October 23, 2013

Project No: 1308315ARG

Mr. Bruce Wik
Weston Solutions
70 NE Loop 410, Suite 600
Phone: (210) 308-4300
Email: Bruce.Wik@WestonSolutions.com

RE: LIMITED ASBESTOS AND LEAD BASED PAINT SURVEY FOR THE MAYER/HALFF HOUSE #308, HEMISFAIR PARK HISTORICAL HOMES, LOCATED IN SAN ANTONIO, TEXAS

Dear Mr. Wik:

Argus Environmental Consultants, LLC was contacted by Weston Solutions to perform a limited asbestos and lead based paint survey of the materials within the Mayer/Halff House #308 located in San Antonio, Texas.

The Scope of Services included in the limited Asbestos Survey consisted of the following:

- Visual evaluation of the interior finish materials.
- Identification of suspect asbestos containing materials (ACM) into homogeneous areas.
- Random collection of bulk samples from building materials that potentially contain asbestos.
- Laboratory analysis of building materials by a third party lab licensed by the Texas Department of State Health Services (DSHS).
- Analysis by Polarized Light Microscopy (PLM) using Environmental Protection Agency (EPA) Method 600.

The Scope of Services included in the limited Lead Based Paint Survey consisted of the following:

- Visual evaluation of the exterior and interior paint finishes.
- Identification of suspect paint into homogeneous areas.
- Random collection of bulk samples from paint that potentially contains lead.
- Laboratory analysis of paint by a third party lab certified by the EPA.
- Analysis by Flame Atomic Absorption using EPA Method SW846-7000B.

Argus Environmental's entire liability pertaining to this report and all work associated with it is limited to the INVOICED amount defined within the Scope of Services.

Indoor Air Quality
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Asbestos
Lead
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Small Women Owned Business

10004 Wurzbach Rd., #247, San Antonio, TX 78230-2214
Phone: 210.493.2560 ♦ Fax: 210.342.9027
www.argusenvironmental.com

This report has been prepared for the exclusive use of the Weston Solutions, Inc. and the City of San Antonio and their assigned agents. It and all contents, findings, conclusions and recommendations expressed herein are not intended for any other purpose than that stated nor is intended to be used by any other party.

The asbestos survey and lead based paint survey was performed on September 18, 2013 by Elizabeth Aguilar Texas DSHS Asbestos Inspector License #603203.

The following asbestos homogenous areas were identified and bulk samples were collected:

Homogenous Area	**Description**	**Sample IDs**
1	Gypsum board	308-1ABC
2	Joint compound	308-2ABC
3	Wall texture – stipple	308-3ABC
4	Grey plaster	308-4ABC
5	Grey brick grout	308-5ABC
6	Brown cove base mastic	308-6ABC
7	White window caulk	308-7ABC
8	White restroom caulk	308-8ABC
9	Ceiling texture – popcorn	308-9ABC
10	Cream/white Thermal System Insulation (TSI): wrap, mastic, and yellow insulation	308-10ABC
11	Wall texture – heavy stipple	308-11ABC
12	White sink undercoat	308-12ABC
13	Black weathering strip	308-13ABC
14	Black pipe mastic	308-14ABC
15	Grey floor grout	308-15ABC
16	12x12" White with black floor tile and yellow mastic	308-16ABC
17	Black floor mastic	308-17ABC
18	White riser caulk	308-18ABC
19	Yellow wall panel mastic	308-19ABC
20	Wall texture – flat	308-20ABC
21	White window caulk	308-21ABC
22	Grey brick grout	308-22ABC

The following building painted surfaces were identified as potentially containing lead and were sampled:

Sample ID	Description
L01	Plaster wall – brown
L02	Plaster wall – white
L03	Gypsum board wall – white
L04	Wood window – stain
L05	Wood window – brown
L06	Wood wall panel – white
L07	Wood door case - brown
L08	Wood floor – white
L09	Wood wall – yellow
L10	Wood cabinet door – dark stain
L11	Plaster wall – tan
L12	Metal pipe – green
L13	Plaster wall – green
L14	Wood wall – tan
L15	Wood window – brown
L16	Wood floor – grey
L17	Wood door – brown
L18	Wood floor – stain
L19	Wood floor – brown
L20	Wood stair riser – red
L21	Wood window – tan
L22	Wood door – tan
L23	Wood walls – black
L24	Wood walls – dark brown
L25	Wood beams - white

Conclusions:

Asbestos

ACM were found in the following materials:

Homogeneous Area	Description/ Location	Sample ID	Percent (%) Asbestos	Quantity	Condition	Friable/ Non-friable
10	Cream-white TSI: wrap, mastic and yellow insulation/1st and 2nd Floor, crawl space and Basement pipes	308-10B	3% Chrysotile	120 linear feet	Good condition	Non-friable
12	White sink undercoat/ 2nd Floor kitchen	308-12A	3% Chrysotile	2 linear feet	Good condition	Non-friable
14	Black pipe mastic/2nd Floor and Basement pipes	308-14A	7% Chrysotile	100 linear feet	Good condition	Non-friable

ACM not regulated by the Texas DSHS were found by PLM in the following materials:

Homogenous Area	Description/Location	Sample ID	Percent (%) Asbestos	Condition	Friable/ Non-friable
2	Joint compound/gypsum board ceiling & wall systems	308-2C	<1% Chrysotile	Good condition	Non-friable
9	Ceiling texture – popcorn/1st & 2nd Floor ceiling system	308-9A	<1% Chrysotile	Good condition	Non-friable
20	Wall texture – flat/3rd Floor wall systems	308-20ABC	<1% Chrysotile	Good condition	Non-friable

Homogenous Area	Description/Location	Sample ID	Percent (%) Asbestos	Condition	Friable/ Non-friable
21	White window caulk/1st Floor	308-21ABC	<1% Chrysotile	Good condition	Non-friable

Lead Based Paint

Greater than the EPA's minimum regulatory level of 0.5% by weight (wt.) was identified by laboratory analysis in the following samples:

Sample ID	Description/Location	Percent (%) Lead by Weight (wt.)
L04	1st Floor wood window – stain	18% wt.
L05	1st Floor wood window – brown	6.3% wt.
L07	2nd Floor wood door case – brown	23% wt.
L08	2nd Floor wood floor – white	11% wt.
L09	2nd Floor wood wall – yellow	13% wt.
L10	2nd Floor wood cabinet door – dark stain	1.0% wt.
L11	2nd Floor plaster wall – tan	0.55% wt.
L12	2nd Floor metal pipe – green	2.2% wt.
L13	2nd Floor plaster wall - green	1.1% wt.
L14	2nd Floor wood wall – tan	9.6% wt.
L15	2nd Floor wood window – brown	13% wt.
L16	2nd Floor wood floor – grey	3.2% wt.
L17	2nd Floor wood door – brown	4.4% wt.
L19	2nd Floor wood floor – brown	6.3% wt.
L20	2nd Floor wood stair riser – red	18% wt.
L21	3rd Floor wood window - tan	1.9% wt.
L22	3rd Floor wood door – tan	6.7% wt.
L23	1st Floor wood walls – black	16% wt.
L24	1st Floor wood beams – dark brown	1.5% wt.

Recommendations:

Asbestos

If the regulated ACM are involved in any renovation, abate ACM in accordance with the Texas DSHS regulations as required. This will involve the submittal of a Texas DSHS Notification Form no less than 10 days prior to the commencement of work. ACM may be removed using typical wet methods within a glove bag enclosure by a Texas DSHS licensed abatement contractor.

Abatement projects involving 160 square feet, 260 linear feet or 35 cubic feet of ACM will require a written Scope of Work known as an Asbestos Abatement Design Specification written by an Asbestos Consultant licensed by Texas DSHS. Since only 122 linear feet were detected this rule does not directly apply to this property and no Asbestos Abatement Design Specification will be required to abate the identified ACM.

All abatement projects will require air monitoring and project management onsite by a Texas DSHS licensed Air Monitoring Technician/Project Manager (AMT/PM). Final work area clearance and a written report by a Texas DSHS licensed Consultant appointed AMT/PM will serve to complete abatement activities.

Inform contractors involved with the renovation that non-regulated ACM was identified in the gypsum board ceiling and wall systems, joint compound on wall and ceiling system, popcorn ceiling texture, wall texture and window caulk. Any material disturbance by the contractor and associated personnel should be completed by keeping the materials adequately wet with an amended water solution. The contractor should provide appropriate and adequate personal protective equipment for all personnel. Debris may be disposed of as general construction waste. Final clean-up should be accomplished by using a High Efficiency Particulate Air (HEPA) filtered vacuum. Regulations from the Occupational Safety and Health Administration's 29 Code of Federal Regulations (CFR) 1926.1101 apply.

Lead Based Paint

Inform contractors involved with the renovation that lead based paint components were identified. Any material disturbance by the contractor and associated personnel should be completed by keeping the materials adequately wet with an amended water solution. The contractor should provide appropriate and adequate personal protective equipment for all personnel. Debris and material components that are removed and disposed, should be subjected to additional testing using the Toxicity Characteristic Leaching Procedure (TCLP) for waste characterization. Final clean-up should be accomplished by using a HEPA filtered vacuum.

Should the property ultimately house children six years or younger, then the renovation contractor should be certified by the United States EPA's Lead Based Paint Renovation and Restoration Rule.

Please do not hesitate to contact Argus Environmental with any questions or comments regarding the on-site survey or the findings contained within this report.

Sincerely,
For Argus Environmental Consultants, LLC.

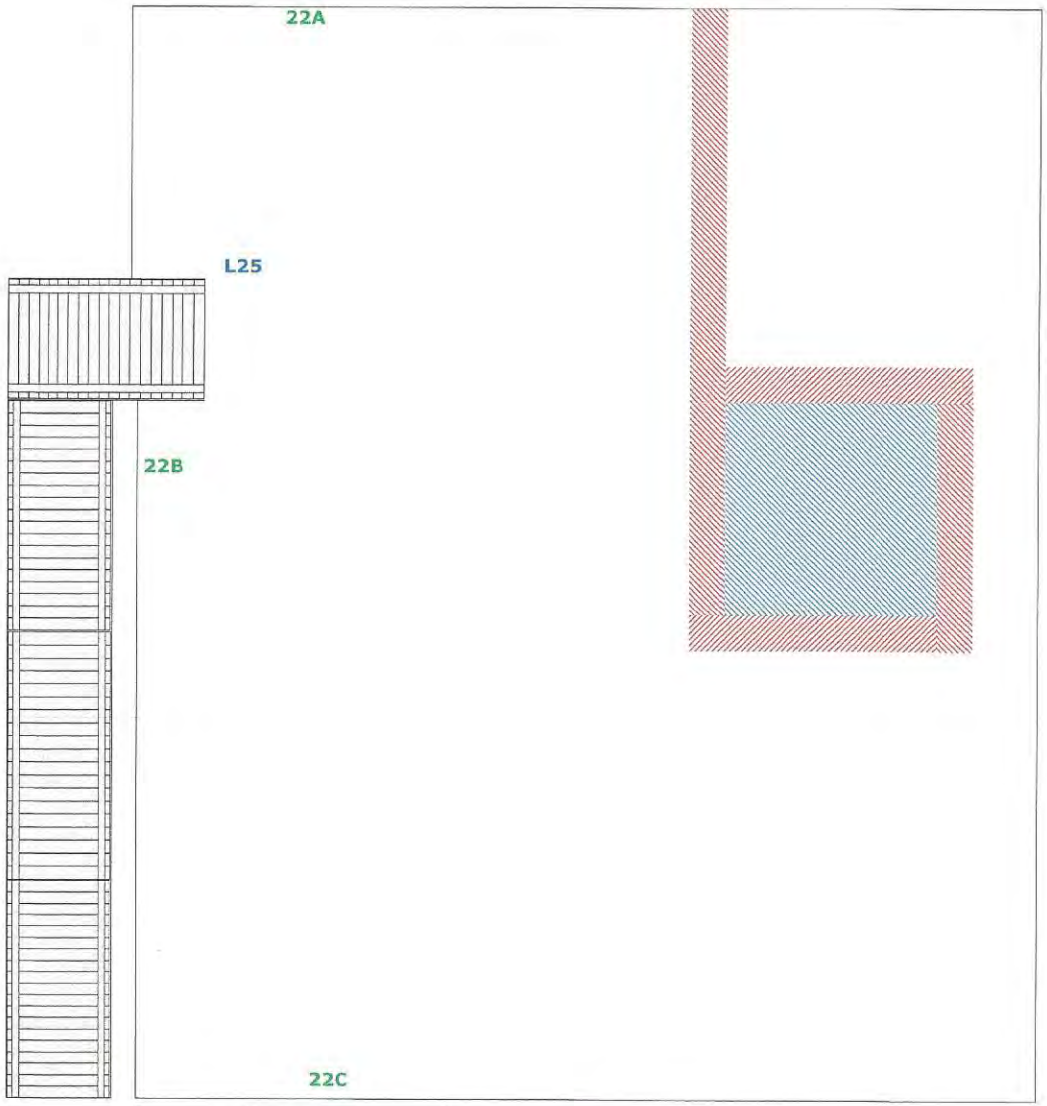
Elizabeth Aguilar

Elizabeth Aguilar
Texas DSHS Asbestos Inspector License #603203 (Exp. 12/12/2014)
Texas DSHS Lead Inspector License #2060867 (Exp. 1/09/2015)

Robert W. Miller
Texas DSHS Asbestos Consultant #105237 (Exp. 8/19/2015)
Texas DSHS Lead Risk Assessor #2070094 (Exp. 8/4/2014)

Attachments: 1) EMSL Analytical, Inc.'s EPA 600 PLM Asbestos Sample Results 9/24/2013
2) EMSL Analytical, Inc.'s Lead-Based Paint Sample Results 9/19/2013
3) Floor Plan indicating sample locations

Mayer/Halff House #308 - Basement



Legend

Green - Asbestos Sample Location

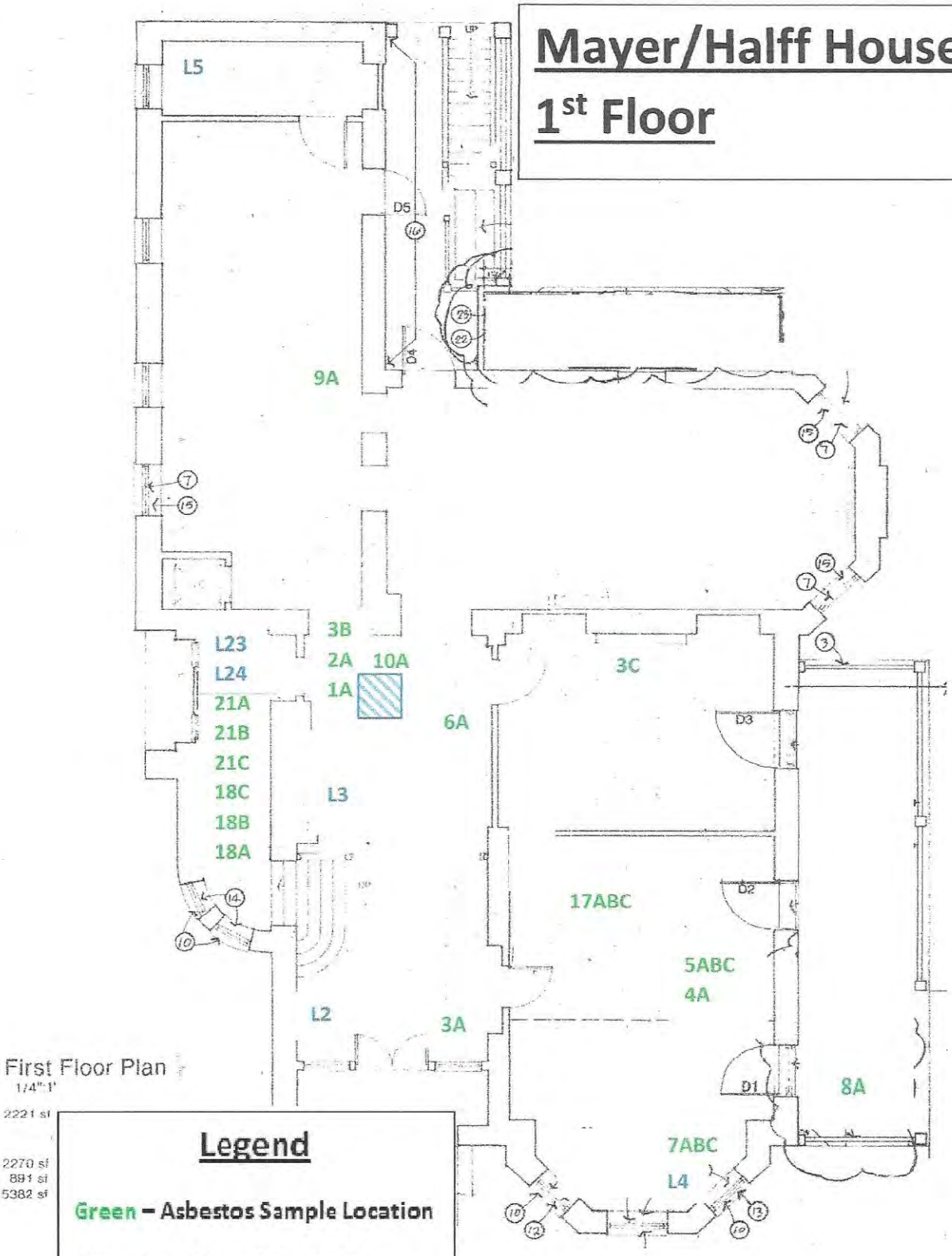
Blue - Lead Sample Location

- ACM Cream/white Thermal System Insulation (TSI): wrap, mastic, and yellow insulation

- ACM Black pipe mastic

Argus Environmental

Mayer/Halff House #308 – 1st Floor



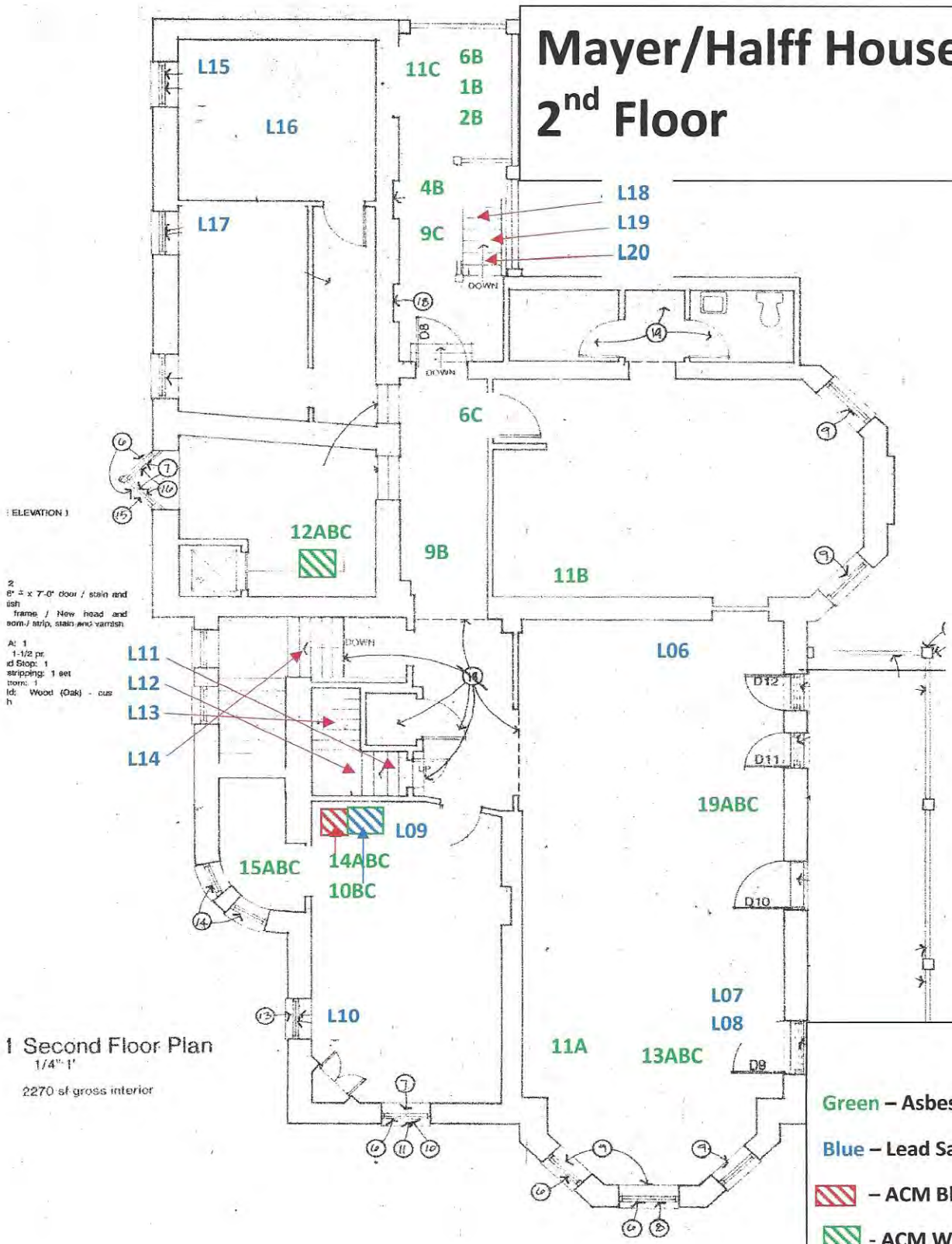
Legend

Green – Asbestos Sample Location

Blue – Lead Sample Location

– ACM Cream/white Thermal System Insulation (TSI): wrap, mastic, and yellow insulation

Mayer/Halff House #308 – 2nd Floor



Legend

Green – Asbestos Sample Location

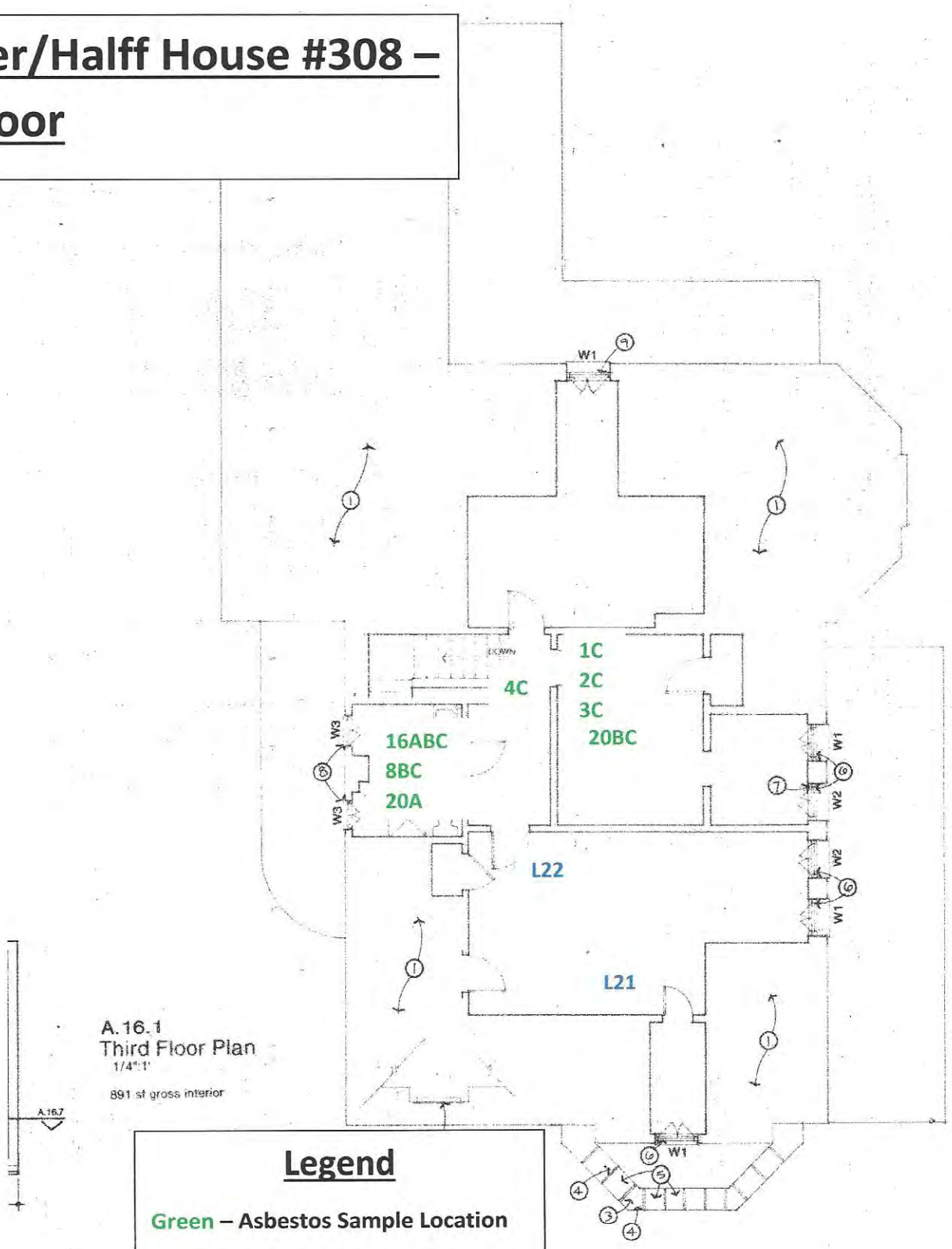
Blue – Lead Sample Location

– ACM Black pipe mastic

- ACM White sink undercoat

- ACM Cream/white Thermal System Insulation (TSI): wrap, mastic, and yellow insulation

Mayer/Halff House #308 – 3rd Floor



Legend

Green – Asbestos Sample Location

Blue – Lead Sample Location

APPENDIX B

Report for:

Craig Tribley
STC Environmental Services Inc.
4754 Research Dr
San Antonio, TX 78240

Regarding: Project: 14044 Hemsfair Park Homes; Acosta Hlf House #234, SA, TX
EML ID: 1169022

Approved by:

Approved Signatory
Baluswamy Krishnan

Dates of Analysis:
Asbestos-EPA Method 600/R-93/116: 02-10-2014

Service SOPs: Asbestos-EPA Method 600/R-93/116 (EPA-600/M4-82-020 (SOP 01267))

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the items tested. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

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6301 NW 5th Way, Suite 2850, Ft. Lauderdale, FL 33309
(877) 711-8400 Fax (954) 776-8485 www.emlab.com

Client: STC Environmental Services Inc.
C/O: Craig Tribley
Re: 14044 Hemsfair Park Homes; Acosta Hlf House # 234, SA, TX

Date of Sampling: 01-31-2014
Date of Receipt: 02-10-2014
Date of Report: 02-10-2014

ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116

Total Samples Submitted:	6
Total Samples Analysed:	6
Total Samples with Layer Asbestos Content > 1%:	3

Location: 14044-01, Vibration Damper

Lab ID-Version‡: 5291252-1

Sample Layers	Asbestos Content
Green Fibrous Material	ND
Composite Non-Asbestos Content:	95% Cotton
Sample Composite Homogeneity:	Good

Location: 14044-02, Vibration Damper

Lab ID-Version‡: 5291253-1

Sample Layers	Asbestos Content
Green Fibrous Material	ND
Composite Non-Asbestos Content:	95% Cotton
Sample Composite Homogeneity:	Good

Location: 14044-03, Vibration Damper

Lab ID-Version‡: 5291254-1

Sample Layers	Asbestos Content
Green Fibrous Material	ND
Composite Non-Asbestos Content:	95% Cotton
Sample Composite Homogeneity:	Good

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Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

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(877) 711-8400 Fax (954) 776-8485 www.emlab.com

Client: STC Environmental Services Inc.
C/O: Craig Tribley
Re: 14044 Hemsfair Park Homes; Acosta Hlf House # 234, SA, TX

Date of Sampling: 01-31-2014
Date of Receipt: 02-10-2014
Date of Report: 02-10-2014

ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116

Location: 14044-04, Pipe TSI Black Mastic

Lab ID-Version‡: 5291255-1

Sample Layers	Asbestos Content
Black Mastic	10% Chrysotile
Silver Foil	ND
Composite Non-Asbestos Content:	3% Glass Fibers
Sample Composite Homogeneity:	Good

Location: 14044-05, Pipe TSI Black Mastic

Lab ID-Version‡: 5291256-1

Sample Layers	Asbestos Content
Black Mastic	10% Chrysotile
Silver Foil	ND
Yellow Insulation	ND
Composite Non-Asbestos Content:	30% Mineral Wool 3% Glass Fibers
Sample Composite Homogeneity:	Good

Location: 14044-06, Pipe TSI Black Mastic

Lab ID-Version‡: 5291257-1

Sample Layers	Asbestos Content
Black Mastic	10% Chrysotile
Silver Foil	ND
Yellow Insulation	ND
Composite Non-Asbestos Content:	30% Mineral Wool 3% Glass Fibers
Sample Composite Homogeneity:	Good

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Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

CHAIN OF CUSTODY

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San Bruno, CA: 1150 Bayhill Drive, #100, San Bruno, CA 94066 * (866) 889-6653

Weather	Fog	Rain	Snow	Wind	Clear
Level: None	☑	☑	☑	☐	☐ CL
Light	☐	☐	☐	☑	☐ PC
Moderate	☐	☐	☐	☐	☐ OC
Heavy	☐	☐	☐	☐	☐

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001169022

CONTACT INFORMATION

Company:	STC Environmental Services, Inc.	Address:	4754 Research Dr. San Antonio TX 78240
Contact:	Craig Tribley	Special Instructions:	Send report to: ctribley@stces.com,
Phone:	210-696-6288		

PROJECT INFORMATION

Project ID:	14044 HEMISFAIR PARK HOMES		
Project Description:	ACOSTA HALF HOUSE #234 SA.TX		
Project Zip Code:	78205	Sampling Date & Time:	1/31/2014
PO Number:	099-14	Sampled By:	EK Halbert

TURN AROUND TIME CODES (TAT)

STD – Standard (DEFAULT)
ND – Next Business Day 24 HR
SD – ~~Same Business Day Rush~~
WH – Weekend / Holiday

Rushes received after 2 pm or on weekends, will be considered received the next business day. Please alert us in advance of weekend analysis needs.

Sample ID	Description	Sample Type (Below)	TAT (Above)	Total Volume / Area (as applicable)	Notes (Time of day, Temp, RH, etc.)
14044 - 01	VIBRATION DAMPER	B	ND	BULK	1ST FLOOR CEILING
" - 02	" "	B		"	" "
" - 03	" "	B		"	" "
14044 - 04	PIPE TSI BLACK MASTIC	B		"	CRAWL SPACE
" - 05	" "	B		"	" "
" - 06	" "	B		"	" "

Sample ID	Fungi – Spore Trap Analysis	Spore Trap Analysis – Other particles	Direct Microscopic Exam (Qualitative)	Quantitative Spore Count Direct Exam	1-Media Surface Fungi (Genus ID + Asp. spp.)	2-Media Surface Fungi (Genus ID + Asp. spp.)	3-Media Surface Fungi (Genus ID + Asp. spp.)	Culturable Air Fungi (Genus ID + Asp. spp.)	Gram Stain & Counts (Culturable Air & Surface Bacteria)	Legionella culture	Total Coliform, E. coli (Presence/Absence)	Membrane Filtration (specify organism)	MPN Bacteria (specify organism)	QuantiTray – Sewage Screen	Asbestos Analysis – PCM Airborne Fiber Count (NIOSH 7400)	Asbestos Analysis – PLM (EPA method 600/R-93-116)	PCR (specify test)	Other Requests
14044 - 01																☑		
" - 02																☑		
" - 03																☑		
14044 - 04																☑		
" - 05																☑		
" - 06																☑		

Spore Trap | Tape Swab Bulk | Non-Culturable | Water, Bulk, Lab, Oil, Contact Plate

SAMPLE TYPE CODES

BC – BioCassette ™	ST – Spore Trap: Zefon, Allergenco, Burkard ...	T – Tape	D – Dust
AIS – Anderson		SW – Swab	SO – Soil
SAS – Surface Air Sampler	P – Potable Water	B – Bulk	
CP – Contact Plate	NP – Non-Potable Water	O – Other:	

RELINQUISHED BY	DATE & TIME	RECEIVED BY	DATE & TIME
E.K. Halbert To: FedEx	2/7/2014 pm		2/10/14
			9

By submitting this Chain of Custody, you agree to be bound by the terms and conditions set forth at http://www.emlab.com/s/main/servicetermsi.html

CL = Clear, PC = Partly Cloudy, OC = Overcast

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Report for:

Craig Tribley
STC Environmental Services Inc.
4754 Research Dr
San Antonio, TX 78240

Regarding: Project: 14044 Hemisfair Park Homes; Kampmann/Solomon/Half #245 House
EML ID: 1170224

Approved by:

Approved Signatory
Baluswamy Krishnan

Dates of Analysis:
Asbestos-EPA Method 600/R-93/116: 02-12-2014

Service SOPs: Asbestos-EPA Method 600/R-93/116 (EPA-600/M4-82-020 (SOP 01267))

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the items tested. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

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(877) 711-8400 Fax (954) 776-8485 www.emlab.com

Client: STC Environmental Services Inc.
C/O: Craig Tribley
Re: 14044 Hemisfair Park Homes; Kampmann/ Solomon/Half #245 House

Date of Sampling: 02-11-2014
Date of Receipt: 02-12-2014
Date of Report: 02-12-2014

ASBESTOS PLM REPORT: EPA-600/M4-82-020 & EPA METHOD 600/R-93-116

Total Samples Submitted:	4
Total Samples Analysed:	4
Total Samples with Layer Asbestos Content > 1%:	3

Location: 14044-01, HVAC Duct Mastic (Black)

Lab ID-Version‡: 5296758-1

Sample Layers	Asbestos Content
Black Mastic	5% Chrysotile
Silver Foil	ND
Yellow Insulation	ND
Composite Non-Asbestos Content:	60% Mineral Wool
Sample Composite Homogeneity:	Good

Location: 14044-02, HVAC Duct Mastic (Black)

Lab ID-Version‡: 5296759-1

Sample Layers	Asbestos Content
Black Mastic	5% Chrysotile
Silver Foil	ND
Yellow Insulation	ND
Composite Non-Asbestos Content:	60% Mineral Wool
Sample Composite Homogeneity:	Good

Location: 14044-03, HVAC Duct Mastic (Black)

Lab ID-Version‡: 5296760-1

Sample Layers	Asbestos Content
Black Mastic	5% Chrysotile
Silver Foil	ND
Yellow Insulation	ND
Composite Non-Asbestos Content:	60% Mineral Wool
Sample Composite Homogeneity:	Good

Location: 14044-04, White Mud Joint On Pipe

Lab ID-Version‡: 5296761-1

Sample Layers	Asbestos Content
Off-White Semi-Fibrous Material	ND
Composite Non-Asbestos Content:	40% Mineral Wool 1% Cellulose
Sample Composite Homogeneity:	Good

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Inhomogeneous samples are separated into homogeneous subsamples and analyzed individually. ND means no fibers were detected. When detected, the minimum detection and reporting limit is less than 1% unless point counting is performed. Floor tile samples may contain large amounts of interference material and it is recommended that the sample be analyzed by gravimetric point count analysis to lower the detection limit and to aid in asbestos identification.
‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

CHAIN OF CUSTODY

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Phoenix, AZ: 1501 West Knudsen drive, Phoenix, AZ 85027 * (800) 651-4802
San Bruno, CA: 1150 Bayhill Drive, #100, San Bruno, CA 94066 * (866) 888-6653

Weather	Fog	Rain	Snow	Wind	Clear
Level: None	☑	☑	☑	☑	☐ CL
Light	☑	☑	☐	☐	☐ PC
Moderate	☐	☐	☐	☐	☑ OC
Heavy	☐	☐	☐	☐	☐

Page 1 of 1

001170224

CONTACT INFORMATION

Company:	STC Environmental Services, Inc.	Address:	4754 Research Dr. San Antonio TX 78240
Contact:	Craig Tribley	Special Instructions:	Send report to: ctribley@stces.com
Phone:	210-696-6288		

PROJECT INFORMATION

Project ID:	14044 HEMISFAIR PARK HOMES		
Project Description:	KAMPMANN/Solomon/HALF #255 HOUSE		
Project Zip Code:	78205	Sampling Date & Time:	2/11/2014
PO Number:	105-14	Sampled By:	EK Halbert

TURN AROUND TIME CODES (TAT)

STD – Standard (DEFAULT)
ND – Next Business Day
SD – Same Business Day Rush
WH – Weekend / Holiday

Rushes received after 2 pm or on weekends, will be considered received the next business day. Please alert us in advance of weekend analysis needs.

Sample ID	Description	Sample Type (Below)	TAT (Above)	Total Volume / Area (as applicable)	Notes (Time of day, Temp, RH, etc.)
14044-01	HVAC DUCT MASTIC (BLACK)	B	SD	BULK DUCTS	IN CRAWL SPACE
" -02		B	SD	"	"
" -03		B	SD	"	"
14044-04	WHITE MUD JOINT ON PIPE	B	SD	BULK PIPES	IN CRAWL SPACE

Requests

Fungi – Spore Trap Analysis	Spore Trap Analysis – Other particles	Direct Microscopic Exam (Qualitative)	Quantitative Spore Count Direct Exam	1-Media Surface Fungi (Genus ID + Agg. spp.)	2-Media Surface Fungi (Genus ID + Agg. spp.)	3-Media Surface Fungi (Genus ID + Agg. spp.)	Culturable Air Fungi (Genus ID + Agg. spp.)	Gram Stain & Counts (Culturable Air & Surface Bacteria)	Legionella culture	Total Coliform, E. coli (Presence/Absence)	Membrane Filtration (specify organism)	MPN Bacteria (specify organism)	QuantiTray – Sewage Screen	Asbestos Analysis – PCM Airborne Fiber Count (NIOSH 7400)	Asbestos Analysis – PLM (EPA method 600/R-93-116)	PCR (specify test)
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SAMPLE TYPE CODES

BC – BioCassette ™	ST – Spore Trap: Zefon, Allergenco, Burkard ...	T – Tape	D – Dust
ATS – Anderson		SW – Swab	SO – Soil
SAS – Surface Air Sampler	P – Potable Water	B – Bulk	
CP – Contact Plate	NP – Non-Potable Water	O – Other:	

RELINQUISHED BY	DATE & TIME	RECEIVED BY	DATE & TIME
E. K. Halbert for: EK	2/11/2014 pm	YE	02-12-14 (11:30AM)

By submitting this Chain of Custody, you agree to be bound by the terms and conditions set forth at http://www.emlab.com/s/main/servicetermsl.html

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CL = Clear, PC = Partly Cloudy, OC = Overcast

TLI

ENVIRONMENTAL SERVICES

CLOSE OUT REPORT OF ASBESTOS ABATEMENT ACTIVITIES

MAYER/HALFF HOUSE #308
139 E. NUEVA
SAN ANTONIO, BEXAR COUNTY, TEXAS

Prepared For:

CITY OF SAN ANTONIO
ATTN: MR. DAREN JOHNSTON

Prepared By:

TLI & ENVIRONMENTAL SERVICES, INC.
P. O. Box 482
Kempner, Texas 76539
(254) 518-4400 Phone
(254) 518-4447 Fax

DATE ISSUED: 16 JUNE 2014

TLI

ENVIRONMENTAL SERVICES

ASBESTOS ABATEMENT MONITORING

ASBESTOS ABATEMENT ACTIVITIES
MAYER/HALFF HOUSE #308
139 E. NEUVA
SAN ANTONIO, BEXAR COUNTY, TEXAS

Executive Summary

An asbestos abatement was performed on 27 May 2014 and ended 6 June 2014 by TLI & Environmental Services of Kempner, Texas at the Mayer/Halff House located at 139 E. Nueva (Hemisfair Park) in San Antonio, Texas.

An original notification was submitted to the Texas Department of Health (TDH) on 12 May 2014, with amendments being sent as follows: Amendment 1, 6 June 2014.

All the asbestos containing material (ACM) identified by the Consultant in the October 2013 ACM survey, and in a February 2014 supplemental ACM survey and as identified by the Consultant's on-site project manager, was removed using wet methods inside a full containment under negative pressure and/or RFCI/NESHAP and/or glove bag methods as applicable.

All materials were transported by TLI & Environmental Services to Covel Gardens Landfill in San Antonio, Texas, a Texas Commission on Environmental Quality (TCEQ) licensed landfill #2093-H.

Scope of Work

The scope of work required the removal of approximately 231 ln ft of insulation on pipe <12" and approximately 231 ln ft of mastic on pipe insulation. All the asbestos containing material (ACM) identified by the Consultant in the October 2013 ACM survey, and in a February 2014 supplemental ACM survey and as identified by the Consultant's on-site project manager, was removed using wet methods inside a full containment under negative pressure and/or RFCI/NESHAP and/or glove bag methods as applicable.

The identified ACM material was removed using wet methods inside a full containment with critical barriers. Upon removal, all materials were double bagged, goose-necked, sealed and placed in a properly placarded covered van for transportation to an approved disposal facility. Each bag had a generator label attached.

Project Administration

The asbestos abatement project management described herein was conducted by TLI & Environmental Services, Inc. This summary consisted solely of the activities described within this summary.

Prepared by:

Ray Medrano
TLI & Environmental Services
Texas Licensed Individual Asbestos Management Planner # 205450

TLI
ENVIRONMENTAL SERVICES

CLOSE OUT REPORT OF ASBESTOS ABATEMENT ACTIVITIES

ACOSTA/HALFF HOUSE #234
138 E. NUEVA
SAN ANTONIO, BEXAR COUNTY, TEXAS

Prepared For:

CITY OF SAN ANTONIO
ATTN: MR. DAREN JOHNSTON

Prepared By:

TLI & ENVIRONMENTAL SERVICES, INC.
P. O. Box 482
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DATE ISSUED: 16 JUNE 2014

TLI
Environmental Services

ASBESTOS ABATEMENT MONITORING
ASBESTOS ABATEMENT ACTIVITIES
ACOSTA/HALFF HOUSE #234
138 E. NUEVA
SAN ANTONIO, BEXAR COUNTY, TEXAS

Executive Summary

An asbestos abatement was performed on 27 May 2014 and ended 6 June 2014 by TLI & Environmental Services of Kempner, Texas at the Acosta/Halff House located at 138 E. Nueva (Hemisfair Park) in San Antonio, Texas.

An original notification was submitted to the Texas Department of Health (TDH) on 12 May 2014, with amendments being sent as follows: Amendment 1, 6 June 2014.

All the asbestos containing material (ACM) identified by the Consultant in the September 2013 ACM survey, and in a February 2014 supplemental ACM survey and as identified by the Consultant's on-site project manager, was removed using wet methods inside a full containment under negative pressure and/or RFCI/NESHAP and/or glove bag methods as applicable.

All materials were transported by TLI & Environmental Services to Covel Gardens Landfill in San Antonio, Texas, a Texas Commission on Environmental Quality (TCEQ) licensed landfill #2093-H.

Scope of Work

The scope of work required the removal of approximately 510 sq ft of asbestos containing sheetrock and joint compound, approximately 60 ln ft of mastic on pipe insulation and approximately 240 ln ft of mastic on duct insulation. All the asbestos containing material (ACM) identified by the Consultant in the September 2013 ACM survey, and in a February 2014 supplemental ACM survey and as identified by the Consultant's on-site project manager, was removed using wet methods inside a full containment under negative pressure and/or RFCI/NESHAP and/or glove bag methods as applicable.

The identified ACM material was removed using wet methods inside a full containment with critical barriers. Upon removal, all materials were double bagged, goose-necked, sealed and placed in a properly placarded covered van for transportation to an approved disposal facility. Each bag had a generator label attached.

Project Administration

The asbestos abatement project management described herein was conducted by TLI & Environmental Services, Inc. This summary consisted solely of the activities described within this summary.

Prepared by:

Ray Medrano
TLI & Environmental Services
Texas Licensed Individual Asbestos Management Planner # 205450

TLI
ENVIRONMENTAL SERVICES

CLOSE OUT REPORT OF ASBESTOS ABATEMENT ACTIVITIES

KAMPMANN/SOLOMON HALFF HOUSE #235
142 E. NUEVA
SAN ANTONIO, BEXAR COUNTY, TEXAS

Prepared For:

CITY OF SAN ANTONIO
ATTN: MR. DAREN JOHNSTON

Prepared By:

TLI & ENVIRONMENTAL SERVICES, INC.
P. O. Box 482
Kempner, Texas 76539
(254) 518-4400 Phone
(254) 518-4447 Fax

DATE ISSUED: 16 JUNE 2014

TLI
Environmental Services

ASBESTOS ABATEMENT MONITORING
ASBESTOS ABATEMENT ACTIVITIES
KAMPMANN/SOLOMON HALFF HOUSE #235
142 E. NUEVA
SAN ANTONIO, BEXAR COUNTY, TEXAS

Executive Summary

An asbestos abatement was performed on 27 May 2014 and ended 6 June 2014 by TLI & Environmental Services of Kempner, Texas at the Kampmann/Solomon Halff House located at 142 E. Nueva (Hemisfair Park) in San Antonio, Texas.

An original notification was submitted to the Texas Department of Health (TDH) on 12 May 2014, with amendments being sent as follows: Amendment 1, 6 June 2014.

The asbestos containing material (ACM) identified by the Consultant in the October 2013 ACM survey, and in a February 2014 supplemental ACM survey and as identified by the Consultant's on-site project manager, in the basement of the house was removed using wet methods inside a full containment under negative pressure and/or RFCI/NESHAP and/or glove bag methods as applicable. **The ACM identified by the Consultant in the crawlspace was not accessible and was not removed.**

All materials were transported by TLI & Environmental Services to Covel Gardens Landfill in San Antonio, Texas, a Texas Commission on Environmental Quality (TCEQ) licensed landfill #2093-H.

Scope of Work

The scope of work required the removal of approximately 200 ln ft of insulation on pipe <12". The asbestos containing material (ACM) identified by the Consultant in the October 2013 ACM survey, and in a February 2014 supplemental ACM survey and as identified by the Consultant's on-site project manager, in the basement of the house was removed using wet methods inside a full containment under negative pressure and/or RFCI/NESHAP and/or glove bag methods as applicable. The ACM identified by the Consultant in the crawlspace was not accessible and was not removed.

The identified ACM material was removed using wet methods inside a full containment with critical barriers. Upon removal, all materials were double bagged, goose-necked, sealed and placed in a properly placarded covered van for transportation to an approved disposal facility. Each bag had a generator label attached.

Project Administration

The asbestos abatement project management described herein was conducted by TLI & Environmental Services, Inc. This summary consisted solely of the activities described within this summary.

Prepared by:

Ray Medrano
TLI & Environmental Services
Texas Licensed Individual Asbestos Management Planner # 205450

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Hemisfair Historic Homes Stablization and Rehabilitation.

B. Owner's Name: Hemisfair Park Area Development Corporation.

C. Architect's Name: Fisher Heck Inc., Architects.

D. The Project consists of the stablization and exterior rehabilitation of (10) ten historically significant homes within the boundaries of Hemisfair Park.
   1. Homes requring stablization include:
      a. Sweeney House - Building 2.
      b. Schultze House - Building 4.
      c. Mayer Halff House - Building 5.
      d. Acosta House - Building 7.
      e. Smith House - Building 16.
   2. Homes requiring exterior rehabilitation include:
      a. Kampmann House - Building 6.
      b. Pereida House - Building 11.
      c. Koehler House - Building 13.
      d. Espinoza House - Building 14.
      e. Amaya House - Building 15.

1.02 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy of the existing spaces. Provide temporary barriers from, including but not limited to construction noise, dust, and debris for Occupants.

1.03 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Arrange use of site and premises to allow:
   1. Owner occupancy of Kampman House - Building 6.
   2. Work by Others which include road construction of Water Street and Goliad, and construction of new Playscape.

C. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction at Kampmann House: Keep all exits required by code open during construction period; provide temporary exit signs and clearly identify egress routes to public way if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

D. Existing homes not occupied may not be used for storage.

E. Time Restrictions:
   1. Limit conduct of especially noisy exterior work to the hours of 8:00 am to 5:00 pm.

F. Utility Outages and Shutdown:
   1. Limit disruption of utility services to hours the site when it is unoccupied, arranged at least 24 hours in advance with Owner.
   2. Do not disrupt or shut down life safety systems, including but not limited to fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
   3. Prevent accidental disruption of utility services to other facilities.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

B. Documentation of changes in Contract Price and Contract Time.

C. Change procedures.

D. Correlation of Contractor submittals based on changes.

E. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.

B. Document 00 5200 - Agreement Form: Contract Price, retainages, payment period, monetary values of unit prices.

C. Document 00 7200 - General Conditions and Document 00 7300 - Supplementary Conditions: Additional requirements for progress payments, final payment, changes in the Work.

D. Section 01 2100 - Allowances: Payment procedures relating to allowances.

E. Section 01 2200 - Unit Prices: Monetary values of unit prices, payment and modification procedures relating to unit prices.

1.03 SCHEDULE OF VALUES

A. Form to be used: AIA G702, Application and Certification for Payment and AIA Document G703, Continuation Sheet.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Submit Schedule of Values in duplicate within 15 days after date of Owner-Contractor Agreement.

E. Format: A unique schedule of values is required for each individual house, but is allowed to be on the same form. Utilize the Table of Contents of this Project Manual, identifying each line item on the form with number and title of the specification Section. For each section, provide one line item for material and one line item for labor. Identify site mobilization, bonds, and insurance as separate line items for each separate house.

F. Include on separate line items, the amount of Allowances specified in this section for each material denoting an allowance. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

G. Include separately from each line item, a direct proportional amount of Contractor's overhead and profit.

H. Provide a minimum of 15 line items per $100,000 with each line item separated into materials and labor.

I. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. For each item, provide a column for listing each of the following:

1. Item Number.
2. Description of work.
3. Scheduled Values.
4. Previous Applications.
5. Work in Place and Stored Materials under this Application.
6. Authorized Change Orders.
7. Total Completed and Stored to Date of Application.
8. Percentage of Completion.
9. Balance to Finish.
10. Retainage.

E. Execute certification by signature of authorized officer.

F. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.

G. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of Work.

H. Submit a minimum of four copies of each Application for Payment. One copy will be retained by Architect.

I. Include the following with the application:
1. Transmittal letter as specified for Submittals in Section 01 3000.
2. Construction progress schedule, revised and current as specified in Section 01 3000.
3. Current construction photographs specified in Section 01 3000.
4. Partial release of liens from major Subcontractors and vendors.
5. Project record documents as specified in Section 01 7800, for review by Owner which will be returned to the Contractor.
6. Affidavits attesting to off-site stored products.

J. On-site record drawings and specifications are required to be updated prior to submitting for payment.

K. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

A. Submit name of the individual authorized to receive change documents and who will be responsible for informing others in Contractor's employ or subcontractors of changes to the Contract Documents.

B. For minor changes not involving an adjustment to the Contract Price or Contract Time, Architect will issue instructions directly to Contractor.

C. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
1. The document will describe the required changes and will designate method of determining any change in Contract Price or Contract Time.
2. Promptly execute the change.

D. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within 7 calendar days.

E. Contractor may propose a change by submitting a request for change to Architect, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and the effect on the Contract Price and Contract Time with full documentation and

a statement describing the effect on Work by separate or other contractors. Document any requested substitutions in accordance with Section 01 6000.

F. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
   3. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

G. Substantiation of Costs: Provide full information required for evaluation.
   1. Provide following data:
      a. Quantities of products, labor, and equipment.
      b. Insurance, and bonds.
      c. Overhead and profit.
      d. Justification for any change in Contract Time.
      e. Credit for deletions from Contract, similarly documented.
   2. Support each claim for additional costs with additional information:
      a. Origin and date of claim.
      b. Dates and times work was performed, and by whom.
      c. Time records and wage rates paid.
      d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
   3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

H. Time extensions will only be given if critical path is affected.

I. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.

J. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Price.

K. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

L. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Price, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:
   1. All closeout procedures specified in Section 01 7000.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2100
ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

B. Payment and modification procedures relating to allowances.

1.02 RELATED REQUIREMENTS

A. Section 01 2000 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 CASH ALLOWANCES

A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts .

B. Architect Responsibilities:
   1. Consult with Contractor for consideration and selection of products, suppliers, and installers.
   2. Select products in consultation with Owner and transmit decision to Contractor.
   3. Prepare Change Order.

C. Contractor Responsibilities:
   1. Assist Architect in selection of products, suppliers, and installers.
   2. Obtain proposals from suppliers and installers and offer recommendations.
   3. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
   4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
   5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences in costs will be adjusted by Change Order.

1.04 ALLOWANCES SCHEDULE

A. Section 07 7210-Bird Spikes: Include the stipulated sum of $2,000.00 for purchase, delivery, and installation of bird spikes.

B. Section 08 6100-Window Restoration and Replication: Include the stipulated sum of $5,000.00 for purchase, delivery, and installation of sash weights.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2200
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

C. Defect assessment and non-payment for rejected work.

1.02 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.03 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section. In the event of conflict, the requirements of the individual specification section govern.

B. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

D. Stipulated Price Measurement: Items measured by weight, volume, area, or linear means or combination, as appropriate, as a completed item or unit of the Work.

E. Perform surveys required to determine quantities, including control surveys to establish measurement reference lines. Notify Architect prior to starting work.

F. Contractor's Engineer Responsibilities: Sign surveyor's field notes or keep duplicate field notes, calculate and certify quantities for payment purposes.

1.05 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

B. Payment will not be made for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected Products.

1.06 DEFECT ASSESSMENT

A. Replace Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct one of the following remedies:
   1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Architect.
   2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect.

C. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.

D. The authority of Architect to assess the defect and identify payment adjustment is final.

1.07 SCHEDULE OF UNIT PRICES

A. Item #1: Provide price per square foot for all associated costs of concealed infill replacement of deteriorated wood roof decking using nominal 1 x 6 boards.

B. Item #2: Provide price per square foot for all associated costs of replacement of deteriorated beaded board soffits to match existing at porches.

C. Item #3: Provide price per square foot for all associated costs of replacement of whole roof or large areas of deteriorated wood, only at concealed roof decking, using 3/4 inch plywood.

D. Item #4: Provide price per sash for all associated costs of replacement of two (2) weights per sash.

E. Item #5: Provide price per linear foot for all associated costs of installation of bird spikes.

F. Item #6: Provide price per square foot for all associated costs for replacement of lime plaster due to test failure by sounding the plaster.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2300
ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Description of alternates.

B. Procedures for pricing alternates.

C. Documentation of changes to Contract Price and Contract Time.

1.02 ACCEPTANCE OF ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted alternates will be identified in the Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work to integrate the Work of each alternate.

1.03 SCHEDULE OF ALTERNATES

A. Additive Alternate No. 1 - Kampmann House Building 6: Exterior Wood Shutters
   1. Base Bid Item: Do not provide additional shutters.
   2. Additive Alternative Item: Provide additional shutters at locations indicated on the Window Schedule of the Drawings.

B. Additive Alternate No. 2 - Pereida House Building 11: Exterior Wood Shutters
   1. Base Bid Item: Do not provide additional shutters.
   2. Additive Alternative Item: Provide additional shutters at locations indicated on the Window Schedule of the Drawings.

C. Additive Alternate No. 3 - Espinoza House Building 14: Exterior Wood Shutters
   1. Base Bid Item: Do not provide additional shutters.
   2. Additive Alternative Item: Provide additional shutters at locations indicated on the Window Schedule of the Drawings.

D. Deduct Alternate No. 4 - Kampmann House Building 6: Existing Wood Windows:
   1. Base Bid Item: Repair all windows to be fully operable.
   2. Alternate Item: Existing windows are to be prepared, primed, and painted only. The windows will not be made operable and no weatherstripping installed. Eliminate General Notes 1 and 2.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Electronic document submittal service.
B. Preconstruction meeting.
C. Site mobilization meeting.
D. Progress meetings.
E. Construction progress schedule.
F. Submittals for review, information, and project closeout.
G. Number of copies of submittals.
H. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Document 00 7200 - General Conditions: Dates for applications for payment.
B. Document 00 7200 - General Conditions: Duties of the Construction Manager.
C. Section 01 1000 - Summary: Stages of the Work, Work covered by each contract, occupancy, .
D. Section 01 7000 - Execution and Closeout Requirements: Additional coordination requirements.
E. Section 01 7800 - Closeout Submittals: Project record documents.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF) format and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
   1. Besides submittals for review, information, and closeout, this procedure applies to requests for information (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, and any other document any participant wishes to make part of the project record.
   2. Contractor and Architect are required to use this service.
   3. It is Contractor's responsibility to submit documents in PDF format.
   4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
   5. Users of the service need an email address, Internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
   6. Paper document transmittals will not be reviewed; emailed PDF documents will not be reviewed.
   7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
B. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.

C. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Project Coordinator will schedule a meeting after Notice of Award.

B. Attendance Required:
   1. Owner.
   2. Architect.
   3. Contractor.

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.
   5. Designation of personnel representing the parties to Contract, Project Coordinator and Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 SITE MOBILIZATION MEETING

A. Attendance Required:
   1. Contractor.
   2. Owner.
   3. Architect.
   4. Special Consultants.
   5. Contractor's Superintendent.
   6. Major Subcontractors.

B. Agenda:
   1. Use of premises by Owner and Contractor.
   2. Owner's requirements and occupancy prior to completion.
   3. Survey and building layout.
   4. Security and housekeeping procedures.
   5. Schedules.
   6. Application for payment procedures.
   7. Procedures for testing.
   8. Procedures for maintaining record documents.
   9. Requirements for start-up of equipment.
   10. Inspection and acceptance of equipment put into service during construction period.

3.04 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the Work at maximum interval of every other week.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner, Architect, Project Coordinator as appropriate to agenda topics for each meeting.

D. Agenda:
   1. Review minutes of previous meetings.

2. Review of Work progress.
3. Field observations, problems, and decisions.
4. Identification of problems that impede, or will impede, planned progress.
5. Review of submittals schedule and status of submittals.
6. Review of off-site fabrication and delivery schedules.
7. Maintenance of progress schedule.
8. Corrective measures to regain projected schedules.
9. Planned progress during succeeding work period.
10. Coordination of projected progress.
11. Maintenance of quality and work standards.
12. Effect of proposed changes on progress schedule and coordination.
13. Other business relating to Work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.05 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date established in Notice to Proceed, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

3.06 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
1. Product data.
2. Shop drawings.
3. Samples for selection.
4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.

C. Samples will be reviewed only for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - CLOSEOUT SUBMITTALS.

3.07 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
1. Design data.
2. Certificates.
3. Test reports.
4. Inspection reports.
5. Manufacturer's instructions.
6. Manufacturer's field reports.
7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner. No action will be taken.

3.08 SUBMITTALS FOR PROJECT CLOSEOUT

A. When the following are specified in individual sections, submit them at project closeout:
1. Project record documents.
2. Operation and maintenance data.
3. Warranties.
4. Bonds.
5. Other types as indicated.

B. Submit for Owner's benefit during and after project completion.

3.09 NUMBER OF COPIES OF SUBMITTALS

A. Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected. Secure PDF's which do not allow for electronic comments and use of PDF program's tools will be rejected.

B. Extra Copies at Project Closeout: See Section 01 7800.

C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.10 SUBMITTAL PROCEDURES

A. Transmit each submittal with approved form.

B. Sequentially number the submittal, beginning with the first submittal labeled (1). Revise submittals with original number and a sequential alphabetic suffix.

C. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.

D. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.

E. Schedule submittals to expedite the Project, and coordinate submission of related items.
   1. Within 10 days after date of the Agreement, submit preliminary submittal schedule defining the complete list of submittals required for the project, date for each submittal which Contractor expects to submit to Architect. Provide line items for information to be filled in during construction. Specifically include the scheduled date the submittal will be sent to Architect, the actual date when Contractor submitted to Architect, and actual date received from Architect.

F. For each submittal for review, allow 15 calendar days excluding delivery time to and from the Contractor.

G. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.

H. Provide space for Contractor and Architect review stamps.

I. When revised for resubmission, identify all changes made since previous submission.

J. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.

K. Submittals not requested will not be recognized or processed.

L. Submittals may marked by the Architect as "Not Approved" for the following reasons:
   1. Using copied Construction Documents from the project and included them in the submittal as original material.
   2. Failure of Contractor to accurately review submittal prior to sending to Architect including excessive discrepancies noted by Architect's review.

END OF SECTION

SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Proposed completion dates for Rehabiliation structures and Acosta House.

C. Construction progress schedule, with network analysis diagrams and reports.

1.02 RELATED SECTIONS

A. Section 01 1000 - Summary: Work sequence.

1.03 REFERENCES

A. AGC (CPSM) - Construction Planning and Scheduling Manual; Associated General Contractors of America; 2004.

B. M-H (CPM) - CPM in Construction Management - Project Management with CPM, O'Brien, McGraw-Hill Book Company; 2006.

1.04 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule defining planned operations for the first 60 days of Work, with a general outline for remainder of Work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.

1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit the number of opaque reproductions that Contractor requires, plus two copies that will be retained by Architect.

G. Submit under transmittal letter form specified in Section 01 3000.

1.05 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request using Microsoft Project software.

1.06 SCHEDULE FORMAT

A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

B. Diagram Sheet Size: Maximum 22 x 17 inches (560 x 432 mm) or width required.

C. Scale and Spacing: To allow for notations and revisions.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Include the proposed completion date of March 26, 2015 for rehabilitated structures and Acosta House.

B. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

C. Identify each item by specification section number.

D. Identify work of separate stages and other logically grouped activities.

E. Provide sub-schedules for each stage of Work identified in Section 01 1000.

F. Provide sub-schedules to define critical portions of the entire schedule.

G. Include pre installation conferences and progress meetings in schedule.

H. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

I. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, Products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.

J. Indicate delivery dates for owner-furnished products.

K. Coordinate content with schedule of values specified in Section 01 2000.

L. Provide legend for symbols and abbreviations used.

3.03 NETWORK ANALYSIS

A. Prepare network analysis diagrams and supporting mathematical analyses using the Critical Path Method.

B. Illustrate order and interdependence of activities and sequence of work; how start of a given activity depends on completion of preceding activities, and how completion of the activity may restrain start of subsequent activities.

C. Mathematical Analysis: Tabulate each activity of detailed network diagrams, using calendar dates, and identify for each activity:
   1. Preceding and following event numbers.
   2. Activity description.
   3. Estimated duration of activity, in maximum 15 day intervals.
   4. Earliest start date.
   5. Earliest finish date.
   6. Actual start date.
   7. Actual finish date.
   8. Latest start date.
   9. Latest finish date.
   10. Total and free float; float time shall accrue to Owner and to Owner's benefit.
   11. Monetary value of activity, keyed to Schedule of Values.
   12. Percentage of activity completed.
   13. Responsibility.

D. Analysis Program: Capable of compiling monetary value of completed and partially completed activities, accepting revised completion dates, and recomputation of all dates and float.

E. Required Reports: List activities in sorts or groups:
   1. By preceding work item or event number from lowest to highest.
   2. By amount of float, then in order of early start.
   3. By responsibility in order of earliest possible start date.
   4. In order of latest allowable start dates.
   5. In order of latest allowable finish dates.
   6. Contractor's periodic payment request sorted by Schedule of Values listings.
   7. Listing of basic input data that generates the report.
   8. Listing of activities on the critical path.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION

SECTION 01 3553
SECURITY PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Security measures including formal security program, entry control, personnel identification, and miscellaneous restrictions.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: use of premises and occupancy.

1.03 SECURITY PROGRAM

A. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.

B. Initiate program in coordination with Owner's existing security system at project mobilization.

C. Maintain program throughout construction period until Owner occupancy.

1.04 ENTRY CONTROL

A. Restrict entrance of persons and vehicles into Project site and existing facilities.

B. Allow entrance only to authorized persons with proper identification.

1.05 PERSONNEL IDENTIFICATION

A. Provide identification badge to each person authorized to enter premises.

B. Badge To Include: Personal photograph, name, assigned number, expiration date and employer.

C. Require return of badges at expiration of their employment on the Work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. References and standards.

B. Quality assurance submittals.

C. Mock-ups.

D. Control of installation.

E. Tolerances.

F. Testing and inspection services.

G. Manufacturers' field services.

1.02 RELATED REQUIREMENTS

A. Document 00 3100 - Available Project Information: Soil investigation data.

B. Section 01 3000 - Administrative Requirements: Submittal procedures.

C. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008.

B. ASTM C1077 - Standard Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation; 2013a.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2012.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2012a.

E. ASTM E329 - Standard Specification for Agencies Engaged Construction Inspection and/or Testing; 2011.

F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2009.

1.04 SUBMITTALS

A. Testing Agency Qualifications:
   1. Prior to start of Work, submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

C. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.

g. Type of test/inspection.
h. Date of test/inspection.
i. Results of test/inspection.
j. Conformance with Contract Documents.
k. When requested by Architect, provide interpretation of results.

2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.

D. Certificates: When specified in individual specification sections, submit certification by the manufacturer and Contractor or installation/application subcontractor to Architect, in quantities specified for Product Data.
1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.

E. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

F. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
1. Submit report in duplicate within 30 days of observation to Architect for information.
2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.

G. Erection Drawings: Submit drawings for Architect's benefit as contract administrator or for Owner.
1. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents.
2. Data indicating inappropriate or unacceptable Work may be subject to action by Architect or Owner.

1.05 REFERENCES AND STANDARDS

1.06 TESTING AND INSPECTION AGENCIES

A. Owner will employ and pay for services of an independent testing agency to perform other specified testing required by the list of Special Inspections included in the Drawings or as a third party testing agency is required in the Project Manual.

B. Employment of agency in no way relieves Contractor of obligation to perform Work in accordance with requirements of Contract Documents.

C. Contractor Employed Agency:
1. Testing agency: Comply with requirements of ASTM E329, ASTM E543, ASTM C1021, ASTM C1077, and ASTM C1093.
2. Inspection agency: Comply with requirements of ASTM D3740 and ASTM E329.
3. Laboratory: Authorized to operate in Texas.
4. Laboratory Staff: Maintain a full time registered Engineer on staff to review services.
5. Testing Equipment: Calibrated at reasonable intervals either by NIST or using an NIST established Measurement Assurance Program, under a laboratory measurement quality assurance program.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have Work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.02 MOCK-UPS

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups shall be a comparison standard for the remaining Work.

D. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, remove mock-up and clear area when directed to do so.

3.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

3.04 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-conformance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.
   4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
   5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
   6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-conformance to specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-conformance to specified requirements shall be paid for by Contractor.

3.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not conforming to specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Temporary utilities.

B. Temporary telecommunications services.

C. Temporary sanitary facilities.

D. Temporary Controls: Barriers, enclosures, and fencing.

E. Security requirements.

F. Vehicular access and parking.

G. Waste removal facilities and services.

H. Field offices.

1.02 RELATED REQUIREMENTS

A. Section 01 5813 - Temporary Project Signage.

1.03 TEMPORARY UTILITIES

A. Provide and pay for all electrical power, lighting, water, heating and cooling, and ventilation required for construction purposes.

B. Existing facilities may not be used.

1.04 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.

B. Telecommunications services shall include:
   1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Telephone Mobile Lines: One line, minimum; one handset per line.
   3. Internet Connections: Minimum of one; DSL modem or faster.
   4. Email: Account/address reserved for project use.

1.05 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.

B. Maintain daily in clean and sanitary condition.

1.06 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.

C. Provide protection for plants designated to remain. Replace damaged plants.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.07 FENCING

A. Construction: Commercial grade chain link fence.

B. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.08 INTERIOR ENCLOSURES

A. Provide temporary partitions as indicated to separate work areas from Owner-occupied areas, to prevent penetration of dust and moisture into Owner-occupied areas, and to prevent damage to existing materials and equipment.

B. Construction: Framing and reinforced polyethylene sheet materials with closed joints and sealed edges at intersections with existing surfaces:

1.09 SECURITY

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.10 VEHICULAR ACCESS AND PARKING

A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.

B. Coordinate access and haul routes with governing authorities, Project Coordinator, and Owner.

C. Provide and maintain access to fire hydrants, free of obstructions.

D. Provide means of removing mud from vehicle wheels before entering streets.

E. Designated existing on-site roads may be used for construction traffic.

F. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.11 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.12 FIELD OFFICES

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Locate offices a minimum distance of 30 feet (10 m) from existing and new structures.

1.13 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 5813
TEMPORARY PROJECT SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project identification sign.

B. Project informational signs.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Responsibility to provide signs.

1.03 REFERENCE STANDARDS

A. FHWA (SHS) - Standard Highway Signs; Federal Highway Administration, U.S. Department of Transportation; 2004.

1.04 QUALITY ASSURANCE

A. Design sign and structure to withstand 50 miles/hr (80 km/hr) wind velocity.

B. Sign Painter: Experienced as a professional sign painter for minimum three years.

C. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.

PART 2 PRODUCTS

2.01 SIGN MATERIALS

A. Structure and Framing: New, wood, structurally adequate.

B. Sign Surfaces: Exterior grade plywood with medium density overlay, minimum 3/4 inch (19 mm) thick, standard large sizes to minimize joints.

C. Rough Hardware: Galvanized.

D. Paint and Primers: Exterior quality, two coats; sign background of color as selected by graphic design of Architect.

E. Lettering: Exterior quality paint, contrasting colors.

2.02 PROJECT IDENTIFICATION SIGN

A. Content:
   1. Designations and City of San Antonio information provided after Award of Contract.

B. Graphic Design, Colors, Style of Lettering: Conforming to City of San Antonio Transportation and Capital Improvements standards and as indicated on Drawings.

2.03 PROJECT INFORMATIONAL SIGNS

A. Painted informational signs of same colors and lettering as Project Identification sign, or standard products; size lettering to provide legibility at 100 foot (30 m) distance.

B. Provide at each field office, storage shed, and directional signs to direct traffic into and within site. Relocate as Work progress requires.

C. Provide municipal traffic agency directional traffic signs to and within site.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install project identification sign within 30 days after date fixed by Notice to Proceed.

B. Erect at location of high public visibility adjacent to main entrance to site.

C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.

D. Install sign surface plumb and level, with butt joints. Anchor securely.

E. Paint exposed surfaces of sign, supports, and framing.

3.02 MAINTENANCE

A. Maintain signs and supports clean, repair deterioration and damage.

3.03 REMOVAL

A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations and procedures.

F. Procedures for Owner-supplied products.

G. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Document 00 2113 - Instructions to Bidders: Product options and substitution procedures prior to bid date.

B. Section 01 1000 - Summary: Lists of products to be removed from existing building.

C. Section 01 4000 - Quality Requirements: Product quality monitoring.

D. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

1.03 REFERENCE STANDARDS

A. 16 CFR 260 - Guides for the Use of Environmental Marketing Claims; Federal Trade Commission; current edition.

B. CAN/CSA Z809 - National Standard for Sustainable Forest Management; CSA International Inc.; 2008.

C. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.04 SUBMITTALS

A. Proposed Products List: Submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.
   1. Submit within 15 days after date of Agreement.
   2. For products specified only by reference standards, list applicable reference standards.
   3. For each Specification section requiring submittals, all Product Data, Shop Drawings, and Samples, must complete and submitted concurrently to the Architect. Incomplete submittals will be sent back as Not Approved.
      a. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.
      b. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.
      c. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
      d. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

A. Do not use materials and equipment removed from existing premises unless specifically required or permitted by the Contract Documents.

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by the Contract Documents.

B. Do not use products having any of the following characteristics:
   1. Made using or containing CFC's or HCFC's.
   2. Made of wood from newly cut old growth timber.

C. Where all other criteria are met, Contractor shall give preference to products that:
   1. Are extracted, harvested, and/or manufactured closer to the location of the project.
   2. Have longer documented life span under normal use.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION PROCEDURES

A. Instructions to Bidders specify time restrictions for submitting requests for substitutions during the bidding period. Comply with requirements specified in this section.

B. Substitutions may be considered when a product becomes unavailable through no fault of the Contractor.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.

D. A request for substitution constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product.
   2. Will provide the same warranty for the substitution as for the specified product.
   3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension that may subsequently become apparent.
   5. Will reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

E. Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

F. Substitution Submittal Procedure:
   1. Submit three copies of request for substitution for consideration. Limit each request to one proposed substitution.

2. Submit shop drawings, product data, and certified test results attesting to the proposed product equivalence. Burden of proof is on proposer.
3. The Architect will notify Contractor in writing of decision to accept or reject request.

3.02 OWNER-SUPPLIED PRODUCTS

A. Owner's Responsibilities:
1. Arrange for and deliver Owner reviewed shop drawings, product data, and samples, to Contractor.
2. Arrange and pay for product delivery to site.
3. On delivery, inspect products jointly with Contractor.
4. Submit claims for transportation damage and replace damaged, defective, or deficient items.
5. Arrange for manufacturers' warranties, inspections, and service.

B. Contractor's Responsibilities:
1. Review Owner reviewed shop drawings, product data, and samples.
2. Receive and unload products at site; inspect for completeness or damage jointly with Owner.
3. Handle, store, install and finish products.
4. Repair or replace items damaged after receipt.

3.03 TRANSPORTATION AND HANDLING

A. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

B. Transport and handle products in accordance with manufacturer's instructions.

C. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

D. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

E. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

F. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.04 STORAGE AND PROTECTION

A. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication.

B. Store and protect products in accordance with manufacturers' instructions.

C. Store with seals and labels intact and legible.

D. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

E. For exterior storage of fabricated products, place on sloped supports above ground.

F. Provide bonded off-site storage and protection when site does not permit on-site storage or protection.

G. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

H. Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

I. Prevent contact with material that may cause corrosion, discoloration, or staining.

J. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

K. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 6116
VOLATILE ORGANIC COMPOUND RESTRICTIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."

B. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittal procedures.

B. Section 01 4000 - Quality Requirements: Procedures for testing and certifications.

C. Section 01 6000 - Product Requirements: Fundamental product requirements, substitutions and product options, delivery, storage, and handling.

1.03 DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:
   1. Adhesives, sealants, and sealer coatings.
   2. Paints and coatings.
   3. Insulation.
   4. Gypsum board.
   5. Acoustical ceilings and panels.
   6. Cabinet work.

B. Interior of Building: Anywhere inside the exterior weather barrier.

C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Evidence of Compliance: Submit for each different product in each applicable category.

C. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required.

D. Installer Certifications for Accessory Materials: Require each installer of any type of product (not just the products for which VOC restrictions are specified) to certify that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products, or 2) that such products used comply with these requirements.

1.05 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS

2.01 MATERIALS

A. Adhesives and Joint Sealants: Provide only products having volatile organic compound (VOC) content not greater than required by South Coast Air Quality Management District Rule No.1168.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Report of laboratory testing performed in accordance with requirements.

B. Aerosol Adhesives: Provide only products having volatile organic compound (VOC) content not greater than required by GreenSeal GS-36.
   1. Evidence of Compliance: Acceptable types of evidence are:
      a. Current GreenSeal Certification.

C. Paints and Coatings: Provide products having VOC content as specified in Section 09 9000.

D. Other Product Categories: Comply with limitations specified elsewhere.

PART 3 EXECUTION

3.01 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. All additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work, including selective demolition, except removal, disposal, and/or remediation of hazardous materials and toxic substances.

C. Pre-installation meetings.

D. Cutting and patching.

E. Surveying for laying out the work.

F. Cleaning and protection.

G. Closeout procedures, except payment procedures.

H. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on working in existing building; continued occupancy; work sequence; identification of salvaged and relocated materials.

B. Section 01 3000 - Administrative Requirements: Submittals procedures.

C. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

D. Section 01 5000 - Temporary Facilities and Controls: Temporary exterior enclosures.

E. Section 01 7800 - Closeout Submittals: Project record documents, operation and maintenance data, warranties and bonds.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in conformance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.

1.05 QUALIFICATIONS

A. For survey work, employ a land surveyor registered in Texas and acceptable to Architect. Submit evidence of Surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate.

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in Texas.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in Texas.

1.06 PROJECT CONDITIONS

A. Use of explosives is not permitted.

B. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

C. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

D. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.
   1. Minimize amount of bare soil exposed at one time.
   2. Provide temporary measures such as berms, dikes, and drains, to prevent water flow.
   3. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
   4. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

F. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

G. Rodent Control: Provide methods, means, and facilities to prevent rodents from accessing or invading premises.

H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. When required in individual specification sections, convene a preinstallation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Notify Architect four days in advance of meeting date.

D. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish a minimum of two permanent bench marks on site, referenced to established control points. Record locations, with horizontal and vertical data, on project record documents.

H. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:

1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations.
2. Grid or axis for structures.
3. Building foundation, column locations, ground floor elevations.

I. Periodically verify layouts by same means.

J. Maintain a complete and accurate log of control and survey work as it progresses.

K. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
1. Verify that construction and utility arrangements are as shown.
2. Report discrepancies to Architect before disturbing existing installation.
3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Keep areas in which alterations are being conducted separated from other areas that are still occupied.

C. Remove existing work as indicated and as required to accomplish new work.
1. Remove items indicated on drawings.
2. Relocate items indicated on drawings.
3. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
4. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

D. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove, relocate, and extend existing systems to accommodate new construction.
1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   a. Disable existing systems only to make switchovers and connections; minimize duration of outages.
   b. Provide temporary connections as required to maintain existing systems in service.
4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub

and tag with identification; patch holes left by removal using materials specified for new construction.

E. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

F. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

G. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

H. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

I. Clean existing systems and equipment.

J. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

K. Do not begin new construction in alterations areas before demolition is complete.

L. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-conforming work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

J. Patching:

1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
2. Match color, texture, and appearance.
3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle plastic coverings if possible.

3.10 ADJUSTING

3.11 FINAL CLEANING

A. Execute final cleaning after Substantial Completion but before making final application for payment.

B. Use cleaning materials that are nonhazardous.

C. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

D. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

E. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

F. Clean filters of operating equipment.

G. Clean debris from roofs, gutters, downspouts, and drainage systems.

H. Clean site; sweep paved areas, rake clean landscaped surfaces.

I. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.12 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.
   1. Provide copies to Architect, Owner and Project Coordinator.

B. Notify Architect when work is considered ready for Substantial Completion.

C. Submit written certification that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's review.

D. Owner will occupy all of the building as specified in Section 01 1000.

E. Correct items of work listed in executed Certificates of Substantial Completion within 14 calendar days of Substantial Completion Walkthrough and comply with requirements for access to Owner-occupied areas.
   1. Testing and Balancing must be completed prior to Substantial Completion Walkthrough.
   2. Obtaining the Certificate of Occupancy from the governing jurisdictiction.

F. Notify Architect when work is considered finally complete.

G. Complete items of work determined by Architect's final inspection.

3.13 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7800
CLOSEOUT SUBMITTALS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project Record Documents.

B. Operation and Maintenance Data.

C. Warranties and bonds.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittals procedures, shop drawings, product data, and samples.

B. Section 01 7000 - Execution and Closeout Requirements: Contract closeout procedures.

C. Individual Product Sections: Specific requirements for operation and maintenance data.

D. Individual Product Sections: Warranties required for specific products or Work.

1.03 SUBMITTALS

A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.

B. Operation and Maintenance Data:
   1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
   2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
   3. Submit two sets of revised final documents in final form within 10 days after final inspection.

C. Warranties and Bonds:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
   2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

D. Approved Submittals:
   1. Submit one copy of all approved submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.

E. Electronic Copy: Provide electronic copy on compact disc (CD) or DVD of Record Documents and Approved Submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed shop drawings, product data, and samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
   1. Measured depths of foundations in relation to finish first floor datum.
   2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
   3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
   4. Field changes of dimension and detail.
   5. Details not on original Contract drawings.

3.02 OPERATION AND MAINTENANCE DATA

A. Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation. Delete inapplicable information.

B. Drawings: Supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams. Do not use Project Record Documents as maintenance drawings.

C. Typed Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

3.03 OPERATION AND MAINTENANCE DATA FOR MATERIALS AND FINISHES

A. For Each Product, Applied Material, and Finish:
   1. Product data, with catalog number, size, composition, and color and texture designations.
   2. Information for re-ordering custom manufactured products.

B. Instructions for Care and Maintenance: Manufacturer's recommendations for cleaning agents and methods, precautions against detrimental cleaning agents and methods, and recommended schedule for cleaning and maintenance.

C. Moisture protection and weather-exposed products: Include product data listing applicable reference standards, chemical composition, and details of installation. Provide recommendations for inspections, maintenance, and repair.

D. Additional information as specified in individual product specification sections.

E. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

F. Provide a listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

3.04 OPERATION AND MAINTENANCE DATA FOR EQUIPMENT AND SYSTEMS

A. For Each Item of Equipment and Each System:
   1. Description of unit or system, and component parts.
   2. Identify function, normal operating characteristics, and limiting conditions.
   3. Include performance curves, with engineering data and tests.
   4. Complete nomenclature and model number of replaceable parts.

B. Where additional instructions are required, beyond the manufacturer's standard printed instructions, have instructions prepared by personnel experienced in the operation and maintenance of the specific products.

C. Panelboard Circuit Directories: Provide electrical service characteristics, controls, and communications; typed.

D. Include color coded wiring diagrams as installed.

E. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.

F. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

G. Provide servicing and lubrication schedule, and list of lubricants required.

H. Include manufacturer's printed operation and maintenance instructions.

I. Include sequence of operation by controls manufacturer.

J. Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

K. Provide control diagrams by controls manufacturer as installed.

L. Provide Contractor's coordination drawings, with color coded piping diagrams as installed.

M. Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

N. Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

O. Include test and balancing reports.

P. Additional Requirements: As specified in individual product specification sections.

3.05 ASSEMBLY OF OPERATION AND MAINTENANCE MANUALS

A. Assemble operation and maintenance data into durable manuals for Owner's personnel use, with data arranged in the same sequence as, and identified by, the specification sections.

B. Where systems involve more than one specification section, provide separate tabbed divider for each system.

C. Prepare instructions and data by personnel experienced in maintenance and operation of described products.

D. Prepare data in the form of an instructional manual.

E. Binders: Commercial quality, 8-1/2 by 11 inch (216 by 280 mm) three D side ring binders with durable plastic covers; 2 inch (50 mm) maximum ring size. When multiple binders are used, correlate data into related consistent groupings.

F. Cover: Identify each binder with typed or printed title OPERATION AND MAINTENANCE INSTRUCTIONS; identify title of Project; identify subject matter of contents.

G. Project Directory: Title and address of Project; names, addresses, and telephone numbers of Architect, Consultants, Contractor and subcontractors, with names of responsible parties.

H. Tables of Contents: List every item separated by a divider, using the same identification as on the divider tab; where multiple volumes are required, include all volumes Tables of Contents in each volume, with the current volume clearly identified.

I. Dividers: Provide tabbed dividers for each separate product and system; identify the contents on the divider tab; immediately following the divider tab include a description of product and major component parts of equipment.

J. Text: Manufacturer's printed data, or typewritten data on 24 pound paper.

K. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

L. Arrange content by systems under section numbers and sequence of Table of Contents of this Project Manual.

M. Contents: Prepare a Table of Contents for each volume, with each product or system description identified, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for special finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
   3. Part 3: Project documents and certificates, including the following:
      a. Shop drawings and product data.
      b. Air and water balance reports.
      c. Certificates.
      d. Photocopies of warranties and bonds.

N. Provide a listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

O. Table of Contents: Provide title of Project; names, addresses, and telephone numbers of Architect, Consultants, and Contractor with name of responsible parties; schedule of products and systems, indexed to content of the volume.

3.06 WARRANTIES AND BONDS

A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.

B. Verify that documents are in proper form, contain full information, and are notarized.

C. Co-execute submittals when required.

D. Retain warranties and bonds until time specified for submittal.

E. Manual: Bind in commercial quality 8-1/2 by 11 inch (216 by 279 mm) three D side ring binders with durable plastic covers.

F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.

G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.

H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

B. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Section 00 3100 - Available Project Information: Existing building survey conducted by Owner; information about known hazardous materials.

B. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

C. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2013.

1.04 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of three years of documented experience.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.01 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.
   9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.

E. Protect existing structures and other elements that are not to be removed.
   1. Provide bracing and shoring.
   2. Prevent movement or settlement of adjacent structures.
   3. Stop work immediately if adjacent structures appear to be in danger.

F. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

G. If hazardous materials are discovered during removal operations, stop work and notify Architect and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.02 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.03 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as shown.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 5000 in locations indicated on drawings.
   2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications): Remove existing systems and equipment as indicated.

1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
3. Verify that abandoned services serve only abandoned facilities before removal.
4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

F. Protect existing work to remain.
1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

3.04 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 02 8333.13

LEAD-BASED PAINT REMOVAL AND DISPOSAL

PART 1 - GENERAL

1.01 DESCRIPTION

A. This section specifies abatement and disposal of lead-based paint (LBP) and controls needed to limit occupational and environmental exposure to lead hazards.

1.02 RELATED WORK

A. Section 01 3100 - Available Project Information: Lead Based Paint Surveys.

B. Section 02 4100 - Demolition.

B. Section 09 9000 - Painting and Coating.

1.03 APPLICABLE PUBLICATIONS

A. National Fire Protection Association (NFPA): NFPA 701-2004 - Methods of Fire Test for Flame-Resistant Textiles and Films.

B. National Institute for Occupational Safety And Health (NIOSH) NIOSH OSHA Booklet 3142 Lead in Construction.

C. Underwriters Laboratories (UL) UL 586-1996 (Rev 2009) High-Efficiency, Particulate, Air Filter Units.

1.04 DEFINITIONS

A. Action Level: Employee exposure, without regard to use of respirations, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period. As used in this section, ”30 micrograms per cubic meter of air" refers to the action level.

B. Area Monitoring: Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations which may reach the breathing zone of personnel potentially exposed to lead.

C. Physical Boundary: Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area."

D. Certified Industrial Hygienist: As used in this section, refers to an Industrial Hygienist employed by the Contractor and is certified by the American Board of Industrial Hygiene in comprehensive practice.

F. Competent Person: A person capable of identifying lead hazards in the work area and is authorized by the contractor to take corrective action.

G. Decontamination Room: Room for removal of contaminated personal protective equipment (PPE).

H. Eight-Hour Time Weighted Average (TWA): Airborne concentration of lead averaged over an 8-hour workday to which an employee is exposed.

I. High Efficiency Particulate Air (HEPA) Filter Equipment: HEPA filtered vacuuming equipment with a UL 586 filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

J. Lead: Metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.

K. Lead Control Area: An enclosed area or structure with full containment to prevent the spread of lead dust, paint chips, or debris of lead-based paint removal operations. The lead control area is isolated by physical boundaries to prevent unauthorized entry of personnel.

L. Lead Permissible Exposure Limit (PEL): Fifty micrograms per cubic meter of air as an 8-hour time weighted average. If an employee is exposed for more than 8 hours in a work day, the PEL shall be determined by the following formula. PEL (micrograms/cubic meter of air) = 400/No. of hrs worked per day

M. Personnel Monitoring: Sampling of lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 150 mm to 225 mm (6 to 9 inches) and the center at the nose or mouth of an employee.

1.05 QUALITY ASSURANCE

A. The Contractor shall employ a Certified Industrial Hygienist who will be responsible for the following:

1. Certify Training.
2. Review and approve lead-based paint removal plan for conformance to the applicable referenced standards.
3. Inspect lead-based paint removal work for conformance with the approved plan.
4. Direct monitoring.
5. Ensure work is performed in strict accordance with specifications at all times.
6. Ensure hazardous exposure to personnel and to the environment are adequately controlled at all times.

B. Training: Train each employee performing paint removal, disposal, and air sampling operations prior to the time of initial job assignment.

C. Training Certification: Submit certificates signed and dated by the Certified Industrial Hygienist and by each employee stating that the employee has received training.

D. Respiratory Protection Program:

1. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 6 months thereafter.

2. Establish and implement a respiratory protection program as required by.

E. Hazard Communication Program: Establish and implement a Hazard Communication Program.

F. Hazardous Waste Management: The Hazardous Waste Management plan shall comply with applicable requirements of Federal, State, and local hazardous waste regulations and address:

1. Identification of hazardous wastes associated with the work.
2. Estimated quantities of wastes to be generated and disposed of.
3. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of EPA, state, and local hazardous waste permit applications, permits, and EPA Identification numbers.
4. Spill prevention, containment, and cleanup contingency measures to be implemented.
5. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.
6. Cost for hazardous waste disposal according to this plan.

G. Safety and Health Compliance:

1. In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials.
2. Where specification requirements and the referenced documents vary, the most stringent requirements shall apply.

H. Pre-Construction Conference: Along with the, meet with the Certified Industrial Hygienist to discuss in detail the lead-based paint removal work plan, including work procedures and precautions for the work plan.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Manufacturer's Catalog Data:

1. Vacuum filters.
2. Respirators.

C. Instructions: Paint removal materials. Include applicable material safety data sheets.

D. Statements Certifications and Statements:

1. Qualifications of certified industrial hygienist : Submit name, address, and telephone number of the selected to perform the specified responsibilities. Provide previous experience. Submit proper documentation that the Industrial Hygienist is certified by the American Board of Industrial Hygiene in comprehensive practice, including certification number and date of certification/recertification.
2. Testing Laboratory: Submit the name, address, and telephone number of the testing laboratory selected to perform the monitoring, testing, and reporting of airborne

concentrations of lead. Provide proper documentation that persons performing the analysis have been judged proficient by successful participation within the last year in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program. The laboratory shall be accredited by the American Industrial Hygiene Association (AIHA). Provide AIHA documentation along with date of accreditation/reaccreditation.

3. Lead Based Paint Removal Plan:
   a. Submit a detailed job-specific plan of the work procedures to be used in the removal of lead-based paint. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination rooms, change rooms, shower facilities, and mechanical ventilation system.
   b. Include in the plan, eating, drinking, smoking and restroom procedures, interface of trades, sequencing of lead related work, collected wastewater and paint debris disposal plan, air sampling plan, respirators, protective equipment, and a detailed description of the method of containment of the operation to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not exceeded outside of the lead control area.
   c. Include air sampling, training and strategy, sampling methodology, frequency, duration of sampling, and qualifications of air monitoring personnel in the air sampling portion on the plan.
4. Field Test Reports: Monitoring Results: Submit monitoring results to the Owner and Architect within 3 working days, signed by the testing laboratory employee performing the air monitoring, the employee that analyzed the sample, and the Certified Industrial Hygienist.
5. Records:
   a. Completed and signed hazardous waste manifest from treatment or disposal facility.
   b. Employee training certification.

PART 2 PRODUCTS

2.01 MATERIALS

A. Paint Removal Products: Submit applicable Material Safety Data Sheets for paint removal products used in paint removal work. Use the least toxic product, suitable for the job and acceptable to the Industrial Hygienist.

PART 3 EXECUTION

3.01 PROTECTION

A. Notification: Notify the Owner 20 days prior to the start of any paint removal work.
B. Lead Control Area Requirements.
   1. Establish a lead control area by completely enclosing with containment screens the area or structure where lead-based paint removal operations will be performed.
   2. Contain removal operations by the use of a negative pressure full containment system with at least one change room and with HEPA filtered exhaust.

C. Protection of Existing Work to Remain: Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition.

D. Boundary Requirements: Provide physical boundaries around the lead control area by roping off the area or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.

E. Heating, Ventilating and Air Conditioning (HVAC) Systems: Shut down, lock out, and isolate HVAC systems that supply, exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6-mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area.

F. Mechanical Ventilation System:

1. Use adequate ventilation to control personnel exposure to lead in accordance with 29 CFR 1926.57.
2. To the extent feasible, use fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by the industrial hygienist. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with ANSI Z9.2.
3. If air from exhaust ventilation is recirculated into the work place, the system shall have a high efficiency filter with reliable back-up filter and controls to monitor the concentration of lead in the return air and to bypass the recirculation system automatically if it fails. Air may be recirculated only where exhaust to the outside is not feasible.

G. Personnel Protection: Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been given appropriate training and protective equipment.

H. Warning Signs: Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area.

3.02 WORK PROCEDURES

A. Perform removal of lead-based paint in accordance with approved removal plan. Use procedures and equipment required to limit occupational and environmental exposure to lead when lead-based paint is removed, except as specified herein. Dispose of removed paint chips and associated waste in compliance with Environmental Protection Agency (EPA), federal, state, and local requirements.

B. Personnel Exiting Procedures:

1. Whenever personnel exist the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:
   a. Vacuum themselves off.
   b. Remove protective clothing in the decontamination room, and place them in an approved impermeable disposal bag.
   c. Shower.
   d. Change to clean clothes prior to leaving the physical boundary designated around the lead-contaminated job site.

C. Monitoring: Monitoring of airborne concentrations of lead shall be as specified herein. Air monitoring, testing, and reporting shall be performed by a certified industrial hygienist or an Industrial Hygiene Technician who is under the direction of the Certified Industrial Hygienist:
   1. The Certified Industrial Hygienist or the Industrial Hygiene Technician under the direction of the Certified Industrial Hygienist shall be on the job site directing the monitoring, and inspecting the lead-based paint removal work to ensure that the requirements of the Contract have been satisfied during the entire lead-based paint removal operation.
   2. Take personal air monitoring samples on employees who are anticipated to have the greatest risk of exposure as determined by the Certified Industrial Hygienist. In addition, take air monitoring samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.
   3. Submit results of air monitoring samples, signed by the Certified Industrial Hygienist, within 24 hours after the air samples are taken. Notify the Architect immediately of exposure to lead at or in excess of the action level of 30 micrograms per cubic meter of air outside of the lead control area.

D. Monitoring During Paint Removal Work:
   1. Perform personal and area monitoring during the entire paint removal operation. Sufficient area monitoring shall be conducted at the physical boundary to ensure unprotected personnel are not exposed above 30 micrograms per cubic meter of air at all times. If the outside boundary lead levels are at or exceed 30 micrograms per cubic meter of air, work shall be stopped and the Certified Industrial Hygienist shall immediately correct the condition(s) causing the increased levels and notify the Architect immediately.
   2. The certified industrial hygienist shall review the sampling data collected on that day to determine if condition(s) requires any further change in work methods. Removal work shall resume when approval is given by the Certified Industrial Hygienist. The Contractor shall control the lead level outside of the work boundary to less than 30 micrograms per cubic meter of air at all times. As a minimum, conduct area monitoring daily on each shift in which

lead paint removal operations are performed in areas immediately adjacent to the lead control area.

3. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area. If adjacent areas are contaminated, clean and visually inspect contaminated areas. The Certified Industrial Hygienist shall certify that the area has been cleaned of lead contamination.

3.03 LEAD-BASED PAINT REMOVAL

A. Remove paint within the areas designated on the drawings in order to completely expose the substrate. Take whatever precautions are necessary to minimize damage to the underlying substrate.

B. Indoor Lead Paint Removal: Select paint removal processes to minimize contamination of work areas with lead-contaminated dust or other lead-contaminated debris/waste. This paint removal process should be described in the lead-based paint removal plan. Perform manual sanding and scraping to the maximum extent feasible.

C. Mechanical Paint Removal and Blast Cleaning: Perform mechanical paint removal and blast cleaning in lead control areas using negative pressure full containments with HEPA filtered exhaust. Collect paint residue and spent grit (used abrasive) from blasting operations for disposal in accordance with EPA, state and local requirements.

D. Outside Lead Paint Removal: Select removal processes to minimize contamination of work areas with lead-contaminated dust or other lead-contaminated debris/waste. This paint removal process should be described in the lead-based paint removal plan. Perform manual sanding and scraping to the maximum extent feasible.

3.04 SURFACE PREPARATIONS

Avoid flash rusting or other deterioration of the substrate. Provide surface preparations for painting in accordance with Section 09 9000 Painting and Coating.

3.05 CLEANUP AND DISPOSAL

A. Cleanup: Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner and wet mopping the area.

B. Certification: The Certified Industrial Hygienist shall certify in writing that the inside and outside the lead control area air monitoring samples are less than 30 micrograms per cubic meter of air, the respiratory protection for the employees was adequate, the work procedures were performed in accordance with the most stringent jurisdictional guidelines and requirements, and that there were no visible accumulations of lead-contaminated paint and dust on the worksite. Do not

remove the lead control area or roped-off boundary and warning signs prior to the issuance of the Certified Industrial Hygienist's certification. Reclean areas showing dust or residual paint chips.

C. Testing of Lead-Based Paint Residue and Used Abrasive: Where indicated test lead-based paint residue and used abrasive for hazardous waste.

D. Disposal:

1. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing which may produce airborne concentrations of lead particles and label the containers. Dispose of lead-contaminated waste material at a EPA or state approved hazardous waste treatment, storage, or disposal facility off Government property.
2. Store waste materials in U.S. Department of Transportation approved 55-gallon drums. Properly label each drum to identify the type of waste and the date the drum was filled.
3. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with jurisdictional regulations.

E. Disposal Documentation Submit written evidence that the hazardous waste treatment, storage, or disposal facility (TSD) is approved for lead disposal by the EPA and state or local regulatory agencies.

END OF SECTION

SECTION 03 6000
GROUTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

1. Epoxy grouts.

B. Related Sections:

1. Section 05 5213 Pipe and Tube Railings: Anchorage devices to be grouted.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. C 109− Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2−in. or 50−mm Cube Specimens).
2. C 827 − Test Method for Early Volume Change of Cementitious Mixtures.
3. C 882 − Test Method for Bond-Strength of Epoxy-Resin Systems Used with Concrete.
4. C 1090 − Test Method for Measuring Changes in Height of Cylindrical Specimens from Hydraulic-Cement Grout.
5. C 1107 − Specification for Packaged Dry, Hydraulic-Cement Grout (Non-Shrink).
6. D 570 − Test Method for Water Absorption of Plastics.
7. D 638 − Test Method for Tensile Properties of Plastics.
8. D 695 − Test Method for Compressive Properties of Rigid Plastics.
9. D 790 − Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

B. US Army Corps of Engineers (COE) CRD−C 621 − Specification for Non-Shrink Grout.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements.

1. Product Data: Include manufacturer's specifications, surface preparation and application instructions, and protection of adjacent surfaces.
2. Test Data: Confirm compliance with specified requirements.

1.04 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, and handle products under provisions of Section 01600 Product Requirements.

B. Store materials in a dry area at a temperature between 40 and 100 degrees F (4 and 38 degrees C).

1.05 PROJECT CONDITIONS

A. Environmental Requirements: Maintain temperature between 45 and 90 degrees F (7 and 32 degrees C) during application and curing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Dayton Superior Corporation, 402 South First Street, Oregon, IL 61061, (800) 745−3707.

B. Substitutions: See Section 01600 – Product Requirements.

2.02 MATERIALS

A. Epoxy Grout:

1. Product: Sure-Grip Epoxy Grout (J−54).
2. Description: Multi-component, pre-proportioned epoxy grout.
3. High impact and vibration resistance.
4. Compressive strength: Tested per ASTM D 695: Time at Test Compressive Strength − psi (MPa) At 72 degrees F(22 degrees C) At 50 degrees F(10 degrees C).
   a. 8 hours 6000 (41.4)
   b. 1 day 12,000 (82.7) 9200 (63.4)
   c. 7 days 12,300 (84.8) 10,500 (72.4)
   d. 14 days 12,500 (86.2) 12,000 (82.7)
5. Modulus of elasticity (compressive): 350,000 psi (2413 MPa), tested per ASTM D 695 at 14 days.
6. Tensile strength: 2600 psi (17.9 MPa), tested per ASTM D 638 at 10 days.
7. Flexural strength: 5000 psi (34.5 MPa), tested per ASTM D 790 at 14 days.
8. Bond strength to concrete: 2200 psi (15.2 MPa), tested per ASTM C 882 at 14 days.
9. Water absorption: 0.3 percent, tested per ASTM D 570.
10. Approximate working time at 72 degrees F (22 degrees C): 60 minutes.
11. Color: Match existing adjacent concrete surface.

2.03 ACCESSORIES

A. Curing Compound: Safe Cure & Seal (J−18).

2.04 MIXING

A. Mix materials in accordance with manufacturer's instructions.
Include the following for applications where depth of grout will exceed 3 inches (75 mm).

B. Add aggregate at maximum rate of 25 pounds (11.3 kg) per 55 pound (25 kg) bag.

C. Do not retemper mix.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surfaces to remove loose and foreign matter.

B. Remove unsound concrete by chipping or grinding.

C. Grind or sandblast steel surfaces; remove rust, mill scale, and paint.

D. Install forms to contain liquid grout. Seal joints and corners.

3.02 INSTALLATION

A. Follow manufacturer's instructions.

B. Allow surfaces to dry completely before grouting.

C. Place grout continuously by most practical means. Work from one side to avoid entrapped air.

D. For grout depths exceeding 3 inches (75 mm), place grout in maximum 3 inch (75 mm) lifts; allow each lift to cure before placing next lift.

E. Consolidate material to eliminate voids and air pockets.

F. Lightly mist exposed grout with solvent, then steel trowel to smooth surface. Do not apply curing compounds.

END OF SECTION

SECTION 04 0140

MASONRY RESTORATION AND CLEANING

PART 1 - GENERAL

1.01 SUMMARY

A. Section includes:

1. Restoration of exposed exterior limestone.
2. Restore and limestone and brick concealed with lime plaster finish.
3. Epoxy filler for epoxy injection repairs to masonry cracks.
4. Repointing of existing mortar at existing limestone and brick masonry.
5. Salvage and reuse of existing limestone and brick masonry at Espinoza House, Koehler House, Kampmann House, Acosta House, and Mayer Halff House.
6. Low pressure cleaning.
7. Hand Cleaning.

1.02 RELATED SECTIONS

A. Section 04 0515 - Preparing Lime Mortars for Repointing Masonry: Mortar for restoration of masonry.

B. Section 09 2250 - Natural Lime Plaster: Application of natural hydraulic lime (NHL) plaster system to masonry.

1.03 SALVAGE AND REUSE OF MASONRY

A. Damaged and deteriorated masonry units will be completely replaced. Masonry dutchman will be used only for special conditions after visual review by Architect.

B. Cut out damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials and store for reuse.

C. Install salvaged masonry with coursing to match and align with existing joints, faces, plumb, and in line.

1.04 SPECIAL PROPERTIES

A. Mortar shall contain admixtures, such as pigments, to match the characteristics of the original mortar. Use of all admixtures shall be subject to approval.

1.05 CLEANING AND RESTORATION METHODS

A. Submit for approval the cleaning and restoration methods, and materials selected for a specific structure, before work starts, taking into account the total construction system of the building to be worked upon, including different masonry and mortar materials, as well as non-masonry elements which may be affected by the work.

1.06 SUBMITTALS

A. Shop Drawings: Drawings showing location of masonry elements in the work, building elevations, interface with adjacent materials, special placing instructions, and pinning/anchoring instructions, in sufficient detail to cover fabrication, placement, and finishing.

B. Mortar Material Testing: Provide laboratory testing of original mortar to determine required matching for composition and color of new mortar.

C. Product Data: Provide data for new masonry units, epoxy filler, and mortar based on Mortar Material Testing.

D. Verification Samples:

1. For each product specified, provide two (2) sets of samples indicating sizes, shapes, finishes, color, and pertinent accessories. If a finish or color selection is required, provide samples of manufacturer's full line for Architect's selection.

1.07 QUALITY ASSURANCE

A. Basis for Standard of Care: U.S. Department of the Interior – National Park Service – Standards and Guidelines.

B. Provide required qualifications for workers trained and experienced in restoration of masonry in historic structures, and furnish documentation of 5 consecutive years of work of this type.

C. A list of similar jobs shall be provided identifying when, where, and for whom the work was done.

D. Submit for approval Sample Masonry Panels of each procedure proposed for use in the work.

E. No masonry or mortar shall be used in the work until the samples and the represented mixture have been approved.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Furnish mortar in suitable bags used for packaging mortars. Labeling of packages shall clearly define contents, manufacturer, and batch identification.

B. Detergents, masonry cleaners, paint removers, solvents, epoxies and other chemicals used for masonry cleaning shall be in sealed containers that legibly show the designated name, formula or specification number, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name of manufacturer.

C. Store materials in weathertight structures which will exclude moisture and contaminants. Accessories shall be stored avoiding contamination and deterioration.

D. Admixtures which have been in storage onsite for six months or longer, or which have been subjected to freezing, shall not be used unless retested and proven to meet the specified requirements.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Masonry, mortar, and epoxy adhesives shall not be placed when weather conditions detrimentally affect the quality of the finished product. No masonry or mortar shall be placed when the air temperature is below 40 degrees F in the shade.

B. When air temperature is likely to exceed 90 degrees F masonry and mortar shall have a temperature not exceeding 90 degrees F when deposited. Materials to be used in the work shall be neither produced nor placed during periods of rain or other precipitation. Stop material

placements, and protect all in-place material from exposure, during periods of rain or other precipitation.

C. Masonry surfaces shall be cleaned only when air temperatures are above 40 degrees F and will remain so until masonry has dried out, but for not less than 7 days after completion of the work.

1.10 WARRANTIES

A. Cleaning Warranty: Cleaning procedures shall be warranted for a period of two years against harm to substrate (masonry and mortar) or to adjacent materials including, but not limited to, discoloration of substrate from improper procedures or usage, chemical damage from inadequate rinse procedures, and abrasive damage from improper procedures.

B. Repair Warranty: Repair procedures, including repointing, shall be warranted for a period of two years against: discoloration or mismatch of new mortar to adjacent original historic mortar, discoloration or damage to masonry from improper mortar clean-up, loss of bond between masonry and mortar, fracturing of masonry edges from improper mortar joint preparation procedures or improper mortar formulation, and occurrence of efflorescence.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Materials, physical and chemical properties, and composition of masonry and mortar used in renovation work shall match that of original existing masonry and mortar to be repaired, unless samples and testing determine that existing mixtures and materials are faulty or non-performing.

2.02 EQUIPMENT AND TECHNIQUES DEMONSTRATION

A. Demonstrate equipment and techniques of operation in an approved location and subject to approval.

B. Dependable and sufficient equipment, appropriate and adequate to accomplish the work specified, shall be assembled at the work site in sufficient lead time before the start of the work to permit inspection, calibration of weighing and measuring devices, adjustment of parts, and the making of any repairs that may be required.

C. Maintain the equipment in good working condition throughout the project.

2.03 EQUIPMENT AND TECHNIQUES DEMONSTRATION

A. Cleaning equipment shall not cause staining, erosion, marring, or other damage or changes in the appearance of the surfaces to be cleaned.

B. Sandblasting equipment will not be allowed for cleaning masonry surfaces.

C. Water Cleaning

1. Provide water cleaning equipment including a trailer-mounted water tank, pumps, high-pressure hose, wand with safety release cutoff control, nozzle, and auxiliary water re-supply equipment.
2. The equipment shall not be operated at a pressure which will cause etching or other damage to the masonry surface or mortar joints.

3. Operate the equipment at a discharge capacity of 55 psi and 2.5 to 3 gpm for general surface cleaning operations.
4. The water tank and auxiliary re-supply equipment shall be of sufficient capacity to permit continuous operations.
5. Provide protective covers and barriers as required to prevent over-spray onto adjacent surfaces.

A. Equipment and hand tools used for placing, finishing and texturing masonry and mortar shall be commercially available and commonly used in masonry construction and repair.
   1. Surface grinders, impact tools, and other equipment shall conform to the specified requirements, except as specifically required by the type of finish and texture.

B. Compressed air equipment shall deliver clean, oil and moisture free compressed air at the surface to be cleaned.
   2. The compressed air line shall have at least two in-line air filters to remove oil and moisture from the air supply. Test the compressed air supply during each shift for the presence of oil and moisture.

2.04 MATERIAL HANDLING AND ASSOCIATED EQUIPMENT

A. Provide equipment used for mixing, transporting, placing, and confining masonry and mortar placements capable of satisfactorily mixing material and supporting placement operations in an uninterrupted manner.

B. Defects and deficiencies in operation or capacity shall be resolved prior to use in the work.

C. Equipment used for mixing, conveying, and placing of materials shall be clean, free of old materials and contaminants, and shall conform to the material manufacturer's recommendations.

D. Provide associated equipment, such as mixer timing equipment, valves, pressure gauges, pressure hoses, other hardware, and tools, as required to ensure a continuous supply of material and operation control.

2.05 REPAIR MATERIALS

A. Masonry and mortar materials used for repair and renovation shall match the original existing historic materials as closely as possible in composition, color, texture, strength, size, finishing and porosity based on results of mortar materials testing.

B. Mortar Patching Mix For Epoxy Injection
   1. Use salvaged mortar ground into powder consistency and mix into manufacturer’s epoxy masonry adhesive used for both epoxy injection.

2.06 EPOXY MASONRY ADHESIVE FOR EPOXY INJECTION

A. Manufacturer: Edison Coatings; 3 Northwest Drive; Plainville, CT 06062; www.edisoncoatings.com.
   1. Flexi-seal 510 for cracks 1/16” in width or smaller.
   2. Flexi-seal 510-U for cracks larger than 1/16” in width, and a maximum width of 1/8”.

PART 3 - EXECUTION

3.01 TESTING, EVALUATION, AND ANALYSIS

A. Masonry renovation shall be undertaken only after complete evaluation and analysis of the areas to be repaired are completed including sampling and testing of the existing mortar to determine its composition and qualities.

B. No repair work shall be undertaken until conditions that have caused masonry deterioration have been identified; such conditions shall be corrected, if possible, prior to start of the work.

3.02 MASONRY CLEANING

A. Historic materials shall not be damaged or marred in the process of cleaning. Cleaning shall conform to ASTM C 1515.

B. Temporarily caulk or otherwise protect open joints to prevent water and cleaner intrusion into the interior of the structure from pressure spraying.

C. Protect non-masonry materials and severely deteriorated masonry by approved methods prior to initiation of cleaning operations.

D. Masonry cleaning shall remove all organic and inorganic contaminants from the surface and pores of the substrate, returning the masonry to its natural color. Surfaces shall be evenly cleaned with no evidence of streaking or bleaching. The cleaning process shall not affect the density, porosity, or color of the masonry or mortar.

E. Cleaned masonry shall have a neutral pH. Use the gentlest methods possible for cleaning historic masonry to achieve the desired results. Make test patches to determine a satisfactory cleaning result.

F. Cleaning shall proceed in an orderly manner, working from top to bottom of each scaffold width and from one end of each elevation to the other. Perform cleaning in a manner which results in uniform coverage of all surfaces, including corners, moldings, interstices and which produces an even effect without streaking or damage to masonry.

G. The cleaning materials, equipment, and methods shall not result in staining, erosion, marring, or other damage to the surfaces of the structure. Following an initial inspection and evaluation of the structure and surfaces, give the structure a surface cleaning which shall be completed prior to start of repair work, and sampling and testing of mortars. The work shall provide for the complete cleaning of all exterior masonry surfaces of the structures, removing all traces of moss, dirt, and other contaminants to allow determination of the masonry's color and shades, finish and texture, and other properties.

H. Following completion of the surface cleaning of the structure (or side of structure) the masonry shall be dried prior to the start of any repair work.

I. The following sequence of methods shall be used to determine the least aggressive, effective cleaning method:

1. Water with brushes.
2. Water with mild soap.

3. Water with sodium hypocholorite (household beach).
4. Water with stronger soap plus vinegar (but not on calcareous masonry).
5. Stronger chemical cleaners, only when above methods are determined to be ineffective by the Architect.

J. Acidic chemical cleaners shall not be used on limestone, marble, concrete and other calcareous (calcium containing) masonry materials.

3.03 TEST PATCHES

A. The materials, equipment, and methods to be used in cleaning shall be demonstrated in a test section approximately 3 by 3 ft square.

B. The location of the test section, and the completed test section shall be subject to approval. Adjust the cleaning process as required and the test section rerun until an acceptable process is obtained. Test patches shall be located in inconspicuous areas of the building.

C. The areas tested shall exhibit soiling characteristics representative of those larger areas to be cleaned.

D. Tested areas shall be allowed to dry before a determination is made on the effectiveness of a particular treatment.

3.04 PRESSURE SPRAYING

A. Spray apply water to masonry surfaces to comply with requirements indicated by test patches for location, purpose, water temperature, pressure, volume, and equipment.

B. Unless otherwise indicated, the surface washing shall be done with clean, low pressure water (pressure of less than 55 psi and 2.5 to 3 gpm discharge) and the spray nozzle shall not be held less than 12 inches from surface of masonry.

C. Water shall be applied side to side in overlapping bands to produce uniform coverage.

3.05 HANDSCRUBBING

A. Pre-wetted surfaces shall be scrubbed using hand-held natural bristle or nylon brushes.

B. Wire brushes shall not be used.

C. Surfaces to be cleaned shall be scrubbed to remove surface contaminants.

3.06 RINSING

A. Scrubbed surfaces shall be rinsed clean of all contaminants and cleaning solutions with water in a low-to-moderate pressure spray, working upwards from bottom to top of each treated area.

B. The rinsing cycle shall remove all traces of contaminants and cleaning solutions.

3.07 MASONRY REPAIR

A. Repaired surfaces shall match adjacent existing surfaces in all respects.

B. Masonry repair shall proceed only after the cause of deterioration has been identified and corrected.

C. Masonry repair shall proceed only after the area to be repaired has been cleaned.

D. The materials, methods and equipment proposed for use in the repair work shall be demonstrated in test panels.

E. The location, number, size and completed test panels shall be subject to approval.

F. Use products in accordance with the manufacturer's instructions.

3.08 REPOINTING

A. Repointing work shall be in accordance with Guidelines for Rehabilitating Historic Buildings: Masonry, Procedure Code 0109106S provided by United States General Services Administration.

B. Deteriorated caulking, grout, or mortar shall be removed from previously repaired cracks where it is failing. Remove loose particles from cracks.

C. Cracks shall be cleaned, rinsed with water followed by blowing with filtered, dry, compressed air.

3.09 MORTAR ANALYSIS

A. Test and analyze existing original historic mortar before repointing in order to provide a match with the new repointing mortar.

B. Historic mortars are usually softer than newer mortars, often using lime as a binder rather than cement. Lime for repointing mortar shall conform to ASTM C 207, Type S, unless otherwise specified.

C. Full laboratory analysis of the existing mortar shall conform to ASTM C 1324.

3.10 TAKING AND PREPARATION OF SAMPLES

A. Take and analyze samples of unweathered original historic mortar and different type of mortar in the structure in order to match the new mortar to be used for repointing.

B. Four samples of each type of mortar to be matched shall be removed with a hand chisel from several locations on each building. Set aside the largest sample for comparison with the repointing mortar.

C. The remaining samples shall be broken apart with a wooden mallet, powdering them into their constituent parts.

3.11 TOOLS AND EQUIPMENT

A. Clean tools and equipment to be used again in the work before the epoxy-resin grout sets.

3.12 HEALTH AND SAFETY PRECAUTIONS

A. Provide full-face shields for mixing, blending, and placing operations as required and protective coveralls and neoprene-coated gloves for workers engaged in the operations.

B. Supply protective creams of a suitable nature for the operation. Adequate fire protection shall be maintained at mixing and placing operations.

C. Smoking or the use of spark- or flame-producing devices shall be prohibited within 50 feet of mixing and placing operations.

D. The mixing, placing, or storage of epoxy-resin grout or solvent shall be prohibited within 50 feet of any vehicle, equipment, or machinery that could be damaged from fire or could ignite vapors from the material.

3.13 MASONRY REPLACEMENT

A. Replace masonry with salvaged stone from existing building, or approved sources.

B. If a few isolated masonry units are to be replaced, remove each without disturbing the surrounding masonry. Deteriorated masonry units and mortar requiring replacement shall be removed by hand chiselling.

C. Adjoining masonry units shall not be damaged during the removal of deteriorated units and mortar.

D. Test the new element for fitting into its space without mortar. If wedges are used to support and align the new unit, they shall be covered with at least 1-1/2 inches of mortar when pointing is complete.

E. Cover the four sides and back of the space with sufficient mortar to ensure that there will be no air spaces when the new unit is set. The new unit shall be lined up and set by tapping it into place with a wooden or rubber mallet.

F. Align face of new unit with that of existing masonry.

G. Joints shall be repointed to match the rest of the wall after new units have been properly installed and adjusted.

H. Clean replacement areas with a non-metallic brush and water to remove excess mortar.

3.14 MASONRY AND MORTAR FINISHES AND COLOR

A. The exposed surfaces of masonry and mortar repair shall match the finish, color, texture, and surface detail of the original surface.

B. Mechanical finishing and texturing may be required to produce the required finish and appearance.

C. The finishing and texturing shall conceal bond lines between the repaired area and adjacent surfaces. The texturing shall provide replication of all surface details, including tooling and machine marks.

D. The equipment used in finishing and texturing shall be a low-impact energy type which will not weaken the patch or damage the patch bond and the adjacent concrete.

3.15 JOINT SEALING

A. Provide joint sealing as specified in Section 07 0005 JOINT SEALERS.

3.16 FINAL CLEANING

A. No sooner than 72 hours after completion of the repair work and after joints are sealed, faces and other exposed surfaces of masonry shall be washed down with water applied with a soft bristle brush, then rinsed with clean water.

B. Discolorations which cannot be removed by these procedures shall be considered defective work.

C. Perform cleaning work when temperature and humidity conditions allow the surfaces to dry rapidly.

D. Protect adjacent surfaces from damage during cleaning operations.

3.17 PROTECTION OF WORK

A. Protect work against damage from subsequent operations.

3.18 DEFECTIVE WORK

A. Defective work shall be repaired or replaced, as directed, using approved procedures.

3.19 FINAL INSPECTION

A. Following completion of the work, inspect the structure for damage, staining, and other distresses. The patches shall be inspected for cracking, crazing, delamination, unsoundness, staining and other defects.

B. The finish, texture, color and shade, and surface tolerances of the patches shall be inspected to verify that all requirements have been met.

C. Repair surfaces exhibiting defects as directed.

3.20 SCHEDULE

A. Espinoza House
   1. Repoint mortar in limestone and brick masonry.
   2. Repair damaged limestone including damaged window sills.
   3. Repoint masonry mortar in areas where plaster finish coat is indicated to be removed.

B. Koehler House
   1. Remove paint from brick masonry.
   2. Repoint mortar in limestone and brick masonry.
   3. Repair damaged limestone including damaged window sills.
   4. Repoint masonry mortar in areas where plaster finish coat is indicated to be removed.
   5. Repair and repoint brick chimneys.

C. Kampmann House
   1. Repoint mortar in limestone and brick masonry.
   2. Repair damaged limestone quions, lintels, and window sills.
   3. Repoint masonry mortar in areas where plaster finish coat is indicated to be removed.
   4. Repair and repoint brick chimneys.

D. Acosta House
   1. Repoint mortar in brick masonry.
   2. Repair damaged limestone including window sills.

E. Mayer Halff House
   1. Repoint mortar in limestone masonry.
   2. Remove inappropriate mortar and repoint.
   3. Repair damaged limestone lintels, and window sills.

END OF SECTION

SECTION 04 0515

PREPARING LIME MORTARS FOR MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This standard includes guidance on preparing lime mortar for repointing and repairing designated historical limestone masonry in which the construction consists of lime mortar.

1.02 SUMMARY

B. Lime mortars are preferable to portland cement mortars for repointing and repairing historic masonry:

1. Lime mortars are more permeable by water. Water passing through lime mortar will dissolve a small portion of the lime and then will deposit it in hairline cracks as the water evaporates.
2. Lime mortars expand slightly during setting, and resists shrinkage which causes cracking.
3. Lime mortars are more durable than generally recognized.

C. See 01100-07-S for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Safety Precautions
2. Historic Structures Precautions
3. Submittals
4. Quality Assurance
5. Delivery, Storage and Handling
6. Project/Site Conditions
7. Sequencing and Scheduling
8. General Protection (Surface and Surrounding) These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO).

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM), 100 Barr Drive, West Conshohocken, PA 19428, (610) 832-9585 or FAX (610) 832-9555.

1.04 DELIVERY, STORAGE AND HANDLING

A. Storage and Protection: Lime and cement must be protected from rainwater and ground moisture, as water vapor in the air can begin the setting process. Other materials also should be protected from contamination.

PART 2 PRODUCTS

2.01 MATERIALS

A. Lime: Should conform to ASTM C207, Type S, high plasticity, Hydrated Lime for Masonry Purposes.

1. Lime which meets this standard will "work" well, resists drying during curing, and is sufficiently strong for the purpose of repointing and repairing.
2. Lime expands as it hydrates, making high lime mortars more resistant to crack formation.

B. Cement: Should conform to ASTM C150, Type I, White. It should not have more than 0.60% alkali nor more than 0.15% water soluble alkali. Use gray portland cement ONLY if a dark mortar is to be matched.
   1. Cement meeting this standard should increase the workability of the mortar, accelerate the setting time and slightly increase the strength of the mortar.
   2. The low alkali content will prevent efflorescence.

C. Sand: Free of impurities and conforming to ASTM C144.
   1. Sand color, size, and texture should match the original as closely as possible. Provide a sample of the sand for comparison to the original, and have it approved by the RHPO before beginning repointing work.
   2. When possible, use bar sand or beach sand rather than crushed sand for the repointing mortar. Bar sand or beach sand should be washed to remove the salts before using.
      a. Crushed sand has sharp edges, which makes it more "sticky" and difficult to work into the joints.
      b. Bar sand, on the other hand, has rounded edges and flows easily during the mortar application.
      c. The working characteristics of mortar made with crushed sand may be improved by adding a slight amount of portland cement. The amount of cement should be determined by experimentation, but should not exceed 20% of the total lime/cement binder. 20% or less of cement has minimal effect on the hardness of the mortar. Cement content above 20% will make the mortar too hard.

D. Clean, potable water: If the water must be transported or stored in a container, the container must not impart any chemicals to the water.

E. Stone dust finely ground from the same stone as that to be repointed.

F. Additives: No antifreeze compounds or other admixture shall be used. Do not use anti-freeze compounds. These compounds are designed for use with cement mortars, and their effectiveness with high lime mortars is questionable. Furthermore, the compounds contain salts which can lead to serious problems in the masonry at a later time.

G. Air entraining agents are not recommended. These agents are designed for use with cement rather than lime, and they result in decreased bonding of the mortar and the masonry. Air entraining is not necessary with high lime mortars because of the natural ability of these mortars to flex with temperature changes.

2.02 EQUIPMENT

A. Surface temperature thermometer - can be either mechanical (less expensive but must be calibrated often) or digital electronic
B. Wooden mortar boxes
C. Hoe
D. Mesh screen
E. Hawks: Plywood or steel hawk (mortar board)

2.03 MIXES

A. Some factors to consider when mixing lime mortar include durability, color and texture, and workability.
   1. Durability: Repointing mortar should be softer than the masonry units and the original mortar to reduce stresses at the edge of the masonry and, in the case of lime mortar, to reduce shrinkage which can cause cracks in the mortar.
      a. If the new mortar is harder than the masonry or the original mortar, it can cause serious stresses within the wall during thermal expansion and contraction, which can lead to deterioration of the masonry units rather than the mortar.
      b. If the mortar is softer, any deterioration which occurs will take place in the mortar, which is easier to replace than the units themselves.
   2. The repointing mortar should allow the passage of water, both liquid and vapor. If the mortar does not allow water to pass freely through it, the water can become trapped inside the wall, freeze and cause serious deterioration to the masonry.
   3. Color and texture: The repointing mortar should match the original mortar in color, texture and physical characteristics.
      a. Obtaining an accurate color match is best achieved by selecting an appropriate sand.
         1) Use sand which is similar to the original in color and gradation. Sand from more than one source may be required.
         2) For repointing of natural stones, use finely ground stone "dust" in the mortar to match the joints as closely as possible to the stone.
      b. If the original mortar was tinted, or if it is impossible to obtain a color match through the use of sand, it may be necessary to use a special mortar pigment. Caution: pigments may react with other ingredients in the mortar to form efflorescence. They may also weather at a different rate than natural coloring and cause a color variation in the mortar.
      c. If pigments must be used, pure mineral oxides should be used because they do not fade or leach out of the mortar. Amount of pigment should not exceed 2% of the mortar mix by weight.

d. Many mortars used before the twentieth century have small lumps of incompletely burned or ground lime, or other impurities. To match the original appearance of the masonry, these impurities must be included in the new repointing mortar. Use identical materials, such as ground oyster shells (obtained at feed stores) or lumps of lime, to duplicate original lumps.

4. Workability: The workability or plasticity of the mortar is a direct result of the selection of materials.

B. Mortar Mix:

1. Have the existing mortar completely analyzed to insure that the repointing mortar will not be less permeable/harder than the masonry units or the original mortar. IT IS BETTER TO HAVE MORTAR THAT IS MORE PERMEABLE THAN LESS.
2. Measure all ingredients by cubic volume using a pre-established uniform measure, such as a small bucket, rather than a less uniform measure such as a shovel.
3. For historic masonry set in lime mortar, use the following mortar mix:

   1 part portland cement

   3 parts lime

   8-12 parts sand (To match existing mortar as closely as possible.)

   NOTE: The exact mix required will relate to the grain size and sharpness of the sand and will vary depending on the supply.

   -OR- For historic masonry set in standard mortar, use the following mortar mix (ASTM C270 Type "0") as a starting point:

   1 part portland cement

   2 parts lime or lime putty

   6 to 9 parts sand and stone dust (To match existing mortar as closely as possible.)

   -OR-

   For Limestone (ASTM C270 Type "N"):

   1 part portland cement

   1 parts lime

   4-6 parts aggregate

   Enough water to form a workable consistency

   -OR-

   For Granite (ASTM C270 Type "S"):

   2 parts portland cement

   1 part lime

   7-9 parts aggregate

   Enough water to form a workable consistency

4. Mix a final "job-size" batch once the correct sand color, cement content, etc. have been determined through small tests to ensure the on-site mixing conditions will result in the same final product.

PART 3 EXECUTION

3.01 ERECTION, INSTALLATION, APPLICATION

A. Mix Hydrated Lime:
   1. Add dry bagged hydrated lime to water. Stir and hoe the mass to form a thick cream.
   2. Allow to stand at least 24 hours before use.

B. Prepare Roughage Premix (for later use):
   1. Accurately proportion the sand and lime using measuring boxes constructed to contain the exact volume of each ingredient required to make on batch.
   2. Mix sand and lime thoroughly for about ten minutes. Store in plastic-lined drums and seal until required. This compound may be stored indefinitely if. Kept sealed from air and kept from freezing.
   3. When required for use, add and mix the correct portion of gauging cement as specified and use immediately. Accurate portioning is very important.

C. Add cements to lime and aggregate mixes immediately before the use of the mortar.
   1. Perform all batching with wooden boxes or plastic pails of known volume to ensure standardization and conformity of measurement; shovel measurement of materials is not permitted.
   2. Use box sizes that are sufficient for producing a batch size equal to one mixer load.
   3. Mix dry ingredients thoroughly before adding any water (approximately five minutes).

D. Add a small amount of water so that the mortar is just wet enough to hang on a trowel. Excess water will cause shrinkage and too little water will retard carbonation. Record the amount of water added so that it may be used as a guide for future batches.

E. Mix mortars at least 10 minutes before using to improve workability and ensure thorough mixing. Automatic mixers should have rubber blades. Clean mixing boards and mixing machines thoroughly after each use to prevent hardened lumps of mortar from contaminating the next batch of mortar.
   1. Repointing mortars may sit 1-2 hours after initial mixing and then may be remixed to a workable consistency. This is done to reduce shrinkage.
   2. Test the mix by holding a trowel with mortar on it upside down and shaking it once.
      a. If the mortar falls off without shaking, it has too much sand.
      b. If more than one shake is required, the mortar is too sticky or "plastic" and the lime content must be decreased.

F. Coloring Mortars:

1. Take samples of freshly-broken mortar from the original masonry pointing. Note color of aggregate for color-matching. Do not try to match the color of the binder. Use unweathered, unsoiled samples only.
2. Prepare test patties of mortar approximating the inner color of the sample and set aside to dry for at least 72 hours. Drying time may be accelerated by placing the patty sample in an oven or over a hot-plate.
3. Break the sample test patties and compare the inner portions to the original.

G. Use repointing mortar within approximately 1-2 hours of final mixing. Retemper the mortar as necessary to maintain workability.

END OF SECTION

SECTION 05 5213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ramp railings and guardrails.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Placement of anchors in concrete.

B. Section 09 9000 - Painting and Coating: Paint finish.

1.03 REFERENCE STANDARDS

A. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2012.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.

C. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2013.

D. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2007.

E. ASTM B177/B177M - Standard Guide for Engineering Chromium Electroplating; 2011.

F. ASTM E935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings; 2013.

G. ASTM E985 - Standard Specification for Permanent Metal Railing Systems and Rails for Buildings; 2000 (Reapproved 2006).

H. SSPC-Paint 15 - Steel Joist Shop Paint; 1999 (Ed. 2004).

I. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); 2002 (Ed. 2004).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, types of welds, and accessories.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of ASTM E985 and applicable local code.

B. Distributed Loads: Design railing assembly, wall rails, and attachments to resist distributed force of 75 pounds per linear foot (1095 N/m) applied to the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.

C. Concentrated Loads: Design railing assembly, wall rails, and attachments to resist a concentrated force of 200 pounds (890 N) applied at any point on the top of the assembly and in any direction, without damage or permanent set. Test in accordance with ASTM E 935.

D. Allow for expansion and contraction of members and building movement without damage to connections or members.

E. Dimensions: See drawings for configurations and heights.

F. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

G. Provide welding fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.03 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M, Grade B cold-formed structural tubing.

B. Steel Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.

C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

E. Exposed Fasteners: No exposed bolts or screws.

F. Straight Splice Connectors: Steel concealed spigots.

G. Galvanizing: In accordance with requirements of ASTM A123/A123M.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

H. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.04 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, for installation as work of other sections.

C. Apply one coat of bituminous paint to concealed aluminum surfaces that will be in contact with cementitious or dissimilar materials.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Anchor railings securely to structure.

D. Field weld anchors as indicated on drawings. Touch-up welds with primer. Grind welds smooth.

E. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

3.05 SCHEDULE

A. Ramp: Steel handrail with steel bars, primed finish.

END OF SECTION

SECTION 06 1000
ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-structural dimension lumber framing.

B. Roofing nailers.

C. Preservative treated wood materials.

D. Fire retardant treated wood materials.

E. Concealed wood blocking, nailers, and supports.

F. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

D. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2010.

E. WWPA G-5 - Western Lumber Grading Rules; Western Wood Products Association; 2011.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. Species: Douglas Fir, unless otherwise indicated.
   2. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   3. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

B. Lumber fabricated from old growth timber is not permitted.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Grading Agency: Western Wood Products Association (WWPA).

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19.

D. Stud Framing (2 by 2 through 2 by 6 (50 by 50 mm through 50 by 150 mm)):
   1. Species: Douglas Fir-Larch.
   2. Grade: No. 2.

E. Joist, Rafter, and Small Beam Framing (2 by 6 through 4 by 16 (50 by 150 mm through 100 by 400 mm)):
   1. Species: Douglas Fir-Larch.
   2. Species and Grades: As indicated on the drawings for various locations.

F. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

2.03 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

2.04 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Manufacturers:
      a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
      b. Hoover Treated Wood Products, Inc: www.frtw.com.
      c. Osmose, Inc: www.osmose.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.
   2. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Do not use treated wood in direct contact with the ground.

C. Preservative Treatment:
   1. Manufacturers:
      a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
      b. Viance, LLC: www.treatedwood.com.
      c. Osmose, Inc: www.osmose.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.
   2. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft (4.0 kg/cu m) retention.

a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
b. Treat lumber in contact with masonry or concrete.
c. Treat lumber for all concealed in-wall blocking.

3. Preservative Pressure Treatment of Plywood Above Grade: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft (4.0 kg/cu m) retention.
   a. Kiln dry plywood after treatment to maximum moisture content of 19 percent.
   b. Treat plywood in contact with masonry or concrete.
   c. Treat plywood for all concealed in-wall blocking.

PART 3 EXECUTION

3.01 PREPARATION

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

E. Specifically, provide the following non-structural framing and blocking:

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.05 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01 7419.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 1500
WOOD DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Softwood lumber structural wood decking.

B. Plywood structural wood decking.

C. Preservative treatment of wood.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 REFERENCE STANDARDS

A. AITC 112 - Standard for Tongue-and-Groove Heavy Timber Roof Decking; American Institute of Timber Construction; 1993, and errata.

B. AITC 113 - Standard for Dimensions of Structural Glued Laminated Timber; American Institute of Timber Construction; 2010.

C. ASTM D198 - Standard Test Methods of Static Tests of Lumber in Structural Sizes; 2009.

D. ASTM D1761 - Standard Test Methods for Mechanical Fasteners in Wood; 2012.

E. ASTM D2559 - Standard Specification for Adhesives for Bonded Structural Wood Products for Use Under Exterior Exposure Conditions; 2012a.

F. ASTM D2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010.

G. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

H. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood-Preservers' Association; 2012.

I. SPIB (GR) - Grading Rules; Southern Pine Inspection Bureau, Inc.; 2002.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials.

C. Shop Drawings: Indicate deck framing system and loads and cambers.

D. Samples of Wood Deck Exposed To View: Submit two samples, 1 x 6 inch nominal, length of 2 feet, illustrating wood grain, stain, and finish.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design decking under direct supervision of a Professional Structural Engineer experienced in design of work of this type and licensed in Texas.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience and certified by AITC.

C. Installer: Company specializing in performing work of the type specified in this section with minimum three years of experience.

1.06 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire retardant requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 WOOD MATERIALS

A. Wood fabricated from old growth timber is not permitted.

B. Marking: Mark each piece with producer's stamp indicating compliance with specified requirements; for pieces exposed to view in completed construction, submit manufacturer's certificate certifying that products conform to specified requirements in lieu of grade stamping.

C. Lumber for Roof Decking Replacement: Fabricated to AITC 112.
   1. Species: Douglas Fir Larch, grading as indicated on Drawings.
   2. Species: Douglas Fir Larch, graded under SPIB rules as AITC Select quality.
   3. Size: 1 x 6 (25 x 300 mm), nominal.
   4. Pattern: AITC standard beveled V-joint with single tongue and groove.
   5. Moisture Content: 19 percent, maximum.

D. Lumber for Historically Significant Exterior Porch Decking:
   1. Species: Reclaimed Longleaf Pine.
   2. Size: 5/4 inch.
   3. Pattern: AITC standard beveled V-joint with single tongue and groove.
   4. Moisture Content: 19 percent, maximum.

E. Lumber for New Accessible Ramps:
   1. Species: Southern Yellow Pine.
   2.

F. Plywood Decking for Flooring: PS 1 veneer plywood; APA Structural I; Exterior grade;1 A.
   1. Rating as indicated on Drawings.
   2. Size: 48 x 96 inch.
   3. Edges: Tongue and groove.

2.03 ACCESSORIES

A. Fasteners and Anchors:
   1. Fastener Type and Finish: Hot-dipped galvanized steel for high humidity and preservative-treated wood locations, unfinished steel elsewhere.
   2. Anchors: Toggle bolt type for anchorage to hollow masonry.

2.04 WOOD TREATMENT

A. Factory-Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

B. Preservative Pressure Treatment:
   1. Manufacturers:
      a. Arch Wood Protection, Inc: www.wolmanizedwood.com.
      b. Viance, LLC: www.treatedwood.com.
      c. Osmose, Inc: www.osmose.com.
      d. Substitutions: See Section 01 6000 - Product Requirements.
   2. Preservative Pressure Treatment of Lumber Decking: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft (4.0 kg/cu m) retention.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
   3. Preservative Pressure Treatment of Plywood Decking: AWPA U1, Use Category UC2 and UC3B, Commodity Specification F using waterborne preservative to 0.25 lb/cu ft (4.0 kg/cu m) retention.
      a. Kiln dry plywood after treatment to maximum moisture content of 18 percent.
   4. Marking: Mark each piece with stamp of an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

C. Surface-Applied Wood Preservative:

PART 3 EXECUTION

3.01 EXAMINATION

A. Visually inspect existing decking to determine if wood is deteriorated and notify Architect of areas requiring replacement.

B. Maintain record of locations requiring deck replacement for determining unit pricing.

C. Verify that existing support framing structurally acceptable is ready to receive decking. Notify Architect if support framing is in a deteriorated condition.

3.02 PREPARATION

A. Coordinate placement of bearing items.

3.03 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

3.04 INSTALLATION - PLYWOOD DECKING FOR ENTIRE ROOF AREAS

A. Install decking perpendicular to framing members, with ends staggered over firm bearing. On sloped surfaces, lay decking with tongue upward.

B. Engage plywood tongue and groove edges.

C. Allow expansion space at edges and ends.

D. Attach decking with adhesive and screws.

E. Use sheathing clips at unsupported edges of plywood between supporting framing members.

F. Cut decking to accommodate roof drain and flange.

3.05 INSTALLATION - BOARD DECKING INFILL

A. Install decking perpendicular to framing members, with ends staggered over firm bearing. On sloped surfaces, lay decking with tongue upward.

B. Fit butt end deck joints occurring between support members with metal splines to maintain tight, aligned joints.

C. Engage decking tongue and groove edges.

D. Secure with manufacturer's proprietary fastener system.

E. Maintain decking joint space of 1/16 inch (1.5 mm) maximum.

F. Cut decking to accommodate roof drain and flange.

3.06 TOLERANCES

A. Surface Flatness of Decking Without Load: 1/4 inch in 10 feet (2 mm/m) maximum, and 1/2 inch in 30 feet (12 mm / 9 m) maximum.

END OF SECTION

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 4100 - Architectural Wood Casework: Shop fabricated custom cabinet work.

C. Section 08 1416 - Flush Wood Doors.

D. Section 09 9000 - Painting and Coating: Painting and finishing of finish carpentry items.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

C. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

D. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.

E. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 2007.

F. PS 1 - Structural Plywood; 2007.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide data on fire retardant treatment materials and application instructions.

C. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Minimum Scale of Detail Drawings: 1-1/2 inch to 1 foot (1:8).

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience in restoration of historical windows.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Quality Grade: Unless otherwise indicated provide products of quality specified by AWI/AWMAC/WI Architectural Woodwork Standards for Premium Grade.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

C. Exterior Woodwork Items:
   1. Window Casings and Moldings: Long Leaf Southern Yellow Pine; prepare for paint finish.
   2. Attic Vents and Moldings with Concealed Insect Screens: Cypress; prepare for paint finish.

D. Interior Woodwork Items:
   1. Window Sills and Trim: Poplar; prepare for primer-only finish at locations indicated on drawings unless specifically noted otherwise on Drawings.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 LUMBER MATERIALS

A. For matching existing adjacent hardwood or softwood lumber: Match existing species species, match sawn, maximum moisture content of 6 percent; with vertical grain using AWI requirements for quality of wood for opaque or transparent finish. See drawings for locations of finishes.

B. For new softwood lumber: Long Leaf Souther Yellow Pine species, plain sawn, maximum moisture content of 6 percent; with vertical grain, using AWI requirements for quality of wood for opaque or transparent finish. See drawings for locations of finishes.

2.04 SHEET MATERIALS

A. Bead Board Paneling: Southern Pine face species, plain cut, vertical grain, unfinished, sanded.
   1. Thickness: Match existing.
   2. Pattern: Match existing.

B. Softwood Plywood Not Exposed to View: Any face species, veneer core; PS 1 Grade A-B; glue type as recommended for application.

2.05 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Fasteners: Of size and type to suit application; zinc plated finish in concealed locations and zinc plated finish in exposed locations.

C. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES

A. Lumber for Shimming and Blocking: Softwood lumber of any suitable species.

B. Primer: Alkyd primer sealer.

C. Wood Filler: Solvent base, tinted to match surface finish color.

2.07 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

2.08 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

D. Prime paint surfaces in contact with cementitious materials.

E. Back prime woodwork items to be field finished, prior to installation.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards requirements for grade indicated.

B. Set and secure materials and components in place, plumb and level.

C. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim to conceal larger gaps.

3.03 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment in accordance with manufacturer's instructions.

B. Brush apply one coats of preservative treatment on wood in contact with cementitious materials. Treat site-sawn cuts.

C. Allow preservative to dry prior to erecting members.

3.04 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09 9000.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.05 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch (1.5 mm).

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.7 mm).

END OF SECTION

SECTION 06 4919

EXTERIOR WOOD SHUTTERS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

A. Section Includes:
   1. Exterior shutters.
   2. Shop finishing exterior shutters.

1.03 RELATED SECTIONS

A. 01 2300 - Alternates: Pricing alternates to base bid.

A. 09 9000 - Painting and Coating: Opaque finish for exterior wood shutters.

1.04 SUBMITTALS

A. Product Data: For each type of product and process indicated and incorporated into exterior wood shutters during fabrication, finishing, and installation.
   1. Include data for wood-preservative treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained. Include chemical-treatment manufacturer's written instructions for finishing treated material.
   2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
   3. Include copies of warranties from chemical-treatment manufacturers for each type of treatment.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples for Verification:
   1. Lumber for shop-applied opaque finish, 5 inches (125 mm) wide by 12 inches (300 mm) long for each finish system and color, with one-half of exposed surface finished.

1.05 FIELD CONDITIONS

A. Weather Limitations: Proceed with installation of exterior wood shutters only when existing and forecasted weather conditions permit work to be performed and at least one coat of specified finish to be applied without exposure to rain, snow, or dampness.

B. Field Measurements: Verify dimensions of related construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

PART 2 - PRODUCTS

2.01 FABRICATORS

A. Fabricators: Subject to compliance with requirements, available fabricators offering products that may be incorporated into the Work include, but are not limited to, the following:
   1. Kestrel Shutters and Doors, www.diyshutters.com. (800)494-4321 (Basis of Design).
   2. Timberlane Shutters, www.timberlane.com, (800)250-2221.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 EXTERIOR SHUTTERS FOR OPAQUE FINISH

A. Grade: Premium.
B. Wood Species: Spanish Cedar.
C. Style: Bermuda.
D. Configuration: As Scheduled.
E. Options: Tilt Rods.
F. Finish: Primed.

2.03 WOOD MATERIALS

A. Wood Products: Provide materials that comply with requirements of referenced quality standard for each type of woodwork and quality grade specified unless otherwise indicated.
   1. Wood Moisture Content: 9 to 15 percent.

2.04 INSTALLATION MATERIALS

A. Nails: stainless steel.
B. Screws: stainless steel.
   1. Provide self-drilling screws for metal-framing supports, as recommended by metal-framing manufacturer.
C. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip-galvanized anchors and inserts unless otherwise indicated. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.05 FABRICATION

A. Fabricate shutters to correspond with window dimensions. Ease edges to radius indicated for the following:
   1. Edges of Solid-Wood (Lumber) Members 3/4 Inch (19 mm) Thick or Less: 1/16 inch (1.6 mm).
   2. Edges of Rails and Similar Members More Than 3/4 Inch (19 mm) Thick: 1/8 inch (3 mm).
B. Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

2.06 SHOP PRIMING

A. Wood Shutters for Opaque Finish: Shop prime wood shutters for paint finish with one coat of wood primer specified in Section 09 9000 - Painting and Coating.

B. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
   1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of shutters. Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.

2.07 SHOP FINISHING

A. Grade: Premium.
B. General: Entire finish of exterior wood shutters is specified in this Section. To greatest extent possible, finish wood shutters at fabrication shop. Defer only final touchup and cleaning until after installation.
C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing wood shutters, as applicable to each unit of work.
   1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of wood shutters. Apply two coats to surfaces installed in contact with concrete or masonry and to end-grain surfaces.
D. Woodwork for Opaque Finish: Finish wood shutters to comply with Section 099113 "Exterior Painting."

PART 3 - EXECUTION

3.01 PREPARATION

A. Before installing wood shutters, examine shop-fabricated work for completion and complete work as required, including backpriming.

3.02 INSTALLATION

A. Quality Standard: Install wood shutters to comply with same grade as item to be installed.
B. Install wood shutters true and straight with no distortions. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm).
C. Scribe and cut wood shutters to fit adjoining work, and refinish cut surfaces or repair damaged finish at cuts.
D. Complete finishing work specified in this Section to extent not completed at shop or before installation of wood shutters. Fill nail and screw holes with matching filler where exposed.
E. Refer to Section 09 9000 "Painting and Coating" for final finishing of installed wood shutters.

3.03 ADJUSTING AND CLEANING

A. Repair damaged and defective wood shutters, where possible, to eliminate functional and visual defects; replace wood shutters where not possible to repair. Adjust joinery for uniform appearance.

B. Clean wood shutters on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

3.04 SHUTTER SCHEDULE

House	Quality	Louver Type	Configuration	Options	Hardware
Pereida House	Premium	Operable, 2 1/2" Blades, Flat	33-33-33	Solid Radius Top, Operable Tilt Rod, Rabbeted Closing Edge	5 1/2" Mortised Hinges, Cast Iron Lull and Porter, Slide Bolt, Shutter Locks - 2 Per leaf
Kampmann House	Premium	Operable, 2 1/2" Blades, Flat	33-33-33	Operable Tilt Rod, Rabbeted Closing Edge	5 1/2" Mortised Hinges, Cast Iron Lull and Porter, Slide Bolt, Shutter Locks - 2 Per leaf
Koehler House	Premium	Operable, 2 1/2" Blades, Flat	33-33-33	Operable Tilt Rod, Rabbeted Closing Edge	5 1/2" Mortised Hinges, Cast Iron Lull and Porter, Slide Bolt, Shutter Locks - 2 Per leaf
Espinoza House	Premium	Operable, 2 1/2" Blades, Flat	33-33-33	Operable Tilt Rod, Rabbeted Closing Edge	5 1/2" Mortised Hinges, Cast Iron Lull and Porter, Slide Bolt, Shutter Locks - 2 Per leaf

END OF SECTION

SECTION 07 0150.19
PREPARATION FOR RE-ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Removal of existing roofing system in preparation for a new roof system.

1.02 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2200 - Unit Prices, for additional unit price requirements.

B. Repair Existing Wood Deck:
   1. Basis of Measurement: By the square foot (meter).
   2. Basis of Payment: Includes replacing decking with new material of same thickness.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

B. Schedule work to coincide with commencement of installation of new roofing system.

1.04 QUALITY ASSURANCE

A. Materials Removal Firm Qualifications: Company specializing in performing the work of this section with minimum three years of documented experience.

1.05 FIELD CONDITIONS

A. Do not remove existing roofing when weather conditions threaten the integrity of the building contents or substrate material.

B. Maintain continuous temporary protection prior to and during installation of new roofing system.

PART 2 PRODUCTS

2.01 MATERIALS

A. Temporary Protection: Sheet polyethylene; provide weights to retain sheeting in position.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing roof surface is clear and ready for work of this section.

3.02 PREPARATION

A. Sweep roof surface clean of loose matter.

B. Remove loose refuse and dispose off site.

3.03 MATERIAL REMOVAL

A. Remove only existing roofing materials that can be replaced with new materials as the weather will permit.

B. Remove roofing, perimeter base flashings, flashings around roof protrusions, pitch pans and pockets.

C. Repair existing wood deck surface to provide smooth working surface for new roof system.

3.04 FIELD QUALITY CONTROL

A. The drawings identify the approximate limits to material removal.

3.05 PROTECTION

A. Provide temporary protective sheeting over uncovered deck surfaces.

B. Provide for surface drainage from sheeting to existing drainage facilities.

C. Do not permit traffic over unprotected or repaired deck surface.

END OF SECTION

SECTION 07 3120

REPAIRING METAL SHINGLE ROOFING

PART 1-GENERAL

1.01 SUMMARY

A. This section includes guidance on making minor repairs to a metal shingle roof.

B. Safety Precautions:

1. Wear rubber-soled shoes that have non-slip tread (preferably sneakers with a high top for good ankle support). Avoid wearing loose clothing.
2. Wear a safety-belt or harness and secure it to the chimney or other substantial object. Leave only enough slack so that work can be performed comfortably in one area, and adjust that slack as you work on other sections of the roof.
3. Be sure the roof is clear of debris and water.
4. Do not work on wet roofs. Work on cleated walkboards.
5. Steep roofs: On slopes where the roof is steeper than 4 inches rise per foot, special consideration must be given to footing and handling of materials.
   a. Secure chicken ladders or cleats at the top for adequate footing.
   b. Hand and secure approved safety lines with ropes of sufficient strength.
   c. Carry a limited number of materials so that balance and footing are not impaired.
   d. Establish regulations for any foot traffic. Many roofing materials should not be walked on. When working on lead roofing, a self-supporting ladder might be hung from the roof ridge. Such items should be specifically designed and kept in a storage area adjacent to the roof access. Plank ceiling joists under roof hatch.

1.02 SUBMITTALS

A. Manufacturer's data sheets on each product to be used, including:

1. Summary of test results, indicating compliance with specified requirements.
2. Storage and handling requirements and recommendations.
3. Installation methods.
4. Specimen warranty.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in the manufacture of roofing systems similar to those required for this project, with not less than 5 years of documented experience.

B. Installer Qualifications: Company trained and authorized by roofing system manufacturer.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store products on project site as recommended by manufacturer.

1.05 SEQUENCING AND SCHEDULING

A. General Protection (Surface and Surrounding) These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO).

1.06 PROJECT/SITE CONDITIONS

A. Environmental Requirements:

1. Wet weather: Do not repair roofing in misty, rainy weather. Do not apply paint, putty or epoxy to damp surfaces or in misty or rainy weather. Do not remove exterior elements of structures when rain is in the forecast or in progress.
2. Hot weather: Maximum application temperatures: Paint--85 degrees F, Putty--80 degrees F, and Epoxy--80 degrees F. Work in shade when temperature is above 75 degrees F. Work around the structure in the shade away from the sun.
3. Cold weather: Minimum application temperatures: Paint -- 50 degrees F, Putty--50 degrees F, and Epoxy--55 degrees F.

PART 2---PRODUCTS

2.01 MANUFACTURERS

A. Berridge Manufacturing Company www.berridge.com.

B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Rivets or nails compatible with sheet metal type.

B. Solder, flux.

C. Silicone sealer.

D. Flashing cement.

2.03 EQUIPMENT

A. Chicken ladder, safety belt or harness.

B. Protective gloves and gear.

C. Straight snips for cutting straight or slightly curved lines in sheet metal 24 gauge or lighter.

D. Soldering copper, soldering iron.

E. Handy tongs for bending the edges of the solder.

F. Wire brush or steel wool.

PART 3---EXECUTION

3.01 PREPARATION

A. Protection:

1. At the end of each work day, provide building protection for any exterior roofing element removed for repair or replacement.
2. Remove only a quantity of roofing which may be replaced on that same day. At the end of the day, use 15 pound roofing felt or polyethylene sheeting to drape over missing roofing and insert

under roof unit laps or temporarily secure areas of existing roofing and roof as required to make roof watertight and windproof.

3. Keep areas trimmed to prevent branches from scuffing roofing surfaces.

3.02 INSTALLATION AND APPLICATION

A. For Small Rusted Areas:

1. Remove rust using a wire brush.
2. Apply with coat of clear silicone sealer.

B. For Damaged Metal Shingles: Solder a patch.

1. Thoroughly clean the area to be patched of all rust and/or roofing cement - clean down to shiny metal.
2. Cut a patch from the same metal, about two inches larger than the hole as measured from the top of the shingle. If reusing material is not feasible, notify Architect, for selection of a color to match the existing metal panels.
3. Fold the edges under 1 (one) inch and snip off the corners. This makes the patch stronger and takes off easily damaged sharp corners.
4. Place a weight, such as a brick, over the patch to hold it firmly to the metal. If the patch is on a vertical surface, clamp or tack-solder it in place.
5. Solder patch in place.

C. If a soldered repair is not feasible, patch the damaged shingle with sheet metal and flashing cement:

1. Clean the metal with a wire brush or steel wool.
2. Cut a sheet-metal patch that overlaps the hole at least 3 inches on all sides.
3. Coat the back of the patch with flashing cement.
4. Press the patch firmly into place--just hard enough so that the cement doesn't ooze onto the roof.
5. Prime and paint the patch to match the rest of the roof.
3. Cover nail head with a dab of clear silicone sealer.

END OF SECTION

SECTION 07 4623
WOOD SIDING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board siding for Walls with batten strips.

B. Trim, flashings, accessories, and fastenings.

1.02 RELATED REQUIREMENTS

A. Section 06 2000 - Finish Carpentry: Exterior wood trim at windows.

B. Section 07 2500 - Weather Barriers: Weather barrier under siding.

C. Section 07 6200 - Sheet Metal Flashing and Trim: Product requirements for metal flashings and trim associated with wood siding for placement by this section.

D. Section 07 9005 - Joint Sealers: Sealant at perimeter.

E. Section 09 2116 - Gypsum Board Assemblies: Siding substrate.

F. Section 09 9000 - Painting and Coating: Prime and finish painting.

1.03 REFERENCE STANDARDS

A. WCLIB (GR) - Standard Grading Rules for West Coast Lumber No. 17; West Coast Lumber Inspection Bureau; 2004, and supplements.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating materials.

C. Samples: Submit two samples 12 x 12 inch (300 x 300 mm) in size illustrating surface texture and color.

1.05 QUALITY ASSURANCE

A. Grade lumber in accordance with the following:
   1. Western Red Cedar: WCLB (GR).

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in ventilated areas with constant minimum temperature of 60 degrees F (16 degrees C) and maximum relative humidity of 55 percent.

PART 2 PRODUCTS

2.01 SIDING

A. Board Siding: Flat western red cedar, Premium grade, maximum moisture content of 10 percent.
   1. Size: 1 inch (25 mm) thick, 12 inch (305 mm) wide nominal board.
   2. Profile: Board and batten.
   3. Surface Texture: Unsanded.

B. Batten Strips: Same species as siding; 1x2 inch (25x50 mm).

2.02 ACCESSORIES

A. Nails: Hot dipped galvanized type; non-staining, of size and strength to securely and rigidly retain the work .

B. Flashing: Galvanized steel as specified in Section 07 6200.

C. Accessory Components: Fascias, Starter strips, and Trim of same material and finish as siding.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrates are ready to receive work.

B. Verify that weather barrier has been installed over substrate completely and correctly.

C. Do not begin until unacceptable conditions have been corrected.

D. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Prime paint surfaces in contact with cementitious materials.

B. Do not install materials until back priming is complete and dry.

3.03 INSTALLATION

A. Install siding and batten strips in accordance with manufacturer's instructions.

B. Fasten siding in place, level and plumb.
   1. Arrange for orderly nailing pattern. Blind nail except on over trim.
   2. Install siding for natural shed of water.
   3. Position cut ends over bearing surfaces. Sand cut edges smooth and clean.

C. Install corner strips, trim, and battens.

D. Install metal flashings at internal and external corners, sills, and heads of wall openings.

3.04 TOLERANCES

A. Maximum Variation From Plumb and Level: 1/4 inch per 10 feet (6 mm/3 m).

B. Maximum Offset From Joint Alignment: 1/16 inch (1.5 mm).

END OF SECTION

SECTION 07 5200
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Modified bituminous roofing membrane, protected membrane application.

B. Insulation, flat and tapered.

C. Base flashings.

D. Roofing cant strips, accessories, and roofing expansion joints.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood nailers and curbs.

B. Section 07 0150.19 - Preparation for Re-Roofing.

C. Section 07 6200 - Sheet Metal Flashing and Trim: Counterflashings .

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2013.

B. ASTM C728 - Standard Specification for Perlite Thermal Insulation Board; 2013.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2014.

D. ASTM D41/D41M - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing; 2011.

E. ASTM D312 - Standard Specification for Asphalt Used in Roofing; 2000 (Reapproved 2006).

F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

G. ASTM E1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces; 2011.

H. FM DS 1-28 - Wind Design; Factory Mutual Research Corporation; 2007.

I. NRCA ML104 - The NRCA Roofing and Waterproofing Manual; National Roofing Contractors Association; Fifth Edition, with interim updates.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide manufacturer's catalog data for membrane and bitumen materials, base flashing materials, insulation, vapor retarder, and surfacing.
   1. LEED Submittal: Include testing documentation of solar reflectance index.

C. Shop Drawings: Indicate joint or termination detail conditions, conditions of interface with other materials, setting plan for tapered insulation, and mechanical fastener layout.

D. Samples: Submit two samples 12x12 inches (305x305 mm) in size illustrating granule surfaced sheet and colored coated sheet.

E. Manufacturer's qualification data.

F. Installer's qualification data.

G. Manufacturer's Installation Instructions: Indicate special procedures.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with NRCA Roofing and Waterproofing Manual and manufacturer's instructions.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience, and approved by manufacturer.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, with seals and labels intact.

B. Store products in weather protected environment, clear of ground and moisture; ballast materials may be stored outdoors.

1.08 FIELD CONDITIONS

A. Do not apply roofing membrane when environmental conditions are outside the ranges recommended by manufacturer.

B. Do not apply roofing membrane during unsuitable weather.

C. Do not apply roofing membrane when ambient temperature is below 40 degrees F (5 degrees C).

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a two year period after Date of Substantial Completion.

C. Provide 20 year manufacturer's material and labor warranty to cover failure to prevent penetration of water.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Membrane Materials:
   1. Firestone Building Products Co: www.firestonebpco.com.
   2. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation:
   1. Dow Chemical Co: www.dow.com.

2.02 ROOFING - CONVENTIONAL APPLICATION

A. Modified Bituminous Roofing: Two-ply membrane, with vapor retarder and insulation.

B. Roofing Assembly Requirements:
   1. Solar Reflectance Index (SRI): 78, minimum, calculated in accordance with ASTM E1980, based on 3-year aged data.
      a. Field applied coating may not be used to achieve specified SRI.
   2. Internal Fire Spread Classification: Factory Mutual Class 1, FM-approved.
   3. Wind Resistance Classification: Factory Mutual I-75, in accordance with FM DS 1-28.
   4. Insulation Thermal Value (R), minimum: 20 (3 inches); provide insulation of thickness required.

C. Acceptable Insulation Types: .

D. Acceptable Insulation Types - Tapered Application: Any of the types specified.
   1. Uniform thickness perlite, polyisocyanurate, or molded polystyrene board covered with tapered extruded polystyrene or perlite board.

2.03 ROOFING - PROTECTED MEMBRANE APPLICATION

A. Roofing Assembly Requirements:

B. Acceptable Insulation Types: Any of the types specified.

2.04 MEMBRANE AND SHEET MATERIALS

A. Membrane: Polymer modified asphalt, reinforced with non-woven fabric; granule surfaced; with the following characteristics:
   1. Color: To be selected by Architect from manufacturer's full color range.

B. Flexible Flashing Material: Same material as membrane.

2.05 BITUMINOUS MATERIALS

A. Bitumen: Asphalt, ASTM D312 Type IV; for adhering insulation, use Type III.

B. Primer: ASTM D41/D41M, asphalt type.

C. Roof Cement: ASTM D4586/D4586M, Type II.

2.06 INSULATION

A. Perlite Board Insulation for exterior areas, used as a flat, smooth subsurface: Expanded perlite mineral aggregate, ASTM C728, with the following characteristics:
   1. Board Size: 24 x 48 inch (619 x 1220 mm).
   2. Board Thickness: 1/2 inch (13 mm).

B. Polyisocyanurate Board Insulation: Rigid cellular foam, complying with ASTM C1289, Type I, aluminum foil both faces; Class 1, non-reinforced foam core, and with the following characteristics:
   1. Compressive Strength: 16 psi (110 kPa)
   2. Board Size: 48 x 96 inch (1220 x 2440 mm).
   3. Board Thickness: 1.5 inch (37.5 mm).
   4. Tapered Board: Slope as indicated; minimum thickness 1.5 inch (37.5 mm); fabricate of fewest layers possible.
   5. Thermal Resistance: R-value of 20.
   6. Board Edges: Square.
   7. Manufacturers:
      a. Dow Chemical Co: www.dow.com.
      b. GAF: www.gaf.com.
   8. Substitutions: See Section 01 6000 - Product Requirements.

2.07 ACCESSORIES

A. Cant and Edge Strips: Asphalt-impregnated wood fiberboard, compatible with roofing materials; cants formed to 45 degree angle.

B. Insulation Joint Tape: Glass fiber reinforced type as recommended by insulation manufacturer, compatible with roofing materials; 6 inches (150 mm) wide; self adhering.

C. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify adjacent wood trim is not deteriorated, replace with new pressure treated wood blocking as specified in Section 06 1000 Rough Carpentry to be used as a subsurface for the cant strip and 8 inch vertical rise of roofing material onto wall.

C. Verify deck is supported and secure.

D. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

E. Verify deck surfaces are dry and free of snow or ice.

F. Verify that cant strips are in place.

3.02 WOOD DECK PREPARATION

A. Verify flatness and tightness of joints of existing wood decking. Fill knot holes with latex filler.

B. Confirm dry deck by moisture meter with 12 percent moisture maximum.

C. Extend two plies of felt from 12 inches (300 mm) around roof perimeter to roof edge and onto wall air seal material with 8 inches (20 mm) of lap; seal air tight.

D. Mop cant strips in place with hot bitumen.

3.03 INSULATION INSTALLATION

A. Attachment of Insulation:
   1. Mechanically fasten first layer of insulation to deck in accordance with roofing manufacturer's instructions and Factory Mutual requirements.
   2. Embed second layer of insulation into flood coat mopping of hot bitumen in accordance with roofing and insulation manufacturers' instructions.

B. Lay subsequent layers of insulation with joints staggered minimum 6 inch (150 mm) from joints of preceding layer.

C. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

D. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

E. Tape joints of insulation in accordance with roofing and insulation manufacturers' instructions.

F. Do not apply more insulation than can be covered with membrane in same day.

3.04 MEMBRANE APPLICATION

A. Apply membrane in accordance with manufacturer's instructions.

B. Apply membrane; lap and seal edges and ends permanently waterproof.

C. Apply smooth, free from air pockets, wrinkles, fish-mouths, or tears. Ensure full bond of membrane to substrate.

D. At end of day's operation, install waterproof cut-off. Remove cut-off before resuming roofing.

E. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 8 inches (200 mm) onto vertical surfaces.
   2. Apply flexible flashing over membrane.
   3. Secure flashing to nailing strips at 4 inches (100 mm) on center.
   4. Insert base flashing into reglets and secure.

F. At gravel stops, extend membrane and base sheet under gravel stop and to the outside face of the wall.

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field quality control and inspection.

B. Require site attendance of roofing and insulation material manufacturers daily during installation of the Work.

3.06 CLEANING

A. Remove bituminous markings from finished surfaces.

B. In areas where finished surfaces are soiled by bitumen or other source of soiling caused by work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

C. Repair or replace defaced or damaged finishes caused by work of this section.

3.07 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 6100
SHEET METAL ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sheet metal roofing, associated flashings, and underlayment for matching historically significant adjacent sections of standing seam and flat seam metal roofing systems.

B. Counterflashings.

1.02 RELATED REQUIREMENTS

A. Section 09 900 - Painting and Coating: Field finishing sheet metal roofing panels.

B. Section 07 7123 - Manufactured Gutters and Downspouts: Installation of gutter and downspout components.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

B. ASTM B32 - Standard Specification for Solder Metal; 2008.

C. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

D. ICC-ES AC188 - Acceptance Criteria for Roof Underlayments; 2012.

E. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.
   1. Review preparation and installation procedures and coordinating and scheduling required with related work.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details. Clearly identify and differeniate standard shapes from special or custom shapes.

C. Product Data: Provide data on metal types, finishes, characteristics .

D. Submit two samples 24x24 inch (610x610 mm) in size illustrating metal site finished color.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual requirements and standard details, except as otherwise noted.

B. Installer Qualifications: Company specializing in performing custom sheet metal roof installations similar in scope and complexity with minimum three years of documented experience. Provide list of similar buildings, including contacts.

1.07 MOCK-UP

A. Construct mock-up of sheet metal roofing, 4 feet (1.22 m) long by 4 feet (1.22 m) wide, illustrating associated attachments.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a twenty year period after Date of Substantial Completion. Defective work includes degradation of metal finish and failure of watertightness or seals.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Turner Roofing Company, 18953 Redland Rd., San Antonio, TX 78259, (210) 496-2256.

B. American Roofing and Metal Company, 801 Wyoming St., San Antonio, TX 78203, (210) 224-5463, (www.amerroofing.com).

C. Mangold Roofing, 3222 Thousand Oaks Dr, San Antonio, TX 78247, (210) 494-7615, (www.mangoldroofing.com).

D. Substitutions: See Section 01 6000 - Product Requirements.

2.02 SHEET MATERIALS

A. Galvanized Steel Sheet: ASTM A653/A653M, with G90/Z275 zinc coating; 24 gage (0.6 mm) core steel for field finishing.

2.03 ACCESSORIES

A. Fasteners: Galvanized steel .

B. Underlayment: ASTM D226/D226M, organic roofing felt, Type II ("No.30").

C. Protective Backing Paint: Zinc molybdate alkyd.

D. Sealant: Type as specified in Section 07 9005.

2.04 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate and install roofing panels, ridges, seams, valleys, and eaves to match the existing historical roofing. Manufacturers' standard shapes are not acceptable at areas which are not concealed.

C. Fabricate cleats of same material as sheet, same gage as roofing sheet, interlockable with sheet.

D. Fabricate starter strips, interlockable with sheet.

E. Form pieces in single length sheets to match existing adjacent lengths.

F. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

G. Form material with standing seams and flat seams in locations indicated on Drawings. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

2.05 FACTORY FINISHING

A. Primer Coat: On coated sheets, finish concealed side of sheet with primer compatible with finish system as recommended by finish system manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to drains.

B. Verify deck is dry and free of snow or ice. Verify joints in wood deck are solidly supported and fastened.

C. Verify correct placement of wood nailers and insulation positioning between nailers.

D. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets are in place, and nailing strips located.

E. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

C. Place eave edge metal flashings tight with fascia boards. Weather lap joints 2 inches (50 mm) and seal with plastic cement. Secure flange with nails spaced 6 inches (152 mm)OC.

3.03 INSTALLATION - GENERAL ROOFING

A. Apply underlayment over entire roof area.
   1. Apply in single layer laid perpendicular to slope; weather lap edges 2 inches (50 mm) and nail in place.
   2. Apply in 2 layers; the first layer laid parallel to slope with joints lapped 6 inches (150 mm), second layer laid perpendicular to slope with 2 inch (50 mm) lapped edges.
   3. Minimize nail quantity.

B. Cleat and seam all joints.

C. Use plastic cement for joints between metal and bitumen and for joints between metal and felts.

D. Provide formed metal pans for protrusions through roof. Fill pans watertight with plastic cement.

E. Provide panels to match existing size, seam construction, and existing profile.

F. Solder lap joints. After soldering, wash metal clean with neutralizing solution, rinse with water.

3.04 INSTALLATION - FLAT SEAM ROOFING

A. Seam spacing to match existing roof. Verify prior to existing roof removal.

B. Notch corners and turn up edges 3/4 inch (19 mm).

C. Lay sheets with long dimension parallel to existing pattern. Apply pans at damaged locations, starting closest to the eave.

D. Lock cleats into seams and flatten in direction of drainage.

E. Stagger transverse joints of roofing sheets.

F. At eaves and gable ends, terminate roofing by hooking over edge strip.

G. Fold lower ends of seams at eaves over at 45 degree angle.

3.05 INSTALLATION - STANDING SEAM ROOFING

A. Lay sheets with long dimension perpendicular to eaves. Apply pans beginning at eaves.

B. Lock cleats into seams and flatten.

C. Stagger transverse joints of roofing sheets.

D. At eaves and gable ends, terminate roofing by hooking over edge strip.

E. Bend up one side edge 1-1/2 inches (38 mm) and other edge 1-3/4 inches (44 mm).

F. Make first fold 1/4 inch (6 mm) wide single fold and second fold 1/2 inch (13 mm) wide, providing locked portion of standing seam, 5 plies in thickness.

G. Fold lower ends of seams at eaves over at 45 degree angle.

3.06 INSTALLATION - FLASHINGS

A. Secure flashings in place using concealed fasteners.

B. Cleat and seam all joints.

C. Apply plastic cement compound between metal flashings and felt flashings.

D. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

E. For flat seam roofing: Seal metal joints watertight.

F. For standing seam roofing: Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings and counterflashings for field finishing.

B. Reglets and accessories.

1.02 RELATED REQUIREMENTS

A. Section 06 1000 - Rough Carpentry: Wood blocking for batten seams.

B. Section 07411 - Preformed Metal Roof Panels: Roofing System.

C. Section 07 9005 - Joint Sealers.

1.03 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

B. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2010.

C. ASTM B32 - Standard Specification for Solder Metal; 2008.

D. ASTM D226/D226M - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2009.

E. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2012)e1.

F. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA Architectural Sheet Metal Manual and CDA Copper in Architecture Handbook requirements and standard details, except as otherwise indicated.

B. Maintain one copy of each document on site.

C. Fabricator and Installer Qualifications: Company specializing in sheet metal work with three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch (0.6 mm) thick base metal.

2.02 ACCESSORIES

A. Fasteners: Galvanized steel, with soft neoprene washers.

B. Underlayment: ASTM D226/D226M, organic roofing felt, Type II ("No. 30").

C. Primer: Zinc chromate type.

D. Protective Backing Paint: Zinc molybdate alkyd.

E. Plastic Cement: ASTM D4586, Type I.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18 inch (450 mm) long legs; seam for rigidity, seal with sealant.

F. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

G. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing gravel. Return and brake edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners. Use exposed fasteners only where permitted.

B. Apply plastic cement compound between metal flashings and felt flashings.

C. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

END OF SECTION

SECTION 07 7123
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel gutters and downspouts for field finishing.

B. Precast concrete splash blocks.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; American Architectural Manufacturers Association; 2012.

B. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels; 2013.

C. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels; 2013.

D. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

E. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2010.

F. ASTM B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate [Metric]; 2010.

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; Sheet Metal and Air Conditioning Contractors' National Association; 2003.

1.04 DESIGN REQUIREMENTS

A. Conform to SMACNA Architectural Sheet Metal Manual for sizing components for rainfall intensity determined by a storm occurrence of 1 in 5 years.

B. Conform to applicable code for size and method of rain water discharge.

C. Maintain one copy of each document on site.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate locations, configurations, jointing methods, fastening methods, locations, and installation details.

C. Product Data: Provide data on prefabricated components.

D. Samples: Submit two samples, 8 inch (203 mm) long illustrating component design, finish, color, and configuration.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.

B. Prevent contact with materials that could cause discoloration, staining, or damage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Gutters and Downspouts:
   1. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Galvanized Steel Sheet: ASTM A653/A653M, with G90/Z275 zinc coating; minimum 0.02 inch (0.6 mm) thick base metal.

B. Primer: Zinc molybdate type.

C. Protective Backing Paint: Zinc molybdate alkyd.

2.03 COMPONENTS

A. Gutters: Profile to match existing adjacent gutter, or as indicated on Drawings.

B. Downspouts: CDA Round profile, size to match adjacent downspouts on building.

C. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Anchoring Devices: In accordance with CDA requirements.
   2. Gutter Supports: Brackets.
   3. Downspout Supports: Brackets.

D. Fasteners: Galvanized steel .

2.04 ACCESSORIES

A. Splash Blocks: Precast concrete type, size and profiles indicated; minimum 3000 psi (21 MPa) at 28 days, with minimum 5 percent air entrainment.

2.05 FABRICATION

A. Form gutters and downspouts of profiles and size indicated.

B. Fabricate with required connection pieces.

C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

D. Hem exposed edges of metal.

E. Fabricate gutter and downspout accessories; seal watertight.

2.06 FACTORY FINISHING

A. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by field finish system manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that surfaces are ready to receive work.

3.02 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil (0.4 mm).

3.03 INSTALLATION

A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

B. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.

C. Slope gutters 1/8 inch per foot (9 mm/m), 1.5 percent minimum.

D. Solder metal joints for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

E. Set splash blocks under downspouts.

END OF SECTION

SECTION 07 7210

BIRD SPIKES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Install Bird Barrier Dura-Spike on exposed or protected ledges where birds loaf, roost or nest, to prevent damage from droppings and nesting materials.

1.02 QUALITY ASSURANCE

A. Obtain technical literature from manufacturer or distributor, telephone consultation and plan/photograph evaluation.

B. Utilize certified installation companies in your area who are fully skilled with Bird Barrier products, and carry the proper insurance coverage.

C. Utilize labor recommended by Bird Barrier for especially challenging applications.

1.03 SUBMITTALS

A. Submit manufacturer's samples, catalog cuts, shop sketches and other descriptive material.

1.04 PRODUCT HANDLING

A. Protect Bird Barrier Dura-Spike from damage before, during and after installation.

B. If damage occurs to Bird Barrier Dura-Spike, make all replacements immediately.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Bird Barrier America, Inc., 20925 Chico Street, Carson, CA 90746. www.birdbarrier.com, phone 800-503-5444, fax 310-527-8005.

B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DESCRIPTION

A. Dura-Spike Narrow (BP-S200)

1. Rod Material : 302 grade Stainless Steel, 12 per foot
2. Base Material: 302 grade Stainless Steel
3. Width: 2.5" (6.35 cm)
4. Height: 4.5" (11.5 cm)
5. Length: 36" (91.44 cm) per piece

B. Dura-Spike Wide (BP-S400)

1. Rod Material : 302 grade Stainless Steel, 24 per foot
2. Base Material: 302 grade Stainless Steel
3. Width: 5" (12.7 cm)
4. Height: 4.5" (11.5 cm)
5. Length: 36" (91.44 cm) per piece

C. Dura-Spike Xtra-Wide (BP-S600)

A. Dura-Spike Xtra-Wide

1. Rod Material : 302 grade Stainless Steel, 36 per foot

2. Base Material: 302 grade Stainless Steel
3. Width: 8" (20.5 cm)
4. Height: 4.75' (12 cm)
5. Length: 36" (91.44 cm) per piece

2.03 MOUNTING SYSTEMS

A. Bird Barrier Bond (2 hour cure) or Super Bond (1 hour cure) for steel, stone, concrete, wood or other surfaces where holes are not desired.

B. Self-tapping stainless steel screws for sheet metal surfaces.

C. Self-tapping wood screws for wood surfaces.

EXECUTION

3.01 EXAMINATION

A. Examine installation area, and field verify existing conditions. Notify architect of detrimental work conditions.

B. Do not proceed until conditions are corrected.

C. Evaluate conditions and building materials, and measure depths of mounting surfaces. On the mounting surface, install appropriate bird spike width/model number bird spikes based manufacturer's recommendations.

3.02 SURFACE PREPARATION

A. Ledges and mounting surfaces shall be cleaned with a combination of Bird Barrier's cleaning products, Dissolve-It, Disinfect-It or Absorb-It when applicable. The surface should then be dry and free of peeling paint, rust, bird droppings or other debris. Bird droppings shall be removed in a safe manner; large quantities shall be removed and disposed of by reputable waste removal companies.

B. Remove or repair articles that may damage the Dura-Spike after installation, such as tree limbs, brush, and loose parts of the building.

3.03 INSTALLATION

A. Installing Dura-Spike on surfaces not able to be drilled using Bird Barrier Bond. Apply 4-5 quarter sized dabs of Bird Barrier Bond to the base of the 3-foot piece of Dura-Spike and apply to surface to be protected. Follow recommended installation instructions, which are supplied by the manufacturer. The Dura-Spike shall overhang the ledge by 1/4", and the tips can be up to 2.5" from the back wall of the ledge.

B. Dura-Spike shall cover the complete ledge, not just the outer perimeter. Dura-Spike shall extend to each corner. Dura-Spike is an anti-landing device, not a barrier. It is acceptable to leave 2.5" between rows (measured from the tip of the rods) of Dura-Spike narrow or wide.

C. Dura-Spike shall be installed straight, or must follow the contours of the architecture perfectly. Uneven spacing of Dura-Spike will result in an unattractive installation, and space left between ends of Dura-Spike will present a landing opportunity for the deterred birds. Refer to Dura-Spike installation literature for details.

3.04 INSPECTION

A. Visually inspect Dura-Spike for poor adherence to mounting surfaces, or other problems related to poor installation or surface preparation.

B. Repair as necessary immediately.

END OF SECTION

SECTION 07 9005

JOINT SEALERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes joint sealants for the applications indicated in the Joint-Sealant Schedule at the end of Part 3.

1. Exterior joints in the following vertical surfaces and horizontal nontraffic surfaces:
   a. Control and expansion joints in unit masonry.
   b. Joints in dimension stone cladding.
   c. Joints in exterior portland cement stucco.
   d. Joints between metal panels.
   e. Joints between different materials listed above.
   f. Perimeter joints between materials listed above and frames of doors, windows and louvers.
   g. Control joints in ceilings and other overhead surfaces.
   h. Other joints as indicated.
2. Exterior joints in the following horizontal traffic surfaces:
   a. Isolation and contraction joints in cast-in-place concrete slabs.
   b. Joints between different materials listed above.
   c. Other joints as indicated.
3. Interior joints in the following vertical surfaces and horizontal nontraffic surfaces:
   a. Control joints on exposed interior surfaces of exterior walls.
   b. Perimeter joints of exterior openings where indicated.
   c. Perimeter joints between interior wall surfaces and frames of interior doors and windows.
   d. Other joints as indicated.
4. Interior joints in the following horizontal traffic surfaces:
   a. Isolation joints in cast-in-place concrete slabs.
   b. Control joints in tile flooring.
   c. Other joints as indicated.

B. Related Sections include the following:

1. Section 04 0140 Masonry Restoration and Cleaning: Masonry control and expansion joint fillers and gaskets.
2. Section 08 8000 Glazing: Glazing sealants.

3. Section 09 2400 Portland Cement Plastering: Sealing perimeter joints.
4. Section 09 2116 Gypsum Board Assemblies: Sealing perimeter joints of gypsum board.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Product Data: For each joint-sealant product indicated.

B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.

D. Product Certificates: For each type of joint sealant and accessory, signed by product manufacturer.

E. Qualification Data: For Installer.

F. Compatibility and Adhesion Test Reports: From sealant manufacturer, indicating the following:

1. Materials forming joint substrates and joint-sealant backings have been tested for compatibility and adhesion with joint sealants.
2. Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

B. Perform work in accordance with sealant manufacturer’s requirements for preparation of surfaces and material installation instructions.

C. Perform acoustical sealant application work in accordance with ASTM C919.

D. Product Testing: Obtain test results for "Product Test Reports" Paragraph in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period preceding the commencement of the Work.

1. Test elastomeric joint sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.
2. Test elastomeric joint sealants according to SWRI's Sealant Validation Program for compliance with requirements specified by reference to ASTM C 920 for adhesion and cohesion under cyclic movement, adhesion-in-peel, and indentation hardness.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.7 WARRANTY

A. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: Two years from date of Substantial Completion.

C. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:

1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
2. Disintegration of joint substrates from natural causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products listed in other Part 2 articles.

2.2 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.3 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

C. Suitability for Immersion in Liquids. Where elastomeric sealants are indicated for Use I for joints that will be continuously immersed in liquids, provide products that have undergone testing according to ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.

D. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600

E. Single-Component Non-sag Polyether Sealant **ES-A** (Very Low VOC [less than 2%]):

1. Available Products <u>Very Low VOC (less than 2%)</u>
   a. STS Coatings, GreatSeal PE-.150 (830-995-5177)
   b. Sonneborn, Division of BASF: Sonolastic 150.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
   a. Use O Joint Substrates: galvanized steel, brick, and concrete.
6. Stain-Test-Response Characteristics: Nonstaining to porous substrates per ASTM C 1248.

F. Exterior Gypsum Joint Sealants (<u>Very Low VOC less than 2%)</u> (IECC Required)

1. LT-100 Sealant by STS Coatings (830-995-5177)
2. UniverSeal by York Mfg. (800-551-2828)

G. Single-Component Neutral-Curing Silicone Sealant **ES- B**:

1. Available Products:
    a. Sonneborn, Division of ChemRex Inc., BASF; Omniseal 50.
    b. Dow Corning Corporation; 795
    c. GE Silicones; SilPruf NB SCS9000.
    d. Pecora Corporation; 895.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 50.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
    a. Use O Joint Substrates: Glass and color anodic aluminum.

H. Single-Component Acid-Curing Silicone Sealant **ES-C**:
1. Available Products:
    a. Dow Corning Corporation; 999-A.
    b. GE Silicones; Sanitary SCS1700.
    c. Pecora Corporation; 860..
    d. Sonneborn, Division of ChemRex Inc.; OmniPlus.
    e. Tremco; Tremsil 200.
2. Type and Grade: S (single component) and NS (nonsag).
3. Class: 25.
4. Use Related to Exposure: NT (nontraffic).
5. Uses Related to Joint Substrates: G, A, and, as applicable to joint substrates indicated, O.
    a. Use O Joint Substrates: ceramic tile and stainless steel.

I. Multicomponent Nonsag Urethane Sealant **ES-D**:
1. Available Products:
    a. Sonneborn, Division of ChemRex Inc.; NP 2.
2. Type and Grade: M (multicomponent) and NS (nonsag).
3. Class: 25.
4. Uses Related to Exposure: T (traffic) and NT (nontraffic).
5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.
    a. Use O Joint Substrates: Color anodic aluminum, galvanized steel, brick, and ceramic tile.

J. Multicomponent Pourable Urethane Sealant **ES-E**:
1. Available Products:
    a. Pecora Corporation; Dynatrol II-SG.

b. Sika Corporation, Inc.; Sikaflex - 2c SL.

c. Sonneborn, Division of ChemRex Inc.; SL 2.

2. Type and Grade: M (multicomponent) and P (pourable).

3. Class: 25.

4. Uses Related to Exposure: T (traffic) and NT (nontraffic).

5. Uses Related to Joint Substrates: M, G, A, and, as applicable to joint substrates indicated, O.

a. Use O Joint Substrates: ceramic tile and concrete.

2.4 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.5 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:
   a. Concrete.
   b. Masonry.
3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
   a. Metal.
   b. Glass.

B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.

D. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

F. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

G. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
    a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

H. Installation of Preformed Tapes: Install according to manufacturer's written instructions.

I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:

1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.

2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

J. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:
1. Extent of Testing: Test completed elastomeric sealant joints as follows:
   a. Perform 10 tests for the first 1000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.
   b. Perform 1 test for each 1000 feet (300 m) of joint length thereafter or 1 test per each floor per elevation.
2. Test Method: Test joint sealants according to Method A, Field-Applied Sealant Joint Hand Pull Tab or Method D, Water Immersion in Appendix X1 in ASTM C 1193, as appropriate for type of joint-sealant application indicated.
   a. For joints with dissimilar substrates, verify adhesion to each substrate separately; do this by extending cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
4. Inspect tested joints and report on the following:
   a. Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
   b. Whether sealants filled joint cavities and are free of voids.

c. Whether sealant dimensions and configurations comply with specified requirements.

5. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.

6. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

B. Evaluation of Field Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 JOINT-SEALANT SCHEDULE

	Location	Type	Color
A.	Window Perimeter, Frames, Storefront Or Curtain Wall Assembly	ES-B	To Match Adjacent
B.	Door Frames / Wall Perimeters	ES-A	To Match Adjacent
C.	Under Thresholds Under Window system which rests directly on the floor slab in order to prevent infiltration	ES-A	Black
D.	Toilet Room Fixtures, Accessories Ceramic Tile	ES-C	White
E.	Intersection of dissimilar materials that allows water or air infiltration	ES-A	To Match Adjacent
F.	Perimeter Joints on interior side of door	ES-A	To Match Adjacent

	Frames, louvers in exterior walls		
G.	Perimeter Joints of door frames, window frames And other framed openings in walls with no Finished edge flange.	ES-A	To Match Adjacent
H.	Open Joints at penetrations through walls, and open joints at penetrations through concrete or gypsum board ceilings, where intended to be tight sealed joints	ES-A	To Match Adjacent
I.	Open Joint, between dissimilar materials where intended to be tight, sealed joint.	ES-A	To Match Adjacent
J.	Joints where edge trim of gypsum board abuts irregular surfaces or other surfaces and leaves open joint	ES-A	To Match Adjacent
K.	Within and perimeter of Masonry System	ES-A	To Match Adjacent
L.	Intersection of dissimilar materials which installations not uniform or where workmanship does not meet acceptable construction tolerances, when such workmanship is acceptable by the Architect.	ES-A	To Match Adjacent
M.	Metal Siding, louvers, fixtures and other penetrations in building enclosures not otherwise sealed weathertight. Unless noted otherwise provide continuous sealing perimeter joints and all other joints at exterior soffits.	ES-A	To Match Adjacent
N.	Paving Floors joints Expansion joints in and around concrete pavement, curbs, or other horizontal surfaces. In horizontal joints in concrete floor where intended to be tight, sealed joints. Expansion joints in concrete slabs, around column piers penetrating concrete slab, at all natural concrete slab expansion control points as specified	ES-E	To Match Adjacent
O.	Within Glazing Systems	ES-B	To Match Adjacent
P.	Within Roofing System	ES-A, ES-D	To Match Adjacent

END OF SECTION

SECTION 08 1433
STILE AND RAIL WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid wood doors, stile and rail design for site finishing, without veneer layer.

B. Panels of wood and glass.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 7100 - Door Hardware.

C. Section 08 8000 - Glazing.

1.03 REFERENCE STANDARDS

A. AWI (QCP) - Quality Certification Program, www.awiqcp.org; current edition at www.awiqcp.org.

B. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate stile and rail materials and construction, species, type and characteristics.

C. Specimen warranty.

D. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, identify cutouts for glazing and louvers.

E. Samples: Submit two samples of door, 12x12 inch (305x305 mm) in size illustrating wood grain, stain color, and sheen.

F. Manufacturer's Installation Instructions: Indicate special installation instructions.

G. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years of documented experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

B. Installer Qualifications: New work done shall be performed by a firm with successful experience in similar work on not less than five complete previous projects comparable to this project in historic reconstruction scope, nature, and complexity. Workmen shall be skilled finish carpenters (where applicable), and experienced in the type of historical repair work required. Submit references with name of contact person and telephone number for the two (2) submitted similar projects.
   1. Only skilled workers who are familiar and experienced with the methods specified for replication of new elements are to be used for wood door and frame restoration.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver, and store doors in accordance with quality standard specified.

B. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Stile and Rail Wood Doors:
   1. Vision Openings: www.visionopenings.com.
   2. Hallmark Cabinetry: 210.828.8779.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS

A. Quality Level: Premium Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.

B. Exterior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; solid lumber construction; mortised and tenoned joints.

C. Transom Panels: To match door.

2.03 DOOR AND PANEL SPECIES

A. Exterior Doors: Spanish Cedar species, plain sliced, for paint finish.

2.04 SITE FINISHING

A. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
   1. Transparent:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Stain: As selected by Architect.
      c. Sheen: Satin.
   2. Opaque:
      a. System - 4, Latex Acrylic, Water-based.
      b. Color: As selected by Architect.
      c. Sheen: Semigloss.

B. Site finish doors in accordance with approved sample and Section 09 9000 Painting and Coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and AWI/AWMAC Quality Standards requirements.

B. Trim door width by cutting equally on both jamb edges.

C. Trim door height by cutting bottom edges to a maximum of 3/4 inch (19 mm).

D. Machine cut for hardware.

E. Coordinate installation of doors with installation of frames and hardware.

F. Coordinate installation of glazing.

3.03 TOLERANCES

A. Conform to specified quality standard for fit, clearance, and joinery tolerances.

B. Maximum Width Distortion (Cup): 1/8 inch (3 mm) measured with straight edge or taut string, edge to edge, over an imaginary 36 x 84 inch (915 X 2130 mm) surface area.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 2150
WOOD DOOR REPAIR

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Rehabilitation and repair of historically significant salvaged wood doors and frames, as indicated on the drawings.

B. Reinstallation of wood doors, as indicated on the door schedule.

1.02 RELATED SECTIONS

A. Section 06 1000 - Rough Carpentry

B. Section 09 9000 - Painting and Coating

1.03 QUALITY ASSURANCE

A. Contractor Qualifications: All work shall be performed by skilled Subcontractors having not less than five (5) years satisfactory experience in comparable wood door restoration including work on at least two (2) projects similar in scope and scale to this Project. Submit references with name of contact person and telephone number for the two (2) submitted similar projects.

1. Only skilled workers who are familiar and experienced with the methods specified for consolidation, fill, and replication of new elements are to be used for wood door and frame restoration.

1.04 SUBMITTALS

A. Section 01 3000 - Submittals

B. Shop Drawings

1. Submit shop drawings of all door assemblies requiring work. Show all details of types of materials, size of members, profiles, methods of securing and fastening members to adjacent work, and a complete schedule of work showing types, finishes, locations, and dimensions.

C. Restoration and Installation

1. Submit proposed methods for preparation, protection, installation, and finishing of all existing wood door assemblies to Architect for review prior to commencement of work. Include detailed description of method, techniques, tools, and other pertinent information regarding repair and restoration of wood door assemblies.

D. Field Samples: Prior to beginning work and after manufacturer's data and initial samples have been approved, prepare a mock-up field sample for wood door installation and repair, including wood dutchmen and epoxy repairs. The approved sample shall meet or exceed the level of craftsmanship as exhibited in the mock-up installation which will serve as a standard for acceptable technique and appearance for all wood doors.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Keep wood doors protects from exposure to weather at all times.

1. Stack wood doors sufficiently above the ground to avoid exposure to wet or damp surfaces.

2. Cover wood doors with temporary polyethylene or other similar waterproof sheeting.

B. Store wood doors to provide for air circulation within and around stacks.

C. Deliver materials to the site in protective packaging bearing labels as to cataloguing and type of material. Delivered materials shall be identical to approved samples.

1.06 JOB CONDITIONS

A. Install doors and frames in an environment free of detrimental humidity. And construction activity.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Epoxy adhesives filler: As manufactured by Abatron, Inc., 141 Center Drive, Gilberts, IL 60136, (312) 426-2200. Color to achieve a uniform appearance of finished wood.

B. Adhesives: Non-staining, waterproof resorcinol type glue such as Weldwood Waterproof Resorcinol Glue, manufactured by DAP, Inc., 2400 Boston Street, Suite 200, Baltimore, MD 21224, (800) 543-3840, or equal. Note: this glue is tinted and should not extrude from any visible seams.

C. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MANUFACTURERS

A. Hull Historical Architectural Millwork, 201 Lipscomb Street Ft. Worth TX 76104, www.brenthull.com.

B. Hallmark Cabinetry: 210.828.8779.

C. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Prior to commencement of work, examine all doors indicated for repair and report to the Architect any doors which in the Contractor's opinion require replacement rather than repair. Architect to re-examine any such doors and to approve or disapprove any proposed revisions.

B. All salvaged doors and frames to be stripped of paint and coatings. Installed salvaged material shall be free of excessive gouges. If salvaged material cannot be reinstalled, as approved by Architect, contractor shall provide new material to match existing as specified.

3.02 PREPARATION

A. Remove all dirt and debris from frame and threshold.

B. Remove hardware. Refer to hardware schedule in Section 08 7100 - Finish Hardware for hardware to be retained.

C. Remove all extraneous nails, staples, bolts, hooks, etc., from frame and door.

D. Protect frame and opening from water damage. Dry all wood to moisture content below 17%.

3.03 REPAIR PROCEDURES

A. Tighten loose and open joints in frames to remain using waterproof glue and nails properly countersunk. Fill all joints without dismantling the frame and fill all other holes in wood with epoxy wood filler.

B. Repairs larger than 1":

1. Any holes in the finish surface over 1" in diameter should be filled with a wood dutchmen repair rather than filled with epoxy filler. All repairs will match surrounding profiles, texture, and coloring.
2. Any areas of delamination or severe weathering that cannot be repaired with consolidation and sanding shall be replaced as needed. Any such repairs must be approved by the Architect prior to execution.

C. Sand to smooth finish.

D. Prepare surfaces, stain, and finish all exposed surfaces as specified in Section 09900 - Painting.

3.04 INSTALLATION

A. As indicated on door schedule, install rehabilitated original door hardware or new hardware, see Section 08 7100 - Finish Hardware.

B. Install rehabilitated door assemblies level and plumb without warp or rack. Make joints tight and form joints to conceal shrinkage. Install work flush and tight to adjacent wood and plaster finishes. Any work that exhibits gaps larger than hairline will not be accepted.

C. Adjust and lubricate all hardware to provide for smooth operation.

D. All doors shall be in excellent operating condition at the conclusion of the work.

E. Salvaged original doors not reinstalled remain the property of the Owner.

F. Provide protective covering for installed doors and frames, which may only be removed at time of owner occupancy.

3.05 CLEAN-UP

A. Upon completion of wood door restoration, remove tools, equipment, and other unnecessary materials from site. Return adjacent area and surrounding property to the condition which existed prior to the start of work.

B. Remove and legally dispose off-site all debris, rubbish, and other materials resulting from operations of this section.

END OF SECTION

SECTION 08 6100

WINDOW RESTORATION AND REPLICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 DESCRIPTION OF WORK

A. Window work is defined as three general types, 1) Replicate, 2) Repair, and 3) Prepare and Paint:

1. Replicate: Reconstruction of windows in their entirety.
   a. Replace existing windows with newly constructed wood windows as detailed on Drawings.
2. Repair: Including all Scope of Work in Prepare and Paint and also, Replace damaged or deteriorated window elements with new components, including but not limited to:
   a. Replace deteriorated elements as indicated on Window Schedules on the Drawings.
   b. Reinforce, straighten and align, sagging or warping upper sash meeting rail/lower sash bottom rails.
   c. Replace sash members meeting rail requiring replacement with a new as noted on schedules.
   d. Realign and reglue loose sash joints.
   e. Set nails in sash, frame, or trim members not fully set and fill resulting holes with epoxy patch.
   f. Replacement of structurally damaged sash sections as well as various elements of the window frame and trim.
   g. Small areas of decayed wood shall be removed and the area epoxy patched/consolidated. If 10% or more of the element is rotted, replace entire element.
   h. Elements missing in their entirety (e.g. a window sill, parting stop, etc.) shall be replaced.
   i. Broken glass shall be replaced.
   j. Renovation of structurally damaged sash sections not to be replaced as well as designated elements of the window frame and trim:
      1) Repair as necessary, damaged elements, including chips, gouges, and splits, which hold water, allow water to penetrate, or which would tend to accelerate deterioration, to promote rapid runoff of water and eliminate pounding water within 1 hour of precipitation.
      2) Remove non-original elements and resultant holes patched (e.g. surface applied weather-stripping, eyehooks reinforcing angles at sash joints, sheet

metal patches at rotten wood jamb/sill, wood blocks holding up upper sash, etc.)

3) Reinforce, straighten and realign sagging or warped upper sash meeting rail/lower sash bottom rail.

4) Replace upper sash meeting rails requiring replacement.

5) Realign and reglue loose sash joints.

6) Repair damaged existing weather-stripping to remain.

k. Coordination of replacement of missing, cracked, and/or damaged glass:

1) Reglaze, using existing glass, at sash indicated to receive structural repairs or joint realignment. Seal sash glazing groove continuously inside and out with specified sealant and glazing compound.

l. With the completion of the work specified in this section, it is required that the condition of indicated windows be as follows:

1) Selected sash units shall be restored as indicated ready for glazing and painting, all lower sash fully operational, with original or replicated hardware installed. Upper sash shall be fixed as indicated and sealed to prelude air and water penetration.

2) Selected frame and trim shall be restored as indicated with damaged areas replaced or renovated, missing elements replaced, surface damage repaired and ready for painting or finishing and installation of sealant.

3) Indicated meeting rail sections shall be reinforced with metal and bow removed from wood section.

4) Weather-stripping of operable sash shall be restored, reworked, or replaced as indicated to produce no crack widths at sash junctures to frame in excess of 1/64”.

m. Exposed Replacement Hardware:

1) Provide each restored window with full complement of hardware and fasteners matching that on original windows. Use salvaged, restored existing hardware insofar as possible and new hardware to match existing hardware where hardware is missing or existing hardware is damaged or deteriorated so as to be unrestorable.

3. Prepare and Paint: Replacing weatherstripping, sash cords, and sash weights with new components to make windows fully operable prior to application of paint.

a. Replace all weatherstripping on all windows.

b. Replacement of all sash cords and damaged weights on all windows.

c. Paint removal and general repair to selected historic wood window assemblies, including removal of wood window elements as required to effect restoration and alterations.

d. Finish painting: Applying paint system on all wood windows. On existing windows, minor chips and gouges, need not be repaired, except as accomplished by general preparation for painting.

e. Refer Window Schedules on the Drawings for windows requiring painting.

f. Fill screw and nail holes with epoxy patch.

1.3 RELATED WORK

A. Section 01 2100 Allowances: Allowance for sash weights.

B. Section 01 2200 Unit Prices: Unit price for sash weights.

C. Section 08 8000 Glazing: Glazing window units.

D. Section 07 0005 Joint Sealers: Joint Sealers for window frames at walls.

E. Section 09 9000 Painting and Coating: Paint system for windows.

1.4 QUALITY ASSURANCE

A. General:

1. Comply with repair guidelines contained in Preservation Briefs number 9, The Repair of Historic Wooden Windows, published by the U.S. Dept. of Interior and available from the Preservation Assistance Division. (202-343-9573)

2. Comply with the general requirements for epoxy consolidation and repair of wood contained in Epoxies for Wood Repairs in Historic Buildings, published by the U.S. Dept. of the Interior and available from the Preservation Assistance Division. (202-343-9573)

3. Qualified Manufacturer: To function as Contractor's Specialist for documentation of unit price work and to perform, modifications and repairs on historic window sash indicated to be removed and on window units indicated to be restored to operational condition, employ a specialized firm with not less than five years of previous experience replicating or remanufacturing historic wood windows.

4. Installer Qualifications: Restoration work done shall be performed by a firm with successful experience in similar work on not less than five complete previous projects comparable to this project in historic reconstruction/ repair scope, nature, and complexity. Workmen shall be skilled finish carpenters (where applicable), and experienced in the type of historical repair work required. Submit references with name of contact person and telephone number for the two (2) submitted similar projects.

   a. Only skilled workers who are familiar and experienced with the methods specified for consolidation, fill, and replication of new elements are to be used for wood door and frame restoration.

1.5 SUBMITTALS

A. Provide submittals in compliance with Division 1 Sections "Submittals" and "Shop Drawings, Product Data, and Samples" for the items herein described:

B. Product Data: Submit manufacturer's data sheets for every item of specified weather-stripping and window accessories.

C. Shop Drawings: Submit shop drawings of detail in areas to be patched or restored showing field measurements taken in the field prior to demolition. Show details of proposed repair and restoration method in each case including the following information:

1. Reinforced meeting rail section-full scale.

1.6 PROJECT/SITE CONDITIONS

A. Remove and replace existing window sash element, frames, mullions, muntins, casings, sills, stools, aprons, and trim, or portions thereof, where:

1. Indicated.
2. Identified as damaged beyond repair during examination by Contractor's repair specialist and approved by Owner's representation.
3. Damaged beyond repair during the Work under this Contract.

B. Remove and replace entire sash unit, reglazed with original glass, and finished as indicated, where:

1. Indicated.
2. Required restoration procedures are so extensive that replacement is considered more practical by specialist and Owner's representative concurs.
3. Bottom rail of upper replacement sash shall be reinforced with metal.

C. Contractor shall establish, during initial inspection of each work area with Owner's representative and Architect which sash units shall be completely replaced.

D. Sash removal may be required to perform the following repair procedures:

1. Reinforce or replace warped sash rails.
2. Repair, realign sash joints separated in excess of 1/8" cumulative across the width of window on operable window sash.
3. Replace missing weather-stripping on operable windows.
4. Adjust, repair, or replace weather-stripping on operable windows.
5. Repair or replace sash weights and chain on operable windows.
6. Where it is necessary to remove original sash to perform repair procedures, mark sash and frame in a concealed location with waterproof, non-staining to exposed surfaces marker with unique number for frame and corresponding sash element. Install restored sash at the same location from which it was removed.

E. Removal of existing glass and reinstallation (reglazing with existing glass) is required where interior wood stops are altered or replaced.

F. Coordinate glass and glazing work as follows:

1. Where window sashes are to be removed and window sashes reinstalled, ensure that decorative glass (if any) and original polished plate glass have been removed from the sash and properly stored or sent to shop for repair as specified in Section "Glass and Glazing". Cooperate with glazier in removal of existing glass for protection or repair of existing glass.

2. Note: Not all existing glass is believed to be original polished plate glass. Architect has not surveyed the locations of original polished plate glass. There is no known contemporary source for polished plate glass in the sizes required for replacement.
3. Protecting existing glass to remain in place during indicated repair procedures and which do not otherwise require sash removal. Replace glass which is broken during repair procedures with products complying with the requirements indicated in the applicable "Glass and Glazing" Sections.
4. Should it become necessary to remove existing interior window coverings, such as shutters, blinds, draperies, etc., in order to perform the restoration of the windows, the Contractor shall record, remove store, and reinstall window coverings in their original locations.

PART 2 - PRODUCTS

2.1 FABRICATION OF REPLICATED UNITS

A. Replicated Units: Replacement sash, sill, other frame and trim sections shall match the existing in configuration, sash pattern and construction.

B. Manufacturers
   1. Hull Historical Architectural Millwork, 201 Lipscomb Street Ft. Worth TX 76104, www.brenthull.com.
   2. Hallmark Cabinetry: 210.828.8779.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.2 MATERIALS FOR REPLICATING AND REPAIRING WINDOWS

A. Epoxy Consolidant: Penetrating two part epoxy compound. A product complying with the requirement is Arcon Seep-N-Seal, as manufactured by Allied Resin Corporation, East Weymouth, Massachusetts.

B. Three-part, semi-rigid compound consisting of one part epoxy resin, polysulfide polymer and curing agent, and fillers. Compound shall be equal to Compound No. 1 as set forth in the referenced standard Epoxies for Wood Repairs in Historic Buildings, or at Contractor's option, provide proprietary patching compound as follows:

C. Epoxy patching compounds: Marine-Tex as manufactured by Travaco Laboratories, 345 Eastern Avenue, Chelsea MA. Abatron, Inc., 33 Center Drive, Gilberts, IL 60136.

D. Replacement wood for sash repair/replacement: Clear, Long Leaf Pine lumber which has been treated with water repellent preservative in conformance with NWMA IS-4 standard after machining and kiln-dried to be moisture content of 6 to 12 percent at time of fabrication.

E. Replacement wood for sills repair/replacement: Clear Cypress lumber which has been treated with water repellent preservative in conformance with NWMA IS-4 standard after machining and kiln-dried to be moisture content of 6 to 12 percent at time of fabrication.

F. Replacement wood for exterior trim, frame: Clear, longleaf, heart pine which has been salvaged from historical buildings by suppliers experienced in providing such lumber. Subject to compliance with requirements, suppliers or acceptable product include but are not limited to:

Mountain Lumber	Albany Woodwork Co.
Route 2, Box 43-1	PO Box 729
Ruckersville, VA 22968	Albany, LA 70711
(804) 295-1922	(504) 567-1155

G. Replacement wood for interior trim: Clear White Oak kiln-dried to be moisture content of 6 to 12 percent at time of fabrication.

H. Adhesive: Resorcinal formaldehyde resin waterproof adhesive per CS 35 Type 1.

I. Wood primer/sealer: Product compatible with finish specified in Division 9 Sections and which is compatible with mildewcide additives as follows:

J. Paint additive for Primer: An acceptable product is ADD-X Mildewcide Paint Additive manufactured by Zehrung Corporation, Portland, Oregon.

K. Fasteners: Comply with NWMA requirements for fabrication and with manufacturer's recommendations and standard industry practices for type and size of installation fasteners.

1. For fabrication and installation of wood elements, use only countersunk stainless steel or brass structural reinforcements, screws, dowels, and resorcinol adhesives, or combinations of listed fasteners and adhesive.
2. For hardware and accessory installation use brass screws.
3. Pulls, latches, and other hardware items: Match existing fastener hardware on visible elements.

L. Compression Weather-stripping for Operable Windows: Bronze spring metal, designed for permanently resilient sealing under bumper or wiper action, completely concealed when window sash is closed.

M. Sash weights: Where sash weights are missing provide cast iron weights of the same weight of the existing units.

N. Sash weight cords: Provide new copper coated steel chains, sized for the sash hardware, for repair of existing windows.

O. Provide replicated replacement hardware on visible window elements or reinstall repaired, cleaned, salvaged hardware. Replacement hardware shall replicate the appearance of existing hardware elements visible when windows are closed.

P. Salvaged hardware elements are suitable for reuse and shall be reinstalled on operable windows where salvaged hardware functions properly and has no missing components.

PART 3 - EXECUTION

3.1 GENERAL PREPARATION REQUIRED FOR WINDOW ELEMENTS:

A. Remove heavy paint build-up from all exterior window elements. Protect interior finishes from staining or damage associated with paint removal techniques employed on exterior. Comply with Division 9 Section "Finish Removal" for general finish removal criteria for wood substrates. Accessible window elements will be considered free of heavy paint build-up if all loose paint is removed, paint is removed to bare wood at areas to receive patching, re-gluing, or chemical

consolidation, and areas not required to be patched or consolidated have firmly adhered smooth paint film remaining.

B. Where refinishing, replacement, or repair of interior sash elements or interior trim and parting stops is required, finish removal and refinishing of element may be performed at a remote location and reinstalled completely finished.

C. Paint Removal: Remove paint which is peeling, crazing, alligatoring, or showing other similar defects by chemical stripping, or wet sanding. In extreme cases, a hot air gun may be required to loosen paint. It is not desirable to remove all paint. Remove to the degree necessary to perform repair operations, as herein specified, and to permit application of uniform finish.

D. Remove wood elements indicated to be replaced or removed. Coordinate removal of glass which is broken or indicated to be replaced. Sand to feather junctions between paint to remain and bare wood.

E. Remove applied sealant materials and unsound previous repair materials.

F. Bare sound wood areas shall be treated with a paintable mildewcide preservative solution.

G. Except where epoxy consolidation “in situ” is indicated or as recommended by Contractor’s specialist and approved by Architect, decayed or unsound wood areas shall be removed with a plane or specialized tool which minimizes damage to adjacent sound wood prior to treatment and patching.

H. Remove penetrating elements and foreign materials from window.

I. Paint Disposal: Process debris shall remain segregated from all other waste material and disposed of in containers provided by Owner.

J. Contractor’s window specialist shall inspect window unit and mark repair areas with a non-staining marker which will not bleed through specified finishes. Specialist shall particularly note condition of areas which were concealed or not accessible for Architect’s initial observations. Contractor shall mark and log location and extent of serious damage in these areas. Serious damage shall be defined to include warpage or deformation so extreme as to preclude proper operation (on windows to be made operable), impending structural failure due to rot or termite damage, and joint separation of intersecting sash parts in excess of 1/16” on operable sash units.

K. Identify, mark and log locations of original polished plate glass. Indicate where original glass is intact. Indicate extent and nature of cracks or other damage to original glass in place.

L. At intervals convenient to the Owner, assist Architect and Owner’s representative in performing survey of prepared exterior window areas on the ground, first, second, third and fourth floors.

M. Perform logs and inspections prior to work by separate asbestos abatement contractor. Photograph conditions at vulnerable areas.

3.2 GENERAL REPAIR PROCEDURES

A. Remove indicated sash units. Remove loose paint, glazing, glazing compound and hardware. Fill screw and nail holes with epoxy patch.

1. While sash is out of frame openings, the openings are to be provided with temporary covers to exclude wind driven rain.

B. Resecure loose frame sections so that frame members fit tightly and the entire frame fits securely in the wall.

C. Fill minor holes, gouges, weather worn areas, etc with epoxy patching compound applied in conformance with recommendations referenced. Sand surfaces so that new paint will smoothly blend in over areas which have been patched.

D. Repair intact decayed wood with Epoxy Consolidant: Where required to consolidate, drill 1/8" to ¼" diameter holes along the length of piece perpendicular to the grain. Fill holes with epoxy consolidant, repeating as wood absorbs the fluid. Cure according to referenced standards. Where approved by the Architect, consolidate existing wood in place, in lieu of complete replacement of piece. This option will only be considered by the Architect for repair of localized rot at frame and sill components.

E. Repair of Wood Sections with Epoxy Patching Compound: Preparation and application shall be in accordance with the requirements as set forth in the publication referenced in Part 1, General, and as follows:

1. Brush apply area to be patched with epoxy consolidant immediately prior to patching.

F. Replace sill, frame, sash or trim members indicated to be replaced with the members of same configuration as original of material specified.

3.3 REPAIR PROCEDURES FOR OPAQUE FINISHED WOOD

A. Epoxy Patch: Strengthen and stabilize wood using consolidant epoxies which saturate the bare wood. Confine application of epoxy consolidant to the immediate area to be patched. Apply epoxy patch while consolidant is still tacky. Then fill with epoxy patching compound and sand. Use epoxy compounds to building up missing damaged parts of members; duplicate existing profiles.

B. Wood Replacement: Remove and discard damaged portion and cut and fit in a matching portion. Where window parts are damaged beyond practical repair by the indicated method, Contractor may elect with approval of Owner's representative to remove the entire part (such as an operating sash or an entire frame) and provide a new matching part. Where portions are indicated to be removed and new portions provided, the new portion shall be the entire portion (entire bottom sash rail, for example). Do not splice members. Where entire members have been removed and new members provided, provide joint reinforcements where new and existing or two members join. Retain and match existing woodwork joinery configurations adapting only as required to incorporate joint reinforcements and adhesive.

C. Holes larger than 3/8" diameter (except for holes through sash): Install wood plug or "Dutchmen" with resorcinol adhesive.

D. Seal bare areas immediately after repair work is complete with a clear primer sealer.

3.4 INSTALLATION OF WINDOWS

A. Install replacement sash units, frame elements and trim elements with units of specified material to visually match the original missing elements.

B. Re-install existing and install new sash weights on chain as specified. Replace sash weight access panels in jamb members so joints are flush and smooth.

C. Replace missing or inoperative sash locks, weights and chains.

3.5 WINDOW OPERATIONS AND HARDWARE:

A. Repair or remove and provide new parts for existing window operator parts at operable windows, such as counterbalances and sash-weight chains (or cords). New parts shall match existing, except substitute chains for cords.

B. Rework existing bronze weather-stripping where salvageable, or where not feasible to reuse or where missing, provide new weather-stripping for each operable window within the Contract limit line. Weather-strip each side of each operator, including meeting rails.

C. Remove existing window hardware which is deteriorated or damaged, salvaging items suitable for reuse. Where existing hardware has been removed or is missing, provide replacement hardware, including reinforcement, fasteners, and other hardware and devices required for proper window operation.

D. Fix and seal operating panels at fixed sash locations, but provide, or retain, acceptable existing exposed to view hardware.

E. Adjust hardware at operable windows for easy operation.

3.6 ADJUST AND CLEAN

A. Adjust operating sash and hardware to provide smooth operation with tight, weatherproof closure. Lubricate hardware and moving parts.

B. Refer to Division 9 Sections for required finish to be applied on wood window units at project site. Glaze each unit before application of final finish coat where coat extends over removable glazing bead or over exposed face glazing.

C. Clean glass of window units promptly after installation; comply with requirements of “Glass and Glazing” Section for cleaning and maintenance.

D. Institute protection required through remainder of construction period, to ensure that wood window units will be without damage or deterioration (other than normal weathering) at time of acceptance.

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Glass.

B. Glazing compounds and accessories.

1.02 RELATED REQUIREMENTS

A. Section 08 6100 - Window Restoration: Replacing deteriorated wood components from existing windows.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2011).

C. ASTM C1036 - Standard Specification for Flat Glass; 2011e1.

D. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

E. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2013.

F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

G. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2012a.

H. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2010.

I. GANA (GM) - GANA Glazing Manual; Glass Association of North America; 2009.

J. GANA (SM) - GANA Sealant Manual; Glass Association of North America; 2008.

K. ICC (IBC) - International Building Code; 2012.

L. SIGMA TM-3000 - Glazing Guidelines for Sealed Insulating Glass Units; Sealed Insulating Glass Manufacturers Association; 2004.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors.

C. Samples: Submit two samples 12x12 inch (305x305 mm) in size of glass units.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

1.06 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F (10 degrees C).

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 GLAZING TYPES

A. Type E-1 - Single Exterior Vision Glazing:
   1. Applications: For use in windows with new frames which match historical character of building and adjacent windows.
   2. Type: Annealed float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6 mm).
   5. Solar Heat Gain Coefficient:.82 percent, nominal.

B. Type E-2 - Single Exterior Vision Glazing:
   1. Applications: For use in historically significant windows in existing frames.
   2. Type: Annealed float glass.
   3. Tint: Clear.
   4. Thickness: 1/8 inch (3 mm).
   5. Solar Heat Gain Coefficient:.86 percent, nominal.

C. Type S-3 - Single Safety Glazing: Non-fire-rated.
   1. Applications: Provide this type of glazing in the following locations:
      a. Glazed lites in doors.
      b. Glazed sidelights to doors.
      c. Other locations required by applicable federal, state, and local codes and regulations.
      d. Other locations indicated on the drawings.
   2. Type: Fully tempered float glass as specified.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6 mm).
   5. Solar Heat Gain Coefficient:.82 percent, nominal.

2.02 GLASS MATERIALS

A. Float Glass Manufacturers:
   1. Guardian Industries Corp: www.sunguardglass.com.
   2. Pilkington North America Inc: www.pilkington.com/na.
   3. PPG Industries, Inc: www.ppgideascapes.com.
   4. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Float Glass: All glazing is to be float glass unless otherwise indicated.
   1. Annealed Type: ASTM C1036, Type I, transparent flat, Class 1 clear, Quality Q3 (glazing select).
   2. Heat-Strengthened and Fully Tempered Types: ASTM C1048.
   3. Tinted Types: Color and performance characteristics as indicated.
   4. Thicknesses: As indicated; for exterior glazing comply with specified requirements for wind load design regardless of specified thickness.

2.03 GLAZING COMPOUNDS

A. Manufacturers:
   1. Bostik Inc: www.bostik-us.com.
   2. Pecora Corporation: www.pecora.com.
   3. BASF Construction Chemicals-Building Systems: www.buildingsystems.basf.com.
   4. Substitutions: Refer to Section 01 6000 - Product Requirements.

B. Glazing Putty : Polymer modified latex recommended by manufacturer for outdoor use, knife grade consistency; grey color.

2.04 GLAZING ACCESSORIES

A. Provide as required for a complete installation, including glazing points or clips. Provide noncorroding metal accessories. Provide primer-sealers and cleaners as recommended by the glass and putty compound manufacturers.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

3.03 GLAZING INSTALLATION USING SETTING POINTS AND PUTTY COMPOUND

A. Preparation, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, and manufacturer's recommendations.

B. Determine the sizes to provide the required edge clearances by measuring the actual opening to receive the glass.

C. Grind smooth in the shop glass edges that will be exposed in finish work.

D. Leave labels in place until the installation is approved, except remove applied labels on heat-absorbing glass and on insulating glass units as soon as glass is installed.

E. Securely fix movable items or keep in a closed and locked position until glazing compound has thoroughly set.

3.04 GLASS SETTING

A. Shop glaze or field glaze items to be glazed using glass of the quality and thickness specified or indicated. Glazing, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, and manufacturer's recommendations.

3.05 MANUFACTURER'S FIELD SERVICES

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.06 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.07 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste.

END OF SECTION

SECTION 08 9100
METAL LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal Louvers, frames, and accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim.

B. Section 07 9005 - Joint Sealers.

C. Section 09 9000 - Painting and Coating: Field painting.

1.03 REFERENCE STANDARDS

A. AMCA 500-L - Laboratory Methods of Testing Louvers for Rating; Air Movement and Control Association International, Inc.; 2012.

B. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2013.

C. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, tolerances; head, jamb and sill details; blade configuration, screens, blankout areas required, and frames.

D. Test Reports: Independent agency reports showing compliance with specified performance criteria.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with minimum three years of documented experience.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Provide twenty year manufacturer warranty against distortion, metal degradation, and failure of connections.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wall Louvers:
   1. Airolite Company, LLC: www.airolite.com.
   2. American Warming and Ventilating: www.awv.com.
   3. Construction Specialties, Inc: www.c-sgroup.com.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 LOUVERS

A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
   1. Wind Load Resistance: Design to resist positive and negative wind load of 25 psf (1.2 kPa) without damage or permanent deformation.
   2. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
   3. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

B. Stationary Louvers : Horizontal blade, formed galvanized steel sheet construction.
   1. Free Area: 50 percent, minimum.
   2. Blades: Drainable.
   3. Frame: 4 inches (100 mm) deep, channel profile; corner joints mitered and, with continuous recessed caulking channel each side.
   4. Metal Thickness: Frame 0.06 inch (1.52 mm); blades 0.06 inch (1.52 mm).
   5. Finish: Field painted, finished after fabrication.

2.03 MATERIALS

A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.

B. Bird Screen: Interwoven wire mesh of steel, 0.063 inch (1.6 mm) diameter wire, 1/2 inch (13 mm) open weave, diagonal design.

C. Insect Screen: 18 x 16 size aluminum mesh.

2.04 ACCESSORIES

A. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.

B. Fasteners and Anchors: Galvanized steel.

C. Head and Sill Flashings: See Section 07 6200.

D. Sealant: As specified in Section 07 9005.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that prepared openings and flashings are ready to receive work and opening dimensions are as indicated on shop drawings.

B. Verify that field measurements are as indicated.

3.02 INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Coordinate with installation of flashings by others.

C. Install louvers level and plumb.

D. Align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

E. Secure louver frames in openings with concealed fasteners.

F. Install perimeter sealant in accordance with Section 07 9005.

3.03 ADJUSTING

A. Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.

3.04 CLEANING

A. Strip protective finish coverings.

B. Clean surfaces and components.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Gypsum sheathing.

B. Gypsum wallboard.

C. Joint treatment and accessories.

D. Textured finish system.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 06 1000 - Rough Carpentry: Building framing and sheathing.

C. Section 06 1000 - Rough Carpentry: Wood blocking product and execution requirements.

D. Section 07 9005 - Joint Sealers: Acoustic sealant.

1.03 REFERENCE STANDARDS

A. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2012.

B. ASTM C514 - Standard Specification for Nails for the Application of Gypsum Board; 2004 (Reapproved 2009)e1.

C. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2009)e1.

D. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board.

E. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs.

F. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2010a.

G. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

H. ASTM C1280 - Standard Specification for Application of Gypsum Sheathing.

I. ASTM C1396/C1396M - Standard Specification for Gypsum Board.

J. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2012.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2013a.

L. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on gypsum board, accessories, and joint finishing system.

C. Samples: Submit two samples of gypsum board finished with proposed texture application, 12 by 12 inches (300 by 300 mm) in size, illustrating finish color and texture.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing gypsum board application and finishing, with minimum three years of documented experience.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

2.02 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
   1. Georgia-Pacific Gypsum: www.gpgypsum.com.
   2. USG Corporation: www.usg.com.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
   1. Application: Exterior sheathing, unless otherwise indicated.
   2. Core Type: Regular and Type X, as indicated.
   3. Type X Thickness: 5/8 inch (16 mm).
   4. Regular Board Thickness: 1/2 inch (13 mm).
   5. Edges: Square, for vertical application.
   6. Glass Mat Faced Products:
      a. Georgia-Pacific Gypsum; DensGlass Sheathing.
      b. National Gypsum Company; Gold Bond Brand eXP Extended Exposure Sheathing.
      c. Substitutions: See Section 01 6000 - Product Requirements.

C. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
   1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
   2. At Assemblies Indicated with Fire-Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
   3. Type X Thickness: 5/8 inch (16 mm).
   4. Regular Type Thickness: 1/2 inch (13 mm).
   5. Edges: Tapered.

2.03 ACCESSORIES

A. Joint Materials: ASTM C475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
   2. Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
   3. Ready-mixed vinyl-based joint compound.

B. Textured Finish Materials: Latex-based compound; plain.

C. Nails for Attachment to Wood Members: ASTM C514.

D. Adhesive for Attachment to Wood: ASTM C557.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Seal joints, cut edges, and holes with water-resistant sealant.

C. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

1. Seal joints, cut edges, and holes with water-resistant sealant.

D. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For non-rated assemblies, install as follows:
   1. Single-Layer Applications: Adhesive application.

3.03 INSTALLATION OF TRIM AND ACCESSORIES

A. Corner Beads: Install at external corners, using longest practical lengths.

B. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.04 JOINT TREATMENT

A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

3.05 TEXTURE FINISH

A. Apply finish texture coating by means of spraying apparatus in accordance with manufacturer's instructions and to match approved sample.

3.06 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION

SECTION 09 2250

NATURAL HYDRAULIC LIME PLASTER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. New application of natural hydraulic lime (NHL) plaster system.

B. Application to patch existing lime plaster walls.

1.02 RELATED REQUIREMENTS

A. Section 01 2100 Allowances: Lump Sum Allowance for Sound Testing.

B. Section 01 2200 Unit Prices: Pricing per square foot for lime plaster replacement due to wall failure of sound the existing walls.

C. Section 04 0140 Masonry Restoration and Cleaning: Wall substrate surface.

D. Section 04 0100 Restoration of Masonry and Stucco in Historic Structures: Wall substrate surface.

1.03 REFERENCE STANDARDS

A. ASTM C25 – Test Methods for Chemical Analysis of Limestone, Quicklime and Hydrated Lime.

B. ASTM C91 – Standard Specification for Masonry Cement.

C. ASTM C109 – Test Method for Compressive Strength of Hydraulic Cement Mortars.

D. ASTM C141 – Standard Specification for Hydraulic Lime for Structural Purposes.

E. ASTM C144 – Standard Specification - Aggregate for Masonry Mortar.

F. ASTM C150 – Standard Specification for Portland Cement.

G. ASTM C206 – Standard Specification for Finishing Hydrated Lime.

H. ASTM C207 – Standard Specification for Hydrated Lime for Masonry Purposes.

I. ASTM C897 – Standard Specification for Aggregate for Job- Mixed Portland Cement-Based Plasters.

J. ASTM C926 – Standard Specification for Application of Portland Cement-Based Plaster.

1.04 PERFORMANCE REQUIREMENTS

A. It is the intent of this specification to protect historic structures to the greatest extent possible. Use the gentlest means to perform the work and take the greatest of care to ensure that the historic materials are not damaged in the process of the work. In addition to requirements in this section, comply with NPS Hist Prop.

1.05 SUBMITTALS

A. See Section 01 3000 – Administrative Requirements for submittal procedures.

B. Product Data: Submit data on plaster materials, characteristics and limitations of products specified.

1.06 QUALITY ASSURANCE

A. Perform work in accordance with Manufacturer's Instructions.

1.07 QUALIFICATIONS

A. The firm performing the plaster work shall have a minimum of five years experience on similar

projects. The firm shall have completed work similar in material, design, and extent to that indicated for this Project and shall demonstrate a record of successful in-service performance. Proven implementation of NPS Hist Prop and related Preservation Briefs are required.

1.08 MOCK-UP

A. See Section 01 4000 Quality Requirements for general requirements of mock- up.

B. Construct mock-up, six (6) feet long by six (6) wide of exterior wall surface illustrating finish, texture, and color.

C. Locate where directed by Architect.

D. Mock up may remain as a part of the work.

1.09 PREINSTALLATION MEETING

A. See Section 01 3000 Administrative Requirements for general requirements of Pre-Installation Meeting.

B. Convene minimum one week prior to commencing work of this section.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Store in dry and protected conditions not exceed 12 months.

B. Provide environmental conditions at areas where work of this section is being performed to allow lime plaster to properly cure.

C. Take precautionary measures necessary to assure that excessive temperature changes do not occur.

D. Do not apply and let dry below +5°C (41°F) and above +30°C (86°F) wall and air temperature. Do not apply in direct sun, wind or rain, and protect surfaces during and after application until the material is completely hardened.

E. Hot Weather Requirements: Protect lime plaster from uneven and excessive evaporation during dry, hot weather. Provide tarping over the outside of all scaffolding.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all plaster products and accessories used from the same manufacturer; no exceptions.

B. Natural Lime Plaster: Keim Mineral Coatings of America: www.kiem.com.

C. Substitutions: See Section 01 6000 Product Requirements.

2.02 ACCESSORIES

A. Glass Fiber Mesh, woven mineral glass lattice, recommended by plaster manufacturer.

B. Beads, Screeds, and Joint Accessories: See Section 09 2236.23.

C. Water: Clean, fresh, potable and free of mineral or organic matter capable of affecting plaster.

PART 3 EXECUTION

3.01 EXAMINATION AND FEILD INSPECTION

A. The substrate must be solid, sound and free from dust, oil and dirt.

B. Verify that the surface is sound enough to receive the plaster coat and on manufacturer recommendations and instructions. Remove all loose material.

C. Sound the Walls: Tap the wall surface, either by hand or with appropriate tool, to identify hollow sounding areas of all existing plaster walls. If a hollow sound is encountered it is considered a failed area and requires removal.
   1. After a complete survey is finished and suggested removal areas and levels are determined, notify Architect for verification of areas.
   2. Determine Level of repair based on area requiring removal.

3.02 FIELD TESTING

3.03 PREPARATION

A. Undercoat renders must be properly set prior to applying additional coats.
B. Particularly smooth surfaces must be pre-treated with the manufacturer's recommended bridging coat.
C. Highly absorbing substrates must be pre-wetted. At masonry, a multilayer application is recommended to reduce the risk of cracking.
D. Soft, sanding undercoat renders must be solidified by a pre-treatment as recommended by manufacturer.

3.04 LEVEL 1 - REPAIRING MINOR CRACKS IN PLASTER

A. Lime Plaster Crack Repair: Universalputz Standard Render.
B. Apply plaster in accordance with manufacturer’s instructions.
C. Completely fill crack, flush with adjacent surfaces.

3.05 LEVEL 2 - REPAIRING MAJOR CRACKS IN PLASTER

A. Larger cracks with fine texture: NHL - Kalkputz Fine - Lime Render/ Mortar.
   3. Apply in accordance with manufacturer’s instructions.
   4. Completely fill crack, flush with adjacent surfaces.
B. Larger cracks with larger texture: NHL - Kalkputz Grob - Lime Render/ Mortar.
   5. Apply in accordance with manufacturer’s instructions.
   6. Completely fill crack, flush with adjacent surfaces.

3.06 LEVEL 3 - REPAIRING LARGE AREAS OF LIME PLASTER

A. Plastering: NHL - Kalkputz Grob - Lime Render/ Mortar.
   1. Apply plaster in accordance with manufacturer’s instructions.
   2. Apply base coat to a nominal thickness of 1/4 inch over existing limestone surface.
   2. Install glass fiber mesh over base coat as recommended by manufacturer.
   3. Apply three (2) coats in 1/4 inch layers to a finish of 1/2 inches.
   4. After curing, dampen previous coat prior to applying finish coat. Follow manufacturer recommendations for thicknesses and drying times.
   5. Apply finish coat to indicated color and texture to match existing lime plaster finishes and approved mock-up.

3.07 CLEAN UP

A. Cover surfaces which are not to be treated. Any splashes on surrounding areas must be rinsed off immediately with plenty of water.

3.08 ERECTION TOLERANCES

A. Section 01 4000 – Quality Requirements: Tolerances.

3.09 SAFETY

A. Protect the eyes and skin from splashes.

3.10 ADJUSTING AND REPAIR

D. Remove damaged or defective plaster by cutting and replace with specified materials to match adjacent plaster.

END OF SECTION

SECTION 09 2400
PORTLAND CEMENT PLASTERING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Portland cement plaster for installation over solid surfaces where indicated.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Structural metal framing for plaster.

B. Section 09 2236.23 - Metal Lath: Metal furring and lathing for plaster.

1.03 REFERENCE STANDARDS

A. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

B. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

C. ASTM C206 - Standard Specification for Finishing Hydrated Lime; 2003 (Reapproved 2009).

D. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

E. ASTM C926 - Standard Specification for Application of Portland Cement-Based Plaster; 2012a.

F. ASTM C932 - Standard Specification for Surface-Applied Bonding Compounds for Exterior Plastering; 2006.

G. ICC (IBC) - International Building Code; 2012.

H. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

I. PCA EB049 - Portland Cement Plaster/Stucco Manual; Portland Cement Association; 2003.

J. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide data on plaster materials, characteristics and limitations of products specified.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing the work of this section with minimum three years of experience.

B. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.06 MOCK-UP

A. Construct mock-up of exterior wall, 6 feet (0.91 m) long by 6 feet (0.91 m) wide, illustrating surface finish.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.07 FIELD CONDITIONS

A. Do not apply plaster when substrate or ambient air temperature is under 50 degrees F (10 degrees C) or over 80 degrees F (27 degrees C).

B. Maintain minimum ambient temperature of 50 degrees F (10 degrees C) during installation of plaster and until cured.

PART 2 PRODUCTS

2.01 PLASTER MATERIALS

A. Portland Cement, Aggregates, and Other Materials: In accordance with ASTM C926.

B. Portland Cement: ASTM C150, Type I.
   1. For finish coat: Gray color.

C. Lime: ASTM C206, Type S.

D. Aggregate: Natural sand, within the following sieve sizes and percentage retained limits:
   1. No. 4 (4.75 mm): 0.
   2. No. 8 (2.36 mm): 0 to 5.
   3. No. 16 (1.18 mm): 5 to 30.
   4. No. 30 (0.60 mm): 30 to 65.
   5. No. 50 (0.30 mm): 65 to 95.
   6. No. 100 (0.15 mm): 90 to 100.

E. Water: Clean, fresh, potable and free of mineral or organic matter that could adversely affect plaster.

F. Plaster Mix Reinforcement: Glass fibers, chopped to 1/2 inch (13 mm) nominal length, alkali resistant .

2.02 METAL LATH

A. Metal Lath and Accessories: As specified in Section 09 2236.23.

B. Beads, Screeds, and Joint Accessories: As specified in Section 09 2236.23.

2.03 PLASTER MIXES

A. Over Metal Lath: Three-coat application, mixed and proportioned in accordance with ASTM C926.

B. First Coat :
   1. One part Portland cement.
   2. Minimum 3/4 and maximum 1-1/2 part hydrated lime.
   3. Minimum 2-1/2 and maximum 4 parts aggregate, per sum of cementitious materials.
   4. Reinforcement at 1-1/2 lbs (0.7 kg) per sack of cement.

C. Second Coat: Same as first coat, except minimum 3 parts and maximum 5 parts aggregate.

D. Finish Coat:
   1. One part Portland cement.
   2. Minimum 3/4 and maximum 1-1/2 parts lime.
   3. 3 parts sand, per sum of cementitious materials.

E. Mix only as much plaster as can be used prior to initial set.

F. Mix materials dry, to uniform color and consistency, before adding water.

G. Protect mixtures from freezing, frost, contamination, and excessive evaporation.

H. Do not retemper mixes after initial set has occurred.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify the suitability of existing conditions before starting work.

B. Metal Lath and Accessories: Verify lath is flat, secured to substrate, and joint and surface perimeter accessories are in place.

C. Mechanical and Electrical: Verify services within walls have been tested and approved.

3.02 PREPARATION

A. Dampen masonry surfaces to reduce excessive suction.

B. Clean concrete surfaces of foreign matter. Clean surfaces using acid solutions, solvents, or detergents. Wash surfaces with clean water.

C. Roughen smooth concrete surfaces and apply bonding agent in accordance with manufacturer's instructions.

3.03 PLASTERING

A. Apply plaster in accordance with ASTM C926.

B. Three-Coat Application Over Metal Lath:
   1. Apply first coat to a nominal thickness of 3/8 inch (9 mm).
   2. Apply second coat to a nominal thickness of 3/8 inch (9 mm).
   3. Apply finish coat to a nominal thickness of 1/8 inch (3 mm).

C. Moist cure base coats.

D. Apply second coat immediately following initial set of first coat.

E. After curing, dampen previous coat prior to applying finish coat.

F. Finish Texture: Float to a consistent and smooth finish.

G. Avoid excessive working of surface. Delay troweling as long as possible to avoid drawing excess fines to surface.

H. Moist cure finish coat for minimum period of 48 hours.

3.04 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m).

SCHEDULES

4.01 SCHULTZE HOUSE AND AMAYA HOUSE: REPAIRING EXISTING PORTLAND CEMENT PLASTER SURFACES.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints and other coatings.

C. Materials for backpriming woodwork.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

1.03 DEFINITIONS

A. Conform to ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2012.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 2007.

D. SSPC (PM1) - Good Painting Practice: SSPC Painting Manual, Vol. 1; Society for Protective Coatings; Fourth Edition.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

C. Manufacturer's Instructions: Indicate special surface preparation procedures.

D. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Paint and Coatings: 1 gallon (4 L) of each color; store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum three years experience.

1.07 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 4 feet (1.22 m) long by 4 feet (1.22 m) wide, illustrating special coating color, texture, and finish.

C. Locate where directed.

D. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

D. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

B. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, unless intended to be a field-catalyzed coating.
   1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   2. Supply each coating material in quantity required to complete entire project's work from a single production run.
   3. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
   2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Chemical Content: The following compounds are prohibited:
   1. Aromatic Compounds: In excess of 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).

2. Acrolein, acrylonitrile, antimony, benzene, butyl benzyl phthalate, cadmium, di (2-ethylhexyl) phthalate, di-n-butyl phthalate, di-n-octyl phthalate, 1,2-dichlorobenzene, diethyl phthalate, dimethyl phthalate, ethylbenzene, formaldehyde, hexavalent chromium, isophorone, lead, mercury, methyl ethyl ketone, methyl isobutyl ketone, methylene chloride, naphthalene, toluene (methylbenzene), 1,1,1-trichloroethane, vinyl chloride.

E. Flammability: Comply with applicable code for surface burning characteristics.

F. Colors: As selected by Architect.
1. Selections to be made by Architect after award of contract.
2. Allow for minimum of five colors for each system, for each house, unless otherwise indicated, without additional cost to Owner.
3. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint WE-OP-3A - Wood, Opaque, Alkyd, 3 Coat:
1. One coat of alkyd primer sealer.
2. Semi-gloss: Two coats of alkyd enamel.

B. Paint WE-TR-VS - Wood, Transparent, Varnish, Stain:
1. Filler coat (for open grained wood only).
2. One coat of stain.
3. One coat sealer .
4. Satin: One coat of varnish.

C. Paint GE-OP-3A - Plaster, Opaque, Alkyd, 3 Coat:
1. One coat of alkyd primer sealer.
2. Flat: Two coats of alkyd enamel.

D. Paint MgE-OP-3A - Galvanized Metals, Alkyd, 3 Coat:
1. One coat galvanize primer.
2. Gloss: Two coats of alkyd enamel.

2.04 PAINT SYSTEMS - INTERIOR

A. Paint I-OP - All Interior Surfaces to be primed only, Unless Otherwise Indicated.

B. Paint WI-OP-1A - Wood, Opaque, Alkyd, 1 Coat:
1. One coat alkyd primer sealer.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required to achieve the finishes specified whether specifically indicated or not; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of coatings until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Plaster and Stucco: 12 percent.

3. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
4. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

G. Plaster Surfaces: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

I. Interior Wood Surfaces to Receive Primer Only: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed and end cut surfaces before installation.

J. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed and end cut surfaces before installation.

K. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with tinted primer.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

C. Apply products in accordance with manufacturer's instructions.

D. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

E. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

F. Apply each coat to uniform appearance.

G. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

H. Sand wood and metal surfaces lightly between coats to achieve required finish.

I. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finished coatings until completion of project.

B. Touch-up damaged coatings after Substantial Completion.

END OF SECTION

SECTION 09 9010

SILICATE PAINTS AND COATINGS

PART 1 – GENERAL

1.01 SUMMARY OF WORK

A. For coating stucco and plaster surfaces.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category

C. Maintenance Materials: Furnish the following for Texas Historical Commission's use in maintenance of project.

1. See Section 01 6000 - Product Requirements, for additional provisions.
2. Extra Paint and Coatings: 1 gallon (4 L) of each color; store where directed.
3. Label each container with color in addition to the manufacturer's label.

D. Samples shall be submitted for color matching to the same address.

E. Material Safety Data Sheets (MSDS) as appropriate.

1. Apply coating samples on masonry—preferably on the building. Do not apply samples to plywood or other non-masonry surfaces.
2. Written verification from the Contractor that all specified items will be used. Provide purchase orders, shipping tickets, receipts, etc. to prove that the specified materials were ordered and received.

1.03 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in commercial painting and finishing with three years documented experience and approved by the coating manufacturer.

B. Coating Samples: Prepare a sample of each type of repair listed below. Prepare, install, and finish each sample according to the specifications.

1.04 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 6 feet (1.83 m) long by 6 feet (1.83 m) wide, illustrating special coating color, texture, and finish.

C. Prepare samples in an area where they will be exposed to the same conditions as will be present on the building during curing. Allow samples to cure at least three days (or longer, if possible) before obtaining Owner’s approval for color match. Samples should be viewed from a minimum distance of 12 feet.

D. Locate where directed.

E. Mock-up may remain as part of the work.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Materials are to be delivered, stored, and handled to protect them from damage, extreme temperature, and moisture in accordance with Manufacturer's written instructions.
B. Deliver and store material in Manufacturer's original, unopened containers with the production date shown on the container or packaging.
C. Comply with the Manufacturer's written specifications and recommendations for mixing, application, and curing coatings.

1.06 PROTECTION/ SITE CONDITIONS

A. Cold Weather Requirements: Do not work in temperatures below 45° F, when the substrate is colder than 45° F, or when the temperature is expected to fall below 45° F for 48 hours after installation of the coating.
B. Hot Weather Requirements: Protect coating from direct sunlight and wind during application. Do not use or prepare coating when ambient air temperature is above 95° F.
C. Foul weather requirements: Do not work when precipitation is expected within 48 hours of installation. The coating needs adequate time to bond to the substrate. Moisture disrupts the curing process.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.
B. Paint System: Keim Mineral Coatings of America: www.kiem.com.
   1. Products:
      a. 2 coat system: Soldalit Paint.
      b. Color: Custom to match existing paint colors.
C. Substitutions: See 01 6000 Product Requirements.

PART 3 – EXECUTION

3.01 PREPARATION

A. Do not start work until surfaces to be coated are in proper condition to produce finished surfaces of uniform, satisfactory appearance.
B. Mildew, algae and fungus should be removed by methods recommended by the coating manufacturer.
C. Remove dust and loose particulate matter from surfaces to receive coatings immediately prior to coating application.
D. Protect all non-masonry surfaces such as: glass, wood, metal, etc.
E. Cracks and spalls must be repaired and cured prior to coating application.
F. To ensure even penetration of the coating, make sure any masonry repairs have been made with repair materials that are compatible to the substrate.
G. Remove any previous or existing coatings before application of new mineral coating.

H. Substrate must be completely dry before coating. Do not work when precipitation is expected within 48 hours of installation. The coating needs adequate time to bond to the substrate. Moisture disrupts the curing process.

3.02 MIXING COATING SYSTEM

A. It is recommended that proper eye protection be worn during mixing in case of accidental splashing.

B. Both the base and finish coats require diluting prior to application.

C. Mix the paint coatings using silicate paint thinner in the desired proportions, before applying to surface.

D. Allow for drying time as recommended by manufacturer before adding successive coats.

E. Approximate mixing ratio is 2 quarts of silicate paint thinner for every 5 1/2 gallons for both the base coat and finish coat. Depending on the desired coating consistency and the substrate surface, may slightly vary.

3.03 APPLICATION OF SILICATE COATING

A. Apply each coat by brush or 1 ¼" lambs-wool roller, making sure to work the material into the pores of the plaster surface. The coating is designed to be absorbed into the surface so it should not be applied in thick layers. Brush application increases the absorption of the coating into the masonry. This feature results in a longer lasting, more durable coating.

B. Allow manufacturer's specified drying time, and ensure correct coating adhesion, for each coat before applying the next coat.

C. Apply succeeding coat until it matches the approved mock-up.

D. Where coating application abuts other materials or other coating color, terminate coating, making clean sharp termination line without coating overlap.

E. Where color changes occur between adjoining spaces, through framed openings that are of same color as adjoining surfaces, change color at outside stop corner nearest to face of closed door.

3.04 CLEAN UP

A. Place tools immediately in clean water when pausing work (15-30 minutes or more). Clean tools with clean water immediately after finishing work. Mineral Life Silicate Paint can be removed from non-porous surfaces with clean water while still wet.

END OF SECTION

SECTION 31 2323
FILL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Filling pea gravel below building for drainage at Espinoza House.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM C136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates; 2006.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Materials Sources: Submit name of imported materials source.

C. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.

1.05 DELIVERY, STORAGE, AND HANDLING

A. When necessary, store materials on site in advance of need.

PART 2 PRODUCTS

2.01 FILL MATERIALS

A. Granular Fill - Pea Gravel : Natural stone; washed, free of clay, shale, organic matter.
   1. Graded in accordance with ASTM C136, within the following limits:
      a. Minimum Size: 1/4 inch (6 mm).
      b. Maximum Size: 5/8 inch (16 mm).

2.02 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for testing and analysis of soil material.

B. If tests indicate materials do not meet specified requirements, change material and retest.

C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Identify required lines, levels, contours, and datum locations.

3.02 PREPARATION

A. Scarify subgrade surface to a depth of 6 inches (150 mm) to identify soft spots.

B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.

C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.

D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.03 FILLING

A. Fill to contours and elevations indicated using unfrozen materials.

B. Employ a placement method that does not disturb or damage other work.

C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.

D. Maintain optimum moisture content of fill materials to attain required compaction density.

E. Slope grade away from building minimum 2 inches in 10 ft (50 mm in 3 m), unless noted otherwise. Make gradual grade changes. Blend slope into level areas.

F. Correct areas that are over-excavated.

1. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.

G. Compaction Density Unless Otherwise Specified or Indicated:

H. Reshape and re-compact fills subjected to vehicular traffic.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection and testing.

B. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"), ASTM D1557 ("modified Proctor"), or AASHTO T 180.

C. If tests indicate work does not meet specified requirements, remove work, replace and retest.

END OF SECTION