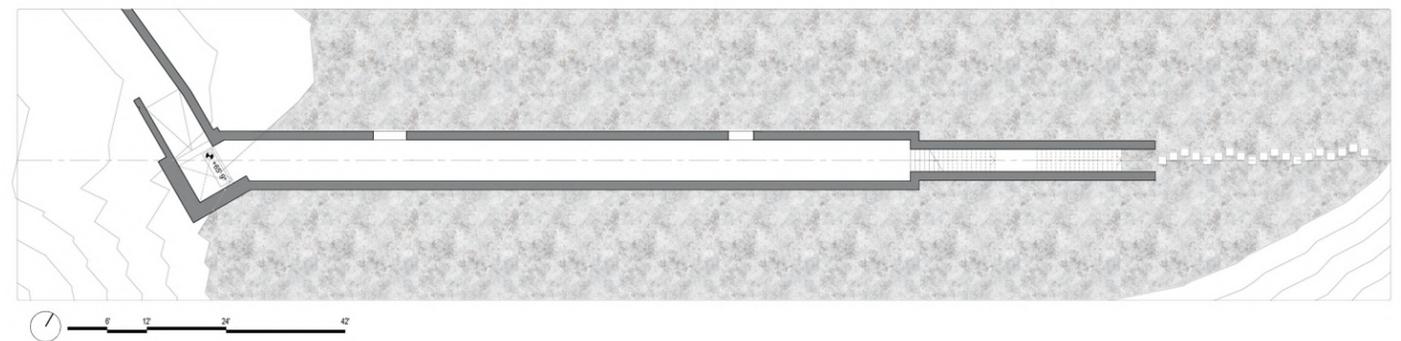
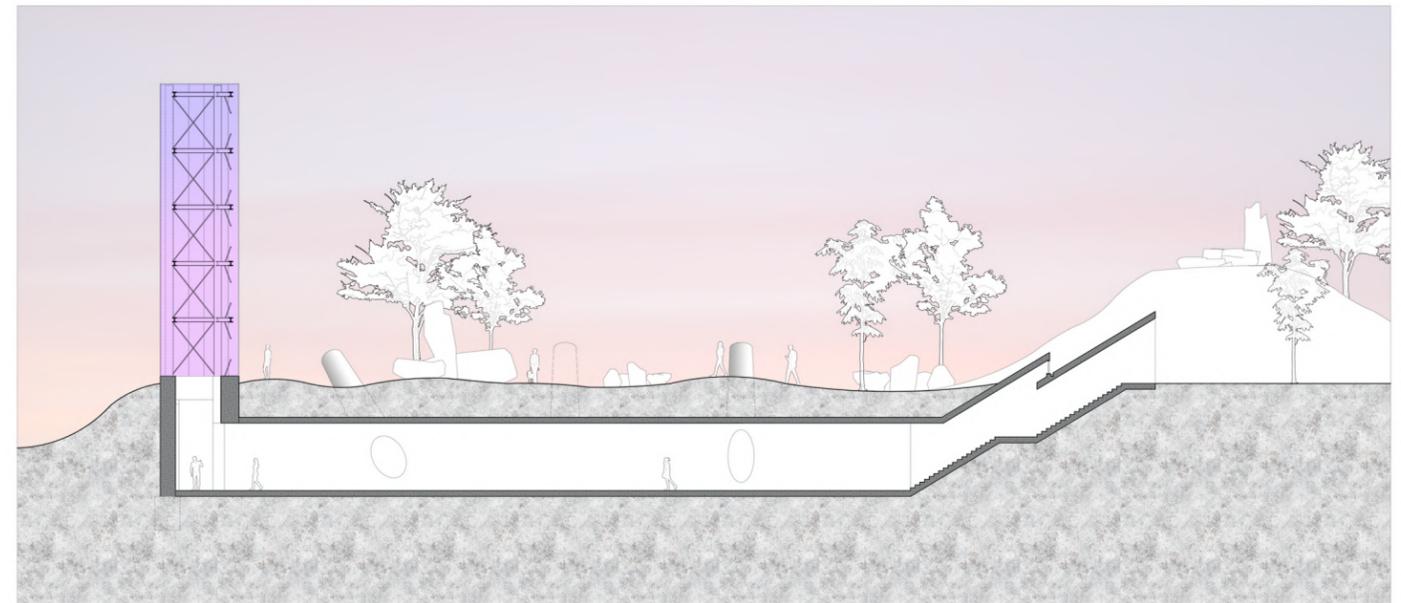


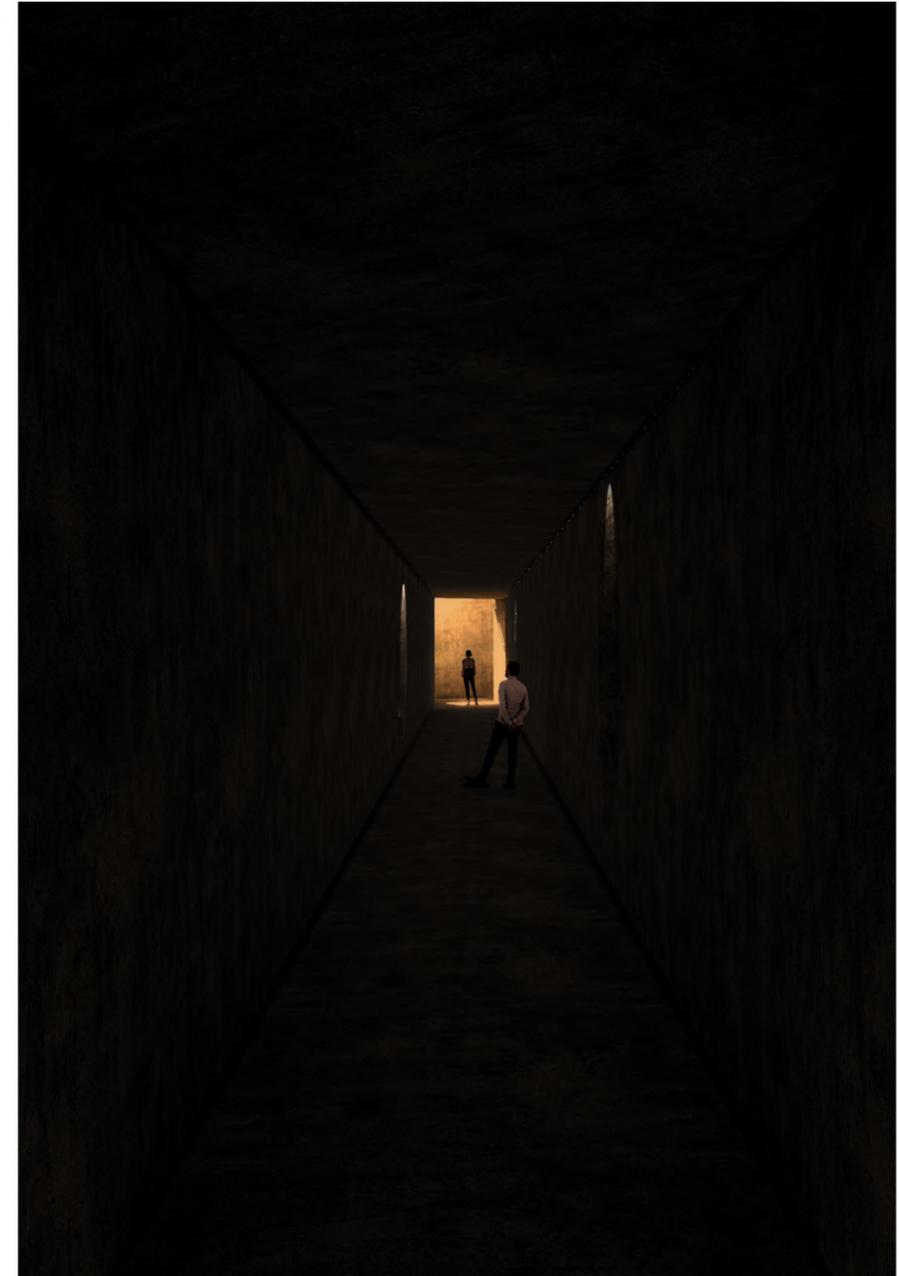
0 feet

dusk

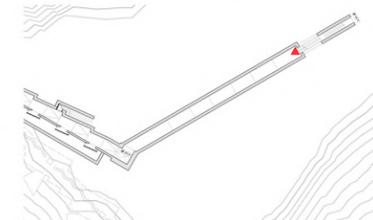


This long corridor is aligned to the Winter Solstice. The darkness of this path leads to the bright colors cast by the beacon. During winter, the light from the beacon aligns with the path itself, creating a moment to celebrate and look forward to each year.



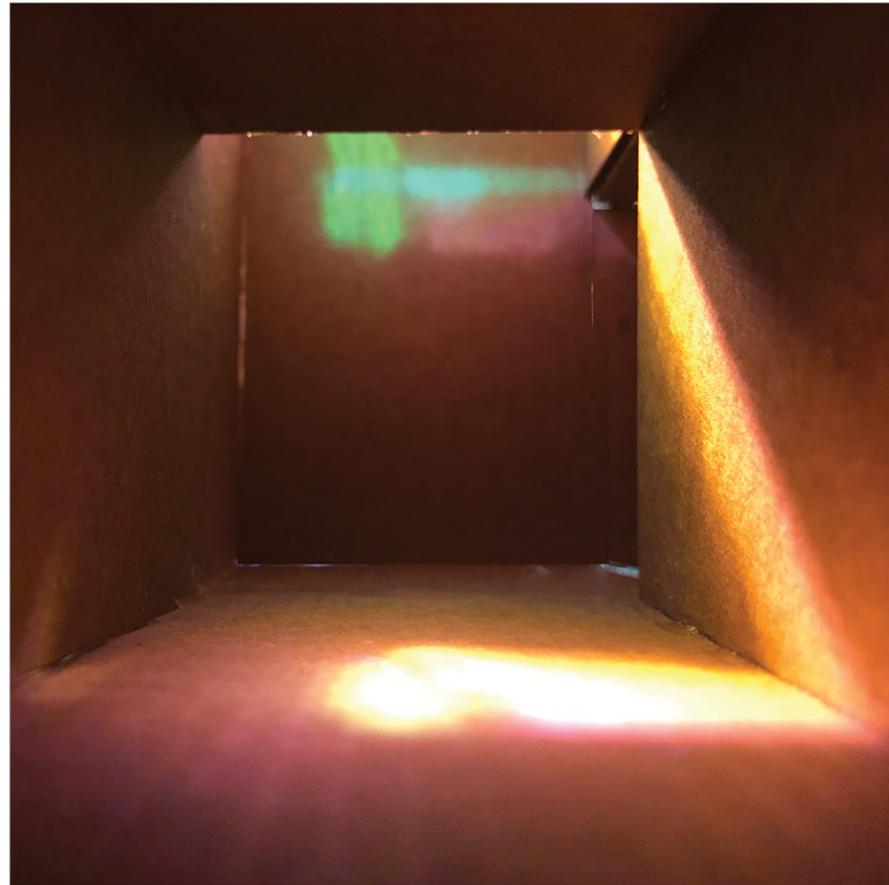


view from the entrance

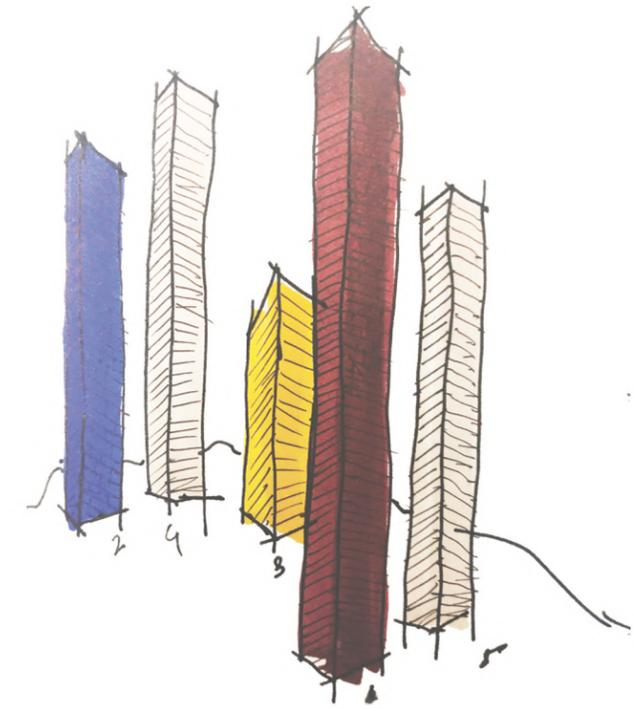


160 feet

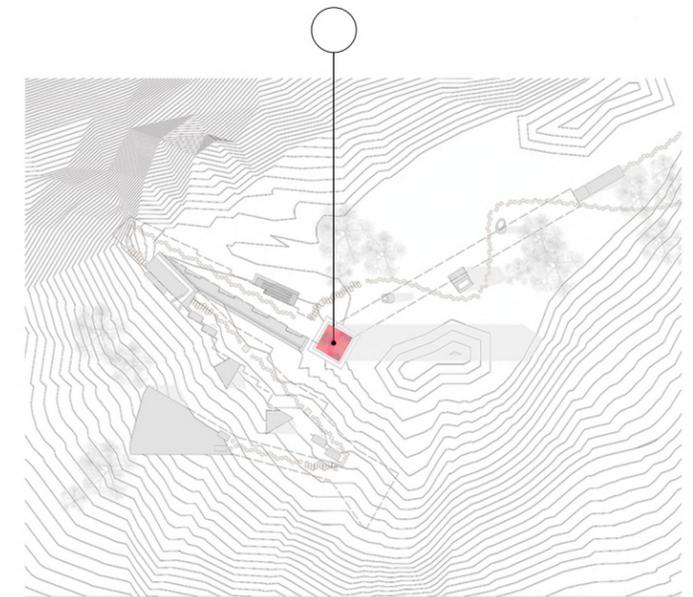
beacon



Winter conditions as seen from "dusk"

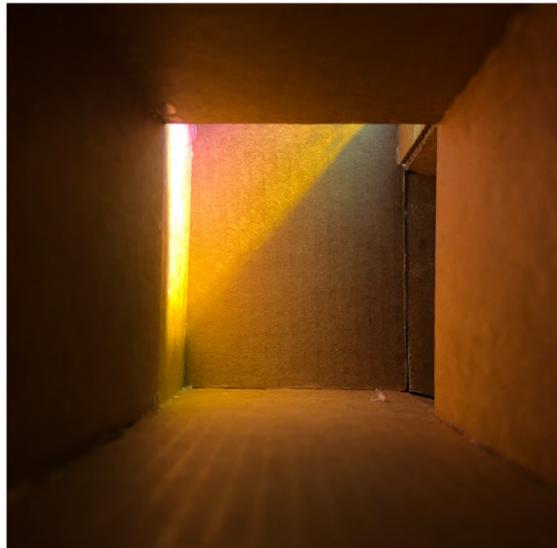


A beacon is a light set up in a visually prominent position as a warning, signal, or celebration. This monolithic dichroic glass tower marks the entry way into the deconstruction of sunset. While inside the tunnel, it gives the spectator a sense of direction through the dark entry tunnel "dusk" into "chromatic vesper". On the exterior, it serves as a landmark on the summit, creating curiosity in hikers and travelers to invite them into 500 feet of sunset. Just like the sky, the tower keeps shifting in its appearance every minute, hour, day and season. The tower is especially striking during winter solstice sunsets due to its long shadow that is cast on the summit outside, and its multi-color long ray inside.



160 feet

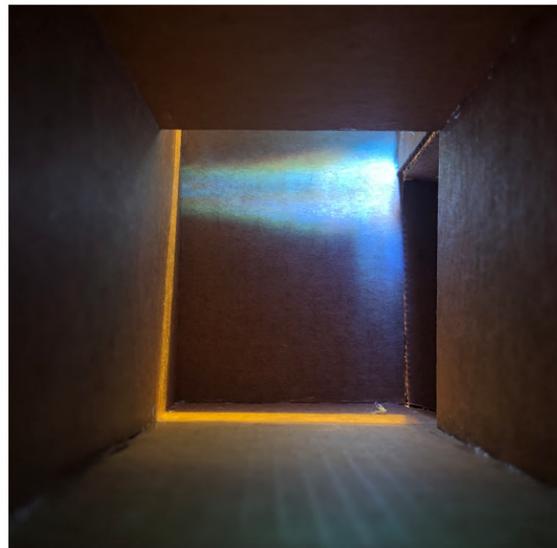
beacon



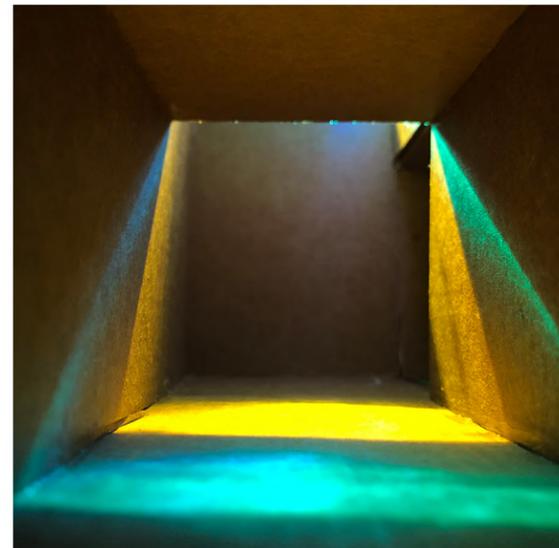
Summer solstice - Noon



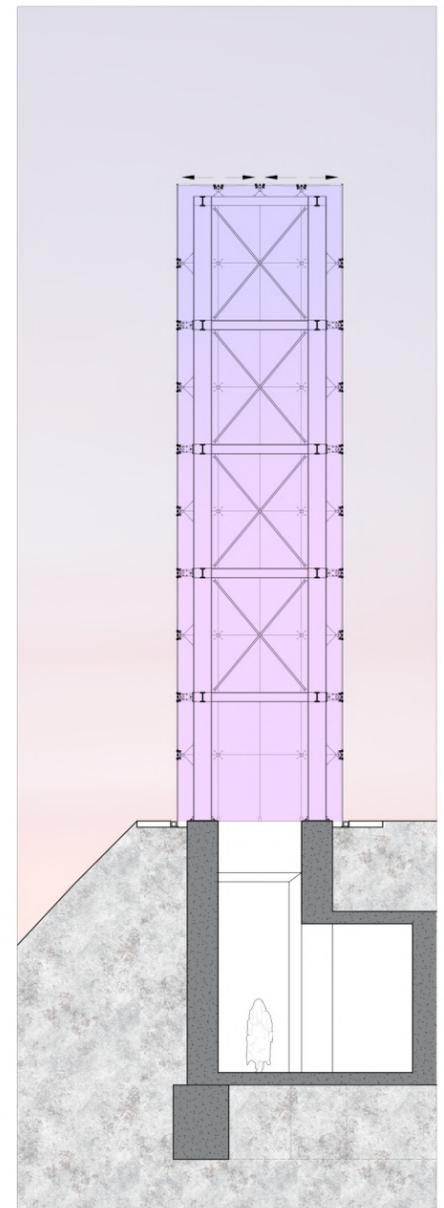
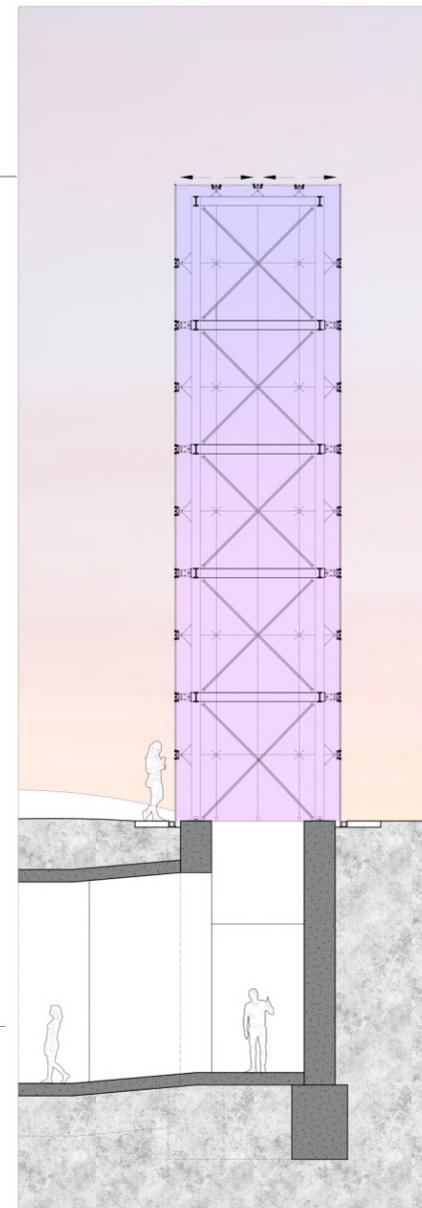
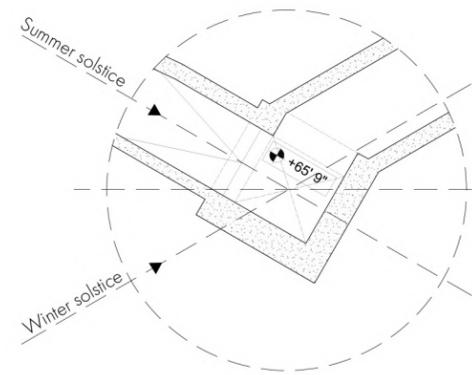
Summer solstice - Sunset



Winter solstice - Noon

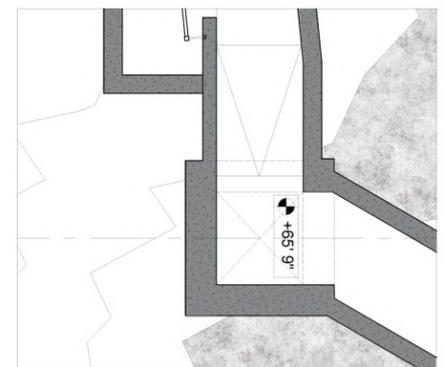
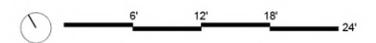
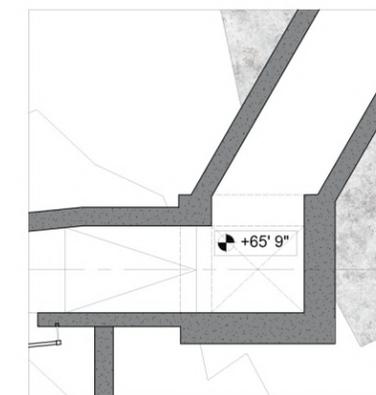


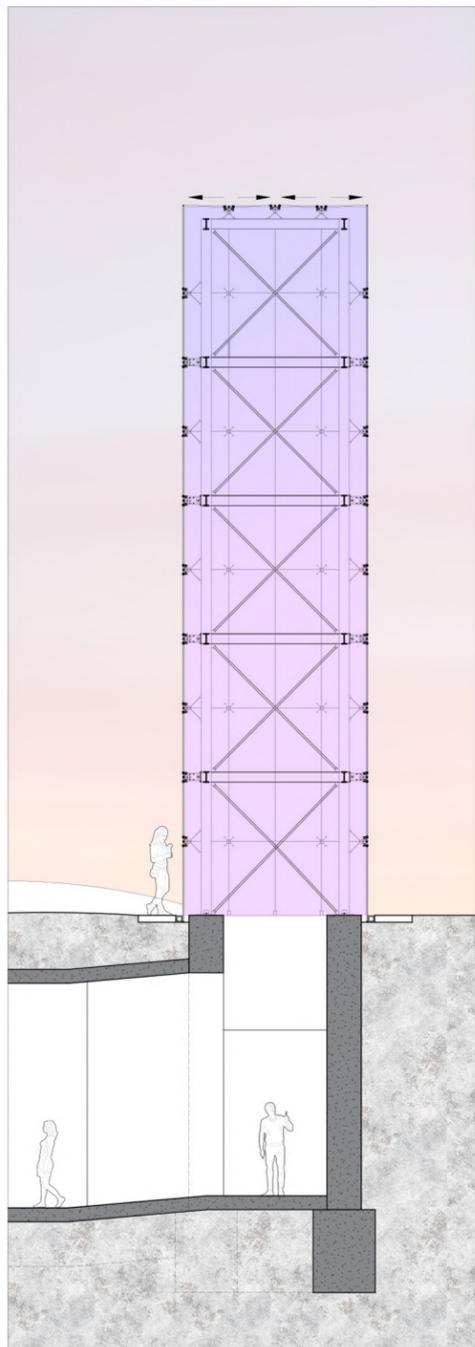
Winter solstice - Sunset



Although the light produced by the beacon is intense, its source is not revealed directly.

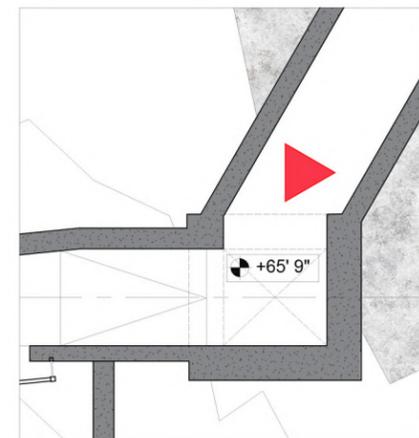
On the return path above ground, the dichroic tower which is placed to mark a turn in the tunnel below dominates the landscape as a vertical man-made object, perhaps hinting at the source of the effects produced below.





160 feet

beacon



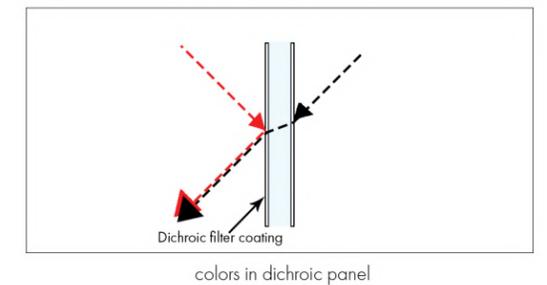
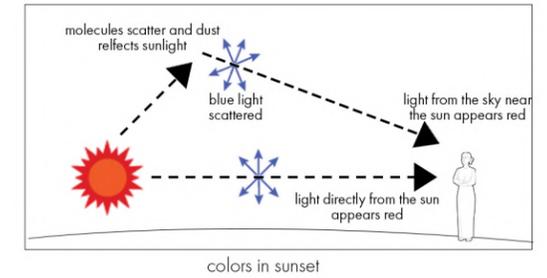
View of the space under the beacon

chromatic vesper



Most common sunset colors in the Appalachian.

“Clouds come floating into my life, no longer to carry rain or usher storm, but to add color to my sunset sky”.
 – Rabindranath Tagore, *Stray Birds*

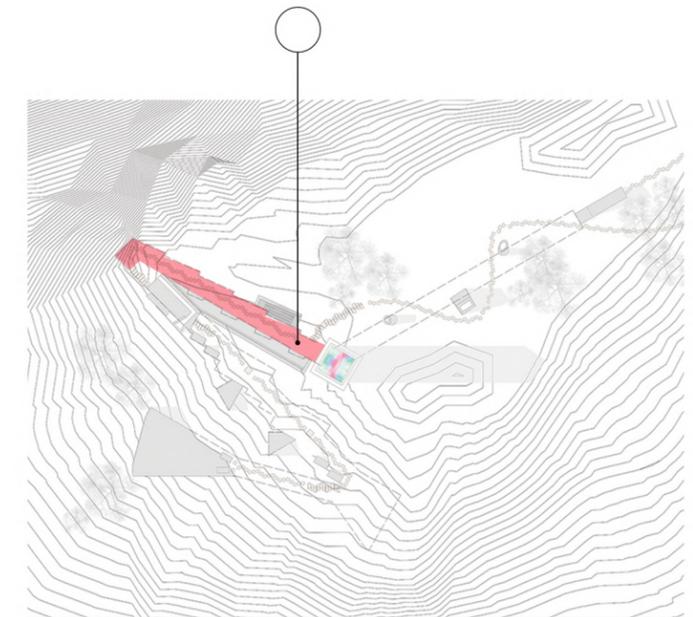


The architecture here seeks to isolate these wonderful phenomena in designated spaces along the pathway with the intent that the viewer becomes part of the colors.

As mentioned before, Goethe stipulates that there are three types of color: Physiological - as apparent effects produced by the retina; Physical - as chromatic effects that change and are associated with the diffusion or reflection of light; and Chemical - as permanent and belonging to surface of things. Colors produced by the rays of a sunset and filtered by a dichroic film fall under the physical category of diffusion and refraction; in other words, small particles refract, reflect and scatter light. When the angle of light or the particles change, the colors and effects produced are completely different. Especially during sunset, the movement of the sun appears to be faster and so does the shifting angles which makes the dichroic glass shift constantly, making reality more apparent. To capture and intensify the colors of sunset, a combination of gold-blue and copper-bronze DF PA Chill Dichroic Films have emerged as preferable in the model studies.

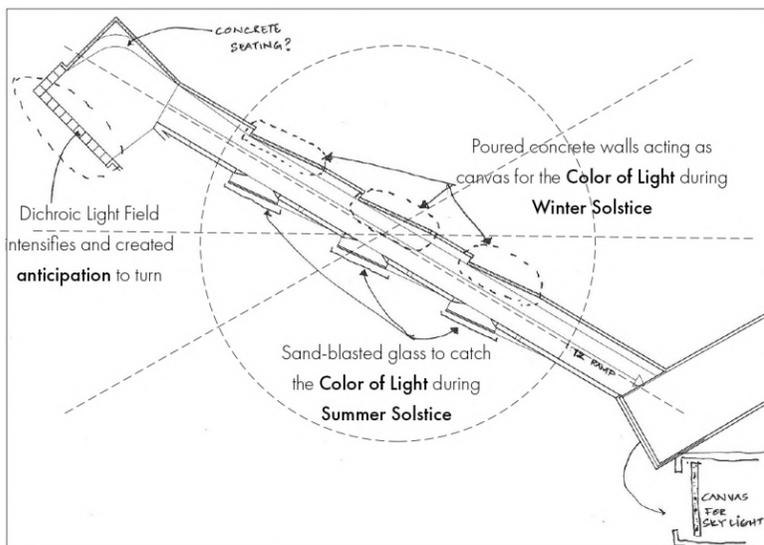
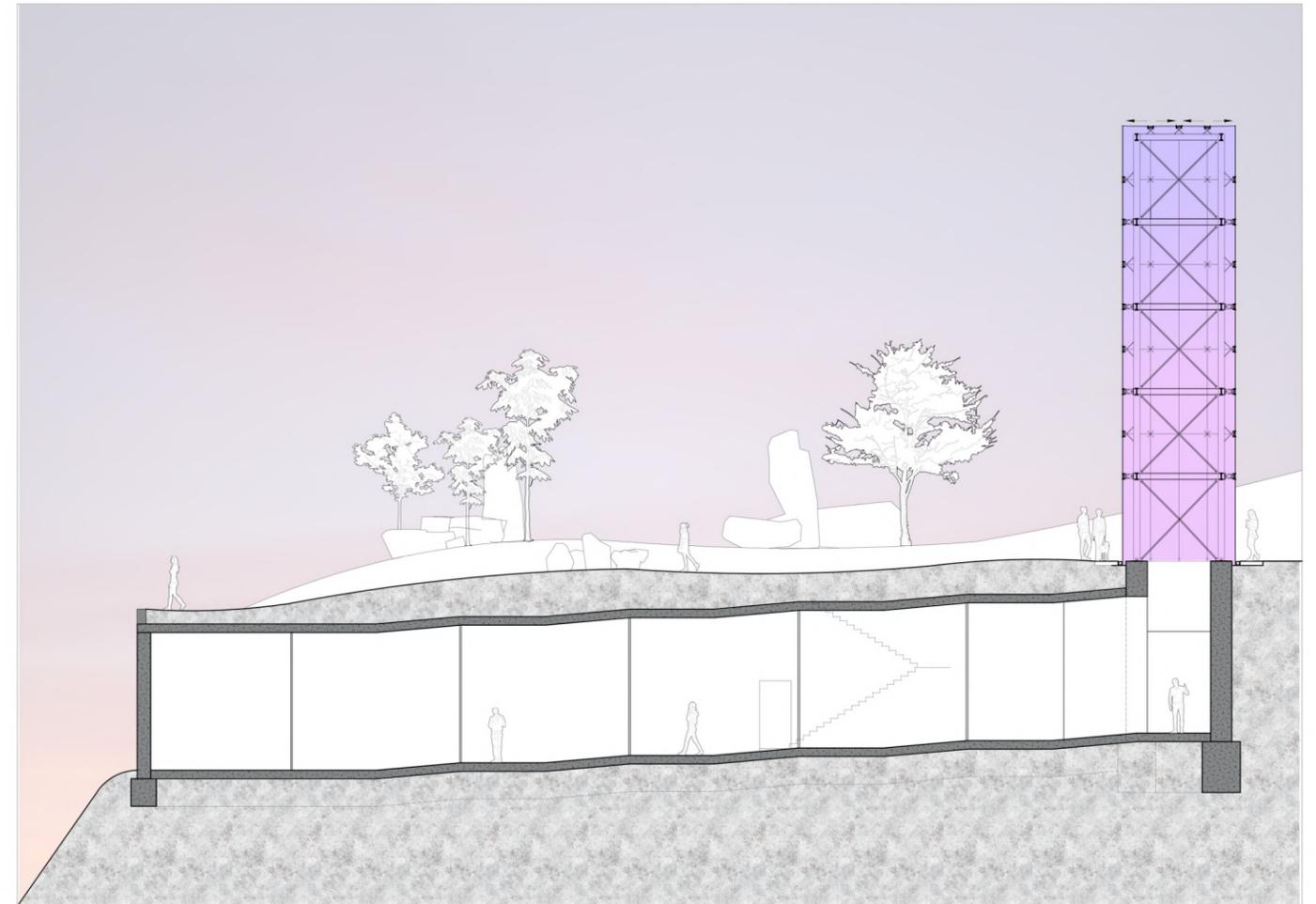
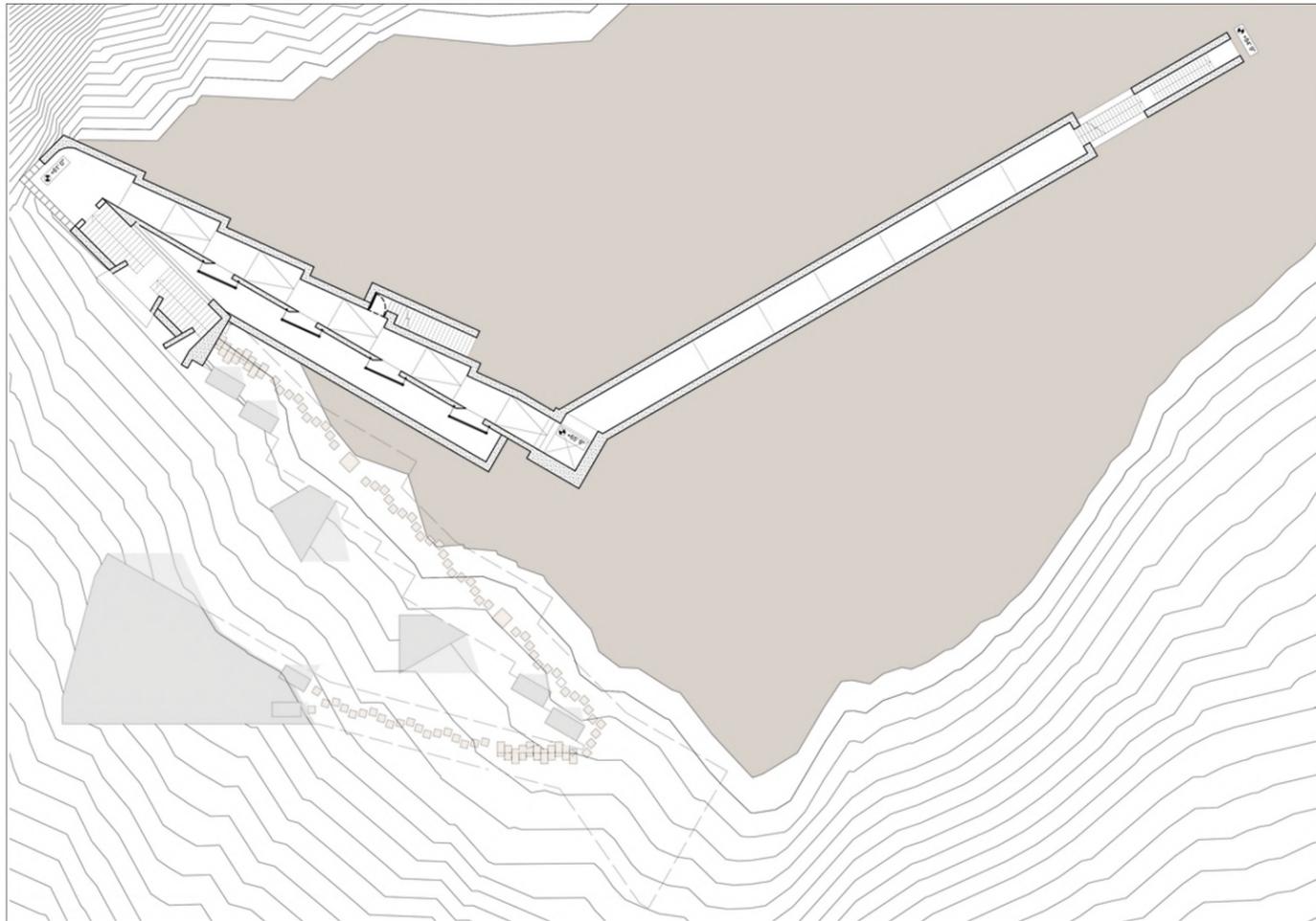


DF PA Chill colors shift between cool tones of blue, magenta, yellow and gold, blue. The material is made of Multi-layered polymeric film.



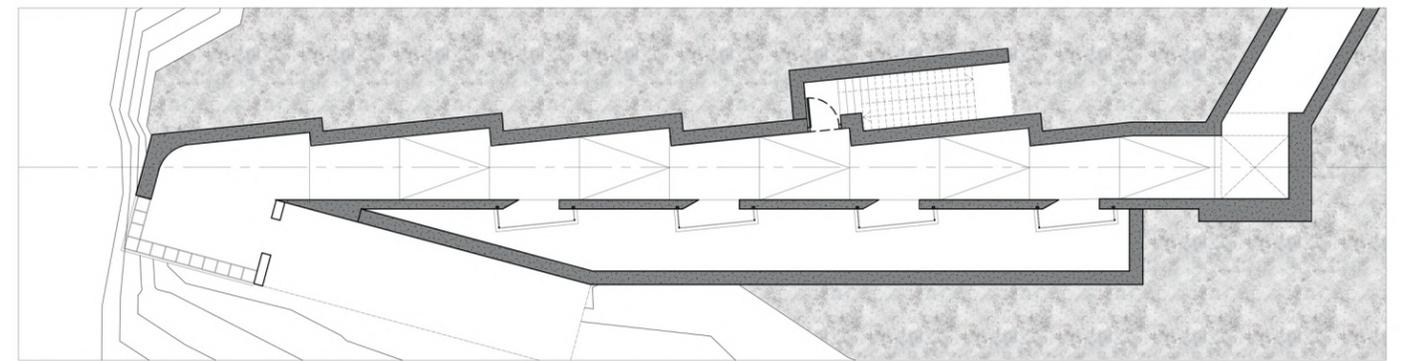
chromatic vesper

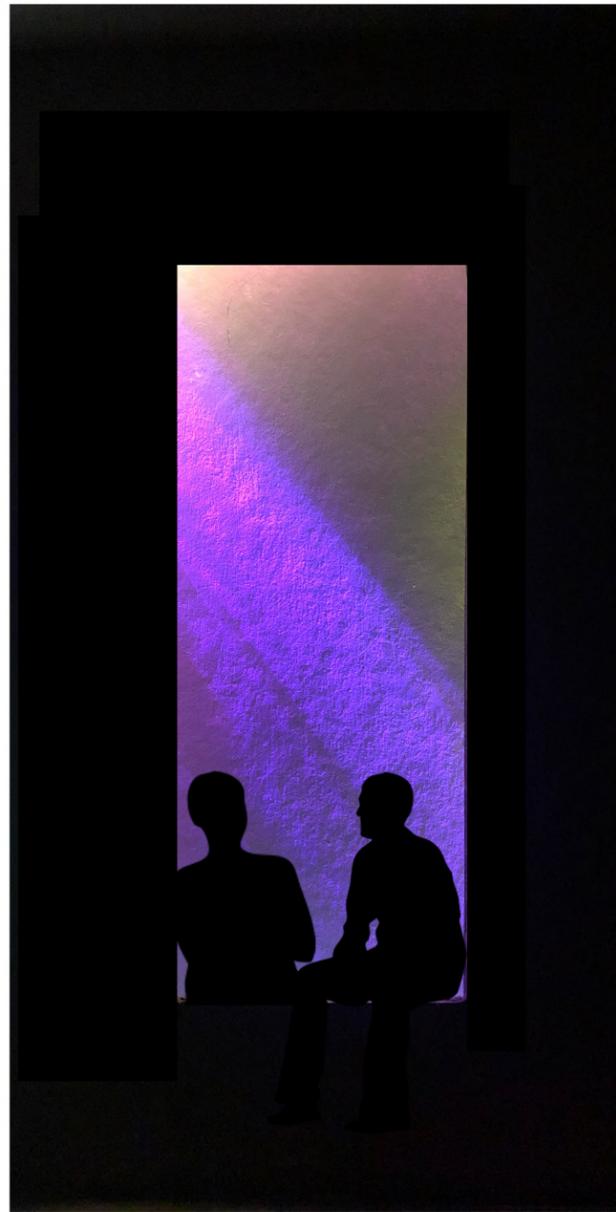
170 feet



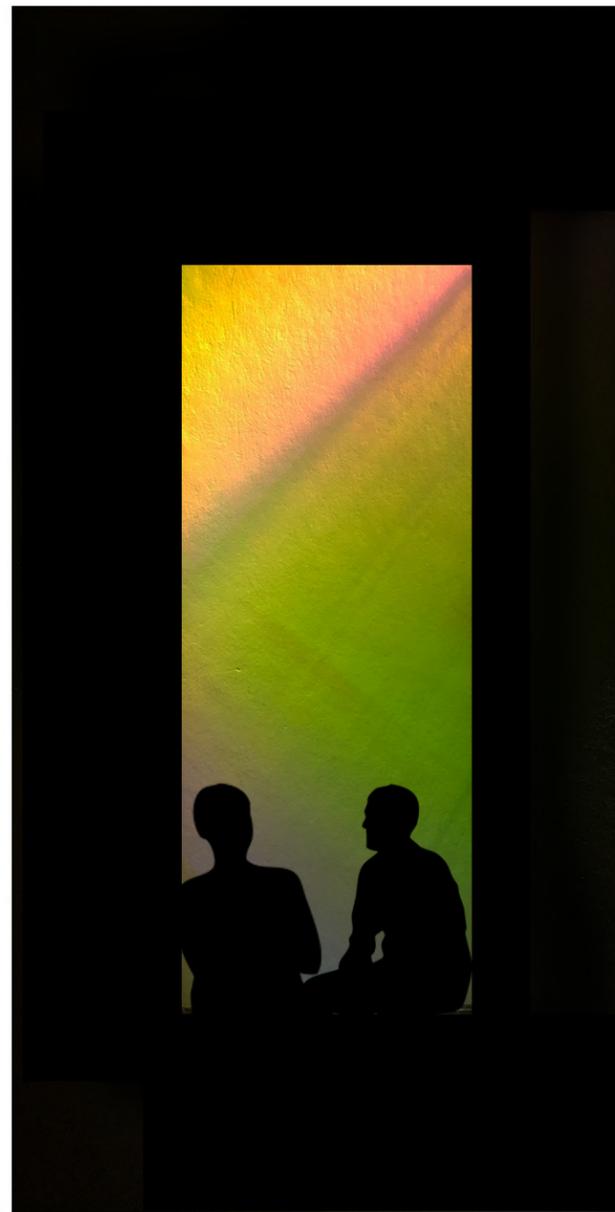
This long corridor is aligned to the Summer Solstice. Cantilevered windows with dichroic sides and sandblasted glass bring in the light at different angles into the wing.

During summer, the sandblasted glass becomes the canvas for colors. During winter, the walls on the opposite receive the colors.



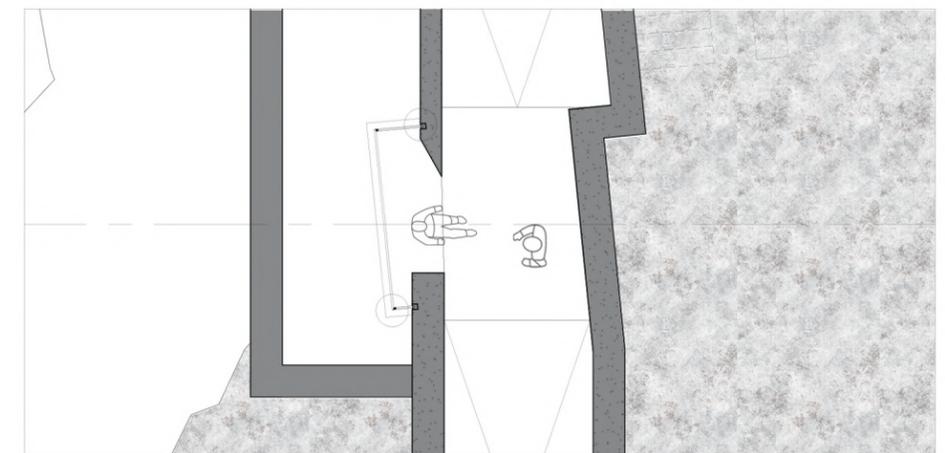
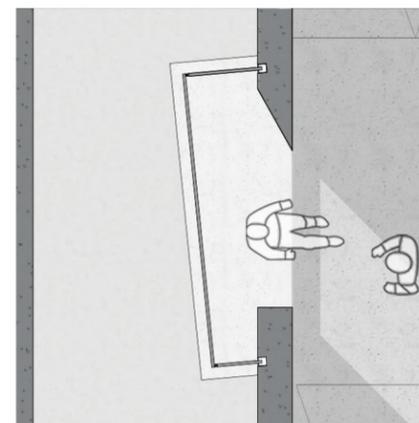
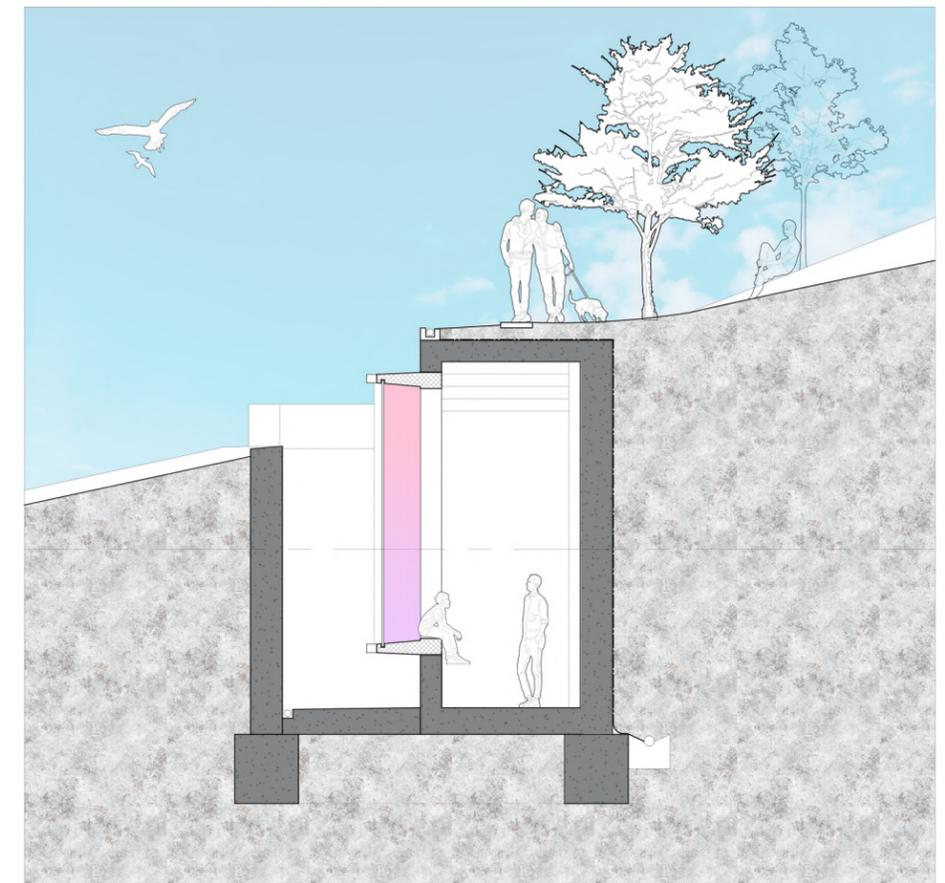


Summer solstice - Noon



Summer solstice - Evening

These models illustrate the view into the cantilevered window during summer conditions. When the spectator turns to look through the window into the Sunset, they are instead treated with the play of colored light on the sand-blasted glass by dichroic glass, urging them to move forward into the wing towards brighter light.

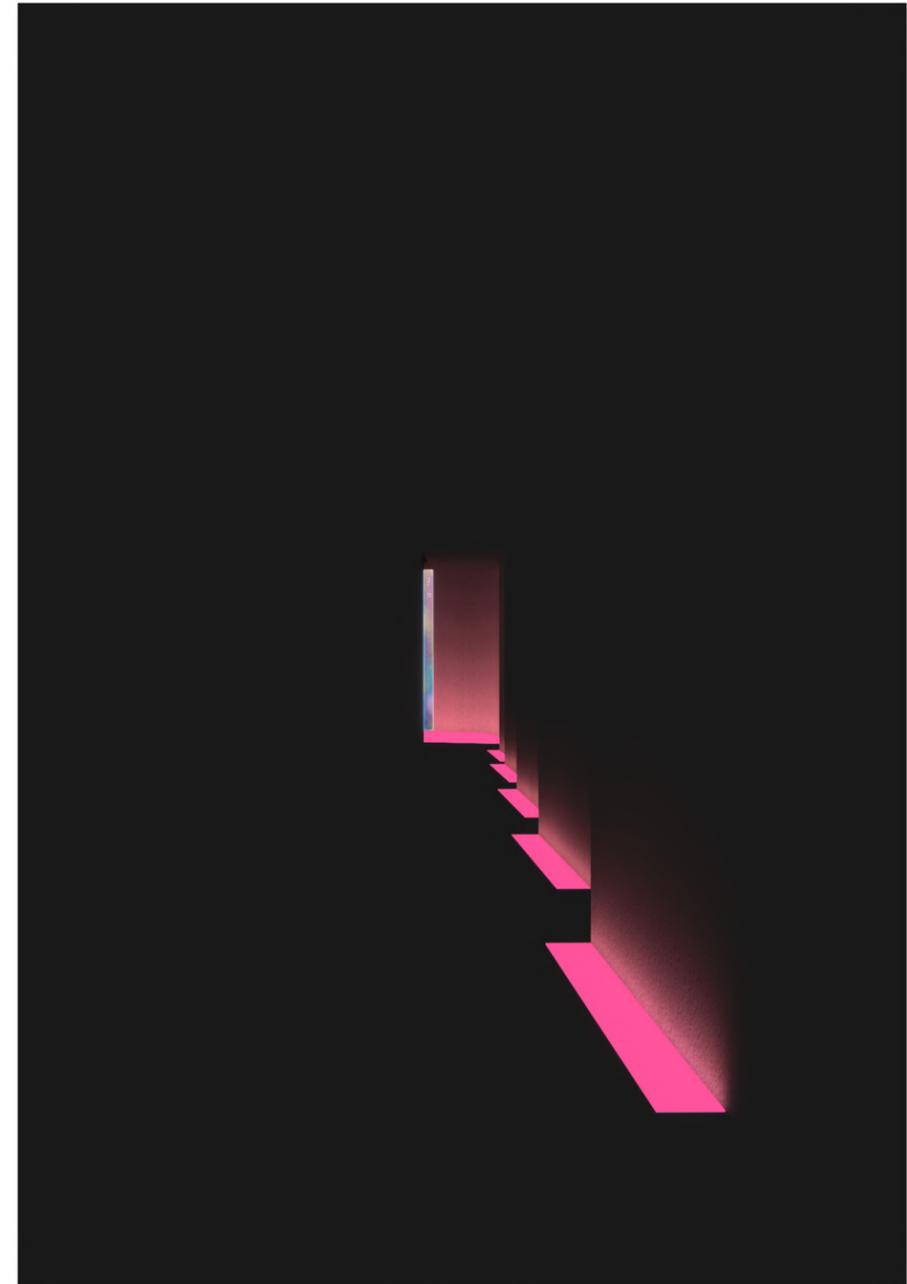


170 feet

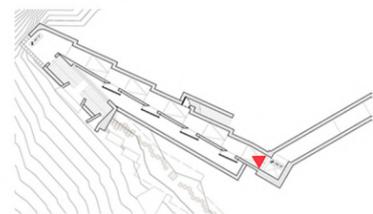
chromatic vesper



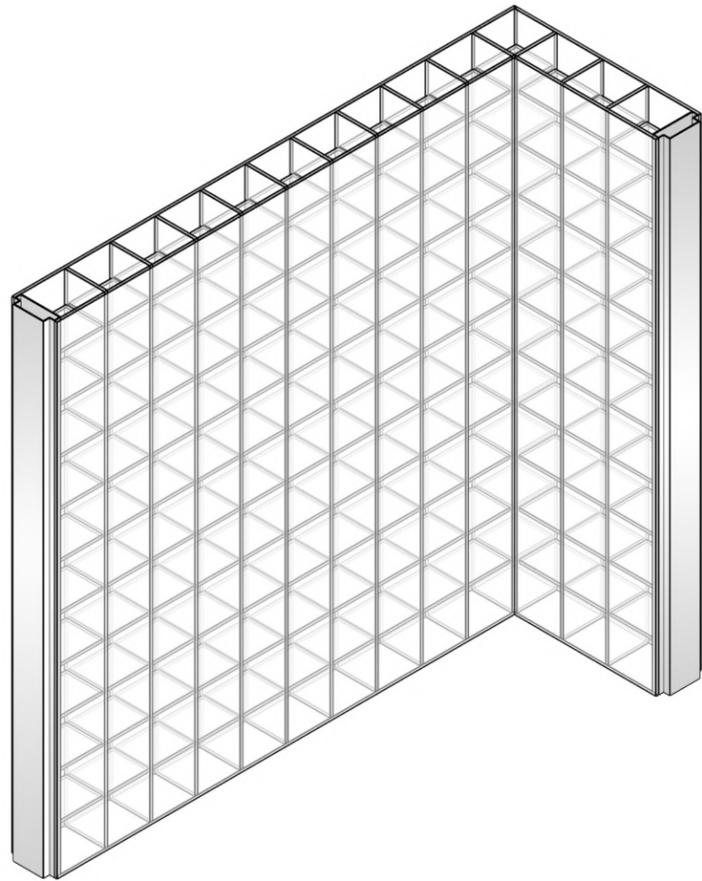
Summer conditions



Winter conditions

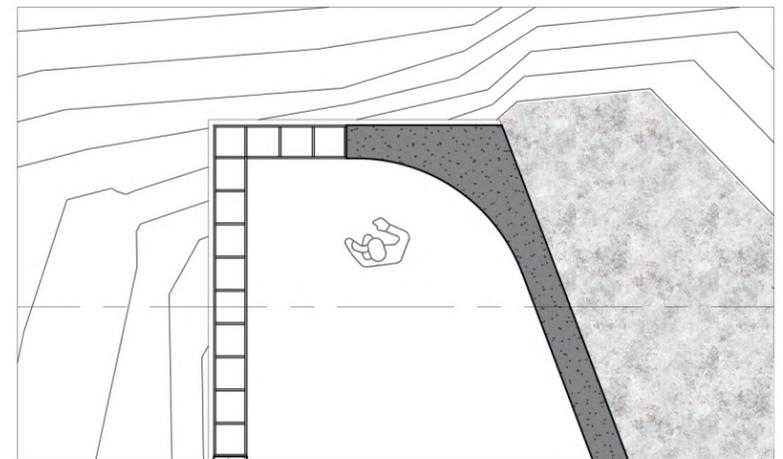
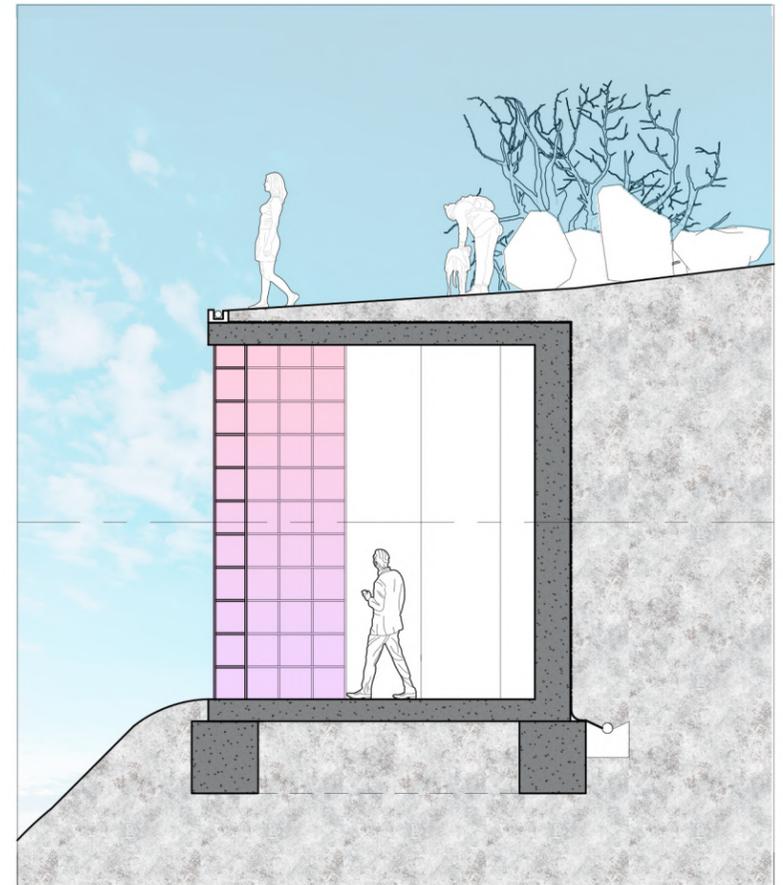


270 feet *chromatic vesper*



This space is the conclusion of the Chromatic Vesper segment. The light from floor to ceiling lined with dichroic glass creates anticipation when one walks through the wing, expecting to get an actual view of the sunset. Instead, a play of light and color through multiple layers of dichroic presents a different lesser known aspect of the sunset.

This instrument is constructed by using 1'6" gridded all-glass structure. All glass panes are brought together using structural silicone, eliminating the need for metal channels.



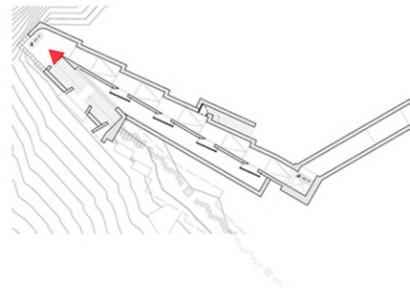
○ *chromatic vesper*
270 feet



Summer conditions



Winter conditions



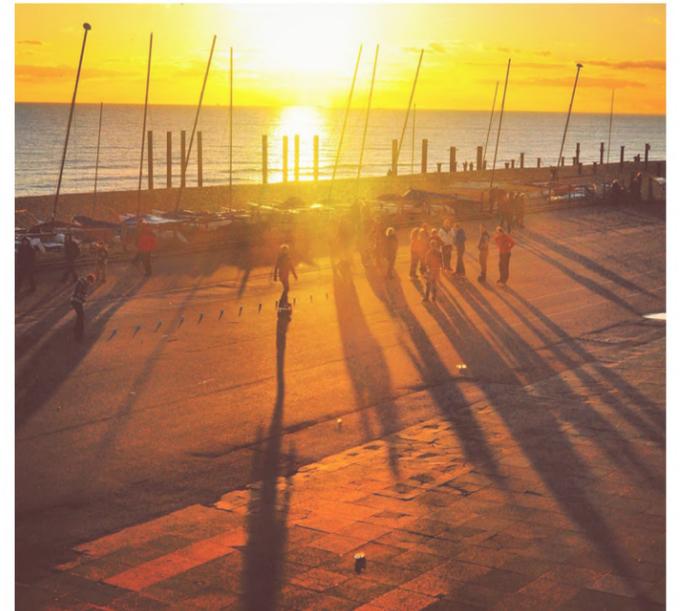
310 feet

gleam of light



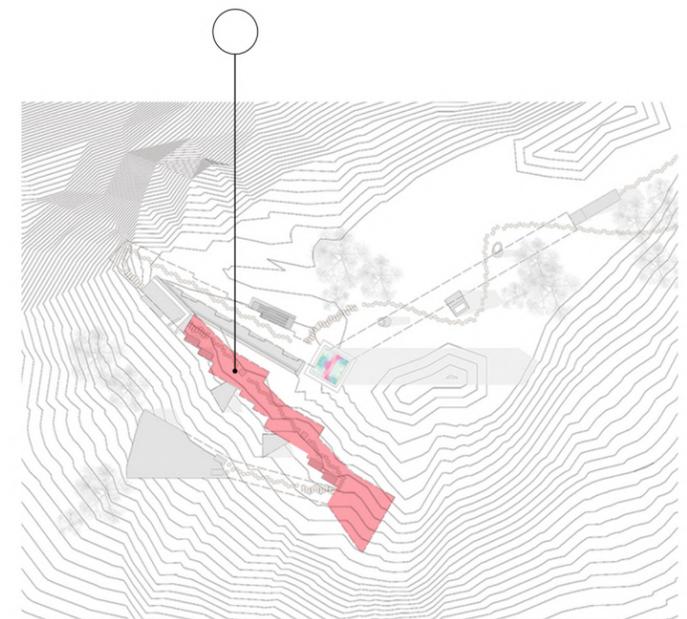
Early sketch - Long shadows and Orange Wash

"We can imagine space as a clocking, timekeeping paradigm. Our experience of foreground, middle ground, and distant view merge with the quality of material and light in a measure of time."
- Steven Holl, *Color, Light, Time*



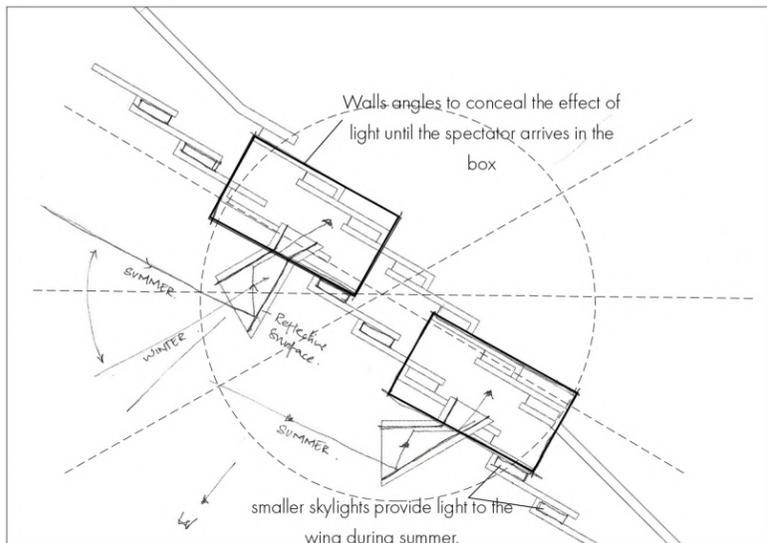
Apart from the color, the angle of light and the respective shadows are the most mystical aspect of sunsets. Shadows are the longest during when the sun is low on the horizon. The orange washed light cast by the light tunnels intensify of the last moments of the sunset. Although poured-in-place concrete is used for most parts of the building, the material surface becomes very important in this wing as light interacts with it more directly. Together, the tunnels act as devices that reveal seasonal, diurnal and linear time.

In this wing, is where the presentation of individual phenomena begins to shift toward offering the entirety of sunset. The spectator first gets a glimpse of the changing skies.



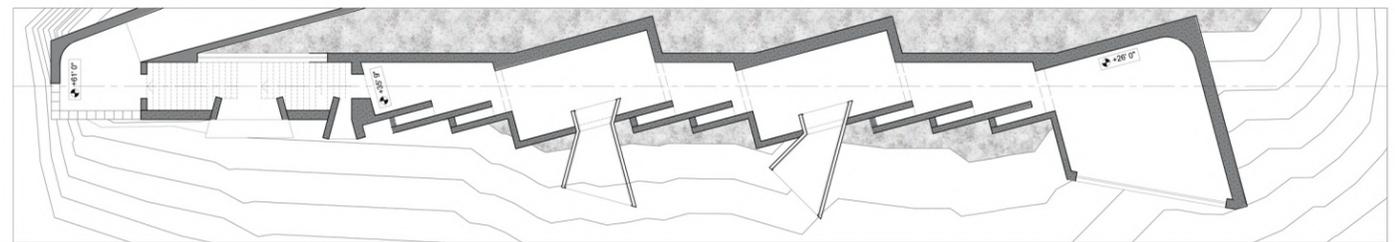


1



This long Corridor contains 2 light boxes. Each lightbox is positioned to cast direct rays onto the opposite wall as its canvas during evening time, where the projected solar pattern acts as time teller.

A bright orange wash of the sunset horizontally on the canvas wall just above the spectator's head, beckoning them to raise their hand and catch the rays.





Summer conditions



Winter conditions

310 feet

gleam of light



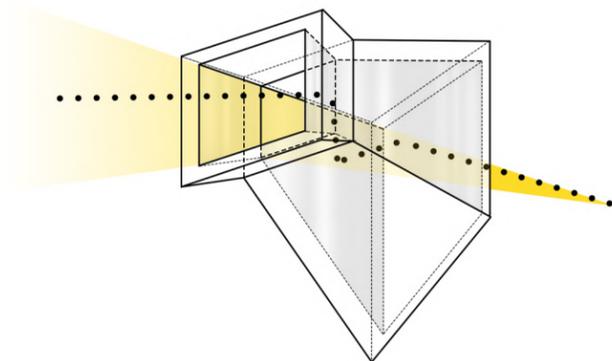
Winter conditions



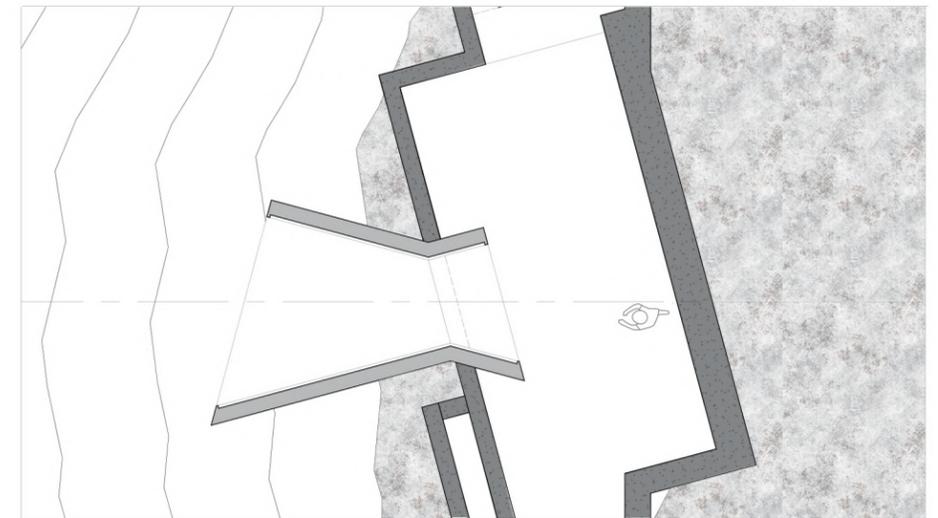
Summer conditions

These models illustrate summer and winter conditions through the light tunnels that are lined with mirrors in the interior. Light Tunnels are oriented to get direct light from the winter sun and indirect reflected light from the summer sun.

These light tunnels cast crisp, geometric, orange light on the canvas walls revealing the purity of sunset color and horizontality of light.

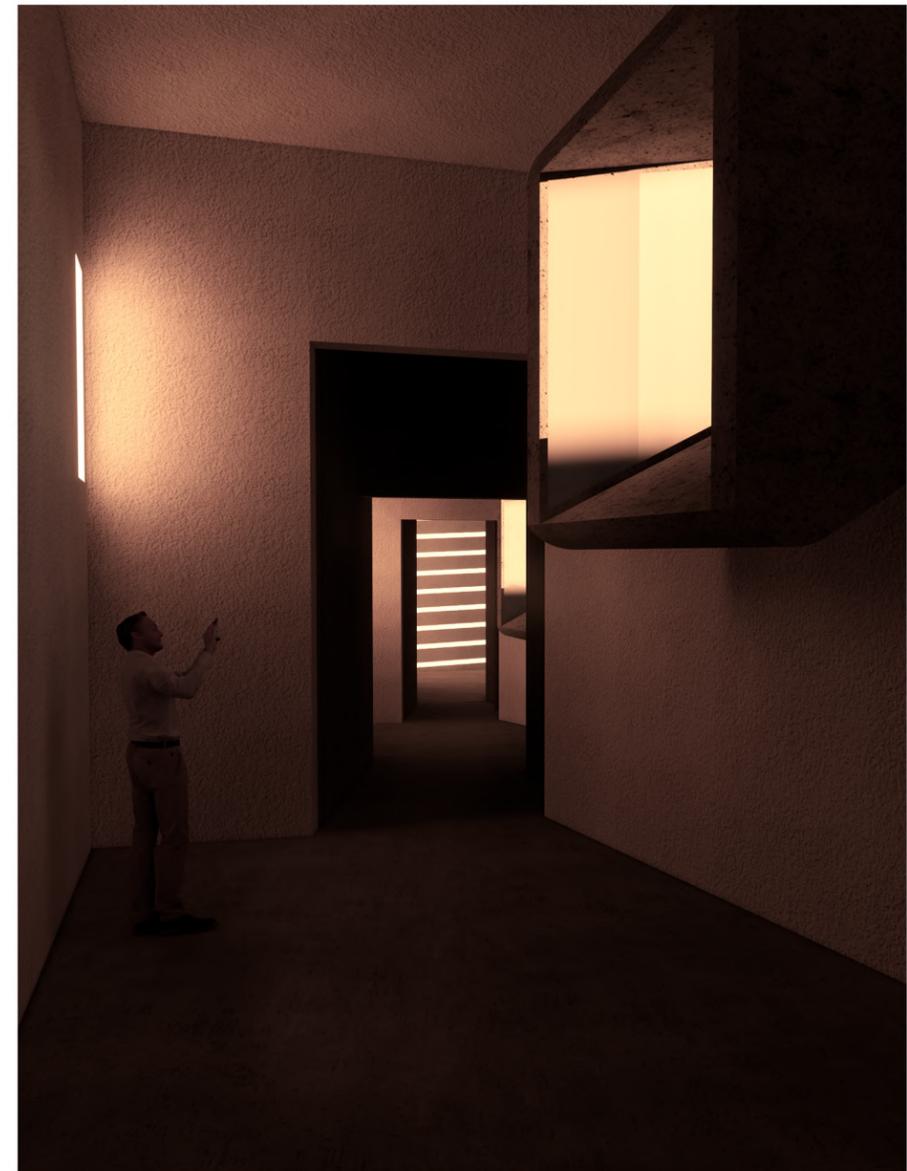


The roof of the light tunnels are slightly slanted to allow water drainage. There is also drainage provided inside the path covered with steel grates.

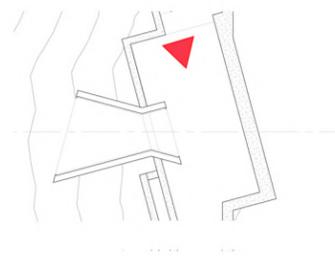


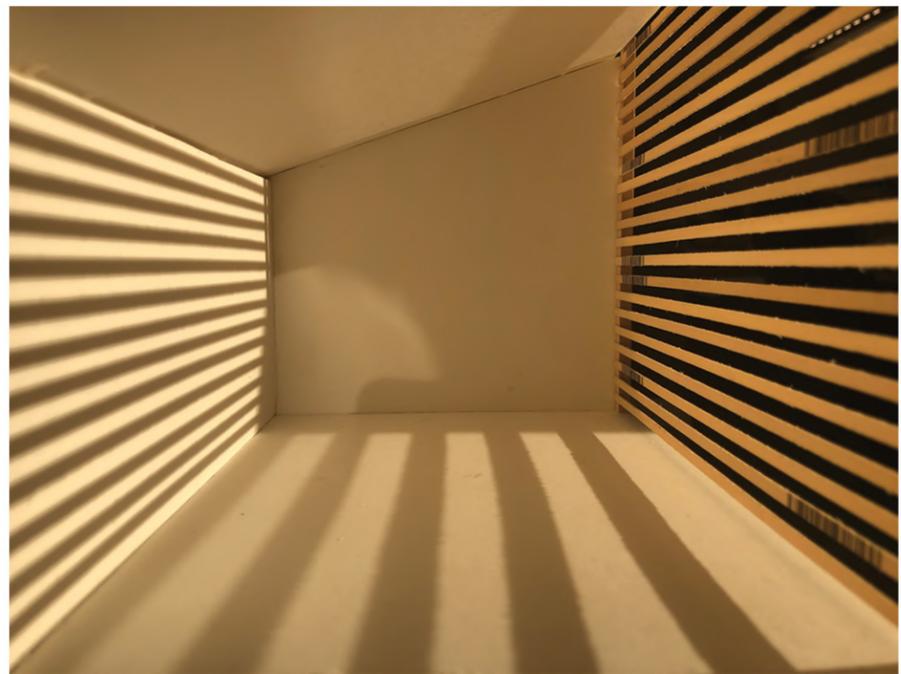


Summer conditions

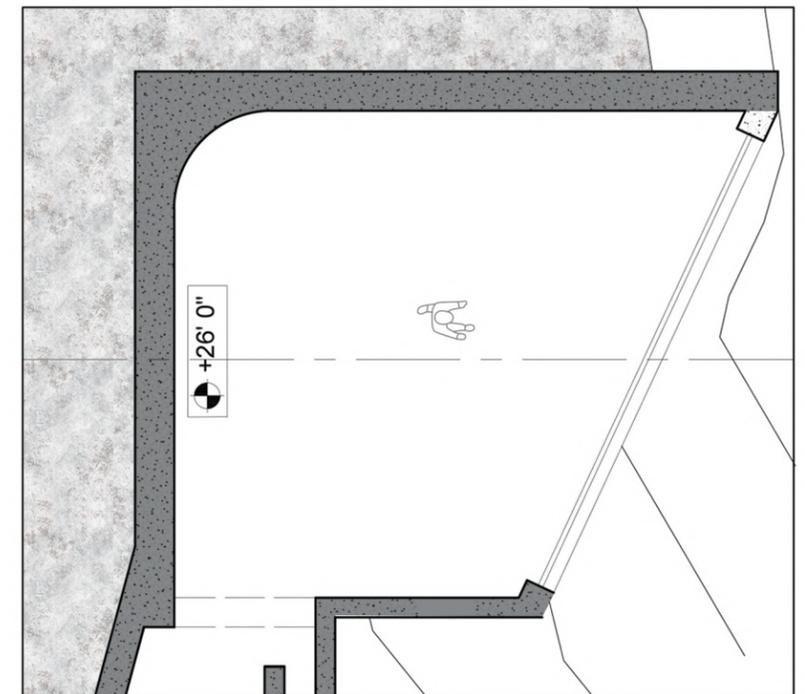
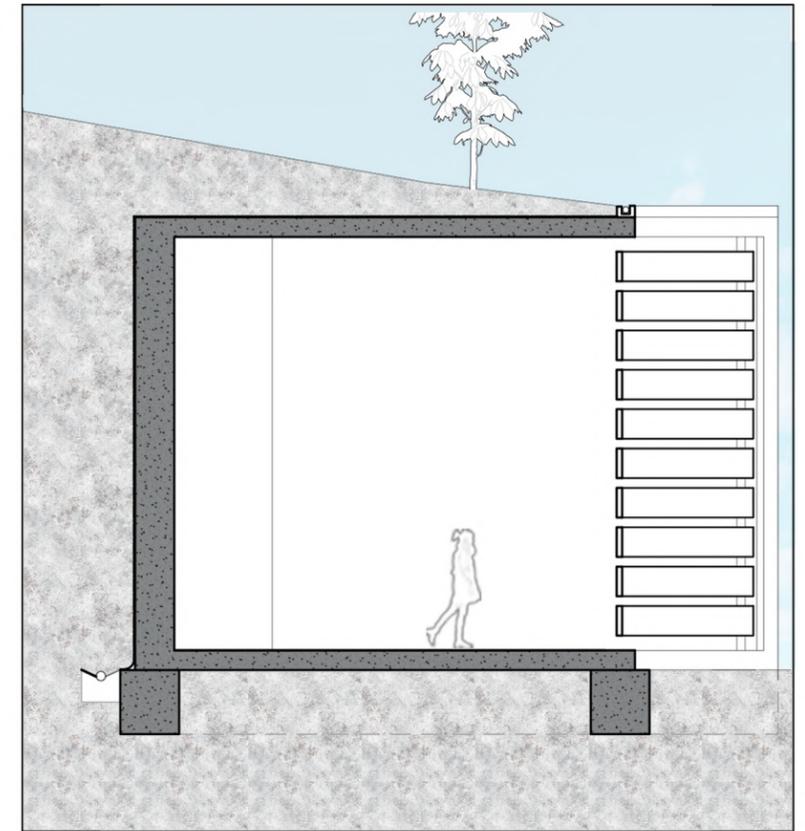


Winter conditions



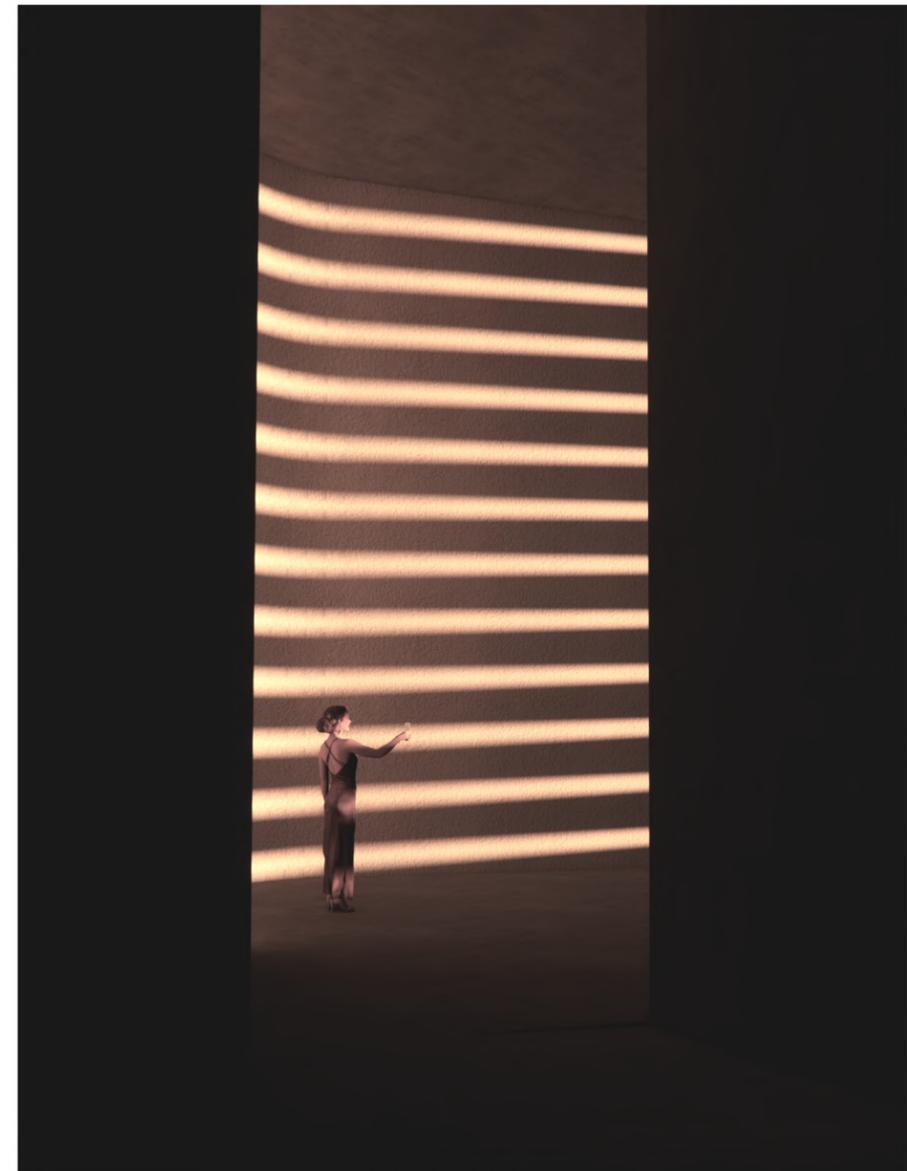


Study models illustrating the effect of light through a screen of horizontal slats at sunset. The slats used for this purpose are 1'6" to scale, which is also being used in the building.

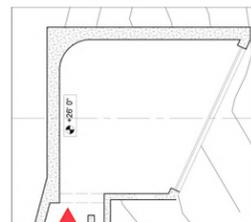




Summer conditions

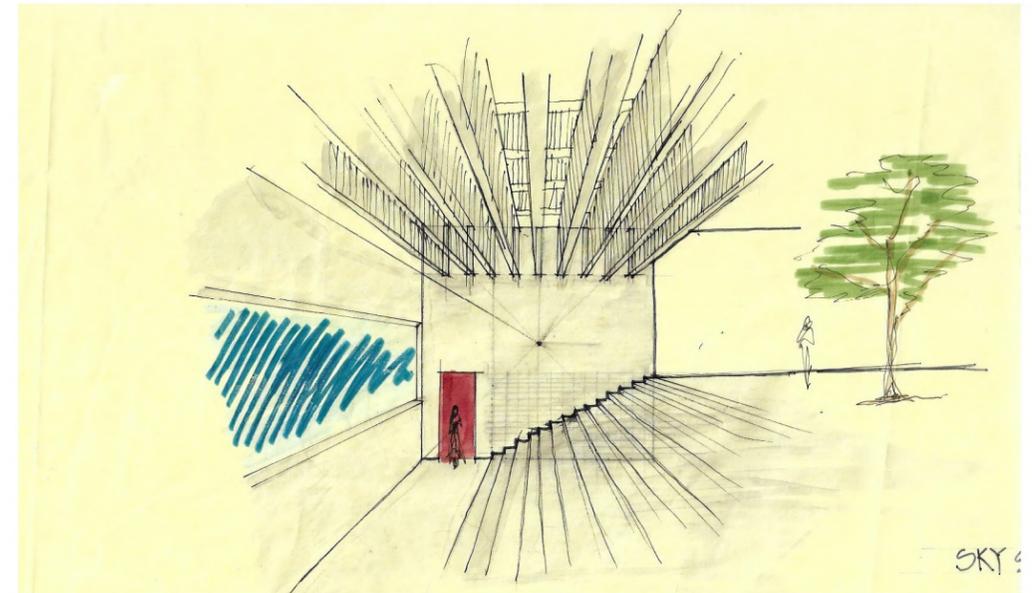


Winter conditions



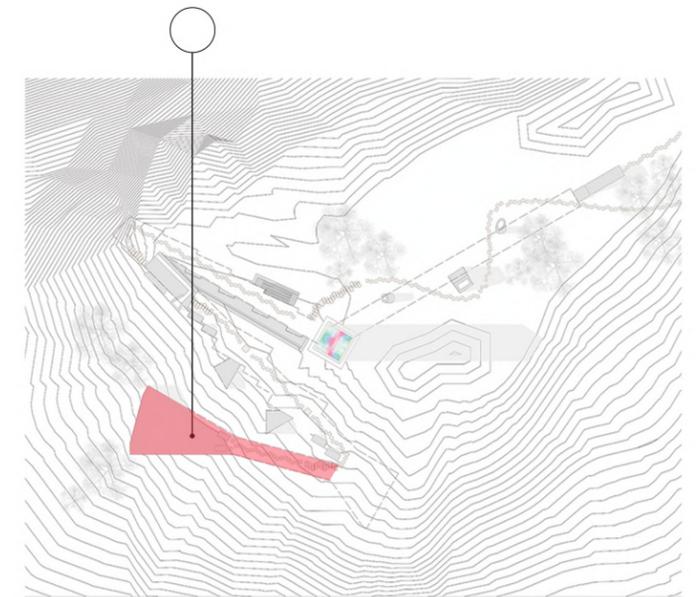


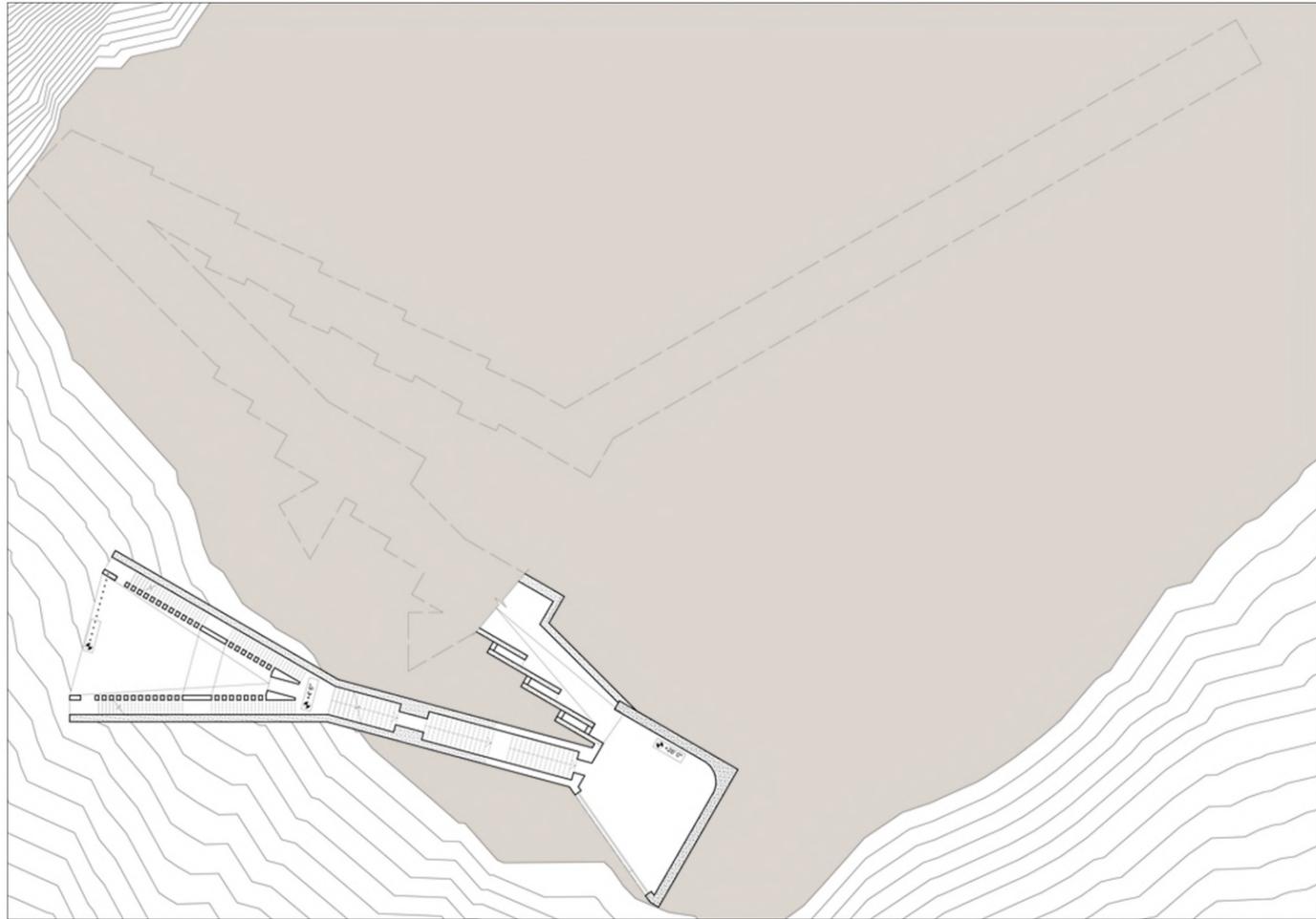
Window at Casa Malaparte



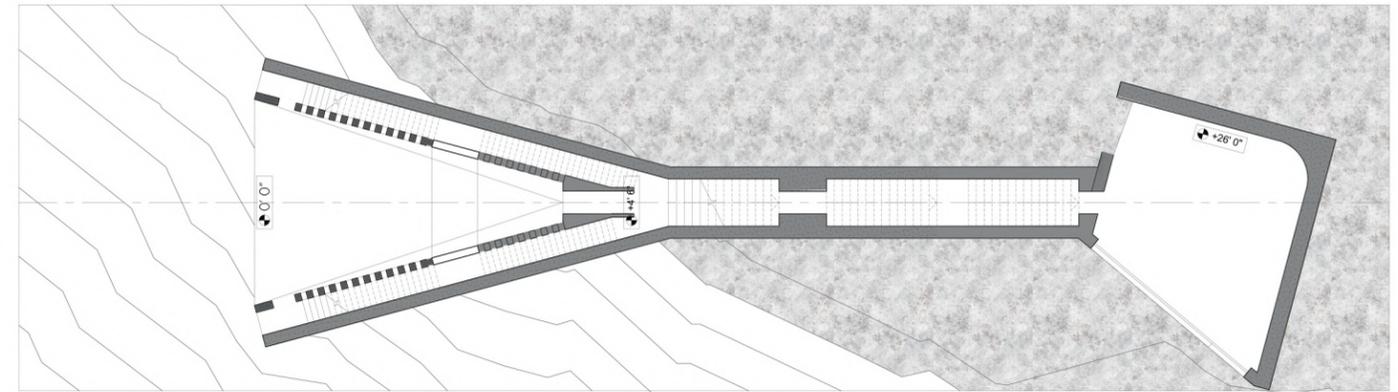
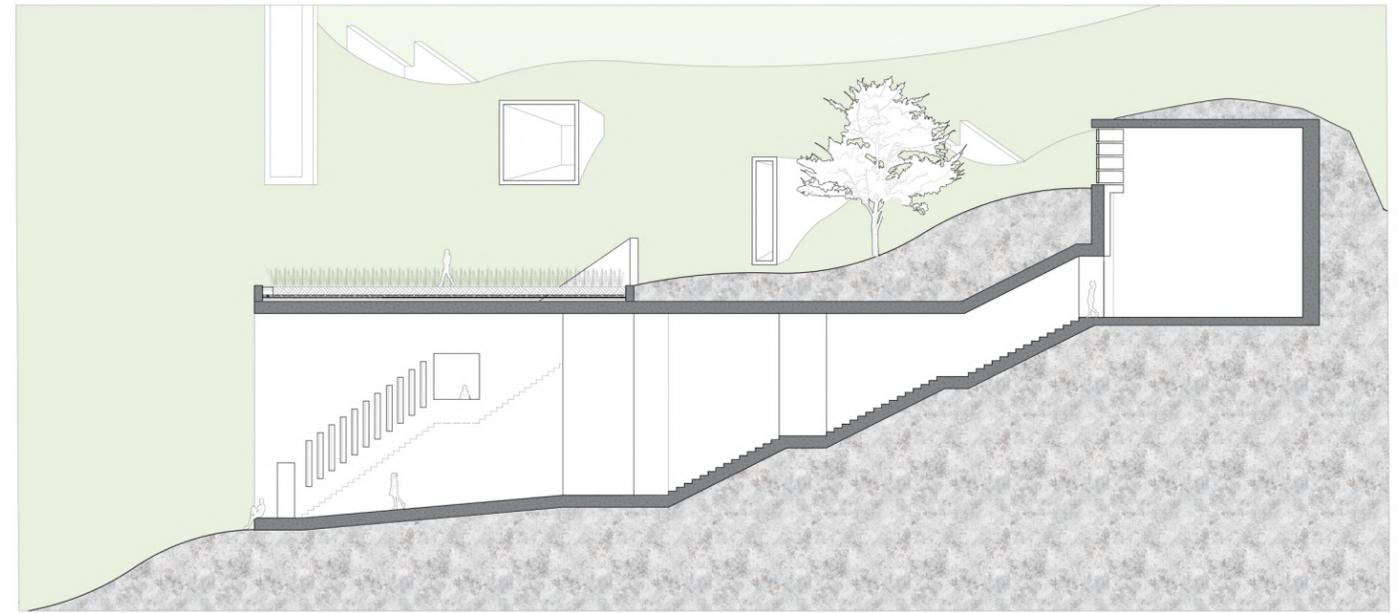
early sketch - framing through stairs

After 450 feet of encountering the various fragments of the phenomenon of sunset, descending through a narrow set of stairs invites the unencumbered view of the sunset. The release is kept simple, the space is a 25' x 25' frame, pointing into the directional range of the sunset. This space is kept simple, with no furnishing or seating to emphasize the framed event. The return path begins with two sets of stairs tucked between the 'double wall enclosure' for the frame.



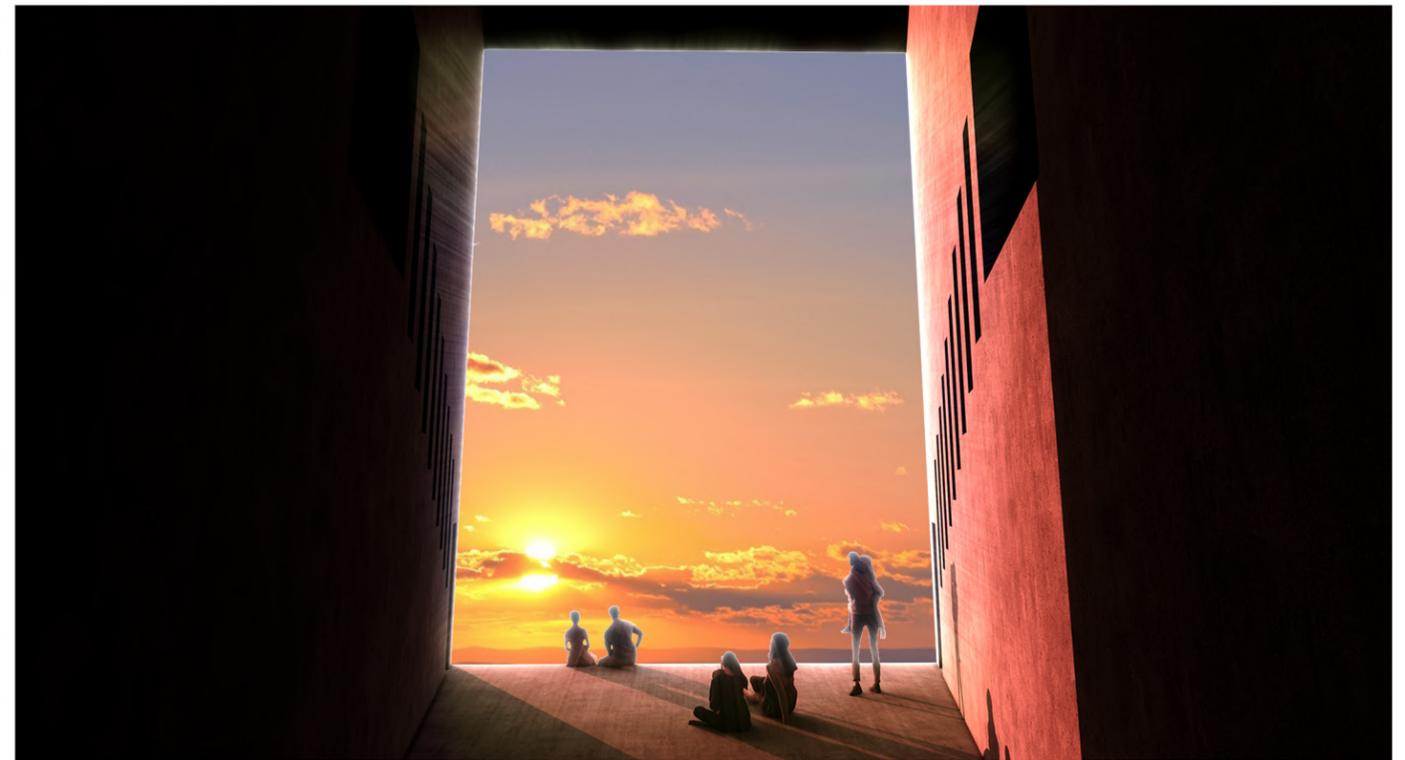


The view, oriented to embrace the varying angle of the sunset between solstices also offers a view of the smaller hills and towns beneath. Its orientation takes advantage of major views and vistas from Hawksbill Summit.

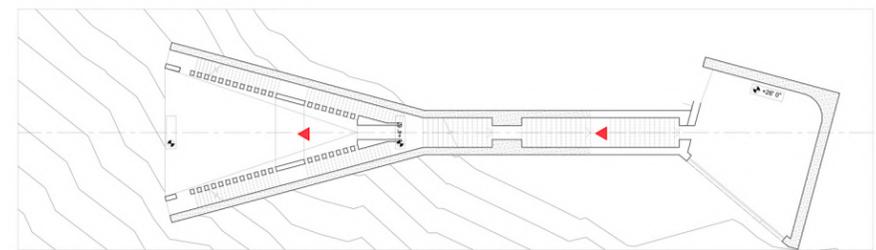




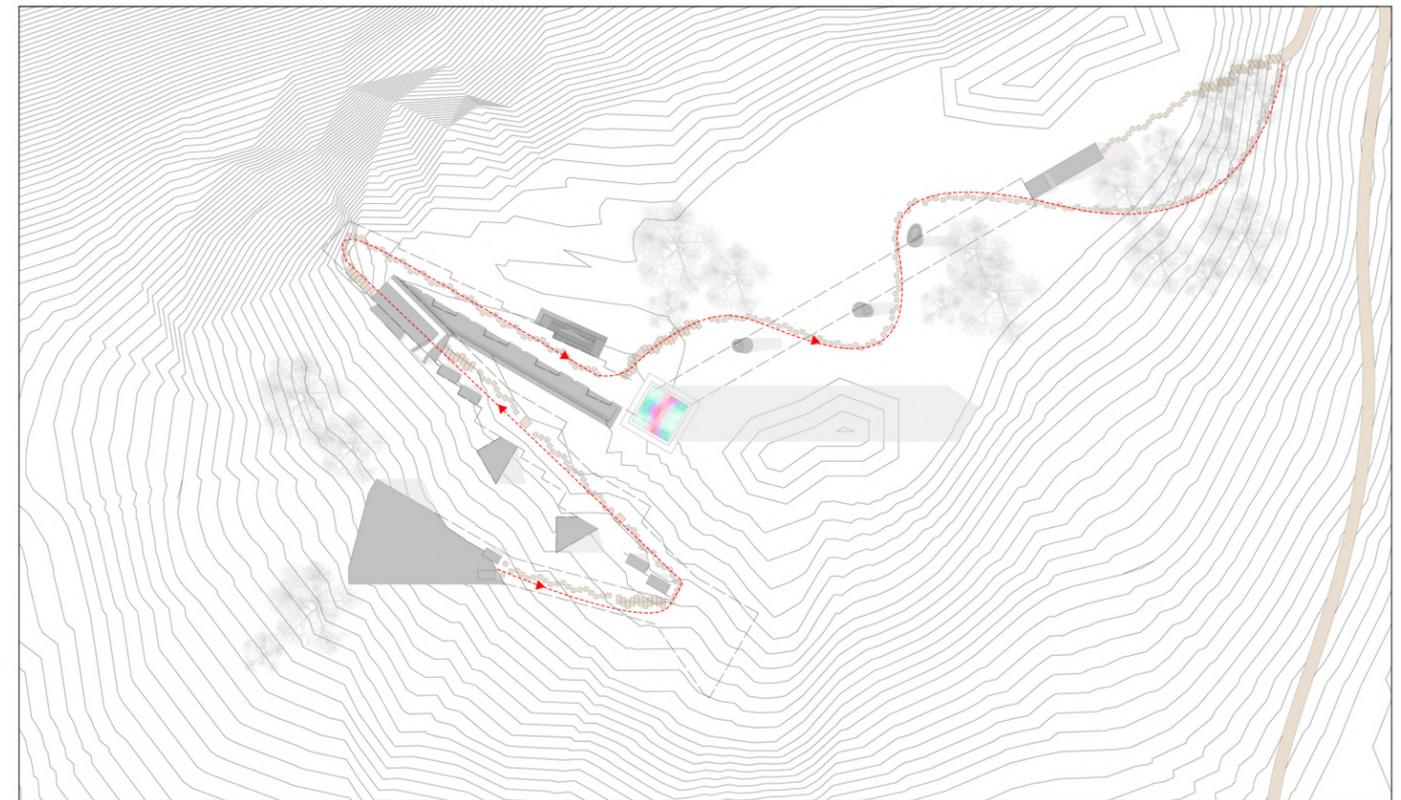
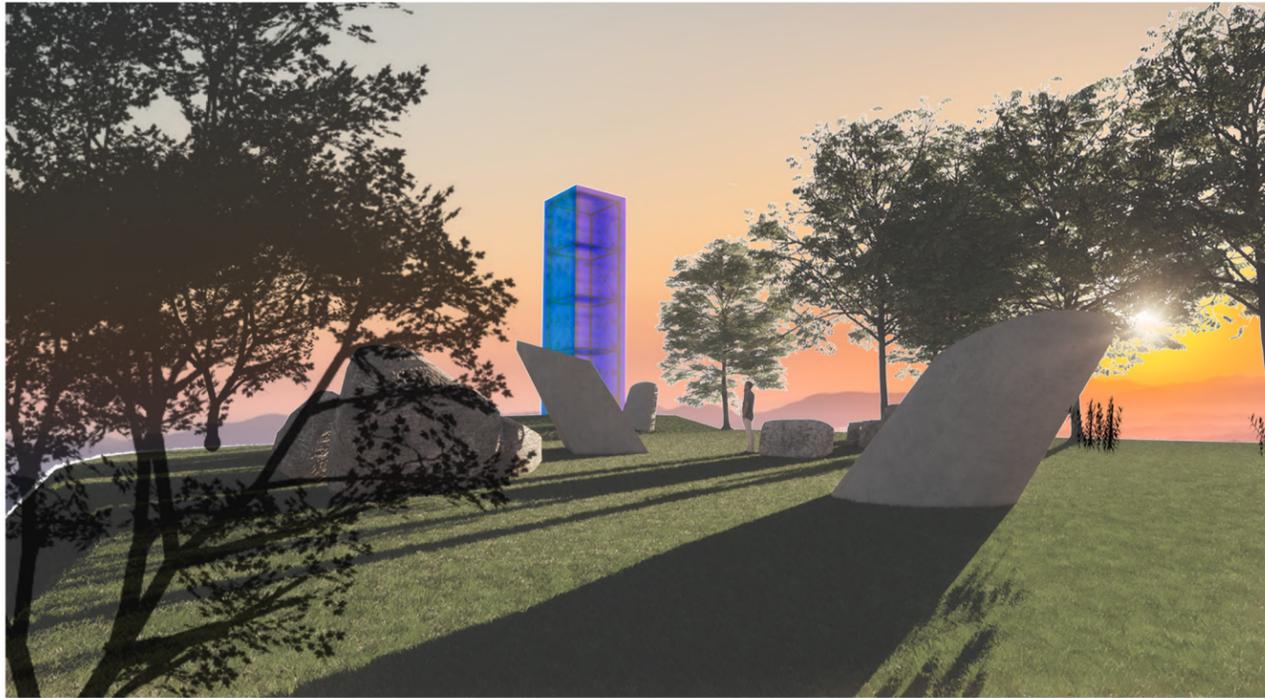
view from the staircase



Winter conditions



return



The return path to the entrance is choreographed in such a way that the spectator passes through the external surface appearance of the sun-capturing instruments which feed the events inside the tunnel below. The intention is to have the sun-capturing instruments appear as mystical objects or follies in the dusk landscape that sometimes blend with the rocky terrain, but also to evoke a curiosity to better understand how the light effects below are generated.

conclusion

Architecture has the potential to amplify the beauty of natural occurrences. In this sense, architecture embraces what is normally an intangible natural phenomenon and gives a momentary tangible space by which it can be better understood in a phenomenological sense.

The thesis and its proposed architecture aim to offer an increased intensity of the beauty of colors, light and shadow in concert with the diminishing brightness of the sunset. The architecture of 500 feet of sunset is conceived as an aggregate space of color, shadow and darkness combined as a cumulative spatial sequence to render a deep and memorable moment of a natural phenomenon.

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