LANDMARKS CO	DMMISSION APPLIC	CATION		LC
Complete all sections of this the requirements on the acc If you need an interpreter, translate	application, making sure to note companying checklist (reverse). or, materials in alternate formats or other	City of Madison Planning Division 126 S Hamilton St PO Box 2985 Madison Wi 52201 2005		
accommodations to access these fo	rrms, please call (608) 266-4635	(608) 266-4635		ALECONSIN
1. LOCATION				
Project Address:	44 FRANCES S	TREET	e.	Aldermanic District:
2. <u>PROJECT</u>				
Project Title/Description: _	DELTA UPSILON	EXTERIOR RES	STORA	TION
This is an application for: (a	check all that apply)			
Alteration/Addition to or Designated Landma) a building in a Local Historic D ark <i>(specify)</i> **:	District		Legistar #:
□ Mansion Hill	Third Lake Ridge	First Settlement		DATE STAMP
University Heights	Marquette Bungalows	🛛 Landmark		
□ Land Division/Combin or to Designated Land	ation in a Local Historic District mark Site <i>(specify)**</i> :		۲ ۲	CITY OF MADISON
		First Settlement	SE ON	MAY 1 8 2018
			CED U	12:30 PM
Alteration/Addition to	a building adjacent to a Design	acted Landmant	Ō	& Economic Development
□ Variance from the Hist	a building adjacent to a Design			
□ Landmark Nomination (Please contact the Hi □ Other (specify):	/Rescission of Historic District	napter 41) Nomination/Amendment cific Submission Requirements.)		Preliminary Zoning Review Zoning Staff Initial:
3. <u>APPLICANT</u>				Date: / /
Applicant's Name:	PA DAVIS	Company:	jus À	RCHITECTURE Ne.
Address: 613	Street	SUITE 203 M	ADISON	WI. 53703
Telephone: 608-31	1-6360	Email: <u>davis e</u>	is-ar	ch. Com
Property Owner (if not appli	icant): DELTA UPSI	LON OF WISCONS	SIN 1	NC,
Address: <u>Po B</u>	0× 188	MA	DSON	L WI 53701
ROBELT R - RER Property Owner's Signature	Ry Street		City Dat	State Zip
NOTICE REGARDING LOBBYING	ORDINANCE: If you are seeking approval of	f a development that has over 40.000 so	uare feet of	non-residential space or a

residential development of over 10 dwelling units, or if you are seeking assistance from the City with a value of \$10,000 (including grants, loans, TIF or similar assistance), then you likely are subject to Madison's lobbying ordinance (Sec. 2.40, MGO). You are required to register and report your lobbying. Please consult the City Clerk's Office for more information. Failure to comply with the lobbying ordinance may result in fines.

4. APPLICATION SUBMISSION REQUIREMENTS (see checklist on reverse)

All applications must be filed by 12:00pm on the submission date with the Preservation Planner, the Department of Planning & Community & Economic Development, Planning Division, located at 126 S Hamilton Street. Applications submitted after the submission date *or* incomplete applications will be postponed to the next scheduled filing time. Submission deadlines can be viewed here: <u>https://www.cityofmadison.com/dpced/planning/documents/LC_Meeting_Schedule_Dates.pdf</u>

4.05	
	LICATION SUBMISSION REQUIREMENTS CHECKLIST:
un c unle	order to be considered complete, every application submission shall include at least the following information ess otherwise waived by the Preservation Planner.
Ø	andmarks Commission Application w/signature of the property owner (1 copy only).
	Twelve (12) collated paper copies 11" x 17" or smaller (via mail or drop-off) of submission materials (see below).
	Electronic files (via email) of submission materials (see below).
	Narrative Description/Letter of Intent addressed to the Landmarks Commission, describing the location of the property and the scope of the proposed project.
	Photographs of existing conditions;
	Photographs of existing context;
	Architectural drawings reduced to 11" x 17" or smaller pages which may include:
	 Dimensioned site plans showing siting of structures, grading, landscaping, pedestrian and vehicular access, lighting, signage, and other features;
	\square Elevations of all sides showing exterior features and finishes, subsurface construction, floor and roof;
I	Floor Plan views of levels and roof;
1	For proposals of more than two (2) commercial or residential or combination thereof units, a minimum of two (2) accurate street-view normal perspectives shown from a viewpoint of no more than five (5) feet above existing grade.
	**Landmarks Commission staff will preliminarily review projects related to the construction of additions and/or new construction with Zoning staff in order to determine the completeness of the submission materials. Applicants are encouraged to contact Zoning staff to discuss projects early in the process;
l I i	Any other information requested by the Preservation Planner to convey the aspects of the project which may nclude:
0	Perspective drawing
Ľ	Photographs of examples on another historic resource
[Manufacturer's product information showing dimensions and materials;
ĺ	Other

CONTACT THE PRESERVATION PLANNER:

Please contact the Preservation Planner with any questions. Amy Scanlon, Registered Architect City of Madison Planning Division 126 S Hamilton St P.O. Box 2985 (mailing address) Madison, WI 53701-2985 <u>ascanlon@cityofmadison.com</u> (608) 266-6552

ISTHMUS ARCHITECTURE, INC. 613 Williamson Street

Suite 203

Phone 608.294.0206

Letter of Intent **City of Madison** Landmarks Commission

Amy Scanlon, Registered Architect **Preservation Planner** City of Madison, Planning Division PO Box 2985 126 S. Hamilton Street Madison, WI. 53701-2985

May 21, 2018

Owner and Project Location:

Delta Upsilon of Wisconsin Langdon Street Historic District Historic Name: Delta Upsilon Fraternity 1906 644 Frances Street Madison, WI. 53701

NOTE: All quantities are approximate

Commission Members:

Delta Upsilon is requesting a Certificate of Appropriateness for the Exterior Restoration at their house located at 644 Frances Street. Delta Upsilon built the fraternity house in 1906 and their members have been occupying it ever since. Delta Upsilon hired Isthmus Architecture to determine required repairs that follow the Secretary of the Interior's Standards for the Treatment of Historic Properties. Below are our recommendations.

General

The house is a wood, balloon framed, five-story structure with one layer of three-quarter-inch wood plank and clad with one wythe of solid cast brick. Long nails were used to anchor the masonry to the wood structure. The majority of the exterior walls extend past the roof structure. creating gables that are capped with metal coping. The metal coping and the flashing connection between roof and wall have failed many times in the building's 112 years allowing water to enter the wall cavity and rust the masonry nail anchors resulting in the masonry separating from the wood structure.

Cast stone is used at each window opening as lintels, sills and accents. The lintels range in size from five-feet long to over twelve-feet long and are self-supporting. At four-inches thick all but one large lintel has failed.

Isthmus Architecture performed the on-site condition survey at 644 Frances Street the week of May 1, 2018. As part of our investigations, five original bricks and handfuls of mortar were removed from the building and sent for testing to determine their physical characteristics to inform our specifications for their replacement in kind. The report for both materials are attached.

Recommended brick and cast stone repairs/replacements occur on all four elevations. The exterior brick is in fair to good condition. The cast stone lintels, sills and banding have not fared as well and will require significant replacement. The metal elements of the building are also in poor condition and will require complete replacement. Because of the juxtaposition between required brick/dormer gable repair and the existing roofing, we also recommend full roofing and flashing replacement.

Exterior Masonry Recommendations

The building has 5,500 SF of exposed exterior face brick. Each brick is 2-inches high by 7 ³/₄inches long by 3 ½-inches deep and the brick joints range in width from 3/8-inch to ½-inch. One square foot of brick wall equals 7 1/2 bricks and 7 lineal feet of joint; therefore, the building has approximately 41,250 bricks and 38,500 lineal feet of brick joints.

Face Brick:

16% to 20% of the brick on the main walls needs replacing. The south elevation has the largest quantity at 270 square feet. The total amount of brick needing replacement is 450 square feet. An additional 200 single brick removal/replacement is needed for miscellaneous deteriorated single brick.

Rebuild Gables and Tops of Chimneys:

8% of the total brick areas require rebuilding. Works includes completely rebuilding two small gables (one on the north and one on the south elevation, including strengthening of the wood stud structure behind), rebuilding four main gable corners and twelve small gable corners. This amounts to 350 square feet of brick.

The upper 3 ½-feet of both chimneys need rebuilding. This amounts to 125 square feet of brick and the replacement of the cast stone caps (see below).

Cast Stone Elements:

Cast stone elements include window, door and louver opening lintels, window sills, window accents, chimney caps and banding.

53% (29 out of 55) of the lintels need replacing, 55% (21 out of 38) window sills need replacing, less than 2% (3 out of 168) of the window accents need replacing, 100% of the chimney caps need replacing and 7% of the banding needs replacing. We recommend steel angle lintels be added to the larger window openings to help support the cast stone.

Exterior Metal Recommendations

Exterior metal elements include main and small gable coping (caps) and the continuous band located at the third-floor level. 100% of the metal requires replacing. There is 75 lineal feet of main gable coping, 130 lineal feet of small gable coping and 140 lineal feet of banding. Each location has its own profile. The recreation will match the original profiles.

Roofing, Flashing, Gutters and Downspouts Recommendations

3,520 square feet of roofing, 350 lineal feet of roof flashing and 280 square feet of plywood at backside of gables should be replaced. In addition, the existing material on the backside of the gable should be replaced with water resistant plywood. The non-original gutters and downspouts could be salvaged and reused; however, for warranty and long-term maintenance scheduling we recommend replacement of these items too. There is 40 lineal feet of gutter and 230 lineal feet of downspouts.

Materials

Brick: solid cast brick that closely matches the make-up of the existing brick in size, color, absorption and compression rates. See attached report.

Mortar: Type O mortar tinted to match existing. See attached report.

Cast Stone: Limestone quality cast stone with horizontal corduroy finish

Decorative Metal: Aluminum with PVDF Finish (Polyvinylidene Fluoride Resin) custom made shapes; three total in a standard color

Roofing: Three-Tab-Strip, SBS Modified Asphalt Shingles

Flashing, Gutters and Downspouts: Aluminum with PVDF Finish (Polyvinylidene Fluoride Resin). Gutter shall be half-round and downspouts 6" round.

Respectfully submitted by:

am -

Preservation Architect Isthmus Architecture, Inc.

Attachments:

Schmitt Technical Services LLC – Masonry Mortar Sample Testing and Brick Sample Testing Drawings: A-1 and A-2 dated May 21, 2018

Photographs



Picture 5971: Immediate Need



Picture 5976: Immediate Need



Picture 5956: Chimney repair



Picture 5960: Crack and bulge



Picture 5961: Typical damaged brick



Picture 5963: Typical damaged cast stone lintel

Picture 5913: Damaged original metal banding

Picture 5977: Damaged non-original metal banding

April 16, 2018

Mr. Laura Davis Isthmus Architecture, Inc. 613 Williamson Street Madison, WI 53703

RE: Testing of One (1) Masonry Mortar Sample and Five (5) Clay Brick Samples from Delta Upsilon Fraternity House, 644 Frances Street, Madison, WI – STS Project No. 18012

Dear Ms. Davis:

Schmitt Technical Services, Inc. (STS) has completed testing of masonry mortar and clay brick samples from historically significant Delta Upsilon Fraternity House on the University of Wisconsin – Madison, WI Campus. Delta Upsilon Fraternity House was built in 1906 to 1907. Masonry walls have been patched and tuck pointed several times. The exterior masonry envelope has now reached advanced stages of deterioration and is in need of extensive repair. Masonry samples were taken for laboratory testing as part of a pre-repair evaluation study by Isthmus Architecture, Inc.

Five (5) clay brick samples and one (1) unlabeled masonry mortar sample consisting of a bag of mortar fragments (Photograph 1) were received at STS on March 28, 2018. Table 1 list the samples received, sample locations and tests requested.

FINDINGS AND CONCLUSIONS

Subject to the qualifications in the attached Appendix A, the following findings and conclusions are made:

- 1. Brick test results are reported in the attached Appendix B.
- 2. The mortar sample is composed of various sized, intact fragments with bed faces intact (Photograph 1). Joint thickness represented by this sample is generally 1/4 to 3/8 in.
- 3. Some of the mortar fragments have a surface tuckpointing mortar weakly adhering to the exposed face. Tuckpointing mortar thickness ranges from 1/16 to 1/8 in.
- 4. Bed faces are lightly lined with fine calcium carbonate and ettringite deposits (Photograph 2), indicating significant moisture intrusion with the mortar joints.

3916 Birch Trail, Cross Plains, WI 53528 ph: 608-445-6162 www.schmitttechnicalservices.com

- 5. The mortar aggregate is a mixed siliceous and carbonate natural sand containing quartz, dolomite, feldspar, sandstone, chert and minor amounts other rock and mineral types (Photographs 3 and 4).
- 6. Measured maximum aggregate size is 2.0 mm or No. 10 US standard mesh sieve screen. The aggregate gradation appears similar to today's ASTM C 144 (Standard Specification for Aggregate for Masonry Mortar) gradation requirements. Overall, the sand appears to be performing as intended in the mortar.
- 7. Using the results of our petrographic and insoluble residue analyses, we determined the relative constituent proportions as follows:

Constituent	Part
Lime	1
Sand	2-3/4 to 3
Binder-to-Aggregate Ratio	1:2-3/4 to 3

- 8. The binder or matrix is dark reddish brown due to the presence of naturally occurring hematite as a pigmenting material. The pigment largely masks the microstructural characteristics of the mortar (Photograph 5). The pigment largely ranges from less than 0.001 to 0.010 mm diameter, with some occasional much large particles; and therefore, the pigment grading is poor which is typical of the crude technology of that era. The pigment was likely natural iron ore fines from either the Gogebic or Mesabi Iron Ranges which were both operational at the time of this construction.
- 9. Portland cement is not present in the binder. The binder matrix is lime (Photograph 6) and contains the characteristic microscopic shrinkage cracking typical of lime based mortars (Photograph 7). Lime balls and relicts of lime balls are present (Photographs 4 and 8), suggesting incomplete and uneven mixing of the lime. These observations are typical of the period of construction and level of materials technology of the time.
- 10. The mortar is soft and porous with an entrapped void content of 4 to 7%. The soft and porous nature of the mortar is likely due to the abundance of poorly graded brown iron oxide pigment and by virtue of being a lime cement matrix.
- 11. Based on the composition, the mortar is equivalent to a modern ASTM C 270 Type O masonry mortar.
- 12. If repointing, it is most appropriate to repoint the masonry with a Type O or N mortar based on exposure conditions, per Table X1.1 in Appendix X.1 of ASTM C 270.

LABORATORY PROCEDURES

Brick Testing

Half bricks sawed from the brick samples were tested according to the following sections of ASTM C 67, "Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile":

- Section 7 Compressive Strength and
- Section 8.3 Absorption by 24 hour (cold water) submersion.

Brick testing was performed by Professional Testing Service, Janesville, WI.

Masonry Mortar Testing

Petrographic Examination

We analyzed the mortar sample in accordance with the petrographic methods and insoluble residue sections of ASTM C1324 – Standard Test Method for Examination and Analysis of Hardened Masonry Mortar, which incorporates applicable procedures of ASTM C856 – Standard Practice for Petrographic Examination of Hardened Concrete.

The mortar examination included sawing the sample longitudinally; followed by lapping one half of the sawed slice with successively finer lapping grits to produce a finely ground (and nearly polished) surface of the entire mortar sample thickness. The lapped surface and freshly broken surfaces of the specimen were examined visually (with the unaided eye) and under a stereomicroscope at magnifications of 7 to 40X.

In addition, a thin section was made of the mortar, as were temporary, crushed fragment (i.e., "powder or immersion") mounts. The thin section and immersion mounts were examined under plane and cross-polarized light at magnifications of 50 to 400X using a polarizing light microscope.

Estimates of water-to-cement ratio (where applicable) were done using techniques outlined in FHWA-HRT-04-150 and methods developed by Dr. Donald Campbell ("Application of the Microscope in the Concrete Industry," Proceedings of the Third International Conference on Cement Microscopy, Houston, 1981).

It is a pleasure to be of service on this project. If you have any questions or need additional consultation, please contact us.

Sincerely,

Schmitt Technical Services, Inc.

James W. Schmitt

James W. Schmitt Principal/President

JWS/jws

Attachments

Photograph 1. Unlabeled mortar sample in the condition received for testing. Top scale is in centimeters. Bottom scale is in inches.

Photograph 2. Photomicrograph illustrating the abundance of white, secondary calcium carbonate along the bed face, indicating significant moisture intrusion along the mortar joints. Scale is in millimeters.

Photograph 3. This is a lapped surface of mortar interior showing the transparent to translucent quartz and feldspar sand particles, white lime balls and yellowish dolomite sand particles constituting the aggregate. Note the uniform aggregate gradation and distribution. Scale is in millimeters.

Photograph 4. This thin section photomicrograph depicts the presence of gray and white quartz and feldspar sand particles, gold dolomite sand particles (red arrows), and lime balls (yellow arrows) all embedded in a brownish lime matrix. Crossed-polarized light. 40x magnification.

Photograph 5. Thin section photomicrograph showing the binder or matrix is dark reddish brown due to the presence of naturally occurring hematite as a pigmenting material (red arrows). The pigment largely masks the microstructural characteristics of the mortar. The pigment largely ranges from less than 0.001 to 0.010 mm diameter, with some occasional much large particles. 200x magnification. Crossed polarized light.

Photograph 6. Thin section photomicrograph showing the grayish color of the matrix that is typical for lime binder mortars (red arrows). 200x magnification. Crossed polarized light.

Photograph 7. Thin section photomicrographs depicting characteristic microscopic shrinkage cracking typical of lime based mortars. Plane polarized light. 100x magnification.

Photograph 8. Photomicrograph illustrating lime balls (red arrows) in the mortar matrix. Scale is in millimeters.

Appendix A

Document Qualifications

APPENDIX A DOCUMENT QUALIFICATIONS

Standard of Care

This report has been prepared for the exclusive use of the Client for specification application to their project. This report is not intended for use by others. Schmitt Technical Services, Inc. (STS) has provided professional services consistent with generally accepted evaluative and geologic practices. No other warranties are expressed or implied. The opinions and recommendations submitted in this report are based on interpretation of field observations, samples taken from specific locations and/or field and/or laboratory test results.

Samples

The samples taken during the field observations depict conditions only at specific locations and times indicated in the report. Conditions at other locations may differ from conditions where sampling was conducted. The passage of time may also result in changes in conditions interpreted to exist at the locations where sampling was conducted. Samples will be retained for seven (7) business days after report issuance.

Completion of Characterization of Site Conditions

The scope of services described in this report is based on a limited number of samples. The nature and variations in other locations may exist and may not become evident until repairs are performed. If variations or other latent conditions become evident, additional evaluation and testing may be warranted.

Conceptual Level of Project Scope

The field activities, testing procedures and evaluative approaches used in this study are consistent with those normally used in testing of construction materials and products. The number of samples and tests and scope of testing were done within Client's budget, but may represent less, more or an adequate amount of data than that generally needed to evaluate the areal extent of less than expected performance.

Test Repair and Repair Observations and Testing

Since findings, discussion and observations are based on limited numbers of observations and tests, the Client should be particularly sensitive to the potential need for adjustment in extent of repair, repair procedures and repair materials in the field. It is in the best interest of the client to retain STS to observe and test repair materials and repairs to observe general compliance with repair design concepts, specifications and contractor/manufacturer recommendations and to assist in development of changes should field conditions differ from those anticipated before the start of repair construction.

Limitations-Repair Construction Considerations

The recommendations made in the report are not intended to dictate type of repair materials to be used, construction methods or construction sequences. Prospective contractors and material suppliers must evaluate potential repair problems on the basis of their knowledge and experience in the local area and on the basis of similar project in other localities, taking into account their own proposed repair construction methods and procedures.

Testing Conducted by Others

When subcontracted outside field and/or laboratory services and analyses are used, STS will rely upon the data provided by the outside field service or laboratory, and will not conduct an independent evaluation of the reliability of their data.

Appendix B

Brick Test Results

PTS Professional Testing Service

"From Highways to High-Rises"

4217 Commercial Dr., Janesville, WI 53545 Phone: 608-371-4668 Project: STS 18012

Client: Unknown

Procedure	Used:	ASTM (
FIOLEGUIE	Useu.	ASTIVIC

Procedure	Used:	ASTM C67		24 hr cold
Sample #	Dry Wt.	24 hr Absorption (grams)	Absorbed Weight (grams)	(%) ABS
1	900.8	1035	134.2	14.9
2	851.2	985.9	134.7	15.8
3	853.6	991.8	138.2	16.2
4	860.5	999.5	139	16.2
5	935.5	1083.2	147.7	15.8
Average	880.3	1019.1	138.8	15.8

Procedure	Used:	ASTM C67		5 hr Boil
Sample #	Dry Wt.	5 hr Boil Absorption (grams)	Absorbed Weight (grams)	(%) ABS
1	900.8	1045.8	145	16.1
2	851.2	993.5	142.3	16.7
3	853.6	999.6	146	17.1
4	860.5	1009.7	149.2	17.3
5	935.5	1092.7	157.2	16.8
Average	880.3	1028.3	147.9	16.8

Procedure Used: ASTM C67

Sample #	24 hr Cold	5 hr Boil	
	(% ABS)	(%ABS)	Coeficient of Saturation
1	14.9	16.1	0.93
2	15.8	16.7	0.95
3	16.2	17.1	0.95
4	16.2	17.3	0.94
5	15.8	16.8	0.94
Average	15.8	16.8	0.94

Notes: Contaminated samples from service environment with mortar attached.

Removal of over 99% of mortar accomplished with hand tools.

This method used to preserve fired surface of specimens and give more reliable absorption values.

Compressive Strength:

Sample #	Area (In)	Applied Load (pounds)	Compressive Strength (PSI)
1	15.10	65,680	4350
2	12.06	54,350	4510
3	13.70	36,880	2690
4	13.64	68,030	4990
5	14.34	60,670	4230
Average	13.35	57,122	4150

Procedure Used: ASTM C39 and C67

DELTA UPSILON EXTERIOR RESTORATION 644 FRANCES STREET MADISON, WISCONSIN

ISTHMUS ARCHITECTURE, INC 613 Williamson Street Suite 203 Madison, WI 53703 Phone: 608.294.0206 Fax: 608.294.0207 The Contractor shall verify all dimensions at the job site and confirm with the Architect before proceeding with the wor © . Isthmus Architecture, Inc. DELTA UPSILON EXTERIOR RESTORATION 644 Frances Street Madison, WI.

Project

Proj. No.:

1804.01

TITLE SHEET

PROJECT TEAM

ISTHMUS

ARCHITECT

613 WILLIAMSON STREET, SUITE 203 MADISON, WISCONSIN 53703 PHONE: 608-294-0206

CONTACT: LAURA DAVIS WWW.IS-ARCH.COM

ARCHITECTURE, INC.

SHEET INDEX

T-1 TITLE SHEET

A-1 NORTH AND WEST ELEVATIONS

A-2 SOUTH AND EAST ELEVATIONS

KEY NOTES

REPLACE ONE WYETH OF FACE BRICK. 450 SF ACCOUNT FOR AN ADDITIONAL 200 SINGLE BRICK REMOVAL/REPLACEMENT

> REPLACE CAST STONE ELEMENT WITH CORDUROY FINISH (LINTEL, SILL, DECORATION). 130 CF

REPLACE DECORATIVE METAL ELEMENT (MAIN GABLE COPING 75 LF,SMALL GABLE COPING 130 LF, HORIZONTAL BAND 140 LF)

REMOVE/REPLACE: 1. 3,520 SF OF ROOFING

- 2. 280 SF OF PLYWOOD SHEATHING
- BACKSIDE OF GABLES 3. 350 LF OF ROOF FLASHING
- 4. 75 LF OF GUTTER 5. 230 LF OF DOWNSPOUTS

ACCOUNT FOR THE INSTALLATION OF (24) 2X6 8'-0" LONG AND (6) 2X6 4'-0" LONG SISTER STUDS IN LARGE AND SMALL GABLE WING ENDS.

KEY NOTES

REPLACE ONE WYETH OF FACE BRICK. 450 SF ACCOUNT FOR AN ADDITIONAL 200 SINGLE BRICK

REPLACE CAST STONE ELEMENT WITH CORDUROY FINISH (LINTEL, SILL, DECORATION). 130 CF

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1. 3,520 SF OF ROOFING

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ACCOUNT FOR THE INSTALLATION OF (24) 2X6 8'-0" LONG AND (6) 2X6 4'-0" LONG SISTER STUDS IN LARGE AND SMALL

