Exhibit 1:
Artwork Proposals

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Public Art Program Finalist Proposal

$150,000 Award Category

Dragon Dance

Artist: Dmitrii Volkov

Proposed Location: Adjacent to the Main Street Ferry Terminal

Call ID: 1247601 Artist ID: 276158
Status: Received

Dmitrii Volkov

Custom Answers

Artist StatementDescription of the artist or team’s interest in the project, initial vision for the work, and relevant experience or background. Include contact information: name, address, phone, and email. (3000 characters maximum, including spaces)

Ladies & Gentlemen,

Please consider my proposal as an individual artist with past and present exhibition experience. I am asking for this opportunity to make an impressive, site-specific contribution to Alamada's public art scene. I'd love to work to design, fabricate and install a durable and portable sculpture to accompany the Alameda Point. This wonderful site offers a very favorable location with USS Hornet Museum in the background. In this place, the Dragons will look as if hovering over the water. It is an open space with perspective and beautiful view with the sea horizont that could be developed and will attract investments. I believe that both the site and the City of Alameda deserve an iconic public art work in this place that will attract people, their attention and provoke developing its surroundings. It will be a honor for me to be a part of this growth and evolution and make my contribution.

I combine extensive experience in the production and installation of public art sculptures creating popular public art attractions for specific themes and places.
My steel/wooden sculptures are among the most remarkable and beloved in my native St. Petersburg, Russia. "Moment of Inspiration" in a plaza at the Stieglitz Art Academy, has become a popular site for young lovers. The memorial to local soldiers who died in the Soviet-Afghan war serves as a focal point for annual observances including military color and honor guards and the ceremonial laying of hundreds of carnations at the memorial's base. I created a centerpiece sculpture for the thematic permanent exposition for the newly remodeled and reopened Museum of Russian Political History.
In August this year, the U.S. Citizenship and Immigration Service approved my application for "green card" permanent residence status as an "Alien of Extraordinary Ability". The National Visa Center is processing Green Cards and it to be issued early next year that allows me easily to realize the project.

On the first place I put the artistic value and quality of manufacturing but I do not forget about the budget and possible accompanying circumstances.

I hope you will have a favorable view of my proposal and my approach to the Public Art for the City of Alameda project and offer me the opportunity to respond to the RFP. Thanks for your consideration!

Sincerely,
Dmitrii Volkov

Concept of Proposed Art PieceDescription of the concept of the proposed project, including the design intent, color, size, materials, lifetime and fabrication processes. (2000 characters maximum, including spaces)

Ladies & Gentlemen,

The sculpture is called "Dragon Dance". It represents two dragons as if dancing and playing with each other. It is going to be a relevant and beautiful addition to this site is a reflective and creating mood. Dragons will be looked from afar as if hovering over the water against the backdrop of the water horizon. Such an eye-catching composition will attract people and their attention and make this site one of the favorite place to visit.
It will be durable and portable sculpture that could change its location. My initial thoughts turn to large curving sheets of corten steel shaped and decorated and long tubes as basic structure. Most of the parts will be made by forging, also will be used deforming or knocking tehnichs. For connecting parts will be used welding, riveting and bolting. The surface will have natural grey-rusty color. All details will be covered with beeswax in order to protect them. The maintance of the sculpture is to refresh beeswax cover once a five year. With the proper maintenance the Lifetime could be up to 150 years and more.
Dimensions (HxWxD): 33' x 57' x 40'
Thank you for your consideration!

Sincerely,
Dmitrii Volkov

Concept DesignA rendering of your conceptual design, including multiple viewpoints/angles, if possible.

Dmitrii Volkov Dragons.pdf

LocationThe location in the City of Alameda where the project will be installed, including address.

The City of Alameda the property near B25 and B29

Location PhotosUp to 5 photos of the proposed project location, in one file.

Dmitrii Volkov photo.pdf

Location - Letter of SupportA letter of support from the property owner, or other documentation, must be provided. Within the letter, the property owner must acknowledge that the owner will be accepting responsbility for the maintenance and insurance of the artwork, and that the City of Alameda will maintain ownership of the artwork for its established lifetime. For land owned by the City of Alameda or a public agency, a letter of support from the head of the department overseeing the property is sufficient. (1 page maximum)

Dmitrii Volkov (Continued)

Budget EstimateEstimated, itemized budget for the proposed project, including costs for materials, fabrication, installation, the required 10% contingency, and any other relevant costs. (2 page maximum)

Budget Estimate.pdf

Project ScheduleEstimated schedule for completion of work (1 page maximum)

Project Schedule.pdf

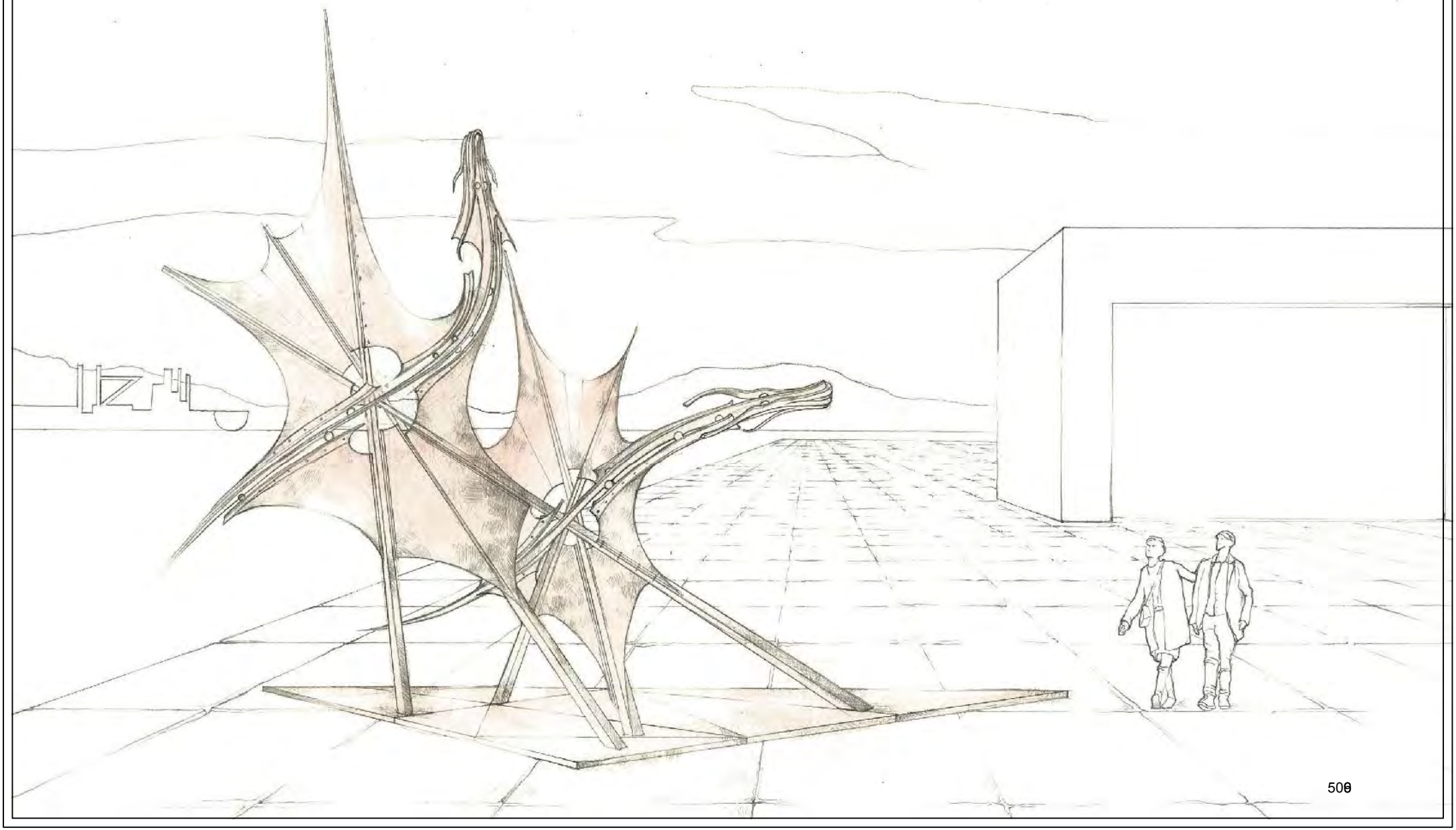
ResumeCurrent professional resume (1 page maximum, front and back)

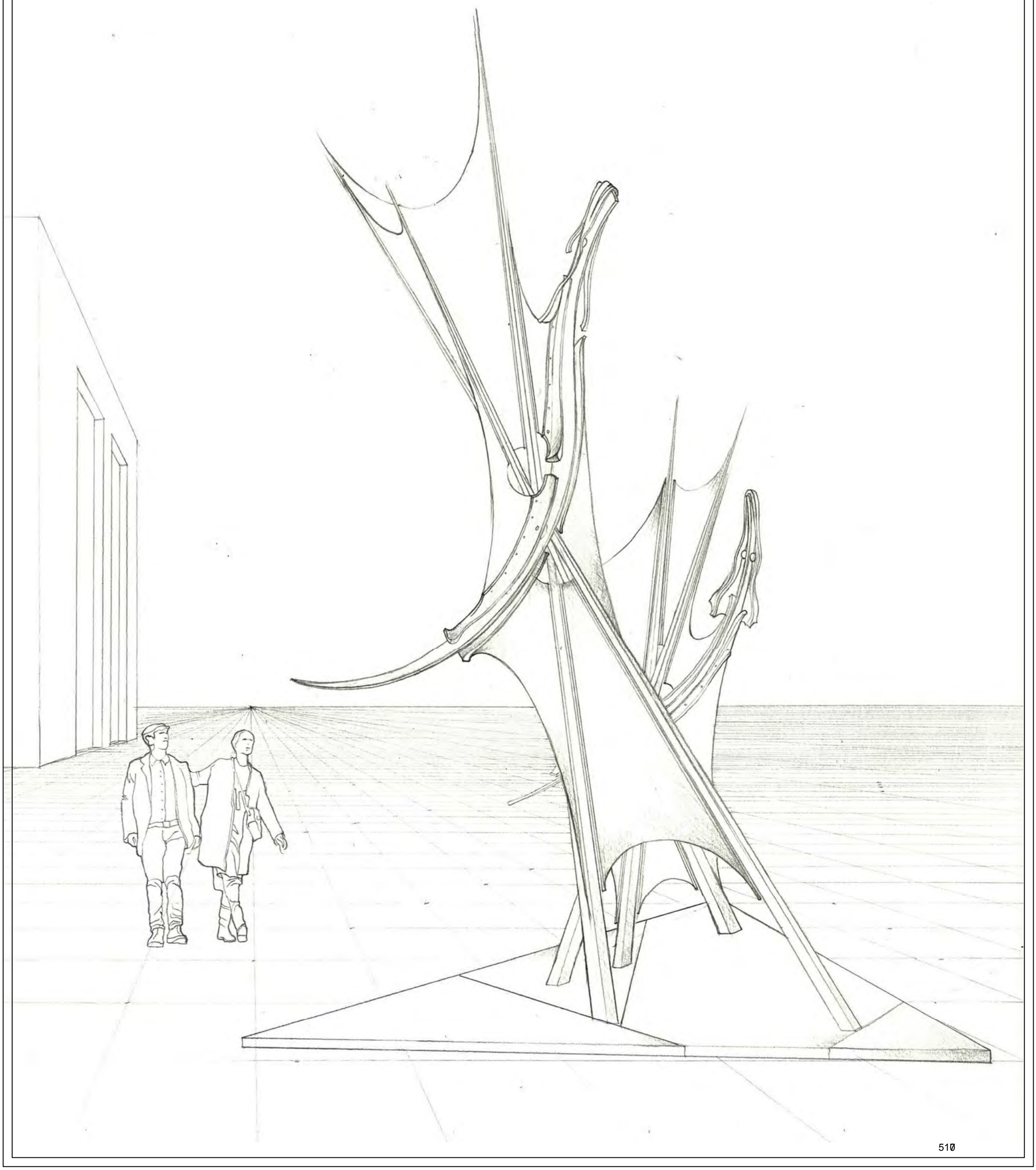
Dmitrii Volkov CV.pdf

Art Detail

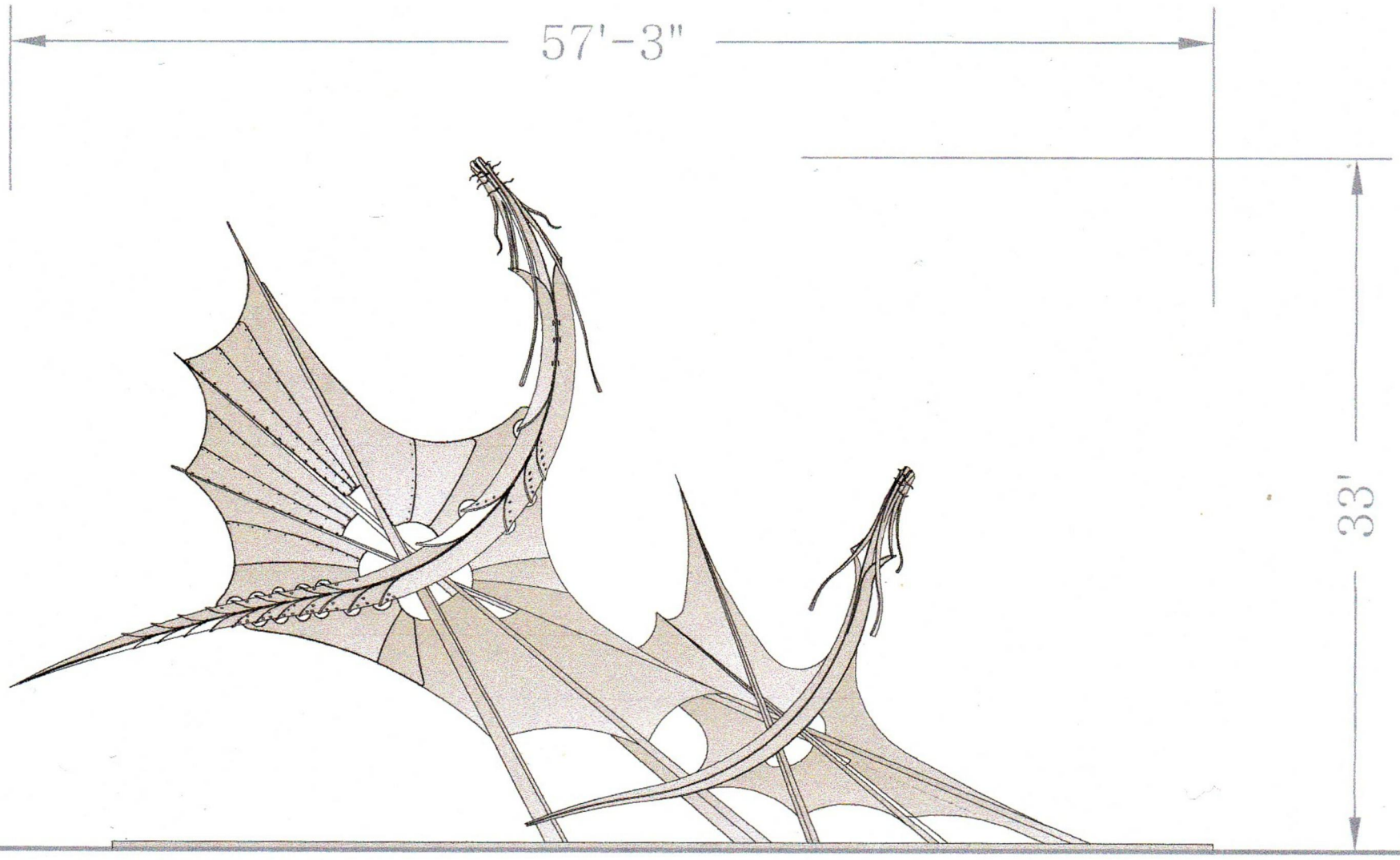
Category Award level: $150,000
Statement

P R O P O S A L F O R P H Y S I C A L P U B L I C A R T F O R T H E C I T Y O F A L A M E D A





PROPOSAL FOR PHYSICAL PUBLIC ART FOR THE CITY OF ALAMEDA



PROPOSAL FOR PHYSICAL PUBLIC ART FOR THE CITY OF ALAMEDA

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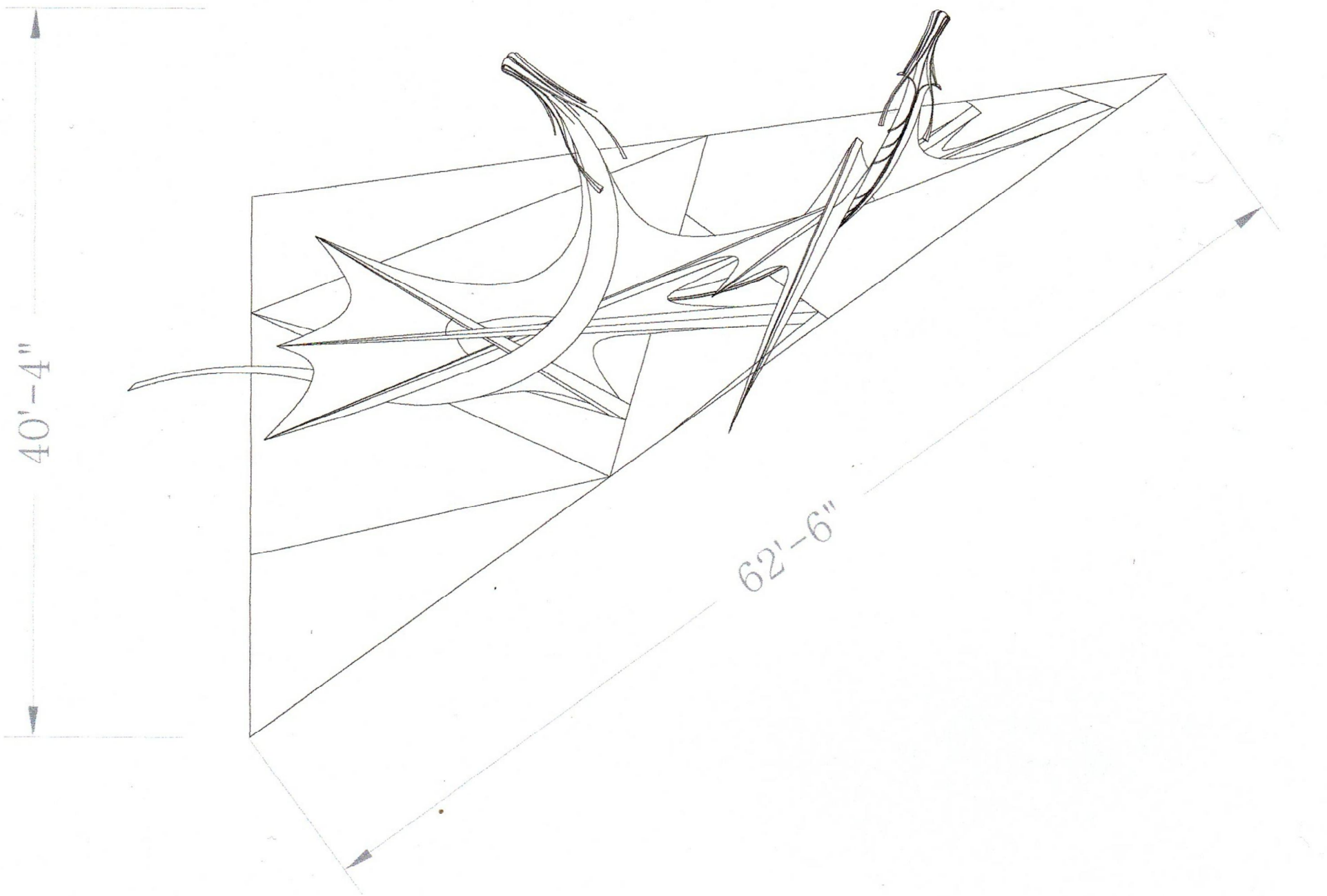
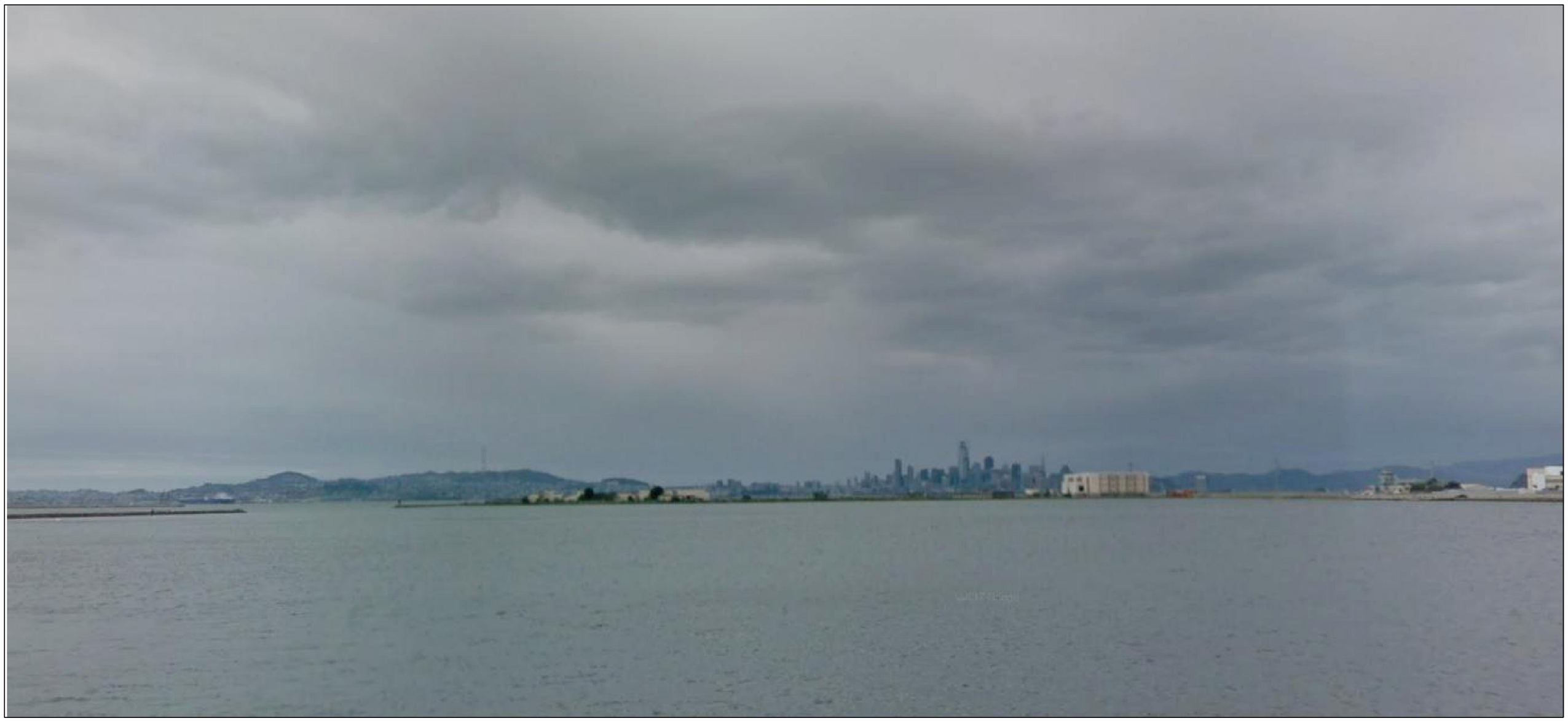




City of Alameda • California

Public Art Commission Members,

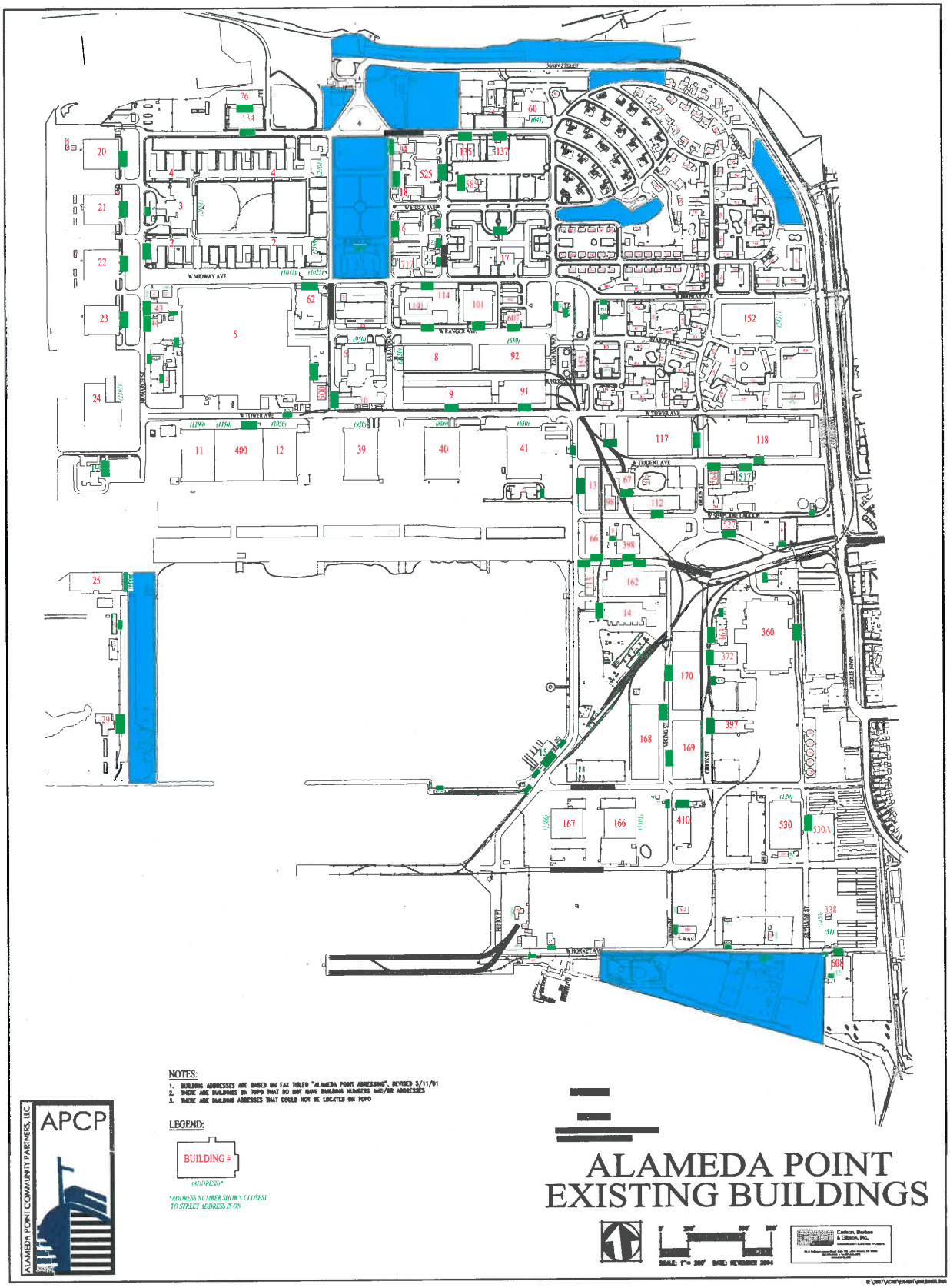
As the Assistant Director of the Community Development Department, I have reviewed the proposal submitted by Dmitrii Volkov for the property near B 25 and B 29. I believe this artwork will be an important addition to the site, and will provide cultural benefits to the Alameda community.

The Base Reuse and Community Development departments support the proposed artwork, and understands that, should the artwork be selected for award and installation, the City of Alameda will be taking on all maintenance and insurance costs associated with the artwork.

Sincerely,

Nanette Mocanu
Assistant Community Development Director
Community Development Department
2263 Santa Clara Avenue, Room 120
Alameda, CA 94501

Base Reuse Department
2263 Santa Clara Avenue, Room 130
Alameda, California 94501-4477
510.747.7440 • Fax 510.523.1081 • TTY 510.522.7538


MAIN STREET
W MIDWAY AVE
W RANGER AVE
W TOWER AVE
W TRIDENT AVE
W THOMAS AVE
NOTES:
1. BUILDING ADDRESSES ARE BASED ON FAX TITLED "ALAMEDA POINT ADRESSING", REVISED 5/11/01
2. THERE ARE BUILDINGS ON TOPO THAT DO NOT HAVE BUILDING NUMBERS AND/OR ADDRESSES
3. THERE ARE BUILDING ADRESSES THAT COULD NOT BE LOCATED ON TOPO
LEGEND:
BUILDING #
(ADDRESS)*
*ADDRESS NUMBER SHOWN CLOSEST TO STREET ADDRESS IS ON
APCP
ALAMEDA POINT COMMUNITY PARTNERS, LLC
ALAMEDA POINT
EXISTING BUILDINGS
Cadence, Bierbaum & Gibson, Inc.

City of Alameda

RE: RFP for physical public art for the City of Alameda

December 18, 2017

Budget Estimate for the project "Dragon Dance"

- Artist fee: $25 000
- Fabrication cost (materials, labour, subcontractors, storage and work space, transportation and delivery): $81 000
- Fees and Administration (travel and accommodation, courier, supplies, phone/fax, printing documentation, management fee, bookkeeping): $17 000
- Insurance (woker's compensation, liability, automotive): $9 000
- Installation Costs (site preparation, security barriers, equipment, materials, labour, subcontractors, clean-up and finishing) : $3 000
- Contingency 10% : $15 000

Total: $150 000

Sincerely,
Dmitrii Volkov

City of Alameda

RE: RFP for physical public art for the City of Alameda

December 18, 2017

Schedule for the project "Dragon Dance"

- Making detailed project: 1 weeks
- The organization of the workshop and the required equipment, purchase and delivery of materials: 3 weeks
- Fabrication the sculpture: 29 weeks
- Packing, Delivery and Installation: 1 week

Total 34 weeks.

Sincerely,
Dmitrii Volkov

CURRICULUM VITAE

DMITRII VOLKOV

Education:

Master of Fine Arts (**M.F.A.**) in Metalworking and Jewelry
Master of Fine Arts (**M.F.A.**) in Design and Illustration

1994 – 2000 Alexander von Stieglitz State Art and Industry Academy St.Petersburg, Russia
1988 – 1993 Nicholas Roerich Art School, St.Petersburg, Russia.

Awards and Featured Work:

2016 – Member of State Examination Board of Alexander von Stieglitz State Art and Industry Academy St.Petersburg
2016 – Participation in the Charity evening of Art for children with special needs (cystic fibrosis)
2015 – Design and manufacture a piece of interior for *Russian hockey Hall of Fame*
2013 – Design and implementation of metal parts of the *Monument to soldiers Afghan* memory installed on Petersburg street.
2013 – Design and implementation of the artist's memory of a *memorial plaque Mylnikova AV* installed on the house where he lived in the city center.
2012 – Unique and impressive project of *Russian Orthodox church* containing all main interior decision as an altar, iconostasis, chandelier and some exterior aspects as a cross and main gate made in metal.
2012 – Implementation of the project 2009 year Henkel Art Contest with the following installation on of the one of the main street of St.Petersburg.
2011 – Design and manufacture various art pieces for *The State Museum of Political History of Russia*, St.Petersburg
2009 – Worked under municipal architectural commission on restoration of decorative elements of *the front facade of the DLT Department Store – early XX century architectural monument.*
2009 – Second place award in Henkel Art Contest: *Future Realization – Art Object*
2008 – 2013 Designed and built a Russian Orthodox Church outside of Luga, Russia Architectural design; metal works
2005 – Participated in restoration project of the front entrance stairway of Catherine-the-Great Palace, XVIII century architectural monument, UNESCO world heritage site *(Tsarskoye Selo, Pushkin, Russia)*
1998 - Winner of the *Young St. Petersburg Jewelers' Contest* commemorating the 150th anniversary of Carl Fabergé
1997 - Designed and manufactured metal decorative elements of the façade of the *Maliy Drama Theatre main stage building in St.Petersburg*
1995 - Established and Operated Art Studio *Blacksmith Art: Dmitrii Volkov*

Work in private collections:

The Helen Williams Drutt Collection

Exhibitions:

2017

-- Juried Outdoor Sculpture Exhibition AIR Art in Roanoke "City in Motion", US

2016

- YPRES-2106 Juried Exhibition "Transition", UK – Belgium

2015

- SIERAAD 2015 Amsterdam, Nitherland
- Juried Exhibition Ausgezeichnet! most excellent! Chemnitz, Germany

2014

- Spring-2014, St.Petersburg Russia
- Dedicated to the 100th anniversary of the Armenian Genocide
- Dedicated to the Victory Day, St.Petersburg Russia
- Autumn-2014, St.Petersburg Russia
- Accessory as an Art, St.Petersburg Russia

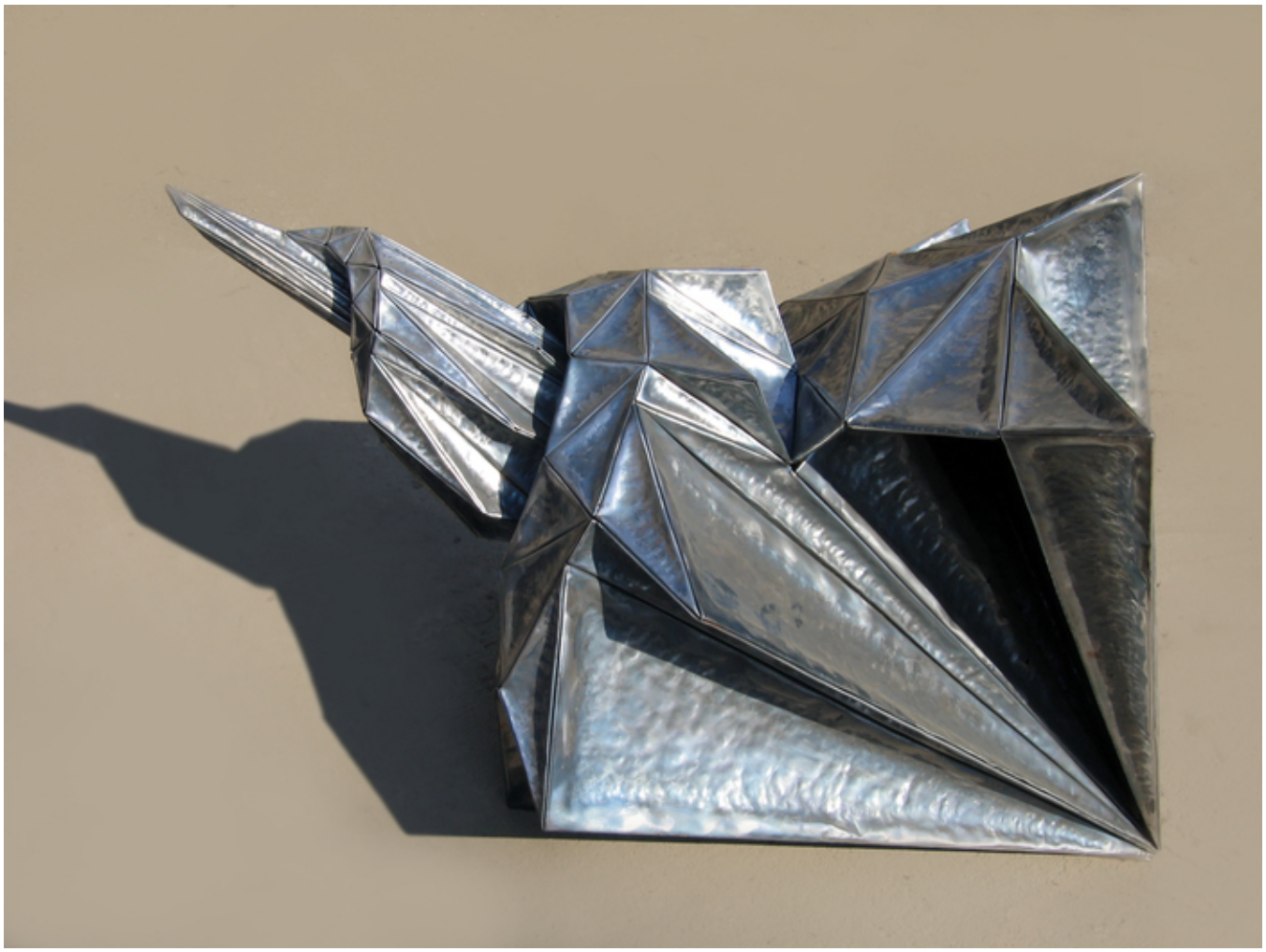
Publications:

- The ANVIL'S Ring summer 2016 – **The Gallery**
- ART AUREA Winter 2015 - **Showroom**
- "World of Metal" November 2014 - **Blacksmith school. The lesson of African mask**.
- "World of Metal" January 2014 - **Metal is my Co-Author**
- Art Metal XXI century "Staircases, Gates, Fences" 2013
- "World of Metal" April 2006 - **The Art Box**
- Art Metal XXI century "Staircases, Gates, Fences" 2010
- Art Metal XXI century "Staircases, Gates, Fences" 2013

Memberships:

ABANA - Artist Blacksmith Association of North America


olga_usova2012



DMITRII VOLKOV

“DRAGONS DANCE”

PROPOSAL

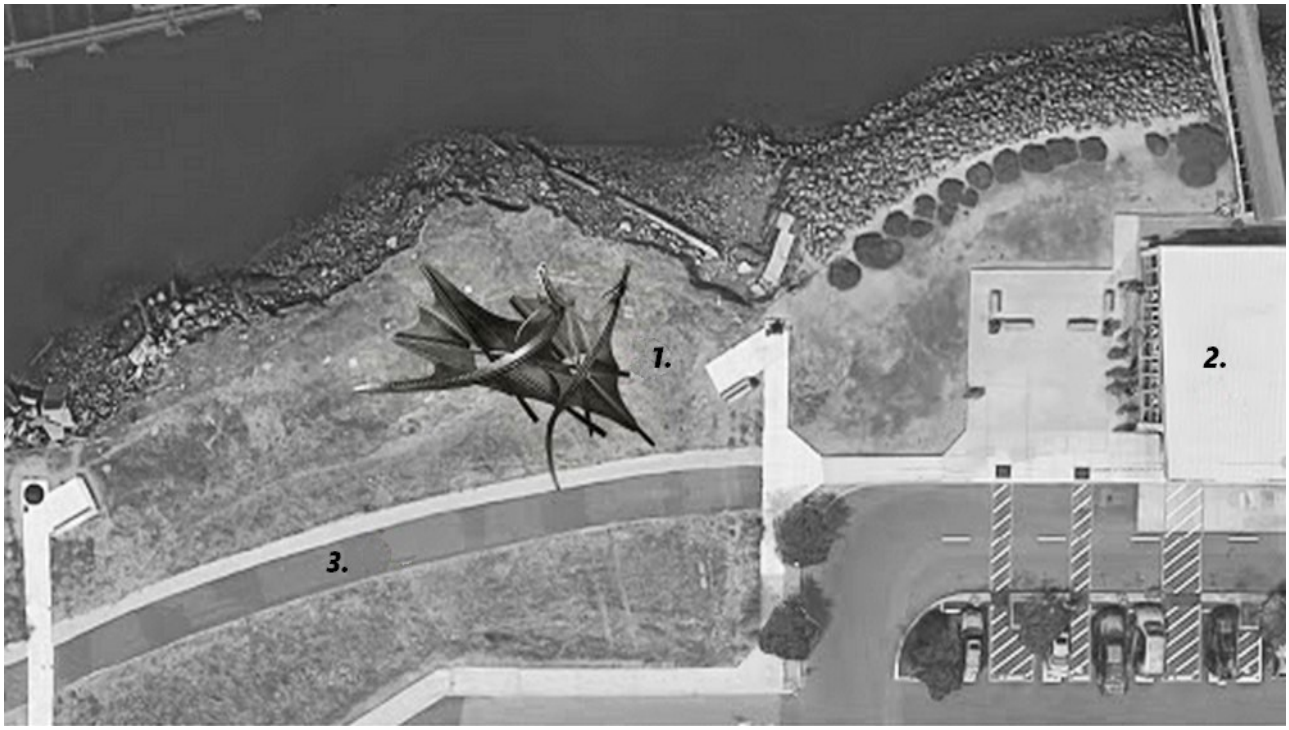
For
PHYSICAL PUBLIC ART

For The
CITY OF ALAMEDA

2018

Site Plan

The sculpture “Dragons Dance” is supposed to be placed just west of the Alameda Main Street Ferry Terminal. The sculpture would greet ferry passengers as they arrive in Alameda, and directly face the famous Oakland cranes across the estuary at the Port of Oakland.

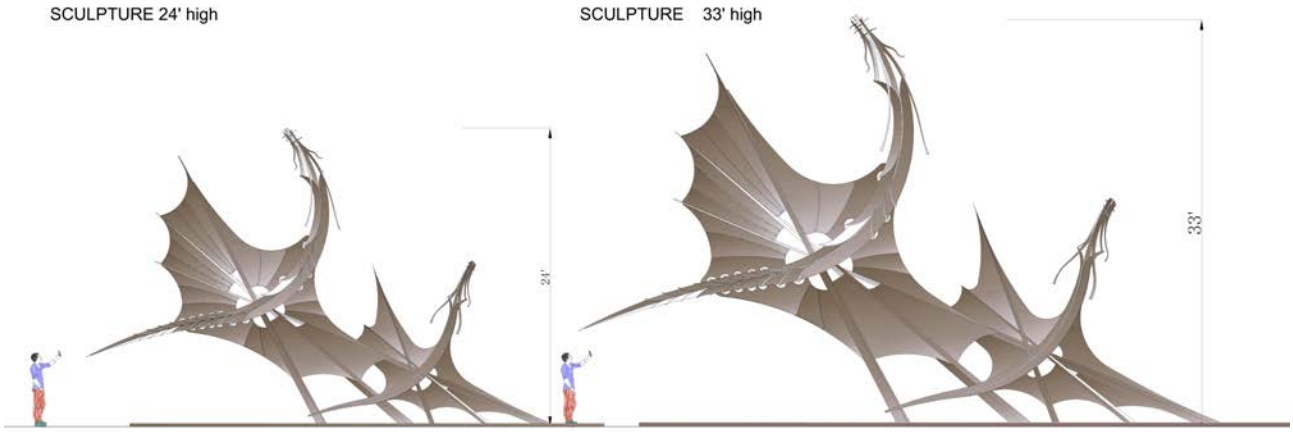


1. The sculpture “Dragons Dance”
2. Alameda Main Street Terminal
3. San Francisco Bay Trail

The height of the sculpture is 33 feet.

The height of the sculpture is 33 feet.

The sculpture is offered in two dimensions: 24' height and 33' height



Information about materials

The sculpture will fabricated from ecological natural materials. For fabrication the sculpture will be used steel A606-4 and A588 (COR-TEN).

The finish will be made with natural bee's wax that will protect the steel and gives it natural patina.

The base is made of concrete and steel reinforcement.

Detailed Budget

(A) Fabrication in cooperation with GIZMO Art Production, Inc. The height of the sculpture is 33 feet.

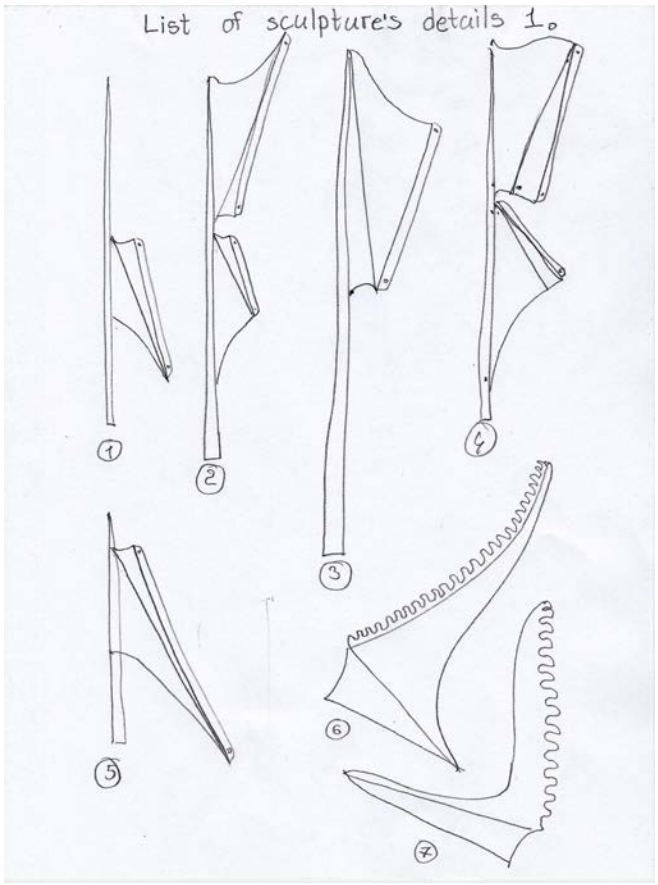
Item	Amount	Notes
Artist fee	25000	
Fabrication of bodies and wings:		
Management:Project Management	8000	GIZMO Art Production: project and production management
Design: Drafting	9000	GIZMO: draftspersn for creating of plans, details, specifications
Design: Engineering	15000	GIZMO: engineering for sculpture — CA stamped drawings
Materials: Metal	17952	GIZMO: Corten metal
Cutting service	10500	GIZMO: waterjet cutting
Materials: Hardware	1500	GIZMO: riverts
Labor: Fabricator 3	20240	GIZMO: expert metal woker
Labor: Fabricator 2	15840	GIZMO: journeyman metal woker
Design: Engineering	1800	GIZMO: inspections — welding
Materials: Paint	800	GIZMO: bees wax
Foundation:	45000	GIZMO: concrete base
Delivery to Alameda	2500	GIZMO: delivery to the site
Equipment rental	15000	GIZMO: crane
Installation: Installer 3	3680	GIZMO: rig and install sculpture
Installation: Installer 2	8640	GIZMO: rig and install sculpture
Materials: speciality	900	GIZMO: anti-bird guard wires
Fabrication of heads:		
Materials: Metal	1500	Corten metal
Materials: Hardware	300	Riverts
Materials: Cardboard	80	Cardboard
Consumables	1400	Brushes, disks, gloves, oxygen, propane.
Labor: Fabricator	15000	High level blacksmith
Workshop rent	3000	Workshop rent 3 months
Delivery to Alameda	8000	Delivery from WV to CA (Gizmo) by DB Schenker service
Author's supervision	12000	Author's supervision 4 visits to Gizmo (travelling from WV)
Engineering		Indicated above
Permit costs	2250	Based on GIZMO estimation
Subtotal	244882	
10% contingency	24488,2	
Total	269370,2	

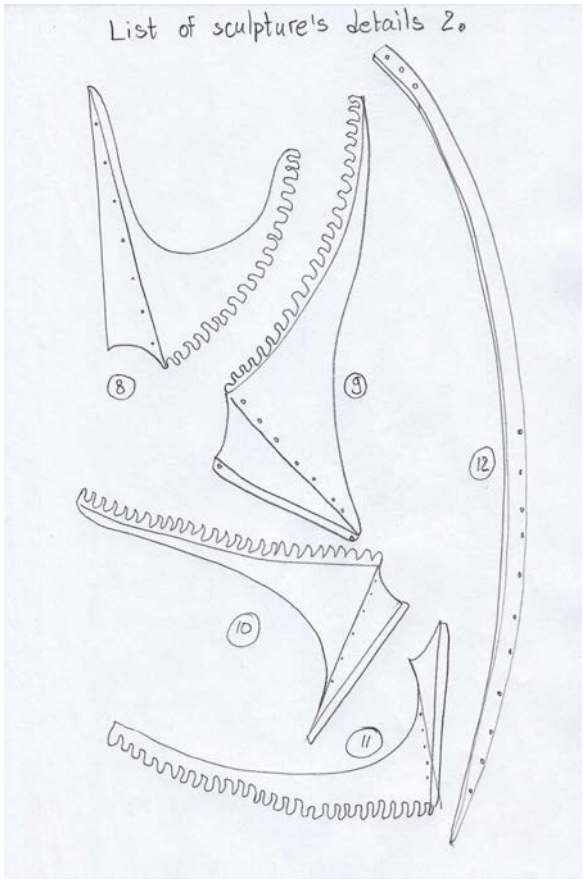
(B) Fabrication in cooperation with Anvil Works in West Virginia. The height of the sculpture is 33 feet and 24 feet.

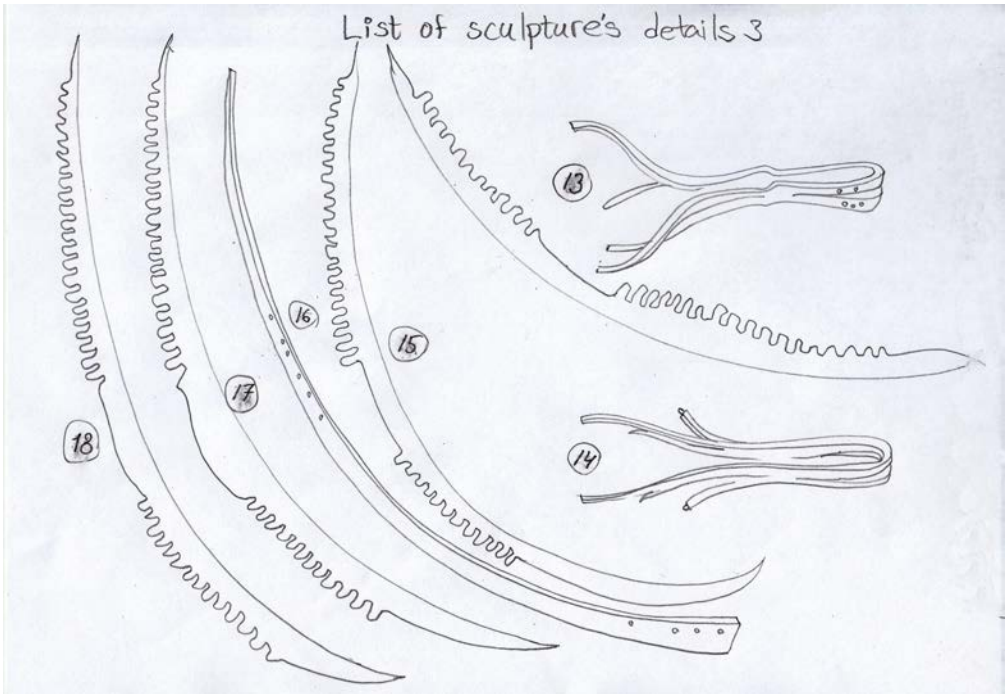
Item	Amount	Amount	Notes
	Height 33'	***Height 24'***	The height of the sculpture
Artist fee	25000	24000	
Foundation engineering	4800	3500	Foundation drawings and calculations for support and seismic anchorage of sculpture
Foundaton fabrication	30000	17000	Concrete fundation
Design: Drafting	8000	7000	Creating plans, details, specificatios
Design: Engineering	9000	7000	Engineering for sculpture
Materials: Metal	5200	4700	Cor-ten L-metal 20'x20'
Materials: Metal	3300	2800	Cor-ten flat sheets thickness 1/8 inch
Materials: Metal	1000	800	Cor-ten flat bar thickness ¼ inch
Materials: Hardware	1000	800	Riverts
Materials: Cardboard	180	140	Cardboard
Materials: Bee's wax	900	700	Finish Bee's wax
Consumables	2500	1800	Brushes, disks, gloves, oxygen, propane.
Cutting service	6000	2440	Laser cutting
Labor: Fabricator	28800	24000	High level blacksmith
Labor: Fabricator	21600	10080	Journeyman blacksmith
Workshop rent	14000	10000	Rent a workshop with a ceiling above 40' / 30'
Equipment rental	6000	4000	Bending machine
Delivery to Alameda	18000	9000	DB Schenker service
Equipment rental	7500	4500	Crane
Materials: Specialty	900	600	Anti-bird guard wires
Engineering			Indicated above: Design Engineering, Foundation engineering
Permit costs	1500	1500	Estimated at $1,500 for $150,000 artwork, and $1,000 for $50,000 artwork
Subtotal	195180	136360	
10% contingency	19518	13636	
Total	214698	149996	

Installation plan

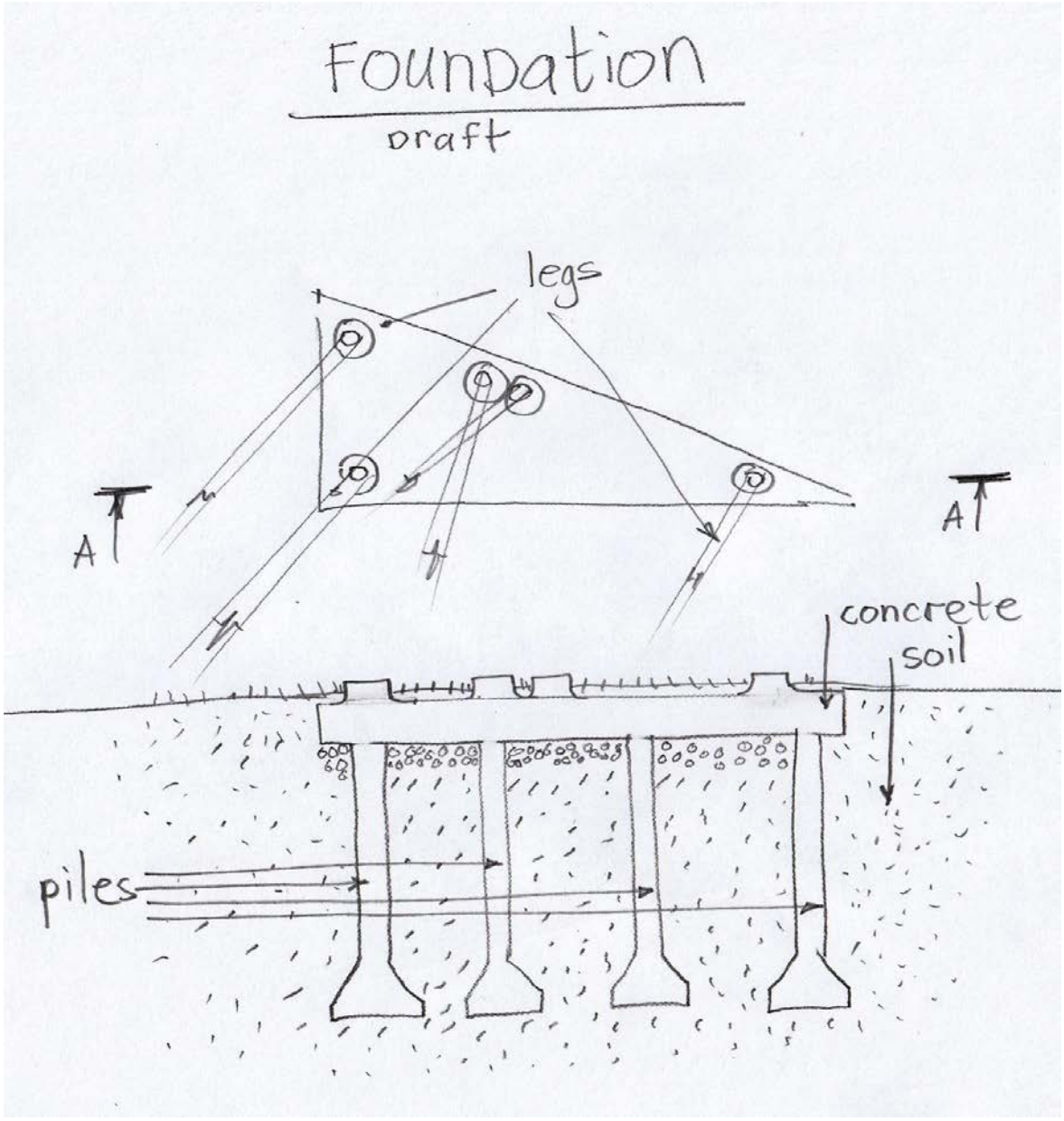
(B) The sculpture will be brought in dismantled in the form of 18 details and will be assembled at the site.





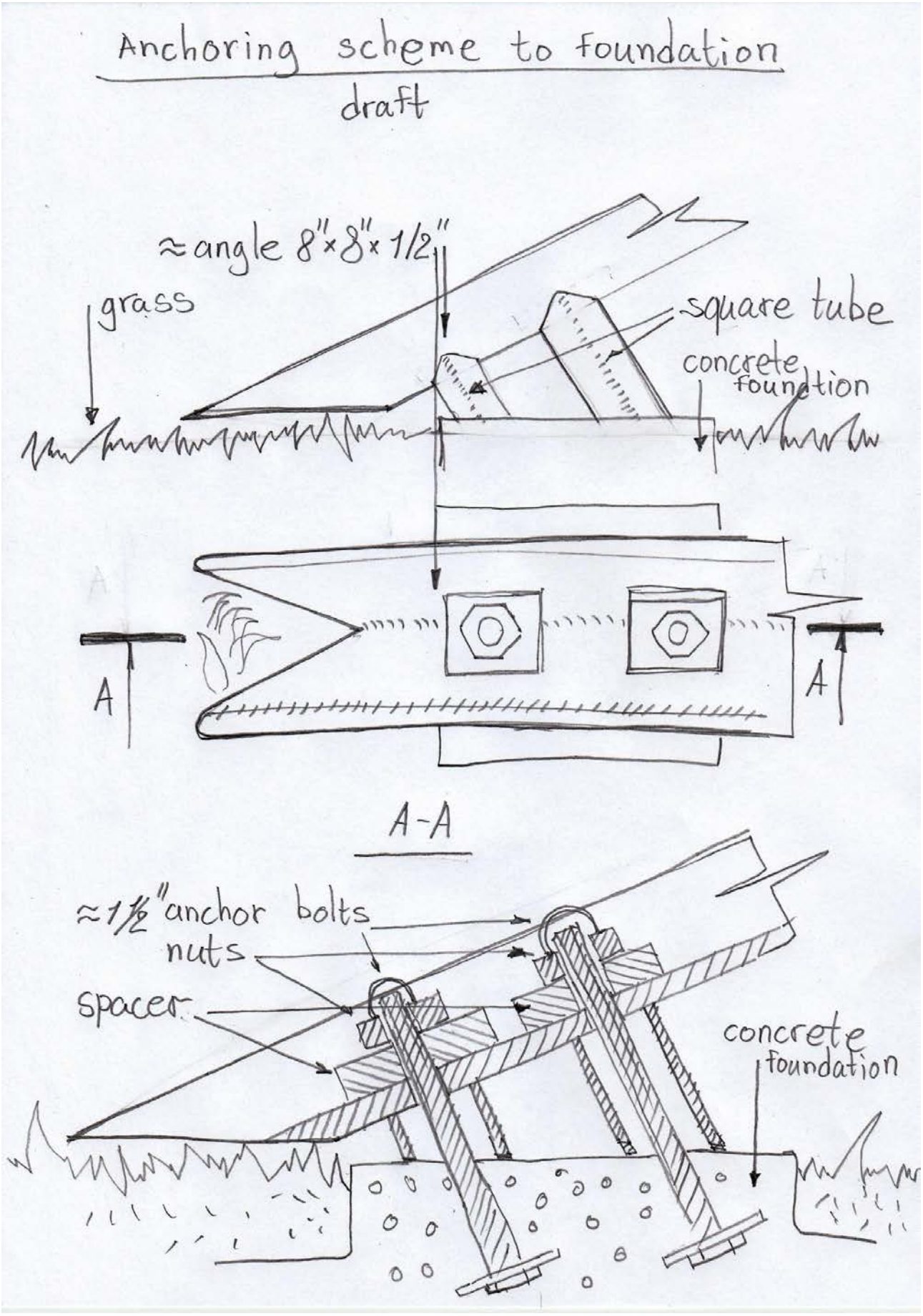


The sculpture has five points of support which are anchored to the concrete base. The base is immersed in the ground and covered with grass.



Anchoring scheme to foundation

draft



Maintenance plan

Corten steel has a chemical composition in which the rust forms a protective coating that protects the part from atmospheric corrosion. So the constant maintenance is optional. In order to extend the life of the sculpture, it could be covered with bees wax once in one or two years.

Schedule for completion of the work

	Week (Dates)	Notes
Complete Schematic drawings	0 (09/03/18)	The part of detailed proposal
Complete design development drawings	3 (09/24/18)	Design include scale, size, and materials; may also include weight.
Complete 80% construction drawings	3 (10/15/18)	Near complete construction drawings - some details may be undecided, or presented as alternatives
Complete 100% construction drawings	3 (11/05/18)	Complete construction drawings
Commence permit process	2 weeks	It is suggestion, do not obtain exact information
Commence fabrication	11/19/2018	
Fabrication 50% complete	18 (03/24/19)	18 weeks
Fabrication 100% complete	18 (07/28/19)	18 weeks
Installation	08/05/19	Transportation from WV to CA takes one week

Gizmo Art Production, Inc
PO BOX 411372
SAN FRANCISCO, CA 94141-1372
415-222-6181
mark@gizmosf.com

ESTIMATE

ADDRESS
1840 - Dmitrii Volkov -
Dancing Dragons

ESTIMATE # 1572
DATE 05/08/2018

ACTIVITY	QTY	RATE	AMOUNT
Based on conceptual drawings for "Dancing Dragons" by Dmitrii Volkov; sculpture is approx. 53’ long x 20’ wide x 33’ high and is built from cortex steel and sculpted elements. The sculpture will be anchored to a concrete pad.			
Management:Project Management Project and Production Management	80	100.00	8,000.00
Design:Drafting Draftsperson for creating of plans, details, specifications.	100	90.00	9,000.00
Design:Engineering Engineering for sculpture - CA stamped drawings - based on current size	1	15,000.00	15,000.00
Permit Fees Permit Fees	1	2,250.00	2,250.00
Materials:Metal Metal - 8" x 12" I-beams (CORTEN) @ 30’ LONG (W12X40)	5	1,510.00	7,550.00
Materials:Metal Metal - 1/4" corten plate - 5’ x 10’	14	608.00	8,512.00
Materials:Metal Metal - 4" x 4" corten tubing (1/8" wall) @ 20’	6	315.00	1,890.00
Cutting Services Waterjet Cutting	60	175.00	10,500.00
Materials:Hardware Hardware (Rivets)	1	1,500.00	1,500.00
Labor:Fabricator 3 Fabricator Level 3; Expert Metal Worker - form and weld metal parts	176	115.00	20,240.00
Labor:Fabricator 2 Fabricator Level 2; Journeyman Metal Worker - form and weld metal parts	176	90.00	15,840.00
Design:Engineering Inspections - welding	1	1,800.00	1,800.00
Materials:Paint Finish - Bee’s wax or equivalent (includes application)	1	800.00	800.00
Materials:Concrete	1	45,000.00	45,000.00

ACTIVITY	QTY	RATE	AMOUNT
Concrete costs (includes digging, wire cages & mesh, formwork, concrete, stripping, clean-up). DOES NOT INCLUDE FINISHED LANDSCAPE.			
Delivery Deliver to Alameda	1	2,500.00	2,500.00
Equipment Rental Equipment Rental - crane	1	15,000.00	15,000.00
Installation:Installer 3 Installer 3 - rig and install sculptures	32	115.00	3,680.00
Installation:Installer 2 Installer 2 - rig and install sculpture	96	90.00	8,640.00
Materials:Specialty Anti-bird guard wires (includes installation)	1	900.00	900.00

Includes installation of dragon head sculptures provided by artist.
DOES NOT INCLUDES COST FOR USE OF BLACKSMITH'S SHOP.
DOES NOT INCLUDE LAWNWORK OVER FOUNDATION;

TOTAL **$178,602.00**

Accepted By

Accepted Date

COR-TEN,CORTEN A,CORTEN STEEL,A242,A558 GR A,S355JOW,
DIFFERENT TYPE AND GRADES OF CORTEN STEEL.

CORTEN A STEEL / Weather resistant steel

Physical Properties

Weather resistant steel	Standard	Tensile Strength MPa	Yield Strength MPa	Elongation in 2 inches (min.) %
CORTENA	US steel	470-630	355	20
IRSM 41-97	Indian Railways	480 min	340 min	21
ASTM A 588	ASTM	485 MIN	345 min	21

Chemical Properties

Weather resistant steel	C	Mn	P	S	Si	Cr	Ni	Mo	Cu
Corten-A	0.12	0.20-0.50	0.070-0.150	0.030	0.25-0.75	0.50-1.25	0.65	-	0.25-0.55
IRS M-41	0.10	0.25-0.45	0.075-0.112	0.030	0.28-0.72	0.35-0.49	0.20-0.49	-	0.30-0.39
ASTM A 588	0.20	0.75-1.30	0.04 MAX	0.050	0.15-0.50	0.30-050	0.50 MAX	-	0.20-0.40

ASTM A242-04 High-Strength Low-alloy Structural Steel

Grade	Chemicals Composition%					Tensile Test				
	C	Mn	P	S	Cu	Thikness (t)mm	Yield Point Ksi(N/mm2)	Tensile Strength Ksi(N/mm2)	Elongation	
						t<19.05	50(345) Min	70(480) Min	Test Piece In (mm)	% Min
			0.15	0.05	0.20	19.05<t<38.10	46(315) Min	67(460) Min	GL=8(200)	18
Type1	0.15 Max	1.00 Max	Max	Max	Min	38.10<t<101.6	42(290) min	63(435) Min	GL=2(50)	21

Remarks:
1 For plates wider than24 in(600mm), the Elongatior requirment is reduce Two Percentage points.
2 For normal thickness 5/16in(8mm), the deduction from the specified percentage of elongation in 8 in(200mm). Shall be made for decereses of the nominal thickness below 5/16 in.(8mm). See elongation requirement adjustment under the tension tests section of specification A6 for deduction values.

Specifications for Corten Steel Strip & Coil according tp Jis 3125-87(SPA-H & SPA-C)JAPAN STANDA										
Type Symbol	C	Si	Mn	P	S	Cu	Cr	Ni	Yield N/mm2	TensileN/mm
SPA-H	0.12 max	0.25 to 0.75	0.20 to 0.50	0.07 to 0.15	0.4 max	0.25 to0.60	0.30 to 1.25	0.65 max	343 min	481 min
SPA-C									34 min	451 min

Standards

Europe	Material no.	D	F	GB	USA	J	Salzgitter Flachstahl	FK[1)]
S355J0WP	1.8945	-	E 36 WA 3	WR 50 A	-	-	Allwesta 510 P	B
S355J2WP	1.8946	-	E 36 WA 4	-	A 242 Type 1	-	Allwesta 510 FP	B
S355J0W	1.8959	-	E 36 WB 3	WR 50 B	A 588	SMA 50 AW	Allwesta 510	B
S355J2W	1.8965	WTSt 52-3	E 36 WB 4	WR 50 C	-	SMA 50 CP	Allwesta 510 F	B
S355K2G2W	1.8967	-	-	-	-	-	Allwesta 510 F 40	B

[1)]FK = Tensile strength class

Chemical composition in percent by weight[1)][%] (Heat analysis)

Grade	C	Si	Mn	P	S	N	Cu	Cr	Ni
	max.	max.			max.	max.			max.
S355JOWP	0,12	0,75	max. 1,00	0,06 - 0,15	0,035	0,009[3)]	0,25 - 0,55	0,30 - 1,25	0,65
S355J2WP	0,12	0,75	max. 1,00	0,06 - 0,15	0,030	–[4)]	0,25 - 0,55	0,30 - 1,25	0,65
S355JOW	0,16	0,50	0,50 - 1,50	max. 0,035	0,035	0,009[2)] [3)]	0,25 - 0,55	0,40 - 0,80	0,65
S355J2W	0,16	0,50	0,50 - 1,50	max. 0,030	0,030	–[4)]	0,25 - 0,55	0,40 - 0,80	0,65
S355K2W	0,16	0,50	0,50 - 1,50	max. 0,030	0,030	–[4)]	0,25 - 0,55	0,40 - 0,80	0,65

1) The steel may contain a maximum of 0,65 % Ni, 0,30 % Mo and 0,15 % Zr.
2) Exceeding the specified maximum value is permitted if the phosphorous content remains below the maximum value by 0,005 % for each 0,001 % of nitrogen; however, the nitrogen content must not exceed 0,012 % in the heat analysis.
3) The maximum nitrogen content shall not apply if the steel grades contain at least 0,020 % Altotal or sufficient quantities of other nitrogen-fixing elements.
4) The steel grades contain at least one of the following elements: Altotal : ≥ 0,020 %, Nb: 0,015 - 0,060 %, V: 0,02 - 0,12 %, Ti: 0,02 - 0,10 %. If a combination of these elements is present, at least one of them is contained with the specified minimum content.

Mechanical properties[1)]

Grade	Position of sample	Min. yield strength		Tensile strength		Min. total elongation [%]			
		MPa		MPa		L_0= 80 mm			L_0= 5,65 $\sqrt{S_0}$
		$e^{2)}\leq 16$	$e^{2)}> 16$	$e^{2)}< 3$	$e^{2)}\geq 3$	$e^{2)}\leq 2$	$2 < e^{2)}\leq 2,5$	$2,5 < e^{2)}\leq 3$	$e^{2)}\geq 3$
S355J0WP	l/t	355	-	510 - 680	470 - 630	16/14	17/15	18/16	22/20
S355J2WP	l/t	355	-	510 - 680	470 - 630	16/14	17/15	18/16	22/20
S355J0W	l/t	355	345	510 - 680	470 - 630	16/14	17/15	18/16	22/20
S355J2W	l/t	355[3)]	345	510 - 680	470 - 630	16/14	17/15	18/16	22/20
S355K2W	l/t	355[3)]	345	510 - 680	470 - 630	16/14	17/15	18/16	22/20

The tensile test values given in the table apply to longitudinal samples; in case of strip and sheet steel of widths of ≥ 600 mm, transverse samples should be taken.
2) Nominal thickness e [mm]
3) S355J0WP and S355J2WP: e ≤ 12 mm.

Notch impact energy in condition of delivery (minimum values obtained using Charpy-V samples)

Grade	Notch impact energy[1)]	Position
	J	^{0}C
S355J0WP	27	0
S355J2WP	27	-20
S355J0W	27	0
S355J2W	27	-20
S355K2W	40	-20

Average values of 3 samples; one individual value may fall short of the required minimum value by not
2)More than 30 %. The sample width shall equal the product thickness if the latter is between 5 - 10 mm,
3)The tests being performed using samples which are similar to Charpy-V samples. The valuesspecified
4)In the table above are to be reduced proportionally to the sample width.

COR-TEN, CORTEN, CORTEN A, CORTEN STEEL, A242, A558 GR A, S355JOW,

Scope

CORTEN A applies to plates up to 12.5mm in thickness, CORTEN B applies to plates up to 50mm in thickness.

Definition

Weathering means that due to their chemical compositions CORTEN A and CORTEN B steels, when utilised unprotected, exhibits increased resistance to atmospheric corrosion compared to unalloyed steels. This is because it forms a protective layer on its surface under the influence of the weather.

The corrosion retarding effect of the protective layer is produced by the nature of its structure components and the particular distribution and concentration of alloying elements in it. The layer protecting the surface develops and regenerates continuously when subjected to the influence of the weather.

Formation, duration of development and protective effect of the covering layer on weathering steels depend largely upon the corrosive character of the atmosphere. Its influence varies and depends mainly upon general weather condition (e.g. continental) macroclimate (e.g. industrial, urban, maritime or countryside climate) and the orientation of the structure components (e.g. exposed to or shaded from the weather, vertical or horizontal position). The amount of aggressive agents in the air has to be taken into account . In general the covering layer offers protection against atmospheric corrosion in industrial, urban and countryside climate.

When utilising this steel in unprotected condition it is up to the designer to take into account the expected loss of thickness due to corrosion and as far as necessary, compensate for it by increasing the thickness of the material.

In cases of particular air pollution by aggressive agents conventional surface protection is recommended. Coating is absolutely necessary in cases of contact with water for long periods, when permanently exposed to moisture, or if it is to be used in the vicinity of the sea. The susceptibility of paint coats to undercreepage by rust is less in the case of weathering steel than in the case of comparable non-weathering steel.

Applications

The corten steel is used for various types of welded, bolted and riveted constructions e.g. steel frame structures, bridges, tanks and containers, exhaust systems, vehicles and equipment constructions.

Basic guidles for the use of corten steel in the unprotected condition are described in EN 10025-5 and DASt rule 007.

The entire application technology is of fundamental importance for the performance of the products made from this steel. It must be taken into account that not only general climate conditions but also specific unfavourable local climate conditions in the broadcast sense as well as details of a construction may affect the corrosion behaviour of unprotected weathering steel. The dependency on these facts makes it understandable that no warranty can be given. It is recommended to control the corrosion progress of protected parts out of weathering steel exposed to the influence of weather in reasonable time intervals. A minimum thickness of 5mm is recommended when exposed to the

weather in the unprotected condition.

To use the benefits of the higher atmospheric corrosion resistance of CORTEN in comparison to unalloyed steel it is necessary that design and execution of structures as well as the performance of maintenance works allow an impeded formation and regeneration of the protective rust layer. The methods must meet the latest requirements of technical progress and must be suited for the proposed application. Due consideration must be given to relevant construction specifications.

The selection of the material is up to the purchaser.

Chemical Composition(heat analysis, %)

Grade	C	Si	Mn	P	S	Cr	Cu	V	Ni
COR-TEN A	0.12	0.25-0.75	0.20-0.50	0.07-0.15	0.030	0.50-1.25	0.25-0.55		0.65
COR-TEN B	0.16	0.30-0.50	0.80-1.25	0.030	0.030	0.40-0.65	0.25-0.40	0.02-0.10	0.40

In order to obtain fine grain structure a sufficient amount of nitrogen absorbing elements is added (e.g. ≥0.02% Al).

Mechanical Properties, in the state of delivery condition

At room temperature for plates ≥3mm in thickness (transverse test specimans, according to EN 10002). Requirements to hot rolled plates ≤3mm in thickness according to EN 10025-5.

Grade	Minimum yield point (ReH Mpa *)	Tensile strength Rm MPa	Minimum elongation A (Lo=5.65 √So) %
COR-TEN A	355	470-630	20

*) 1 Mpa = 1N/mm2

In case of cold rolled material the yield point is min. 310 Mpa and the tensile strength min. 445 MPa. Furthermore cold rolled sheets ≤3mm in thickness made of steel grade COR-TEN A-F for increased demand to the cold formability is available. Mechanical properties: Yield point min. 275 Mpa; Tensile strength min. 410 Mpa; elongation min. 25%. Tolerances on dimensions and shape according to EN 10131.

Mechanical Properties, in the state of delivery condition

At room temperature for plates ≥3mm in thickness (transverse test specimans, according to EN 10002). Requirements to hot rolled plates ≤3mm in thickness according to EN 10025-5.

Grade	Material thickness mm	Minimum yield point (ReH Mpa *)	Tensile strength Rm MPa	Minimum elongation A (Lo=5.65 √So) %
COR-TEN B	≤16	355	470-630	20
	> 16 ≤50	345		

*) 1 Mpa = 1N/mm2

The notched-bar impact energy is determined on ISO-V longitudinal test specimans at a temperature of - 20°C as an average of three tests. For product thicknesses ≥10mm the average value is at least 27 J. For thicknesses between 10mm and 6mm, the minimum impact value is reduced

proportionally to the speciman width (product thickness).

No impact test is performed on products below 6mm in thickness.

Number of Tests

1 tensile test	1 test specimen per 40 t from eachheat*)
1 notched bar impact test (3 specimens)	1 set specimens per 40 t from each heat *) (at test temperature -20°C)

*) as referenced in EN 10025-5

General Processing Information

The information given below can only deal with some important points.

Forming

The conditions for hot forming are in accordance with those stated in EN 10025-5. For cold forming the statements according to table 6 of EN 10025-5 are valid. If the mechanical properties have undergone changes due to cold forming, the properties indicated in the table can be substantially restores by stress relieving - at least 30 minutes at 530°C - 580°C. For higher degrees of cold forming subsequent normalising is recommended.

Flame Cutting

CORTEN is suitable for flame cutting provided proper operating methods are used. At temperatures below 5°C a sufficiently wide zone on either side of the intended cut should be preheated. If flame cut edges are to undergo cold forming, the hardening effect should be prevented by preheating - as in the case of S355J2 or the hardened zones must be worked off e.g. by appropriate grinding.

Welding

CORTEN can be welded both manually and mechanically, provided the general rules of welding practices are observed. A prerequisite for obtaining identical mechanical properties in the weld and in the base material is the application of suitable welding consumables and the choice of appropraite welding conditions. To consider are EN 10025-5 - Technical delivery conditions for structural steels with improved atmospheric corrosion resistance

Recommendations for welding are also given in EN 1011 part 1 and part 2 - Welding, Recommendations for welding of metallic materials-.

Lime basic electrodes, inert-gas welding wire, and wire/power combinations equivalent to the tensile strength of S355 are used as welding consumables

For unprotected use care must be taken that the welded joint is also weather resistant. This is possible by using welding consumables matching the base material.

If due to design or building specification stress relieving is required, it should be performed in the range temperature from about 530°C to 580°C.

Bolting and Riveting

Joining elements such as bolts, rivets and their accessories (nuts and washers) must be so selected that the formation of local electro-chemical cells are avoided. The joining elements should preferably consist of weathering steel.

At these joints capillary action can lead to permanent moisture resulting in increased corrosion. Critical zones should therefore be protected by painting, sealing or other protective measures.

In the case of high-strength connections (HV) the conditions for non-weathering structural steels as given in DIN 18800 part 1 apply.

Central Steel & Wire Company

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SAFETY DATA SHEETS (SDS) / MATERIAL SAFETY DATA SHEETS (MSDS)

Below is a list of REPRESENTATIVE Safety Data Sheets (SDS) for the products and materials available from Central Steel & Wire Company. Although the materials covered are not considered as hazardous in the state in which they are delivered to you, subsequent burning, welding, brazing, heating, sanding, grinding, polishing and cutting operations may release metallic dust or fumes that could be hazardous. If you intend to perform any of these or similar operations, the appropriate REPRESENTATIVE SDS should be consulted for the information that is appropriate for your circumstances.

Click on the SDS # to open/download a pdf version (requires Adobe Reader). If you have questions, please call 800-621-8510.

ALUMINUM SDS			
ALCOA #390	ALUMINUM ALLOYS WITH LEAD	ALCOA #666	4xxx SERIES ALLOYS
ALCOA #663	1xxx SERIES ALLOYS	ALCOA #667	5xxx SERIES ALLOYS
ALCOA #664	2xxx SERIES ALLOYS	ALCOA #668	6xxx SERIES ALLOYS
ALCOA #665	3xxx SERIES ALLOYS	ALCOA #669	7xxx SERIES ALLOYS

BRONZE, BRASS, COPPER SDS			
AMPCO # J79-191	all AMPCO, Bronze Alloys 624, 630, 642, 954	Mueller Brass	Leaded Brass Alloys 353, 360
KME	Copper Alloy 147	Drawn Metal Tube	Brass Alloy 330
National Bronze	Copper Alloys 110, 122, 145 * Brass Alloys 230, 260, 280, 464, 485 * Bronze Alloys 220, 316, 510, 544, 932		

STEEL SDS	
North American Stainless	All Stainless Grades
Nucor - Carbon & Alloy Steels	Structural Product Grades: A36, A572, A588, A709 (Gr 36, Gr 50), A992 Carbon Steel Bar Grades: A36, A709 Gr 36, 10xx, 11xx, 12xx, INcut®, Stressproof®, Fatigue-Proof® Alloy Steel Bar Grades: 41xx, 43xx, 86xx, E52100, "e.t.d." 150®
Nucor Cold Finish Steel	All Bars Leaded Grades - Carbon and Alloy
U.S. Steel # 73712	Hot Roll Plate Carbon Grades: A36, A709 Gr 36, Abrasion Resistant, CQ, 1045 Hot Roll Plate HSLA Grades: A656, A709 Gr 36, 50, 50W, AR 400, Ex-Ten, Cor-Ten, CleanForm, DOMEX Hot Roll Plate Grades for: Pressure Vessel Quality Plate and Floor Plate
Arcelor Mittal USA-003	Steel Plate Alloy Grades T-1 or A514
U.S. Steel # 52297	Sheet/Coil Carbon Grades: CS, DS, 1050, 1074, 1095 Sheet/Coil HSLA Grades: Ex-Ten, Cor-Ten, DOMEX, A1011 HSLAS
U.S. Steel # 1650	Sheet/Coil Coated Grades: Galvanized, Galvannealed, Paintgrip
U.S. Steel # 7644	Sheet/Coil Coated Grade: Electrogalvanized-Paintlok
Arcelor Mittal USA-002	Sheet/Coil Coated Grade: Aluminized
PTC Alliance-Steel Tube	Tube and Pipe : All Grades
Precision Marshall Steel	Tool Steel/Drill Rod: All Grades

United States Steel Corporation

Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp
Safety Data Sheet (SDS)

USS IHS Number: 52297
(Replaces USS Code Number: 3A001, 3C011, 3H011)
Locations: Irvin, Fairfield, Gary, Granite City, Lake Erie, Hamilton

Section 1 – Identification

1(a) Product Identifier Used on Label: Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp

1(b) Other Means of Identification: Carbon Steel Sheet/Strip and Skelp

1(c) Recommended Use of the Chemical and Restrictions on Use: None

1(d) Name, Address, and Telephone Number:

United States Steel Corporation
600 Grant Street, Room 1662
Pittsburgh, PA 15219-2800

Phone number : (412) 433-6840 (8:00 am to 5:00 pm)
FAX: (412) 433-5019

1(e) Emergency Phone Number: 1-800-262-8200 (CHEMTREC)

Section 2 – Hazard(s) Identification

2(a) Classification of the Chemical: As sold, this product, **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** is not hazardous according to the criteria specified in REACH [REGULATION (EC) No 1907/2006] and CLP [REGULATION (EC) No 1272/2008]. Under 29 CFR 1910.1200 Hazard Communication Standard, steel products are considered mixtures due to further processing which may produce dusts and or fume. The categories of Health Hazards as defined in "GLOBALLY HARMONIZED SYSTEM OF CLASSIFICATION AND LABELLING OF CHEMICALS (GHS), Third revised edition ST/SG/AC.10/30/Rev. 3" United Nations, New York and Geneva, 2009 have been evaluated. Refer to Section 3, 8 and 11 for additional information. Precautionary Statement/Emergency Overview: This formed solid metal product poses little or no immediate health or fire hazard. When product is subjected to welding, burning, melting, sawing, brazing, grinding or other similar processes, potentially hazardous airborne particulate and fumes may be generated.

2(b) Signal Word, Hazard Statement(s), Symbols and Precautionary Statement(s):

Hazard Symbol	Hazard Classification	Signal Word	Hazard Statement(s)	Precautionary Statement(s)
	Carcinogenicity - 2 Toxic to Reproduction - 2 Single Target Organ Toxicity (STOT) Repeat Exposure -1	**Danger**	Suspected of causing cancer. Suspected of damaging fertility or the unborn child. Causes damage to lungs through prolonged or repeated inhalation exposure. Harmful if swallowed. May cause an allergic skin reaction. May cause respiratory irritation. Causes eye irritation.	Do not breathe dusts / fume / spray. Wear protective gloves / protective clothing / eye protection / face protection. Contaminated work clothing must not be allowed out of the workplace. Use only outdoors or in well ventilated areas. Wash thoroughly after handling. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not eat, drink or smoke when using this product. If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If on skin: Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. Dispose of contents in accordance with federal, state and local regulations.
	Acute Toxicity-Oral 4 Skin Sensitization - 1 STOT Single Exposure - 3			
NA	Eye Irritation - 2B			

2(c) Hazards Not Otherwise Classified: None Known

2(d) Unknown Acute Toxicity Statement (mixture): None Known

Section 3 – Composition/Information on Ingredients

3(a-c) Chemical Name, Common Name (synonyms), CAS Number and Other Identifiers, and Concentration:

Chemical Name	CAS Number	EC Number	% weight
Iron	7439-89-6	231-096-4	>86
Aluminum	7429-90-5	231-072-3	≤2.0
Chromium	7440-47-3	231-157-5	≤5.0
Copper	7440-50-8	231-159-6	≤2.5
Manganese	7439-96-5	231-105-1	≤3.0
Molybdenum	7439-98-7	231-107-2	≤2.5
Nickel	7440-02-0	231-111-4	≤5.0
Silicon	7440-21-3	231-130-8	≤2.0

EC- European Community
CAS- Chemical Abstract Service

Section 4 – First-aid Measures

4(a) Description of Necessary Measures: If exposed, concerned or feel unwell: Get medical advice/attention.

- **Inhalation: Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.). If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Eye Contact:** This product as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.). If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue Rinsing. If eye irritation persists: Get medical advice/attention. If exposed, concerned or feel unwell: Get medical advice/attention.
- **Skin Contact:** If on skin: Wash thoroughly after handling. Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off and wash contaminated clothing before reuse.
- **Ingestion:** This product as sold/shipped is not a likely form of exposure. However during further processing (welding, grinding, burning, etc.). If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. If exposed, concerned or feel unwell: Get medical advice/attention.

4(b) Most Important Symptoms/Effects, Acute and Delayed (chronic):

- **Inhalation:** This product as sold/shipped is not likely to present an acute or chronic health effect.
- **Eye:** This product as sold/shipped is not likely to present an acute or chronic health effect.
- **Skin:** This product as sold/shipped is not likely to present an acute or chronic health effect.
- **Ingestion:** This product as sold/shipped is not likely to present an acute or chronic health effect.

4(c) Immediate Medical Attention and Special Treatment: None Known

Section 5 – Fire-fighting Measures

5(a) Suitable (and unsuitable) Extinguishing Media: Not applicable for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as sold/shipped. Use extinguishers appropriate for surrounding materials.

5(b) Specific Hazards Arising From the Chemical: Not applicable for this product as sold/shipped. When burned, toxic smoke and vapor may be emitted.

5(c) Special Protective Equipment and Precautions for Fire-fighters: Self-contained NIOSH approved respiratory protection and full protective clothing should be worn when fumes and/or smoke from fire are present. Heat and flames cause emittance of acrid smoke and fumes. Do not release runoff from fire control methods to sewers or waterways. Firefighters should wear full face-piece self-contained breathing apparatus and chemical protective clothing with thermal protection. Direct water stream will scatter and spread flames and, therefore, should not be used.

Section 6 - Accidental Release Measures

6(a) Personal Precautions, Protective Equipment and Emergency Procedures: Not applicable for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as sold/shipped. For spills involving finely divided particles, clean-up personnel should be protected against contact with eyes and skin.

6(b) Methods and Materials for Containment and Clean Up: Not applicable for this product as sold/shipped. If material is in a dry state, avoid inhalation of dust. Fine, dry material should be removed by vacuuming or wet sweeping methods to prevent spreading of dust. Avoid using compressed air. Do not release into sewers or waterways. Collect material in appropriate, labeled containers for recovery or disposal in accordance with federal, state, and local regulations. Follow applicable OSHA regulations (29 CFR 1910.120) and all other pertinent state and federal requirements.

Section 7 - Handling and Storage

7(a) Precautions for Safe Handling: Not applicable for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as sold/shipped, however further processing (welding, burning, grinding, etc.) with the potential for generating high concentrations of airborne particulates should be evaluated and controlled as necessary. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Practice good housekeeping. Avoid breathing metal fumes and/or dust. Do not eat, drink or smoke when using this product.

7(b) Conditions for Safe Storage, Including any Incompatibilities: Store away from acids and incompatible materials.

Section 8 - Exposure Controls / Personal Protection

8(a) Occupational Exposure Limits (OELs): Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp as sold/shipped in its physical form does not present an inhalation, ingestion or contact hazard, nor would any of the following exposure data apply. However, operations such as high temperature (burning, welding, sawing, brazing, machining and grinding) may produce fumes and/or particulates. The following exposure limits are offered as reference, for an experience industrial hygienist to review.

Ingredients	8(a) OSHA PEL [1]	ACGIH TLV [2]	NIOSH REL [3]	IDLH [4]
Iron	10 mg/m³ (as iron oxide fume)	5.0 mg/m³ (as iron oxide dust and fume)	5.0 mg/m³ (as iron oxide dust and fume)	2,500 mg Fe/m^3
Aluminum	15 mg/m³ (total dust, PNOR) [5] 5.0 mg/m³ (as respirable fraction, PNOR)	1.0 mg/m^3	10 mg/m³ (as total dust) 5.0 mg/m³ (as respirable dust)	NE
Chromium	0.5 mg/m³ (as Cr II & III, inorganic compounds) 1.0 mg/m³ (as Cr, metal) 0.005 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble) "AL" 0.0025 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	0.5 mg/m³ (as Cr III, inorganic compounds) 0.5 mg/m³ (as Cr, metal) 0.05 mg/m³ (as Cr VI, inorganic compounds) 0.01 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	0.5 mg/m³ (as Cr II & III, inorganic compounds) 0.5 mg/m³ (as Cr, metal) 0.001 mg/m³ (as Cr VI, inorganic compounds & certain water insoluble)	250 mg/m³ (as Cr II & metal) 25 mg/m³ (as Cr III) 15 mg/m³ (as Cr VI)
Copper	0.1 mg/m³ (as fume, Cu) 1.0 mg/m³ (as dusts & mists, Cu)	0.1 mg/m³ (as fume) 1.0 mg/m³ (as dusts & mists, Cu)	1.0 mg/m³ (as dusts & mists)	100 mg Cu/m^3
Manganese	"C" 5.0 mg/m³ (as Fume & Mn compounds)	0.2 mg/m³	"C" 5.0 mg/m³ 1.0 mg/m³ (as fume) "STEL" 3.0 mg/m³	500 mg Mn/m^3
Molybdenum	15 mg/m³ (as total dust, PNOR) 5.0 mg/m³ (as respirable fraction, PNOR)	10 mg/m³ (as Mo insoluble compounds, inhalable fraction[6]) 3.0 mg/m³ (as Mo insoluble compounds, respirable fraction[7]) 0.5 mg/m³ (as Mo soluble compounds, respirable fraction)	NE	NE
Nickel	1.0 mg/m³ (as Ni metal & insoluble compounds)	1.5 mg/m³ (as inhalable fraction Ni metal) 0.2 mg/m³ (as inhalable fraction Ni inorganic only insoluble and soluble compounds)	0.015 mg/m³ (as Ni metal & insoluble and soluble compounds)	10 mg/m³ (as Ni)
Silicon	15 mg/m³ (total dust, PNOR) 5.0 mg/m³ (as respirable fraction, PNOR)	10 mg/m³	10 mg/m³ (as total dust) 5.0 mg/m³ (as respirable dust)	NE

NE - None Established

1. OSHA PELs (Permissible Exposure Limits) are 8-hour TWA (Time-Weighted Average) concentrations unless otherwise noted. A ("C") designation denotes a ceiling limit, which should not be exceeded during any part of the working exposure unless otherwise noted. An Action level (AL) is used by OSHA and NIOSH to express a health or physical hazard. They indicate the level of a harmful or toxic substance/activity, which requires medical surveillance, increased industrial hygiene monitoring, or biological monitoring. Action Levels are generally set at one half of the PEL but the actual level may vary from standard to standard. The intent is to identify a level at which the vast majority of randomly sampled exposures will be below the PEL.
2. Threshold Limit Values (TLV) established by the American Conference of Governmental Industrial Hygienists (ACGIH) are 8-hour TWA concentrations unless otherwise noted. ACGIH TLVs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes. A Short Term Exposure Limit (STEL) is defined as the maximum concentration to which workers can be exposed for a short period of time (15 minutes) for only four times throughout the day with at least one hour between exposures.
3. The National Institute for Occupational Safety and Health Recommended Exposure Limits (NIOSH-REL) Compendium of Policy and Statements. NIOSH, Cincinnati, OH (1992). NIOSH is the federal agency designated to conduct research relative to occupational safety and health. As is the case with ACGIH TLVs, NIOSH RELs are for guideline purposes only and as such are not legal, regulatory limits for compliance purposes.
4. The "Immediately Dangerous to Life or Health air concentration values (IDLHs)" are used by NIOSH as part of the respirator selection criteria and were first developed in the mid-1970's by NIOSH. The Documentation for Immediately Dangerous to Life or Health Concentrations (IDLHs) is a compilation of the rationale and sources of information used by NIOSH during the original determination of 387 IDLHs and their subsequent review and revision in 1994.
5. PNOR (Particulates Not Otherwise Regulated). All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by a limit which is the same as the inert or nuisance dust limit of 15 mg/m^3 for total dust and 5 mg/m^3 for the respirable fraction.
6. Inhalable fraction. The concentration of inhalable particulate for the application of this TLV is to be determined from the fraction passing a size-selector with the characteristics defined in the ACGIH 2013 TLVs ® and BEIs® (Biological Exposure Indices) Appendix D, paragraph A.
7. Respirable fraction. The concentration of respirable dust for the application of this limit is to be determined from the fraction passing a size-selector with the characteristics defined in ACGIH 2013 TLVs ® and BEIs ® Appendix D, paragraph C.

8(b) Appropriate Engineering Controls: Use controls as appropriate to minimize exposure to metal fumes and dusts during handling operations. Provide general or local exhaust ventilation systems to minimize airborne concentrations. Local exhaust is necessary for use in enclosed or confined spaces. Provide sufficient general/local exhaust ventilation in pattern/volume to control inhalation exposures below current exposure limits.

Section 8 - Exposure Controls / Personal Protection (continued)

8(c) Individual Protection Measures:

- **Respiratory Protection:** Seek professional advice prior to respirator selection and use. Follow OSHA respirator regulations (29 CFR 1910.134) and, if necessary, use only a NIOSH-approved respirator. Select respirator based on its suitability to provide adequate worker protection for given working conditions, level of airborne contamination, and presence of sufficient oxygen. Concentration in air of the various contaminants determines the extent of respiratory protection needed. Half-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 10 times the exposure limit. Full-face, negative-pressure, air-purifying respirator equipped with P100 filter is acceptable for concentrations up to 50 times the exposure limit. Protection by air-purifying negative-pressure and powered air respirators is limited. Use a positive-pressure-demand, full-face, supplied air respirator or self-contained breathing apparatus (SCBA) for concentrations above 50 times the exposure limit. If exposure is above the IDLH (Immediately Dangerous to Life or Health) for any of the constituents, or there is a possibility of an uncontrolled release or exposure levels are unknown, then use a positive-demand, full-face, supplied air respirator with escape bottle or SCBA.

  Warning! Air-purifying respirators both negative-pressure, and powered-air do not protect workers in oxygen-deficient atmospheres.
- **Eyes**: Wear appropriate eye protection to prevent eye contact. For operations, which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use safety glasses to prevent eye contact. Contact lenses should not be worn where industrial exposures to this material are likely. Use safety glasses or goggles as required for welding, burning, sawing, brazing, grinding or machining operations.
- **Skin**: Wear appropriate personal protective clothing to prevent skin contact. Cut resistant gloves and sleeves should be worn when working with steel products. For operations, which result in elevating the temperature of the product to or above its melting point or result in the generation of airborne particulates, use protective clothing, and gloves to prevent skin contact. Protective gloves should be worn as required for welding, burning or handling operations. Contaminated work clothing must not be allowed out of the workplace.
- **Other Protective Equipment**: An eyewash fountain and deluge shower should be readily available in the work area.

Section 9 - Physical and Chemical Properties

9(a) Appearance (physical state, color, etc.): Metallic Gray

9(b) Odor: Odorless

9(c) Odor Threshold: NA

9(d) pH: NA

9(e) Melting Point/Freezing Point: ~ 2750 ºF (~1510 C)

9(f) Initial Boiling Point and Boiling Range: ND

9(g) Flash Point: NA

9(h) Evaporation Rate: NA

9(i) Flammability (solid, gas): Non-flammable, non-combustible

9(j) Upper/lower Flammability or Explosive Limits: NA

9(k) Vapor Pressure: NA

9(l) Vapor Density (Air = 1): NA

9(m) Relative Density: 7.85 g/cc

9(n) Solubility(ies): Insoluble

9(o) Partition Coefficient n-octanol/water: ND

9(p) Auto-ignition Temperature: NA

9(q) Decomposition Temperature: ND

9(r) Viscosity: NA

NA - Not Applicable

ND - Not Determined for product as a whole

Section 10 - Stability and Reactivity

10(a) Reactivity: Not Determined (ND)

10(b) Chemical Stability: Steel products are stable under normal storage and handling conditions.

10(c) Possibility of Hazardous Reaction: None Known

10(d) Conditions to Avoid: Storage with strong acids or calcium hypochlorite.

10(e) Incompatible Materials: Will react with strong acids to form hydrogen. Iron oxide dusts in contact with calcium hypochlorite evolve oxygen and may cause an explosion.

10(f) Hazardous Decomposition Products: Thermal oxidative decomposition of steel products can produce fumes containing oxides of iron and manganese as well as other alloying elements.

Section 11 - Toxicological Information

11(a-e) Information on Toxicological Effects: The following toxicity data has been determined for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture when further processed using the information available for its components applied to the guidance on the preparation of an SDS under the GHS requirements of OSHA and the EU CPL:

Hazard Classification	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA			
Acute Toxicity Hazard (covers Categories 1-5)	NA*	4[a]		**Warning**	Harmful if swallowed.
Eye Damage/ Irritation (covers Categories 1, 2A and 2B)	NA*	2B[c]	No Pictogram	**Warning**	Causes eye irritation.

Section 11 - Toxicological Information (continued)

11(a-e) Information on Toxicological Effects (continued):

Hazard Classification	Hazard Category		Hazard Symbols	Signal Word	Hazard Statement
	EU	OSHA			
Skin/Dermal Sensitization (covers Category 1)	NA*	1[d]		**Warning**	May cause an allergic skin reaction.
Carcinogenicity (covers Categories 1A, 1B and 2)	NA*	2[g]		**Warning**	Suspected of causing cancer.
Toxic to Reproduction (covers Categories 1A, 1B and 2)	NA*	2[h]		**Warning**	Suspected of damaging fertility or the unborn child.
Specific Target Organ Toxicity (STOT) Following Single Exposure (covers Categories 1-3)	NA*	3[i]		**Warning**	May cause respiratory irritation.
STOT following Repeated Exposure (covers Categories 1 and 2)	NA*	1[j]		**Danger**	Causes damage to lungs through prolonged or repeated inhalation exposure.

* Not Applicable

Toxicological data listed below are presented regardless to classification criteria. Individual hazard classification categories where the toxicological information has met or exceeded a classification criteria threshold are listed above.

a. No LC_{50} or LD_{50} has been established for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp**. The following data has been determined for the components:

- **Iron:** Rat LD_{50} =98.6 g/kg (REACH)
  Rat LD_{50} =1060 mg/kg (IUCLID)
  Rat LD_{50} =984 mg/kg (IUCLID)
  Rabbit LD_{50} =890 mg/kg (IUCLID)
  Guinea Pig LD_{50} =20 g/kg (TOXNET)
  Human LD_{LO} =77 g/kg (IUCLID)
- **Aluminum:** Rat LD_{50} > 15.9 g/kg (REACH)
- **Copper:** Rat LD_{50} = 481 mg/kg (REACH
  Rat LD_{50} > 2500 mg/kg (REACH)
- **Nickel:** LD_{50} >9000 mg/kg (Oral/Rat); NOAEC >10.2 mg/l(Inhalation/Rat)
- **Silicon:** LD_{50} = 3160 mg/kg (Oral/Rat)
- **Manganese:** Rat LD_{50} > 2000 mg/kg (REACH)
  Rat LD_{50} > 9000 mg/kg (NLM Toxnet)

b. No Skin (Dermal) Irritation data available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture. The following Skin (Dermal) Irritation information was found for the components:

- **Molybdenum:** May cause skin irritation.

c. No Eye Irritation data available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture. The following Eye Irritation information was found for the components:

- **Iron and Molybdenum:** Causes eye irritation.
- **Silicon:** Slight eye irritation in rabbit protocol.
- **Nickel:** Slight eye irritation from particulate abrasion only.

d. No Skin (Dermal) Sensitization data available **for Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture. The following Skin (Dermal) Sensitization information was found for the components:

- **Nickel:** May cause allergic skin sensitization.

e. No Respiratory Sensitization data available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture or its components.

f. No Germ Cell Mutagenicity data available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture. The following Mutagenicity and Genotoxicity information was found for the components:

- **Iron:** IUCLID has found some positive and negative findings in vitro.
- **Aluminum:** IUCLID; ATSDR have found this ingredient is not mutagenic *in vitro*; but has marginal effects *in vivo.*
- **Nickel:** EU RAR has found positive results in vitro and in vivo but insufficient data for classification.

g. Carcinogenicity: IARC, NTP, and OSHA do not list **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as carcinogens. The following Carcinogenicity information was found for the components:

- **Welding Fumes -** IARC Group 2B carcinogen, a mixture that is possibly carcinogenic to humans.
- **Chromium (as metal and trivalent chromium compounds)** – IARC Group 3 carcinogens, not classifiable as to their human carcinogenicity.
- **Nickel and certain nickel compounds –** Group 2B - metallic nickel Group 1 - nickel compounds ACGIH confirmed human carcinogen. Nickel – EURAR Insufficient evidence to conclude carcinogenic potential in animals or humans; suspect carcinogen classification Category 2 Suspected of causing cancer.

h. No Toxic to Reproduction data available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture. The following Toxic to Reproductive information was found for the components:

- **Nickel**: Effects on fertility.

Section 11 - Toxicological Information (continued)

11(a-e) Information on Toxicological Effects (continued):

i. No Specific Target Organ Toxicity (STOT) following a Single Exposure data available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a mixture. The following STOT following a Single Exposure data was found for the components:

- **Iron and Molybdenum:** Irritating to respiratory tract.
- **Copper:** Target organs affected - Skin, eyes liver, kidneys and respiratory tract.
- **Aluminum**: Repeated exposure associated with Asthma, fibrosis in lungs and encephalopathy in humans.

j. No Specific Target Organ Toxicity (STOT) following Repeated Exposure data was available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a whole. The following STOT following Repeated Exposure data was found for the components:

- **Aluminum:** Reviews have found chronic exposure to aluminum flake has been reported to cause pneumoconiosis in workers. Repeat oral exposure to aluminum results in decrements in neurobehavioral function and development.
- **Copper:** Target organs affected - Skin, eyes liver, kidneys and respiratory tract
- **Nickel**: Rat 4 wk inhalation LOEL 4 mg/m^3 Lung and Lymph node histopathology. Rat 2 yr inhalation LOEL 0.1 mg/ m^3 Pigment in kidney, effects on hematopoiesis spleen and bone marrow and adrenal tumor. Rat 13 Week Inhalation LOAEC 1.0 mg/m^3 Lung weights, and Alveolar histopathology.
- **Manganese**: Inhalation of metal fumes - Degenerative changes in human Brain; Behavioral: Changes in motor activity and muscle weakness (Whitlock *et al.,* 1966).

The above toxicity information was determined from available scientific sources to illustrate the prevailing posture of the scientific community. The scientific resources includes: The American Conference of Governmental Industrial Hygienist (ACGIH) Documentation of the Threshold Limit Values (TLVs) and Biological Exposure Indices (BEIs) with Other Worldwide Occupational Exposure Values 2013, The International Agency for Research on Cancer (IARC), The National Toxicology Program (NTP) updated documentation, the World Health Organization (WHO) and other available resources, the International Uniform Chemical Information Database (IUCLID), European Union Risk Assessment Report (EU-RAR), Concise International Chemical Assessment Documents (CICAD), European Union Scientific Committee for Occupational Exposure Limits (EU-SCOEL), Agency for Toxic Substances and Disease Registry (ATSDR), Hazardous Substance Data Bank (HSDB), and International Programme on Chemical Safety (IPCS).

The following health hazard information is provided regardless to classification criteria and is based on the individual component(s) and potential resultant components from further processing:

Acute Effects by component:

- **Iron and Oxides:** Iron is harmful if swallowed, causes skin irritation, and causes eye irritation. Contact with iron oxide has been reported to cause skin irritation and serious eye damage.
- **Aluminum:** Not Reported/ Not Classified
- **Chromium, Oxides and Hexavalent Chrome:** Hexavalent chrome causes damage to gastrointestinal tract, lung, severe skin burns and eye damage, serious eye damage, skin contact may cause an allergic skin reaction. Inhalation may cause allergic or asthmatic symptoms or breathing difficulties.
- **Copper and Oxides:** Copper may cause allergic skin reaction. Copper oxide is harmful if swallowed, causes skin and eye irritation, and may cause an allergic skin reaction.
- **Manganese and Oxides:** Manganese and Manganese oxide are harmful if swallowed.
- **Molybdenum and Oxides:** Molybdenum causes skin and eye irritation. Molybdenum oxide is toxic if swallowed, and causes eye irritation.
- **Nickel and Oxides:** Nickel may cause allergic skin sensitization. Nickel oxide may cause an allergic skin.
- **Silicon and Oxides:** May be harmful if swallowed.

Delayed (chronic) Effects by Component:

- **Iron and Oxides**: Chronic inhalation of excessive concentrations of iron oxide fumes or dusts may result in the development of a benign pneumoconiosis, called siderosis, which is observable as an X-ray change. No physical impairment of lung function has been associated with siderosis. Inhalation of excessive concentrations of ferric oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens. Iron oxide is listed as a Group 3 (not classifiable) carcinogen by the International Agency for Research on Cancer (IARC).
- **Aluminum**: Chronic inhalation of finely divided powder has been reported to cause pulmonary fibrosis and emphysema. Repeated skin contact has been associated with bleeding into the tissue, delayed hypersensitivity and granulomas. Chronic exposure to aluminum flake has been reported to cause pneumoconiosis in workers. Repeat oral exposure to aluminum results in decrements in neurobehavioral function and development.
- **Chromium, Oxides and Hexavalent Chromium:** The health hazards associated with exposure to chromium are dependent upon its oxidation state. The metal form (chromium as it exists in this product) is of very low toxicity. The hexavalent form is very toxic. Repeated or prolonged exposure to hexavalent chromium compounds may cause respiratory irritation, nosebleed, ulceration and perforation of the nasal septum. Industrial exposure to certain forms of hexavalent chromium has been related to an increased incidence of cancer. NTP (The National Toxicology Program) Fourth Annual report on Carcinogens cites "certain Chromium compounds" as human carcinogens. ACGIH has reviewed the toxicity data and concluded that chromium metal is not classifiable as a human carcinogen. Hexavalent chromium may cause genetic defects and is suspected of damaging the unborn child. Developmental toxicity in the mouse, suspected of damaging fertility or the unborn child.
- **Copper and Oxides**: Inhalation of high concentrations of freshly formed oxide fumes and dusts of copper can cause metal fume fever. Chronic inhalation of copper dust has caused, in animals, hemolysis of the red blood cells, deposition of hemofuscin in the liver and pancreas, injury to lung cells and gastrointestinal symptoms.
- **Manganese and Oxides:** Chronic exposure to high concentrations of manganese fumes and dusts may adversely affect the central nervous system with symptoms including languor, sleepiness, weakness, emotional disturbances, spastic gait, mask-like facial expression and paralysis. Animal studies indicate that manganese exposure may increase susceptibility to bacterial and viral infections. Occupational overexposure (Manganese) is a progressive, disabling neurological syndrome that typically begins with relatively mild symptoms and evolves to include altered gait, fine tremor, and sometimes, psychiatric disturbances. May cause damage to lungs with repeated or prolonged exposure. Neurobehavioral alterations in worker populations exposed to MnO including: speed and coordination of motor function are especially impaired.

Section 11 - Toxicological Information (continued)

Delayed (chronic) Effects by Component (continued):

- **Molybdenum and Oxides:** Certain handling operations, such as burning and welding, may generate both insoluble molybdenum compounds (metal and molybdenum dioxide) and soluble molybdenum compounds (molybdenum trioxide). Molybdenum compounds generally exhibit a low order of toxicity with the trioxide the more toxic. However, some reports indicate that the dust of the molybdenum metal, molybdenum dioxide and molybdenum trioxide may cause eye, skin, nose and throat irritation in animals. Also has been reported to cause induction of tumors in experimental animals, suspected of causing cancer. Molybdenum oxide is suspected of causing cancer in humans.
- **Nickel and Oxides:** Exposure to nickel dusts and fumes can cause sensitization dermatitis, respiratory irritation, asthma, pulmonary fibrosis, edema, and may cause nasal or lung cancer in humans. Causes damage to lungs through prolonged or repeated inhalation exposure. IARC lists nickel and certain nickel compounds as Group 2B carcinogens (sufficient animal data). ACGIH 2013 TLVs® and BEIs® lists insoluble nickel compounds as confirmed human carcinogens. Suspected of damaging the unborn child.
- **Silicon and Oxides:** Silicon dusts are a low health risk by inhalation and should be treated as a nuisance dust. Eye contact with pure material can cause particulate irritation. Skin contact with silicon dusts may cause physical abrasion.

Section 12 - Ecological Information

12(a) Ecotoxicity (aquatic & terrestrial): No Data Available for **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as sold/shipped. However, individual components of the product when processed have been found to be toxic to the environment. Metal dusts may migrate into soil and groundwater and be ingested by wildlife as follows:

- **Iron Oxide**: LC_{50}: >1000 mg/L; Fish 48 h-EC_{50} > 100 mg/L (Currenta, 2008k); 96 h-$LC_0 \geq$ 50,000 mg/L. Test substance: Bayferrox 130 red (95 – 97% Fe_2O_3; < 4% SiO_2 and Al_2O_3) (Bayer, 1989a).
- **Aluminum Oxide:** LC_{50} >100 mg/l for fish and algae.
- **Hexavalent Chrome:** EU RAR listed as category 1, found acute EC_{50} and LD_{50} to algae and invertebrates < 1 mg.
- **Nickel Oxide:** IUCLID found LC_{50} in fish, invertebrates and algae > 100 mg/l.

12(b) Persistence & Degradability: No Data Available

12(c) Bioaccumulative Potential: No Data Available

12(d) Mobility (in soil): No data available for this product as sold/shipped. However, individual components of the product have been found to be absorbed by plants from soil.

12(e) Other Adverse Effects: None Known

Additional Information:

Hazard Category: Not Reported **Signal Word:** No Signal Word

Hazard Symbol: No Symbol

Hazard Statement: No Statement

Section 13 - Disposal Considerations

Disposal: Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp should be recycled whenever possible. Product dusts and fumes from processing operations should also be recycled, or classified by a competent environmental professional and disposed of in accordance with applicable federal, state or local regulations

Container Cleaning and Disposal: Follow applicable federal, state and local regulations. Observe safe handling precautions. European Waste Catalogue (EWC): 16-01-17 (ferrous metals), 12-01-99 (wastes not otherwise specified), 16-03 (off specification batches and unused products), or 15-01-04 (metallic packaging).

Please note this information is for Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp in its original form. Any alterations can void this information.

Section 14 - Transport Information

14 (a-g) Transportation Information:

US Department of Transportation (DOT) under 49 CFR 172.101 **does not** regulate **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a hazardous material. All federal, state, and local laws and regulations that apply to the transport of this type of material must be adhered to.

Shipping Name: Not Applicable (NA)	**Packaging Authorizations**	**Quantity Limitations**
Shipping Symbols: NA	**a) Exceptions:** NA	**a) Passenger, Aircraft, or Railcar:** NA
Hazard Class: NA	**b) Group:** NA	**b) Cargo Aircraft Only:** NA
UN No.: NA	**c) Authorization:** NA	**Vessel Stowage Requirements**
Packing Group: NA		**a) Vessel Stowage:** NA
DOT/ IMO Label: NA		**b) Other:** NA
Special Provisions (172.102): NA		**DOT Reportable Quantities**: NA

International Maritime Dangerous Goods (IMDG) and the Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID) classification, packaging and shipping requirements follow the US DOT Hazardous Materials Regulation.

Section 14 - Transport Information (continued)

14 (a-g) Transportation Information:

Regulations Concerning the International Carriage of Dangerous Goods by Road (ADR) does not regulate **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a hazardous material.

Shipping Name: Not Applicable (NA) **Classification Code:** NA **UN No.:** NA **Packing Group:** NA **ADR Label:** NA **Special Provisions:** NA **Limited Quantities:** NA	**Packaging** **a) Packing Instructions:** NA **b) Special Packing Provisions:** NA **c) Mixed Packing Provisions:** NA	**Portable Tanks & Bulk Containers** **a) Instructions:** NA **b) Special Provisions:** NA

International Air Transport Association (IATA) does not regulate **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a hazardous material.

Shipping Name: Not Applicable (NA) **Class/Division:** NA **Hazard Label (s):** NA **UN No.:** NA **Packing Group:** NA **Excepted Quantities (EQ):** NA	**Passenger & Cargo Aircraft Limited Quantity (EQ)**		**Cargo Aircraft Only:** **Pkg Inst:** NA **Max Net Qty/Pkg:** NA	**Special Provisions:** NA **ERG Code:** NA
	Pkg Inst: NA **Max Net Qty/Pkg:** NA	**Pkg Inst:** NA **Max Net Qty/Pkg:** NA		

Pkg Inst – Packing Instructions Max Net Qty/Pkg – Maximum Net Quantity per Package ERG – Emergency Response Drill Code

Transport Dangerous Goods (TDG) Classification: Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp does not have a TDG classification.

Section 15 - Regulatory Information

Regulatory Information: *The following listing of regulations relating to a U. S. Steel product may not be complete and should not be solely relied upon for all regulatory compliance responsibilities.* This product and/or its constituents are subject to the following regulations:

SARA Potential Hazard Categories: Immediate Acute Health Hazard; Delayed Chronic Health Hazard.

Section 313 Supplier Notification: The product, **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** contains the following toxic chemicals subject to the reporting requirements of section 313 of Title III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR part 372:

CAS #	Chemical Name	Percent by Weight
7440-47-3	Chromium	5.0 max
7440-50-8	Copper	2.5 max
7439-96-5	Manganese	3.0 max
7440-02-0	Nickel	5.0 max

State Regulations: The product, **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** as a whole is not listed in any state regulations. However, individual components of the product are listed in various state regulations:

California Prop. 65: Contains elements known to the State of California to cause cancer or reproductive toxicity. This includes chromium compounds and nickel.

Other Regulations:

WHMIS Classification (Canadian): The product, **Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp** is not listed as a whole. However individual components are listed.

Ingredients	WHMIS Classification
Copper	D2B, B4
Manganese	B4, D2A
Molybdenum	B4, D2B
Nickel	D2B
Silicon	B4

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Section 16 - Other Information

Prepared By: United States Steel Corporation

Revision History: **Expiration Date: 4/01/17**

4/1/2014 - Update to OSHA HAZ COM 2012.

12/16/10 – Combined the following three SDS's to create one that covers all three of these products:

Section 16 - Other Information (continued)

Revision History (continued):

Update of content and format to comply with GHS.

IHS Number	Product Name	USS Code	SRP Number
1848	Hot or Cold Rolled Alloy Steel Sheet/Strip & Hot Rolled Skelp	3A001	
22123	Hot or Cold Rolled Carbon Steel Sheet/Strip & Hot Rolled Skelp	3C011	
1652	Hot or Cold Rolled Carbon Steel Sheet/Strip & Hot Rolled Skelp	3H001	

Additional Information:

Hazardous Material Identification System (HMIS) Classification

Health Hazard	1
Fire Hazard	0
Physical Hazard	0

HEALTH= **1**, Denotes possible chronic hazard if airborne dusts or fumes are generated Irritation or minor reversible injury possible.

FIRE= **0**, Materials that will not burn.

PHYSICAL HAZARD= **0**, Materials that are normally stable, even under fire conditions, and will not react with water, polymerize, decompose, condense, or self-react. Non-explosives.

National Fire Protection Association (NFPA)

HEALTH = **1**, Exposure could cause irritation but only minor residual injury even if no treatment is given.

FIRE = **0,** Materials that will not burn.

INSTABILITY = **0**, Normally stable, even under fire exposure conditions, and are not reactive with water.

ABBREVIATIONS/ACRONYMS:

ACGIH	American Conference of Governmental Industrial Hygienists	**NIF**	No Information Found
BEIs	Biological Exposure Indices	**NIOSH**	National Institute for Occupational Safety and Health
CAS	Chemical Abstracts Service	**NTP**	National Toxicology Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	**ORC**	Organization Resources Counselors
CFR	Code of Federal Regulations	**OSHA**	Occupational Safety and Health Administration
CNS	Central Nervous System	**PEL**	Permissible Exposure Limit
GI, GIT	Gastro-Intestinal, Gastro-Intestinal Tract	**PNOR**	Particulate Not Otherwise Regulated
HMIS	Hazardous Materials Identification System	**PNOC**	Particulate Not Otherwise Classified
IARC	International Agency for Research on Cancer	**PPE**	Personal Protective Equipment
LC50	Median Lethal Concentration	**ppm**	parts per million
LD50	Median Lethal Dose	**RCRA**	Resource Conservation and Recovery Act
LD $_{Lo}$	Lowest Dose to have killed animals or humans	**RTECS**	Registry of Toxic Effects of Chemical Substances
LEL	Lower Explosive Limit	**SARA**	Superfund Amendment and Reauthorization Act
LOEL	Lowest Observed Effect Level	**SCBA**	Self-contained Breathing Apparatus
LOAEC	Lowest Observable Adverse Effect Concentration	**SDS**	Safety Data Sheet
µg/m^3	microgram per cubic meter of air	**STEL**	Short-term Exposure Limit
mg/m^3	milligram per cubic meter of air	**TLV**	Threshold Limit Value
mppcf	million particles per cubic foot	**TWA**	Time-weighted Average
MSHA	Mine Safety and Health Administration	**UEL**	Upper Explosive Limit
NFPA	National Fire Protection Association		

Disclaimer: This information is taken from sources or based upon data believed to be reliable. However, United States Steel Corporation makes no warranty as to the absolute correctness or sufficiency of any of the foregoing or that additional or other measures may not be required under particular conditions.

United States Steel Corporation

Hot or Cold Rolled Steel Sheet/Strip and Hot Rolled Skelp

Signal Word: **DANGER**

Symbols:

HAZARD STATEMENTS:

Suspected of causing cancer.
Suspected of damaging fertility or the unborn child.
Causes damage to lungs through prolonged or repeated inhalation exposure.
Harmful if swallowed.
May cause an allergic skin reaction.
May cause respiratory irritation.
Causes eye irritation.

PRECAUTIONARY STATEMENTS

Do not breathe dusts / fume / spray.
Wear protective gloves / protective clothing / eye protection / face protection.
Contaminated work clothing must not be allowed out of the workplace.
Use only outdoors or in well ventilated areas.
Wash thoroughly after handling.
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Do not eat, drink or smoke when using this product.
If inhaled: Remove person to fresh air and keep comfortable for breathing. If exposed, concerned or feel unwell: Get medical advice/attention.
If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If on skin: Wash with plenty of water. If irritation or rash occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse.
Dispose of contents in accordance with federal, state and local regulations.

United States Steel Corporation
600 Grant Street, Room 1662
Pittsburgh, PA 15219-2800
Original Issue Date: 08/01/1985
USS IHS #: SDS #52297
Phone Number : (412) 433-6840 (8:00 am to 5:00 pm)
Emergency Contact: 1-800-262-8200 (CHEMTREC)
Revised: 04/01/2014

SAFETY DATA SHEET

1. Identification

Product identifier **Rapid Set Concrete Mix**

Other means of identification

Product code 130010060, 130013000, 130040045, 130040047, 130040050, 131010060, 132013000, 132040050

Recommended use Industrial use.

Recommended restrictions Workers (and your customers or users in the case of resale) should be informed of the potential presence of respirable dust and respirable crystalline silica as well as their potential hazards. Appropriate training in the proper use and handling of this material should be provided as required under applicable regulations.

Manufacturer/Importer/Supplier/Distributor information

Company name CTS Cement Manufacturing Corporation

Address 11065 Knott Ave Suite A
Cypress, CA 90630
United States

Telephone 1-800-929-3030

E-mail info@ctscement.com

Contact person Safety Officer

Emergency telephone number 1-800-929-3030 (8 AM - 5 PM)

2. Hazard(s) identification

Physical hazards Not classified.

Health Hazards

Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 1
Carcinogenicity	Category 1A
Specific Target Organ Toxicity, Single Exposure	Category 3 respiratory tract irritation
Specific Target Organ Toxicity, Repeated Exposure	Category 2 (Lungs)

OSHA defined hazards Not classified.

Label elements

Signal word Danger

Hazard statement Causes skin irritation. Causes serious eye damage. May cause cancer. May cause respiratory irritation. May cause damage to organs (Lungs) through prolonged or repeated exposure.

Precautionary statement

Prevention Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe dust. Wash thoroughly after handling. Use in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

Response If exposed or concerned: Get medical advice/attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center/doctor. If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.

Storage Store in dry location. Store away from incompatible materials.

Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.
Hazard(s) not otherwise classified (HNOC)	None known.

3. Composition/information on ingredients

Mixtures

Chemical name	CAS number	%
Calcium Sulfoaluminate Cement	960375-09-1	20-35
Silica sand, quartz	14808-60-7	65-80

Composition comments All concentrations are in percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

4. First-aid measures

Inhalation If dust from the material is inhaled, remove the affected person immediately to fresh air. Call a physician if symptoms develop or persist.

Skin contact Remove contaminated clothing. Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye contact Do not rub eyes. Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention immediately.

Ingestion Immediately rinse mouth and drink plenty of water. Call an ambulance and take these instructions. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Upper respiratory tract irritation. Coughing. Discomfort in the chest. Shortness of breath. Wheezing. Skin irritation.

Indication of immediate medical attention and special treatment needed Provide general supportive measures and treat symptomatically. Keep victim under observation. Symptoms may be delayed.

General information If you feel unwell, seek medical advice (show the label where possible). Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

Suitable extinguishing media Water fog. Foam. Dry chemical powder. Carbon dioxide (CO2).

Unsuitable extinguishing media Do not use water jet as an extinguisher, as this will spread the fire.

Specific hazards arising from the chemical During fire, gases hazardous to health may be formed.

Special protective equipment and precautions for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Fire fighting equipment/instructions Move containers from fire area if you can do so without risk.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

General fire hazards No unusual fire or explosion hazards noted.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures
Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not breathe dust. Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.

Methods and materials for containment and cleaning up
Stop the flow of material, if this is without risk. If sweeping of a contaminated area is necessary use a dust suppressant agent which does not react with the product. Collect dust using a vacuum cleaner. Minimize dust generation and accumulation. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.

Environmental precautions
Avoid discharge into drains or water courses.

7. Handling and storage

Precautions for safe handling
Provide appropriate exhaust ventilation at places where dust is formed. Minimize dust generation and accumulation. Do not breathe dust. Do not get this material in contact with eyes. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices.

Conditions for safe storage, including any incompatibilities
Store in original tightly closed container. Store in dry location. Store away from incompatible materials (see Section 10 of the SDS).

8. Exposure controls/personal protection

Occupational exposure limits

US. OSHA Table Z-3 (29 CFR 1910.1000)

Components	Type	Value	Form
Silica, quartz (CAS 14808-60-7)	TWA	20 mppcf	
		0.3 mg/m3	Total dust.
		0.1 mg/m3	Respirable.
		2.4 mppcf	Respirable.

US. ACGIH Threshold Limit Values

Components	Type	Value	Form
Silica, quartz (CAS 14808-60-7)	TWA	0.025 mg/m3	Respirable fraction.

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value	Form
Silica, quartz (CAS 14808-60-7)	TWA	6 mg/m3	
	TWA	0.05 mg/m3	Respirable dust.

Biological limit values
No biological exposure limits noted for the ingredient(s).

Exposure guidelines
Occupational exposure to nuisance dust (total and respirable) and respirable crystalline silica should be monitored and controlled.

Appropriate engineering controls
Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Ventilation should be sufficient to effectively remove and prevent buildup of any dusts or fumes that may be generated during handling or thermal processing. If engineering measures are not sufficient to maintain concentrations of dust particulates below the Occupational Exposure Limit (OEL), suitable respiratory protection must be worn. Eye wash facilities and emergency shower must be available when handling this product.

Individual protection measures, such as personal protective equipment

Eye/face protection	Wear safety glasses or safety goggles unless full face respirator is in use.
Skin protection	
Hand protection	Wear appropriate chemical resistant gloves.
Other	Wear appropriate chemical resistant clothing. Use of an impervious apron is recommended.
Respiratory protection	Use a NIOSH/MSHA approved respirator if there is a risk of exposure to dust/fume at levels exceeding the exposure limits.
Thermal hazards	Wear appropriate thermal protective clothing, when necessary.
General hygiene considerations	When using, do not eat, drink or smoke. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Observe any medical surveillance requirements.

9. Physical and chemical properties

Appearance

Physical state	Solid.
Form	Powder.
Color	Tan.
Odor	Low.
Odor threshold	Not available.
pH	11 – 12 when wet
Melting point/freezing point	Not applicable.
Initial boiling point and boiling range	Not applicable.
Flash point	Not applicable.
Evaporation rate	Not applicable.
Flammability (solid, gas)	Non combustible.

Upper/lower flammability or explosive limits

Flammability limit - lower (%)	Not applicable.
Flammability limit - upper (%)	Not applicable.
Vapor pressure	Not applicable.
Vapor density	Not applicable.
Relative density	2.7-3.1 @ 20°C
Solubility(ies)	
Solubility (water)	Not available.
Partition coefficient (n-octanol/water)	Not applicable.
Auto-ignition temperature	Not applicable.
Decomposition temperature	2460 °F (1350 °C)
Viscosity	Not applicable.

Other information

Bulk density	60 lb/ft³
Partition coefficient (oil/water)	Not applicable.
VOC (Weight %)	0 g/L when mixed with water

10. Stability and reactivity

Reactivity	The product is stable and non-reactive under normal conditions of use, storage and transport.
Chemical stability	Material is stable under normal conditions.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Conditions to avoid	Avoid temperatures exceeding the decomposition temperature. Contact with incompatible materials. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).
Incompatible materials	Powerful oxidizers.
Hazardous decomposition products	Carbon oxides. Sulfur oxides. Silicium oxide.

11. Toxicological information

Information on likely routes of exposure

Inhalation	May cause damage to organs through prolonged or repeated exposure by inhalation. Inhalation of dusts may cause respiratory irritation. Prolonged inhalation may be harmful.
Skin contact	Causes skin irritation. Prolonged contact with wet cement/mixture may cause burns.
Eye contact	Causes serious eye damage. Prolonged contact with wet cement/mixture may cause burns.
Ingestion	Swallowing may cause gastrointestinal irritation.
Symptoms related to the physical, chemical and toxicological characteristics	Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Permanent eye damage including blindness could result. Upper respiratory tract irritation. Coughing. Discomfort in the chest. Shortness of breath. Wheezing. Skin irritation.

Information on toxicological effects

Acute toxicity	May cause respiratory irritation.
Skin corrosion/irritation	Causes skin irritation.
Serious eye damage/eye irritation	Causes serious eye damage.

Respiratory or skin sensitization

Respiratory sensitization	No data available.
Skin sensitization	No data available.

Germ cell mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
Carcinogenicity	May cause cancer. In 1997, IARC (the International Agency for Research on Cancer) concluded that crystalline silica inhaled from occupational sources can cause lung cancer in humans. However in making the overall evaluation, IARC noted that "carcinogenicity was not detected in all industrial circumstances studied. Carcinogenicity may be dependent on inherent characteristics of the crystalline silica or on external factors affecting its biological activity or distribution of its polymorphs." (IARC Monographs on the evaluation of the carcinogenic risks of chemicals to humans, Silica, silicates dust and organic fibres, 1997, Vol. 68, IARC, Lyon, France.) In June 2003, SCOEL (the EU Scientific Committee on Occupational Exposure Limits) concluded that the main effect in humans of the inhalation of respirable crystalline silica dust is silicosis. "There is sufficient information to conclude that the relative risk of lung cancer is increased in persons with silicosis (and, apparently, not in employees without silicosis exposed to silica dust in quarries and in the ceramic industry). Therefore, preventing the onset of silicosis will also reduce the cancer risk..." (SCOEL SUM Doc 94-final, June 2003) According to the current state of the art, worker protection against silicosis can be consistently assured by respecting the existing regulatory occupational exposure limits. Occupational exposure to respirable dust and respirable crystalline silica should be monitored and controlled.

IARC Monographs. Overall Evaluation of Carcinogenicity

Silica, quartz (CAS 14808-60-7) 1 Carcinogenic to humans.

NTP Report on Carcinogens

Silica, quartz (CAS 14808-60-7) Known To Be Human Carcinogen.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

Reproductive toxicity	May damage fertility or the unborn child.
Specific target organ toxicity - single exposure	May cause respiratory irritation.
Specific target organ toxicity - repeated exposure	May cause damage to organs (Lungs) through prolonged or repeated exposure.
Aspiration hazard	Due to the physical form of the product it is not an aspiration hazard.
Chronic effects	Prolonged or repeated exposure may cause lung injury, including silicosis. May cause skin disorders if contact is repeated or prolonged.

12. Ecological information

Ecotoxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
Persistence and degradability	No data is available on the degradability of this product.
Bioaccumulative potential	No data available.
Mobility in soil	No data available.
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.

13. Disposal considerations

Disposal instructions	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport information

DOT

Not regulated as dangerous goods.

IATA

Not regulated as dangerous goods.

IMDG

Not regulated as dangerous goods.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.

15. Regulatory information

US federal regulations	This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Not regulated.

OSHA Specifically Regulated Substances (29 CFR 1910.1001-1050)

Not listed.

CERCLA Hazardous Substance List (40 CFR 302.4)

Not listed.

Superfund Amendments and Reauthorization Act of 1986

(SARA) Hazard categories Immediate Hazard - Yes
Delayed Hazard - Yes
Fire Hazard - No
Pressure Hazard - No
Reactivity Hazard - No

SARA 302 Extremely hazardous substance

Not listed.

SARA 311/312 Hazardous chemical Yes

SARA 313 (TRI reporting)

Not regulated.

Other federal regulations

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

Clean Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Safe Drinking Water Act (SDWA) Not regulated.

US state regulations WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

US. Massachusetts RTK - Substance List
Silica, quartz (CAS 14808-60-7)

US. New Jersey Worker and Community Right-to-Know Act
Silica, quartz (CAS 14808-60-7)

US. Pennsylvania Worker and Community Right-to-Know Law
Silica, quartz (CAS 14808-60-7)

US. Rhode Island RTK

Not regulated.

US. California Proposition 65

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Silica, quartz (CAS 14808-60-7)

International Inventories

Country(s) or region	Inventory name	On inventory (yes/no)*
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates this product complies with the inventory requirements administered by the governing country(s).
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information, including date of preparation or last revision

Issue date 30-September-2014

Revision date -

Version # 01

HMIS® ratings Health: 3*
Flammability: 0
Physical hazard: 0

Disclaimer CTS Cement Manufacturing Corporation cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.

CONCRETE MIX

Very Rapid Hardening Concrete

PRODUCT DATASHEET

DESCRIPTION: Rapid Set® CONCRETE MIX is a high-performance, fast-setting, multi-purpose concrete repair material. Durable in wet environments, CONCRETE MIX is a blend of Rapid Set hydraulic cement and quality aggregates. CONCRETE MIX is non-metallic and no chlorides are added. Mix CONCRETE MIX with water to produce a workable, quality concrete material that is ideal where fast strength gain, high durability and low shrinkage are desired. CONCRETE MIX sets in 15 minutes and is ready for traffic in 1 hour.*

USES: Use CONCRETE MIX for general and structural concrete repair, construction of pavements, formed work, footings, setting posts, industrial floors and machine bases. CONCRETE MIX contains an air-entraining admixture, in some geographical areas, for freeze-thaw durability.

ENVIRONMENTAL ADVANTAGES: Use CONCRETE MIX to reduce your carbon footprint and lower your environmental impact. Production of Rapid Set cement emits far less CO_2 than portland cement. Contact your representative for LEED values and environmental information.

APPLICATION: Apply CONCRETE MIX in thicknesses from 2" to 24" (5 cm to 61 cm). For thinner sections, use Rapid Set® Cement All® or Rapid Set® Mortar Mix. Not intended for high heat applications above 300°F (149°C). For overlay applications, a minimum of one test section should be prepared to evaluate the suitability of the materials and procedures.

SURFACE PREPARATION: For repairs, application surface shall be clean, sound and free from any materials that may inhibit bond, such as oil, asphalt, curing compound, acid, dirt and loose debris. Roughen surface and remove all unsound material. Apply CONCRETE MIX to a thoroughly saturated surface with no standing water.

MIXING: The use of a power-driven mechanical mixer, such as a mortar mixer or a drill-mounted mixer, is recommended. Organize work so that all personnel and equipment are in place before mixing. Use clean potable water. **CONCRETE MIX may be mixed using 3.5 to 4.5 quarts (3.3 L to 4.2 L) of water per 60-lb (27.2-kg) bag. Use less water to achieve higher strengths. Do not exceed 4.5 quarts (4.2 L) of water per bag.** For increased fluidity and workability, use Rapid Set® FLOW Control® plasticizing admixture from the Rapid Set® Concrete Pharmacy®. Place the desired quantity of mix water into the mixing container. While the mixer is running, add CONCRETE MIX. Mix for the minimum amount of time required to achieve a lump-free, uniform consistency (usually 1 to 3 minutes). Do not retemper.

INSTALLATION: CONCRETE MIX may be placed using traditional construction methods. Organize work so that all personnel and equipment are ready before placement. Place, consolidate and screed quickly to allow for maximum finishing time. Use a method of consolidation that eliminates air voids. Do not wait for bleed water; apply final finish as soon as possible. CONCRETE MIX may be troweled, floated or broom finished. On flatwork, do not install in layers. Install full-depth sections and progress horizontally. To extend working time, use Rapid Set® SET Control® retarding admixture from the Concrete Pharmacy or cold mix water. Do not install on frozen surfaces. CONCRETE MIX may be applied in temperatures ranging from 45°F to 90°F (7°C to 32°C).

OVERVIEW

Highlights:

- Fast: Sets in 15 minutes, ready for traffic in 1 hour*
- Durable: Formulated for long life in critical applications
- Structural: For repair and new construction
- Multi-Purpose: Use for concrete repair, formed work, setting posts, footings, floors, machine bases, and more

Conforms to:

- ASTM: C928, C387
- State and Local Approvals

MasterFormat® 2016

03 01 30	Maintenance of Cast-in-Place Concrete
03 01 50	Maintenance of Cast Decks and Underlayment
03 01 70	Maintenance of Mass Concrete
03 33 00	Architectural Concrete - Cast-in-Place Concrete

Manufacturer:

CTS Cement Manufacturing Corp.
11065 Knott Ave., Suite A
Cypress, CA 90630
Tel: 800-929-3030 | Fax: 714-379-8270
Web: www.CTScement.com
E-mail: info@CTScement.com

CONCRETE MIX Very Rapid Hardening Concrete

CURING: Water cure all Rapid Set® CONCRETE MIX installations by keeping exposed surfaces wet for a minimum of 1 hour. Begin curing as soon as the surface starts to lose its moist sheen. When experiencing extended setting time due to cold temperature or the use of retarder, longer curing times may be required. The objective of water curing shall be to maintain a continuously wet surface until the product has achieved sufficient strength.

COLD WEATHER: Environmental and material temperatures below 70°F (21°C) may delay setting time and reduce the rate of strength gain. Lower temperatures will have a more pronounced effect. Thinner sections will be more significantly affected. To compensate for cold temperatures, keep material warm, use heated mix water, and follow ACI 306 Procedures for Cold Weather Concreting.

WARM WEATHER: Environmental and material temperatures above 70°F (21°C) may speed setting time and increase the rate of strength gain. Higher temperatures will have a more pronounced effect. To compensate for warm temperatures, keep material cool, use chilled mix water and follow ACI 305 Procedures for Hot Weather Concreting. The use of Rapid Set® SET Control® retarding admixture from the Rapid Set® Concrete Pharmacy® will help offset the effects of high temperatures.

YIELD & PACKAGING: CONCRETE MIX is available in 60-lb (27.2-kg) bags. One 60-lb (27.2-kg) bag of CONCRETE MIX will yield approximately 0.5 ft^3.

SHELF LIFE: CONCRETE MIX has a shelf life of 12 months when stored properly in a dry location, protected from moisture, out of direct sunlight, and in an undamaged package.

USER RESPONSIBILITY: Before using CTS products, read current technical data sheets, bulletins, product labels and safety data sheets at www.CTScement.com. It is the user's responsibility to review instructions and warnings for any CTS products prior to use.

WARNING: DO NOT BREATHE DUST. AVOID CONTACT WITH SKIN AND EYES. Use material in well-ventilated areas only. Exposure to cement dust may irritate eyes, nose, throat, and the upper respiratory system/lungs. Silica exposure by inhalation may result in the development of lung injuries and pulmonary diseases, including silicosis and lung cancer. Seek medical treatment if you experience difficulty breathing while using this product. The use of a NIOSH/MSHA-approved respirator (P-, N- or R-95) is recommended to minimize inhalation of cement dust. Eat and drink only in dust-free areas to avoid ingesting cement dust. Skin contact with dry material or wet mixtures may result in bodily injury ranging from moderate irritation and thickening/cracking of skin to severe skin damage from chemical burns. If irritation or burning occurs, seek medical treatment. Protect eyes with goggles or safety glasses with side shields. Cover skin with protective clothing. Use chemical resistant gloves and waterproof boots. In case of skin contact with cement dust, immediately wash off dust with soap and water to avoid skin damage. In case of skin contact with wet concrete, wash exposed skin areas with cold running water as soon as possible. In case of eye contact with cement dust, flush immediately and repeatedly with clean water, and consult a physician. If wet concrete splashes into eyes, rinse eyes with clean water for at least 15 minutes and go to the hospital for further treatment.

PROPOSITION 65 WARNING: This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Please refer to the SDS and www.CTScement.com for additional safety information regarding this material.

LIMITED WARRANTY: CTS CEMENT MANUFACTURING CORP. (CTS) warrants its materials to be of good quality and, at its option, will replace or refund the purchase price of any material proven to be defective within one (1) year from date of purchase. The above remedies shall be the limit of CTS's responsibility. Except for the foregoing, all warranties expressed or implied, including merchantability and fitness for a particular purpose, are excluded. CTS shall not be liable for any consequential, incidental, or special damages arising directly or indirectly from the use of the materials.

TYPICAL PHYSICAL DATA

Set Time, ASTM C403	
Initial set	15 minutes
Final set	35 minutes

Compressive Strength, ASTM C39	
1 hour*	3000 psi (20.7 MPa)
3 hours	3600 psi (24.8 MPa)
24 hours	4500 psi (31.0 MPa)
7 days	5500 psi (37.9 MPa)
28 days	6000 psi (41.4 MPa)

Slant Shear Bond, ASTM C882	
24 hours	1200 psi (8.27 MPa)
28 days	2200 psi (15.2 MPa)

Splitting Tensile, ASTM C496	
7 days	600 psi (4.14 MPa)
28 days	700 psi (4.83 MPa)

Flexural Strength, ASTM C78	
7 days	500 psi (3.45 MPa)
28 days	550 psi (3.79 MPa)

Length Change, ASTM C157 per C928 (max)**	
28 days in air	-0.04
28 days in water	0.02

*After final set
Data obtained at 4" slump by ASTM C143 at 70°F (21°C)

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FREEMAN

Technical Data Sheet

Beeswax

Description

Pure filtered Beeswax is a firm, light-colored wax having none of the softness or stickiness of lower-quality waxes. Beeswax is commonly used for modeling, engraving, and finishing leather, textile, and wood. Each cake weighs approximately 1 pound.

Physical Properties

Color	Light Yellow
Melting Point	143.6-149°F
Penetration @ 77°F	15.0-20.0
Specific Gravity	0.95-0.96
Flash Point	468-482°F
Acid Value	17.0-24.0
Ester Value	72.0-79.0

Ordering Information

SKU	Description	Size	Net wt.
027220	Beeswax	Cake	1 lb.

Safety Data Sheet

Beeswax

Section 1 Identification

HMIS	
H	0
F	1
R	0
PPE	Sec. 8

Product identifiers

Product name: Beeswax

Relevant identified uses

Identified uses: Pharmaceutical/Cosmetic/Personal Care

Details of the supplier of the safety data sheet

Freeman Manufacturing and Supply Company
1101 Moore Road, Avon, OH 44011
Phone (440) 934-1902
FAX (440) 934-7200

24 Hour Emergency Phone Number: (800) 424-9300

Section 2 Hazards Identification

GHS Classification

Not a hazardous substance

GHS Label

Symbols: Not applicable
Hazard Statements: None
Precautionary Statements: Contact with molten wax may cause thermal burns

Section 3 Composition/Information on Ingredients

Component	CAS Number	Weight %
Beeswax	8006-40-4 (yellow)	100

Impurities/Additives: None

Section 4 First Aid Measures

Eye Contact

Eye irritation. Flush immediately with large amounts of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Get immediate medical attention.

Skin Contact

For contact with molten material, leave material on skin and flush or immerse affected area(s), using cold water. Seek Medical Attention.

Inhalation

If respiratory symptoms develop from exposure to fumes emitted by the molten material, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.

Ingestion

Solid material is not acutely toxic; however, if molten material is swallowed, seek immediate medical attention.

Section 5 Fire-Fighting Measures

Extinguishing media

Use dry chemical, foam, sand, water fog

Special hazards arising from the substance or mixture

This material may burn, but will not readily ignite

Advice for firefighters

Wear proper protective equipment and positive pressure self-contained breathing apparatus.

Section 6 Accidental Release Measures

Isolate area and keep unauthorized personnel out. Contain spill if it can be done with minimal risk. Wear appropriate protective equipment. Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways. Cleanup molten wax under supervision is advised.

Section 7 Handling and Storage

Precautions for safe handling

Wash thoroughly after handling. Do not wear contaminated clothing or shoes. Use good personal hygiene practice.

Conditions for safe storage, including any incompatibilities

Store in tightly closed containers in cool, dry, well-ventilated area away from heat, sources of ignition and incompatibles such as strong oxidizers. Store at ambient or lower temperature. Store out of direct sunlight. Protect against physical damage.

Section 8 Exposure Controls/Personal Protection

Components with workplace control parameters

None

Personal protective equipment

Skin Protection

When handling in molten form, proper resistant clothing, gloves, and shoes must be worn.

Eye Protection

When handling in molten form, proper eye shields are worn to prevent injury

Respiratory Protection

No special precautions for normal use

Section 9 Physical and Chemical Properties

Appearance:	Yellow solid at room temperature
Odor:	Wax
Odor Threshold:	None
pH:	None
Melting Point:	62 - 65°C
Initial Boiling Point:	Not applicable
Evaporation Rate:	Not applicable
Flash Point:	400°C

Section 9 Physical and Chemical Properties continued

Flammability:	Not flammable
Vapor Pressure:	Not applicable
Vapor Density:	Not applicable
Specific Gravity:	0.96 g/ml at 20°C
Solubility:	Insoluble in water. Soluble in organic solvents when warmed
Partition Coefficient:	Not determined
Auto-ignition Temperature:	Not applicable
Decomposition Temperature:	Not applicable
Volatility:	Not applicable
Viscosity:	8 - 12 cSt at 100°C

Section 10 Stability and Reactivity

Reactivity: This material is stable and unlikely to react in a hazardous manner under normal conditions of use.
Chemical Stability: Stable under normal conditions. Avoid strong oxidizing agents.
Hazardous Reactions: Avoid strong oxidizing agents.
Decomposition Products: Thermal decomposition can produce a variety of products which may include oxides of carbon and nitrogen.

Section 11 Toxicological Information

Signs and Symptoms of Overexposure

Nasal and throat irritation.

Acute Effects

Eye Contact: Not expected to be an eye irritant
Skin Contact: No harmful effects from skin adsorption.
Inhalation: Vapors emitted from molten wax are expected to have slight degree of irritation
Ingestion: No harmful effects are expected.

Acute Toxicity Values

CIR Review of Natural Waxes published in 2005. FDA: GRAS (Generally Recognized As Safe) Title 21 CFR 184.1973

Section 12 Ecological Information

Toxicity	No data available
Persistence and degradability	Readily biodegradable
Bioaccumulative potential	Not expected
Mobility in soil	No data available
Results of PBT & vPvB assessment	No data available

Section 13 Disposal Considerations

Not considered a RCRA hazardous waste if discarded. Disposal must be made in accordance with all applicable Local, State and Federal regulations.

Section 14 Transport Information

DOT: Not regulated
TDG: Not regulated
IMDG: Not regulated
IATA: Not regulated

Section 15 Regulatory Information

U.S. Federal Regulations

Toxic Substances Control Act (TSCA): All components of this product are included on the TSCA inventory.

Clean Water Act (CWA): Not hazardous.

Clean Air Act (CAA): Not Hazardous

Superfund Amendments and Reauthorization Act (SARA) Title III Information: This product contains no toxic chemical(s) subject to reporting requirements of SARA Section 313 (40 CFR 372)

State Regulations

California: This product contains no chemicals(s) known to the State of California to cause cancer, birth defects or reproductive harm.

International Regulations

Canadian Environmental Protection Act: All of the components of this product are included on the Canadian Domestic Substances list (DSL).

Canadian Workplace Hazardous Materials Information System (WHMIS): This product has not been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

European Inventory of Existing Chemicals (EINECS): All of the components of this product are included on EINECS.

EU Classification: None **EU Risk (R) and Safety (S) Phrases**: None

Section 16 Other Information

Disclaimer

The following supersedes Buyer's documents. SELLER MAKES NO REPRESENTATION OR WARRANTY, EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. No statements herein are to be construed as inducements to infringe any relevant patent. Under no circumstances shall Seller be liable for incidental, consequential or indirect damages for alleged negligence, breach of warranty, strict of liability arising in connection with the product(s). Buyer's sole remedy and Seller's sole liability for any claims shall be Buyer's purchase price. Data and results are based on controlled lab work and must be confirmed by Buyer by testing for its intended conditions of use. The product(s) has not been tested for, and is therefore not recommended for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended; or for uses for which implantation within the human body is intended.

Public Art Program Finalist Proposal

$150,000 Award Category

Bronze Squid

Artist: Rossella Scapini & Luke Heimbigner

Proposed Location: Bay Trail at West Hornet Avenue: 61 West Hornet Avenue

Call ID: 1240733 Artist ID: 57967
Status: Received

rossella scapini

Custom Answers

Artist StatementDescription of the artist or team’s interest in the project, initial vision for the work, and relevant experience or background. Include contact information: name, address, phone, and email. (3000 characters maximum, including spaces)

Team: Rossella Scapini and Luke Heimbigner
We envision an iconic new symbol for Alameda Point, a 12 feet tall bronze sculpture that will draw attention and make the area immediately recognizable, combining elements of the site's historic naval past with the increasing awareness for marine conservancy.
Rossella Scapini has extensive experience in figurative sculpture and bronze casting, has worked with several local and international artists and companies such as:
-Scientific Art Studio, Richmond CA, where she created scientific replicas of flora and fauna for zoos and natural parks,
-Artworks Foundry, Berkely CA, supervising the sculpting and large scale mold making department,
-Mario Chiodo's "Remember Them" monument in downtown Oakland,
-Grup Graf, Barcelona Spain, creating sculptures for water parks and movies.
Luke Heimbigner is a bronze and metal sculptor, with a long experience as a metal chaser for Artworks Foundry, Berkeley CA.
Among the artists he has worked with are Stephen DeStaebler, Bruce Wolfe and Bruce Beasley.
Both artists show regularly at Vessel Gallery, Oakland CA.

Concept of Proposed Art PieceDescription of the concept of the proposed project, including the design intent, color, size, materials, lifetime and fabrication processes. (2000 characters maximum, including spaces)

The project is for a 12 feet tall bronze sculpture in the shape of a stylized squid standing erect on its arms. Tall and sleek, the sculpture is envisioned as a design object rather than a realistic animal, with the tentacles working as arches/columns, allowing people to walk between the inner/outer space they create. The domed space within the tentacles will be roughly 6 feet wide and, being the sculpture hollow, just a little of 12 feet high.
Instead of suckers, the tentacles will have a single line of porthole-shaped rings, a reference to the naval past of Alameda Point, allowing more light and interaction. The portholes will not be open, but have either glass or plexiglass to avoid collecting litter on the bottom of each tentacle.
As an outdoor bronze sculpture, the color will be the usual dark brown (other patinas fade due to the elements) but the portholes and the rim of the eyes will have a contrasting, dark amber/copper tone.
Fabrication process:
The artists team will sculpt a 12 ft model (based on an existing 26 inches model created in 2017 by Rossella Scapini) in EPS foam and clay, complete with details and texture, and proceed to make a rubber mold of it. The piece will then be cast using the lost wax casting technique at Artworks Foundry in Berkeley, CA, that will cast, assemble and finish the sculpture.

Concept DesignA rendering of your conceptual design, including multiple viewpoints/angles, if possible.

squid.jpg

LocationThe location in the City of Alameda where the project will be installed, including address.

Alameda Point Shoreline, south of Hornet Field

Location PhotosUp to 5 photos of the proposed project location, in one file.

loc.jpg

Location - Letter of SupportA letter of support from the property owner, or other documentation, must be provided. Within the letter, the property owner must acknowledge that the owner will be accepting responsbility for the maintenance and insurance of the artwork, and that the City of Alameda will maintain ownership of the artwork for its established lifetime. For land owned by the City of Alameda or a public agency, a letter of support from the head of the department overseeing the property is sufficient. (1 page maximum)

Scapini Rossella_Public Art Letter of Support_2017.pdf

Budget EstimateEstimated, itemized budget for the proposed project, including costs for materials, fabrication, installation, the required 10% contingency, and any other relevant costs. (2 page maximum)

budget.estimate.docx

Project ScheduleEstimated schedule for completion of work (1 page maximum)

schedule.docx

ResumeCurrent professional resume (1 page maximum, front and back)

Heimbigner.resume.pdf

City of Alameda • California

Public Art Commission Members,

As the Assistant Director of the Community Development Department, I have reviewed the proposal submitted by Rossella Scapini for the property at Bay Trail near WETA. I believe this artwork will be an important addition to the site, and will provide cultural benefits to the Alameda community.

The Base Reuse and Community Development departments support the proposed artwork, and understands that, should the artwork be selected for award and installation, the City of Alameda will be taking on all maintenance and insurance costs associated with the artwork.

Sincerely,

Nanette Mocanu
Assistant Community Development Director
Community Development Department
2263 Santa Clara Avenue, Room 120
Alameda, CA 94501

ESTIMATED BUDGET EXPENSES

MODEL FABRICATION COSTS:	
• Metal structure armature	$ 250.00
• EPS foam	$ 1,700.00
• Clay (plasticine)	$ 2,000.00
MOLD MAKING COSTS:	
• Urethane rubber	$ 1,500.00
• Plaster	$ 350.00
• Fiberglass	$ 200.00
• Fabrication	$ 10,000.00
BRONZE CASTING COST:	
• Cast, assemblage, finish, patina	$ 60,000.00
TRANSPORTATION AND INSTALLATION	$ 4,000.00
CONTINGENCY FEE	$ 8,000.00
TOTAL ESTIMATED COST	**$ 80,000.00**

PROJECT SCHEDULE

1. Model fabrication completion	8-10 months from approval
2. Bronze casting completion	6-8 months after (1) model completion
3. Installation	2-4 weeks after (2) bronze completion
Estimated completion date	**June 2019**

Luke Heimbigner

Education

2006 Bachelor of Fine Arts, concentration in Sculpture, Minor in Media Arts. The University of Montana, Missoula.

Exhibitions

2016 Scaffolding 3D,
Vessel Gallery, Oakland, California-Sept
2016 Alter Egos,
Sunpower Egress Gallery, Richmond, California-Sept
2016 Trails and Vistas,
Donner Summit, Truckee, California-Sept
2015 Botanica,
Bedford Gallery, Walnut Creek, California-July
2015 Title Unknown
Space1213, Oakland, California-May
2014 More than one way,
Southern Exposure, San Francisco, California-November
2014 Gallatin Art Crossing,
Downtown Bozeman, Bozeman, Montana-August 2014-August 2015
2014 Sculpture in the garden,
The Ruth Bancroft garden, Walnut Creek, California-June
2013 Sharp,
Waker studios, Bozeman, Montana-July
2013 Davies after hours
Davies Symphony Hall, San Francisco, California-March
2012 Vessel 8: Charting the Waters,
Vessel Gallery, Oakland, California-May
2012 Horizons of Promise,
Vessel Gallery, Oakland, California-March
2011 Umi to Yama,
Vessel Gallery, Oakland, California-December
2011 Spring showcase,
Vessel Gallery, Oakland, California-May
2007-16
Moonlight Pour shows,
Artworks Foundry, Berkeley, California
2006 BFA Exhibition,
Gallery of Visual Arts, The University of Montana, Missoula

Academic Awards

2005/2006
The Walter Hook Memorial Scholarship,
The Art Department, The University of Montana, Missoula.

Selected Press and Reviews

2012 Photograph in Art Voices Magazine-August
2011 Advertisement in ArtLtd. Magazine-December
2011 Review by Dewitt Cheng in the East Bay Express-December

Professional and Related Experience

2015 to present	Independent chasing and metal fabrication.
2007 to 2015	Metal chaser, mold maker, and foundry worker, Artworks Foundry, Berkeley, California.
Spring 2010	Attended 2nd Western Cast Iron Art Conference, Missoula, Montana.
Summer 2008	Attended Western Cast Iron Art Conferencce, Denver, Colorado.
Spring 2006	Attended 5th International Conference on Contemporary Cast Iron Art, Telford, England.

Public Art Projects I've been involved with

2008 Daub Firmin Studios,
Allegories of Civilization, Utah State Capitol, Salt Lake city, Utah
2008 Daub Firmin Studios,
Abraham Lincoln as a Boy, Town circle, Hodgenvile, Kentucky
2008 Shawn Smith
Doppel Fountain, SKS Fibro Gen building, San Francisco, California
2008 Patricia Borum,
Spanish Rider and Horse, "Andalusia at Coral Mountains," La Quinta, California
2009 Brian Goggin,
Speechless, Lafayette library, Lafayette, California
2010 Ron Barron,
Stratigraphy, San Jose Library/community center, San Jose, California
2011 Mildred Howard,
The House Will Not Pass for Any Color but its Own, Sacramento International Airport, Sacramento, California
2012 Mario Chiodo,
Remember Them, Henry J. Kaiser Memorial Park, Oakland, California

ROSELLA SCAPINI

AWARD $150,000

CITY OF ALAMEDA PHYSICAL PUBLIC ART PROPOSAL

The following proposal exemplifies details of Rossella Scapini and Luke Heimbigner's "Squid" project as physical public art for the City of Alameda.

CONCEPT OF ART PIECE

We envision an iconic new symbol for Alameda point, a 12 foot tall bronze sculpture that will draw attention and make the area immediately recognizable, combining the elements of the site's historic naval past with the increasing awareness for marine conservancy.
The project is for a 12 foot tall bronze sculpture in the shape of a stylized squid standing erect on its arms. Tall and sleek, the sculpture is envisioned as a design object rather than a realistic animal, with the tentacles working as arches/columns, allowing people to walk between the inner/outer space they create. The domed space between the tentacles will be roughly 6 feet wide and, being the sculpture hollow, just a little less of 12 feet high.
Instead of suckers, the tentacles will have a single line of portholes-shaped rings, a reference to Alameda Point's naval past. The portholes will be closed with a metal screen; this will avoid collecting litter inside, and at the same time will allow light and interaction.
We wish to find original portholes from historical ships in Alameda (possibly 3 different sizes) to cast and use in the sculpture!

CONSTRUCTION PROCESS

To create the bronze sculpture the artists will first get a digital scan of the display model and enlarge it in foam through a CNC milling process (Scan by ScanSite, Marin CA; foam enlargement by Satellite Studio, Belmont CA)
We will then resurface the sculpture with clay to create the right texture and add details before proceeding in making the mold in rubber and plaster. The piece will then be cast using the lost wax technique, assembled and finished. It will sit on a specifically designed concrete pad that will be built on location prior to the installation.

SITE PLAN

The designed location for this project is the Alameda Point Shoreline, on the lot west of the Hornet Soccer Field. The sculpture will be installed on the lot's south western edge where a dirt road connects the shoreline to W Hornet Ave. Such lot is currently vacant, with no trees or any other visible elements. On the other side of the dirt road is another grassy lot with some trees.
The sculpture will be facing the water, oriented towards the Bay Trail.

MATERIALS

The sculpture will be made of cast bronze and stainless steel, anchored to a concrete pad.
-**BRONZE**: alloy composed of 96% copper, zinc and other elements in smaller quantities.
-**MARINE GRADE STAINLESS STEEL**: SAE 316 stainless steel is a molybdenum-alloyed steel and is the preferred steel for use in marine environments because of its greater resistance to pitting corrosion.
-**CONCRETE PAD**: Reinforced Concrete (composition of three main components: coarse aggregate (stone), fine aggregate (sand) and cement) with steel rebars to strengthen and hold concrete in compression.

INSTALLATION AND MAINTENANCE PLAN

Kenneth Hughes is the designed structural engineer for the project (**krhughes@pacbell.net**)

The sculpture will be transported to location via flatbed truck, unloaded and installed with a forklift of appropriate capacity. Onsite the piece will be secured to the pad, bolting the inner stainless steel to the concrete. (The sculpture's feet will have openings in order to access the stainless steel, once secured they will be closed with bolts)

The sculpture is designed to have a green teal patina with a pattern of layered colors, stains and spots. In proximity of marine environment it will naturally oxidize towards a green mint, adding greenish hues and coppery dots that will enrich the color scheme.

Care and maintenance for an outdoor bronze requires cleaning and waxing. Dust and bird droppings will be removed with light soap water using rags and brushes. Once rinsed and dried-usually in a couple of hours-, the sculpture will need to be waxed, wax being the real barrier that seals the bronze from the outdoor elements.

Johnson's Clear Paste Wax or Renaissance Wax are some recommended products.
This maintenance plan should be performed once a year in the first five years, and then biannually.

ARTISTS TEAM

Rossella Scapini has extensive experience in figurative sculpting and bronze casting, has worked with local and international artists such as:

- Scientific Art Studio, Richmond CA, where she created scientific replicas of flora and fauna for the San Francisco Zoo and the Oakland Zoo,
- Artwork Foundry, Berkeley CA, supervising sculpting and large scale mold making department,
- Mario Chiodo's "Remember Them" monument in downtown Oakland,
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Both artists show regularly at Vessel Gallery, Oakland CA>

City of Alameda Public Art Budget Template

Note: this budget includes mandatory cost categories (engineering, permit costs, and contingency). Please add your budget line items to this sheet.

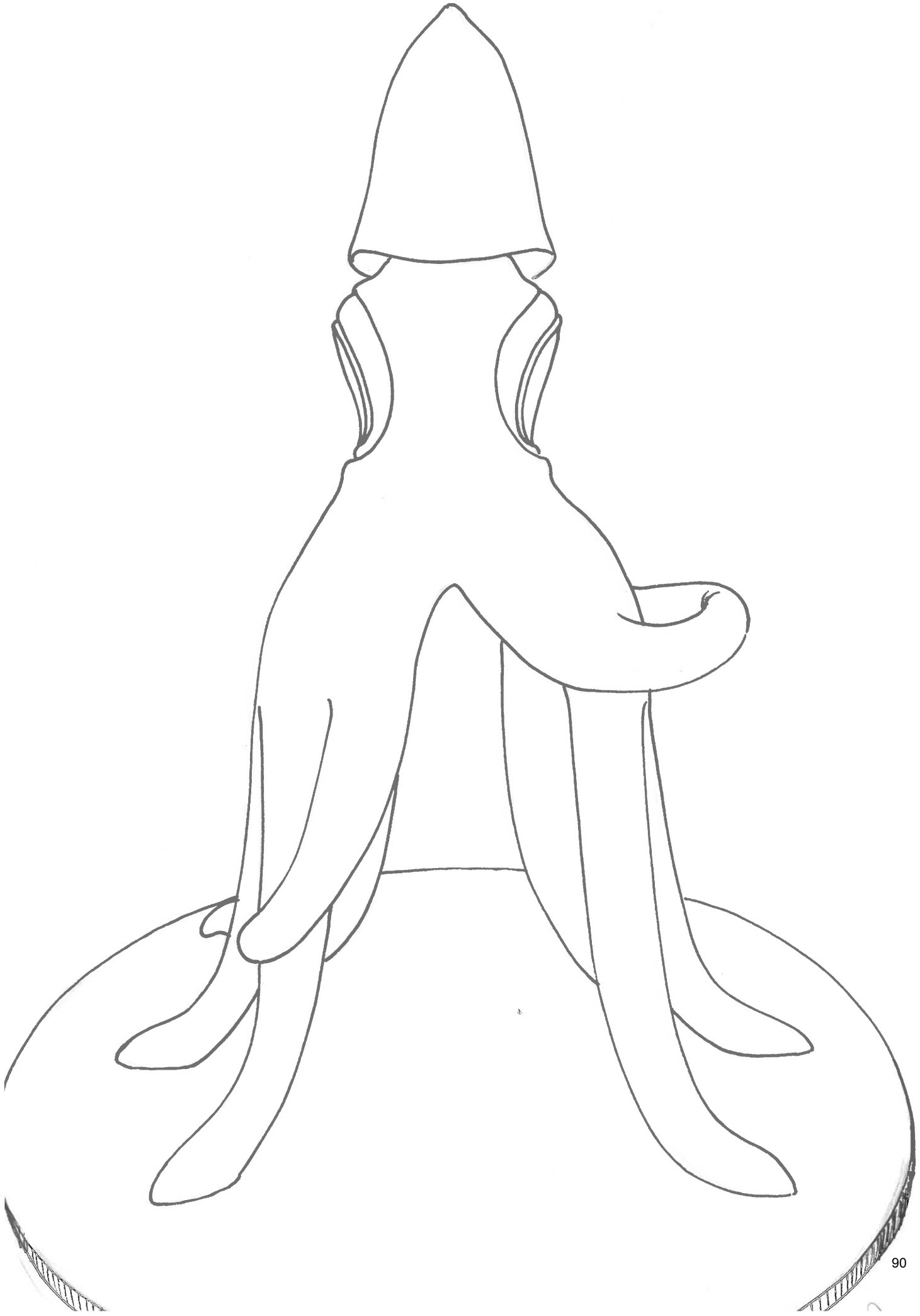
Item	Amount	Notes
MODEL MAKING		
3D scan	**1,000.00**	
foam enlargement	**4,600**	
oil based clay	**2,000**	
MOLD MAKING		
urethne rubber	**4,000**	
plaster	**1,000.00**	
fiberglass	**500**	
BRONZE		
cast bronze	**90,000.00**	
stainless steel marine grade 3/16	**5,000.00**	
concrete pad	**1,300.00**	
TRANSPORT AND INSTALLATION	**3,000.00**	
ARTISTS STIPEND	**20,000.00**	
Engineering	**2,500.00**	
Permit costs	1,500.00	Estimated at $1,500 for $150,000 artwork, and $1,000 for $50,000 artwork
Subtotal	136400	
10% contingency	13640	
Total	150040	

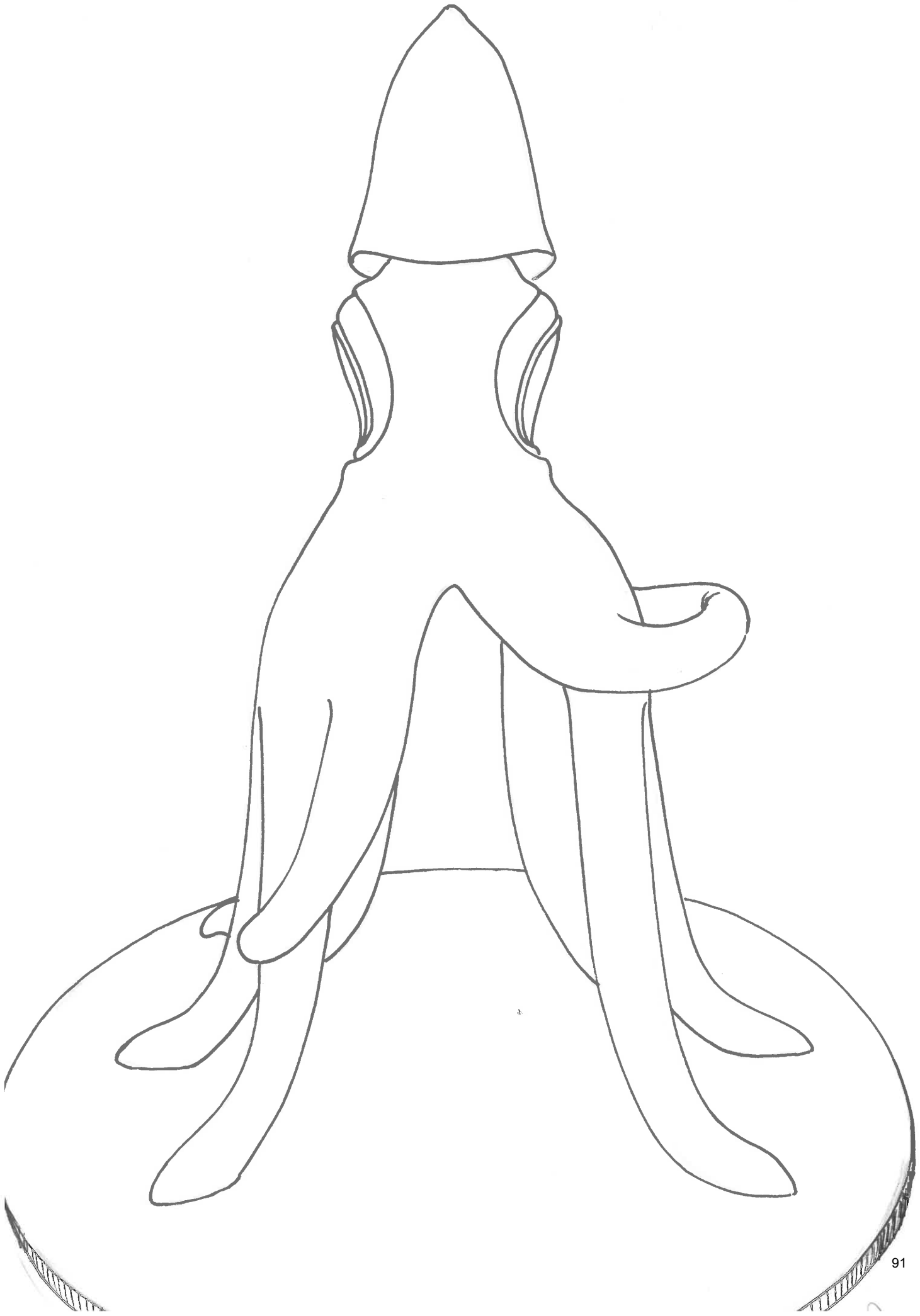
City of Alameda Public Art ScheduleTemplate

Note: we know start dates may vary, so please use days or weeks from start to show schedule timelines (i.e. complete in week 1 or week 3 etc)

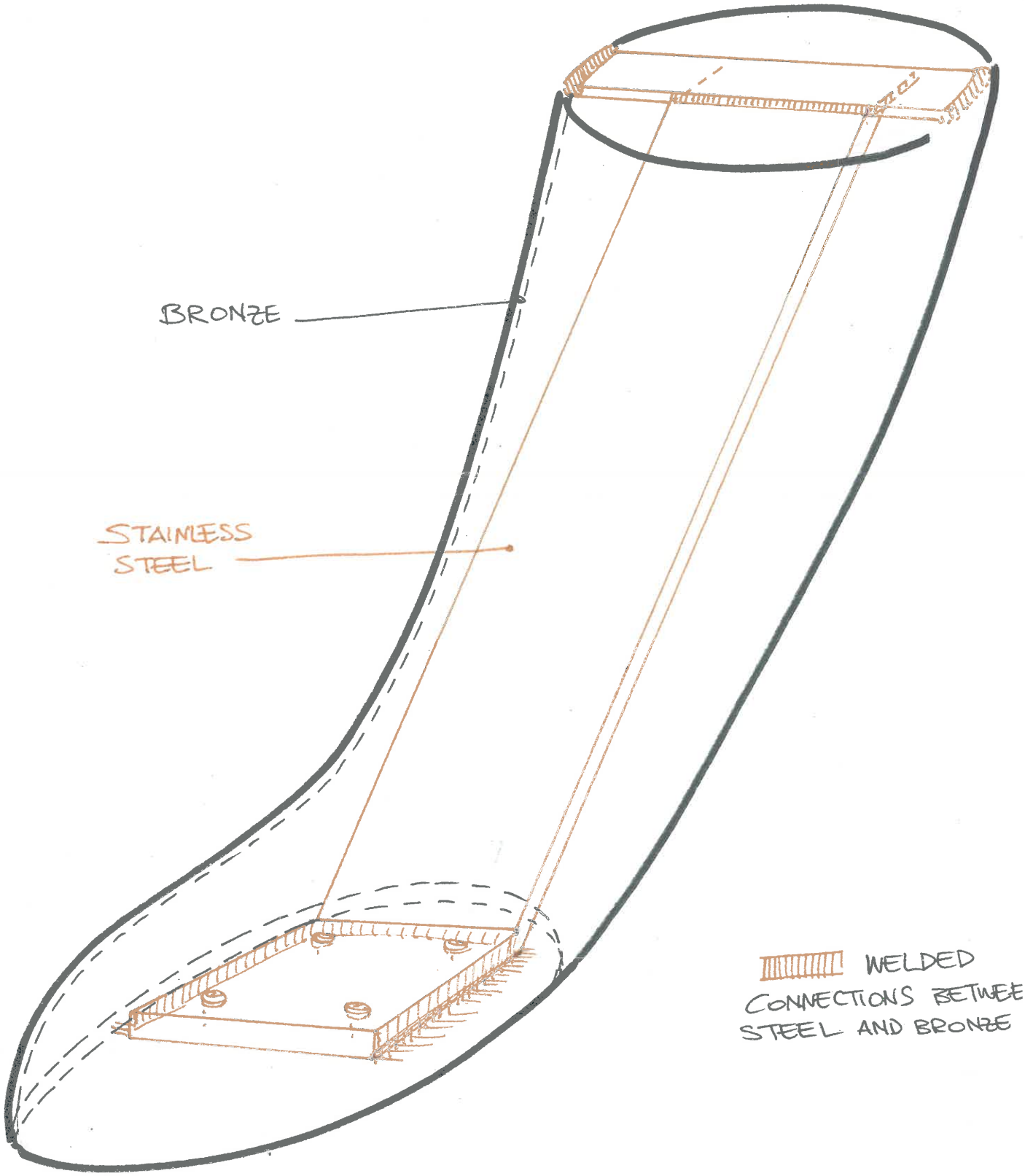
Note: This is a template schedule with suggested dates. Please edit as needed.

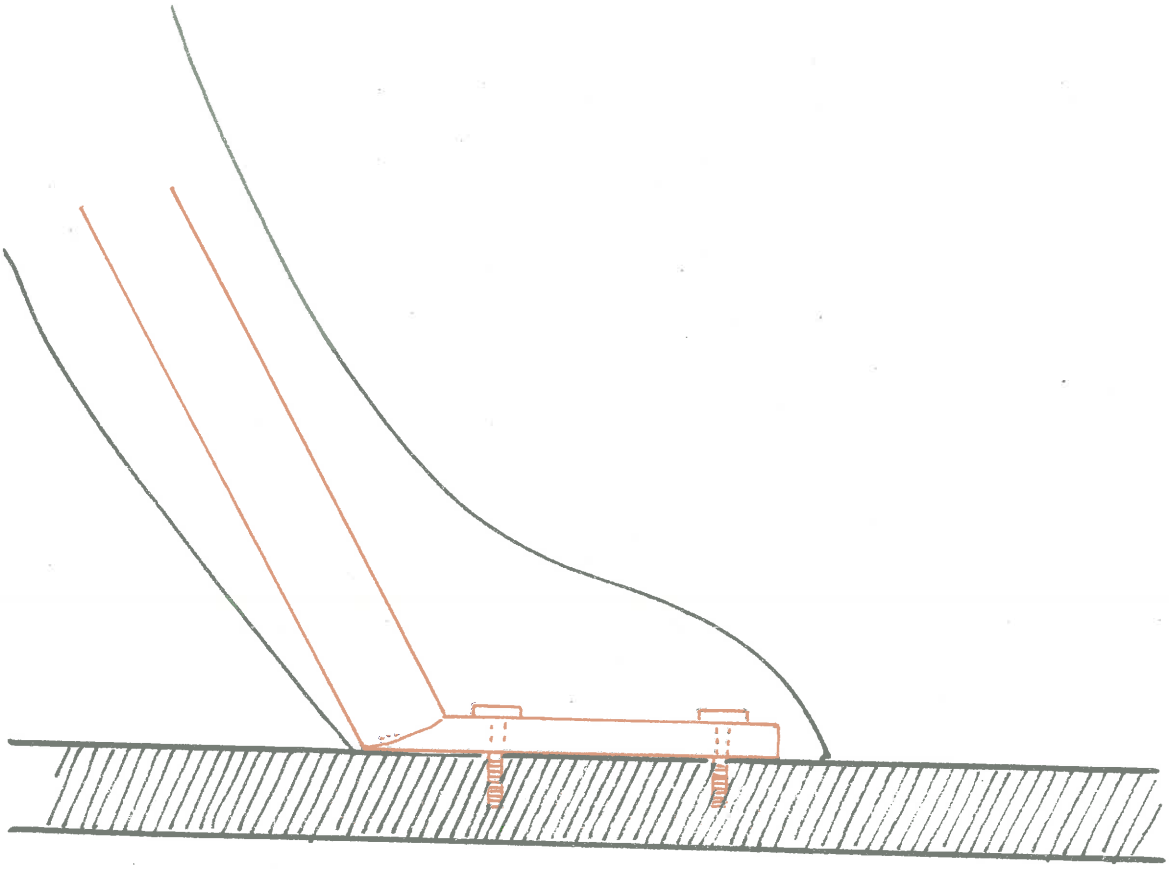
	Day or Week	Notes
Complete Schematic drawings	2 weeks	Similar to a conceptual drawing, but with more context and detail (this may be a part of your detailed proposal)
Complete design development drawings	4 weeks	Should include scale, size, and materials; may also include weight.
Complete 80% construction drawings	10 weeks	Near complete construction drawings - some details may be undecided, or presented as alternatives
Complete 100% construction drawings	12 weeks	Complete construction drawings
Commence permit process	14 weeks	
Commence fabrication	15 weeks	assemble foam, resurface
Fabrication 50% complete	40 weeks	mold, wax
Fabrication 100% complete	80 weeks	cast, finish, patina
Installation	84 weeks	





STAINLESS STEEL
REINFORCEMENT STRUCTURE
#1


BRONZE
STAINLESS STEEL
WELDED CONNECTIONS BETWEE STEEL AND BRONZE



STAINLESS STRUCTURE
REINFORCEMENT
#2