

## Action Center to End World Hunger Instructions and Bid Forms

January 11, 2008

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January 11, 2008



Name  
Fabricator / Systems Integrator /  
Street Address  
City, State Zip

Dear Prospective Bidder:

On behalf of MercyCorps (MC), LandAir Project Resources, Inc. (LAPR) and ESI Design (ESI) are pleased to solicit your bid for Exhibit Fabrication or Systems Integration for two new interactive educational spaces. The first project, The Action Center to End World Hunger (ACWH) will be completed in Battery Park City, in lower Manhattan, in September 2008. The second Center, similar in design, is targeted for installation at MercyCorps' headquarters in Portland, Oregon, for the summer of 2009. Both locations are covered in this proposal; however Bidders must respond with separate bids for each project.

Two separate contracts will be awarded for each project: 1) Exhibit Fabrication and 2) Systems Integration in New York, and 1) Exhibit Fabrication and 2) System Integration in Portland.

Sealed bids are due no later than 2pm EST on February 11, 2008. Please refer to the Bid Instructions for details on submitting the proposal.

The Action Center to End World Hunger will attract passer-bys with bold graphics displaying positive messages about how their time can help the fight against world hunger. Once inside, staff members greet visitors and provide them with additional information about the ACWH. An orientation video in the Briefing Area discusses the root causes of world hunger, while the staffed Information Hub presents up to the minute information about this and other MercyCorps projects. Located at the heart of the Center are four Training Towers presenting interactive videos. The Training Towers can be used in conjunction with movable huts so that groups can gather to discuss world hunger issues with staff members. The perimeter of the space consists of a Global Status Wall (an exciting visual and contextual interactive exhibit), artifact cases, Take Action Stations (computer stations for visitor discovery), a photo wall, and a retail table. Each exhibit component is designed for maximum flexibility so that the ACWH can

adapt to their space and the ever-changing struggle to alleviate world hunger.

**DESIGN.**


The Owner requires that the Exhibit Fabricator implement practices and procedures that meet the project's environmental performance goals, which include achieving Platinum LEED Certification for Commercial Interiors. Specific project goals that may impact this area of work are listed in the Exhibit Fabricator Specifications and other sections of the bid documents. The Contractor shall ensure that the requirements related to these goals are implemented.

MercyCorps, LandAir Project Resources, Inc. and ESI Design encourage bidders to submit all notes, recommendations and questions concerning the project. Please refer to the Bid Instructions on how bid information requests will be handled. All correspondence and questions will be done via email. No calls will be accepted.

All requests for information must be submitted by Friday, January 25, 2008. The project team will collect all questions and respond on Friday, February 1, 2008.

Thank you for your interest in the Action Center to End World Hunger. We look forward to reviewing your bid proposal.

Sincerely,



Candace Jackson  
Project Consultant  
cjackson@projectresoucesgroup.com

Trip Kyle  
Production Manager  
tkyle@esidesign.com

## **Bid Instructions**

Action Center to End World Hunger

January 11, 2008

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### **1. Preparation of Bids**

Bidders are responsible for examining with appropriate care all of the Bid Documents and it is their responsibility to inform themselves with respect to all conditions which might in any way affect the cost or the time for performance of all or any part of the work.

The Bidder should prepare and submit the following as an integral part of the Bid:

1. Bidder's Qualifications and Staffing Plan Form (This includes resumés of key staff assigned to the project. Also, bidders must identify and submit qualifications for all key subcontractors.)
2. Two Exhibit Fabrication Bids forms: One for New York and one for Portland (All bids shall be submitted on the bid form and broken out as indicated on said form. Bids submitted with items missing will be disqualified.)

and/or

3. Two Systems Integration Bid forms: One for New York and one Portland (All bids shall be submitted on the bid form and broken out as indicated on said form. Bids submitted with items missing will be disqualified.)
4. Production Schedule (This must include a schedule for payment disbursement and associated milestones).

Any clarification, interpretation or correction will be issued to all prospective Bidders in writing as an Addendum and will become a part of the Bid Documents.

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### **2. Submission of Bids and the Final Submission Date**

A sealed bid opening is scheduled for 2 pm EST on Monday, February 11, 2008 (Final submission time).

Two separate packages shall comprise the complete bid submittal:

1. Bid Qualifications
2. Exhibit Fabrication and/or Systems Integration Bid Forms & Production Schedule (Fee proposal)

## **Bid Instructions**

Action Center to End World Hunger

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The bid components must be submitted separately as follows:

The **Bid Qualifications must be submitted electronically in pdf format** to the attention of: [cjackson@projectresourcesgroup.com](mailto:cjackson@projectresourcesgroup.com). In addition, two (2) bound hard copies of the bid qualifications must be submitted in a sealed envelope.

**The Exhibit Fabrication and/or Systems Integration Bid Forms and Production Schedule must be submitted ONLY in a separate sealed envelope**, containing two (2) hard copies. Please mark the envelopes "Sealed Bid" and with the project name, company name, and date of bid submission clearly labeled.

Bids must be signed by a person duly authorized to execute the same on behalf of the Bidder.

In addition, a complete bid submission (bid qualifications and Exhibit Fabrication and/or Systems Integration Bid Forms & Production Schedule) must be submitted in PDF form on compact disk in a sealed envelope.

Please send the Exhibit Fabrication and/or Systems Integration Bid Forms and Production Schedule envelopes to the attention of:

Candace Jackson  
Project Consultant  
LandAir Project Resources  
10 East 33rd Street  
New York, NY 10016

Any bids received after 2pm EST on February 11, 2008 will be deemed non-responsive.

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### **3. Bid Validity**

Any Bid shall be irrevocable after the Final Submission Time and shall remain valid for a period of ninety (90) days from the date following the Final Submission Time.

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### **4. Owner Acceptance of Bid and Award of the Contract**

Bidders acknowledge the right of MercyCorps (MC) to reject any or all Bids in whole or in part, and to waive any informality or irregularity therein.

## **Bid Instructions**

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Bidders further acknowledge that MC is not bound to accept the lowest Bid or any Bid at all.

Awarding of the Contract will be made at the absolute discretion of MC and shall not be questioned or challenged by any unsuccessful bidder.

Firms submitting a proposal in response to this RFP may be required to give an oral presentation to Senior Staff and/or Board Members of Mercy Corps. This oral presentation is intended as an opportunity to clarify and elaborate on the proposal, although it will not alter the original submission. Mercy Corps's request for an oral presentation shall not constitute acceptance of a proposal.

Mercy Corps reserves the right to reject any or all of the proposals if such election is deemed to be in the best interest of Mercy Corps. Mercy Corps assumes no obligation, no responsibility, and no liability for costs incurred by the responding firms prior to the issuance of a contract.

Respondents to this RFP may participate in a non-mandatory site visit and inspection of the Project premises at Battery Park Site 16 / 17 on January 22, 2008 @ 1:30pm. The project fit-out and exhibit design plans and specifications may be requested by contacting the Client's representative at [cjackson@projectresourcesgroup.com](mailto:cjackson@projectresourcesgroup.com).

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### **5. Confidentiality**

The information provided by MC in, or in connection with, this Invitation for Bid is for the sole purpose of this Bid process and is to be considered confidential. Any information learned by Bidders in the submittal of their Bids shall not be revealed by them or used for any purpose other than the preparation of their Bids.

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### **6. Bid Drawings and General Exhibit Production Specifications**

All drawings referred to herein are furnished with and become an integral part of the bid specifications.

The General Exhibit Production referred to herein are furnished with and become an integral part of the bid specifications.

These drawings and specifications shall remain the property of MC and shall be returned by all unsuccessful bidders, within 10 days after formal notification.

## **Bid Instructions**

Action Center to End World Hunger

January 11, 2008

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### **7. LEED Qualifications**

The Owner requires that the Exhibit Fabricator implement practices and procedures to meet the project's environmental performance goals, which include achieving Platinum LEED Certification for Commercial Interiors. Specific project goals that may impact this area of work are listed in the Exhibit Fabricator Specifications and other sections of the bid documents. The Contractor shall ensure that the requirements related to these goals, are implemented.

To this end, The Owner, ESI, and LEED Consultants have collaborated to develop design specifications targeted to comply with LEED goals. This team is committed to working with the producers to facilitate an efficient and groundbreaking "green" project. It is important that the production team shares the purpose, responsibility, and enthusiasm for these project goals.

LEED-related areas of the Bid Form should be noted for the specific scope of work involved.

In the section LEED Project Management, The Owner requires that the total cost for the following be included:

- LEED-related meetings and general communications
- LEED-related product research
- LEED-related submittals as outlined in the bid documents

The fee proposal should include all LEED-related costs other than material costs. LEED-related costs must include LEED certification administration and coordination with LEED commissioning agent.

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### **8. Representation by Bidders**

By making a Bid, Bidders represent to MercyCorps as follows:

1. That they have read and understood all Bid Documents, and that all Bid Documents are acceptable to them; and
  2. That their Bid is based upon the supply, execution, completion and guarantee of the Work upon the terms and conditions set forth in the Bid Documents.
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### **9. Bidder Qualifications**

## **Bid Instructions**

Action Center to End World Hunger

January 11, 2008

The Bidder shall be a firm with experience in exhibit fabrication, installation, and graphics and/or with systems integration of similar magnitude and quality as specified for the subject job (requirements further specified to the Qualifications Form).

As a component of the Bid Qualifications, the Bidder is required to submit documentation verifying their capabilities in projects of a similar nature and scale. This documentation should include descriptions, references, and photographs from relevant projects.

Bidders must also submit a staffing plan, including resumes for key staff who will be assigned to the project. Bidders must also identify and submit qualifications for all key subcontractors.

In order to meet best effort practices, The Owner, LandAir Project Resources and ESI encourage Minority and Women-owned Business Enterprises to submit Bids.

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### **10. Sub-Contractor Information and Qualifications**

If the Bidder proposes to sub-contract portions of the work, such sub-contractors shall be identified and their responsibilities and qualifications detailed in the bid.

The work as performed by a sub-contractor shall be considered as part of the Exhibit Fabricator's responsibility with that work as part of the Exhibit Fabricator's statement.

The Bidder shall provide direct supervision of the sub-contracted work. Supervision of such sub-contracted work cannot be intermittent, but shall be continuous during the installation.

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### **11. Coordination of Trades**

Bidders are required to determine labor union affiliation requirements for all trades involved in the project. Bidders are required to negotiate, in advance of submitting their bid, any labor union jurisdictional issues relevant to the trades required for this project.

It shall be the responsibility of the Exhibit Fabricator to cooperate at all times, and to the fullest extent, with all trades doing work in the building, to the end that lost time, work stoppages, interference, and inefficiencies do not occur.



## **Bid Instructions**

Action Center to End World Hunger

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Bidders are required to review in full, the plans and specifications for the site base fit-out and coordinate with the site construction manager, preparation, schedules and, ways and means for exhibit installation.

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### **12. Pricing of Bids**

The Bid price, and all components thereof itemized on the attached Bid Form, shall be fixed and firm lump sums, inclusive of all the Bidder's costs and expenses and required payments of MercyCorps of any nature, including, without limitation, all overhead and profits, insurance, travel, and all taxes.

The Bidder must clearly delineate and separate the New York Exhibit Fabrication and System Integration bid pricing from the Portland Exhibit and System Integration bid pricing.

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### **13. Comprehensive Prices**

The sum total of prices submitted on the bid form is to be comprehensive and include all costs involved in producing and installing the fabricated exhibit elements for New York and Portland separately.

Prices must include all costs for coordination between Bidder and other contractors, the Construction Manager and their subcontractors, building owner, and MercyCorps.

If the Bidder identifies any items of the exhibit program which have been left out of the Bid Form, the Bidder shall notify ESI and MC and include an addendum to the Bid Form, with bid prices, for those items.

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### **14. Installation and Warranty Statement**

Prices listed for individual elements on the bid form shall be inclusive of any transportation, delivery, installation, insurance, warranty, sales tax, & training costs that may be appropriate.

The Bid price shall include a one-year warranty on all fabricated items, materials, workmanship, systems, and components. Also, Bidder will be responsible for compiling maintenance and training documentation for the owner before project completion.

## **Bid Instructions**

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The Fabricator and Systems Integrator will create a Final Maintenance Manual of the Exhibit program. After inspection and acceptance of the installed exhibits, the Fabricator and Systems Integrator shall conduct an operational training session for the Project Team, Owner, and Exhibit staff.

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### **15. Project Scheduling**

Bidders are advised to review carefully the required sequencing of the Works and the limitations imposed by the Contract.

It is anticipated by MC that during the course of the performance of the Work, separate contracts shall be awarded for other but related work, including the construction base fit-out. Accordingly, the Site shall be shared with the construction manager and related trades; and the Work must be coordinated and executed in a manner to permit orderly, optimum access to the respective work areas required for performance under each contract.

The Bidder acknowledges and accepts responsibility for coordinating site logistics, general conditions and other related activity with the Construction Manager, as appropriate in order to effect efficient and timely completion of exhibit installation and integration. The Exhibit Installer must provide complete oversight of the exhibit installation, including systems integration, testing, and training.

The bidder must assign, at minimum, one fulltime supervisor, for the duration of the installation, through to the acceptance by owner. The supervisor shall have sufficient purchasing authority to resolve issues to effectively complete work within the schedule permitted.

For the periods scheduled as "Punch list" and "Test and de-bug" the contractor is expected to be on site on a full time basis for the entire process.

The Exhibit Fabricator should provide ESI and MC with the anticipated schedule of pertinent milestone dates after award of contract for completion of fabrication, mock-ups, on-site installation work, and punch list completion. The Exhibit Fabricator should also notify all parties of any anticipated requirements that may have a negative impact on the schedule of completion.

The Bidder shall obtain from MC projected dates when the relevant areas will be available for the on-site installation.

## **Bid Instructions**

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Any suggestions of changes to the proposed production schedule (included with this bid package) must be explicitly indicated in the bid submission.

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### **16. Estimated Schedule**

The estimated schedule for the Project is as follows:

01.11.08 RFP Posted  
01.11.08 RFP Issued  
01.22.08 Site Visit & Inspection (non mandatory) – 1:30 pm  
01.25.08 Questions in Writing Due  
02.01.08 Responses from ESI and The Owner  
02.11.08 Proposals Due – 2 pm  
02.18.08 (week of) Interview

The estimated Exhibit Fabrication and Systems Integration schedule is as follows:

02.22.08 Award of Exhibit Fabrication and Systems Integration  
02.25.08 – 03.21.08  
Review Documents, Prepare Estimate and Schedule  
Approved Budget and Schedule  
Bidding, Negotiation, Awards  
03.24.08 – 08.01.08  
Production and Installation Observation  
Exhibit and Systems Fabrication  
07.28.08 – 09.05.08  
Exhibit and Systems Installation  
09.09.08 Soft Opening  
09.08.08 – 10.15.08  
Testing  
10.16.08 Grand Opening

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### **17. Proposed Alternates and Exceptions**

Bidder's suggestions for construction procedures, alternate specifications, and designs or any Bidder's comments or reserves concerning the Bid Documents, are welcomed.

All such alternatives or comments or reserves shall be submitted separately from their Bid. Such suggestions may include details with regard to price reductions, accelerated progress or improvement to quality.

Any and all exceptions to these specifications and related drawings must be made at the time of Bid submission. In the absence of exceptions, these specifications and related drawings shall be binding in letter and intent on the successful Bidder. It will further be assumed that the Bidder has examined the design and specifications in detail, and is prepared to take full responsibility for the performance of the complete installation as designed and specified.

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## **18. Bid Information Requests**

Any requests for clarification, substitution, or changes in these specifications or drawings shall be directed via email to:

Çandace Y. Jackson  
Project Consultant  
LandAir Project Resources Group  
cjackson@projectresourcesgroup.com

Submission of requests for information should be sent by Friday, January 25, 2008. The project team will compile the questions, review them, and then respond to all Bidders with the same document by Friday, February 1, 2008.

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## **19. Compensation for Submission of Bids**

No Bidder shall be entitled to claim, and MercyCorps shall under no circumstances be liable to any Bidder for, any costs, charges or expenses of whatsoever nature, or anticipated profits, incurred in, or associated with, the preparation or submission of its bid or possible Contract award, even though MC may elect to withdraw or change these Bid Documents.

**Staffing Plan and Subcontractor Qualifications Form  
Exhibit Fabrication Contract**

Action Center to End World Hunger  
January 11, 2008

**List below the resumés of key staff members assigned to the project and indicate the lead team member accordingly:**  
(use additional pages if necessary)

**List below any additional key subcontractors for this project and relevant qualifications:**  
(use additional pages if necessary)



**Background and Qualifications Form (cont.)**

**Exhibit Fabrication Contract**

Action Center to End World Hunger

January 11, 2008

(If "yes", please explain. Use additional pages if necessary)  Y  N

Has the firm ever been involved in a bankruptcy reorganization?  
(If "yes", please explain. Use additional pages if necessary)  Y  N

Does the firm currently have any pending judgments, claims, or suits?  
(If "yes", please explain. Use additional pages if necessary)  Y  N

**Production Capabilities:**

Percent of work generally performed in-house: \_\_\_\_\_ %  
(min. 70%)

Please list all production facilities owned and operated by firm (Location)	Staff at this facility	Size (SF) of facility	% of work on this project to be performed at this facility

Total Facility sq. ft.: \_\_\_\_\_ (35K sq. ft. min)

Required In-House Production Capabilities:

- Cabinetry building .....  Y  N
- Millwork .....  Y  N
- Metal cutting, welding, and finishing .....  Y  N
- CNC routing .....  Y  N
- Spray booth.....  Y  N
- Electro-mechanical systems production .....  Y  N
- Applied vinyl graphics production .....  Y  N
- Silk-screen graphics.....  Y  N
- Large and Small Format Digital Imaging .....  Y  N

**Experience and References:**

Please describe three similar or significant projects as references. Include the title of the project and its location; a reference contact person familiar with the project and his/her title and phone number; the amount and nature of the work; and the date of contract award and the date of project completion.

**Background and Qualifications Form (cont.)**

**Exhibit Fabrication Contract**

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**Insurance Requirements:**

Insurance and Bonds that the Contracting firm is required to provide:

- Workers' Compensation: to limits required by New York State Law
- General Liability: \$2,000,000
- Personal Injury: \$1,000,000
- Property Damage: \$1,000,000
- Automobile Liability \$1,000,000
- Excess Liability \$5,000,000 – limits of insurance may be increased or decreased upon finalization of Approved Budget and finalization of Agreement.

All Contracting firms' insurance policies shall name MercyCorps, Gary Shoemaker Architects, ESI Design, Landair Project Resources, Battery Park City Authority, the Lower Manhattan Development Corporation, Agencies of the City of New York as required, and other parties as additionally insured.

Is the firm able to provide insurance and bonds as stated above?

Y N

**Non-discrimination and Affirmative Action Policies:**

It is the policy of the State of New York, BPCA, LMDC, EDC/DDC and MercyCorps to comply with all federal, state, and local laws, policies, orders, rules and regulations, which prohibit unlawful discrimination because of race, creed, color, national origin, sex, sexual orientation, age, disability or marital status, and to take affirmative action in working with contracting parties to ensure that Minority-and Women-owned Business Enterprises (LBE/MWBEs), Minority Group Members and women share in the economic opportunities generated by MercyCorps' participation in projects or initiatives, and/or the use of Mercy Corps funds. As a subsidiary of the NYS ESDC, LMDC and its grantees follow ESDC's non-discrimination and affirmative action policy, which will apply to any contract entered into as a result of the RFP. LMDC has established a 20% LBE/MWBEs participation goal that MercyCorps will require of all funding sources for its entire redevelopment project. The selected firm(s) shall be required to use best efforts to provide for the meaningful participation of United States LBE/MWBEs, Minority Group Members and women in the execution of this contract. A copy of each responding firm's equal employment opportunity policy statement, Attachment 2 relating to the anticipated workforce to be utilized on the contract and Attachment 3 relating to the anticipated participation by LBE/MWBEs as subcontractors, shall be included as part of the response to the RFP. The ESDC Affirmative Action Unit (AAU) and BPCA are both available to assist you in identifying LBE/MWBEs certified by the State of New York that can provide goods and services in connection with the contract anticipated by this RFP. If you require LBE/MWBEs listings, please call the AAU at (212) 803-3224 or Hector Calderon BPCA (212) 417-2280.

Is the firm in compliance with equal employment opportunity requirements?

Y N

Does the firm have LBE/ME/WBE status (Minority-owned Business Enterprise or Women-owned Business Enterprise, as certified by New York and/or Oregon State)?

Y N

Union labor must be employed for on site labor, including transit and handling. Davis-Bacon and/or prevailing wage guidelines apply to off site labor. Installation of low voltage wiring and systems shall be in accordance with NY State DOL. All other electrical work will be performed by union electricians.



**Background and Qualifications Form (cont.)**

**Exhibit Fabrication Contract**

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Is the firm in compliance with utilizing union labor for on site work and complying with Davis-Bacon and/or prevailing wage guidelines as described above?

Y       N

**Bid Form**  
**Exhibit Fabrication Contract**  
 Action Center to End World Hunger  
 January 11, 2008

**Note: Bidders should refer to the drawings to find the quantities of all components. The Description column only includes quantities where we felt it helped to clarify the drawings.**

Name of Firm		Telephone	
Contact		email	

**Exhibit Fabrication: New York**

EX/DWG #	Area/Components	Description	Type	Bid Price \$
<b>Exterior</b>				
<b>AC01/EX08-3.0</b>	<b>Lightboxes</b>			
	Basic Component	Casework and labor	CW	
	Graphics		GR	
	Installation		IN	
	Other			
		<b>Lightboxes</b>		<b>\$0</b>
<b>AC01/EX08-4.0</b>	<b>Sign Band</b>			
	Graphics		GR	
	Exterior Sign	Dimensional letters on existing awning	ES	
	Installation		IN	
	Other		OT	
		<b>Sign Band</b>		<b>\$0</b>
		<b>Subtotal: Exterior</b>		<b>\$0</b>
<b>Entry</b>				
<b>AC02/EX02-1.0</b>	<b>Information Desk, Entry</b>			
	LEED Qualified Materials	Paperstone, sealants, packing materials, and FSC plywood	LD	
	Basic Component	Other materials, casework, furniture, and labor	CW	
	Graphics		GR	
	Installation		IN	
	Other		OT	
		<b>Information Desk, Entry</b>		<b>\$0</b>
<b>AC02/EX02-2.0</b>	<b>Donor Recognition Panel</b>			
	Basic Component	Casework and labor	CW	
	Graphics		GR	
	Installation		IN	
	Other		OT	
		<b>Donor Recognition Panel</b>		<b>\$0</b>
		<b>Subtotal: Entry</b>		<b>\$0</b>
<b>Briefing Area</b>				
<b>AC03/EX03-1.0</b>	<b>Briefing Area</b>			
	LEED Qualified Materials	Sealants, packing materials, FSC Douglas fir, and cork	LD	
	Basic Component	Other materials, casework, and labor	CW	
	Benches	6	BN	
	Graphics		GR	
	Installation		IN	
	Other		OT	
		<b>Briefing Area</b>		<b>\$0</b>
		<b>Subtotal: Briefing Area</b>		<b>\$0</b>
<b>Information Hub</b>				
<b>AC04/EX04-1.0</b>	<b>Information Hub</b>			
	LEED Qualified Materials	Paperstone, sealants, packing materials, and FSC plywood	LD	

<b>Global Status Wall</b>					
<b>AC06/EX05-3.0</b>	<b>Global Status Wall</b>				
	Basic Component	Materials, casework, and labor	CW		
	Graphics		GR		
	Installation		IN		
	Other		OT		
		<b>Global Status Wall</b>			<b>\$0</b>
	<b>Subtotal: Global Status Wall</b>				<b>\$0</b>
<b>Training Towers</b>					
<b>AC07/EX06-1.0</b>	<b>Situation Huts</b>				
	Prototyping		PT		
	LEED Qualified Materials	FSC plywood, cork, and packing materials	LD		
	Basic Component	Other materials, casework, and labor	CW		
	Graphics		GR		
	Installation		IN		
	Other		OT		
		<b>Situation Huts</b>			<b>\$0</b>
<b>AC07/EX06-2.0</b>	<b>Training Towers</b>				
	Basic Component	Casework and labor	CW		
	Graphics		GR		
	Other		OT		
		<b>Training Towers</b>			<b>\$0</b>
	<b>Subtotal: Training Towers</b>				<b>\$0</b>
<b>Action Stations</b>					
<b>AC08/EX07-1.1</b>	<b>Action Stations</b>				
	LEED Qualified Materials	and packing materials	LD		
	Basic Component	Other materials, casework, and labor	CW		
	Graphics		GR		
	Installation		IN		
	Other		OT		
		<b>Action Stations</b>			<b>\$0</b>
	<b>Subtotal: Action Stations</b>				<b>\$0</b>
<b>Display Systems</b>					
<b>AC09/EX08-2.0</b>	<b>Retail Display Systems</b>				
	Basic Component	Materials	CW		
	Display	Display tables (2) and shelves (24)	DS		
	Graphics		GR		
	Installation		IN		
	Other		OT		
		<b>Retail Display Systems</b>			<b>\$0</b>
<b>AC09/EX05-4.0</b>	<b>Photo/Artifact Display Units</b>				
	Basic Component	Materials and labor	CW		
	Graphics		GR		
	Installation		IN		
	Other		OT		
		<b>Photo/Artifact Display Units</b>			<b>\$0</b>
	<b>Subtotal: Display Systems</b>				<b>\$0</b>
<b>Sitewide Treatments</b>					
<b>SW06</b>	Casework	Surfaces	CW		
	Casework LT1	Lecturn	CW		
	Casework ST2	Stackable Chairs: Emeco 20-06 Stacking Chair - hand brushed	CW		
	Casework ST6	White	CW		
	Casework ST7	Storage Bucket Lids Seat Pad: Duluth Trading 90010 - Black	CW		
	Casework	Storage System for Exhibit Materials - Stored in Back of House	CW		
	Casework	School Supplies	CW		
	Other		OT		
		<b>Casework</b>			<b>\$0</b>
	<b>Subtotal: Sitewide Treatments</b>				<b>\$0</b>
<b>Total Exhibit Fabrication Production</b>					<b>\$0</b>
<b>Other</b>					
	Cost of Performance Bond				
	Cost of LEED Project Manager				

**Bid Form**  
**Exhibit Fabrication Contract**  
 Action Center to End World Hunger  
 January 11, 2008

**Note: Bidders should refer to the drawings to find the quantities of all components. The Description column only includes quantities where we felt it helped to clarify the drawings.**

Name of Firm		Telephone
Contact		email

**Exhibit Fabrication: Portland**

EX/DWG #	Area/Components	Description	Type	Bid Price \$
<b>Exterior</b>				
<b>AC01/EX08-3.0</b>	<b>Lightboxes</b>			
	Basic Component	Casework and labor	CW	
	Graphics		GR	
	Installation		IN	
	Other			
		<b>Lightboxes</b>		<b>\$0</b>
<b>AC01/EX08-4.0</b>	<b>Graphic Treatments</b>			
	Graphics		GR	
	Exterior Sign	Dimensional letters on existing awning	ES	
	Installation		IN	
	Other		OT	
		<b>Graphic Treatments</b>		<b>\$0</b>
	<b>Subtotal: Exterior</b>			<b>\$0</b>
<b>Entry</b>				
<b>AC02/EX02-1.0</b>	<b>Information Desk, Entry</b>			
	LEED Qualified Materials	Paperstone, sealants, packing materials, and FSC plywood	LD	
	Basic Component	Other materials, casework, furniture, and labor	CW	
	Graphics		GR	
	Installation		IN	
	Other		OT	
		<b>Information Desk, Entry</b>		<b>\$0</b>
<b>AC02/EX02-2.0</b>	<b>Donor Recognition Panel</b>			
	Basic Component	Casework and labor	CW	
	Graphics		GR	
	Installation		IN	
	Other		OT	
		<b>Donor Recognition Panel</b>		<b>\$0</b>
	<b>Subtotal: Entry</b>			<b>\$0</b>
<b>Briefing Area</b>				
<b>AC03/EX03-1.0</b>	<b>Briefing Area</b>			
	LEED Qualified Materials	Sealants, packing materials, FSC Douglas fir, and cork	LD	
	Basic Component	Other materials, casework, and labor	CW	
	Benches	10	BN	
	Graphics		GR	
	Installation		IN	
	Other		OT	
		<b>Briefing Area</b>		<b>\$0</b>
	<b>Subtotal: Briefing Area</b>			<b>\$0</b>
<b>Information Hub</b>				
<b>AC04/EX04-1.0</b>	<b>Information Hub</b>			
	LEED Qualified Materials	Paperstone, sealants, packing materials, and FSC plywood	LD	

<b>Global Status Wall</b>			
<b>AC06/EX05-3.0</b>	<b>Global Status Wall</b>		
	Basic Component	Materials, casework, and labor	CW
	Graphics		GR
	Installation		IN
	Other		OT
		<b>Global Status Wall</b>	<b>\$0</b>
	<b>Subtotal: Global Status Wall</b>		<b>\$0</b>
<b>Training Towers</b>			
<b>AC07/EX06-1.0</b>	<b>Situation Huts</b>		
	Prototyping		PT
	LEED Qualified Materials	FSC plywood, cork, and packing materials	LD
	Basic Component	Other materials, casework, and labor	CW
	Graphics		GR
	Installation		IN
	Other		OT
		<b>Situation Huts</b>	<b>\$0</b>
<b>AC07/EX06-2.0</b>	<b>Training Towers</b>		
	Basic Component	Casework and labor	CW
	Graphics		GR
	Other		OT
		<b>Training Towers</b>	<b>\$0</b>
	<b>Subtotal: Training Towers</b>		<b>\$0</b>
<b>Action Stations</b>			
<b>AC08/EX07-1.1</b>	<b>Action Stations</b>		
	LEED Qualified Materials	and packing materials	LD
	Basic Component	Other materials, casework, and labor	CW
	Graphics		GR
	Installation		IN
	Other		OT
		<b>Action Stations</b>	<b>\$0</b>
	<b>Subtotal: Action Stations</b>		<b>\$0</b>
<b>Display Systems</b>			
<b>AC09/EX08-2.0</b>	<b>Retail Display Systems</b>		
	Basic Components		CW
	Graphics		GR
	Installation		IN
	Other		OT
		<b>Retail Display Systems</b>	<b>\$0</b>
<b>AC09/EX05-4.0</b>	<b>Photo/Artifact Display Units</b>		
	Basic Component	Materials and labor	CW
	Graphics		GR
	Installation		IN
	Other		OT
		<b>Photo/Artifact Display Units</b>	<b>\$0</b>
	<b>Subtotal: Display Systems</b>		<b>\$0</b>
<b>Sitewide Treatments</b>			
<b>SW06</b>	Graphics	Wallpaper Graphic Treatment on Walls	GR
	Casework LT1	Lecturn	CW
	Casework ST2	Stackable Chairs: Emeco 20-06 Stacking Chair - hand brushed	CW
	Casework ST6	White	CW
	Casework ST7	Storage Bucket Lids Seat Pad: Duluth Trading 90010 - Black	CW
	Casework	Storage System for Exhibit Materials - Stored in Back of House	CW
	Casework	School Supplies	CW
	Other		OT
		<b>Graphics</b>	<b>\$0</b>
	<b>Subtotal: Sitewide Treatments</b>		<b>\$0</b>
<b>Total Exhibit Fabrication Production</b>			<b>\$0</b>
<b>Other</b>			
	Cost of Performance Bond		

**Staffing Plan and Subcontractor Qualifications Form  
Systems Integration Contract**

Action Center to End World Hunger  
January 11, 2008

**List below the resumés of key staff members assigned to the project and indicate the lead team member accordingly:**  
(use additional pages if necessary)

**List below any additional key subcontractors for this project and relevant qualifications:**  
(use additional pages if necessary)

# Background and Qualifications Form Systems Integration Contract

Action Center to End World Hunger  
January 11, 2008

**Please complete the following:**

## Contact Information:

Firm: \_\_\_\_\_

Address: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contact: \_\_\_\_\_ Phone: \_\_\_\_\_

Email: \_\_\_\_\_ Fax: \_\_\_\_\_

Web site: \_\_\_\_\_

## Qualification Requirements:

**Please include documentation demonstrating the following:**

- At least 8 years experience integrating systems within permanent exhibits for public environments.
- At least 8 years experience in computer systems integration and show control programming.
- Experience integrating A/V systems and large screen display systems within public environments.

## Company History:

Years in business (min. 8 years): \_\_\_\_\_

Total work in place last year (\$5 M min.): \$ \_\_\_\_\_

Total bonding capacity: \$ \_\_\_\_\_

Work currently bonded: \$ \_\_\_\_\_

Bond rate: \$ \_\_\_\_\_

Has the firm ever failed to complete a contract?  
(If "yes", please explain. Use additional pages, if necessary)  Y  N

Has any claim been made on a performance bond provided by the firm in the last 5 years?  
(If "yes," please explain. Use additional pages if necessary)  Y  N

Has the firm ever been involved in a bankruptcy reorganization?

**Background and Qualifications Form (cont.)**

**Systems Integration Contract**

Action Center to End World Hunger

January 11, 2008

(If "yes," please explain. Use additional pages if necessary)  Y  N

Does the firm currently have any pending judgments, claims, or suits?  
(If "yes," please explain. Use additional pages if necessary)  Y  N

Has the firm been significantly behind schedule on any project within the last 5 years?  
(If "yes," please explain. Use additional pages if necessary)  Y  N

Estimated percent of work for this project to be performed in-house : \_\_\_\_\_ %  
(min. 75 %)

Systems Integration Experience (Previous 12 Months)

Computer systems configuration .....	<input type="radio"/> Y	<input type="radio"/> N
Network systems integration & configuration .....	<input type="radio"/> Y	<input type="radio"/> N
A/V systems .....	<input type="radio"/> Y	<input type="radio"/> N
Large screen display systems .....	<input type="radio"/> Y	<input type="radio"/> N
Show control programming (AMX/Creston) .....	<input type="radio"/> Y	<input type="radio"/> N
Show control programming (PC-Based) .....	<input type="radio"/> Y	<input type="radio"/> N

**Experience and References:**

Please describe three similar or significant projects as references. Include the title of the project and its location; a reference contact person familiar with the project and his/her title and phone number; the amount and nature of the work; and the date of contract award and the date of project completion.

**Insurance Requirements:**

Insurance and Bonds that the Contracting firm is required to provide:

- Workers' Compensation: to limits required by New York/Oregon State Law
- General Liability: \$2,000,000
- Personal Injury: \$1,000,000
- Property Damage: \$1,000,000
- Automobile Liability \$1,000,000
- Excess Liability \$5,000,000 – limits of insurance may be increased or decreased upon finalization of Approved Budget and finalization of Agreement.

All Contracting firms' insurance policies shall name MercyCorps, Gary Shoemaker Architects, ESI Design, Landair Project Resources, Battery Park City Authority, the Lower Manhattan Development Corporation, Agencies of the City of New York as required, and other parties as additionally insured.

Is the firm able to provide insurance and bonds as stated above?  Y  N

**Non-discrimination and Affirmative Action Policies:**



**Background and Qualifications Form (cont.)**

**Systems Integration Contract**

Action Center to End World Hunger

January 11, 2008

It is the policy of the State of New York, BPCA, LMDC, EDC/DDC and MercyCorps to comply with all federal, state, and local laws, policies, orders, rules and regulations, which prohibit unlawful discrimination because of race, creed, color, national origin, sex, sexual orientation, age, disability or marital status, and to take affirmative action in working with contracting parties to ensure that Minority-and Women-owned Business Enterprises (LBE/MWBEs), Minority Group Members and women share in the economic opportunities generated by MercyCorps' participation in projects or initiatives, and/or the use of Mercy Corps funds. As a subsidiary of the NYS ESDC, LMDC and its grantees follow ESDC's non-discrimination and affirmative action policy, which will apply to any contract entered into as a result of the RFP. LMDC has established a 20% LBE/MWBEs participation goal that MercyCorps will require of all funding sources for its entire redevelopment project. The selected firm(s) shall be required to use best efforts to provide for the meaningful participation of United States LBE/MWBEs, Minority Group Members and women in the execution of this contract. A copy of each responding firm's equal employment opportunity policy statement, Attachment 2 relating to the anticipated workforce to be utilized on the contract and Attachment 3 relating to the anticipated participation by LBE/MWBEs as subcontractors, shall be included as part of the response to the RFP. The ESDC Affirmative Action Unit (AAU) and BPCA are both available to assist you in identifying LBE/MWBEs certified by the State of New York that can provide goods and services in connection with the contract anticipated by this RFP. If you require LBE/MWBEs listings, please call the AAU at (212) 803-3224 or Hector Calderon BPCA (212) 417-2280.

Is firm in compliance with equal employment opportunity requirements?

Y  N

Does the firm have LBE/ME/WBE status (Minority-owned Business Enterprise or Women-owned Business Enterprise, as certified by New York and/or Oregon State)?

Y  N

Union labor must be employed for on site labor, including transit and handling. Davis-Bacon and/or prevailing wage guidelines apply to off site labor. Installation of low voltage wiring and systems shall be in accordance with NY State DOL. All other electrical work will be performed by union electricians.

Is the firm in compliance with utilizing union labor for on site work and complying with Davis-Bacon and/or prevailing wage guidelines as described above?

Y  N

<b>Bid Form</b>							
<b>Systems Integration Contract</b>							
Action Center to End World Hunger							
January 11, 2008							

**Note: Bidders should refer to the drawings to find the quantities of all components. The Description column only includes quantities where we felt it helped to clarify the drawings.**

Name of Firm						Telephone	
Contact						email	

**Systems Integration: New York**

EX/DWG #	Area/Components	Description	Type	Bid Price \$
<b>Entry</b>				
<b>AC02/EX02-1.0</b>	<b>Information Desk, Entry</b>			
	Systems	POS Systems - Hardware Only	SY	
	Installation/Other	Integration for POS System	OT	
	Systems	PA System and Audio	SY	
	Installation/Other	Integration for PA System and Audio	OT	
		<b>Subtotal: Entry</b>		<b>\$0</b>
<b>Briefing Area</b>				
<b>AC03/EX03-1.0</b>	<b>Briefing Area</b>			
	Systems	Hardware	SY	
	Installation/Other	Integration	OT	
		<b>Subtotal: Briefing Area</b>		<b>\$0</b>
<b>Information Hub</b>				
<b>AC04/EX04-1.0</b>	<b>Information Hub</b>			
	Systems	Hardware	SY	
	Installation/Other	Integration	OT	
		<b>Subtotal: Information Hub</b>		<b>\$0</b>
<b>Video Field Dispatches</b>				
<b>AC05/EX05-2.0</b>	<b>Video Field Dispatches</b>			
	Systems	Hardware	SY	
	Installation/Other	Integration	OT	
		<b>Subtotal: Video Field Dispatches</b>		<b>\$0</b>
<b>Global Status Wall</b>				
<b>AC06/EX05-3.0</b>	<b>Global Status Wall</b>			
	Systems	Hardware (projector & spare lamp only)	SY	

					Systems		Hardware		SY	
					Installation/Other		Integration		OT	
					<b>Subtotal: Action Stations</b>					<b>\$0</b>
<b>Sitewide Treatments</b>										
					SW06		Misc. Hardwired Electrical Connections Allowance		SY	
							Misc. Integration		OT	
							Network General/ WiFi		SY	
							Network General/ WiFi Integration		OT	
							Offsite Laptops for use in Field		SY	
							Offsite Laptops Integration		OT	
							Laptops for Staff/Visitors for use at Action Stations		SY	
							Onsite Laptops Integration		OT	
					<b>Subtotal: Sitewide Treatments</b>					<b>\$0</b>
<b>Total Systems Integration Production</b>									<b>\$0</b>	
<b>Performance Bond</b>										
					<b>Performance Bond</b>					
					Cost of Bond					
					Performance Bond					<b>\$0</b>
					<b>Subtotal: Performance Bond</b>					<b>\$0</b>
<b>Total Systems Integration</b>									<b>\$0</b>	
<b>Cost Summary by Category</b>										
					Cost of Materials					
					Cost of Labor					
					Cost of Shipping and Handling					
					Cost of Storage (if necessary)					
					Cost of Travel Expenses					
					Cost of Tax					
					Other					
					<b>Cost Summary by Category</b>					<b>\$0</b>
					<b>Subtotal: Cost Summary by Category</b>					<b>\$0</b>

<b>Bid Form</b>							
<b>Systems Integration Contract</b>							
Action Center to End World Hunger							
January 11, 2008							

**Note: Bidders should refer to the drawings to find the quantities of all components. The Description column only includes quantities where we felt it helped to clarify the drawings.**

Name of Firm					Telephone
Contact					email

## Systems Integration: Portland

EX/DWG #	Area/Components	Description	Type	Bid Price \$
<b>Entry</b>				
AC02/EX02-1.0	Information Desk, Entry			
	Systems	POS Systems - Hardware Only	SY	
	Installation/Other	Integration for POS System	OT	
	Systems	PA System and Audio	SY	
	Installation/Other	Integration for PA System and Audio	OT	
	<b>Subtotal: Entry</b>			<b>\$0</b>
<b>Briefing Area</b>				
AC03/EX03-1.0	Briefing Area			
	Systems	Hardware	SY	
	Installation/Other	Integration	OT	
	<b>Subtotal: Briefing Area</b>			<b>\$0</b>
<b>Information Hub</b>				
AC04/EX04-1.0	Information Hub			
	Systems	Hardware	SY	
	Installation/Other	Integration	OT	
	<b>Subtotal: Information Hub</b>			<b>\$0</b>
<b>Video Field Dispatches</b>				
AC05/EX05-2.0	Video Field Dispatches			
	Systems	Hardware	SY	
	Installation/Other	Integration	OT	
	<b>Subtotal: Video Field Dispatches</b>			<b>\$0</b>
<b>Global Status Wall</b>				
AC06/EX05-3.0	Global Status Wall			
	Systems	Hardware (projector & spare lamp only)	SY	
	Installation/Other	Integration (projector & spare lamp only)	OT	
	Systems	Hardware(excluding projector)	SY	
	Installation/Other	Integration (excluding projector)	OT	
	<b>Subtotal: Global Status Wall</b>			<b>\$0</b>
<b>Training Towers</b>				
AC07/EX06-2.0	Training Towers			
	Systems	Hardware	SY	
	Installation/Other	Integration	OT	



**PART I: GENERAL**

- I.1 **SITE SPECIFICS:** This is an educational visitors center which will be used by people of all ages, as well as visiting school groups, and as such all exhibits must be built to conform to appropriate standards of safety and able to withstand high and unusual levels of wear and tear (banging, licking, hanging on, etc.). It is the responsibility of the contractors to identify anything in the drawings and specifications that look dangerous and/or not durable and suggest alternatives.
- I.2 **PUBLICATION:** No information relative to this project may be released for publication without prior written approval from MercyCorps (The Owner) the Designer (ESI).
- I.3 **INSURANCE:** Before commencing work, the Contractor shall procure and maintain, during the life of the contract, such comprehensive liability and property damage insurance as shall protect The Contractor and The Owner from claims for bodily injury, including death, and claims for property damage which may arise from the operations under this contract.
- I.4 **PERFORMANCE BONDED:** All contractors need to show the ability to hold a performance bond.
- I.5 **VENDEX:** Since New York City funds have been awarded for building the ACWH, all vendors with contracts over \$100,000 shall hold current, or be in the process of approval for, a Vendex certificate.

Pursuant to the Procurement Policy Board (PPB) Rules and the New York City Charter, the City may award contracts only to responsible contractors. A responsible contractor is defined as one that has the technical capability and financial capacity to fully perform the requirements of the contract, as well as the business integrity to justify the award of public tax dollars. For each solicitation, the City agency must make a determination of vendor responsibility prior to awarding a contract. The PPB Rules state certain factors that may affect a contractor's responsibility such as financial resources, technical qualifications, and performance.

For additional information or to obtain forms for application or renewal of your Vendex certificate, please call the Vendex Unit at (212) 341-0933, or visit the New York City website at: <http://www.nyc.gov/html/mocs/html/research/vendex.shtml>.

- I.6 **PROJECT MANAGER:** All contractors shall have a project manager assigned to the project. The project manager will be the single point of contact between The Owner, LAPR, ESI and other Contractors producing work on the project. Hereafter, the terms, "Contractor" and "Project Manager" shall be synonymous.
- I.7 **WORK INCLUDES:** Scheduling, coordinating, overseeing, and managing work produced and installed under this contract.
- I.8 **SPECIFIC REQUIREMENTS:** Project Managers shall be in contact with ESI, the Construction Manager, and The Owner on no less than a weekly basis. Project managers are responsible to perform the following work:

- A. Coordinate all deliverables (Shop Drawings, Samples, Schematics, Scripts, Storyboards, Equipment Lists etc.) and review them for legibility, accuracy, completeness, and compliance with design requirements prior to submission.
- B. Receive all deliverables after review by ESI and The Owner and take appropriate action according to the approval or rejection as follows:
  - ( 1 ) Approved Deliverables - Ensure that all changes, revisions, or additions are noted, and in-house drawings and/or instructions are updated and forwarded to ESI and/or The Owner.
  - ( 2 ) Rejected Deliverables - When deliverables are rejected, ESI will return one (1) copy of the submittal to the Project Manager with reasons for rejection. The Project Manager shall revise the details in question, and then resubmit identifying the revisions.
- C. Provide quality control of work. Ensure that all work performed meets the requirements of the Final Design documents and all modifications or revisions are implemented.
- D. Track work progress to ensure that the project is completed according to the schedule. Coordinate and confirm the dates for shipment, delivery, and installation of the work at the exhibit site with ESI, the Construction Manager, and The Owner.
- E. Inspect completed work prior to shipment and/or final review by ESI to ensure that work meets the quality standard specified in the design specifications. Ensure that work is complete and ready for final review, notifying ESI if any elements will not be ready for review as scheduled.
- F. Delivery and Installation - Ensure that all work is delivered and installed as scheduled in accordance and collaboration with the Construction Manager's progress on site construction fit-out. In the event that The Owner or ESI reports problems during or after shipment, delivery, and/or installation, the Project Manager shall:
  - ( 1 ) Determine and document the nature of the reported problem, damage, or production error and provide a proposal for resolution to The Owner and ESI for review and approval; and
  - ( 2 ) Ensure that approved corrections or repairs are made to the satisfaction of ESI, and The Owner and within the time scheduled.
  - ( 3 ) Coordinate the completion of approved corrections or repairs with the Construction manager within project parameters and time scheduled.
- G. Compile, prepare, and forward closeout packages as described in this document.

**PART II: PROJECT MEETINGS**

- II.1 KICKOFF MEETING: All Project Managers are required to attend a Kickoff meeting. The minimum agenda for the meeting will include the following:
- A. General project review, including discussion of the following:
    - ( 1 ) Contractor responsibilities
    - ( 2 ) Correspondence procedures
    - ( 3 ) Deliverables
    - ( 4 ) Change orders
    - ( 5 ) Project schedule
    - ( 6 ) Handoffs between contractors
    - ( 7 ) Billing and payment procedure
    - ( 8 ) Status meeting schedule
    - ( 9 ) In progress review schedule
    - ( 10 ) Review schedules
  - B. Review of exhibit design documents.
  - C. Review of ESI-furnished reference and source materials.
- II.2 STATUS MEETING: Regularly scheduled status meetings will be attended by the exhibit contractors named in this document in addition to other parties to the project as determined by The Owner and ESI. The minimum agenda for the meeting will include the following:
- A. Identification of problem areas and discussion of proposed solutions;
  - B. Review of schedule;
  - C. Discussions of planned progress during succeeding work period; and
  - D. Discussion of coordination issues between contractors.
- II.3 IN-PROGRESS REVIEW MEETINGS: The Owner, ESI, and the Construction Manager will work with contractors to schedule in-progress reviews as needed to review progress and to maintain quality. The minimum agenda for the meeting will include the following:
- A. Inspection of work in progress and completed work;
  - B. Identification of problem areas and discussion of proposed solutions;
  - C. Review of schedule;
  - D. Discussion of planned progress during succeeding work period; and
  - E. Discussion of work standards and practices to maintain quality.



- II.4 PRE-INSTALLATION MEETING: Fabrication, Systems and Software contractors, their installation team and others of the contractors team as needed will meet with The Owner, ESI, the Architect, the Architectural Contractor (G.C.), Construction Manager and their teams prior to shipment and installation of the exhibits. The minimum agenda for the meeting will include the following:
- A. Building handoff; and
  - B. Review of existing conditions at the installation site, identifying potential problems and proposed solutions.
  - C. Review of installation schedule, including:
    - ( 1 ) Sequence in which work will be shipped, unloaded, setup, and installed; and
    - ( 2 ) Projected work schedules on-site, including working days and hours.
- II.5 MEETING DOCUMENTATION: After all scheduled meetings, meeting minutes will be distributed to the entire project team enumerating all issues discussed and decisions made relative to the project. Contractors shall respond within three (3) working days with any comments regarding inconsistencies with their recollection of events. The responsibility for taking and distributing the meeting minutes will be determined at the production kickoff meeting.

**PART III: TRAVEL**

- III.1 KICK-OFF MEETING: All Contractors are required to attend the kickoff meeting as specified in Section A, Part II, II.1.
- III.2 SITE VISIT: Contractors responsible for fabrication and/or installation of exhibit elements on-site (Fabricators, Systems integrators, electricians, etc.) shall travel to the site as needed to meet with the Facility General Contractor (G.C.), ESI, the Architect, the Construction Manager, The Owner, Owner's Representative or others as needed to review existing conditions prior to fabrication of the exhibits, including the following:
- A. Assess existing conditions for on-site work. Take detailed measurements of the exhibit space to ensure proper fit of all exhibit/systems elements. The contractors shall assess locations of MEP and HVAC elements, doors, windows, lighting fixtures, wall switches and controls, FE cabs, sprinklers and/or emergency lighting, security system alarms and sensors, changes in floor level, floor finishes, ceiling beams, building structures and finishes, and other elements which impact proper fit and operation of the exhibits.
  - B. Assess existing conditions which impact the installation of the exhibits, including: unloading areas, doorway clearances, curbs, stairs, elevators, available storage areas, available areas for setup of power tool work stations, off-site facilities for disposal of debris, parking, and local availability of food, gas, hardware, and other supplies and services.
  - C. Assess existing electrical and lighting systems for determination of their impact on installation and operation of all exhibit elements.
- III.3 INSTALLATION: Travel to the site to oversee installation of exhibit elements by the installation team.

**PART IV: COMMUNICATION:**

## IV.1 REQUESTS FOR INFORMATION:

- A. All Requests for Information (RFI's) whether between Contractors on the project or from a Contractor to LAPR, ESI, the Architect, the Construction Manager, The Owner or the G.C. will be made in writing by electronic mail (e-mail). This is also true for responses.
- B. RFI's and responses thereto shall be addressed to the attention of the project manager of contractor involved.
- C. All RFI's and responses thereto will be copied to the ESI Production Manager for the project.
- D. A numbered list of outstanding RFIs will be maintained and distributed to the project team on a regular basis by ESI.

**PART V: COORDINATION POINTS:**

- V.1 V.1 Some coordination points between producers and fabricators that have been identified thus far include, but are not limited to:
- A. Exhibit Fabricator and Interactive Media Producer/ESI
    - ( 1 ) Final art for exhibit signage and environmental graphics
  
  - B. Exhibit Fabricator and Systems Integrator
    - ( 1 ) Information Desk – Computers and cash register
    - ( 2 ) Briefing Area – projector for briefing video
    - ( 3 ) Information Hub – Staff computers and video field dispatches
    - ( 4 ) Global Status Interactive – Projection
    - ( 5 ) Training Towers – Video set up and speakers
    - ( 6 ) Light Boxes –
    - ( 7 ) Action Stations - Computers
  
  - C. Systems Integrator and Interactive Media Producer/ESI
    - ( 1 ) Linear video programs (Briefing Videos and Training Towers Video Components) - ESI will work with Systems Integrator to ensure agreed upon format that meets all performance requirements specified in Final Design document.
    - ( 2 ) Interactive Media Programs (Training Towers, Video Field Dispatches, Global Status, Action Stations, and Info Hub Feeds) - ESI will work with Systems Integrator to ensure agreed upon format that meets all performance requirements specified in Final Design document. Software programming includes integration of any touch-screen based interactive programs.

**GREEN BUILDING MATERIALS CERTIFICATION FORM**

Fabricator Name: \_\_\_\_\_

Fabricator Contact: \_\_\_\_\_

Telephone Number: \_\_\_\_\_

Material Description	Material Cost Material Cost <sup>1</sup> (less Labor & Equip.)	Recycled Content		Local Materials (yes or no)		Wood
		Post Consumer <sup>2</sup> %	Post Industrial <sup>3</sup> %	Manufactured <sup>4</sup> w/in 500 miles of project site	Raw Resources <sup>5</sup> from w/in 500 miles of project site	FSC Certified <sup>6</sup> (Yes or No)
Product/ Manufacturer						

**Definitions:**

<sup>1</sup>**Material Cost:** Material Cost is the cost of the materials as it would appear on the manufacturer's or distributor's invoice to the contractor or subcontractor. It does not include labor or equipment costs associated with the installation of the material.

<sup>2</sup>**Post-Consumer Recycled Content:** Material or finished product that has served its intended consumer use and has been discarded by the consumer for recovery after the consumer has employed the intended use of the product. (e.g., a plastic bottle from a soft drink).

<sup>3</sup>**Post-Industrial Recycled Content:** recovered industrial and manufacturing materials that are diverted from municipal solid waste for the purpose of collection, recycling and disposition. Scrap raw materials that can be reused in the same manufacturing process from which they are recovered are not considered Post-Industrial Recycled Content. Fly-ash and synthetic gypsum, because they are waste products from coal burning electricity plants, are examples of Post-Industrial recycled materials.

<sup>4</sup>**Manufacturing:** Manufacturing, as defined by the USGBC, refers to the final assembly of components into a building product that is furnished and installed by the tradesmen. For example, if the hardware comes from Seoul, South Korea, the lumber from Vancouver, British Columbia and the joist is assembled in Kent Washington; then the location of the final assembly is Kent Washington.

<sup>5</sup>**Raw Resources:** Raw resources refers to the origin of building product components in regard to the location from which they are extracted, harvested, or recovered.

<sup>6</sup>**FSC Certified:** FSC Certified refers to Certification from the Forest Stewardship Council. This column is only applicable to wood products.

Contractor Certification:

I, \_\_\_\_\_ a duly authorized representative of \_\_\_\_\_ hereby certify that the material information contained herein is an accurate representation of the material qualifications to be provided by us, as components of the final building construction. Furthermore, I understand that any change in such qualifications during the purchasing period will require prior written approval from the Construction Manager and Owner.

Signature of Authorized Representative: \_\_\_\_\_ Date: \_\_\_\_\_

**PART I: GENERAL**

- I.1 WORK INCLUDED:
- A. The Exhibit Fabricator shall comply with all provisions outlined in Section A of this document except where specific provisions are waived in writing by The Owner.
  - B. The Fabricator will be responsible for the fabrication, shipping, handling, and installation of all exhibit elements as well as the fabrication and installation of all graphics and signs shown and specified in ESI's Final Design drawings.
  - C. LEED BUILDING GENERAL REQUIREMENTS: The Owner and ESI require that the Fabricator implement practices and procedures to meet the project's environmental performance goals, which include achieving LEED Certification. Specific project goals that may impact this area of work include: use of recycled-content materials; use of locally-manufactured materials (local to the project site); use of low-emitting materials; construction waste recycling; use of certified wood products; and the implementation of a construction indoor air quality management plan. The Fabricator shall ensure that the requirements related to these goals, as defined in the sections below, are implemented to the fullest extent. Substitutions, or other changes to the work proposed by the Fabricator or their SubFabricators, shall not be allowed if such changes compromise the stated LEED BUILDING Performance Criteria.
  - D. Related Sections:
    - ( 1 ) 01025: Construction and Demolition Waste Management
    - ( 2 ) 01015: VOC Limits for Adhesives, Sealants, Paints and Coatings
    - ( 3 ) 01115: Construction Indoor Air Quality (IAQ) Management
- I.2 COORDINATION:
- A. The Fabricator must coordinate with The Interactive Media Producer/ESI to receive the artwork for the graphics elements of the exhibit program. The fabricator shall provide production requirements and final graphic image dimensions to the AV producer.
  - B. The Fabricator is encouraged to coordinate with ESI through the use of sketches, memos and catalogue cuts to finalize construction, trim, hardware and other details of the physical design to be incorporated into the shop drawing submittals. (This is suggested to decrease rejected submittals and provide for an open dialogue between the designer and fabricator).
  - C. The Fabricator must coordinate work with all other contractors to ensure that all A/V and/or computer components as well as all other electronic or mechanical equipment fits properly and have adequate maintenance access and ventilation as determined by ESI and The Systems Integrator as appropriate.

- D. The Fabricator will coordinate the installation of Exhibit Elements with the Owner, the Architect, G.C. and other contractors as appropriate to overall project schedule and considerations of efficiency.
  - E. Coordinate work with the G.C. for the building, including but not limited to: locations of junction boxes and power outlets for exhibit elements; locations of conduit, cable tray, sprinkler, HVAC and MEP components; installation schedules.
  - F. Coordinate with the Architect and the G.C. on all building life-safety systems installation, permits, inspections, and reviews.
  - G. Verify and coordinate equipment and systems space, access and ventilation requirements with the Systems Integrator.
  - H. Coordinate power distribution requirements with the Systems Integrator and the G.C.
  - I. Work on site may occur only on the dates and during the hours designated by the Owner.
- I.3 SCHEDULE: The Fabricator will produce and maintain a production schedule.
- A. The Fabrication schedule must include the following milestones:
    - ( 1 ) In-Progress reviews at the Fabricators facility;
    - ( 2 ) Shop drawing reviews;
    - ( 3 ) Receipts of Graphics files from the Interactive Media Producer/ESI;
    - ( 4 ) Graphics and Finish sample reviews;
    - ( 5 ) Multimedia systems equipment samples from Integrator;
    - ( 6 ) Final art or content delivery;
    - ( 7 ) Installation;
    - ( 8 ) Building handoff;
    - ( 9 ) Handoff to Systems Integrator;
    - ( 10 ) Punch-list Review;
    - ( 11 ) Punch-list completion;
    - ( 12 ) Training;
    - ( 13 ) Project closeout; and
    - ( 14 ) Project launch date.
  - B. Any changes to the fabrication schedule that effect the Project Schedule shall be brought to the attention of the project team in writing immediately.
  - C. The fabricator will generate and maintain a submittal log to track shop drawings and materials. The log should indicate required permits and their status, as well as fabrication and approval lead times, and deadlines. Shop drawing submittals shall adhere to a published schedule.

**PART II: SUBMITTALS**

## II.1 GENERAL:

- A. No work shall be performed without prior approval from all relevant parties (ESI, Systems Integrator, Owner, Etc.) on issued shop drawings, samples, or other submittals for that work.
- B. Review all measurements relating to the fabrication and installation of work in ESI's Control Drawings. Inform ESI, the Owner and the Architect immediately of all discrepancies prior to performing the work. In the case of a discrepancy between the drawings and/or the written specifications, the Exhibit Fabricator should contact the ESI and mutually agree upon a solution.
- C. The Fabricator shall review all relevant drawings produced by the Architect, the G.C. and their subcontractors, as appropriate. Identify and bring to the attention of ESI any discrepancies between the Final Design documents and the Architectural Drawings.
- D. Attachments to building: detail sketches and weights should be provided to the architect/building structural engineer for review and approval.
- E. The Fabricator shall assess locations of HVAC and MEP systems, doors, windows, lighting fixtures, wall switches and controls, fire sprinklers, emergency lighting, strobes, FE cabinets, exit signs, security system alarms and sensors, changes in floor level, floor finishes, ceiling beams, building structures and finishes, and other elements which impact on proper fit and operation of the exhibits. Take detailed measurements of the exhibit space to ensure proper fit of all exhibit elements.
  - ( 1 ) LEED BUILDING Submittal Requirements.  
The Fabricator or subcontractor shall submit the following LEED BUILDING certification items:
    - (a) A completed GREEN BUILDING MATERIALS CERTIFICATION FORM (sample included at the end of this section). Information to be supplied for this form shall include:
      - (b) Material cost(s) for building materials included in Fabricator's or subcontractor's work. The Materials cost shall not include costs associated with Fabricator's or subcontractor's labor or equipment.
      - (c) The percentage by weight of post consumer and/or post-industrial recycled content in the supplied product(s).
      - (d) The location of origin and manufacture for the supplied product(s).
      - (e) The amount of "FSC Certified" wood product(s) used where specified.
  - ( 2 ) Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the product information supplied



for the attached GREEN BUILDING MATERIALS CERTIFICATION FORM.

- ( 3 ) Product Cut Sheets for all materials that meet the LEED BUILDING Performance Criteria identified in each specification. Cut sheets shall be submitted with the Fabricator or Subcontractor's stamp, as confirmation that the submitted products are the products installed in the project.
- ( 4 ) Documentation for "FSC Certified" wood products. Provide Chain-of-Custody documentation, per Forest Stewardship Council criteria.
- ( 5 ) Material Safety Data Sheets, for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings. Material Safety Data Sheets shall indicate the Volatile Organic Compound (VOC) limits of products submitted (If an MSDS does not include a product's VOC limits, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC limits).
- ( 6 ) The LEED BUILDING Submittal information shall be assembled into one package per specification section (or per subcontractor), and sent to the Architect for review. Incomplete or inaccurate LEED BUILDING submittals may be used as the basis for the Architect's rejection of products or assemblies.

**INESRT GREEN BUILDING MATERIALS CERTIFICATION FORM**

## II.2 SPECIFIC REQUIREMENTS:

- A. Any changes to the design of an exhibit element must be clearly indicated as such in the shop drawings and brought to the attention of ESI prior to review.
- B. Standard orthographic projections and view orientation shall be maintained at all times.
- C. All drafting will utilize standard drafting annotation.
- D. Drawings shall include proper identification, fully dimensioned drawings of the case or exhibit element, material, color, finish call-outs and shall show all methods of fabrication, and installation specifications.
- E. Provide up-to-date information on the drawings, including all products, colors finishes, and materials, identifying manufacturers and associated color or finish numbers.

## II.3 SAMPLES/PROTOTYPES:

- A. Full scale samples of all finishes and materials for review of kind, color, pattern, and texture must be submitted to ESI for approval and receive approval prior to being included in shop drawings.
- B. Two exactly matching samples of each proposed finish or material are to be submitted for approval. One will be returned with approval, the other will be retained by ESI.
- C. Graphic Samples: In accordance with part VI.9 of this section.
- D. Full-scale prototype of two (2) sections of the Situation Huts for review by the project team.

## II.4 SHOP DRAWINGS:

- A. Shop drawings for exhibit elements shall be submitted to ESI for review prior to the start of construction of any given exhibit elements. Construction of an exhibit element may not begin until shop drawings for that element have been reviewed and approved by ESI and/or the Owner, and systems integrator where appropriate.
- B. Drawings may be submitted as hard or electronic copies. Drawings will be submitted on vellum or reproducible media. Electronic set of drawings will be submitted as PDF files via FTP site or on a disk.
- C. The shop drawing requirements may be waived only by ESI in writing for situations of standard construction techniques where the design drawing is sufficient for the fabricator's personnel to construct the exhibit without additional detail.
- D. All shop drawing submittals shall be of complete exhibits with all elements completely detailed and ready for review without omissions or vagaries.

- E. The Fabricator shall not be relieved of contractual responsibility from these documents by the ESI's approval of shop drawings, samples, or other submittals unless the Fabricator has specifically informed the Designer in writing of each deviation at the time of the submittal and the ESI has given written approval of the deviation. The Fabricator shall not be relieved of responsibility for errors or omissions from submittals by ESI's approval of the submittal.
- F. All changes to shop drawings shall be clearly marked in subsequent issues.
- G. Shop drawings for Exhibit elements that incorporate Multimedia, computer, A/V, signs and graphics, or other systems shall be submitted to the appropriate contractor for review and comment prior to submission to ESI. Changes requested by Systems Integrator shall be incorporated into the final drawings and implemented in the fabrication of the exhibit.
- H. Shop drawing submittals must include the following:
  - ( 1 ) Exhibits' location in relation to existing adjacent architectural details including walls, power and signal outlets, HVAC and MEP elements and specific dimensions for locating the exhibit in the exhibit space.
  - ( 2 ) Exhibits' location and orientation in relation to other adjacent or intersecting exhibit elements.
  - ( 3 ) Elevations with finished sizes for equipment openings, graphic panels or artifacts as appropriate.
  - ( 4 ) Section views that show all details of construction.
  - ( 5 ) Section views that show all methods of attachment to base building architecture or adjacent exhibit element.
  - ( 6 ) Indication of all provisions for accommodating electrical and data pathways, ventilation, fan placement and mounting for lighting, A/V, computer and multimedia components.
  - ( 7 ) Isometric drawings to indicate access into all exhibit structures for maintenance, repairs, and re-lamping of lighting fixtures.
- I. Symbols: The Fabricator shall use American National Standards symbols.
- J. Abbreviations: The Fabricator shall provide a key to clearly identify all terms and abbreviations used on the drawings.
- K. Identification: Each drawing shall be identified by a unique drawing number and include the project name, exhibit number, and date of submittal.
- L. ESI will review and approve drawings and sketches and mark-up the PDF files in red, and return them to The Fabricator. The Project Designer will initial all drawings. In the situation that the drawings for exhibits contain systems, these drawings must be sent first to the Systems Integrator for approval. The Systems Integrator will then send these drawings to ESI for approval before they are returned to The Fabricator (See Section C, Part II.2). Approval by anyone other than ESI does not constitute approval to proceed with the work;

- M. Catalog Cuts: The Fabricator shall submit catalog cuts of proposed materials, substitutions, or alternatives prior to inclusion into the drawings or use during fabrication; and
  - N. Revisions; Revisions to drawings shall be done in accordance with ESI's mark-ups. The Fabricator shall not have developed the detailing work on these drawings to such a degree at this stage that it is impossible to change, continue development, or revise the work without causing delay of the project. All revisions shall be clearly marked on the shop drawings.
- II.5 AS-BUILT DRAWINGS: The Fabricator shall prepare a complete set of as-built drawings containing all approved revisions and additions to the original plan. The Fabricator shall include any additional pages approved during fabrication and renumber the full set of original vellum drawings and PDF files.

**PART III: PRODUCTION**

## III.1 GENERAL:

- A. Project Management: In accordance with Section A of this document.
- B. Fabrication of all exhibit elements including cabinetry, panels, platforms, vitrines, or other elements that constitute the basic structural elements of the exhibits.
- C. Production and Fabrication of all graphics and signage as described in the Final Design drawings.
- D. Production of final artwork for review by ESI. In specified cases, Final or camera ready art for custom designed graphics will be provided to the Fabricator by the Interactive Media Producer/ESI.
- E. Location of exhibits: where possible exhibits and graphics should not be bolted, affixed to the slab until ESI has confirmed exact angle/location.
- F. Trial Set-up and Review: Entire exhibits shall be set up in the shop, including casework, finishes, mechanical, electrical, and graphics elements, prior to shipping to site for installation. A schedule of shop set-ups shall be maintained, updated, and distributed by the Exhibit Fabricator. This schedule shall be distributed to ESI and the Owner so that Shop Reviews of set-ups can be anticipated, scheduled and attended by ESI.
- G. Quality Assurance: Refer to the Architectural Woodwork Institute Quality Standards for cabinetry and laminate work. All manufacturers' printed recommendations for materials, coatings, and adhesives are a part of this Specification. Copies of this publication are available from:
  - Architectural Woodwork Institute
  - 1952 Isaac Newton Square
  - Reston, Virginia 20190
  - (703)-733-0600
- H. Product Handling: Store lumber and millwork in a dry location. Do not expose wood to extreme changes of temperature or humidity. Protect panels, cases, and structures from damage during shipping, handling, production, storage, and installation.
- I. Refer to the following related sections for compliance with LEED Building Requirements
  - ( 1 ) II. 2, LEED BUILDING Submittal Requirements
  - ( 2 ) 01025: Construction and Demolition Waste Management
  - ( 3 ) 01015: VOC Limits for Adhesives, Sealants, Paints and Coatings
  - ( 4 ) 01115: Construction Indoor Air Quality (IAQ) Management

## III.2 CHANGES IN WORK

- A. Verbal Instructions: It is the Fabricator's responsibility to advise ESI and Owner in writing regarding any additional costs resulting from verbal instructions; such advice and written approval from ESI and the Owner shall occur before any additional work is executed.
- B. Supplemental Drawings and Specifications: As finishes and details change or are refined further by ESI or the Architect or Owner in response to field conditions or other circumstances, drawings and specifications will be issued before or during construction. In the event that the Fabricator feels these drawings affect the cost of the work that has already been bid, a Change Order will be negotiated with Owner prior to the execution of the work involved.
- C. Substitutions: All proposed substitutions shall be submitted in writing to ESI by the Fabricator and shall include:
  - ( 1 ) Manufacturer's literature required to substantiate the proposed substitution's performance as being equal to the specified product;
  - ( 2 ) Samples as appropriate to substantiate the proposed substitution's suitability; and
  - ( 3 ) A letter from the Fabricator confirming the proposed substitution has no effect on the project cost, schedule, and interface with other specified products or systems.
  - ( 4 ) Material and/or color substitutions necessitated by source limitations shall be approved by ESI. It is the responsibility of the Fabricator to source replacement options and present these options to ESI.
- D. The owner has required that this project shall be construction in accordance with the LEED Building Performance and Quality Assurance Requirements as stated in each respective section. Any substitution will only be approved if it is compliance with these stated requirements.

## III.3 CODE COMPLIANCE, WARRANTY AND SAFETY

- A. All materials, assemblies, and exhibits shall comply with all applicable Federal and State building, fire, safety, and New York and/or Oregon Seismic codes.
- B. All exhibit casework, materials, finishes and clearance dimensions shall comply with the Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities.
- C. The Exhibit Fabricator shall warranty all workmanship, materials and installation for a period of one year.
- D. The exhibits shall be considered permanent exhibits and shall be constructed to last at least 20 years under normal usage for public visitor sites. *Exceptions apply as noted on drawings.*

- E. All exhibits, assemblies and materials shall meet playground safety rules in terms of entrapment points, pinch hazards, and the like. All materials shall be non-splintering.
- F. There shall be no sharp edges or acute angles that might create a hazard to the visitor. All edges shall be radiused a minimum of 1/8". All corners shall be radiused a minimum of 1".
- G. All fasteners exposed to the public shall be tamper-resistant.
- H. All exhibits shall be securely fastened to floor, ground, wall and/or ceiling. Mobile exhibits shall contain enough bottom weight to ensure stability.
- I. All heat producing exhibits (those that include lighting, electronics, mechanical, etc.), shall be provided with adequate filtered ventilation. This ventilation includes filtered intake grilles
- J. If necessary, the Exhibit Fabricator shall engage a structural engineer to create stamped drawings as required by National, State, or Local codes.
- K. It is up to the Fabricator to determine and comply with New York and/or Oregon state laws regarding fire rated materials for exhibit fabrication.



**PART IV: MATERIALS**

## IV.1 WOODWORKING:

A. LEED BUILDING Performance Criteria: The following criteria are REQUIRED for the products included in this section:

- ( 1 ) Engineered wood, not including salvaged wood, shall contain a minimum of 10% (combined) post-industrial/post-consumer recycled content (the percentage of recycled content is based on the weight of the component materials). Certification of recycled content shall be in accordance with the Submittal Requirements of this Section.
- ( 2 ) All composite wood, engineered wood, or agrifiber products (e.g., plywood, particleboard, medium density fiberboard) to be permanently installed on the project shall contain no added urea-formaldehyde resins. Acceptable resins and binders include, but are not limited to, phenol formaldehyde and methyl diisocyanate (MDI). Certification of these products shall be in accordance with the Submittal Requirements of this Section.
- ( 3 ) Adhesives used for work in this section including plastic laminating adhesives shall contain no added Urea Formaldehyde.
- ( 4 ) Wood Materials manufactured, fabricated, and or harvested within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements of this Section.
- ( 5 ) Wood materials that have been Certified as sustainable and are harvested by the Forest Stewardship Council shall be documented in accordance with the LEED Building Submittal requirements of this Section.
- ( 6 ) Adhesives or sealants used for work in this section shall meet the requirements of the following section: "Volatile Organic Compound (VOC) Limits for Adhesives and Sealants", where applicable. VOC Limits include, but are not limited to the following:
  - (a) Wood Flooring Adhesive 100 g/l
  - (b) Clear Wood Varnish 350 g/l
  - (c) Clear Wood Laquer 550 g/l
  - (d) Wood Stains 250 g/l
  - (e) Sanding Sealers 275 g/l
  - (f) Clear Shellac 730 g/l
  - (g) Pigmented Shellac 550 g/l

Certification of these products shall be in accordance with the LEED BUILDING Submittal Requirements of this Section.

B. Quality - The Architectural Woodwork Quality Standards, as published by the Architectural Woodwork Institute (AWI), are by reference made part of this

Specification. Unless otherwise clearly detailed or specified, all cabinetry shall be fabricated to conform to AWI Quality Standards, Section 400, for Custom Grade material and workmanship.

- C. Fabrication - All casework shall be plant assembled. Cases too large for access into the exhibit area shall be made in attachable sections with provisions for re-assembly in the exhibit space. All faceplates, panel ends, and doors shall be of mortise and tenon or doweled fabrication, glued under pressure, with nails only furnishing the pressure. All nails shall be properly set for filling. Filled areas shall be sanded smooth to receive laminate, paint, or other specified finish. Edges of panels and signs shall be filled, sanded smooth, and finished or covered with material matching the panel face. Edges shall not be left unfinished unless otherwise specified on the drawings. All laminate and substrate shall be stored together for at least 72 hours and assembled in an environment of approximately 70 degrees Fahrenheit and 50% relative humidity.
- D. Shelving:
- ( 1 ) Any shelving used as a part of the interior of cabinets shall have a minimum thickness of 3/4", but always refer to the Final Design documents for correct specs.
  - ( 2 ) At a minimum, audiovisual equipment shelves shall have 12" square center portions of perforated metal to allow ventilation around equipment. The Fabricator shall be responsible for ensuring that each shelf is fabricated of material of sufficient strength for the piece of equipment for which it is intended.
- E. Veneer - All veneer shall be ordered in a minimum 3:1 ratio per square foot of plywood substrate required. Face veneer shall be flat sliced with adjacent pieces randomly matched. The maximum width of sapwood per flitch shall not exceed 2". Panel face assembly shall be running matched. Veneer millwork shall be sequence matched. All edges shall be veneer banded on all four (4) edges for final use in the exhibit.

IV.2 METAL WORK: Fabricate to detail and finish as specified on the drawings. Use appropriate fastening devices and welding materials, grind welds smooth, and ease all sharp or ragged edges. All metals shall be prepared and painted in accordance with the paint manufacturer's specifications.

- A. LEED BUILDING Performance Criteria: The following criteria are REQUIRED for the products included in this section:
- ( 1 ) Adhesives or sealants used for work in this section for interior applications shall meet the requirements of the section "Volatile Organic Compound (VOC) Limits for Adhesives and Sealants", where applicable.
  - ( 2 ) Materials manufactured, fabricated, and or harvested within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements.
  - ( 3 ) Steel materials used for work in this section shall contain a minimum of 35% (combined) post industrial/post consumer recycled content (the percentage of recycled content is based on the weight of the

component materials). Certification of recycled content shall be in accordance with the LEED Building Submittal Requirements.

- ( 4 ) Materials that contain recycled content shall be documented in accordance with the LEED Building Submittal Requirements.

IV.3 FINISH HARDWARE OR FASTENERS: Shall be applied and installed so they are fully functional. Screws shall be countersunk to flush level with surface, free of burrs, and at a 90 degree angle to the surface plane.

- A. Casters: unless otherwise noted these are 4" swivel casters with rubber tires. At least two (2) per unit shall lock.

IV.4 PLASTIC, ACRYLIC AND POLYCARBONATE: Follow manufacturers' printed instructions. Cut material to the size specified on the drawings, allowing for expansion and contraction. Welded joints shall be free of gaps and bubbles, continuously sealed, and absolutely invisible. All exposed edges shall be hand polished, no flame polishing (no tool marks). Where glued, no glue marks. Surfaces of acrylic shall be free of scratches, stains, or other imperfections.

- A. LEED Building Performance Requirements:

- ( 1 ) Adhesives, sealants, paints and coatings used for work in this section for interior applications shall meet the requirements of the attached "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Coatings", where applicable.
- ( 2 ) Materials manufactured, fabricated, and or harvested within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements
- ( 3 ) Materials that contain recycled content shall be documented in accordance with the LEED Building Submittal Requirements.

IV.5 FINISHED SUBSTRATES: Surfaces scheduled to receive etching, sandblasting, paint, laminate, photo mounts, or graphic finishes shall be made true and even with joints and nail holes, primed, sealed, and properly supported to prevent warping or bending. Fabricator is responsible for confirming with manufacturer the suitability of the substrate for adhesives.

- A. LEED Building Performance Requirements:

- ( 1 ) Adhesives, sealants, paints and coatings used for work in this section for interior applications shall meet the requirements of the attached "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Coatings", where applicable.
- ( 2 ) Materials manufactured, fabricated, and or harvested within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements
- ( 3 ) Materials that contain recycled content shall be documented in accordance with the LEED Building Submittal Requirements.

- B. Paint - All exposed surfaces to receive paint shall be finished smooth. Finished paint surface shall be without runs, sags, and other imperfections. Match colors specified on the drawings. Colors shall be consistent from surface-to-surface. Paint shall be applied under dry, dust-free conditions, in

accordance with the manufacturer's specifications. Edges, crevices, corners, and joints shall be thoroughly cleaned. Painting shall be of uniform thickness. All exposed edges of painted panels shall be filled, sanded, and painted to match the panel face unless otherwise specified on the drawings.

- ( 1 ) Concealed Areas - Those areas completely enclosed by solid opaque framing and skin. No finishing required.
- ( 2 ) Semi-Exposed Areas - Those areas only visible by opening doors or access panels. Finish with wood sealer.
- ( 3 ) Flat Panels, Framed - The back side of plywood or other framed material. A minimum of two (2) coats flat lacquer primer for the surface.
- ( 4 ) Flat Panels, Unframed - The back side of plywood or other material without framing such as cabinet doors and applied panels. A minimum of three (3) coats of paint, laminate backing sheet, or other finish equal in density and weight to that specified on the drawings for the exposed surfaces.
- ( 5 ) Edges - All exposed edges of panels, plaques, and photos shall be fitted and sanded smooth. Edges shall be finished to match adjoining surfaces as specified on the drawings.
- ( 6 ) Panel Backs - Backs of panels shall be finished with a spray-applied lacquer finish or laminate backing sheet in color specified on the drawings.

C. High Pressure Plastic Laminate - Face of the substrate shall be sanded smooth and free of grease, wax, dust, or other contaminants which interfere with adhesion. Control of the glue line and its thickness and uniformity of spread shall be given constant attention. Spot bonding shall never be used. Cover all areas where contact is made with adhesive. IN ALL CASES, THE ADHESIVE MANUFACTURER'S INSTRUCTIONS FOR USE SHALL BE FOLLOWED. Avoid chipping of laminate by the saw blade. Finish smooth edges on curved cut by sawing the part oversize and finish it by routing, filing, or sanding. When cutting laminate, make certain to prevent hairline cracks or over-cutting at inside corners. Inside corners shall be rounded to prevent corner cracking.

IV.6 FLOORING - As specified on the drawings. Installation shall be in accordance with all manufacturer's specifications.

A. LEED Building Performance Requirements

- ( 1 ) Adhesives, sealants, paints and coatings used for work in this section for interior applications shall meet the requirements of the attached "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Coatings", where applicable.
- ( 2 ) Materials manufactured, fabricated, and or harvested within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements
- ( 3 ) Materials that contain recycled content shall be documented in accordance with the LEED Building Submittal Requirements.

IV.7 ARCHITECTURAL MILLWORK: Fabricate and assemble units complete in the shop, insofar as their dimensions will permit for transportation and proper handling. All woodwork shall be shop finished and delivered to the installation site with protective covering. Use solid stock for frames, jambs, heads, stops, and edges. Where veneer plywood is used, trim exposed edges with hardwood without face nailings. Accurately fit and align separate parts. Provide ample screw, glue-and-bolt blocks, draw-bolts, tongues, grooves, splines, dowels, tenons, mortises, and other means of fastening to render the work substantial, rigid, and permanently secured in the proper position. Provide material to permit scribing to walls, floors, and related work. Provide sufficient allowance for shrinkage occurring after installation. Provide mitered corners at door frames with hairline joints. Fit and adjust doors to achieve smooth and noiseless operation. Exposed fasteners are unacceptable without specific approval from ESI. Countersink face nails and face screws, fill with plastic wood or wood plugs, sand flush to surface, and finish without visible markings.

A. LEED BUILDING Performance Criteria: Refer to section IV.1, LEED Building Requirements for Woodworking.

IV.8 ARTIFACT CASES:

A. LEED Building Performance Requirements

( 1 ) Adhesives, sealants, paints and coatings used for work in this section for interior applications shall meet the requirements of the attached "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Coatings", where applicable.

(a) The Volatile Organic Compound (VOC) content of any field applied interior sealant used as a filler shall not exceed 250 grams per liter (g/l)

(b) The VOC content of any field applied interior waterproofing sealer used as a coating shall not exceed 250 g/l

( 2 ) Materials manufactured, fabricated, and or harvested within 500 miles (by air) of the project site shall be documented in accordance with the LEED Building Submittal Requirements.

( 3 ) Materials that contain recycled content shall be documented in accordance with the LEED Building Submittal Requirements.

B. Wood - Unless otherwise specified, use two (2) coats of BM Eco Spec Latex Primer or AFM Safecoat Polyseal. The Fabricator shall follow manufacturer's specifications for the application of the finish to seal all exposed wood in the artifact chamber and desiccant chamber air space.

- C. Crack and Gap - To ensure that artifact vitrines are as airtight as possible, seal all seams that could allow air exchange with air outside the vitrine. Seal all seams with a neutral curing silicone caulk that does not emit acetic acid during curing.
- IV.9 FANS AND MOTORS: To be rated for operation at 40 degrees C ambient, of ample size to operate their rated load at full speed, continuously, without causing excessive noise, vibration or temperature rise. See Part V.5 for further information.
- IV.10 SUBMITTALS AND APPROVALS
- A. Approved detail drawings specified in Section B Part II
  - B. Color and finish samples for exhibit structures, including finish woods, masonry, metals, laminates, paints, stains, varnishes, veneers, fabrics, and faux finishes. Each sample shall be identified with the brand name, number, color name, and the manufacturer's name, address, and telephone number.
  - C. Catalog cuts for locks, security hardware, specialized hardware and off-the-shelf items provided by The Fabricator.
  - D. Refer to Section II.2 of this document: LEED Building Submittal Requirements.

**PART V: ELECTRICAL AND MECHANICAL**

## V.1 GENERAL

- A. Purchase, fabricate, assemble, install into exhibit structures, and thoroughly test all electrical and mechanical devices; this includes lighting. Install electrical components into exhibit structures to provide and ensure fully operational systems for each exhibit unit. Note: Systems Integrator will be providing equipment only. Fabricator will be providing electrical outlets where Systems Integrator designates and doing all electrical work for lighting.
- B. Quality Assurance: The National Electrical Code shall be the required standard for all electrical work. In the event other codes, state, and local, are in effect at the final exhibit site, they shall be included as part of this Specification and requirement. All manufacturers' printed recommendations for materials are a part of this Specification. Standards for other trades are included as part of this specification.
- C. Ventilation: all exhibit elements containing heat-generating elements shall have adequate ventilation to maintain enclosed equipment within operating conditions meeting manufacturer's specifications for optimal conditions. **Any element containing computers or A/V systems shall have forced air ventilation provided by fans** that create no perceptible sound to visitors.
- D. Exhibit Drawings: In accordance with Section B Part II.
- E. All wires shall be run so as not to be seen by the public.
- F. Product Handling: Store electrical and mechanical components in a dry location. Do not expose to extreme changes of temperature and humidity. Protect components from damage during shipping, handling, storage, and installation. Exercise care so as not to damage electrical components. Store in a protected environment.
- G. Testing: Mechanical, electrical and lighting components of exhibits shall be fully tested and operational in The Fabricator's shop, prior to delivery to the exhibit site.
- H. All lighting integral to exhibits shall be controlled from a single switch that is on the exterior of the unit and easily accessible by staff, but not the public.
- I. Switches shall be adjacent to system power switches where present.

V.2 MATERIALS: Materials shall be new and U/L approved.

V.3 EXECUTION: Fabricator shall obtain and follow all requirements pertaining to state and local codes:

- A. Power - Circuits within each installed exhibit structure shall be distributed from one (1) four (4) gang box mounted inside the exhibit structure. The box shall be connected to the power source (120 volts AC) through flexible conduit. Power supplies for the lighting systems and lighting shall be hard wired to the power source (120 volt AC) through flexible conduit. Provide sufficient extra length of flexible conduit to accommodate movement of power supply on

sliding access shelf. All connections to power sources shall be made at the locations specified on the drawings. The Fabricator shall evaluate power supply versus power demand to determine the appropriateness of existing circuits and work with the Systems Integrator to ensure that power cables do not cause interference with audiovisual signal cables. It shall be the responsibility of the Fabricator to advise ESI and The Architect if total power service requirements for any exhibit structure exceed available power.

*Inclusion of Tesla Coil: 240 V.*

- B. Coordination - Provide secondary distribution lines and one (1) three (3) prong female receptacle within each applicable exhibit unit for hookup of electrical equipment.
- C. Craftsmanship - Circuits shall be clearly and neatly labeled with special operating and maintenance instructions mounted on descriptive panels within each applicable exhibit unit. Run wiring exposed to minor potential physical damage in thin wall metallic tubing. Run inaccessible wiring in conduit. All conduit, junction boxes, fixtures, and equipment shall be neatly and securely attached to support members and concealed. Provide secondary distribution lines within each applicable exhibit unit. Provide receptacles, plugs, slip, or screw terminals to facilitate removal or replacement of equipment. Provide switches to ensure independent operation of individual components or devices found within the same exhibit unit. All work shall be properly grounded.
- D. Access - Ensure serviceability to each and every piece of equipment. Provide cut-outs and access panels to facilitate maintenance. Avoid alterations to exposed surfaces.
- E. Support - Furnish additional equipment support such as clip angles, plates, brackets, thrust blocks, bushings, and bearings necessary to reinforce exhibit structures, and devices relative to "hands-on" use and abuse of each exhibit.
- F. Termination of Wiring - Conductors shall be terminated at ends where attached to components using crimp-type lugs if the component possesses screw-type terminals. Where the component has only soldering lugs, connection shall be by good quality soldered electrical joint. Connection of conductors and wiring, one to another, shall be by insulated quick disconnects or with wire nuts of the correct size. The use of electrical insulating tape is not acceptable.

V.4 LIGHTING (This section will be amended to incorporate notes from the Lighting Designer):

- A. Interior Exhibit Structure - The Fabricator, in conjunction with ESI, shall review the lighting levels and heat output to ensure that proper environment of case interior is met during first inspection of case fabrication at The Fabricator's facility.
- B. Track - During the exhibit installation, The Fabricator shall install and connect all lighting track to power source as indicated in the final design drawings. The Fabricator shall install, aim, adjust track lighting fixtures and accessories, and adjust lamp wattage and beam spread after the exhibits and artifacts are in place. Provide final placement and aiming of lighting fixtures on-site after installation of exhibits and case contents, including measurement and



adjustment of exhibit lighting levels. This detailed information shall be included in the Maintenance Manuals.

- V.5 MECHANICAL: The Fabricator shall install mechanical devices in accordance with manufacturer's written instructions into the exhibit structures and wire them to be fully operational at the time of final inspection. This includes but is not limited to all fans, motors, and conveyor systems.
- V.6 AUDIOVISUAL AND COMPUTER EQUIPMENT: The Fabricator shall be responsible to coordinate with the Systems Integrator to ensure that audiovisual and computer equipment will fit and operate safely and efficiently within the exhibit structures.
- V.7 SUBMITTALS AND APPROVALS: Submittals shall include:
  - A. Catalog cuts and technical data for all Fabricator-purchased electrical, mechanical, and audiovisual equipment, including lighting fixtures and accessories, lamps, power supplies, connectors, switches, controls, pushbuttons, and other equipment.
  - B. A detailed, as-built lighting plan that shows final fixture placement, the treatment of each fixture (lamp type, wattage, gel, diffuser, and louver), and instructions for re-lamping. This detailed information shall be included in the Maintenance Manuals.

**PART VI: GRAPHICS**

- VI.1 Work includes:
- A. Fabrication and installation of all graphics media, using production-ready artwork provided by others (Interactive Media Producer/ESI) Media includes, but is not limited to HPL embedded graphics, Silkscreen graphics, Cut vinyl graphics, Duratrans, Digital vinyl graphics Scotchprint), Dimensional letters, Etched metal graphics, Digital photo-prints, Photo-prints, Internally illuminated signs, Dimensional graphics, Custom fiberglass embedment, Custom Floor mats.
  - B. Coordination of requirements for production artwork with the Interactive Media Producer/ESI.
  - C. Review and preparation for production of all supplied artwork, including production of film positives for screen-printing, and conversion of digital files for specified imaging system output.
  - D. Submission of intermediate proofs, type galleys, samples, and revised layouts to ESI and the Interactive Media Producer/ESI for review and approval prior to production. Exhibit Fabricator is to provide a schedule for these reviews at the production kick-off meeting.
- VI.2 **PRODUCT HANDLING:** All source materials shall be returned to the Interactive Media Producer/ESI unaltered and undamaged. The Fabricator shall provide protection from loss and physical damage at all times. Certified mail or written receipts shall be used in transferring sources to and from graphic processors, and returning material to the Interactive Media Producer/ESI.
- VI.3 **REVIEW OF MATERIAL:** Upon receipt of the graphic and then the production artwork package, The Fabricator shall review all graphic, photographic, and text materials prior to production.
- A. Type - Label identification numbers shall be checked against the drawings to ensure that they correspond properly with content as specified in the graphics and production artwork package.
  - B. Graphics and Photographs - Graphic identification numbers shall be checked against the drawings to ensure that they correspond properly with the labels as specified in the Graphic Schedule. The Fabricator shall verify that the proposed cropping, orientation, and dimensions will fit within the layout as designed.
  - C. Any errors, inconsistencies, omissions, or incorrect identification shall be brought to the attention of Interactive Media Producer/ESI for correction.
- VI.4 **SIGN TYPES (MATERIALS AND METHODS)** As specified on the drawings and/or Graphic Schedule.

**SIGN TYPE 1** – Silk screened graphic. One, two, or three colors as noted.

**SIGN TYPE 2B** – Adhesive vinyl graphics, digitally printed letterforms on adhesive, clear vinyl substrate, individually cut and applied to glass, painted or

other solid surface.

**SIGN TYPE 2C** – Adhesive vinyl graphics, solid color, applied to glass, painted or other solid surface. Edges of letters to be sharp and clean. Colors to be dense and opaque and match color references provided. Adhesives to be compatible with specified substrates.

Material shall consist of a tough, flexible, pigmented, vinyl film and shall be processed with compatible screen printing inks and clear coatings as recommended by the film manufacturer.

The film shall be pre-coated with a pressure-sensitive adhesive, which can be applied down to 60°F. The adhesive shall be protected by a treated paper liner that shall be easily removable without soaking in water or other solvents.

Recommended product: Scotchcal Brand Film series 3650, by 3M. Scotchcal is a durable, dimensionally stable, glossy vinyl film with pressure-sensitive adhesive on the reverse side, which will withstand severe weather and handling conditions. It is available in a wide variety of standard colors and can be silk-screen process printed to custom match non-standard colors.

Material shall be processed in accordance with the manufacturers recommendation for the intended use. Computer guided cutting or die-cut letters only - hand-cut letters are not acceptable.

**SIGN TYPE 3A** – Translucent digital photo print mounted to 1/8" thick clear acrylic panel and set into lightbox frame.

**SIGN TYPE 3B** – Opaque digital photo print mounted to 1/8" thick sintra back panel and set into lightbox frame.

**SIGN TYPE 3C** – Digital photo print, unmounted, set into acrylic frame.

**SIGN TYPE 4** –Dye sublimation print on 1/8" thick fiberglass reinforced polyester panel, and Velcro mounted to metal back panel of frame.

**SIGN TYPE 5** – Glass covered wood display case with dimensional graphics and changeable insert graphics.

**SIGN TYPE 6** – 3M Scotchprint mural applied to wall or panel surface.

**SIGN TYPE 7** – Digital graphics printed on fabric.

**SIGN TYPE 8** – 2" thick dimensional letters applied to existing metal sign band.

**SIGN TYPE 9** – Stencil paint graphic in 2 colors.

**SIGN TYPE 10** – (PV Portable) Digital graphic printed on flexible phenolic based substrate and adhesive to exhibit surface.

VI.5 TYPE: The Fabricator shall use type specifications in accordance the layouts.

- VI.6 SCREEN INK AND PAINT FINISHES: The Fabricator shall test the durability of each brand of screen ink and graphic paint finish on the exact substrate that will be used as a printing surface in the exhibit. The most durable combination of ink, paint, and substrate samples shall be submitted, to ESI for review and approval, prior to the start of production. The ink, paint, and substrate shall be identified by brand name on the sample.
- VI.7 GRAPHIC LAYOUTS: Full-size layouts shall be provided including cut-out shapes of exact size and placement of all graphics identified by graphic number. Layouts shall include all typeset text positioned as specified and identified by exhibit number. All sheets of the full-size graphic layouts shall be submitted in sequence by exhibit number. Each sheet shall be clearly numbered at the top.
- VI.8 FILM POSITIVES: Positives shall be burned to achieve sufficient density to ensure good application of inked image.
- VI.9 FRISKET SHAPES: Graphic material produced by use of masks or stencils shall have clean, crisp, and continuous hard edges with no obvious knife marks or overspray. Paint colors shall be opaque and consistent. Painted surface shall be free of sags, bubbles, and dirt, with no excess paint build up. Prior to painting the colors, The Fabricator shall prime the front and back surfaces with two (2) coats of primer, sanding between coats.
- VI.10 SCREENPRINTING:
- A. Durability - The Fabricator shall determine, through testing, which type screen printing ink is the most durable and long lasting for each substrate. All screen printed images shall adhere completely to the substrate and shall not chip, flake, or pop off the substrate. Images and text shall be cured in accordance with manufacturer's specifications until they are completely dry.
  - B. Color Contrast - The Fabricator shall produce samples of all color combinations. Upon review and approval by ESI, color adjusting may be required in order to ensure high contrast between type, color, and background.
  - C. Quality of Printing - Perfect register, exact measurement, proper color match, opaque, and crisp images. Ghosting, ragged, and soft edges are not acceptable. All borders shall be a consistent width throughout panels. Weight of graphic images, text, or other images used in a "set" shall be consistent throughout the exhibit.
  - D. Preparation of Surface - All surfaces to be screen printed shall be clean and free of grease, dirt, wax, or other coatings which can prevent the ink from adhering to the substrate. Plastic laminate surfaces shall be wiped with alcohol, and lacquer thinner, or other solvents recommended by the manufacturer to remove wax coating on surface.

- VI.11 PAINTED PANELS: Paint colors shall be opaque and consistent. Painted surface shall be free of sags, bubbles, and dirt, with no excess paint build up. Prior to painting the colors, the Fabricator shall prime the front and back surfaces with two (2) coats of primer, sanding between coats.
- VI.12 DIGITAL IMAGES:
- A. Scanning – All artwork provided by the Interactive Media Producer/ESI will have FPO images. The Fabricator shall scan all artwork, photographs, and other material to be used for conventional or digital output at the resolution recommended for the particular output device used, based on the final size of the image.
  - B. Output - Colors in the final image shall match color samples, original artwork, or photographic images. The Fabricator shall provide test samples of portions of the image at final image size, for ESI review and approval, to determine if the image resolution and colors are acceptable. The Fabricator shall save the original scan on digital storage media.
- VI.13 MOUNTING DIGITAL TO SUBSTRATE: The Fabricator shall use a cold roll system press to mount the graphic, in accordance with the manufacturer's specifications. The print shall be securely mounted to the substrate surface, free from wrinkles, blisters, scratches, rips, tears, adhesive residue, or other imperfections. Trim substrate panels square and clean, and lightly ease all edges with fine grit sandpaper on a sanding block, held at a 45 degree angle. Corners shall be well fastened and eased, with no untrimmed pieces left. Substrate and graphic output substrate shall remain flat, true, and even after mounting.
- VI.14 FILM MECHANICAL PREPARATION AND HIGH-PRESSURE PLASTIC EMBEDMENT: The Fabricator shall provide film mechanical preparation, high-pressure plastic embedment panels, embedding screen printed graphics, or encapsulating photographic prints.
- A. Film Mechanical Preparation - The preparation of film mechanicals, positives, or negatives, as specified below:

- ( 1 ) High quality typesetting.
  - ( 2 ) Camera line and halftone negatives and contact and blow-back film positives.
  - ( 3 ) Production of maps, employing multiple colors, utilizing computer graphics software compatible with current version of Adobe Illustrator.
  - ( 4 ) Assembly of film positive elements to color separated and registered films required for the imaging processes.
  - ( 5 ) Negative stripping of graphic elements for contacting to one-piece film positives for the production of etched and anodized exhibits.
  - ( 6 ) Furnishing and stripping sets of four-color process separations, including color proofs.
  - ( 7 ) Furnishing "posterized" film images utilizing standard special effect screens, i.e., mezzotint, steel etch, plus posturization based on the regulated exposure halftone (screen tint) method. Also included are straight line conversions from continuous tone images.
  - ( 8 ) Provide a blueline of filmwork.
- B. Screen Imaging as follows:
- ( 1 ) Screen image in tight register in up to twelve (12) colors, a sheet size range of 9" x 12" to 40" x 72" in editions of 12-to-40 copies per subject.
  - ( 2 ) Handle the above described screen imaging in groups of subjects (average 25 subjects) comprising one (1) job. All production phases of the work involved shall be concurrent and continuous. Submission of full color press proofs of each subject prior to the production run shall be required.
  - ( 3 ) Print 100-line four-color process images in perfect register which match Color Key, Match Print or other color proofs approved by ESI. If intended for embedment, the inks and paper used for this printing shall be compatible with the embedment process.
  - ( 4 ) Print fine line detail, including mezzotint and other special effect conversion screen images, 85-to-133 line half-tone images and 10 pt. Type without discernable saw tooth edge.
  - ( 5 ) Fabricate, image, and wash out screens in-house
  - ( 6 ) Sheet and size paper stock from rolls.
  - ( 7 ) Mix and match ink colors to PMS color specifications or Furnished color swatches.
  - ( 8 ) Hand paint illustrations following Furnished samples, over a ghost image of the base illustration for subsequent trap by black overprint.
  - ( 9 ) Equipment - Printing equipment shall be automatic, semi-automatic, or of the one man squeegee type, but shall have a vacuum platen covering the full image area. Drying shall be accomplished by either heated mechanical dryers or drying racks.
- C. Embedment - Furnish fiberglass reinforced polyester resin embedments of compatible screen imaged material in sizes and thicknesses as specified on

the drawings.

- VI.15 SUBMITTALS AND APPROVALS: The Fabricator shall provide the following submittals for review and approval by ESI:

**Sign Types:**

Silk Screened Graphic -

Adhesive Vinyl Graphics - One (1) 36" x 36" samples of each type of digital vinyl process, as specified in the Graphic Schedule;

Digital Photo Prints – One (1) minimum 12" x 12" sample, technique as specified in the Graphic Schedule;

Dye Sublimation Print

3M Scotchprint Mural

Digital Graphics printed on fabric

Dimensional Letters - One (1) minimum 12" x 12" sample of full-size cut-out letters, technique as specified in the Graphic Schedule;

Stencil Paint Graphic

Digital Graphic printed on flexible phenolic substrate

**Materials/Techniques:**

Color Samples - Submit samples of shop-mixed, dry ink, or paint colors mixed to match the specified exhibit graphic colors to ESI for review and approval prior to use in the exhibit. All color chips shall be marked with exhibit color number;

Digital Color Samples - Submit samples for each specific digital reproduction process for each exhibit color to ESI for review and approval prior to use in the exhibit. All color samples shall be marked with exhibit color number;

Type - Two (2) sets of full-size typeset galleys shall be submitted prior to making full-size graphic layouts, film positives, or screens;

Ink Samples - Samples of the brand of screen printing ink and exact substrate, which shall be used as a printing surface. These shall be identified as to brand name, and shall include the manufacturer's name, address, and telephone number. The designer will test the sample to determine the durability of the ink on the substrate. Samples shall be submitted prior to the start of screen printing;

**PART VII: SETUP AND INSTALLATION**

## VII.1 WORK INCLUDED:

- A. Packaging and shipping of exhibit elements and materials to the site.
- B. On-site installation of exhibit elements and materials.

VII.2 PRODUCT HANDLING: The Fabricator shall receive, store, handle, and transport all exhibit units and related materials in a safe and secure manner. In the event that damage occurs during shipping, The Fabricator shall be responsible for repair or replacement of any broken, damaged, or otherwise unusable elements.

## VII.3 MATERIALS

- A. Packing Materials: The Fabricator shall pack exhibits and components using materials that adhere to LEED specifications and that are considered "green". Please submit your packing material preferences to the project team for approval.
- B. Installation Tools and Materials: The Fabricator shall provide all installation tools and materials in sufficient number to accomplish the job, such as vacuum cleaner, ladders, tools, trash bags, cleaning materials, interior and exterior protective covers, barriers, and "No Admittance" signs.
- C. Related Sections:
  - ( 1 ) 01025: Construction and Demolition Waste Management
  - ( 2 ) 01115: Construction Indoor Air Quality (IAQ) Management

## VII.4 EXECUTION

- A. Wrapping and Packaging:
  - ( 1 ) Structures - Structures shall be blanket-wrapped with all attached exhibit elements protected.
  - ( 2 ) Audiovisual Equipment - Audiovisual equipment shall be shipped in original shipping box from manufacturer with all original packing materials in place.
  - ( 3 ) Photographs - The Fabricator shall use flat, smooth-surfaced materials between overlaminated photographs prior to transportation to the installation site. The Fabricator shall ensure that dust, dirt, sawdust, bubble wrap, styrofoam peanuts, and the rear surfaces of other overlaminated photos do not come in contact with the face of overlaminated photographs and leave impressions in the overlamine surface.
  - ( 4 ) Graphics - All screen printed surfaces shall be protected with brown paper secured with masking tape until completion of final on-site setup.
- B. Shipping: The Fabricator shall pack and crate all materials which shall be shipped by his own or commercial carrier in such a manner that they will



arrive at the designated site undamaged. If exhibit elements are damaged in transit, The Fabricator shall bear the full responsibility for repair or replacement.

VII.5 INSTALLATION:

- A. Installation Team - The Fabricator shall provide adequate personnel to install the exhibits, including the Project Manager. The Fabricator shall provide all required tools and materials in sufficient number to accomplish the job.
- B. Clean Up:
  - ( 1 ) The Fabricator shall maintain all areas in a clean condition on a daily basis and provide means of preventing dirt or waste material from being tracked into adjacent areas of the building. The Fabricator shall provide bags and containers for storage of trash. The Fabricator shall be responsible for removing waste materials generated during installation.
  - ( 2 ) Drilling and cutting shall be complete prior to the installation of artifacts, models, original art, and audiovisual equipment to avoid excessive dust and debris which may damage the sensitive items.
  - ( 3 ) The Fabricator shall thoroughly clean exhibit surfaces to remove hand prints, dust, and miscellaneous markings generated during the installation.
  - ( 4 ) The Fabricator shall handle all acrylic, glass, and graphic panels with clean gloves to minimize hand prints of natural skin oils. Panels shall be thoroughly cleaned until all dust, prints, and smears are removed from the face and rear surfaces.
  - ( 5 ) The Fabricator shall provide labor, materials, equipment, and supplies for final cleaning of the exhibit site, including vacuuming the entire exhibit space.
- C. Storage - Exhibit elements shall be stored at the exhibit site during installation. Storage must be coordinated with the Owner.
- D. Existing Work - The Fabricator shall request authorization from The Owner prior to cutting, drilling, altering, or removing material within the building. Work that is replaced shall match existing work. Anything damaged or defaced within the building due to The Fabricator's error during installation shall be restored to the original condition by The Fabricator. Restoration work shall be coordinated with The Owner.
- E. Protection - The Fabricator shall provide adequate protection for parts of the building, its contents, and occupants wherever work relating to this project is being performed. This includes dust protection where required and protective coverings for interior surfaces and furnishings adjacent to the work area. The Fabricator shall provide cardboard, plastic, or heavy kraft paper for the floor in the exhibit and adjacent work areas. The Fabricator shall provide barriers and post "No Admittance" signs. The Fabricator shall also ensure that artifacts are not left unattended and that they are stored in a secure location when the work site is unattended.

- F. Related Sections:
- ( 1 ) 01025: Construction and Demolition Waste Management
  - ( 2 ) 01015: VOC Limits for Adhesives, Sealants, Paints and Coatings
  - ( 3 ) 01115: Construction Indoor Air Quality (IAQ) Management
- VII.6 WALK-THROUGH INSPECTION: Upon completion of the on-site work, the Fabricator shall conduct a final walk-through of the exhibits with the Project Team, the Owner and Exhibit staff to identify punch list items, demonstrate operation of all electrical and mechanical elements in the exhibit and to demonstrate access into artifact cases and audiovisual equipment enclosures. The Fabricator shall notify the Project Team and the Owner ahead of time when the walk-through can be scheduled and shall assemble installation team members with the appropriate expertise to demonstrate the equipment and answer all questions.
- VII.7 OPERATIONAL TRAINING SESSION: After inspection and acceptance of the installed exhibits, the Fabricator and Systems Integrator shall conduct an operational training session for the Project Team, Owner, and Exhibit staff, using the Final Maintenance Manual as an instructional aid. The training session shall include day-to-day maintenance and cleaning of all exhibit elements, minor repair and touch-up procedures, exhibit case access, and start-up and shut down procedures for all audiovisual equipment and exhibit lighting.
- VII.8 MAINTENANCE MANUALS:
- A. A Preliminary Maintenance Manual will be submitted to the Project Team for review at least five (5) working days Prior to the final walk through of the exhibit program with The Owner.
  - B. The Fabricator and Systems Integrator shall deliver two (2) copies of the Final Maintenance Manual Prior to the final walk-through of the Exhibit program with The Owner, incorporating all changes or corrections to the Preliminary Maintenance Manual.

**PART VIII: PROJECT CLOSEOUT**

## VIII.1 SPECIFIC REQUIREMENTS:

- A. Exhibit Maintenance Kit.
- B. Maintenance Manuals.

## VIII.2 MATERIALS:

- A. MAINTENANCE MANUALS: Black, three (3) ring binders to hold 8-1/2" x 11" format paper, white and black illustration boards, plastic sleeves, pockets, and tabbed identification dividers.
- B. MAINTENANCE KIT: A permanent container, with a lid, to hold all sample finishes, applicators, and bottles or cans for paints, stains, varnishes, thinners, solvents, special finishes, and waxes. Brushes, finish applicators, keys, screw drivers, wrenches, and other special tools shall also be included.

## VIII.3 MAINTENANCE MANUALS - Final Maintenance Manuals shall include the following:

- A. Assembly Instructions - Pages shall be 8 1/2" x 11" sheets, punched and inserted into three (3) ring binders. The spine of the binder shall be labeled "Maintenance Manual - (name of project and site)." Provide actual paint, ink, plastic laminate, fabric, and finish samples in colors specified on the drawings, on 8 1/2" x 11" white illustration board. For all screen printing on plastic laminate, use actual sheets of plastic laminate for sample board substrate. All sample boards shall be punched for insertion into a three (3) ring binder. Sections shall be separated by labeled and tabbed pages.
- B. Content - The Fabricator shall include the following:
  - ( 1 ) Title page - Provide a title page with the name of the exhibit, the site, and installation date.
  - ( 2 ) Index - Provide a list of contents.
  - ( 3 ) Contract Information - Provide name, address, and telephone number for all Fabricators who produced work for the exhibit, identifying the portion of the work they provided.
  - ( 4 ) Cleaning Instructions - Provide instructions for cleaning all exhibit structures, finishes, graphic panels, tactile models, and screened material. Include brand names of recommended cleaning materials and list the name, address, and telephone number of the manufacturers or distributors of the cleaning products. "Not to be used" materials and techniques shall be identified.
  - ( 5 ) Repair Instructions:
    - (a) Describe specific techniques for repairing damage to exhibit surface materials such as: wood and painted finishes, screened areas, plastic laminates, faux finishes, fabric, metal, acrylic, polycarbonate, and glass.

- (b) Include final wiring diagrams for all equipment wired by the Fabricator.
- ( 6 ) Artifact Care and Handling – All mounts and artifact handling shall be done by others.
- ( 7 ) Product List and Catalog Cuts - List brand names of off-the-shelf products purchased for use in the exhibit and the name, address, and telephone number of the supplier or distributor. Provide legible machine copies of catalog cuts. However, if copy of original cannot be produced without loss of readability, original catalog cuts shall be provided. Include at least one (1) original copy of the manufacturer's information packed with Fabricator-Purchased off-the-shelf equipment, inserted into 8 1/2" x 11" clear plastic sleeves, punched for three (3) ring binders.
- ( 8 ) Warranties - Provide manufacturer's warranties for all off-the-shelf equipment purchased by the Fabricator.
- ( 9 ) Access Instructions - Provide isometric or exploded view drawings that clearly and sufficiently illustrate access to artifact, desiccant, and lighting chambers, audiovisual equipment, and electrical and mechanical devices in the cases and in the building. The drawings shall identify the exhibit number and any information relevant to opening or dismantling the structures.
- ( 10 ) Electrical and Mechanical Instructions - Provide maintenance and operation instructions for all lighting, electrical, and mechanical equipment provided by the Fabricator as follows:
- (a) As-built drawings of the exhibit lighting plan which show the manufacturer, model number, and any specialized equipment such as gels, diffusers, and louvers. Include specific instructions for re-lamping.
- (b) Catalog cuts and manufacturer's printed instructions for all ceiling lighting fixtures, lighting tracks, lighting track fixtures, lamps, connectors, transformers, adapters, power strips, clocks, sensors, timers, ventilation fans, thermostats, motors, switches, pushbuttons, fibers, lenses, illuminators, dimmer controls or other electrical, mechanical, or lighting equipment.
- ( 11 ) Color and Finish Samples - Provide actual samples of all materials used in the exhibit such as: woods, veneers, masonry, metal trim, laminates, fabrics, carpets, paints, and inks. Material shall be mounted on 8-1/2" x 11" white illustration board, clearly labeled with the color name and number, the manufacturer's brand name, and other pertinent product identification, keyed to the drawings for location. One (1) 8-1/2" x 11" sample shall be provided for each screen printing ink color and substrate combination used in the exhibit. Samples of specialized techniques such as sandblasting or etching samples shall also be provided.

- ( 12 ) A copy of the Graphic Schedule and facsimiles, Artifact Schedule and facsimiles, and Label Schedule shall be included. All revisions and updated information shall be clearly noted.
- ( 13 ) Exhibit Drawings - Include one-half (1/2) size copies of the exhibit drawings and insert into the Maintenance Manual.

VIII.4 MAINTENANCE KIT: The Fabricator shall provide the following items in a permanent container with a lid.

- A. Touch-Up Kit - Touch-up materials for all finishes and surfaces, including applicators for each sample. Label each sample as to contents and color.
- B. Keys - The Fabricator shall provide two (2) sets of all keys used in the exhibit. Keys shall be identified with the exhibit project name and number.
- C. Tools - The Fabricator shall provide two (2) sets of special screwdrivers for tamperproof screws, wrenches for roto locks, allen (hex) wrenches, or any other specialized tool which shall be used for case access, mobility, or security.
- D. Cleaning Kit - One (1) container of recommended cleaner, and appropriate cleaning wipes, for each material and finish used in the exhibit, including instructions and materials for special stains that require cleaning, sanding and reapplication of finish.

**PART I: GENERAL**

## I.1 WORK INCLUDED:

- A. Software Production. Two types of software production are required for the exhibit program:

- ( 1 ) PC Based Software-to be produced by the Interactive Media Producer/ESI
- ( 2 ) Show Control Based Software - to be produced by the Systems Integrator. See next section for a description of show control programming requirements.

Show control software is defined as all the software that is used to control real world devices and is considered to be not part of the Media Producer's scope of work. The Project Team will decide which programming tasks fall under the Media Producer's scope of work. There are various types of control platforms that are used for programming show control environments. Some typical types of controllers are; Programmable Logic Controllers (PLCs), proprietary show control hardware, such as AMX or Crestron, and custom PC-based show control software.

Most show control environments are a hybrid of the platforms described above. The Systems Integrator should be able to implement each type of system and be familiar with the programming languages for each. Programming languages such as NetLinx and SIMPL Windows for AMX and Crestron, respectively, is required for the implementation of proprietary these systems. Through discussions with the Systems Integrator the Project Team will decide which approach best suits the project requirements.

- B. The Systems Integration Contractor (Integrator) shall comply with all provisions outlined in Section A of this document except where specific provisions are waived in writing by The Owner.
- C. The Integrator will engineer all audiovisual and computer based systems required by the design.
- D. The Integrator shall furnish all equipment and materials, whether specifically mentioned In the Final Systems Integration Appendix or not, to ensure a complete and operating system. Equipment and Materials specifically noted as Not In Contract (NIC) or Owner Furnished Equipment (OFE) are exempted from this requirement.
- E. The Integrator shall provide development systems to the Software Developer.
- F. The Integrator shall generate all shop drawings and information for the complete installation and wiring of the system. The Integrator shall provide the labor for on-site installation and wiring, and shall provide on-going supervision and coordination during the implementation phase.
- G. The Integrator shall be responsible for the initial adjustment of the equipment and shall provide all test equipment for the system checkout and acceptance

tests. Integrator shall provide on-the-job training in the operation and maintenance of the systems for personnel designated by The Owner.

I.2 SITE VISIT AND FIELD CONDITIONS

- A. The Integrator shall verify all dimensions and distances in the field and document the cable lengths and materials to be furnished and installed. The provision and installation of non-specified miscellaneous hardware, i.e.: nuts, bolts, grommets and tie wraps shall also be the Integrator's responsibility.
- B. Existing site conditions, Contract Documents and the overall construction schedule must be carefully reviewed to determine all required interfacing and timing of the work. All such documents shall be available through The Owner.

I.3 COORDINATION: The Integrator shall coordinate and schedule all aspects of the systems installation as it relates to other contractors including but not limited to:

- A. The Interactive Media Producer to ensure compatibility of Systems with the Software being developed for the project and compatibility of show control software with PC-based Software where applicable;
- B. The Integrator will coordinate the installation of Systems Elements (Including conduit, junction boxes, electrical power, display equipment) with The Owner, The Architect, G.C., Exhibit Fabricator and other contractors as appropriate to overall project schedule and considerations of efficiency;
- C. The Fabricator to ensure that all casework and systems housings provide adequate ventilation for systems equipment and that there is sufficient access for maintenance. The Integrator will review all drawings of work which incorporate systems equipment and work with The Fabricator and ESI to resolve any conflicts;
- D. The Fabricator, G.C. and its sub-contractors, as required, to assure clean power locations, load requirements, and cable pathways;
- E. EQUIPMENT DELIVERY AND STORAGE: Costs of all shipping to the site, and of all unusual storage requirements, shall be borne by the Integrator. It shall be the responsibility of the Integrator to make appropriate arrangements, and to coordinate with authorized personnel at the site, for the proper acceptance, handling, protection, and storage of equipment to be delivered.

I.4 SCHEDULE: The Integrator will produce and maintain a production schedule. Any changes to the Integration Schedule that effect the Project Schedule must be clearly identified for the project team. The Integration schedule must include the following:

- A. Relevant milestones from the Project Schedule including:
  - ( 1 ) Proof of technology review;
  - ( 2 ) Alpha and Beta software reviews;
  - ( 3 ) Final Design Review
  - ( 4 ) Building handoff;
  - ( 5 ) Quality Assurance, Systems and Software Testing, Debugging;
  - ( 6 ) User testing/Interactive design review; and

- ( 7 ) Project launch date.
- B. Coordination Milestones including:
  - ( 1 ) Systems Equipment Samples to Fabricator;
  - ( 2 ) Coordination of show control and PC-based software elements between Systems Integrator and Interactive Media Producer/ESI;
  - ( 3 ) Power and signal pathways in base building;
  - ( 4 ) Equipment deliveries to site;
  - ( 5 ) Installation of systems into casework and control room;
  - ( 6 ) Systems Check-out;
  - ( 7 ) Systems Acceptance test;
  - ( 8 ) Punch-list Review;
  - ( 9 ) Punch-list completion
  - ( 10 ) Training of Operations Personnel;
  - ( 11 ) Documentation completion; and
  - ( 12 ) Project Closeout.



**PART II: SUBMITTALS AND REVIEWS**

## II.1 GENERAL

- A. The Integrator is required to review and be familiar with the Final Media Document and the Final Systems Integration Appendix.
- B. Review ESI's specifications for all systems' elements and confirm the availability and appropriateness of all components specified.
- C. The Integrator is responsible for creating the final systems design based on the design intent and working from the Final Systems Integration Appendix included in the Final Design package.
- D. The Integrator must submit a complete equipment list and schematic diagrams of the final system based on the design documents to ESI and The Owner for review prior to the implementation of any work. The equipment list will include all equipment necessary to realize all functionality described in the design whether or not that equipment is specifically indicated in the performance specifications.
- E. Manufacturers' cut sheets will be provided for all equipment to be incorporated into the system and submitted to ESI with the final equipment list and final schematic diagram(s).
- F. Any substitution of specific equipment specified in the system design package must be brought to the attention of ESI and manufacturers' cut-sheets shall be submitted along with a letter indicating the Integrators reasons for proposing the change and what advantages are gained should the change be approved. Equipment substitutions must be approved in writing by ESI prior to purchase / installation.
- G. ESI, the Interactive Media Producer/ESI and The Owner will review the Equipment List and the schematic drawings. Any changes requested shall be made to the systems documentation.
- H. The Integrator shall provide sample pieces of equipment to the Fabricator for the purposes of obtaining a proper fit on or within the casework as well as for the Fabricator to complete reviews and trial set-ups with ESI and The Owner as scheduled.

## II.2 Fabricator Shop Drawings: The Integrator will receive, review, mark-up and forward to ESI with mark-ups the Fabricator's shop drawings for exhibit elements that house or incorporate any systems components.

- A. The Integrator will receive one (reproducible) copy of the shop drawings from The Fabricator.
- B. The Integrator will mark up and forward to ESI the original shop drawing and retain at least one (1) copy.
- C. The Integrator will have five (5) business days to forward shop drawings to ESI for further review.

- D. The Integrator is responsible for review of the Fabricator's shop drawings to ensure the following:
    - ( 1 ) That systems components have adequate ventilation;
    - ( 2 ) That power and signal pathways are clear and there is adequate separation so as not to induce interference;
    - ( 3 ) That the systems components will be easily maintained and serviced; and
    - ( 4 ) All peripherals can be mounted, used and maintained efficiently by the Exhibit staff.
  - E. It is the Integrator's responsibility to give complete and accurate instructions to the Fabricator regarding all systems requirements that affect the construction and installation of the exhibit casework.
  - F. Any changes to systems components that attach to or are enclosed by exhibit casework shall be brought to the immediate attention (In writing) of The Fabricator and ESI.
- II.3 PRELIMINARY DOCUMENTATION: All equipment whether a stock manufactured item or custom built shall be supported by complete and detailed schematic drawings and replacement parts lists. No "black boxes" or unidentified components shall be acceptable under this specification.
- A. Custom Designed Hardware: Prior to performance of the work, the Integrator shall submit to The Owner, ESI, and The Software Developer for approval, all custom designs pertaining to the systems.
  - B. Drawings: Drawing submittals shall be on reproducible media. These designs include, but are not limited to, the following:
    - ( 1 ) Complete system construction and point to point wiring schematic drawings, including all component values and showing complete letter and number identification of all wire and cable as well as jacks, terminals and connectors.
    - ( 2 ) All panels, plates, and designation strips, including details relating to terminology, engraving, finish and color.
    - ( 3 ) All custom designed consoles, tables, carts, support bases, and shelves.
    - ( 4 ) Schematic drawings of all custom components, assemblies and circuitry.
    - ( 5 ) All unusual equipment modifications.
    - ( 6 ) Run sheets or field wiring details.
    - ( 7 ) Patch panels assignment layout drawings.
    - ( 8 ) Front and rear view mechanical drawings of each equipment rack.

**PART III: SPECIFIC REQUIREMENTS**

- III.1 In Shop Testing and Alpha and Beta Reviews:
- A. Entire systems shall be built, configured, and tested in the shop, including all wiring, connectors, cable management, strain relief, interface devices, equipment, rack hardware, and labeling prior to shipping to site for installation.
  - B. A schedule of shop set-ups shall be maintained, updated, and distributed by the Integrator. This schedule shall be distributed to ESI and The Owner so that Shop Reviews of set-ups can be anticipated, scheduled and attended by ESI.
  - C. Alpha and Beta reviews: An Alpha Review is held at the developer's facility. The Owner and ESI shall review a mock-up of the exhibit software. The purpose of this review is to evaluate the effectiveness of the software at a stage where changes can be made to either the software or the exhibit with minimal impact on the project schedule/budget. See Section D, Part II.5 for full description.
- III.2 Materials:
- A. The Integrator shall furnish the following for the exhibit systems:
    - ( 1 ) All materials, labor and any engineering services to provide complete and professionally installed system, in working order. Labor furnished shall be specialized and experienced in work to be performed.
    - ( 2 ) Any additional equipment needed in order to meet the requirements stated herein, even if not specifically mentioned or shown on drawings.
    - ( 3 ) All wire and cable for the Systems.
    - ( 4 ) Mounting hardware and equipment racks.
  - B. All materials and equipment supplied by the Integrator shall be new and shall meet or exceed the latest published specification of the manufacturer in all respects.
  - C. The Integrator shall supply the latest model, available at the time of proposal, of each piece of equipment.
  - D. Equipment racks are to be delivered pre-populated, with all interconnections between equipment completed with the exception of equipment which is to be stored on shelving within the rack, which will be shipped to site in the original carton including all manufacturer' packing material;
  - E. All empty rack spaces will be covered by blank faceplates to match the rack in which they are installed or as specified by ESI.
  - F. Original cartons with manufacturers packaging materials included will be provided to The Owner.

**PART IV: INSTALLATION**

## IV.1 GENERAL

- A. Installation shall include the delivery, unloading, setting in place, fastening to walls, floors, ceilings, counters, or other structures where required, interconnecting wiring of the system components, equipment alignment and adjustment, and all other work whether or not expressly required herein which is necessary to result in complete operational systems.
- B. All installation practices shall be in accordance with, but not limited to, these specifications and drawings. Installation shall be performed in accordance with the applicable standards, requirements, and recommendations of National, State, and Local authorities having jurisdiction over the exhibit site.
- C. If, in the opinion of the Integrator, an installation practice is desired or required, which is contrary to these specifications or drawings, a written request for modification shall be made to ESI. Modifications shall not commence without written approval from ESI.
- D. During the installation, and up to the date of final acceptance, the Integrator shall be under obligation to protect his finished and unfinished work against damage and loss. In the event of such damage or loss, he shall replace or repair such work at no cost to The Owner.
- E. The Integrator shall be responsible for identifying and resolving all union jurisdictional issues that arise throughout the installation of elements under the Integrator's scope of work.

## IV.2 INSTALLATION PRACTICES

- A. Physical Installation
  - ( 1 ) All equipment shall be firmly secured in place unless requirements of portability dictate otherwise.
  - ( 2 ) Fastenings and supports shall be adequate to support their loads with a safety factor of at least three.
  - ( 3 ) All boxes, equipment, etc. shall be secured plumb and square.
  - ( 4 ) All equipment must be installed in accordance to any seismic regulations.
  - ( 5 ) In the installation of equipment and cable, consideration shall be given not only to operational efficiency, but also to overall aesthetic factors.
- B. Cable Installation
  - ( 1 ) All cables, regardless of length, shall be marked with wrap-around cable markers at both ends with a unique alphanumeric code. There shall be no unmarked cables at any place in the system.
  - ( 2 ) Marking codes used on cables shall correspond to codes shown on drawings and or cable schedules.

- ( 3 ) All inter-rack cabling shall be neatly strapped, dressed, and adequately supported.
- ( 4 ) In order to reduce signal contamination all cables shall be grouped according to the signals being carried.
- ( 5 ) As a general practice, all power cables, control cables, and high level cables shall be run on the left side of an equipment rack as viewed from the rear. All other cables shall be run on the right side of an equipment rack, as viewed from the rear.
- ( 6 ) All cables shall be cut to the length dictated by the run. No splices shall be permitted in any pull boxes without prior permission of ESI. For equipment mounted in drawers or on slides, the interconnecting cables shall be provided with a service loop of appropriate length.
- ( 7 ) No cable shall be installed with a bend radius less than what is recommended by the cable manufacturer.

C. Equipment Racks

- ( 1 ) The equipment rack shall be considered as a custom assembly and shall be assembled, wired and tested in the Integrator's shop.
- ( 2 ) Rack shall be installed plumb and square without twists in the frame and in accordance with seismic conditions and regulations.
- ( 3 ) All wire, cable, terminal blocks and rack-mounted equipment shall be clearly and logically labeled as to their function, circuit, or system. Labeling on manufactured equipment shall be engraved plastic laminate or by thermal printer on adhesive tape, with white lettering on black background or dark background that is similar to panel finish.
- ( 4 ) Provide stiffeners to custom panels as needed to prevent panel deformation during normal plugging or switching operations.
- ( 5 ) All wires and cables used in assembling custom panels and equipment racks shall be formed into harnesses that are tied and supported in accordance with accepted engineering practice.
- ( 6 ) Harnessed cables shall be combed straight, tie-wrapped every six (6) to ten (10) inches, and attached to the structure as necessary. Each cable that breaks out from a harness for termination shall be provided with an ample service loop to permit equipment removal from the racks without disconnecting.
- ( 7 ) Harnessed cables shall be formed in either a vertical or a horizontal relationship to equipment, controls, components or terminations.
- ( 8 ) All system components and related wiring shall be located with due regard for the minimization of induced electromagnetic and electrostatic noise, for the minimization of wire length, for proper ventilation, and to provide reasonable safety and convenience for the operator.
- ( 9 ) All rack-mounted equipment, with front panel controls, shall be provided with security covers to avoid tampering with preset levels. If specific security covers are not included in the equipment list, the Integrator will provide the manufacturer's security cover for each specified device or a suitable device or a suitable alternate.

**PART V: PROJECT CLOSEOUT**

- V.1 CLEANUP AND REPAIR: Upon completion of the work the Integrator shall remove all his refuse and rubbish from and about the premises, and shall leave the relevant areas and equipment clean and in an operational state. The Integrator shall be responsible for repairing any damage caused to the premises by the Integrator's installation activities, at no cost to The Owner.
- V.2 SYSTEM CHECKOUT: Before Acceptance Tests are scheduled; the Integrator shall perform his own system checkout. He shall furnish all required test equipment and shall perform all work necessary to determine and/or modify performance of the system to meet the requirements of this specification, and work with Software Developer's quality assurance engineers to help test and debug the systems. This work shall include the following:
- A. Addressing bugs that are system-related.
  - B. Load/Stress testing;
  - C. Configuration testing;
  - D. Adjust all equipment for optimum quality and to meet the manufacturer's published specifications. Establish and mark normal settings for all level controls, and record these settings in the "System Operation and Maintenance Manual".
  - E. Maintain documentation of all performance tests for reference during the System Acceptance Tests.
- V.3 SYSTEM ACCEPTANCE TESTS: System Acceptance Tests will not be performed until the Integrator's System Checkout has been completed. The System Acceptance Tests will be supervised by ESI and Software Producer (See Section D, III.1 and III.2 for further details) and will consist of the following:
- A. Integrated Beta testing.
  - B. Final Quality Assurance checks.
  - C. A physical inventory of all equipment on site.
  - D. Demonstration of the operation of all system equipment by the Integrator.
  - E. Subjective and objective tests to determine compliance with the specifications. The Integrator shall be responsible for providing test equipment for these tests.
  - F. All preliminary "as-built" schematic drawings, cable schedules, manuals, and other required documents, as detailed herein, shall be on hand.
  - G. In the event further adjustment is required, or defective equipment must be repaired or replaced, tests may be suspended or continued at the option of ESI and The Owner.

- V.4 FINAL SYSTEMS DOCUMENTATION: At the completion of the installation, the Integrator shall provide two (2) copies of a System Operation and Maintenance Manual. The Integrator will submit preliminary systems documentation to ESI for review prior to beginning of training the Operation Personnel in the operation and maintenance of the system. The Integrator shall produce this manual specifically for the systems detailed herein. The Operations and Maintenance Manual shall include:
- A. Table of Contents
  - B. The "Operation" section shall describe all typical procedures necessary to activate the systems, perform maintenance tasks and diagnose problems. The reader of this manual shall be assumed to be technically competent, but unfamiliar with this particular facility.
  - C. The "Maintenance" section shall provide a recommended maintenance schedule with reference to the applicable pages in the manufacturer's maintenance manuals. If the manufacturer provides inadequate information, the Integrator shall provide any information necessary for proper maintenance.
  - D. Schematic System Diagrams with cable runs and patch points identified by alphanumeric character. This part of the package may be composed of separate diagrams detailing each exhibit type and including a master diagram detailing the main interconnections within the system. These diagrams will be updated to include any changes made during the installation process. A framed or laminated copy of the master system diagram should be provided for mounting on the wall within the control room.
  - E. Software Code: All source files shall be provided, electronically, as well as, hard-copy printouts. Source files will be included, but not limited to, show control source code, touch panel layouts, associated infrared (IR) Library Files, and Documentation relating to custom protocols developed for the project. Coordinate with Interactive Media Producer/ESI (See Section A, IV.1 C)
  - F. Touch Panel Layouts with descriptions of all touch button controls.
  - G. Cable Schedule. A schedule consisting of a list of all cables used within the systems, each identified by a unique alphanumeric character code shall be provided. The cable schedule shall directly relate to the cabling detailed within the schematic system diagrams. Information for each cable should include Cable's origin (From), Cable's destination (To), cable type (make and model), connector types, and conduit information (if available). Any special cables with custom pin-wiring should be detailed.
  - H. Equipment lists for all equipment provided, including Description, Quantity, Make and Model information for each piece of equipment. Individual equipment lists for each exhibit type, as well as, a master equipment list shall be provided.
  - I. Equipment Rack Layouts: These layouts shall show the locations of all equipment (as they relate to the schematic system diagrams) within the equipment racks (front and rear).
  - J. Equipment manufacturer's operation and maintenance manuals for each piece of equipment.

- K. Manufacturer's warranty registration cards and information for all equipment.
- V.5 FINAL SYSTEMS DOCUMENTATION REVIEW: ESI will review the Preliminary Systems documentation and provide comments to The Integrator. The Integrator shall incorporate these changes into the Final Systems Documentation and provide one (1) copy, neatly bound and labeled with the project name to The Owner and one (1) copy will be issued to ESI.
- V.6 PUNCH-LIST REVIEW: At the completion of work by The Integrator, ESI and The Owner will conduct a walk through of the Exhibit Program. Items that need additional work will be identified. The Integrator will provide projected dates for completion of work
- V.7 OPERATIONAL PERSONNEL TRAINING: The Integrator shall provide on-the-job training by a suitably qualified instructor, to personnel designated by The Owner, to instruct them in the operation and maintenance of the systems. In the event the Integrator does not have qualified instructors on staff for certain sophisticated equipment, a manufacturer's representative will be provided by the Integrator for such instruction, at no additional cost to The Owner. All training shall take place after the systems are operational, but before the acceptance tests.



## **SECTION 01025: CONSTRUCTION & DEMOLITION WASTE MANAGEMENT**

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### **PART 1 - GENERAL**

#### **RELATED DOCUMENTS**

Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

#### **Related Sections:**

All sections of the Specifications involving demolition or construction activities.

#### **PERFORMANCE REQUIREMENTS**

##### **LEED BUILDING – GENERAL REQUIREMENTS**

Implement practices and procedures to meet the project's environmental goals, which include achieving a LEED Building rating. Specific project goals that impact this area of work include the implementation of Construction Waste Management practices to: 1) reduce waste generation; 2) reuse, salvage, or recycle waste materials; and 3) minimize waste disposal in landfills. Ensure that the requirements related to these goals, as defined in the sections below, are implemented to the fullest extent. Substitutions, or other changes to the work proposed shall not be allowed if such changes substantially compromise the stated LEED BUILDING criteria.

##### **REQUIREMENTS FOR CONSTRUCTION WASTE MANAGEMENT**

#### **Overview:**

Prepare and submit a Construction Waste Management Plan (CWM) to the Owner and Architect for approval. The CWM Plan shall outline the provisions to be implemented to recycle and salvage demolition and construction waste generated during the project. The end-of-project recycling rate shall equal, at minimum, 75% (by weight) of the total waste from construction, demolition, and land clearing activities.

Upon approval of the CWM Plan by the Owner and Architect, it shall be implemented throughout the duration of the project, and documented in accordance with the Submittal Requirements of this Specification.

Further Construction Waste Management requirements are as follows:

1) **Construction Waste Management Plan:**

The Construction Waste Management Plan shall include, but not be limited to, the following components:

A) *Listing of Targeted Materials:* Develop a list of the waste materials from the Project that will be targeted for reuse, salvage, or recycling. The following materials shall be accounted for (materials that will not be recycled shall be indicated as such):

- i) Cardboard, paper, packaging
- ii) Clean dimensional wood, palette wood
- iii) Beverage containers
- iv) Land clearing debris
- v) Concrete
- vi) Bricks
- vii) Concrete Masonry Units (CMU)
- viii) Asphalt

- ix) Metals from banding, stud trim, ductwork, piping, rebar, roofing, other trim, steel, iron, galvanized sheet steel, stainless steel, aluminum, copper, zinc, lead, brass, and bronze.
  - x) Drywall
  - xi) Carpet and pad
  - xii) Paint
  - xiii) Asphalt roofing shingles if applicable for any existing building demolition
  - xiv) Rigid Foam
  - xv) Glass
  - xvi) Plastics
- B) *Landfill Information:* Provide the name of the landfill(s) where trash will be disposed of and the applicable landfill tipping fee(s).
- C) *Sorting Method:* Provide a description of the proposed means of sorting and transporting the recyclable materials (whether materials will be site-separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site for off-site sorting).
- D) *Packaging Waste:* Provide an estimate of packaging materials generated, and note whether suppliers will eliminate or take back packaging.
- E) *Field Conditions:* Include provisions in the Construction Waste Management Plan for addressing conditions in the field that do not adhere to the CWM Plan, including provisions to implement a stop work order, or to rectify non-compliant conditions.
- F) *Recycling facilities:* Provide the name of the recycling facilities(s) where materials will be sent for recycling, how it will be recycled, and the applicable fee(s).
- G) *Additional Information:* Include any additional information deemed relevant to describe the scope and intent of the CWM Plan to the Owner and Architect.
- 2) Subcontractor Requirements:  
Construction Waste Management and recycling requirements shall be incorporated into all Subcontractor's contracts.

## SUBMITTALS

### LEED BUILDING Submittal Requirements:

The Contractor and/or Subcontractors shall submit the following LEED BUILDING certification items:

- 1) A copy of the Construction Waste Management Plan, as defined in the REQUIREMENTS FOR CONSTRUCTION WASTE MANAGEMENT section of this specification.
- 2) Calculations and supporting documentation to demonstrate end-of-project recycling rates meeting the requirements for Construction Waste Management in this Specification. The process for recording and assembling documentation shall be as follows:
  - A) Record and document the total weight (in tons) of all demolition and construction waste materials sent to the landfill. Monthly Waste Management Reporting Forms (sample included at the end of this section identified as Exhibit "A") shall be used as the basis for determining the total amount of waste landfilled for the project. The monthly reporting forms shall specify:
    - i) the number of dumpsters or other containers sent to the landfill for that month;
    - ii) the volume (in cubic yards) of each dumpster or container sent to the landfill for that month;
    - iii) the type of waste contained in each dumpster or container; and

- iv) the weight of the waste in each dumpster or container. If the weight of the waste is not directly measured for each dumpster or container, the following Solid Waste Conversion Factors shall be used to convert the volume of waste to weight:

Solid Weight Conversion Factors:

Mixed Waste	350 lbs/cubic yard
Wood	300 lbs/cubic yard
Cardboard	100 lbs/cubic yard
Gypsum Wallboard	500 lbs/cubic yard
Rubble	1,400 lbs/cubic yard
Steel	1,000 lbs/cubic yard

- v) identification of the landfill.

In addition, provide the name of the landfill that will be accepting the materials. Receipts or other proof of facility reception of materials is required.

- B) Record and document the total weight (in tons) of all demolition and construction waste materials recycled or salvaged. Monthly Waste Management Reporting Forms shall be used as the basis for determining the total amount of waste recycled or salvaged for the project. The monthly reporting forms shall specify:

- i) the number of dumpsters or other containers of recycled or salvaged materials for that month;
- ii) the volume (in cubic yards) of each dumpster or container of recycled or salvaged materials for that month;
- iii) the type of recycled or salvaged material contained in each dumpster or container; and
- iv) the weight of the recycled or salvaged material in each dumpster or container. If the weight of the material is not directly measured for each dumpster or container, the Solid Waste Conversion Factors listed for landfill waste (see above) shall be used, where applicable, to convert the volume of material to weight. For materials not contained in the Solid Waste Conversion Factors above (e.g. glass), propose a conversion factor for review by the Owner and Architect.

In addition, provide the name of the receiving facilities/companies that will be purchasing or accepting the recycled or salvaged materials. Receipts or other proof of facility reception of materials is required.

For materials separated for recycling off-site, establish a method for tracking the weight of the recycled material. The method shall be included in the CWM Plan for the Owner's and Architect's review and approval

- C) Calculate the end-of-project recycling rate percentage by dividing the recycled and salvaged waste (in tons) by the total waste generated (recycled, salvaged, and landfilled waste – also in tons), and multiplying by 100.

## **PART 2 – PRODUCTS**

Not used.

## **PART 3 – EXECUTION**

### Implementation:

Implement the Construction Waste Management Plan, and coordinate the Plan with all affected trades. Designate one individual as the Construction Waste Management Representative, who will be responsible for communicating the progress of the Plan with the Owner and Architect on a regular basis, and for assembling the required LEED documentation.

Meetings:

Conduct Construction Waste Management meetings. Meetings shall include Subcontractors affected by the CWM Plan. At a minimum, waste management goals and issues shall be discussed at the following meetings:

- a. Pre-bid meeting.
- b. Pre-construction meeting.
- c. Regular job-site meetings

Monthly Waste Management Reporting Forms:

Monthly Waste Management Reporting Forms shall be submitted to the Owner and Architect for review throughout the duration of the project.

END OF SECTION 01025



## **SECTION 01015: VOLATILE ORGANIC COMPOUND (VOC) LIMITS FOR ADHESIVES, SEALANTS, PAINTS AND COATINGS**

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### **PART 1 - GENERAL**

#### Summary

This Section includes requirements for volatile organic compound (VOC) content in adhesives and sealants used for the project. The criteria are included as part of the LEED BUILDING requirements for the project.

Related Sections: The following Sections contain requirements that relate to this Section:

1. All sections in the Specifications with Interior adhesive or sealant
2. Division 1, Section 01515: "Construction IAQ Management", for requirements for the Construction IAQ Management Plan. (LEED BUILDING)

#### **1.1 GENERAL REQUIREMENTS**

- A. Implement practices and procedures to meet the project's environmental goals, which include achieving a LEED™ Building rating. Specific project goals which may impact this and the other sections of this specification include: use of recycled-content materials; use of locally-manufactured materials; use of low-emitting materials; use of certified wood products; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this Section and other Sections of the contract documents, are implemented to the fullest extent. Substitutions or other changes to the work shall not be allowed if such changes substantially compromise the stated LEED BUILDING criteria.

#### **REFERENCES**

- A. Rule 1168 – "Adhesive and Sealant Applications", amended 7 January 2005: South Coast Air Quality Management District (SCAQMD), State of California, [www.aqmd.gov](http://www.aqmd.gov)
- B. GreenSeal Standard 36 (GS-36) for Commercial Adhesives, effective date October 19, 2000.
- C. GreenSeal Standard 11 (GS-11), First Edition, May 20, 1993
- D. GreenSeal Standard 03 (GS-03), Anti-Corrosive Paints, Second Edition, January 7, 1997
- E. Rule 1113 – "Architectural Coatings". Rule in effect January 1, 2004. South Coast Air Quality Management District (SCAQMD), State of California, [www.aqmd.gov](http://www.aqmd.gov)

## VOC REQUIREMENTS FOR INTERIOR ADHESIVES AND SEALANTS

The volatile organic compound (VOC) content of interior adhesives and sealants used in this project shall not exceed the limits defined in Rule 1168 – “Adhesive and Sealant Applications” of the South Coast Air Quality Management District (SCAQMD), of the State of California.

The VOC limits defined by SCAQMD are as follows. All VOC limits are defined in grams per liter, less water and less exempt compounds.

### General:

Unless otherwise specified below, the VOC content of all adhesives and sealants shall not be in excess of **250 grams per liter**.

For specified building construction related applications, the allowable VOC content is as follows:

### Adhesive VOC Limits

#### Architectural Applications:

Indoor carpet adhesive	50
Carpet pad adhesive	50
Wood Flooring adhesive	100
Rubber floor adhesive	60
Subfloor adhesive	50
Ceramic tile adhesive	65
VCT and asphalt tile adhesive	50
Drywall and panel adhesive	50
Cove base adhesive	50
Multipurpose construction adhesive	70
Structural glazing adhesive	100

#### Specialty Applications:

PVC welding	510
CPVC welding	490
ABS welding	325
Plastic cement welding	250
Adhesive primer for plastic	250
Contact Adhesive	80
Special Purpose Contact Adhesive	250
Adhesive Primer for Traffic Marking Tape	150
Structural Wood Member Adhesive	140
Sheet Applied Rubber Lining Operations	850

Top and Trim Adhesive	250
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Substrate Specific Applications:

Metal to metal	30
Plastic foams	50
Porous material (except wood)	50
Wood	30
Fiberglass	80

Sealant VOC Limits:

<b>Architectural</b>	<b>250</b>
Single Ply Roof Material Installation/Repair	450
Nonmembrane Roof Installation/Repair	300
420	

Sealant Primer:

Architectural – Nonporous	250
Architectural – Porous	775
Other	750

## VOC LIMITS FOR PAINTS AND COATINGS

The volatile organic compound (VOC) content of interior paints, primers, and coatings used in this project shall not exceed the limits below as defined in GreenSeal Standard 11 (GS-11), First Edition, May 20, 1993.

Paints, Primers, and Coatings:

Flat Finishes	50
Non-Flat Finishes (i.e. satin, gloss)	150

The volatile organic compound (VOC) content of interior anti-corrosive and anti-rust paints used in this project shall not exceed the limits defined in GreenSeal Standard 03 (GS-03), Anti-Corrosive Paints, Second Edition, January 7, 1997

Anti-Corrosive Paint Finishes	250
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The volatile organic compound (VOC) content of interior Clear wood finishes, floor coatings, stains, sealers, and shellacs used in this project shall not exceed the limits defined in Rule 1113 – “Architectural Coatings”. Rule in effect January 1, 2004. South Coast Air Quality Management District (SCAQMD), State of California, [www.aqmd.gov](http://www.aqmd.gov)

Architectural Coatings:

Clear Wood Finish: Varnish	350
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Clear Wood Finish: Laquer	550
Stains	250
Floor Coatings	100
Water Proofing Sealers	250
Sanding Sealers	275
All Other Sealers	200
Shellac: Clear	730
Shellac: Pigmented	550

END OF SECTION

## **SECTION 01115: CONSTRUCTION IAQ MANAGEMENT**

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### **PART 1 - GENERAL**

#### **1.01 CONSTRUCTION IAQ MANAGEMENT GOALS FOR THE PROJECT**

- A. The Owner has established that this Project shall minimize the detrimental impacts on Indoor Air Quality (IAQ) resulting from construction activities. Factors that contaminate indoor air, such as dust entering HVAC systems and ductwork, improper storage of materials on-site, poor housekeeping, shall be minimized.

#### **1.02 SUMMARY**

- A. This Section includes requirements for the development of a Construction Indoor Air Quality Management Plan (alternately referred to as “the Plan”). Develop the Plan for approval by the Owner and Architect. The Plan shall be implemented throughout the duration of the project construction, and shall be documented as outlined in the Submittal Requirements of Item 1.08 below. The Plan is included as part of the LEED BUILDING requirements for the project.

#### **1.03 RELATED SECTIONS**

- A. All sections of the Specifications related to interior construction, MEP systems, and items affecting indoor air quality.
- B. Division 1, Section 01015 – Volatile Organic Compound (VOC) Limits For Adhesives And Sealants (LEED BUILDING).
- C. Section 09900 – Painting and Finishing.

#### **1.04 DEFINITIONS**

- A. Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products, including solvents in paints, coatings, adhesives and sealants, wood preservatives; composite wood binder, and foam insulations. Not all VOC's are harmful, but many of those contained within building products contribute to the formation of smog and irritate (at best) building occupants by their smell and/or health impact.
- B. Materials that act as “sinks” for VOC contamination: Absorptive materials, typically dry and soft (such as textiles, carpeting, acoustical ceiling tiles and gypsum board) that readily absorb VOC's emitted by “source” materials and release them over a prolonged period of time.
- C. Materials that act as “sources” for VOC contamination: Products with high VOC contents that emit VOC's either rapidly during application and curing (typically "wet" products, such as paints, sealants, adhesives, caulks and sealers) or over a prolonged period (typically “dry” products such flooring coverings with plasticizers and engineered wood with formaldehyde).

## 1.05 REFERENCES, RESOURCES

- A. "IAQ Guidelines for Occupied Buildings Under Construction", First Edition, November 1995, The Sheet Metal and Air Conditioner Contractors National Association (SMACNA). (703) 803-2980, [www.smacna.org](http://www.smacna.org).
- B. ANSI/ASHRAE 52.2-1999, "Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size", [www.ashrae.org](http://www.ashrae.org)

## 1.06 LEED BUILDING GENERAL REQUIREMENTS

- A. Implement practices and procedures to meet the project's environmental performance goals, which includes achieving LEED Certification. Specific project goals that may impact this area of work include: use of recycled-content materials; use of locally-manufactured materials; use of low-emitting materials; use of certified wood products; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in the sections below, are implemented to the fullest extent. Substitutions, or other changes to the work shall not be allowed if such changes substantially compromise the stated LEED BUILDING Performance Criteria.

## 1.07 CONSTRUCTION IAQ MANAGEMENT PLAN

- A. Prepare and submit a Construction IAQ Management Plan to the Owner for approval. The Construction IAQ Management Plan shall meet the following criteria:
  - 1. Construction activities shall be planned to meet or exceed the minimum requirements of the Sheet Metal and Air Conditioning National Contractors' Association (SMACNA) "IAQ Guidelines for Occupied Buildings under Construction", First Edition, 1995.
  - 2. Absorptive materials shall be protected from moisture damage when stored on-site and after installation.
  - 3. If air handlers are to be used during construction, filtration with a Minimum Efficiency Reporting Value (MERV) of 8 must be at each return air grill, as determined by ASHRAE 52.2-1999.
  - 4. Filtration media shall be replaced immediately prior to occupancy. Filtration media shall have a Minimum Efficiency Reporting Value (MERV) of 13 as determined by ASHRAE 52.2-1999.
  - 5. A "Sequence of Finish Installation Plan" shall be developed, highlighting measures to reduce the absorption of VOCs by materials that act as "sinks".

Upon approval of the Plan by the Owner and Architect, it shall be implemented through the duration of the construction process, and documented in accordance with the Submittal Requirements of Item 1.08 below.

Further description of the Construction IAQ Management Plan requirements is as follows:

1. SMACNA Guidelines: Chapter 3 of the referenced "IAQ Guidelines for Occupied Buildings Under Construction", outline IAQ measures in five categories as listed below. The Construction IAQ Management Plan shall be organized in accordance with the SMACNA format, and shall address measures to be implemented in each of the five categories (including subsections). All subsections shall be listed in the Plan; items that are not applicable for this project should be listed as such.

#### HVAC Protection

- Return Side
- Central Filtration
- Supply Side
- Duct Cleaning

#### Source Control

- Product Substitution
- Modifying Equipment Operation
- Changing Work Practices
- Local Exhaust
- Air Cleaning
- Cover or Seal

#### Pathway Interruption

- Depressurize Work Area
- Pressurize Occupied Space
- Erect Barriers to Contain Construction Areas
- Relocate Pollutant Sources
- Temporarily Seal the Building

#### Housekeeping

##### Scheduling

- Protect of Materials from Moisture Damage: As part of the "Housekeeping" section of the Construction IAQ Management Plan, measures to prevent installed materials or material stored on-site from moisture damage shall be described. This section should also describe measures to be taken if moisture damage does occur to absorptive materials during the course of construction.
- Replacement of Filtration Media: Under the "HVAC Protection" section of the Construction IAQ Management Plan, a description of the filtration media in all ventilation equipment shall be provided. The description shall include replacement criteria for filtration media during construction, and confirmation of filtration media replacement for all equipment immediately prior to occupancy.

- Sequence of Finish Installation for Materials: Where feasible, absorptive materials shall be installed after the installation of materials or finishes which have high short-term emissions of VOC's, formaldehyde, particulates, or other air-borne compounds. Absorptive materials include, but are not limited to: carpets; acoustical ceiling panels; fabric wall coverings; insulations (exposed to the airstream); upholstered furnishings; and other woven, fibrous or porous materials. Materials with high short-term emissions include, but are not limited to: adhesives, sealants and glazing compounds (specifically those with petrochemical vehicles or carriers); paints, wood preservatives and finishes; control and/or expansion joint fillers; hard finishes requiring adhesive installation; gypsum board (with associated finish processes and products); and composite or engineered wood products with formaldehyde binders.

Develop a separate sequencing plan that identifies feasible opportunities to meet the above-stated goals for the project. The plan shall be submitted to the Architect and Owner in accordance with the Submittal Requirements of Item 1.08 of this specification.

- Implementation and Coordination: Implement the Construction IAQ Management Plan, and coordinate the Plan with all affected trades. Designate one individual as the Construction IAQ Representative, who will be responsible for communicating the progress of the Plan with the Owner and Architect on a regular basis, and for assembling the required LEED documentation. Include provisions in the Construction IAQ Management Plan for addressing conditions in the field that do not adhere to the Plan, including provisions to implement a stop work order, or to rectify non-compliant conditions.

## 1.08 SUBMITTALS

Submit the following LEED-required records and documents:

- A. A copy of the Construction IAQ Management Plan as defined in section 1.07 of this specification.
- B. Product cut-sheets for all filtration media used during construction and installed immediately prior to occupancy, with MERV values highlighted. Cut sheets shall be submitted with the Contactor's or Subcontractor's 'approved' stamp as confirmation that the products are the products installed on the project.
- C. Provide the Architect or Owner's Representative with a minimum of 18 photographs comprising of at least six photographs taken on three different occasions during construction. The photographs shall document the implementation of the Construction IAQ Management Plan throughout the course of the project construction. Examples include photographs of ductwork sealing and protection, temporary ventilation measures, and conditions of on-

site materials storage (to prevent moisture damage). Photographs shall be submitted with brief descriptions of the Construction IAQ Management Plan measure documented, or be referenced to project meeting minutes or similar project documents which reference to the Construction IAQ Management Plan measure documented.

**PART 2 – PRODUCTS**

Not used.

**PART 3 – EXECUTION**

Not used.

END OF SECTION 01120 comments