Bell/Grand Artwork

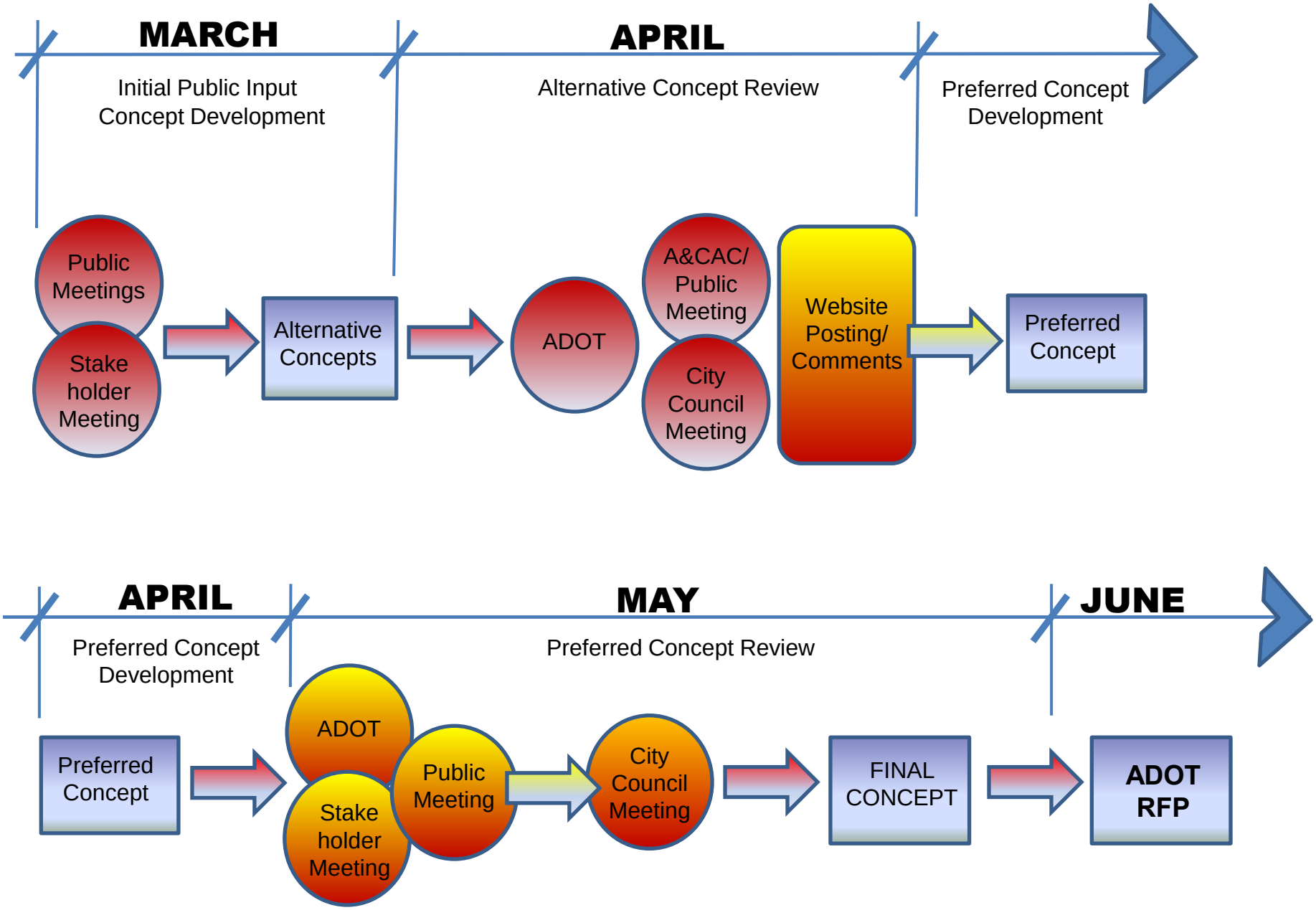
Preferred Concept

City Council Work Session

May 19, 2015

Public Works and Community Development Department

SURPRISE
ARIZONA


MARCH
APRIL
Initial Public Input
Concept Development
Alternative Concept Review
Preferred Concept
Development
Public
Meetings
Stake
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Concepts
ADOT
A&CAC/
Public
Meeting
City
Council
Meeting
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Preferred Concept
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ADOT
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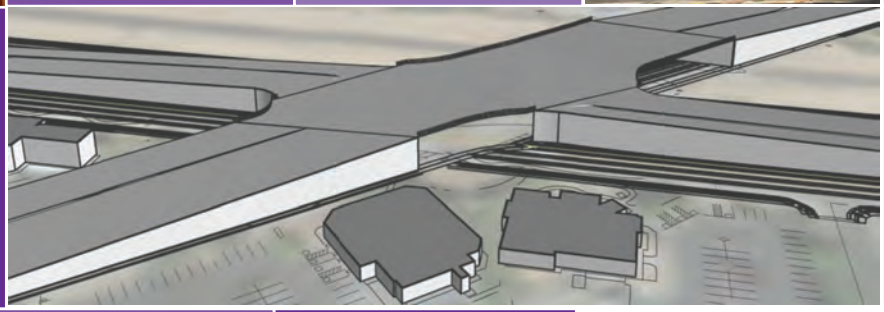
FINAL
CONCEPT
ADOT
RFP

Bell - Grand Art
Phase 1 - Concept Proposal



SURPRISE
ARIZONA

Prepared by:

Meg Saligman

HSA
Heckendorn Shiles Architects

In Association with:

Bell- Grand Art

Preferred Concept Proposal
May 2015

INTRODUCTION

Meg Saligman Studios
megsaligman.com
Meg Saligman loves local color. As a public artist whose work has a worldwide following, Saligman is a master of transforming public spaces. Using a variety of media that includes paint, light, and glass, she is known for her collaborative process and intricate designs, which bring life to new and existing architecture. Meg's projects are always site specific and collaborative by nature. All elements of her designs come directly from their surrounding environment.

Heckendorn Shiles Architects
hsarch.com
Heckendorn Shiles Architects is a studio-based, entrepreneurial firm with commitments to client-first service and diverse portfolio. Founded in 1989, HSA has strived to establish strong ties and maintain participation in the managed development of the communities served, providing both a personable and professional approach to all projects. HSA offers services in architecture, interior design and planning with a broad range of project types, sizes and budgets.

Grenald Waldron Associates
gwalighting.com
A pioneer in the practice of architectural lighting since 1968, GWA has cultivated a widely diverse client base by producing unique and technically proficient design solutions. With its skilled lighting practitioners, the practice utilizes good qualitative lighting principles that render the architectural form and enhance the environmental experience. The firm is recognized for its creative expertise, responsiveness and qualitative results. The firm has received awards for a number of significant projects throughout the world, including two Presidential Awards for Design Excellence.

Project Partners

City of Surprise
http://www.surpriseaz.gov

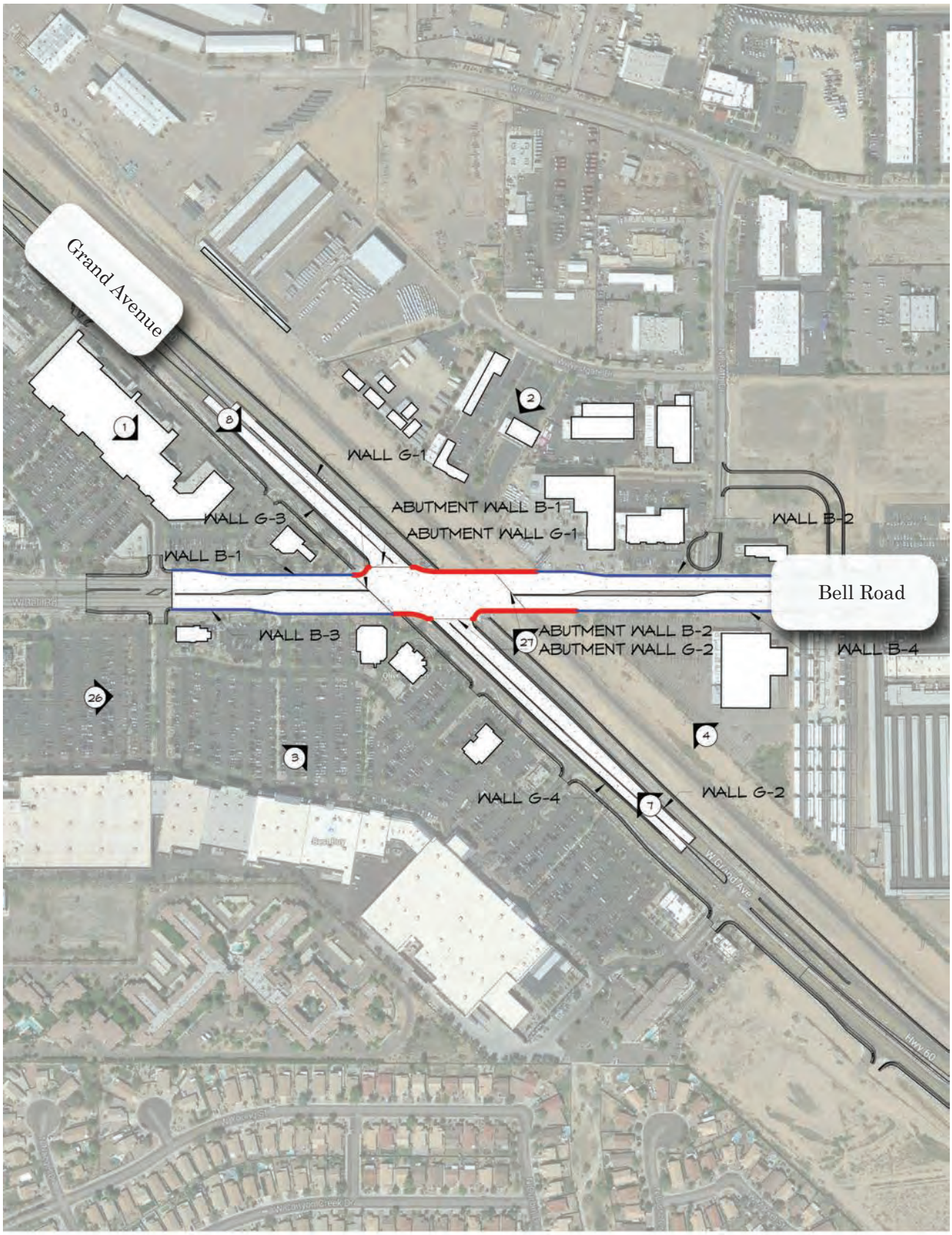
Maricopa Association of Governments (MAG)
The Maricopa Association of Governments is a Council of Governments (COG) that serves as the regional agency for the metropolitan Phoenix area.
http://www.azmag.gov

Arizona Department of Transportation (ADOT)
The Arizona Department of Transportation is a multimodal transportation agency serving one of the fastest-growing areas of the country. ADOT is responsible for planning, building and operating a complex highway system in addition to building and maintaining bridges and the Grand Canyon Airport.
http://azdot.gov

Project Goals
Three main goals were established in order to guide development of the Bell - Grand Art Concept proposal.

- The art will create a gateway landmark and a sense that you have arrived in the City of Surprise.
- This project will lead the way in distinguishing the Grand Avenue corridor, serving as a unique example of place-making and creative development.
- This project will result in a world-class work of art that evokes the "soul" of the City of Surprise, a young city establishing its identity.
- These goals will be referred to throughout the design and implementation process to ensure that the proposed project is appropriate.

SITE MAP



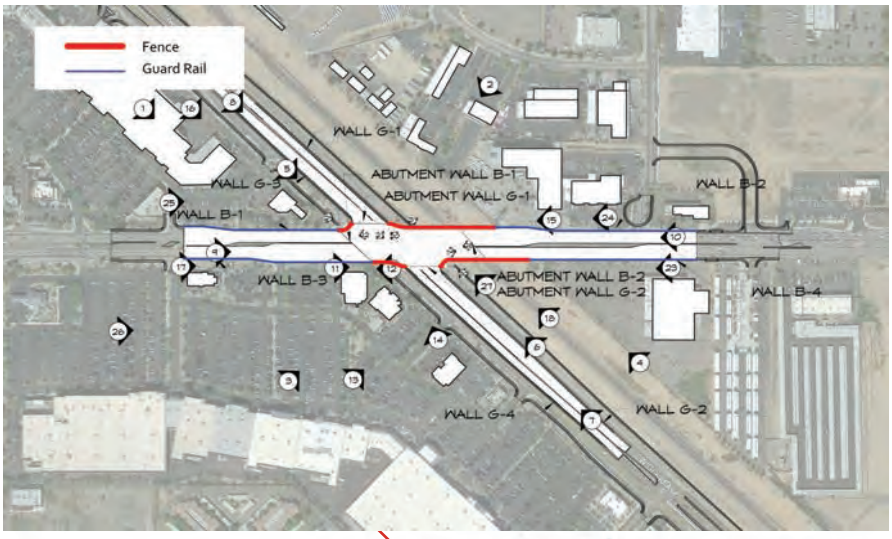
Scale: 1" = 400' - 0"

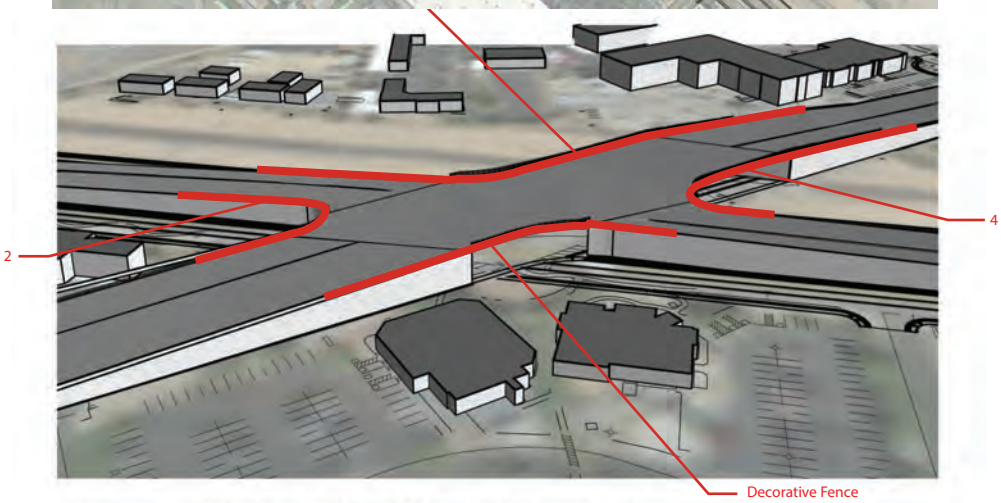
Meg Saligman

HSA Heckendorn Shiles Architects

PROPOSED LOCATION

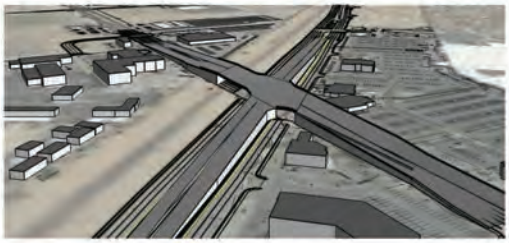
Fence:



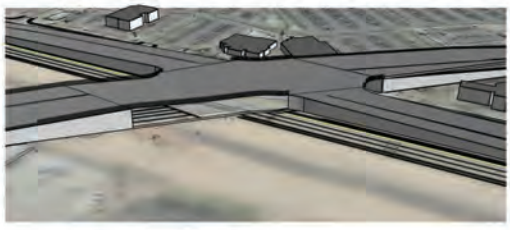


INTERSECTION AERIAL B-3, G-4

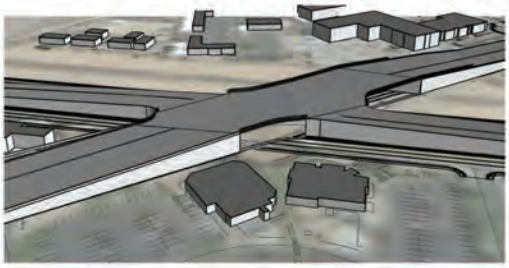
Side Walls:



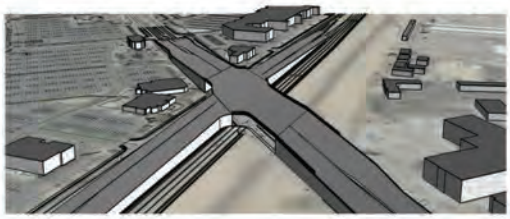
1 INTERSECTION AERIAL B-1, G-3



2 INTERSECTION AERIAL B-2, G- 1



3 INTERSECTION AERIAL B-3, G-4



4 INTERSECTION AERIAL B-4, G-2

PUBLIC PROCESS

Gathering public input is an important step in any design process. In addition to a public survey and multiple presentations, the project has been reviewed by the Arizona Department of Transportation and the City of Surprise during the preliminary planning stages. In April 2015, three concepts were presented for feedback to the Arts and Cultural Advisory Committee, City of Surprise City Council, ADOT and the general public. The preferred concept presented in this document incorporates their input and comments.

MLS will continue to invite the public to collaborate in all stages of the design and construction process, including the fabrication phase. As an example, citizens will be able to contribute images they have made in art workshops (see caption) for the painted portions of the art.

The following are a few of the comments that were received as a result of this public survey:

- “I hope the project helps bring people in Surprise together in ways they have never experienced. Building “community.”
- “This needs to be UNIQUE, SPECIAL, a DESTINATION. Gives Surprise an awesome image that makes people want to come here”
- “Art should be visible from all points, but should be simple.”
- “Progressive, modern, growing, sustainable”
- “Regional leader in the Arts. Corp HQ’s from all over the country. Preserving and respecting the natural environment.”
- “I can’t wait! I hope someday to catch a train in Surprise- go to PHX or Las Vegas!”

These solargram images are made by placing objects on light - sensitive paper and exposing it to the sun. The simple and magical process quickly delights people of all ages and abilities. MLS will invite the public to create solargrams of local plants and objects that will be incorporated in the artwork.

PREFERRED CONCEPT

Agave
After shedding generations of leaves shortly before the end of its life, an agave goes out with a bang in a spectacular array of flowers. The older leaves print their impressions on the younger leaves as they peel away from the plant's core. Just as the agave flower is the result of the collective efforts of its parts, both old and young, the City of Surprise accomplishes amazing feats, more than what would be possible by an individual, through the cooperation of its citizens - more than what would be possible by an individual.

The agave plant will be used a point of reference for the design—weaving together a diversity of images and sculptural forms used to represent the community of Surprise.

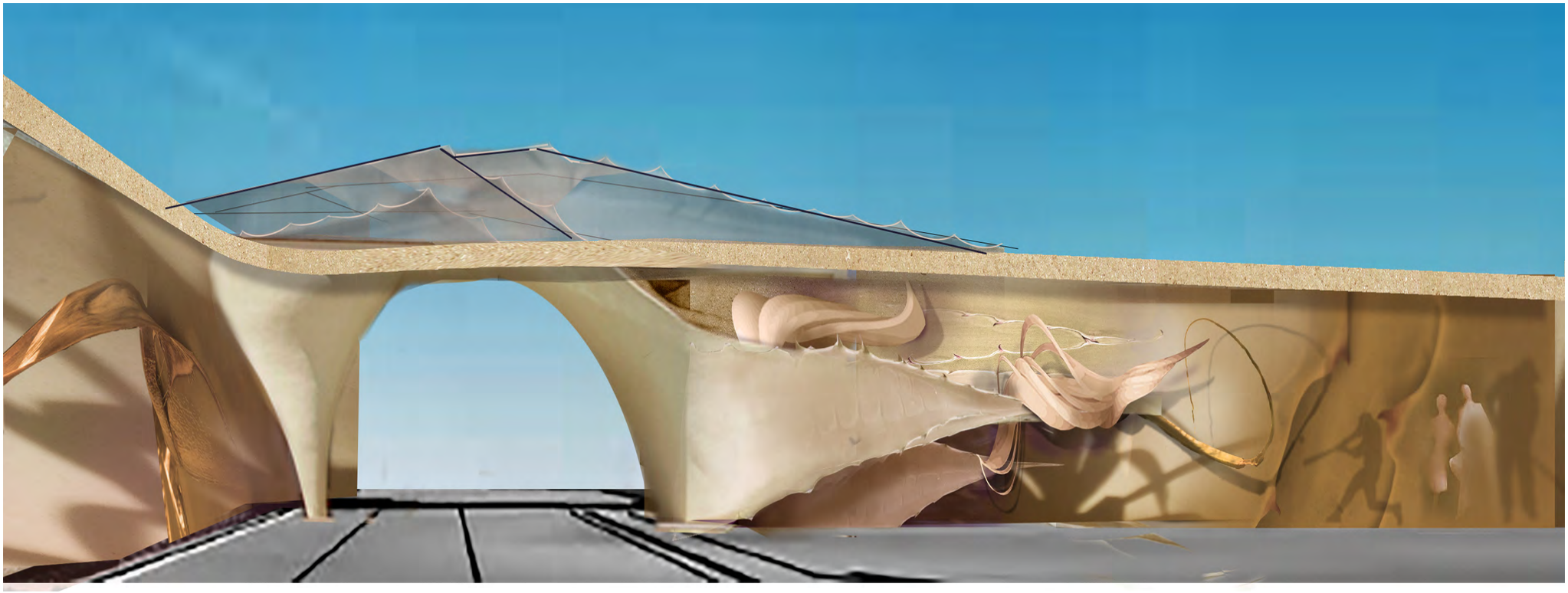
Community Impressions

SURPRISE
ARIZONA

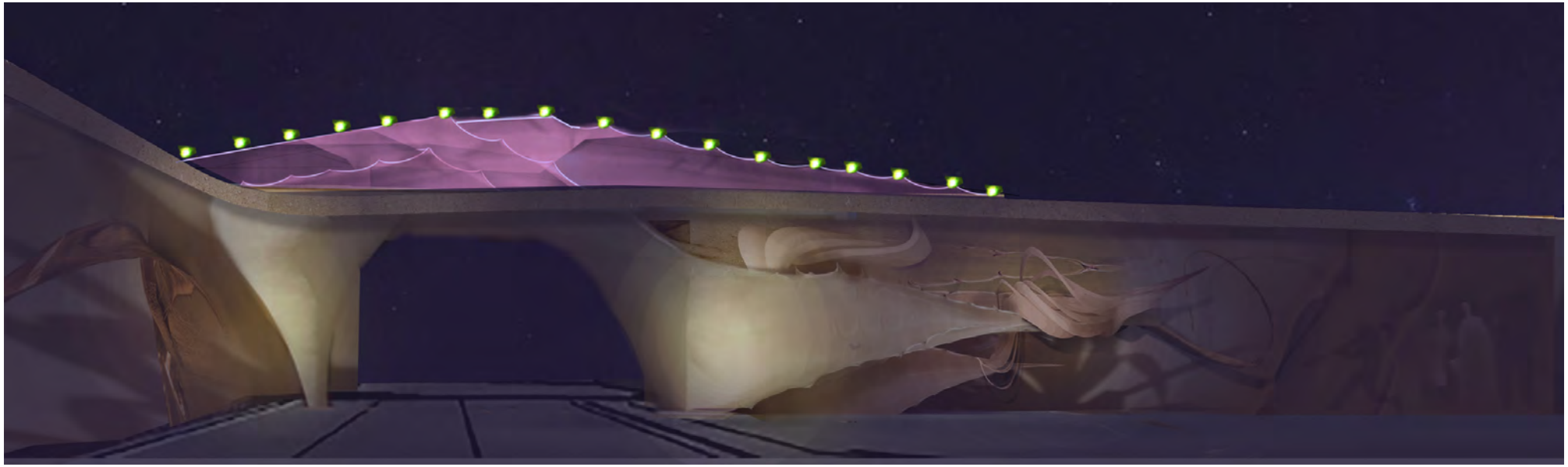
- **Solargrams**
  - Created by the Public
  - Local Plants and Objects
  - Past, Present, and Future

"… weaving together a diversity of images and sculptural forms that represent the Community of Surprise."

Agave Bridge - Daytime View



Agave Bridge - Nightime View



DESIGN ELEMENTS

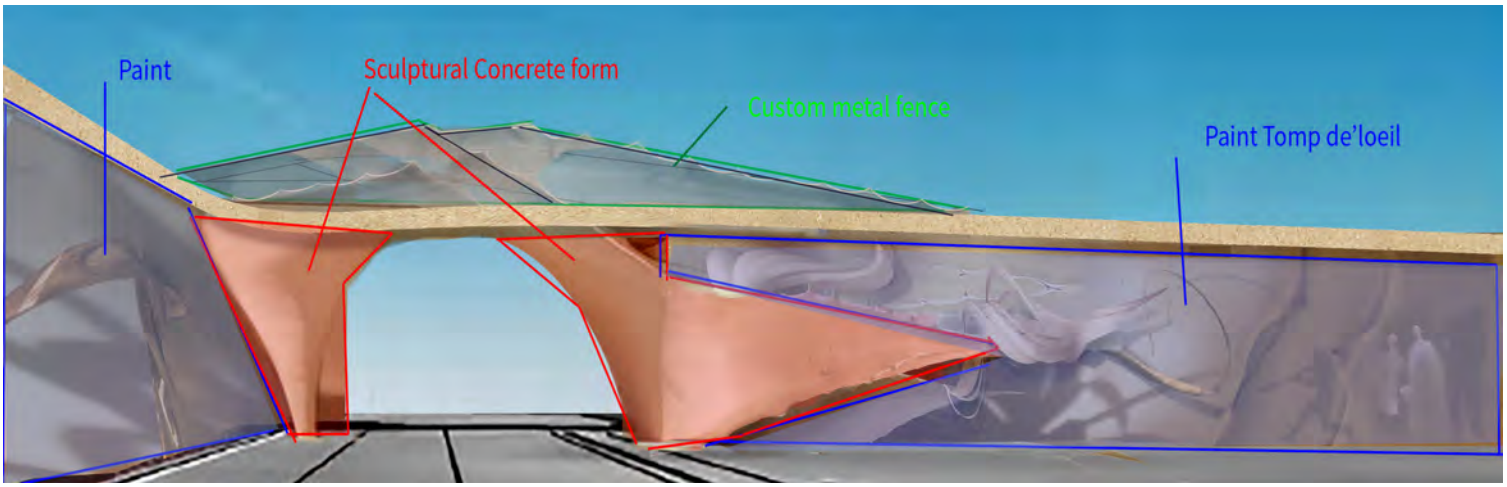
The elements of the art will strive to bend the expected and hard geometry of a highway overpass. Elements will flow between the planes of the bridge abutments, ramp walls, fencing and pedestrian walkways to create something unexpected and marking the arrival to a special place. The focus of the art will change, offering different views and imagery depending on what direction one is traveling. Images and textures will be rich, offering something new with each trip. At night these elements will be transformed into another experience with the magic of lighting.

Concrete
- Using formed concrete, large sculptural elements will soften corners and push out from the plane of key walls at the central portions (largest walls) of the intersection. These elements will be approximately 30'H and over 100' in length.

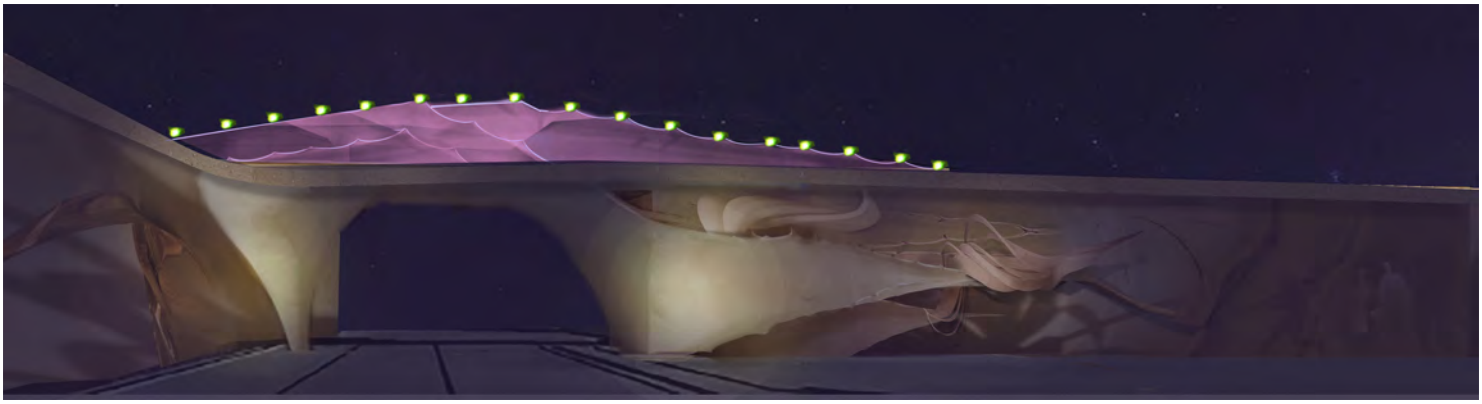
Mural
- Large-scale mural painting will heighten the effect begun by the concrete form of Agave leaf shapes. The actual design will continue to be developed as the artist collects images and ideas from the community.

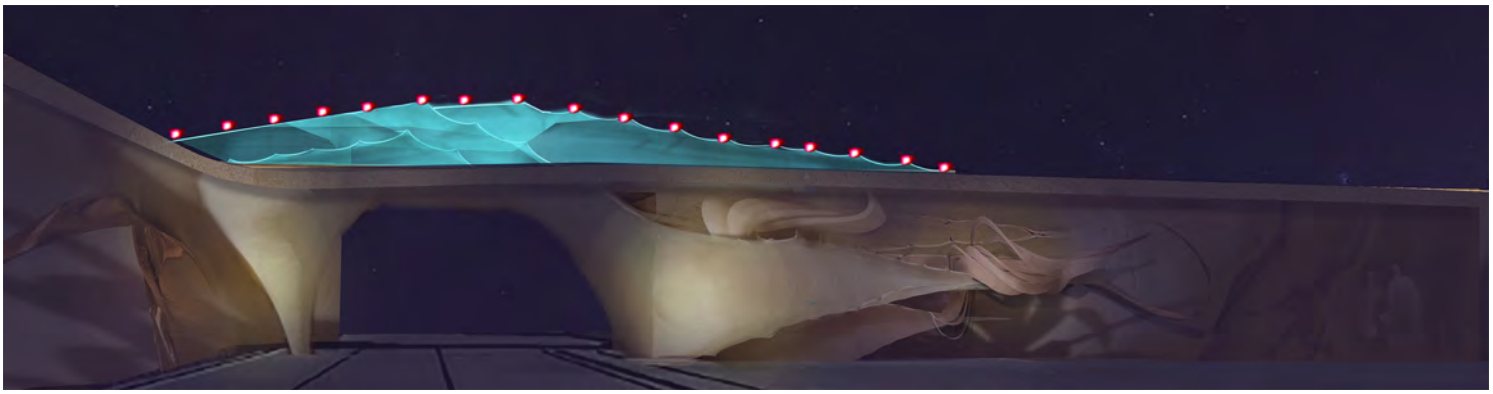
Sculptural Fencing
- Multiple fencing materials will be layered to echo the agave design begun in the mural and concrete below. This fence will give one experience to pedestrians and drivers along Bell while heightening the gateway for travelers passing underneath on Grand.

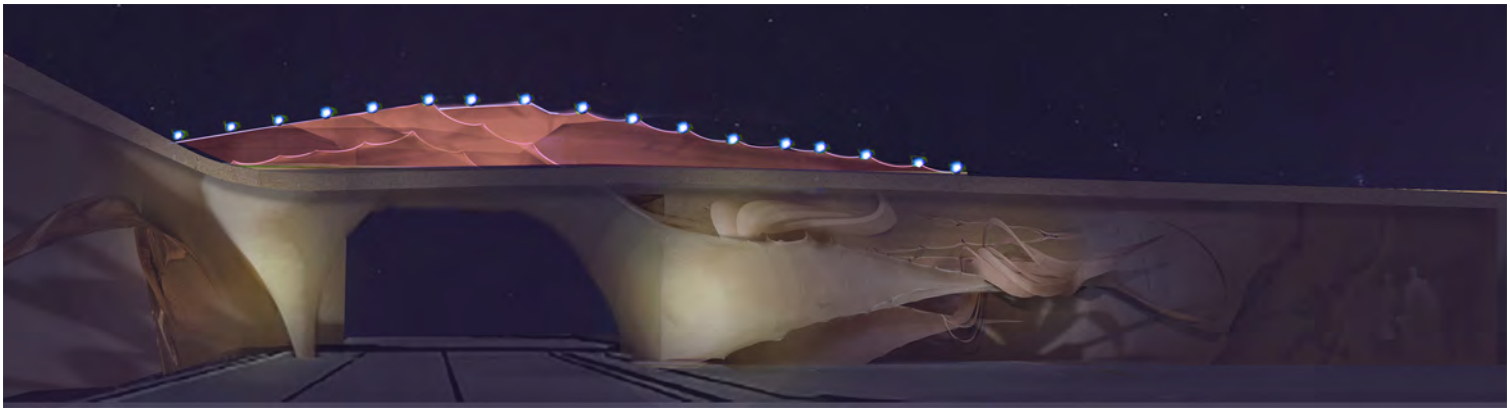
Lighting
- Lighting will be designed to create an engaging user experience with the art at night. Being developed for consideration are design treatments which will accentuate the art piece while addressing the illumination of the intersecting roadways, so that the prescribed light solutions will complement one another. The goal will be to reinforce the daytime experience of the bridge when seen at night and to transform its perception as a sculptural form.



Nightime view - color changing lights on fence
designed from the colors of Surprise's sunset and sunrise.







Proposed Design

Before

Proposed Design

Before

LOCATION SQUARE FOOTAGE RECOMMENDATION

A table of locations and their square footage is provided in Appendix 2.

MATERIALS

Paint
Due to the harsh conditions of the Arizona climate, we propose the use of KEIM Royalan. KEIM coatings and stains are based on a silicate water-glass binder system as opposed to acrylic and resin paint binders which form an adhesive film over the surface. KEIM is different. Combined with the finest inorganic (mineral) pigments and KEIM's silicate technology, KEIM finishes penetrate and chemically react with the mineral substrate you apply them to creating permanent covalent bonds. These chemical bonds are the same kind of bonds that hold brick together.

The most discussed reasons artists use KEIM are longevity, color fastness, inability to peel or blister, clean surfaces, and a natural appearance without glare of the flat matte sheen. KEIM's inorganic mineral pigments will never fade, even after decades of high ultraviolet exposure. Dirt and pollution are not attracted to KEIM's silicate finishes so the rains are generally enough to keep surfaces clean. And their flat matte natural mineral appearance means your work will complement mineral surfaces such as concrete, stucco, masonry, brick, stone, terra cotta, even CMU block.

KEIM patented its silicate finish technology and established its presence in the art world in 1878 where their silicate finishes were used to replicate the frescos of Italy. Silicate finishes proved durable against severe weathering, so durable that many of the German and Swiss decorated façades appear exactly as they did 125 years ago. Keim products were used on the Indian Bend Road Bridge in Scottsdale.

Concrete
In preliminary discussions with a structural engineer, MLS has identified two best options to construct the agave forms in concrete:

Cast-In-Place – The design-build firm would have two options – pouring the walls in place with formliners provided by MLS or constructing the structural wall with attachment provisions for the Agave forms and installing them.

Precast – In this scenario, the structural wall could be MSE or cast-in-place concrete. The Agave forms would be separate precast sections, anchored to the MSE panels. Precast typically provides better quality control and can be less costly than cast-in-place.

In either case, MLS would want to coordinate control joints, panel sizes and/or the placement of anchors with the wall behind. The desire would be to achieve the deepest relief patterns. More information is provided in Appendix I.

Another detail will include a design stamped into the concrete guard along the pedestrian walkway that will enhance the transition to the fence.

Fencing
The use of metal mesh will offer an opportunity to transition the design from solid concrete to the open air. Through a combination of curving structural supports and layering of different sections of metal mesh, a normally flat fence will become an elegant sculptural form that meets the requirement for safety. Furthermore, the woven metal will create a play of sunlight patterns changing with the time of day as well as a canvas for dramatic lighting at night. At a couple intervals, the fence will turn to provide a canopy that offers shade for people walking across. Information on fencing materials is provided in Appendix 4.

Light

A comprehensive light and control system will be designed and specified by Grenald Waldron Associates, an architectural lighting design firm which has extensive experience with the illumination of architectural spaces and unique structures, such as bridges, with dramatic effect. Being developed for consideration is a layering of design solutions which will meet the ADOT illumination standards for roadway lighting while utilizing a luminaire system which can enhance vehicular safety and not detract from the nighttime expression of the art-piece.

A blending of basic layered techniques that use LED luminaires rated to operate from 50,000 to +75,000 hours is to be utilized:

A) Provide a controlled sharp cut-off LED up-light graze of the fence from points along the outside of the pedestrian railing. These lights will be the key lighting of the fence as viewed from the surrounding community.

B) Incorporate LED linear accents within sections of the fence design to possibly articulate portions of the leaf pattern of the fence.

C) Use a horizontal shallow wash-light directed down towards the fence forms from the roadway side, with LED fill-light from pole mounted twin-head cut-off luminaires and/or supplemental floodlights. This lighting treatment is to give added dimension to the impression of the fence form for the view from afar while also expressing the fence for people in their cars.

D) Equally important is to address the illumination of select abutments to provide a visual base to support the art piece.

Color, intensity and distribution are key tools to render any environment.

• COLOR: While the surrounding roadway areas are lighted with the orange tonality of spectrum-limiting High Pressure Sodium roadway light sources, the benefit of working with LED technology allows for standard high color-rendering sources. Research has shown sources with a high CRI provide better visual acuity. LED warm white or white sources in the 3000 to 4000 range would allow the bridge treatment to be a focal point. Some LED sources also offer a tunable color temperature selection which could be programmed to operate in a range from very warm to very cool. Additionally, LED sources can offer the ability to color mix the primary colors of red, green and blue to provide an almost infinite array of color.

• INTENSITY: LED digital technology allows the specifier to individually address the data signal to each point or segment of light, to control its intensity and to tell it to turn on or off. This control ability allows the designer to literally paint with light.

• DISTRIBUTION: Because the LED diodes are small and highly efficacious, luminaires can now be fabricated as compact linear fixtures or light nodes which can direct light in a highly sophisticated manner at a low wattage, for a long life and with high lumen output. And, their presence during the day can be minimized.

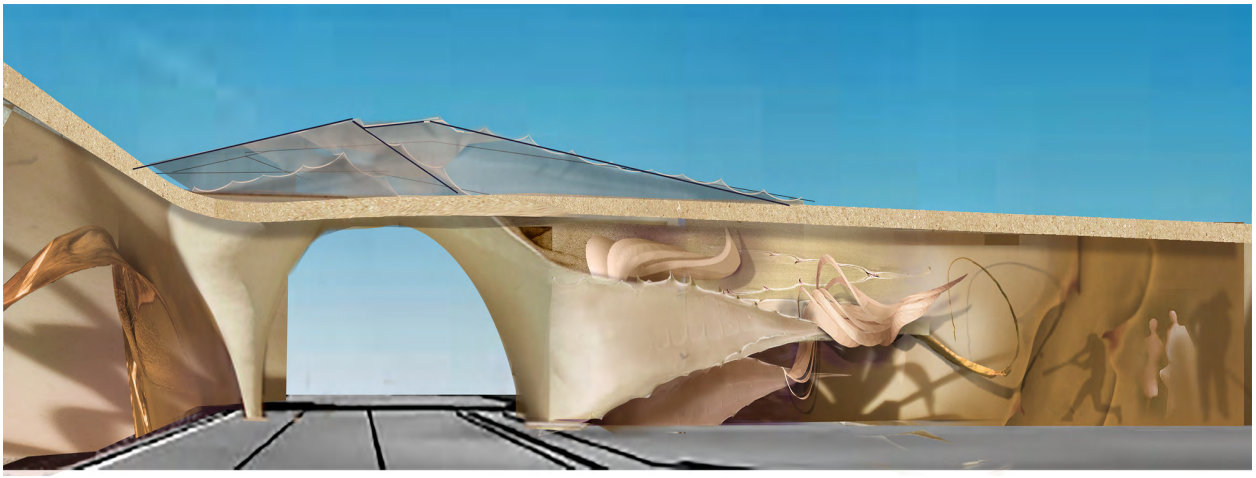
All LED sources have digitally addressable technology which offers programmable control of each luminare. Lighting therefore can operate at different levels of intensity at different times of the night. It can also let the lighting techniques operate in a sequence of settings which can transform the visual expression of the fence through the available lighting tools that are used to render its form. These “shows” can occur at specific times or on specific days or for specific events. The goal is to increase the experience of the bridge at night and establish it as a distinct focal point for the community

BUDGETARY INFORMATION

Preliminary Budget
These cost estimates are a rough order of magnitude based on standard costs per square foot for the fabrication and installation of the art elements. What is not represented is the difference of these estimates over the base project (i.e. cost of MLS designed fence versus the standard fence), as those numbers are unknown at this time. These costs will be refined as the bidding process for the overall project has been concluded by ADOT and design development can continue.

These numbers are intended to give a magnitude of scope and not intended as final budget numbers. A detail breakdown of the lighting costs provide by GWA is provided in Appendix 3.

Design Element	Material	Cost/sf	Location	sf	Total
Mural	Keim Royalan	$20	25% Walls	21,785	$435,700
Concrete- Cast in Place	Forms/ formaliners	$26	abutment corners	24,000	$624,000
Concrete- Architectural panels	Formliners	$50	Side Walls	1,800	$90,000
Concrete- Stamped	Formliners	$7	Concrete guard - inside	1,600	$11,200
Fencing	Metal	$35	Overpass	10,800	$378,000
Lighting	LED Luminaires	See Lighting Budget	See Lighting Budget Detail	See Lighting Budget Detail	$546,000
				59,985	$2,084,900



NEXT STEPS

1. Pre-Bid Meeting with design-bid firms – in order to assure that bidders clearly understand the requirements and coordination needs for a successful art installation; MLS requests that a mandatory pre-bid meeting focusing on the art be a part of the bid process.

2. Design Development/Documentation – with the approach of constructing the bridge through design-build, it is difficult for design development and documentation for the art to be finalized at this time. Additional planning, project coordination, possible design modifications, engineering and design specifications will need to be done in coordination with the chosen bidder.

The proposed scope would include
- Finalize Art Design (in conjunction with actual bridge design)
- Design Phase Approval by City of Surprise, ADOT
- Finalize Fence Material & Concrete form/finish
- Structural Engineering review of art additions
- Complete Material Specifications
- Complete Architectural Dimension Layout Drawings
- Complete Lighting Drawings (with fixture selection, layout and photometrics)

MLS requests to submit a fee proposal for this work.

RESPONSIBILITY MATRIX

The success of the art is dependent on communication, cooperation and coordination with the entire project team involved in the next phases of development. For discussion purposes, MLS studio is providing a matrix that outlines the roles and responsibilities of MLS in relation to the other partners.

BELL - GRAND ART INSTALLATION

Updated 2015-05-11

RESPONSIBILITY MATRIX

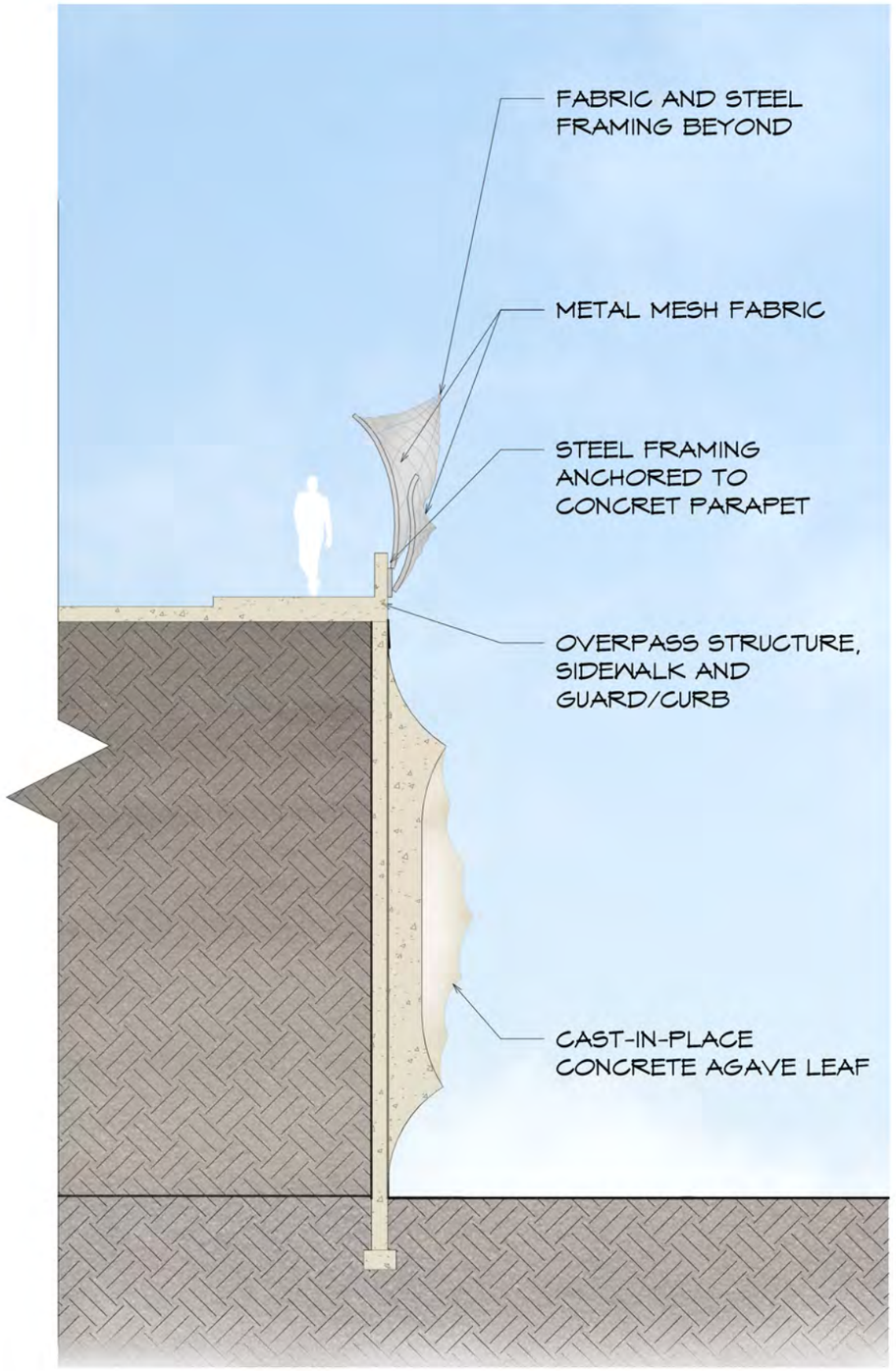
				Meg Saligman Studio Team				
			ADOT	Meg Saligman	Heckendorn Shiles Architects	Lighting Designer	Design Build Firm	Remarks
Overall Design & Documentation								
		Overpass Retaining Wall and Abutment Wall Elevations/Design	X					
		RFP Development & Distribution	X	X (Art Coord Req's)				Meg Saligman Studio Team to provide coordination materials/requirements to ADOT for inclusion in the RFP.
		Pre-Bid Meeting	X	X				Meg Saligman Studio Team Representative to attend Pre-Bid Design Build meeting to discuss Art Coordination Requirements.
		Art Design Presentations		X				ADOT & Surprise Art "Sign-off" anticipated for May 13th
1. Pedestrian Fencing								
	1A	Dimensional Layout Drawings (Elevations and Sections), Material Selections (Specifications)			X			
	1B	Review and Approval of Dimensional Layout Drawings	X					
	1C	Structural Engineering (of ART) for Fencing and Attachment to Retaining Walls		X				Provided by Structural Engineering Consultant to be selected.
	1D	Preparation of Shop Drawings, Product Submittals					X	

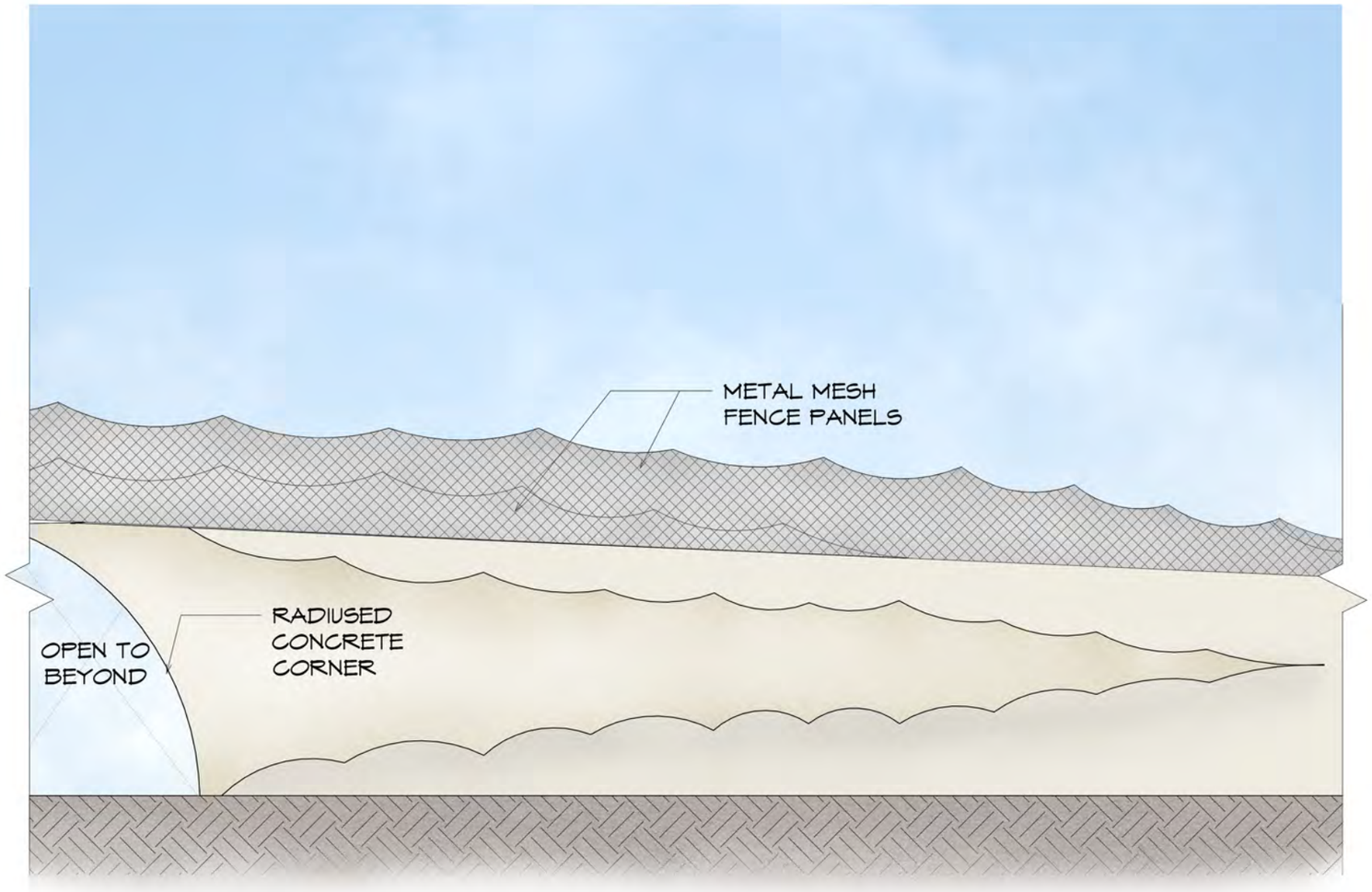
	1E	Approval of Shop Drawings (for Fencing Materials and Layout)		X	X				
	1F	Fabrication and Installation of Fencing; Construction					X		
	1G	Construction Cost		X (increase over standard)			X (base ADOT standard)		Design-Build Contractors to provide specific cost allowance for ADOT Standard Fence in their proposal. Following completion of Fence Design Documents by Meg Saligman Studio Team, Design-Build Contractor to provide proposed cost for Fence as designed and documented.
2. Lighting									
	2A	Lighting Design & Documentation (Fixture Selection & Photometrics)				X			
	2B	Review and Approval of Fixture Selection & Photometrics	X						
	2C	Electrical Engineering Design & Documentation					X		
	2D	Preparation of Submittals					X		
	2E	Review and Approval of Submittals				X			
	2F	Procure Fixtures, Installation; Construction					X		
	2G	Construction Cost		X (increase over standard)			X (base ADOT standard)		Design-Build Contractors to provide specific cost allowance for ADOT Lighting in their proposal. Following completion of Lighting Design Documents by Meg Saligman Studio Team, Design-Build Contractor to provide proposed cost for Lighting as designed and documented.
3. Concrete									
	3A	Dimensional Layout Drawings of Concrete Rustication/Relief Design			X				
	3B	Review and Approval of Dimensional Layout Drawings	X						
	3C	Engineering of Concrete Forms		X					Provided by Structural Engineering Consultant to be selected.
	3D	Preparation of Submittals & Shop Drawings					X		

	3E	Review and Approval of Submittals			X		X					
	3F	Fabricate Forms; Construction								X		
	3G	Construction Cost			X (increase over standard)					X (base ADOT standard)		Design-Build Contractors to provide specific cost allowance for ADOT Standard Retaining Wall requirements in their proposal. Following completion of Concrete Design Documents by Meg Saligman Studio Team, Design-Build Contractor to provide proposed cost for Concrete as designed.
4. Paint												
	4A	Paint, Scaffold/Lift, etc.			X							MSS to provide all set-up/install requirements.

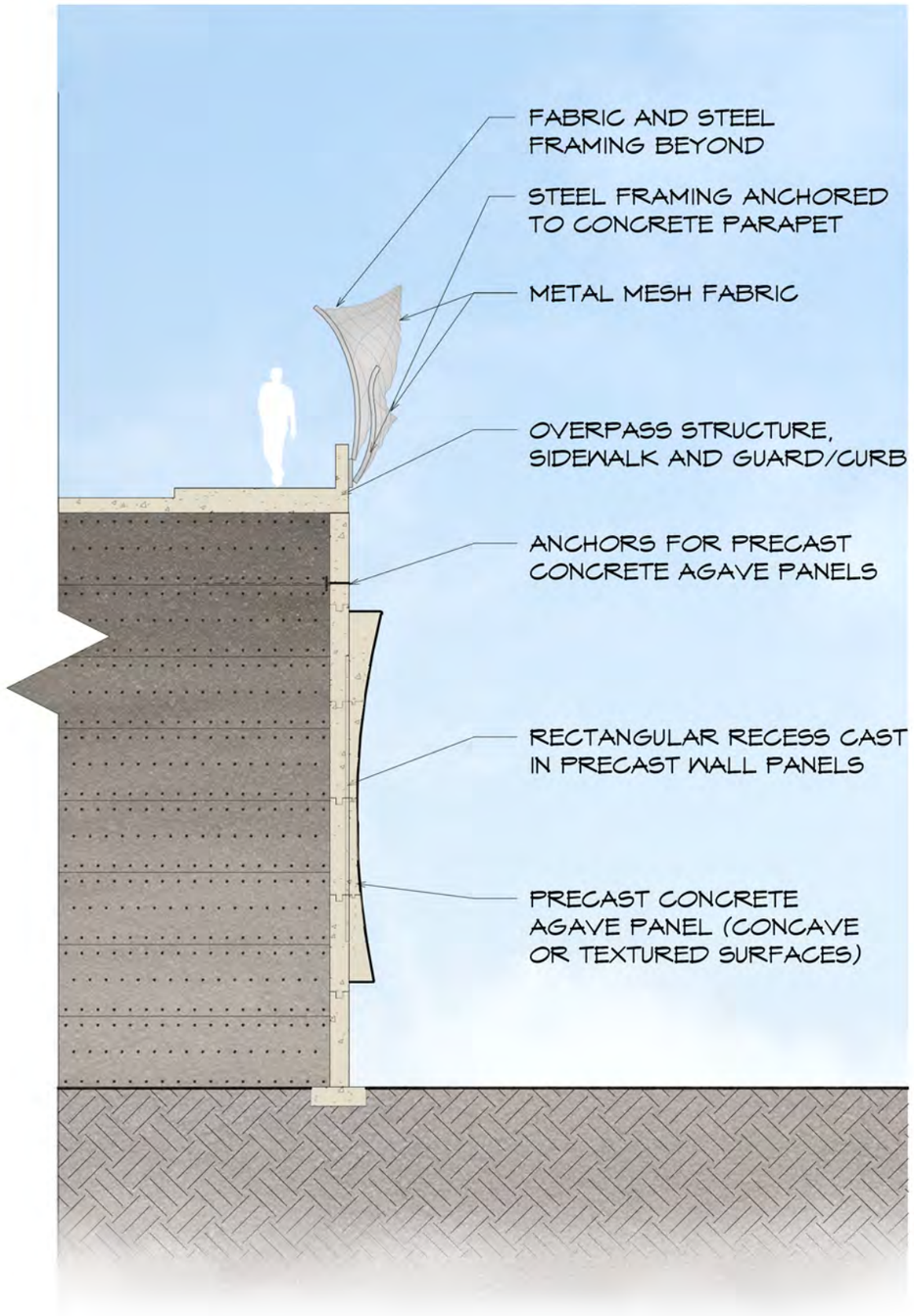
APPENDIX

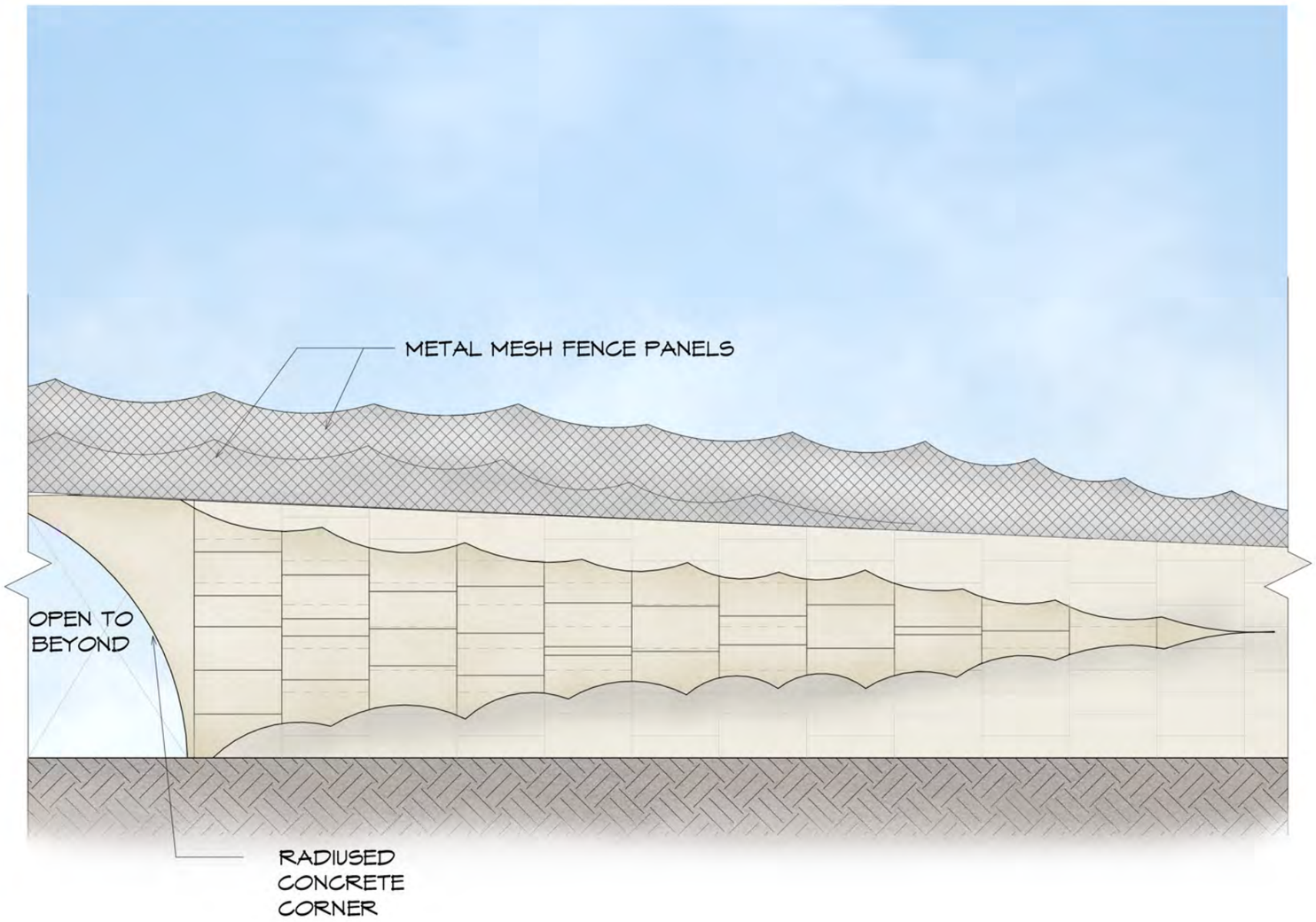
1. Concrete Construction Options
2. Location Square Footage Recommendations
3. Lighting Budget Details
4. Fencing Materials and Construction





OPTION 1 - CAST IN PLACE CONCRETE





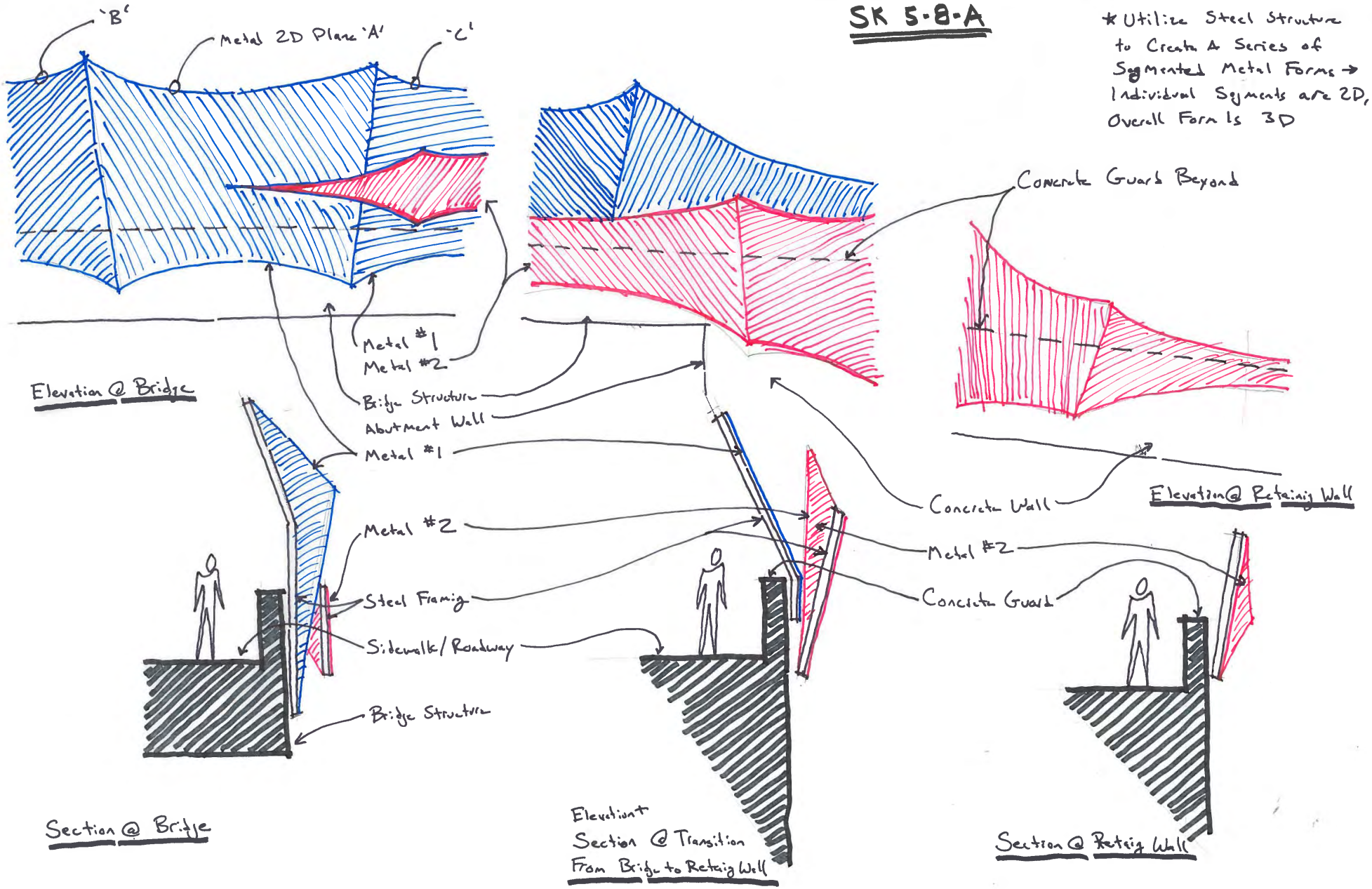
OPTION 2 - MSE PANELS

LOCATION SQUARE FOOTAGE RECOMMENDATIONS

Side Walls		Plan Ref.	Square Footage (ft^2)	Art Area % (ft2)	Art Area (ft2)
	Grand East				
		G-1	7,050	25%	1,763
		G-2	8,150	25%	2,038
		Subtotal:	15,200		3,800
	Grand West				
		G-3	4,920	25%	1,230
		G-4	10,600	25%	2,650
		Subtotal:	15,520		3,880
	Bell North				
		B-1	7,340	25%	1,835
		B-2	13,570	25%	3,393
		Subtotal:	20,910		5,228
	Bell South				
		B-3	10,640	25%	2,660
		B-4	11,850	25%	2,963
		Subtotal:	22,490		5,623
		Total:	74,120		18,530
Abutment Walls		**Plan Ref.**	**Square Footage (ft^2)**		
		G-1	2,310	25%	578
		G-2	2890	25%	723
		B-1	3710	25%	928
		B-2	4110	25%	1,028
		Total:	13,020		3,255
Fence	**Plan Ref.**	**Linear (ft)**	**Square Feet @ 10' - 0"**		
	F-1	59	590	125%	738
	F-2	114	1140	125%	1,425
	F-3	371	3710	125%	4,638
	F-4	320	3200	125%	4,000
	Total:	864	8640		10,800
Location Totals	Walls		74,120		18,530
	Abutment Walls		13,020		3,255
	Fence		8640		10,800
	Total Area		95,780		32,585

LIGHTING BUDGET DETAIL

Lighting Budget detail				
Technique	**QTY**	**Unit Estimate**	**Extended Luminaire Estimate**	**Labor**
A) Fence Graze from railing nodes	100	800	$ 80,000	$ 100,000
B) Linear articulation of fence elements	300LF	150/LF	$ 45,000	$ 50,000
C) Fence washlight of roadway side	16	$750	$ 12,000	$ 25,000
D) Key Abutment elements	24	$600	$ 14,000	$ 20,000
Lighting Controls & Commissioning			$ 80,000	$ 20,000
Miscellaneous Wiring, Conduit & Electrical Hardware, bucket Trucks			$ 50,000	$ 50,000
			$ 281,000	$ 265,000
			Total Estimate	**$ 546,000**


SK 5-8-A
* Utilize Steel Structure to Create A Series of Segmented Metal Forms → Individual Segments are 2D, Overall Form Is 3D
'B'
Metal 2D Plane 'A'
'C'
Concrete Guard Beyond
Metal #1
Metal #2
Elevation @ Bridge
Bridge Structure
Abutment Wall
Metal #1
Concrete Wall
Elevation @ Retaining Wall
Metal #2
Metal #2
Steel Framing
Concrete Guard
Sidewalk/Roadway
Bridge Structure
Section @ Bridge
Elevation +
Section @ Transition
From Bridge to Retaining Wall
Section @ Retaining Wall

FENCE MATERIALS

METAL FABRICATION

WELDED WIRE MESH / FABRIC

Similar to wire mesh, but unwoven. Wires are laid in perpendicular layers and welded at the intersections.

CHAINLINK

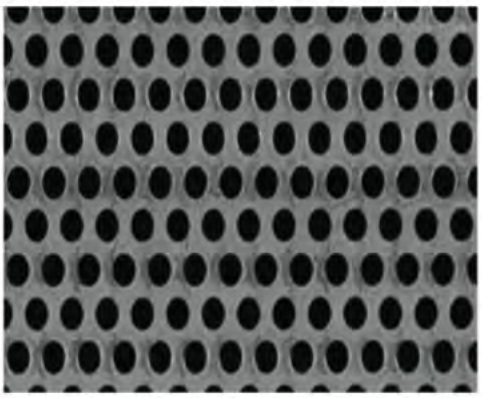
Similar to metal mesh, but wires are twisted around each other instead of weaving. Very easy to manufacture and readily available all over the country.

COLD ROLLED

Metal sheets are fed through a rolling machine and bent into various profilles. Includes plain sheets and perforated.

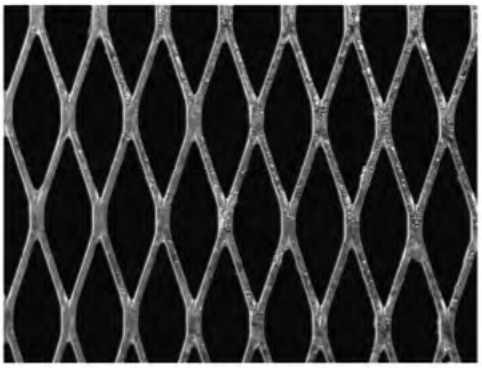
PERFORATED

Holes are punched in metal sheets to create a pattern. Patterns are determined by the size, shape, and spacing of the punch tools. Holes can also be laser-cut for custom patterns & designs.



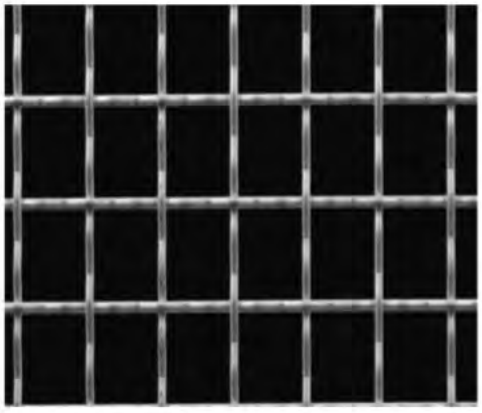
EXPANDED

Metal sheets are sliced and pressed in a continual offset. The expaned sheets can then be rolled flat, if desired.



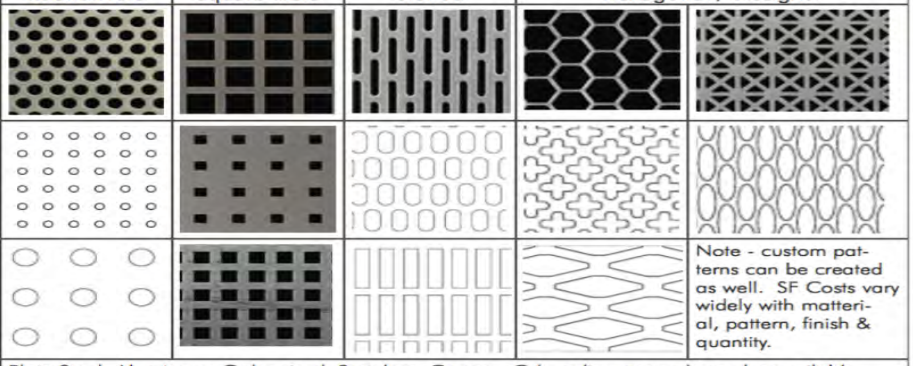
MESH

Metal wires are woven together to create a pattern.



FENCE MATERIALS

PERFORATED METAL

PERFORATED PRODUCT OPTIONS				
	Round Hole	Square Hole	Slotted	Hexagonal / Designer
Pattern Types:				Note - custom patterns can be created as well. SF Costs vary widely with material, pattern, finish & quantity.
Materials:	Plain Steel, Aluminum, Galvanized, Stainless, Corten - Others (i.e. copper) may be available from specialized manufacturers. Plain steel, aluminum and galvanized typically receive an additional finish for protection in exterior settings. Finishes include powder coating, vinyl coating, and anodizing for aluminum.			
Typical Sizes:	3'x8' - 5'x12'	3'x8' - 4'x10'	3'x8' - 3'x10'	3'x8' - 4'x10'
Cost/SF* (uncoated):	$5 - $10	$4.84 - $5.86	$9.50+	$3.34 - $7.23

MANUFACTURERS

Keith Bush Associates, Inc. (PA Mfr. Rep.)
Dave Sedmak - 215-968-5255
http://keithbushassociates.com/

McNICHOLS CO. *
1-877-884-4653
http://www.mcnichols.com

Hendrick Architectural Metals
1-877-840-0881
http://www.hendrickarchproducts.com

Accurate Perforating Company, Inc.
1-888-664-6645
http://accurateperforating.com

EXPANDED METAL

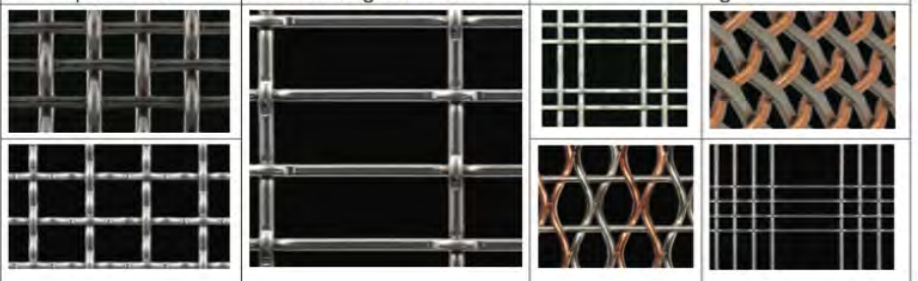
EXPANDED PRODUCT OPTIONS			
	Standard Expanded	Rolled Expanded	Decorative
Pattern Types:			
Materials:	Plain Steel, Aluminum, Galvanized, Stainless. Others (i.e. Corten) may be available from specialized manufacturers. Plain steel, aluminum and galvanized typically receive an additional finish for protection in exterior settings. Finishes include powder coating, vinyl coating, and anodizing for aluminum.		
Typical Sheet Sizes:	4'x8' - 6'x10'	3'x8' - 4'x12'	4'x8'
Cost/SF* (uncoated):	$3-5.50	$4.90-$5.25	$4.60

MANUFACTURERS

McNICHOLS CO. *
1-877-884-4653
http://www.mcnichols.com

Direct Metals Company, LLC.
1-800-711-4939
http://www.directmetals.com

METAL MESH

MESH PRODUCT OPTIONS			
	Square Mesh	Rectangular Mesh	Designer
Pattern Types:			
Materials:	Plain Steel, Aluminum, Galvanized, Stainless. Others may be available from specialized manufacturers. Coatings may be available, but this type of metal is typically selected for the appearance of the uncoated metal. Materials labeled "coated mesh" are not typically woven but are welded.		
Typical Sheet Sizes:	4'x8' - 6'x10' Also in 50' & 100' coils.	3'x9' - 4'x12'	4'x8' - 5'x12'
Cost/SF*:	$17 - $22	$7	$6.50 - $28

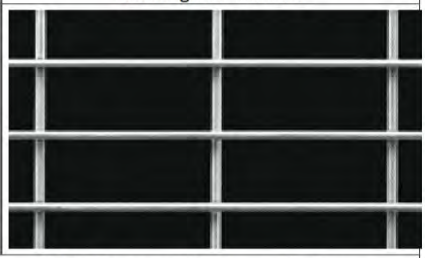
MANUFACTURERS

McNICHOLS CO. *
1-877-884-4653
http://www.mcnichols.com

Direct Metals Company, LLC.
1-800-711-4939
http://www.directmetals.com

FENCE MATERIALS

WELDED WIRE FABRIC

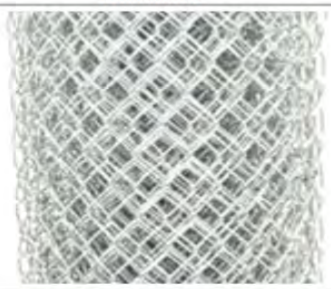
WELDED PRODUCT OPTIONS		
	Square Welded	Rectangular Welded
Pattern Types:		
Materials:	Plain Steel, Galvanized, Stainless. Others may be available from specialized manufacturers. Plain steel and galvanized typically receive an additional finish for protection in exterior settings. Common finishes include powder coating and vinyl / PVC coating, which is applied after the fabric is welded.	
Typical Sheet Sizes:	4' x 10'	4'x10'
Cost/SF*:	$0.50-$14 Note: Welded wire for concrete reinforcement costs much less than visual-grade fabric.	$8.28 - $13.70

MANUFACTURERS

McNICHOLS CO. *
1-877-884-4653
http://www.mcnichols.com

Direct Metals Company, LLC.
1-800-711-4939
http://www.directmetals.com

CHAIN LINK

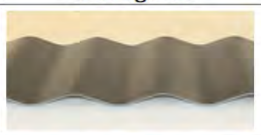
CHAIN LINK PRODUCT OPTIONS		
	Unfinished	Coated
Finish Types: Note: Chain link fabric comes in one pattern that is either unfinished coated. The opening size is typically 1"-2".		
Materials:	Plain steel, Galvanized, Stainless, Aluminum. Others may be available from specialized manufacturers. Plain steel is not common since chain link is typically manufactured for exterior use. Stainless is also difficult to find.	
Typical Sizes:	3'-6' Wide x 50' Roll	4'-6' Wide x 50' Roll
Cost/SF:	$0.50 - $1.84 (Galvanized & Aluminum)	$0.47 - $0.92 (Plain steel w/plastic coating)

PROVIDERS

Western Fence Company
602/244.0368
westernfencecompany.net

Hoover Fence Co.
1-800-355-2335
http://hooverfence.com

COLD ROLLED

COLD ROLLED PRODUCT OPTIONS				
	Corrugated	R-Panel	Box Rib	V-Beam / Rib
Common Profiles				
				
Materials:	Plain Steel, Aluminum, Galvanized, Stainless. Others may be available from specialized manufacturers. For typical wall and roof applicaitons, coatings are typically applied to one side after rolling.			
Typical Sheet Sizes:	Width: 24-48" nominal Length: 8' - 45' (Depending on material and manufacturer)			
Cost:	Varies widely with type & thickness of metal, profile shape, quantity, coatings and manufacturer. Examples: - On the low end, a galvanized steel corrugated panel retails for $0.97 / SF at Lowes. - Perforated corten 7/8" corrugated runs ~ $3.50 / SF from Western States Metal.			

MANUFACTURERS

Corrugated Metals, Inc.
1-800-621-5617
corrugated-metals.com

Fabral, a Euramax company
800.884.4484
http://www.fabral.com

Western States Metal Roofing
855-4CORTEN (426-7836)
http://www.corten.com