

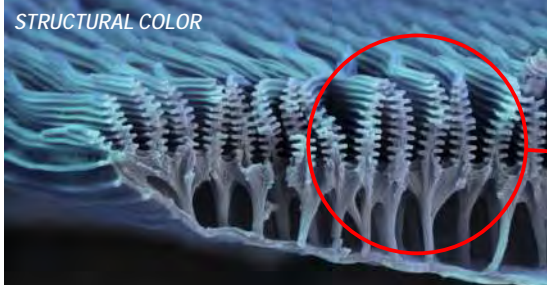


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LEADING LIGHT PROJECT: MOLINE  
Moline Public Art Commission (MPAC), MetroLINK and Quad City Arts  
"Tapestry" concept by Nick Athanasios  
Concept Summary and Background Information

Tapestry considers two main elements (The Avenue & the Tower Facade) that are linked to create a work that engages day & night, providing opportunities for discovery & delight. The work focuses on local fauna & flora & interplays with light to create vistas under constant color metamorphosis. The work is designed to welcome visitors & locals into the heart of Moline and to create a community crucible that is an integral part of Moline's community and its memories.

Background

In nature, color is often created not through pigmentation (a chemical process) but rather via sunlight's interaction with structure (a physical process often termed structural color creation). One classic case is that of butterfly wings and their fine micro-structure within that affects & alters sunlight's passage through them to create the magnificently vibrant, visceral & glorious colors that butterflies are known for (exemplars include indigenous Moline and Quad City butterflies).

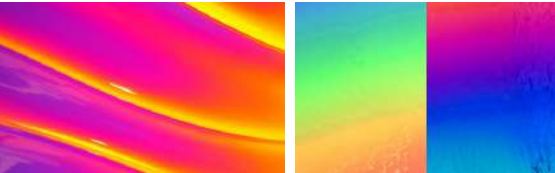


Limenitis arthemis

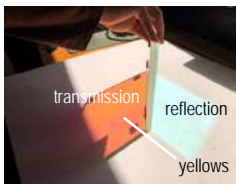
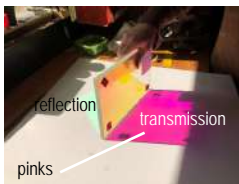
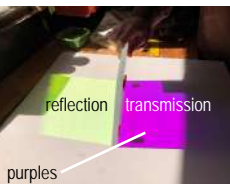


Eastern tiger swallowtail (*Papilio glaucus*)

Our concept utilizes technological materials that replicate nature & in particular recreate the way nature utilizes light to structurally create the aforementioned visceral, vibrant and unique colors and lighting effects. These materials make use of nanotechnology in their fabrication and include dichroic, monochromatic and diffraction optical filters. Examples of some of these materials can be seen below.



Optical filters  
-including  
diffraction gratings  
dichroic optics  
(provide for the  
transmission and  
reflection of light)



Dichroic optical filters allow for the production of colored shadows that alter in color throughout the day. Changing ones vantage point of the filters also manifests color changes.



Other examples in nature  
where light's interaction with structure  
provides for unique color/light effects

Summary of Concept

Tapestry

Both the grassy plaza (east of The Q Multimodal Station) and the tower facade will be populated by indigenous fauna and flora; although fauna will constitute more of a narrative aspect in the grassy plaza element.

The grassy plaza element (ala element one of Tapestry) considers a series wild geraniums (know to provide local insect species with sustenance) that extend up into the sky forming a river like trail of flower leading towards the tower's facade (Geranium Avenue). Two flowers (out of the population of seven-nine) will host an indigenous butterfly aloft them, their wings in variable modes of flutter, but with both butterflies pointing/poises in the direction of the façade. Essentially these butterflies are on a journey to join a kaleidoscope of butterflies (a kaleidoscope is a term used to describe a group of butterflies) that are being hosted by the façade and is own population of flowers that extend out from it (The second element of Tapestry).

The flight path (river like and ascending) of the butterflies from the geraniums to the façade is a metaphor for a journey ahead into Moline, a journey of up and across the skywalk into Moline and equally one of a return to home. The work is designed to provide delight, welcome and joyful discovery for visitors and locals. Its elements are also designed to create an overarching connected ecology and highlight nature's way of creating majestic vistas that excite, provide insight and bring a smile.

The placement of the concept's elements are designed to maximise the use of sunlight, create a vista that is visible from within the Multimodal station, by drivers making their way up 4th Avenue, by those utilising the skybridge and by pedestrians (close and afar). The work is for the community and intended to become part of the community.

The combined elements of the work will create a kinetic and dynamic work that will alter in color as a consequence of light's interaction with its elements, their orientation and the public's viewing vantage point of these.

OTHER QUICK POINTS

The elements that make up the work are strategically placed to not only make best use of light (to provide intense color shadows) but to avoid glare and to consider drivers. Their positioning is also designed to make best use of rain water for self-cleaning.

-The work is designed to remain aesthetically pleasing with the passage time and is fabricated with robust materials (including powder coated stainless steel).

-The work will be under constant change and will be observed differently throughout the day, depending on one's vantage point of the work.

-Included in the work will be small details that provide additional pockets of delightful discovery for visitors and locals alike.

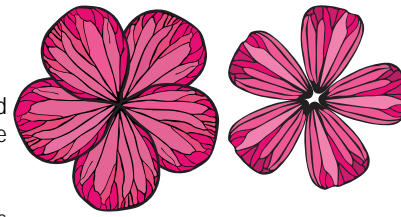
-The complete work across grassy plaza and the façade is designed to act as community crucible, for the community/visitors and yet be a part of the Moline and greater Quad City community: a destination point that becomes integral to the memories of travellers and locals.

-community outreach/educational programs (associated with the project) are in-kind and can run pre or post installation (for example creating a fluttering and kinetic butterfly and/or flower).

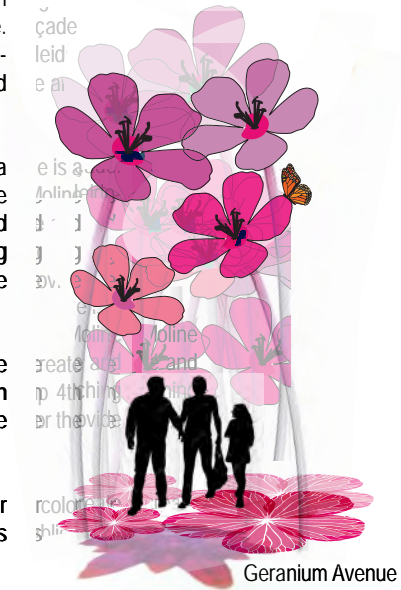
-Skunk Control are more than happy to work with all stakeholders to determine final design elements (inclusions, omissions) and exact site locations.

-Tapestry will not exceed the allotted budget (as mentioned in EOI documentation) and the associated allowance for site preparation.

-The work will illuminate at night and all lights are controllable.



mosaic like petals of geranium, inlaid with color altering optical filters (stained glass in the sky)





**Design Influences** -local flora species (the upstanding/ grass plaza elements)

*Elizabeth Ann cultivar*



### Petals

All Geranium petals are made of two layers of curved powder coated stainless steel (a 0.16inch and 0.12inch layer) that cradle/sandwich between their veinous frame an encapsulated layer of optical filters (dichroic and/or grating and/or colored). No two petals will be the same and each will differ in their optical filter compliment. Five petals with similar curvature will make up one flower head and each flower head will have its own unique unfurling petal spread, meaning that each flower will be in a different state of opening/unfurling and will (due to petal angle orientation) interact with sunlight in different way. This differing interaction between each flowerhead and sunlight is further heightened with the classic Geranium and its associated petal platform jig section which is secured at the tip of its stem. This jig which considers 5 steps/platforms, positions petals (and secures them in place) so as to replicate the overlapping petal arrangement found in nature and also prevents each steel petal from conflicting with its petal neighbours. The orientation of the petals also allows them to self-clean and their connection to the stem allows for water to drain through and not collect within the flower head. The stamens within the flower head are steel based and can be used as a source of lighting.

fine s-steel veins  
(provide stability and strength to petals)

platform jig  
(tabs of the jig allow petals to be positioned at various angles)

various angles

*fine s-steel veins  
(provide stability  
and strength to  
petals)*

platform jig  
(tabs of the jig  
allow petals to  
be positioned  
at various angles)

various angles

stainless steel petal frame (bottom)    encapsulated (optical filters)    stainless steel petal frame (top)

*final petal*

side view of petals

powder coated s/steel (at least 0.18inch)

PET 500mesh encapsulation

— dichroic, grating and/or colored

optical filters  
powder coated s/steel (at least 0.18inch)

-018 and greater stainless steel frames (powder coated) to cradle optical layer (sandwiched between) depending on span of petal.

Elizabeth Ann  
cultivar (petal)

*petals will undergo a color change throughout the day*

petal detail (mozaic like with differing optical filters)

flower head  
will span some  
5.0 to 76 cm in dia.

Geraniums will stand some 16-22feet

flower head (side)

Each film  
will display  
a unique  
stage

step

white  
powder coated  
steel stems  
will be curved  
(they will also capture  
color from petals)

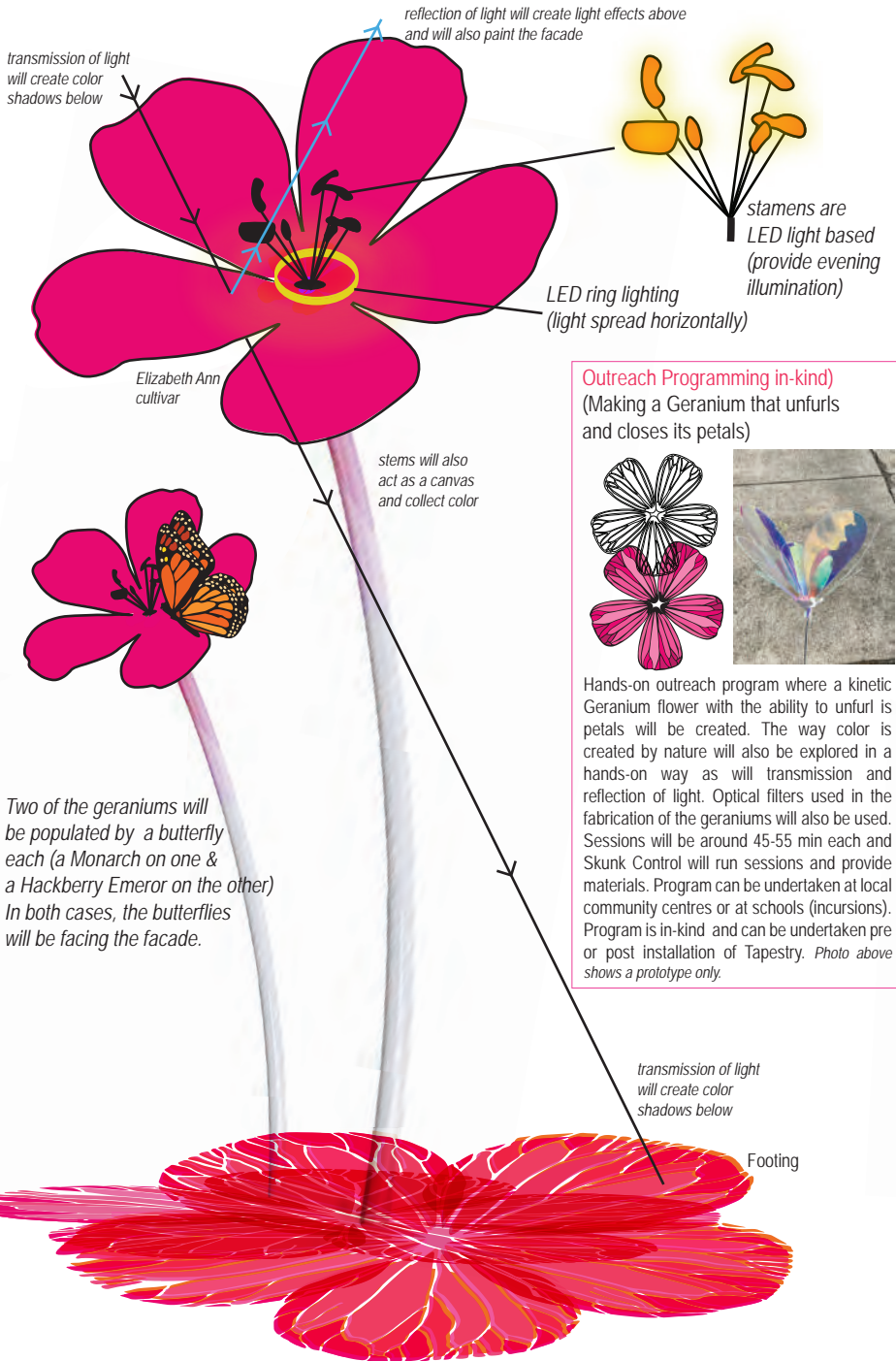
vivid color  
changing  
color shadows  
cast below

*not at scale*

Footing is located below ground



There are two possible lighting methodologies for the geraniums; an LED ring light can be positioned at the stem/petal intersection that will cast light across the petals and illuminate them. An alternative and almost kinetic version would have smaller lights (again LED based) inserted in and extending out of the geranium's stamens. A slight movement in these would provide for a slight light kinetic movement of light that would add an addition level of engagement. Power is low voltage.



Two of the geraniums will be populated by a butterfly each (a Monarch on one & a Hackberry Emeror on the other) In both cases, the butterflies will be facing the facade.

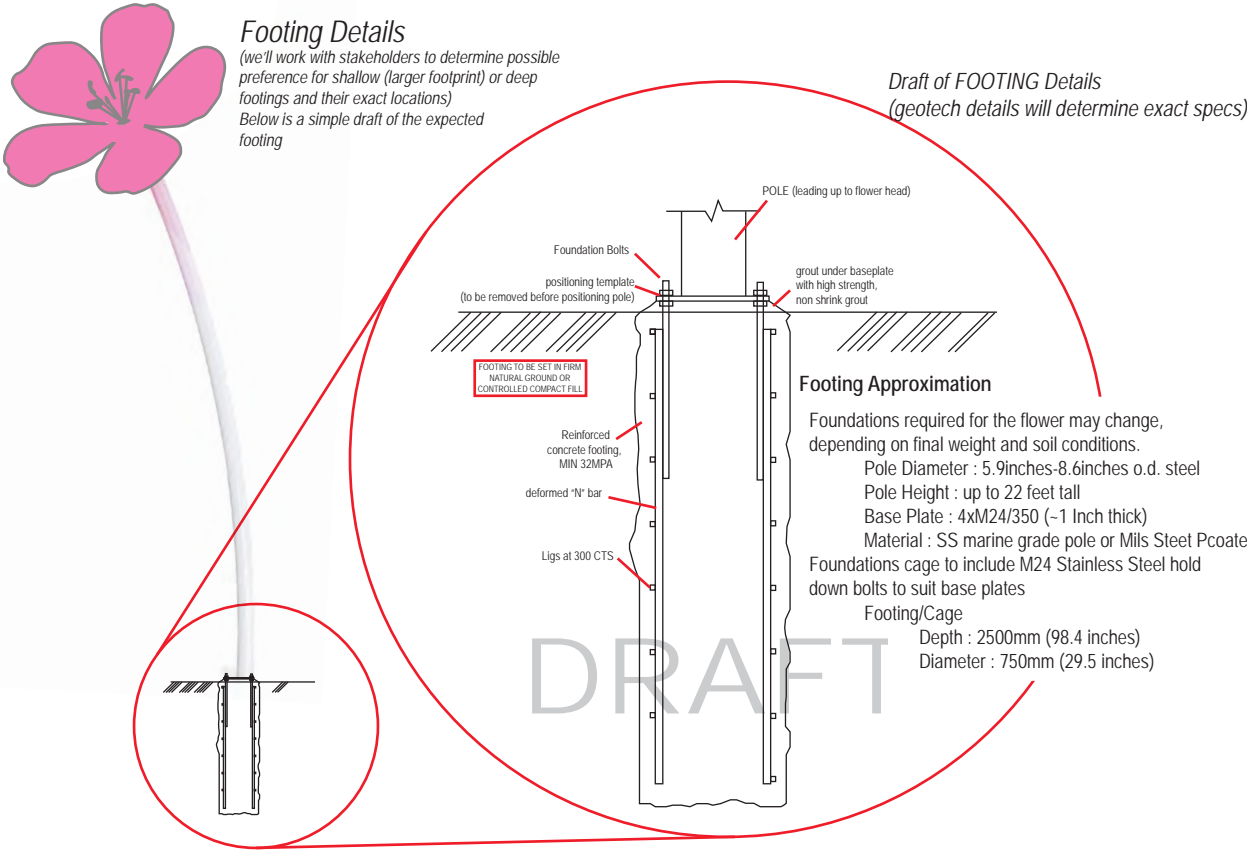


Geraniums are positioned to provide a vista from a number of vantage points including the skybridge, the Q Multimodal Station, roadway, footpath and from a distance. As they will create very vivid color shadows, the concrete path provides a suitable canvas to capture these shadows and create an engaging avenue. The proximity of some of the geraniums to the tower will also allow for reflected light to cast kinetic light effects onto sections of the tower. Two of the geraniums will host butterflies (a Monarch and Hackberry Emperor at different stages of flutter) oriented towards the tower's facade. These butterflies are explored alongside the facade's elements further within this document.

### Footing Details

(we'll work with stakeholders to determine possible preference for shallow (larger footprint) or deep footings and their exact locations)  
Below is a simple draft of the expected footing

Draft of FOOTING Details  
(geotech details will determine exact specs)





# THE TOWER FACADE

## Design Influences

-local flora species

The flowers selected to populate the façade are based on

- their links to local fauna (bees and butterflies),
- their petal number and shapes (how they can best be used to capture as much sunlight as possible in their large-scale form),
- their colour palette and hues,
- their differences between each other (eg., water ways vs field), and
- their “unknownness” to the general public;

Essentially a community and an ecology. Flowers will be positioned onto the facade to make best use of all available light, to complement each other and provide a vista that, bar its ability to engage, will also provide solace, insight and an opportunity for discovery. Small details throughout will reward keen observers and the work will always be under constant change. **Above all, the work is designed to welcome; a work for the community which is part of the community, celebrating community.**

The following two pages explore the concept and indicate the ways and means (methodology) that flowers (and butterflies over subsequent pages) will be positioned and supported onto the tower’s façade. This methodology will be explored via the use of one of the flowers (Azure Aster) that will populate the façade. The numbers of each of the flowers (or butterflies) that will join the Aster on the façade are not provided in this document (detailed structural designs will provide this information). The Aster was chosen to explore the methodology, as it has a large petal compliment that is arranged via the Fibonacci sequence. Here, petals are successively arranged at 137.5 degrees from each other so as to maximize their contact with sunlight.

The 2nd major element of Tapestry is that of the tower’s façade and its population of indigenous (to Moline and nearby localities) flowers and butterflies that now call the tower and Moline home. This element of Tapestry is explored over the following pages. Moline is rich in indigenous flowers and butterfly species. On this page, floral species are presented that will be recreated in large scale (fabricated with curved stainless steel and specialized encapsulated optical filters) to populate the façade and to create a 3D vista that shimmers with life and undergoes a constant color metamorphosis.

Flower species information was obtained from <https://www.moline.il.us/1926/Planting-Native>  
<https://xerces.org/publications/plant-lists/native-plants-for-pollinators-and-beneficial-insects-midwest>



Echinacea purpurea



Virginia Springbeauty (Claytonia virginica)



Common Phlox (Phlox divaricata)



Sharp-lobed hepatica (Hepatica acutiloba)



Downy phlox (Phlox pilosa)



American Bellflower (Campanula americana)



Common polypody (Polypodium virginianum)



Azure aster (Symphyotrichum oolentangiense)



Stiff Tickseed (Coreopsis palmata)



Broadleaf Arrowhead (Sagittaria latifolia)



celandine poppy (Stylophorum diphyllum)



Carolina rose (Rosa carolina)



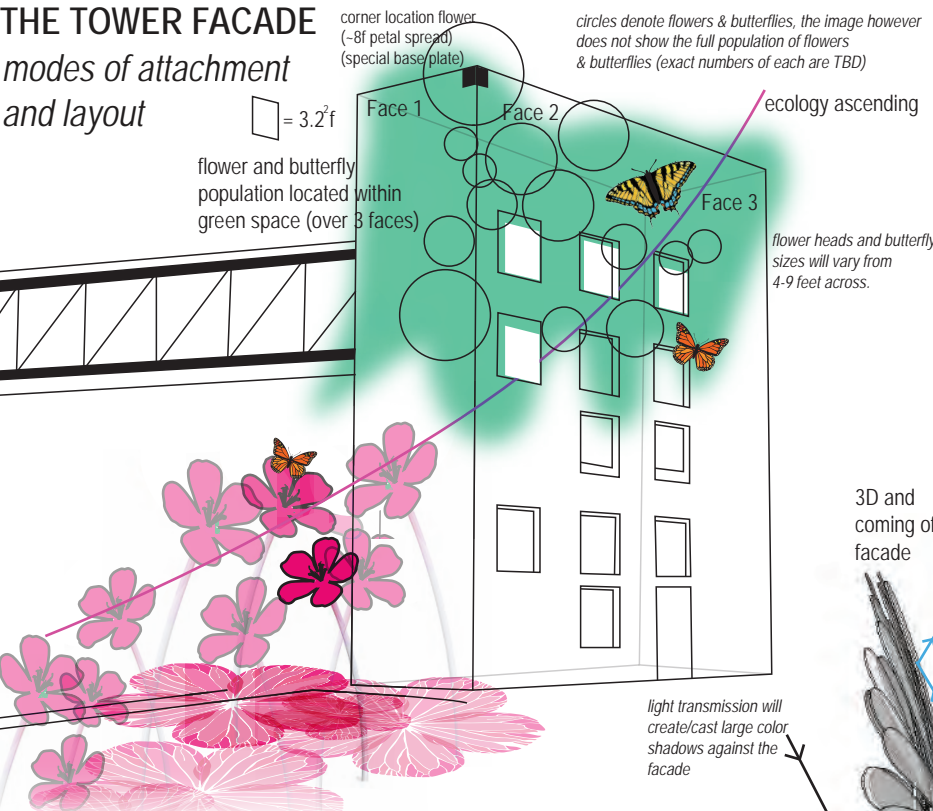
Cornus florida



prairie coreopsis (Coreopsis palmata)



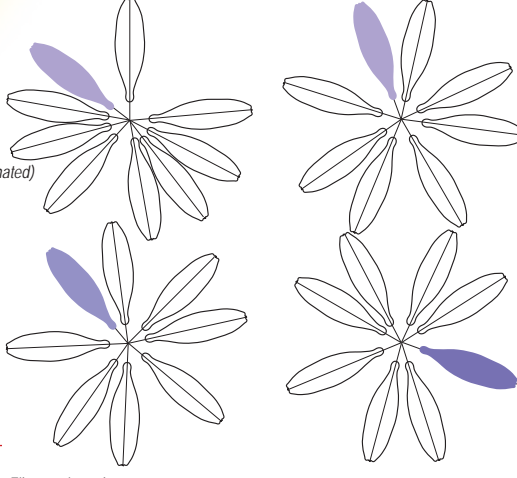
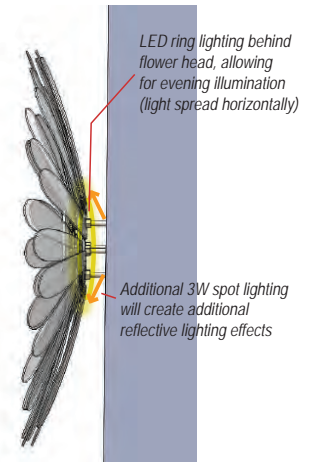
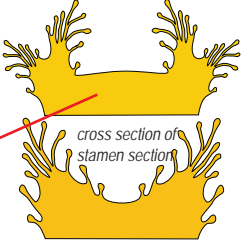
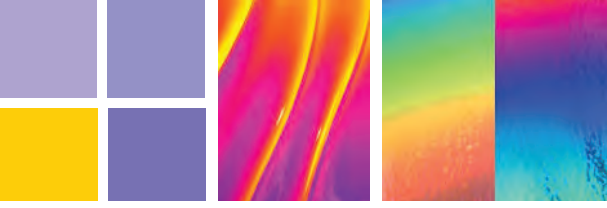
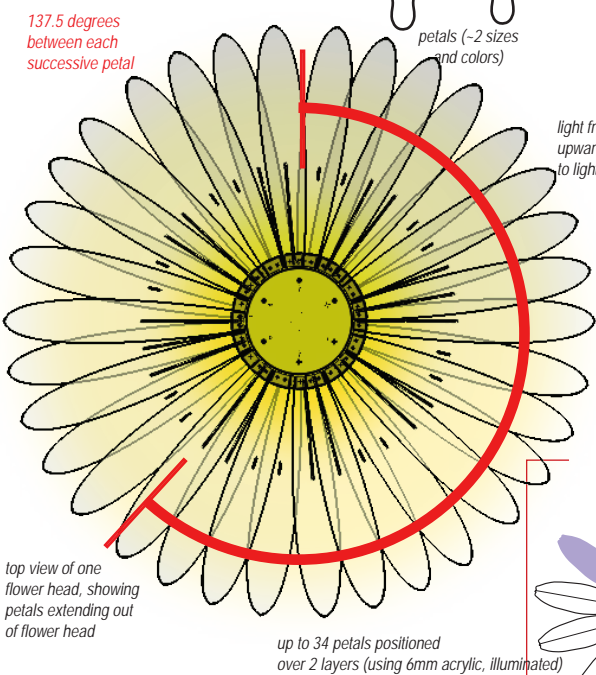
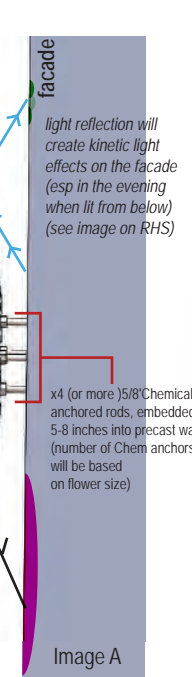
THE TOWER FACADE  
modes of attachment  
and layout



The 2nd major element of Tapestry is that of the tower's façade and its population of indigenous (to Moline and nearby localities) flowers & butterflies that now call the tower & Moline home. These flowers/butterflies extend out of the façade (3D) and like the flower heads of the avenue's geraniums, their flower heads are fabricated from curved stainless steel (powder coated) petal frames inlaid with encapsulated optical filters. These petals (irrespective of type) and butterfly wings are connected to a flower head base plate/butterfly base plate that is then affixed to the façade (via no less than four 5/8" chemically anchored rods are embedded 5-8 inches into the 1f precast, see image A, RHS). At corner locations (eg interface between the tower's face 1 and 2), specialized base plates are used to secure flower to facade. Face 2 will accommodate the greatest ecological population followed by face 1. Face 3 will accommodate 2 flowers that will have low reflective qualities to consider the safety of drivers driving up 4th avenue.

Both flowers & butterflies will range in size (4f - 9f in petal/wing span), flowers will predominately be in an unfurled position (decrease wind load & increase stability). Flowers will overlap with other flowers to create a naturalistic arrangement. Certain sections of windows will have coverage of petals/wings to allow stairwell users to peak outside & see a coloured world (by virtue of looking through the petal/wing's optical filters; a bit of an extra engagement for those using the stairs). Further details relating to the butterflies are found further within this document.

**Lighting.** As in the case of the Geranium Avenue, a ring LED light is located on the back of each flower head (size reflecting size of flower head) providing for evening illumination, resulting in an almost stained glass look & feel. Additional small spotlights (~ 3W each) directed at an angle (see image RHS) into the petals from behind will provide reflective kinetic light effects that will seem to dance around the flower heads. There is the ability to control both ring and spot lights independently. Butterflies will be lit in the evening in much the same way as the flowers and will be predominately be positioned on the façade in an ascending fashion (see ecology ascending line in the image above). The ecology of the façade follows on from the Geranium avenue's gradual elevation (of flower heads) towards the tower, again signalling an entry into Moline via the skybridge (rhythmic movement).





# THE TOWER FACADE

## Design Influences

-local (and diminishing) fauna species

A number of local butterfly species (presented here) were identified within Moline and the broader Quad City area. Five/Six indigenous butterfly species will feature as elements of the overarching work, including the rapidly disappearing Monarch Butterfly (see headlines on the RHS of this page). A number of other species were chosen for their ecological interaction with local flower species and their color-altering birefringent hues (a consequence of how light interacts with the butterfly wing's fine series of scale like micro structures that are organised within its wing (see also introduction section)). Species to feature and be elements of the work include

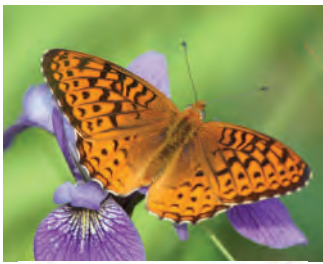
Eastern tiger swallowtail (*Papilio glaucus*), Orange Sulphur. (*Colias eurytheme*), Monarch butterfly (*Danaus plexippus*), Spring Azure (*Celastrina lucia*), Red-spotted Purple (*Limenitis arthemis*), Hackberry emperor (*Asterocampa cellis*) and the Aphrodite fritillary (*Speyeria aphrodite*)

These species of butterflies will populate the facade, with a Monarch and Hackberry Emperor also populating (sitting aloft) two of the upstanding Wild Geranium (*Geranium maculatum*) flowers that populate the grassy plaza area.

Outreach Programming in-kind)  
(Making a fluttering Monarch Butterfly)



Hands-on outreach program where a kinetic Monarch with the ability to flutter its wings will be created. The community and/or school children will be provided with an insight as to how nature can create color through structure and butterfly ecology. Optical filters used in the art work will be used to create the butter wings. Sessions will be around 50min each and Skunk Control will run sessions and provide materials. Program can be undertaken at local community centres or at schools (incursions). Program is in-kind and can be undertaken pre or post installation of Tapestry. Photo above shows a prototype only.



Aphrodite fritillary (*Speyeria aphrodite*)



Monarch butterfly (*Danaus plexippus*)



Hackberry emperor (*Asterocampa cellis*)



Orange Sulphur. (*Colias eurytheme*)

Monarch butterflies to be added to threatened species list in the US

US Fish and Wildlife Service extends protections to 'iconic' insects, who experts say may not survive climate crisis



Monarch butterflies from Canada stop to rest in Cleveland, Ohio, on their way to Mexico, on 12 September 2023. Photograph: Sue Ogrocki/AP

The US Fish and Wildlife Service announced a decision on Tuesday to extend federal protections to monarch butterflies after years of warnings from environmentalists that populations are shrinking and the beloved pollinator may not survive the climate crisis.

### Fish and Wildlife Proposes to List Monarch Butterfly as Threatened Species

Recommendation would bring some habitat protections if finalized.

Illustration by PHOTODISC/GETTY IMAGES



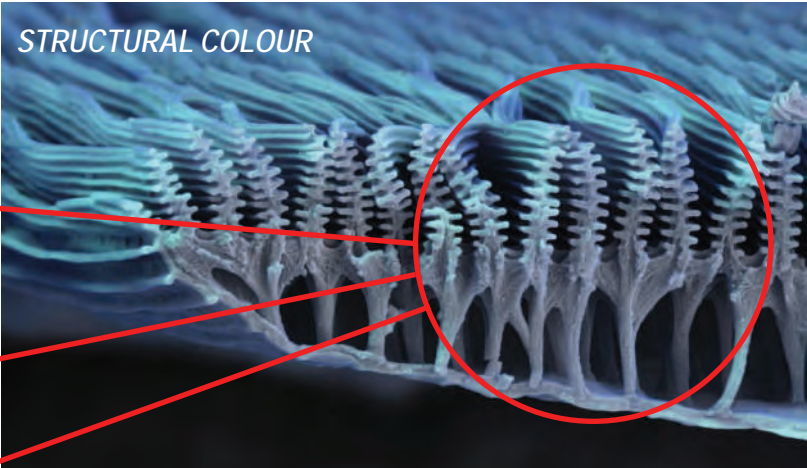
Eastern tiger swallowtail (*Papilio glaucus*)



Spring Azure (*Celastrina lucia*)



Red-spotted Purple (*Limenitis arthemis*) adapted to look like the toxic Pipevine Swallowtail





# Design Influences

-Butterfly Fabrication and attachment methodology



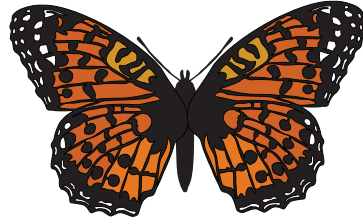
Monarch butterfly (*Danaus plexippus*)



Eastern tiger swallowtail (*Papilio glaucus*)

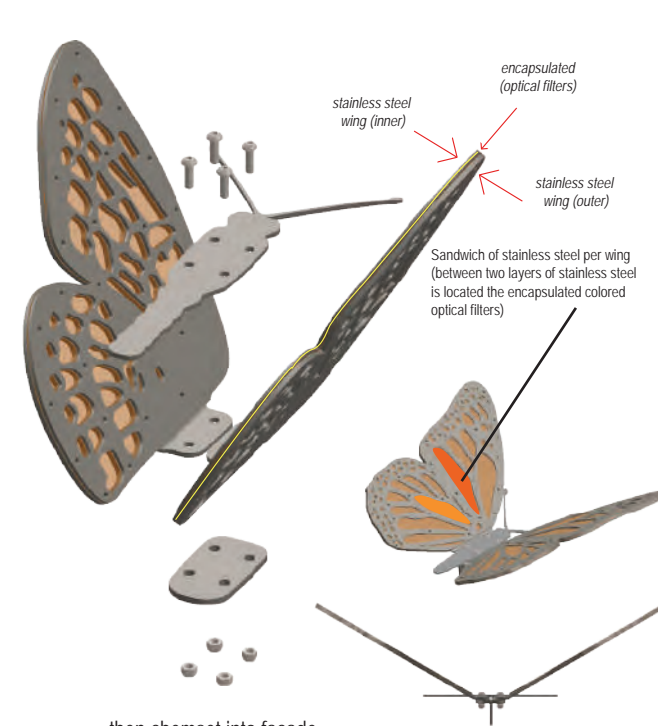


Spring Azure (*Celastrina lucia*)

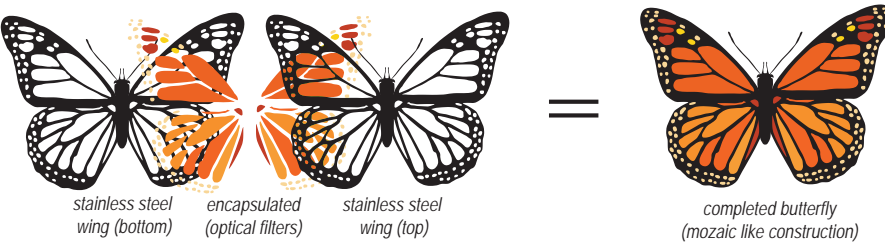
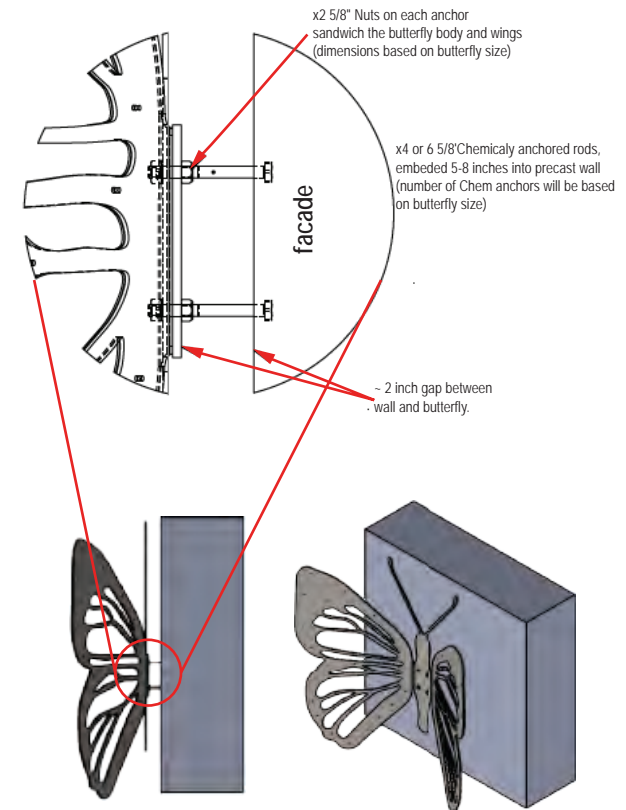


Aphrodite fritillary (*Speyeria aphrodite*)

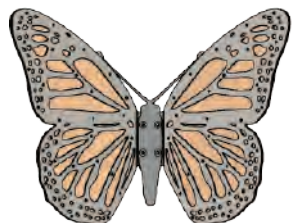
stainless steel and optical filter butterflies



then chemset into facade



The Butterfly bodies (like the flower's petals) are fabricated from powder coated stainless steel (2 x ~0.16 inch layers per wing) onto which butterfly wings are bolted onto. This in turn is then bolted onto the facade (see approximate schematic on this page) via chemical bolting. The butterfly wings are constructed of three main layers, two powder coated stainless steel frames that cradle/sandwich between them encapsulated optical filters (dichroic and/or grating and/or colored optical filters). The dichroic optical filters like those found with the petals of the flowers (and mimic the micro structures found in nature within the wings of butterflies), will both transmit and reflect light and create color changing shadows that will be cast onto the facade (or onto path/grassy plaza below in case of those butterflies aloft the upstanding Geranium flowers); providing for unique color changing and lighting effects. The butterflies have varying wing spans and are positioned so as to maximise their contact with sunlight. This same positioning allows for them to self-clean, allowing water to run off and not accumulate.



side view of butterfly wings

- powder coated s/steel (at least 0.18inch)
- PET 500mesh encapsulation
- dichroic, grating and/or colored optical filters
- powder coated s/steel (2mm)

~018 and greater stainless steel frames (powder coated) to cradle optical layer (sandwiched between) depending on butterfly wing span.

Butterflies will be in various stages of flutter (some possible examples are above)



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LEADING LIGHT PROJECT: MOLINE  
Moline Public Art Commission (MPAC), MetroLINK and Quad City Arts  
"Tapestry" concept by Nick Athanasiou  
Summary

### Overarching summary

Tapestry is active day and night, brimming with life (flowers & butterflies) and a colorscape that is under constant metamorphosis. During the day, the sun's rays interact with the flower and butterfly's specialised optical filters (at their various angles) to create constantly changing and highly vivid colour shadows that animate the plaza and the façade. Changing one's vantage point of the work will also alter the colors that are seen and experienced. This color metamorphosis is a consequence of the optical filter's internal nanostructure and how this alters and affects the passage of light (mimicking nature's way of color creation) and the result is the creation of highly vivid and richly glorious colors that captivate.

### Materials List

Stainless Steel 316 (UNS S31600) powder coated, optical films, Acrylic, Polycarbonate, LEDs, electronics

### Maintenance Information

Tapestry will essentially be self-cleaning. In cases where rain is not plentiful, a quick water wash may be required (with a low-pressure hose) per year; All optical filters are encapsulated and within stainless steel frames; there is little chance of undergoing damage. Additional pre-fabricated wings and petals will also be provided. Skunk Control will attend to the work for the first 12 months following installation.

### Community Outreach and Educational programs

Skunk Control are more than happy to provide a hands-on outreach program for the community and/or school groups that explores structural color and provides an opportunity to create a kinetic version of a Monarch and/or Geranium (see RHS panels for details) to take home and/or exhibit. This will be in-kind for the local community and/or school groups. Skunk Control will create, produce & run these outreach programs either pre or post installation

### Implementation schedule

- all high level engineering design work can be completed 6-12 weeks following selection (and geotech information provided if required)
- sign off from structural engineers can then be undertaken soon after
- fabrication will require 8-12 weeks, with installation over no more than 8 days.
- We will be ready for an installation when requested.

### Project narrative

As creators of public art work we want to create works that will be looked upon by those that have come into contact with them with fondness, delight and respect for having fostered insight and sparked curiosity. "Tapestry" will engage and resonate with the community providing opportunities for delightful discovery and providing a linking narrative that amplifies Moline's ecology and creates wonder. We feel that this work which is itself undergoing constant yet vibrant and engaging change lends itself to the ethos of MetroLINK, that of embracing new adventures and new wondrous journeys that can then be shared with the greater community.

### Sites and Concept

Skunk Control are more than happy to work with stakeholders to modify design and concept elements. This can include placement of geraniums through to location of flowers and butterflies on the tower facade.

### Outreach Programming in-kind (Making a fluttering Monarch Butterfly)

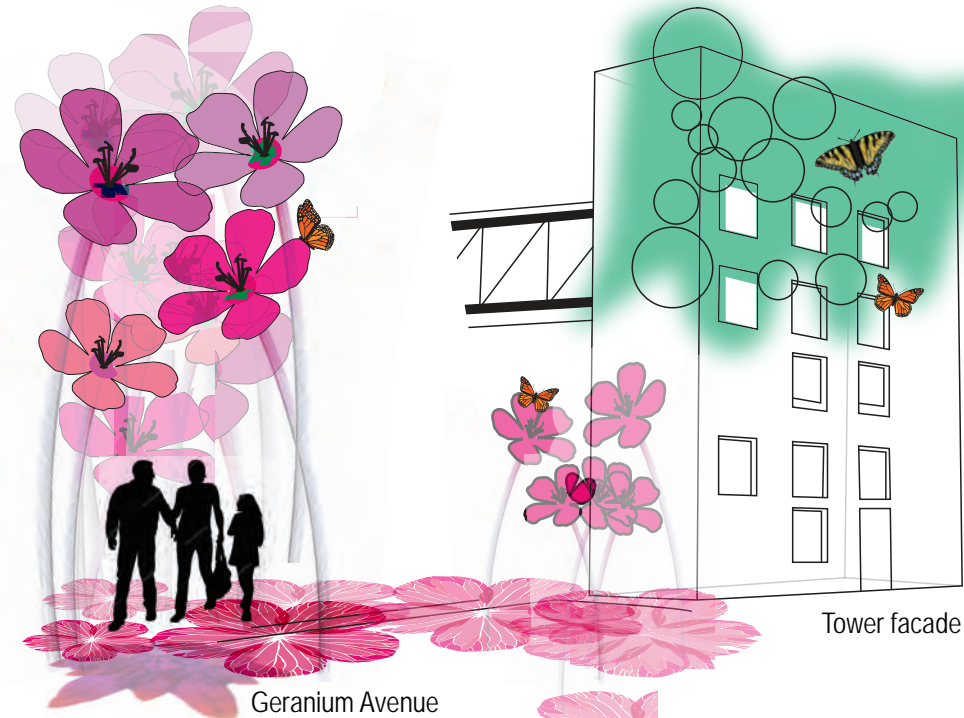
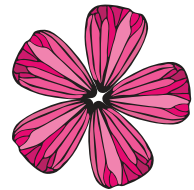
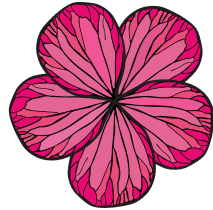


Hands-on outreach program where a kinetic Monarch with the ability to flutter its wings will be created. The community and/or school children will be provided with an insight as to how nature can create color through structure and butterfly ecology. Optical filters used in the art work will be used to create the butter wings. Sessions will be around 50min each and Skunk Control will run sessions and provide materials. Program can be undertaken at local community centres or at schools (incursions). Program is in-kind and can be undertaken pre or post installation of Tapestry. *Photo above shows a prototype only.*

### Outreach Programming in-kind (Making a Geranium that unfurls and closes its petals)



Hands-on outreach program where a kinetic Geranium flower with the ability to unfurl its petals will be created. The way color is created by nature will also be explored in a hands-on way as will transmission and reflection of light. Optical filters used in the fabrication of the geraniums will also be used. Sessions will be around 45-55 min each and Skunk Control will run sessions and provide materials. Program can be undertaken at local community centres or at schools (incursions). Program is in-kind and can be undertaken pre or post installation of Tapestry. *Photo above shows a prototype only.*

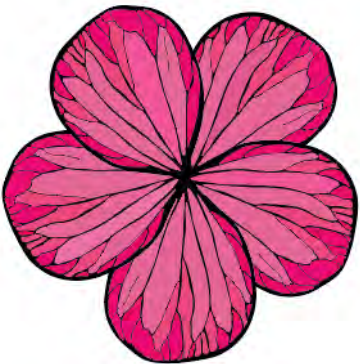
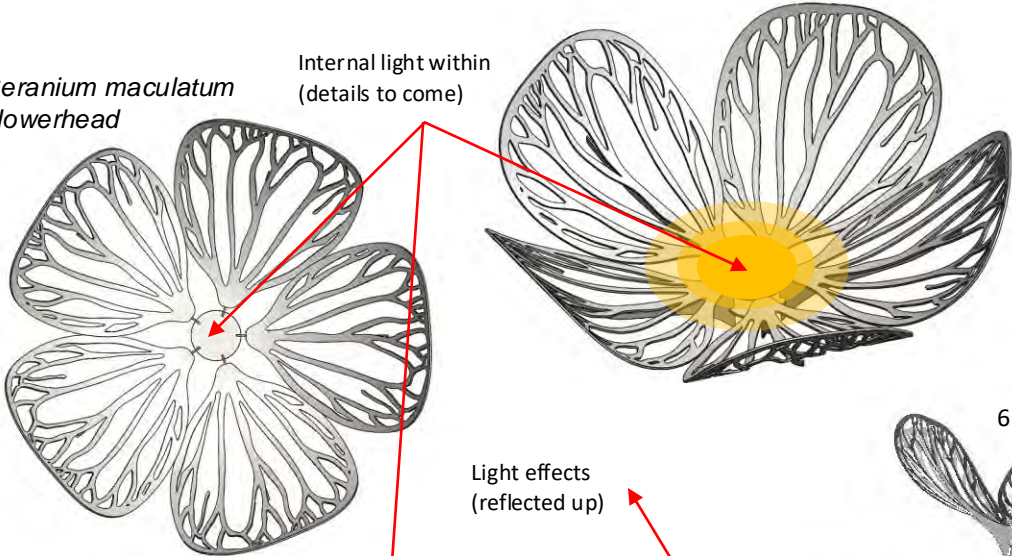




THE AVENUE (model)

*Geranium maculatum*  
Flowerhead

Internal light within  
(details to come)

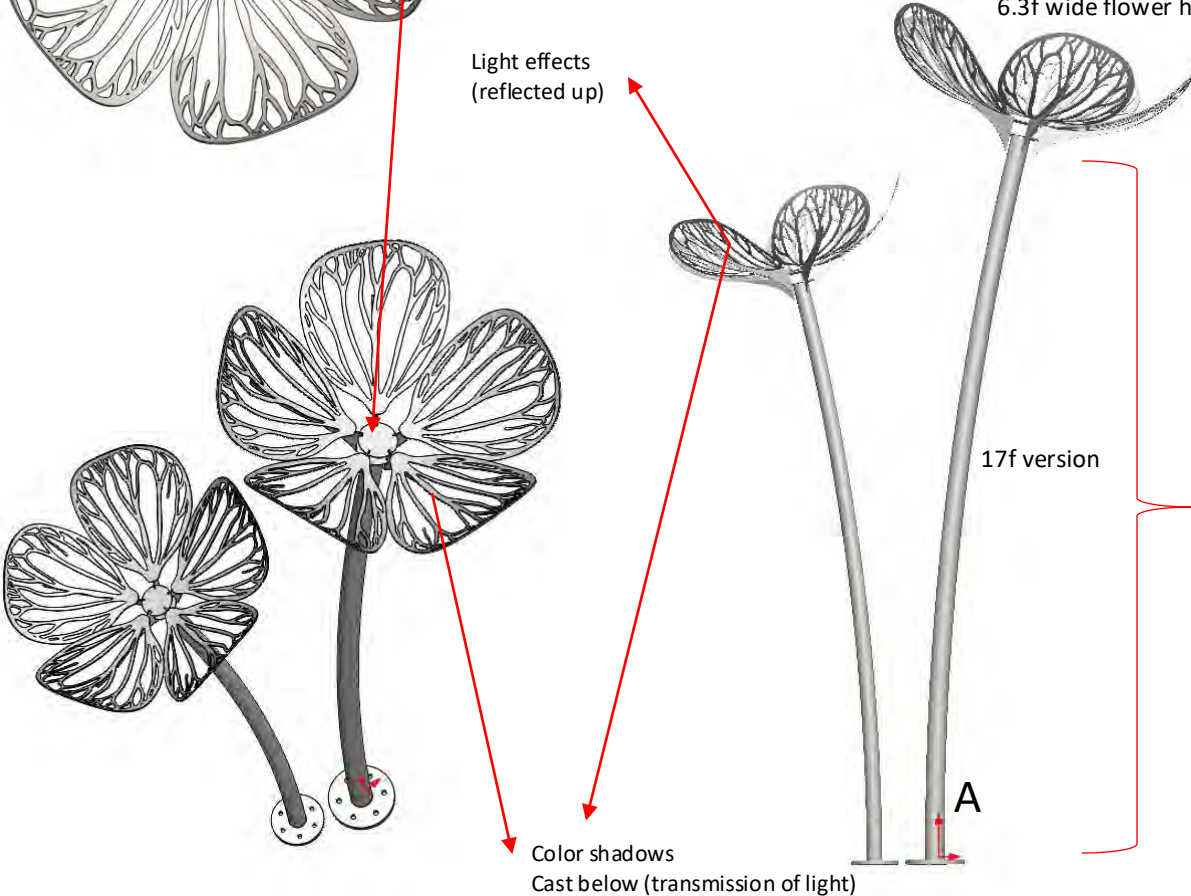


6.3f wide flower head version

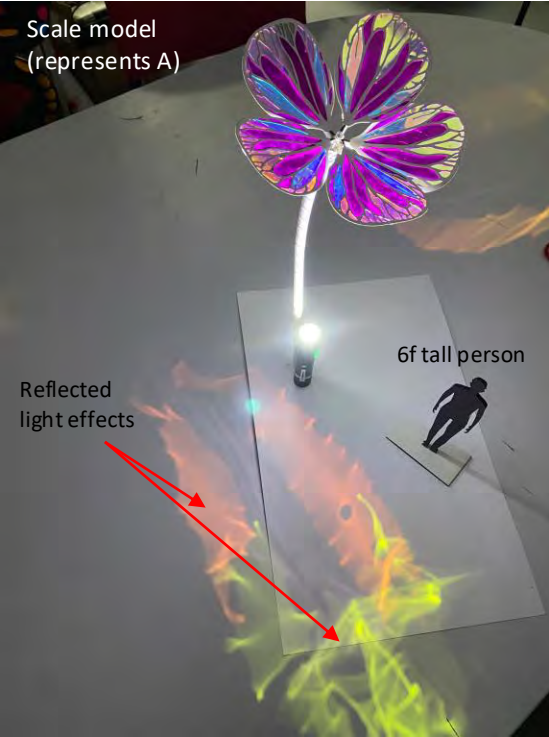


Each flowerhead will be unique  
with no two flowerheads sharing the  
same color segments

Light effects  
(reflected up)



Scale model  
(represents A)



6f tall person

Reflected  
light effects



Color shadows  
Will be very intense in  
direct sunlight  
Cast below  
(transmission of light)

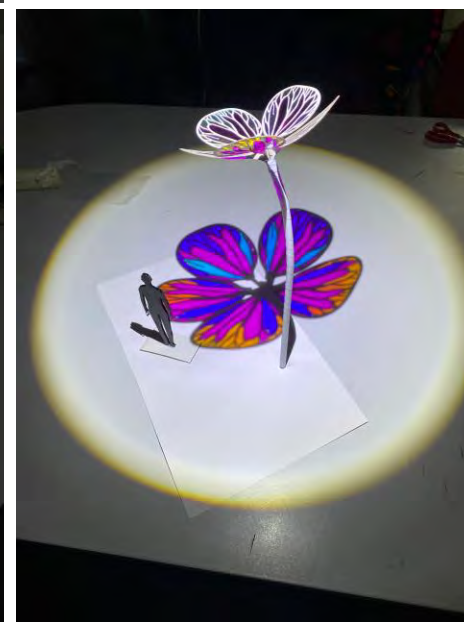
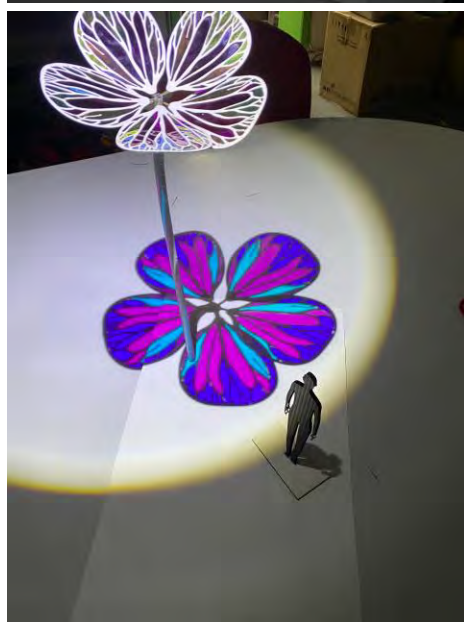
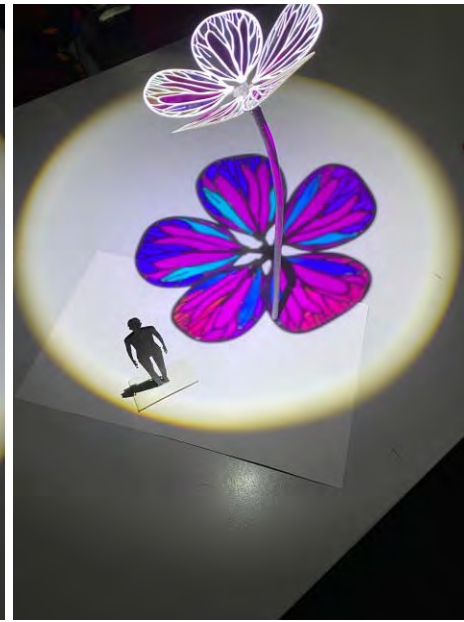


## Color shadows

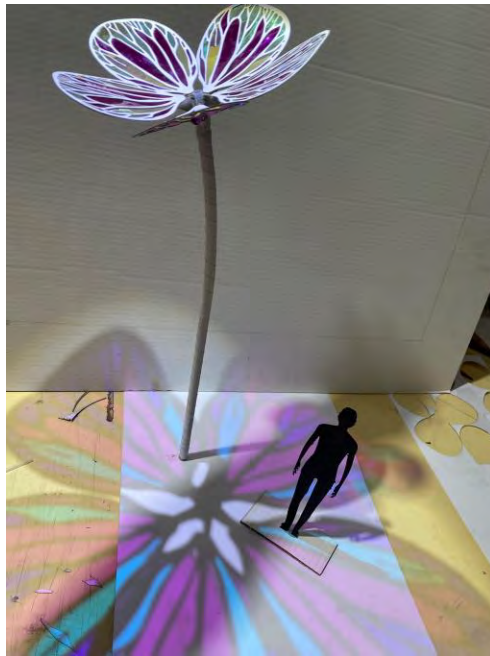
Will be very intense in direct sunlight

And will alter throughout the day, both in location and color. Video (below) and images (RHS) show changing position of color shadows.

video









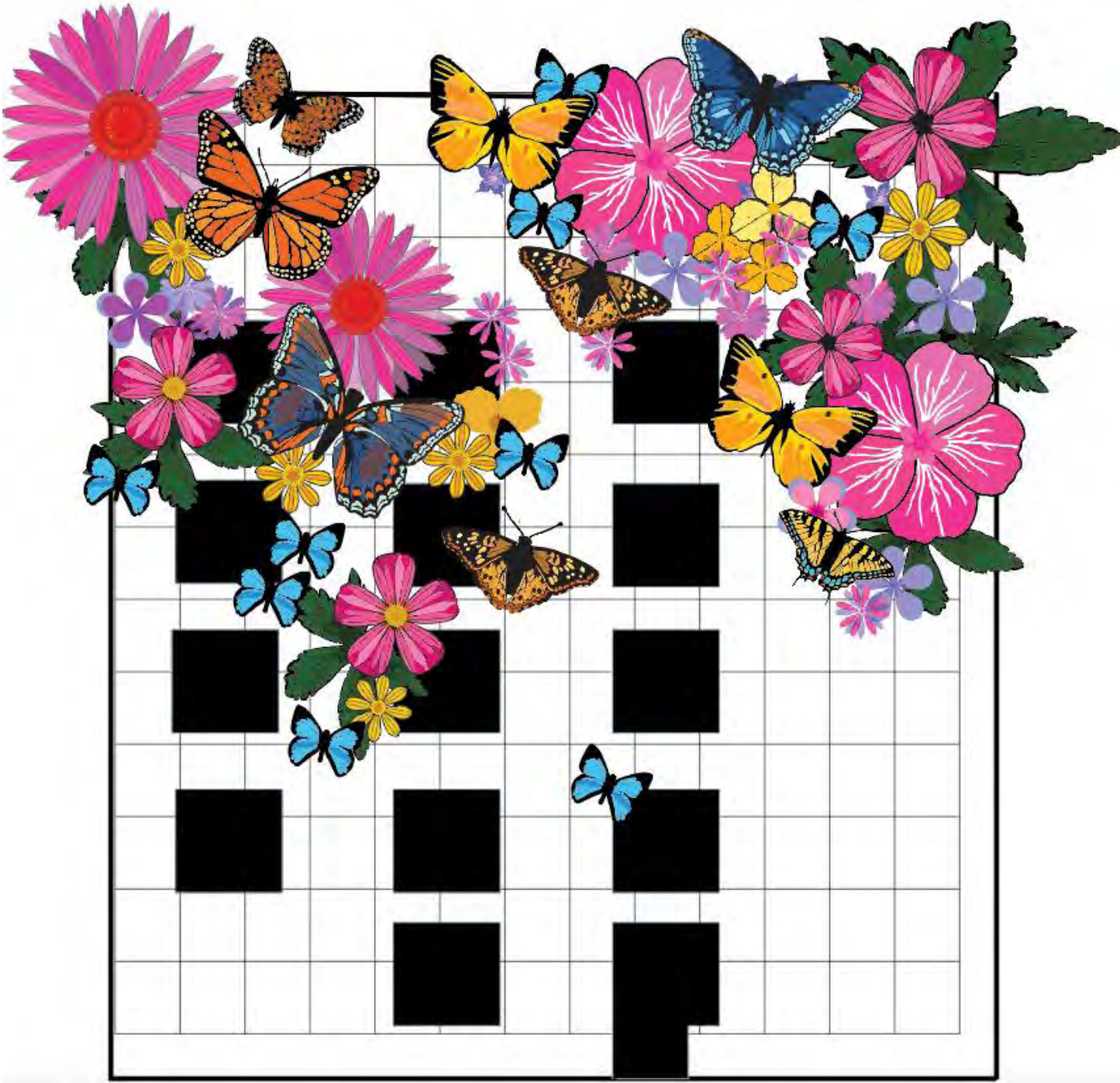
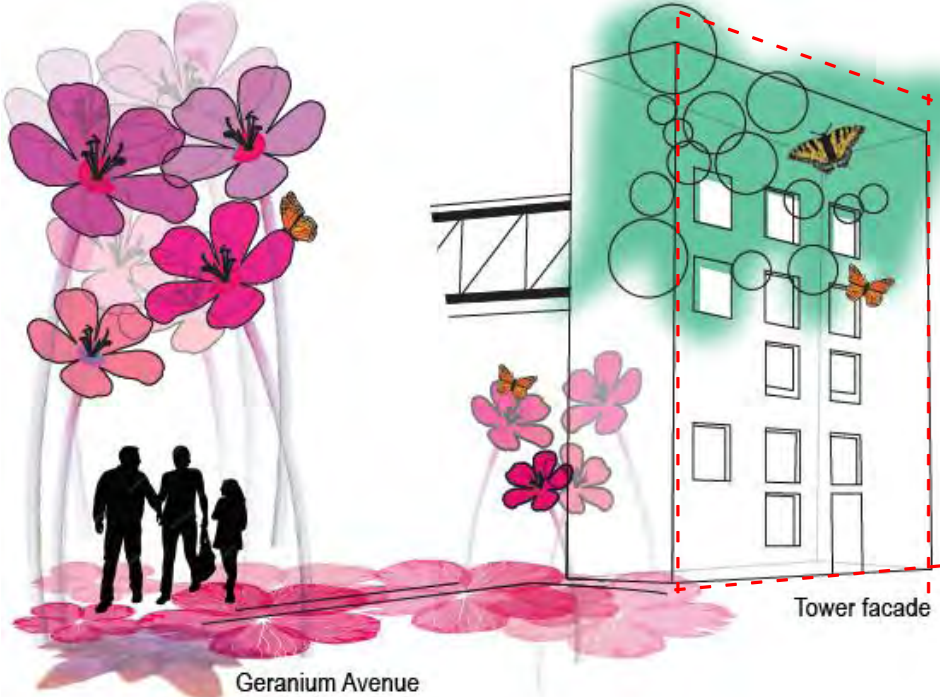
# THE TOWER FACADE



Addition of *Geranium maculatum* leaves to provide some additional color and texture. Leaves fabricated as in the case of the *Geranium maculatum* petals.

Scaled version  
-each flower and butterfly species are in proportion to each other (to maintain proportions as in nature)

Front of façade shown RHS





## Moline Public Art Commission, MetroLINK, and Quad City Arts Budget breakdown (Avenue and Façade) - Skunk Control

(creative works - Arcade of flowers and façade)

	\$US	
Artist fees	15,000	
Documentation (inc structural sign off and shop drawings)	8,000	
Prototypes development	9,000	
Production - materials and fabrication costs	210,000	
Lighting and electronics	12,000	
Transportation of aspects of works within the US	3,500	
Installation	22,000	
Insurance and contingency	20,000	
Transportation of aspects of works from overseas to US	0	in-kind
Hands-on Moline Community Outreach Programs	0	in-kind
Total	299,500	
site prep for the project (footings/power etc and other elements)	30,000	
<b>Gand Total</b>	<b>\$US</b>	<b>329,500</b>