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Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS

June 18, 2019

Re: Masonry Tower & Roof Assessment and Design Documents

Dear Edmund,
Thank you for the opportunity for Building Envelope Specialists, Inc. (BES) to submit a proposal for envelope consulting services on the masonry tower located as part of St. Thomas's overall building complex.

Project Understanding:
As per your request, BES is pleased to submit a proposal for building envelope consulting services on the above-mentioned structure. Our services will be broken into two phases; Pre-Design Phase and Design Phase. During the Pre-Design Phase our project team will arrive on site and field measure the tower in order to create accurate Autocad renderings. After the base drawings are complete, the project team will provide a visual and forensic assessment of the masonry façade and the roof as they currently exist. This assessment may involve removing building materials. With the aid of scaffolding*, ladders and 40X binoculars, the BES project team will document and record areas of damage, deterioration and structural concerns within the tower assemblies. Once the assessment is complete and armed with the information gathered in the field during our assessment, the project moves into the Design Phase. BES will produce a set of masonry and roof repair documents and specifications to include general, project and key notes, annotated building elevations, masonry, roofing and louver repair details.

NOTES:
*To provide an accurate assessment of the masonry, this proposal includes a full scaffolding of all sides of the tower. If the project moves forward prior to scaffolding removal, the amount for scaffolding erection will be credited to the tower repair budget and the monthly rental fee will be the only cost incurred.

Project Team:

- Scott R. Whitaker: Principal in charge. (PIC)
- Phillip Gotts: Director of Design-Senior Envelope Consultant. (SEC)
- Tim Dean PE: Director of Engineering. (PE)
- Gregg Norton: Jr. Envelope Consultant (JEC)

Proposal:
The following proposal is broken down into a dollar value associated with an activity under a defined project phase. Miscellaneous project costs are included and defined below. Line items in red are considered allowances to will be invoiced at net plus 10%. Please refer to the *Exclusions* section for items that are not included within this proposal. BES's fees for the outlined services are as follows:

Pre-Design Phase

• Field Measure & Drawing Prep of Tower Elevations: (PE & JEC for one day-Includes travel)	$5,310.00
Subtotal:	**$5,310.00**

Expenses

• Project Insurance Fee:	$265.50
• Mileage and tolls:	$92.65
• Project Supplies:	$50.00
Subtotal:	**$408.15**
Total for Pre-Assessment Phase:	**$5,718.75**

Assessment Phase

• Detailed Building Assessment: (PIC & PE for one day-Includes travel, scaffolding erection w/ 1 months rent and masonry support for one week.	$56,238.00

NOTE: Scaffolding and masonry assistance costs represent a value of $47,625.00.

If the project moves forward prior to scaffolding removal, the amount for scaffolding erection will be credited to the tower repair budget and the monthly rental fee will be the only cost incurred to the client.

Subtotal: $56,238.00

Expenses

- Project Insurance Fee: $2,811.90
- Mileage and tolls: $92.65
- Project Supplies: $50.00

Subtotal: $2,954.55

Total for Assessment Phase: $59,192.55

Design Phase

- Construction Documents to include general, project and key notes, annotated building elevations, masonry, roofing and louver repair details. $46,170.00

NOTE: BES assumes the masonry and roof are in poor condition. If the assemblies are better than anticipated, BES will invoice only the hours used during the drawings phase as opposed to the anticipated hours carried in the estimate.

Subtotal: $46,170.00

Expenses

- Project Insurance Fee: $1,808.50
- Project Supplies: $100.00

Subtotal: $1,908.50

Total for Design Phase: $48,078.50

Total for Professional Services: $112,989.20

NOTE: The repair document package furnished under this proposal **will** include **a stamp by a registered licensed design professional.**

This project will be scheduled after the return of the accepted proposal. Any services added to the outlined scope will be considered a change order to the contract and will be invoiced per an agreed upon sum.

Exclusions:

- Consulting or Testing for hazardous materials.
- Protection of the organ and any associated items with this instrument.
- Bidding consulting services.
- Value Engineering.
- Construction administration services.

Invoicing Procedure Terms & Conditions:

BES will invoice monthly for our services based on the completion percentage of each task. These financial arrangements allow Net 30 payment terms for all invoices assuming orderly and continuous progress of the project through to completion. Unpaid invoices over Net 30 shall accrue interest at the rate of 1.5% per month plus any costs of collection for the unpaid balance.

P.O. Box 2589. South Portland, Maine 04116
Tele: 207-400-0086

BES will perform the services described above in a good and workmanlike fashion. Any defects in the work performed must be brought to BES's attention in writing within 30 days of completion in order for BES to be responsible for any loss, liability or damage related thereto. BES disclaims all warranties of merchantability and fitness for a particular purpose and provides only the limited warranty set forth in this paragraph. BES shall be liable only for its recklessness or willful misconduct in the performance of the services contemplated by this agreement. In any event, BES's aggregate liability for any and all loss, liability, expense or damage received by the client arising out of the subject matter of this agreement shall not exceed any amounts payable pursuant to insurance coverages maintained by BES.

Authorization:

This Proposal with Terms and Conditions constitute the entire AGREEMENT between you and BES. This Proposal will be open for acceptance for 30 days from the date of this proposal, unless extended by BES in writing.

We look forward to the opportunity to provide professional consulting services to you on this important project. If this proposal satisfactorily sets forth your understanding of our agreement, please sign and return a copy of this letter to us.

If you have any questions, please call my office at 207-400-0086.

Regards,

Scott R. Whitaker-President
Building Envelope Specialists, Inc.

Acceptance: _____ **Date:** _____

All information contained in this proposal including attachment(s) is confidential information and is intended only for the exclusive use by 'The Client' mentioned above. Any disclosure, copying, distribution or use of the information contained herein is strictly prohibited and may be unlawful and constitute a breach in confidentiality laws without the permission of Building Envelope Specialists.

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Tele: 207-400-0086

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St. Thomas' Tower Repair Options
Building Envelope Specialists
Oct-19

	Potential Repair Options					
	A	**B**	**C**	**D**	**E**	**F**
	Restoration Original Materials	**Restoration Modern Materials**	**Wood rebuild with half-timber style**	**Upper tower removal with Lowered Crenellation**	**Upper tower removal with new hip roof and gutter system**	**Tower stabilization crenel to grade**
Estimated Cost:						
CA/Project Management	$ 48,000.00	$ 36,000.00	$ 36,000.00	$ 36,000.00	$ 36,000.00	$ 4,000.00
Masonry	622,930.00	491,650.00	390,040.00	357,925.00	332,800.00	53,000.00
Roofing	300,000.00	200,000.00	200,000.00	200,000.00	175,000.00	-
Sub-total (Church at Risk Cost) [a]	**970,930.00**	**727,650.00**	**626,040.00**	**593,925.00**	**543,800.00**	**57,000.00**
BES General Conditions Fee @ 10%	97,093.00	72,765.00	62,604.00	59,392.50	54,380.00	5,700.00
Project Contingency @ 15%	160,203.45	120,062.25	103,296.60	97,997.63	89,727.00	9,405.00
Construction Management Fee @ 7%	79,179.34	59,339.86	51,053.56	48,434.58	44,346.89	4,648.35
Total (Costruction Manager at Risk)	**$ 1,307,405.79**	**$ 979,817.11**	**$ 842,994.16**	**$ 799,749.71**	**$ 732,253.89**	**$ 76,753.35**
Time Frame	*34 wks.*	*18 wks.*	*18 wks.*	*18 wks.*	*18 wks.*	*2 wks.*

[a] Church is at risk COST rather than the Construction Manager, St Thomas' assumes all risk, to include General Conditions, Project and the CM Management Fee. BES' roll is only as project manager. Any additional scope added to the projects (unforeseen conditions, increase in scope by client) will be subject to a BES Change Order at cost + 5%. Project comes with contractor warranty of 1 year, vs. 5 years under CM at Risk.
(Note: a project contingency should also be added to Church at Risk Cost)

Option A

Building Envelope Specialists

CM at Risk: Construction Management Proposal

P.O. Box 2589 South Portland, Maine 04116
Email: Swhitaker@building-envelope-specialists.net

Project: St. Thomas Episcopal Church			**Schedule:**	34 Weeks:			
Date: 09/26/2019			**Start Date:**	TBD			
Item	Quantity	Unit	Labor	Material	Cost	**Total**	Notes
General Conditions							
a) Site Fence	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
b) Toilets:	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
c) Dumpster: 10 yd. container	N/A	N/A	N/A	N/A	N/A	N/A	**BES: 10 yd. container**
d) Temp Water	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
e) Temp Power	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
f) Liability Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
g) Sub-contractor Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**Gnazzo**
h) Permit	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
CA/Project Management							
Building Envelope Specialists							
34 Meetings to include Kickoff and Closeout.							
Assuming a 10 wk overlap with the masonry and copper roofing work.							
Project Management (16 weeks masonry)	16	$ 2,000.00	12 Hrs/wk		$ 32,000.00		
Project Management (18 weeks copper roof work)	8	$ 2,000.00	12 Hrs/wk		$ 16,000.00		
CA/PM Sub-Total:						**$ 48,000.00**	
Sub-contracts							
Joseph Gnazzo Company							
Covering existing bells with boxed protection.					$ 2,785.00		
Temporary metal roof over tower.					$ 11,800.00		
New pressure treated roof w/ steel I beam.					$ 12,200.00		
New Limestone cornice: (65.2 l.f.)					$ 64,860.00		
Water table restoration to include 32.6 l.f. of new limestone.					$ 27,875.00		
Window surround restoration to include 3 new pieces of limestone.					$ 9,125.00		
Buttress limestone restored.					$ 2,875.00		
Rebuild highlighted stone masonry at a full depth.					$ 309,830.00		
Rebuild highlighted stone masonry at a 1 wythe depth.					$ 106,656.00		
Rake out and repoint mortar joints.					$ 14,790.00		
Winter Conditions Allowance. (Heat)					$ 15,134.00		
Weatherization Allowance for roofing.					$ 10,000.00		
Gnazzo's General Conditions:					$ 35,000.00		
Masonry Sub-Total:						**$ 622,930.00**	
Kevin W. Smith Roofing							
New tower roof allowance. EPDM, roof hatch and drain.					$ 25,000.00		
Danny Allen Roofing							
New copper standing seam roof (with new copper gutter) in leu of slate over North Chapel.					$ 50,000.00		NOT a FINAL PRICE
New copper standing seam roof (with new copper gutter) in leu of slate over Flower Room.					$ 50,000.00		NOT a FINAL PRICE
New copper standing seam roof over Organ.					$ 50,000.00		NOT a FINAL PRICE
New copper standing seam roof adjacent to Flower Room..					$ 50,000.00		NOT a FINAL PRICE
40 l.f. of new copper gutterrunning west from tower.					$ 50,000.00		NOT a FINAL PRICE
Slate and copper flashing repairs on East gable wall.					$ 25,000.00		NOT a FINAL PRICE
Roofing Sub-Total:						**$ 300,000.00**	

Option A

Sub-contractor Total:						**$ 922,930.00**	
Project Sub-Total:						**$ 970,930.00**	
BES General Conditions Fee 10%						**$ 97,093.00**	
Project Contingency @15%						**$ 160,203.45**	
Construction Management Fee @ 7%:						**$ 79,179.34**	
Project Total:						**$ 1,307,405.79**	

Option B

Building Envelope Specialists

CM at Risk: Construction Management Proposal

P.O. Box 2589 South Portland, Maine 04116
Email: Swhitaker@building-envelope-specialists.net

Project: St. Thomas Episcopal Church-CMU Back-up-Tower Restoration (2019 Prices)			**Schedule:**	18 Weeks:			
Date: 10/10/19			**Start Date:**	TBD			
Item	Quantity	Unit	Labor	Material	Cost	**Total**	Notes
General Conditions							
a) Site Fence	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
b) Toilets:	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
c) Dumpster: 10 yd. container	N/A	N/A	N/A	N/A	N/A	N/A	**BES: 10 yd. container**
d) Temp Water	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
e) Temp Power	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
f) Liability Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
g) Sub-contractor Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**Gnazzo**
h) Permit	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
CA/Project Management							
Building Envelope Specialists							
18 Meetings to include Kickoff and Closeout.							
Project Management (16 weeks masonry)	18	$ 2,000.00	12 Hrs/wk		$ 36,000.00		
CA/PM Sub-Total:						**$ 36,000.00**	
Sub-contracts							
MASONRY							
Joseph Gnazzo Company							
Covering existing bells with boxed protection.							
Temporary metal roof over tower.							
New pressure treated roof w/ steel I beam.							
New Limestone cornice: (65.2 l.f.)							
Water table restoration to include 32.6 l.f. of new limestone.							
Lower window surround restoration to include 3 new pieces of limestone.							
Buttress limestone restored.							
Rebuild highlighted stone masonry at a full depth with CMU back-up							
Rebuild highlighted stone masonry at a 1 wythe depth.							
Rake out and repoint mortar joints.							
Winter Conditions. (Heat)							
Gnazzo's General Conditions:							
Masonry Sub-Total:						**$ 491,650.00**	
ROOFING							
Kevin W. Smith Roofing							
New tower roof allowance. EPDM, roof hatch and drain.					$ 25,000.00		
Joseph Gnazzo Company: Roofing							
North Chapel, Flower Room, Tower & Flower Room Apron, Tower Cricket.					**$ 175,000.00**		
See attached sheets for schedmatic design. (Allowence)							
Roofing Sub-Total:						**$ 200,000.00**	
Sub-contractor Total:						**$ 691,650.00**	
Project Sub-Total:						**$ 727,650.00**	
BES General Conditions Fee 10%						**$ 72,765.00**	
Project Contingency @15%						**$ 120,062.25**	
Construction Management Fee @ 7%:						**$ 59,339.86**	
Project Total:						**$ 979,817.11**	

Option C

Building Envelope Specialists

CM at Risk: Construction Management Proposal

P.O. Box 2589 South Portland, Maine 04116
Email: Swhitaker@building-envelope-specialists.net

Project: St. Thomas Episcopal Church-OPTION #1-Tower Restoration (2019 Prices)			**Schedule:**	18 Weeks:			
Date: 10/10/19			**Start Date:**	TBD			
Item	Quantity	Unit	Labor	Material	Cost	**Total**	Notes
General Conditions							
a) Site Fence	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
b) Toilets:	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
c) Dumpster: 10 yd. container	N/A	N/A	N/A	N/A	N/A	N/A	**BES: 10 yd. container**
d) Temp Water	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
e) Temp Power	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
f) Liability Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
g) Sub-contractor Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**Gnazzo**
h) Permit	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
CA/Project Management							
Building Envelope Specialists							
18 Meetings to include Kickoff and Closeout.							
Project Management (16 weeks masonry)	18	$ 2,000.00	12 Hrs/wk		$ 36,000.00		
CA/PM Sub-Total:						**$ 36,000.00**	
Sub-contracts							
MASONRY							
Joseph Gnazzo Company							
Covering existing bells with boxed protection.							
Temporary metal roof over tower.							
Lower window surround restoration to include 3 new pieces of limestone.							
Buttress limestone restored.							
Build Timber frame bell housing as per rendering.							
Rebuild highlighted stone masonry at a 1 wythe depth.							
Rake out and repoint mortar joints.							
Winter Conditions. (Heat)							
Gnazzo's General Conditions:							
Masonry Sub-Total:						**$ 390,040.00**	
ROOFING							
Kevin W. Smith Roofing							
New tower roof allowance. EPDM, roof hatch and drain.					$ 25,000.00		
Joseph Gnazzo Company: Roofing							
North Chapel, Flower Room, Tower & Flower Room Apron, Tower Cricket.					**$ 175,000.00**		
See attached sheets for schedmatic design. (Allowence)							
Roofing Sub-Total:						**$ 200,000.00**	
Sub-contractor Total:						**$ 590,040.00**	
Project Sub-Total:						**$ 626,040.00**	
BES General Conditions Fee 10%						**$ 62,604.00**	
Project Contingency @15%						**$ 103,296.60**	
Construction Management Fee @ 7%:						**$ 51,053.56**	
Project Total:						**$ 842,994.16**	

Option C

Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS

St Thomas Tower Rebuild Options

Option 1 Wood rebuild with half-timber style
(See - St Thomas Tower 01-Tower Re-Build to Half-Timber Enclosure)

Work from water table down

- Rebuild Portions of the tower masonry one Wythe deep. As shown on original BES drawings
- Rake out and Repoint remaining masonry. As shown on original BES drawings
- Patch and Repair tower lower window surround East Side with cast stone. As shown on original BES drawings

Work from water table up

i. Demo all tower masonry down to water table
ii. Build new EPDM Roof with tapered insulation including the framing
    1. Advantech roof sheathing
    2. Ice and Water shield
    3. Roof Hatch
    4. Internal Roof Drain attached to existing system
    5. Termination bar and counter flashing
iii. Rebuild tower with half-timber style
    1. 2x6 #2 SPF @ 16" O.C. Framing
    2. Exterior grade Cementous wall panels
    3. PVC or composite trim
    4. Top of wall roof perimeter edge flashing- copper
    5. Bottom of wall/ water table perimeter edge flashing- copper
    6. (8) New window louvers (See attached Louver Brochures)
    7. Exterior latex enamel paint to match existing

Option 1 additional Roof work

Tower Cricket (South)

i. Roof- new 40-year asphalt shingles
    1. Strip roof
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
ii. Valley – New 12" copper valley
iii. Step & Counter Flashing – Copper Step flashing & lead counter flashing

Tower and Flower room apron (Southwest)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles

Flower Room (West)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
    5. New Copper gutters and leaders
    6. Save Slate for future use
    7. Step & Counter Flashing – Copper Step flashing & lead counter flashing

North Chapel (North)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
    5. New Copper gutters and leaders
    6. Save Slate for future use
    7. Step & Counter Flashing – Copper Step flashing & lead counter flashing

Option D

Building Envelope Specialists

CM at Risk: Construction Management Proposal

P.O. Box 2589 South Portland, Maine 04116
Email: Swhitaker@building-envelope-specialists.net

Project: St. Thomas Episcopal Church-OPTION #2-Tower Restoration (2019 Prices)			**Schedule:**	18 Weeks:			
Date: 10/10/19			**Start Date:**	TBD			
Item	Quantity	Unit	Labor	Material	Cost	**Total**	Notes
General Conditions							
a) Site Fence	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
b) Toilets:	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
c) Dumpster: 10 yd. container	N/A	N/A	N/A	N/A	N/A	N/A	**BES: 10 yd. container**
d) Temp Water	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
e) Temp Power	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
f) Liability Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
g) Sub-contractor Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**Gnazzo**
h) Permit	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
CA/Project Management							
Building Envelope Specialists							
18 Meetings to include Kickoff and Closeout.							
Project Management (16 weeks masonry)	18	$ 2,000.00	12 Hrs/wk		$ 36,000.00		
CA/PM Sub-Total:						**$ 36,000.00**	
Sub-contracts							
MASONRY							
Joseph Gnazzo Company							
Remove existing bells and set on ground.(Client to protect)							
Temporary metal roof over tower.							
New tower roof.							
install 50% cast stone water table.							
Rebuild stone crenilations to match original.							
Lower window surround restoration to include 3 new pieces of limestone.							
Buttress limestone restored.							
Rebuild highlighted stone masonry at a 1 wythe depth.							
Rake out and repoint mortar joints.							
Winter Conditions. (Heat)							
Gnazzo's General Conditions:							
Masonry Sub-Total:						**$ 357,925.00**	
ROOFING							
Kevin W. Smith Roofing							
New tower roof allowance. EPDM, roof hatch and drain.					$ 25,000.00		
Joseph Gnazzo Company: Roofing							
North Chapel, Flower Room, Tower & Flower Room Apron, Tower Cricket.					**$ 175,000.00**		
See attached sheets for schedmatic design. (Allowence)							
Roofing Sub-Total:						**$ 200,000.00**	
Sub-contractor Total:						**$ 557,925.00**	
Project Sub-Total:						**$ 593,925.00**	
BES General Conditions Fee 10%						**$ 59,392.50**	
Project Contingency @15%						**$ 97,997.63**	
Construction Management Fee @ 7%:						**$ 48,434.58**	
Project Total:						**$ 799,749.71**	

Option 2 Upper tower removal with Lowered Crenellation
(See- St Thomas Tower 02- No Tower with Lowered Crenellation)

From water table down

- Rebuild portions of tower masonry one width deep. As shown on original BES drawings
- Rake out and Repoint remaining masonry. As shown on original BES drawings
- Patch and Repair tower lower window surround East Side with cast stone. As shown on original BES drawings

From water table up

Demo all tower masonry down to water table and remove bells and bell structure
Client to Store Bells onsite with a protective cover.

Work from water table up

i. Demo all tower masonry down to water table
ii. Build new EPDM Roof with tapered insulation including the framing
    1. Advantech roof sheathing
    2. Ice and Water shield
    3. Roof Hatch
    4. Internal Roof Drain attached to existing system
    5. Termination bar and counter flashing
iii. Rebuild tower masonry parapet at lower level
    1. Rebuild Battlement with thru wall flashing
        a. Crenel
        b. Merlons
        c. Cast stone cornice

Option 2 additional Roof work

Tower Cricket (South)

i. Roof- new 40-year asphalt shingles
    1. Strip roof
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
ii. Valley – New 12" copper valley
iii. Step & Counter Flashing – Copper Step flashing & lead counter flashing

Tower and Flower
room apron (Southwest)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles

Flower Room (West)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
    5. New Copper gutters and leaders
    6. Save Slate for future use
    7. Step & Counter Flashing – Copper Step flashing & lead counter flashing

North Chapel (North)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
    5. New Copper gutters and leaders
    6. Save Slate for future use
    7. Step & Counter Flashing – Copper Step flashing & lead counter flashing

Option E

Building Envelope Specialists

CM at Risk: Construction Management Proposal

P.O. Box 2589 South Portland, Maine 04116
Email: Swhitaker@building-envelope-specialists.net

Project: St. Thomas Episcopal Church-OPTION #2-Tower Restoration (2019 Prices)			**Schedule:**	18 Weeks:			
Date: 10/10/19			**Start Date:**	TBD			
Item	Quantity	Unit	Labor	Material	Cost	**Total**	Notes
General Conditions							
a) Site Fence	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
b) Toilets:	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
c) Dumpster: 10 yd. container	N/A	N/A	N/A	N/A	N/A	N/A	**BES: 10 yd. container**
d) Temp Water	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
e) Temp Power	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
f) Liability Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
g) Sub-contractor Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**Gnazzo**
h) Permit	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
CA/Project Management							
Building Envelope Specialists							
18 Meetings to include Kickoff and Closeout.							
Project Management (16 weeks masonry)	18	$ 2,000.00	12 Hrs/wk		$ 36,000.00		
CA/PM Sub-Total:						**$ 36,000.00**	
Sub-contracts							
MASONRY							
Joseph Gnazzo Company							
Remove existing bells and set on ground.(Client to protect)							
Temporary metal roof over tower.							
New sloped tower roof.							
Lower window surround restoration to include 3 new pieces of limestone.							
Buttress limestone restored.							
Rebuild highlighted stone masonry at a 1 wythe depth.							
Rake out and repoint mortar joints.							
Winter Conditions. (Heat)							
Gnazzo's General Conditions:							
Masonry Sub-Total:						**$ 332,800.00**	
ROOFING							
Joseph Gnazzo Company: Roofing							
North Chapel, Flower Room, Tower & Flower Room Apron, Tower Cricket.					**$ 175,000.00**		
See attached sheets for schedmatic design. (Allowence)							
Roofing Sub-Total:						**$ 175,000.00**	
Sub-contractor Total:						**$ 507,800.00**	
Project Sub-Total:						**$ 543,800.00**	
BES General Conditions Fee 10%						**$ 54,380.00**	
Project Contingency @15%						**$ 89,727.00**	
Construction Management Fee @ 7%:						**$ 44,346.89**	
Project Total:						**$ 732,253.89**	

Option 3 Upper tower removal with new hip roof and gutter system
(See - St Thomas Tower 03- Pyramid Hip Shingle roof with Copper Base Flashing)

From water table down

- Rebuild portions of tower masonry one width deep. As shown on original BES drawings
- Rake out and Repoint remaining masonry. As shown on original BES drawings
- Patch and Repair tower lower window surround East Side with cast stone. As shown on original BES drawings

From water table up

Demo all tower masonry down to water table and remove bells and bell structure
Client to Store Bells onsite with a protective cover.

Work from water table up

i. Demo all tower masonry down to water table
ii. Build in place a pyramidal 4" pinch roof with a 12" overhang.
    1. 2X6 # 2 SPF @ 16" O.C. framing
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
    5. New Copper gutters and leaders

Option 1 additional Roof work

Tower Cricket (South)

i. Roof- new 40-year asphalt shingles
    1. Strip roof
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
ii. Valley – New 12" copper valley
iii. Step & Counter Flashing – Copper Step flashing & lead counter flashing

Tower and Flower
room apron (Southwest)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles

Flower Room (West)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
    5. New Copper gutters and leaders
    6. Save Slate for future use
    7. Step & Counter Flashing – Copper Step flashing & lead counter flashing

North Chapel (North)

i. Roof- new 40-year asphalt shingles
    1. Strip roof and gutter
    2. New Advantech roof sheathing
    3. Grace ice and water shield
    4. 40-year asphalt shingles
    5. New Copper gutters and leaders
    6. Save Slate for future use
    7. Step & Counter Flashing – Copper Step flashing & lead counter flashing

Option F

Building Envelope Specialists

CM at Risk: Construction Management Proposal

P.O. Box 2589 South Portland, Maine 04116
Email: Swhitaker@building-envelope-specialists.net

Project: St. Thomas Episcopal Church-OPTION #00-Tower Restoration (2019 Prices)			**Schedule:**	2			
Date: 10/10/19			**Start Date:**	TBD			
Item	Quantity	Unit	Labor	Material	Cost	**Total**	Notes
General Conditions							
a) Site Fence	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
b) Toilets:	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
c) Dumpster: 10 yd. container	N/A	N/A	N/A	N/A	N/A	N/A	**N/A**
d) Temp Water	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
e) Temp Power	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
f) Liability Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**BES**
g) Sub-contractor Insurance	N/A	N/A	N/A	N/A	N/A	N/A	**Gnazzo**
h) Permit	N/A	N/A	N/A	N/A	N/A	N/A	**Owner Furnished**
CA/Project Management							
Building Envelope Specialists							
Project Management (2 weeks)	2	$ 2,000.00	12 Hrs/wk		$ 4,000.00		
CA/PM Sub-Total:						**$ 4,000.00**	
Sub-contracts							
MASONRY							
Joseph Gnazzo Company							
Temporary metal roof over tower.							
Installation of protective wrap.							
Gnazzo's General Conditions:							
Masonry Sub-Total:						**$ 53,000.00**	
Project Sub-Total:						**$ 57,000.00**	
BES General Conditions Fee 10%						**$ 5,700.00**	
Project Contingency @15%						**$ 9,405.00**	
Construction Management Fee @ 7%:						**$ 4,648.35**	
Project Total:						**$ 76,753.35**	

Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS

Option F

St Thomas Tower Rebuild Options

Tower stabilization from crenel to grade (3 Year Design)
(See - St Thomas Tower 00-Existing Conditions)

Tower roofing protection

Tower roof

i. Build a temporary pyramid hip roof with a 4:12 pitch and a 12" overhang.
   1. 2X6 # 2 SPF @ 16" O.C. framing
   2. ½" CDX Roof sheathing
   3. Ice and Water shield
   4. Rolled roofing
   5. **(Similar to St. Thomas Tower 03- Pyramid Hip Shingle roof with Copper Base Flashing)**

Tower Cricket (South)

i. Roof - Cover with .60 mil EPDM Membrane and flat bar connections
ii. Valley - Cover with .60 mil EPDM Membrane and flat bar connections
iii. Step and counter flashing - Cover with .60 mil EPDM Membrane and flat bar terminations
iv. (**See - St. Thomas Tower Stabilization Roof Protection**

Tower and Flower room apron (Southwest)

i. Cover apron with .60 mil EPDM Membrane and flat bar connections terminations
ii. (See VE Roof Protection.pdf)

Flower Room (West)

i. Cover roof with .60 mil EPDM Membrane and flat bar connections South face to peak
ii. (See VE Roof Protection.pdf)

North Chapel (North)

i. No work

Tower Masonry Protection

i. Build Protective enclosure for tower
   1. Stone Full height wrap from crenel to grade
   2. Fasteners and termination bars

St. Thomas Tower

01 - Existing Tower + Low Roof Shingles

Option B

Building Envelope Specialists

SPECIALIZED BUILDING CONSULTANTS

St. Thomas Tower

02 - Tower Re-Build to Half-Timber Enclosure

Option C

Building Envelope Specialists

SPECIALIZED BUILDING CONSULTANTS

St. Thomas Tower
02 - No Tower with Lowered Crenellation

Option D

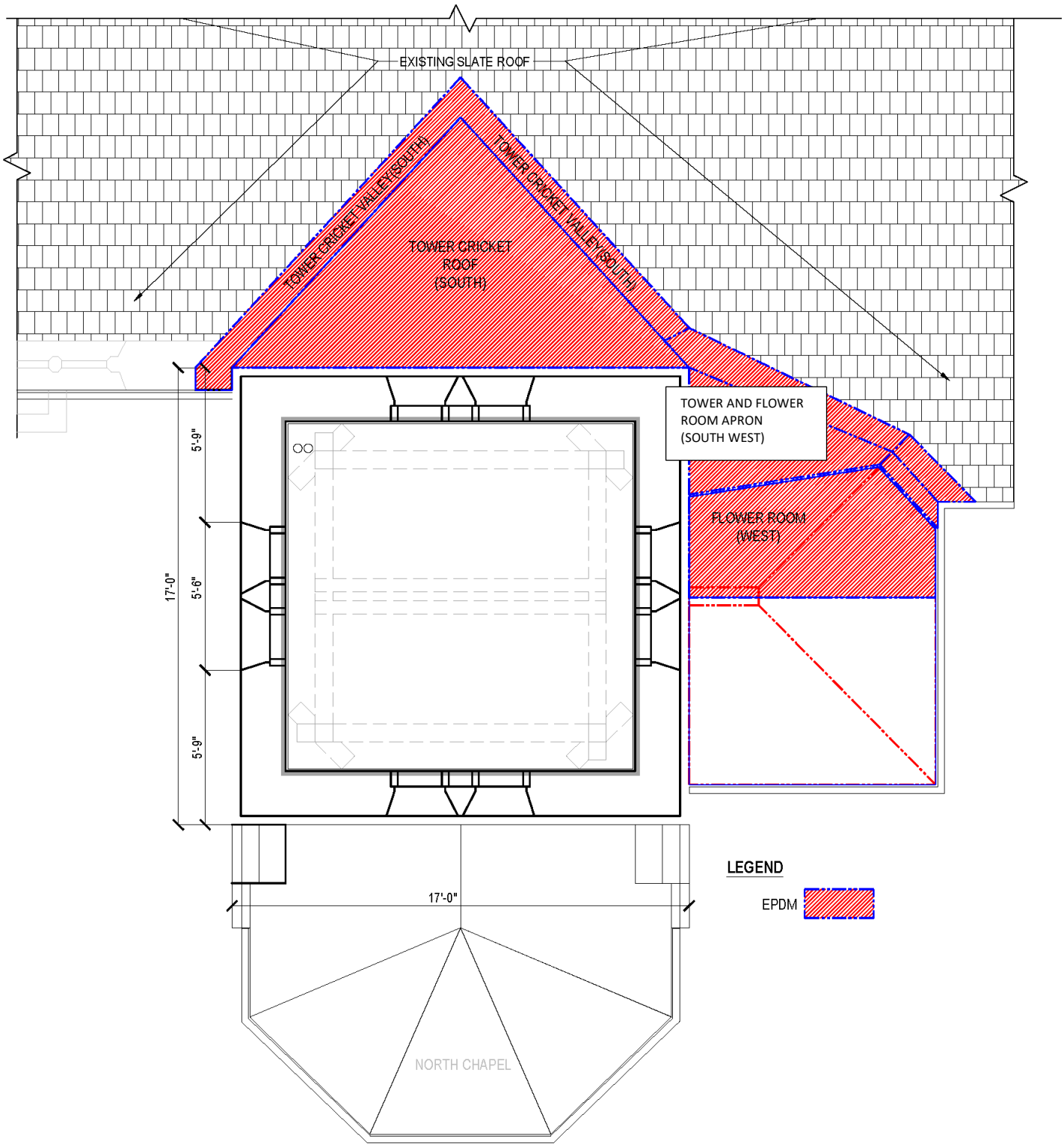
St. Thomas Tower
03 - Pyramid Hip Shingle roof with Copper Base Flashing

Option E

Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS

St Thomas Tower Rebuild Options

St. Thomas Tower
Stabilization Roof Protection



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Bell Tower & Roof (Campbell & Cordjia)

- Bell Tower Repair Opinion of Probable Cost
- Roofing Options
- AACE International Recommended Practice No. 18R-97 - COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE PROCESS INDUSTRIES

JOSEPH GNAZZO COMPANY INC.

Joseph Gnazzo Company Inc.

1053 Buckley Highway
Union, CT 06076

Tel 860-684-2334
Fax 860-684-1306

1554 Alfred Rd
Lyman, ME 04002

www.gnazzo.com
office@gnazzo.com

November 13, 2019

St. Thomas Episcopal Church
33 Chestnut Street
Camden, ME 04843

RE: Tower Restoration Option 00

The following is a proposal to perform the work items listed below at selected areas of the St. Thomas, Camden, ME.

Tower:

1. Temporary Roof.

2. Protective enclosure for tower.

3. All EPDM roof protection (organ room roof, north chapel roof and flower room roof).

Labor, Access and Material $ 53,300.00

Note:
1. All applicable sales tax is not included in price.
2. All work contingencies must be forwarded to JGCI Project Manager for approval.
3. Proposal based on 2019 pricing.
4. Does not include permits or below grade items.

Accepted Signature

Date

Joseph Gnazzo Company, Inc.

Russell Burtt, Vice President

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Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS

November 13, 2019

St. Thomas Episcopal Church
P.O. Box 631
Camden, ME 04843

Re: Tower Wrap inspections

Dear Carlos,
Thank you for the opportunity for Building Envelope Specialists, Inc. (BES) to submit a proposal for envelope consulting services in the form of installation inspections during the St. Thomas Tower Wrap Project.

Project Understanding:
As per your request, BES will provide two (2) onsite inspections with field reports of the installation of the tower wrap. Each inspection will take 3 hours. Price include travel time and project expenses. BES is only functioning as the client's Project Manager during this phase and assumes no liability for the longevity of wrap installation or for repairs (or the management of those repair) to the wrap installation over the life of the project.

Project Team:

- Scott R. Whitaker: Principal in charge.
- Tim Dean PE: Director of Engineering.

Proposal:
The following proposal is broken down into a dollar value associated with an activity under a defined project phase. Miscellaneous project costs are included and defined below. Please refer to the *Exclusions* section for items that are not included within this proposal. BES's fees for the outlined services are as follows:

Pre-Construction Phase

• 2 Project Inspections to include travel time and field reports		$3,500.00
	Subtotal:	**$3,500.00**

Expenses

• Project Insurance Fee:		$175.00
• Mileage and tolls:		$197.20
• Project Supplies:		$100.00
	Subtotal:	**$472.20**
	Total for Professional Services:	**$3,972.20**

This project will be scheduled after the return of the accepted proposal. Any services added to the outlined scope will be considered a change order to the contract and will be invoiced per an agreed upon sum.

Exclusions:

- Consulting or Testing for hazardous materials.

Invoicing Procedure Terms & Conditions:
BES will invoice monthly for our services based on the completion percentage of each task. These financial arrangements allow Net 30 payment terms for all invoices assuming orderly and continuous progress of the project through to completion. Unpaid invoices over Net 30 shall accrue interest at the rate of 1.5% per month plus any costs of collection for the unpaid balance.

BES will perform the services described above in a good and workmanlike fashion. Any defects in the work performed must be brought to BES's attention in writing within 30 days of completion in order for BES to be responsible for any loss, liability or damage related thereto. BES disclaims all warranties of merchantability and fitness for a particular purpose and provides only the limited warranty set forth in this paragraph. BES shall be liable

only for its recklessness or willful misconduct in the performance of the services contemplated by this agreement. In any event, BES's aggregate liability for any and all loss, liability, expense or damage received by the client arising out of the subject matter of this agreement shall not exceed any amounts payable pursuant to insurance coverages maintained by BES.

Authorization:

This Proposal with Terms and Conditions constitute the entire AGREEMENT between you and BES. This Proposal will be open for acceptance for 30 days from the date of this proposal, unless extended by BES in writing.

We look forward to the opportunity to provide professional consulting services to you on this important project. If this proposal satisfactorily sets forth your understanding of our agreement, please sign and return a copy of this letter to us.

If you have any questions, please call my office at 207-400-0086.

Regards,

Scott R. Whitaker-President
Building Envelope Specialists, Inc.

Acceptance: _____ **Date:** _____

All information contained in this proposal including attachment(s) is confidential information and is intended only for the exclusive use by 'The Client' mentioned above. Any disclosure, copying, distribution or use of the information contained herein is strictly prohibited and may be unlawful and constitute a breach in confidentiality laws without the permission of Building Envelope Specialists.

P.O. Box 2589. South Portland, Maine 04116
Tele: 207-400-0086

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Date Issued: October 18, 2021

Bell Tower Repair
Opinion of Probable Cost

St. Thomas Church
33 Chestnut Street
Camden, Maine 04843

Prepared for:
Mr. Chuck Campbell, AIA
Chuck Campbell Architect PLLC
127 Union Road
Waldoboro, ME 04572

- *Construction Risk Management*
- *Real Estate Asset Solutions*
- *Architecture and Engineering*

CORDJIA
CAPITAL PROJECTS GROUP

October 18, 2021

Forwarded via e-mail

Mr. Chuck Campbell, AIA
Chuck Campbell Architect PLLC
127 Union Road
Waldoboro, ME 04572

RE: St. Thomas Church Bell Tower Repair
Opinion of Probable Cost

Dear Mr. Campbell,

Cordjia Capital Projects Group ("Cordjia") is pleased to provide our findings to support St. Tomas' Episcopal Church with a, Opinion of Probable Cost ("OPC") in connection with the Bell Tower Repair located in Camden, Maine, ("Project").

PROJECT UNDERSTANDING

Option No. 1 – Stone Tower Reconstruction - $934,571

Scope of Work - Salvage top 11' of granite masonry at the top of the tower. For the remainder of the tower, remove the exterior wythe of granite brick on the lower portion of the tower to the buttresses. Remove and replace all limestone window elements, cornices, and sandstone water tables. Re-install all salvaged granite block masonry to match existing. Replace the lower copper roof and cricket. Install new roof flashing, granite brick/crack repair at base of tower, and lower window repair. Rake and repoint all tower masonry.

Option No. 2 – New Stone Tower (New Veneer) - $722,221

Scope of Work - Remove all masonry elements from the top of the tower down to the buttresses. Rebuild the tower to match existing with CMU block load bearing walls and stone veneer masonry. Remove and replace all limestone window elements, cornices, and sandstone water tables. Re-install salvaged granite block masonry to match existing where needed. Replace the lower copper roof and cricket. Install new roof flashing, granite brick/crack repair at base of tower, and lower window repair. Rake and repoint all tower masonry.

Option No. 3 – Stone Tower Reconstruction - $483,704

Scope of Work - Remove all masonry elements from the top of the tower and partial removal of the upper portion of the buttresses. Install new hip slate roof to match eve with existing structure.

Replace the lower copper roof and cricket. Install new roof flashing, granite brick/crack repair at base of tower, and lower window repair. Rake and repoint all tower masonry.

Roof Option No. 1 - New Asphalt Shingle Roof - $135,836

Scope of Work - Remove existing slate and metal roofs (excluding roof systems included in the Tower Repair Project). Roof materials to be removed include roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof or slate tiles. Install new asphalt shingle roof system (excluding area included in the Tower Repair Project). New roof system to include roof underlayment (both synthetic and bituminous), drip edge, step flashing, and asphalt shingles. Install new copper gutters and downspouts.

Roof Option No. 2 - New Metal Standing Seam Roof - $202,777

Scope of Work - Remove existing slate and metal roofs (excluding roof systems included in the Tower Repair Project). Roof materials to be removed include roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof or slate tiles. Install new standing seam roof system (excluding area included in the Tower Repair Project). New roof system to include roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof panels. Install new copper gutters and downspouts.

Roof Option No. 3 - New Slate Roof - $272,461

Scope of Work - Remove existing slate and metal roofs (excluding roof systems included in the Tower Repair Project). Roof materials to be removed include roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof or slate tiles. Install new slate roof system (excluding area included in the Tower Repair Project). New roof system to include roof underlayment (both synthetic and bituminous), drip edge, step flashing, and slate roof tiles. Install new copper gutters and downspouts.

Please refer to the attached OPC for a division breakdown of project costs as well as the drawings and documents that were provided to us to obtain the estimated costs within the OPC.

Cordjia reviewed Option Nos. 1 and 2 with a masonry consultant that we have used on similar projects to confirm the costs to perform the work are within current market values. The consultant is located and works in the New England region.

Should you have any questions or comments, please feel free to reach out to me directly.

Thank you,

Curtis S. Dow
Principal and Vice President
Cordjia Capital Projects Group, LLC

St. Thomas' Episcopal Church
Bell Tower Repair
Class 5 Estimate

October 18, 2021

Executive Summary

DESCRIPTION			Estimated Cost
Option No. 1 - Stone Tower Reconstruction			
Base Construction			$602,949
Recommended General Requirements	20%		$120,590
Contractor Fee	10%		$60,295
Recommended Project Contingency	25%		$150,737
		Total Hard Costs	**$934,571**
Option No. 2 - New Stone Tower (Stone Veneer)			
Base Construction			$465,949
Recommended General Requirements	20%		$93,190
Contractor Fee	10%		$46,595
Recommended Project Contingency	25%		$116,487
		Total Hard Costs	**$722,221**
Option No. 3 - Tower Removal with New Hip Roof			
Base Construction			$312,067
Recommended General Requirements	20%		$62,413
Contractor Fee	10%		$31,207
Recommended Project Contingency	25%		$78,017
		Total Hard Costs	**$483,704**
Roof Option No. 1 - New Asphalt Shingle Roof			
Base Construction			$87,636
Recommended General Requirements	20%		$17,527
Contractor Fee	10%		$8,764
Recommended Project Contingency	25%		$21,909
		Total Hard Costs	**$135,836**
Roof Option No. 2 - New Metal Standing Seam Roof			
Base Construction			$130,824
Recommended General Requirements	20%		$26,165
Contractor Fee	10%		$13,082
Recommended Project Contingency	25%		$32,706
		Total Hard Costs	**$202,777**

St. Thomas' Episcopal Church
Bell Tower Repair
Class 5 Estimate

October 18, 2021

Executive Summary

Roof Option No. 3 - New Slate Roof			
Base Construction			$175,781
Recommended General Requirements	20%		$35,156
Contractor Fee	10%		$17,578
Recommended Project Contingency	25%		$43,945
		Total Hard Costs	**$272,461**

St. Thomas' Episcopal Church October 18, 2021

Option No. 1 - Stone Tower Reconstruction

Class 5 Estimate **Division Breakdown**

DIV	DESCRIPTION	Estimated Cost
02 00 00	EXISTING CONDITIONS	$126,388
03 00 00	CONCRETE	$7,000
04 00 00	MASONRY	$416,200
06 00 00	WOOD, PLASTICS, AND COMPOSITES	$7,500
07 00 00	THERMAL AND MOISTURE PROTECTION	$45,862
Base Construction Costs:		**$602,949**
General Conditions and Requirements (20%)		**$120,590**
Contractor Fee (10%)		**$60,295**
Recommended Project Contingency (25%)		**$150,737**
Total Estimated Project Cost		**$934,571**

Project Schedule:

Design: 2 Months
Bid/Procurement: 2 Months
Construction: 16 Weeks Summer 2022

Drawings and Documentation Reviewed:

1. St. Thomas Episcopal Church Tower Repair Document
2. St. Thomas Episcopal Church - Roof Plan A1.0

Scope of Work:

1. The estimate is a Class 4 estimate with the purpose of conceptual study or feasibility with an estimated accuracy of +/- 20%.
2. The cost estimate consists of Q3 2021 market values. The pricing does not include potential changes in the price index measures for labor or materials. The projected escalation for 12 months is 14%; 24 months is 22%.
3. The project cost is contingent on finding a qualified bidder to perform the work.
4. Replace the lower copper roof and cricket. Install new roof flashing, granite brick/crack repair at base of tower, and lower window repair. Rake and repoint all tower masonry.
5. Salvage top 11' of granite masonry at the top of the tower. For the remainder of the tower, remove the exterior wythe of granite brick on the lower portion of the tower to the buttresses. Remove and replace all limestone window elements, cornices, and sandstone water tables. Re-install all salvaged granite block masonry to match existing.
6. Project delivery is assumed to be a General Contractor competitive bid method.
7. Work is to be performed during business hours and non-business hours.
8. Environmental remediation (if required) will be performed as part of the General Contractor's Contract.
9. Temporary relocations will need to occur during the construction period.
10. Bell tower structural hangers to be reconstructed to match existing using wood materials. An allowance was provided for the estimated costs.

St. Thomas' Episcopal Church October 18, 2021

Option No. 1 - Stone Tower Reconstruction

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
02 00 00	EXISTING CONDITIONS				
02 40 00	Demolition and Structure Moving				
	Dumpster Fees	8	wk	$ 1,250.00	$ 10,000
	Full Depth Masonry Salvage (RB2 - 20" Wall)	640	sf	$ 27.50	$ 17,600
	1 Wythe Masonry Salvage (RB1)	425	sf	$ 13.50	$ 5,738
	Copper Gutter Removal	1	al	$ 1,500.00	$ 1,500
	Slate Roof Removal	400	sf	$ 3.50	$ 1,400
	Copper Cricket Removal	150	sf	$ 7.00	$ 1,050
	Stain Glass Protection	1	al	$ 1,100.00	$ 1,100
	Debris Disposal	1	al	$ 3,000.00	$ 3,000
	Staging	1	al	$ 47,500.00	$ 47,500
	Temporary Shoring and Protection	1	ls	$ 37,500.00	$ 37,500
	Demolition and Structure Moving Total:				$ 126,388
				Subtotal Existing Conditions:	$ 126,388
03 00 00	CONCRETE				
03 20 00	Concrete Reinforcing				
	Epoxy and Anchor Rod	4	ea	$ 1,750.00	$ 7,000
	Concrete Reinforcing Total:				$ 7,000
				Subtotal Concrete:	$ 7,000
04 00 00	MASONRY				
04 00 00	Brick Pointing				
	Rake Out and Repoint (RR)	600	sf	$ 32.50	$ 19,500
	Brick Pointing Total:				$ 19,500
04 05 00	Epoxy Masonry Mortaring				
	Epoxy Repair	1	al	$ 7,500.00	$ 7,500
	Concrete Unit Masonry Total:				$ 7,500
04 40 00	Stone Assemblies				
	Limestone Wall Repair (PRR @ Lower Wall)	20	sf	$ 300.00	$ 6,000
	New Granite Block (RB1)	425	sf	$ 400.00	$ 170,000
	Granite Block Re-Build (RB2- 20" Wall)	640	sf	$ 200.00	$ 128,000
	Limestone Cornice - Upper Band (PRR)	68	lf	$ 300.00	$ 20,400
	Limestone Water Table - Lower Band (PRR)	72	lf	$ 300.00	$ 21,600
	Limestone Window Surround Replacement (PRR)	144	lf	$ 300.00	$ 43,200
	Stone Assemblies Total:				$ 389,200
				Subtotal Masonry:	$ 416,200
06 00 00	WOOD, PLASTICS, AND COMPOSITES				
06 10 00	Rough Carpentry				
	Bell Structure Reconstruction	1	al	$ 7,500.00	$ 7,500
	Rough Carpentry Total:				$ 7,500
				Subtotal Wood, Plastics, and Composites:	$ 7,500

St. Thomas' Episcopal Church October 18, 2021

Option No. 1 - Stone Tower Reconstruction

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
07 00 00	THERMAL AND MOISTURE PROTECTION				
07 50 00	Membrane Roofing				
	EPDM Membrane Roof	256	sf	$ 22.50	$ 5,760
	EPDM Membrane Adhesive	5	gal	$ 127.50	$ 638
	Membrane Roofing Total:				$ 5,760
07 60 00	Metal Roof				
	Copper Cricket Replacement	150	sf	$ 42.50	$ 6,375
	Copper Standing Seam Metal Roof	400	sf	$ 42.50	$ 17,000
	Metal Roof Total:				$ 23,375
07 61 00	Metal Flashing				
	Lead Stone Flashing	68	sf	$ 40.00	$ 2,720
	Step Flashing	45	sf/lf	$ 21.50	$ 968
	Copper Flashing	10	sf	$ 52.50	$ 525
	Crenel Top Thru Wall Flashing (RB2)	68	lf	$ 32.50	$ 2,210
	Parapet Thru Wall Flashing (RB2)	68	lf	$ 32.50	$ 2,210
	Copper Gutter	58	lf	$ 30.00	$ 1,725
	Copper Downspout	20	lf	$ 23.50	$ 470
	Drip Edge Flashing	100	lf	$ 4.00	$ 400
	Metal Flashing Total:				$ 11,228
07 70 00	Roof and Wall Specialties and Accessories				
	Scuppers - Re-Install or Replacement	1	al	$ 1,500.00	$ 1,500
	Roof and Wall Specialties and Accessories Total:				$ 1,500
07 90 00	Joint Protection				
	Sanding, Backer Rod, and Sealant (S)	186	lf	$ 21.50	$ 3,999
	Joint Protection Total:				$ 3,999

Subtotal Thermal and Moisture Protection: $ 45,862

ESTIMATED TOTAL PROJECT COST: $ 602,949

St. Thomas' Episcopal Church October 18, 2021

Option No. 2 - New Stone Tower (Stone Veneer)

Class 5 Estimate **Division Breakdown**

DIV	DESCRIPTION	Estimated Cost
02 00 00	EXISTING CONDITIONS	$126,388
03 00 00	CONCRETE	$7,000
04 00 00	MASONRY	$279,200
06 00 00	WOOD, PLASTICS, AND COMPOSITES	$7,500
07 00 00	THERMAL AND MOISTURE PROTECTION	$45,862
Base Construction Costs:		**$465,949**
General Conditions and Requirements (20%)		**$93,190**
Contractor Fee (10%)		**$46,595**
Recommended Project Contingency (25%)		**$116,487**
Total Estimated Project Cost		**$722,221**

Project Schedule:

Design: 2 Months
Bid/Procurement: 2 Months
Construction: 16 Weeks Summer 2022

Drawings and Documentation Reviewed:

1. St. Thomas Episcopal Church Tower Repair Document
2. St. Thomas Episcopal Church - Roof Plan A1.0

Scope of Work:

1. The estimate is a Class 4 estimate with the purpose of conceptual study or feasibility with an estimated accuracy of +/- 20%.
2. The cost estimate consists of Q3 2021 market values. The pricing does not include potential changes in the price index measures for labor or materials. The projected escalation for 12 months is 14%; 24 months is
3. The project cost is contingent on finding a qualified bidder to perform the work.
4. Replace the lower copper roof and cricket. Install new roof flashing, granite brick/crack repair at base of tower, and lower window repair. Rake and repoint all tower masonry.
5. Remove all masonry elements from the top of the tower down to the buttresses. Rebuild the tower to match existing with CMU block load bearing walls and stone veneer masonry. Remove and replace all limestone window elements, cornices, and sandstone water tables. Re-install salvaged granite block masonry to match existing where needed.
6. Project delivery is assumed to be a General Contractor competitive bid method.
7. Work is to be performed during business hours and non-business hours.
8. Environmental remediation (if required) will be performed as part of the General Contractor's Contract.
9. Temporary relocations will need to occur during the construction period.
10. Bell tower structural hangers to be reconstructed to match existing using wood materials. An allowance was provided for the estimated costs.

St. Thomas' Episcopal Church
Option No. 2 - New Stone Tower (Stone Veneer)

October 18, 2021

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
02 00 00	**EXISTING CONDITIONS**				
02 40 00	**Demolition and Structure Moving**				
	Dumpster Fees	8	wk	$ 1,250.00	$ 10,000
	Full Depth Masonry Removal (RB2 - 20" Wall)	640	sf	$ 27.50	$ 17,600
	1 Wythe Masonry Salvage (RB1)	425	sf	$ 13.50	$ 5,738
	Copper Gutter Removal	1	al	$ 1,500.00	$ 1,500
	Slate Roof Removal	400	sf	$ 3.50	$ 1,400
	Copper Cricket Removal	150	sf	$ 7.00	$ 1,050
	Stain Glass Protection	1	al	$ 1,100.00	$ 1,100
	Debris Disposal	1	al	$ 3,000.00	$ 3,000
	Staging	1	al	$ 47,500.00	$ 47,500
	Temporary Shoring and Protection	1	ls	$ 37,500.00	$ 37,500
	Demolition and Structure Moving Total:				**$ 126,388**
				Subtotal Existing Conditions:	**$ 126,388**
03 00 00	**CONCRETE**				
03 20 00	**Concrete Reinforcing**				
	Epoxy and Anchor Rod	4	ea	$ 1,750.00	$ 7,000
	Concrete Reinforcing Total:				**$ 7,000**
				Subtotal Concrete:	**$ 7,000**
04 00 00	**MASONRY**				
04 00 00	**Brick Pointing**				
	Rake Out and Repoint (RR)	600	sf	$ 32.50	$ 19,500
	Brick Pointing Total:				**$ 19,500**
04 05 00	**Epoxy Masonry Mortaring**				
	Epoxy Repair	1	al	$ 7,500.00	$ 7,500
	Concrete Unit Masonry Total:				**$ 7,500**
04 22 00	**Concrete Unit Masonry**				
	Concrete Masonry Unit	1,000	sf	$ 38.50	$ 38,500
	Concrete Unit Masonry Total:				**$ 38,500**
04 40 00	**Stone Assemblies**				
	Stone Veneer	1,000	sf	$ 122.50	$ 122,500
	Limestone Wall Repair (PRR @ Lower Wall)	20	sf	$ 300.00	$ 6,000
	Limestone Cornice - Upper Band (PRR)	68	lf	$ 300.00	$ 20,400
	Limestone Water Table - Lower Band (PRR)	72	lf	$ 300.00	$ 21,600
	Limestone Window Surround Replacement (PRR)	144	lf	$ 300.00	$ 43,200
	Stone Assemblies Total:				**$ 213,700**
				Subtotal Masonry:	**$ 279,200**
06 00 00	**WOOD, PLASTICS, AND COMPOSITES**				
06 10 00	**Rough Carpentry**				
	Bell Structure Reconstruction	1	al	$ 7,500.00	$ 7,500
	Rough Carpentry Total:				**$ 7,500**
				Subtotal Wood, Plastics, and Composites:	**$ 7,500**

St. Thomas' Episcopal Church
Option No. 2 - New Stone Tower (Stone Veneer)

October 18, 2021

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
07 00 00	**THERMAL AND MOISTURE PROTECTION**				
07 50 00	**Membrane Roofing**				
	EPDM Membrane Roof	256	sf	$ 22.50	$ 5,760
	EPDM Membrane Adhesive	5	gal	$ 127.50	$ 638
	Membrane Roofing Total:				**$ 5,760**
07 60 00	**Metal Roof**				
	Copper Cricket Replacement	150	sf	$ 42.50	$ 6,375
	Copper Standing Seam Metal Roof	400	sf	$ 42.50	$ 17,000
	Metal Roof Total:				**$ 23,375**
07 61 00	**Metal Flashing**				
	Lead Stone Flashing	68	sf	$ 40.00	$ 2,720
	Step Flashing	45	sf/lf	$ 21.50	$ 968
	Copper Flashing	10	sf	$ 52.50	$ 525
	Crenel Top Thru Wall Flashing (RB2)	68	lf	$ 32.50	$ 2,210
	Parapet Thru Wall Flashing (RB2)	68	lf	$ 32.50	$ 2,210
	Copper Gutter	58	lf	$ 30.00	$ 1,725
	Copper Downspout	20	lf	$ 23.50	$ 470
	Drip Edge Flashing	100	lf	$ 4.00	$ 400
	Metal Flashing Total:				**$ 11,228**
07 70 00	**Roof and Wall Specialties and Accessories**				
	Scuppers - Re-Install or Replacement	1	al	$ 1,500.00	$ 1,500
	Roof and Wall Specialties and Accessories Total:				**$ 1,500**
07 90 00	**Joint Protection**				
	Sanding, Backer Rod, and Sealant (S)	186	lf	$ 21.50	$ 3,999
	Joint Protection Total:				**$ 3,999**

Subtotal Thermal and Moisture Protection: $ 45,862

ESTIMATED TOTAL PROJECT COST: $ 465,949

St. Thomas' Episcopal Church October 18, 2021

Option No. 3 - Tower Removal with New Hip Roof

Class 5 Estimate **Division Breakdown**

DIV	DESCRIPTION	Estimated Cost
02 00 00	EXISTING CONDITIONS	$120,558
03 00 00	CONCRETE	$7,000
04 00 00	MASONRY	$110,700
06 00 00	WOOD, PLASTICS, AND COMPOSITES	$29,700
07 00 00	THERMAL AND MOISTURE PROTECTION	$44,110
Base Construction Costs:		**$312,067**
General Conditions and Requirements (20%)		**$62,413**
Contractor Fee (10%)		**$31,207**
Recommended Project Contingency (25%)		**$78,017**
Total Estimated Project Cost		**$483,704**

Project Schedule:

Design: 2 Months
Bid/Procurement: 2 Months
Construction: 16 Weeks Summer 2022

Drawings and Documentation Reviewed:

1. St. Thomas Episcopal Church Tower Repair Document
2. St. Thomas Episcopal Church - Roof Plan A1.0

Scope of Work:

1. The estimate is a Class 4 estimate with the purpose of conceptual study or feasibility with an estimated accuracy of +/- 20%.
2. The cost estimate consists of Q3 2021 market values. The pricing does not include potential changes in the price index measures for labor or materials. The projected escalation for 12 months is 14%; 24 months is 22%.
3. The project cost is contingent on finding a qualified bidder to perform the work.
4. Replace the lower copper roof and cricket. Install new roof flashing, granite brick/crack repair at base of tower, and lower window repair. Rake and repoint all tower masonry.
5. Remove all masonry elements from the top of the tower and partial removal of the upper portion of the buttresses. Install new hip slate roof to match eve with existing structure.
6. Project delivery is assumed to be a General Contractor competitive bid method.
7. Work is to be performed during business hours and non-business hours.
8. Environmental remediation (if required) will be performed as part of the General Contractor's Contract.
9. Temporary relocations will need to occur during the construction period.

\# Bell tower structural hangers to be reconstructed to match existing using wood materials. An allowance was provided for the estimated costs.

\# Option No. 2 will require interior finish renovations. An allowance was provided for the estimated costs.

St. Thomas' Episcopal Church October 18, 2021

Option No. 3 - Tower Removal with New Hip Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
02 00 00	**EXISTING CONDITIONS**				
02 40 00	**Demolition and Structure Moving**				
	Dumpster Fees	8	wk	$ 1,250.00	$ 10,000
	Full Depth Masonry Removal (RB2 - 20" Wall)	1,193	sf	$ 27.50	$ 32,808
	Copper Gutter Removal	1	al	$ 1,500.00	$ 1,500
	Slate Roof Removal	400	sf	$ 7.00	$ 2,800
	Copper Cricket Removal	150	sf	$ 9.00	$ 1,350
	Bell Tower Framing and Roof Removal	1	al	$ 3,500.00	$ 3,500
	Stain Glass Protection	1	al	$ 1,100.00	$ 1,100
	Debris Disposal	1	al	$ 3,000.00	$ 3,000
	Staging	1	al	$ 27,000.00	$ 27,000
	Temporary Shoring and Protection	1	ls	$ 37,500.00	$ 37,500
	Demolition and Structure Moving Total:				**$ 120,558**

Subtotal Existing Conditions: $ 120,558

03 00 00	**CONCRETE**				
03 20 00	**Concrete Reinforcing**				
	Epoxy and Anchor Rod	4	ea	$ 1,750.00	$ 7,000
	Concrete Reinforcing Total:				**$ 7,000**

Subtotal Concrete: $ 7,000

04 00 00	**MASONRY**				
04 00 00	**Brick Pointing**				
	Rake Out and Repoint (RR)	600	sf	$ 30.00	$ 18,000
	Brick Pointing Total:				**$ 18,000**
04 05 00	**Epoxy Masonry Mortaring**				
	Epoxy Repair	1	al	$ 7,500.00	$ 7,500
	Concrete Unit Masonry Total:				**$ 7,500**
04 40 00	**Stone Assemblies**				
	Limestone Wall Repair (PRR @ Lower Wall)	68	lf	$ 300.00	$ 20,400
	New Granite Block (RB1)	72	lf	$ 300.00	$ 21,600
	Limestone Window Surround Replacement (PRR)	144	lf	$ 300.00	$ 43,200
	Stone Assemblies Total:				**$ 85,200**

Subtotal Masonry: $ 110,700

06 00 00	**WOOD, PLASTICS, AND COMPOSITES**				
06 10 00	**Rough Carpentry**				
	Bell Structure Reconstruction	1	al	$ 4,000.00	$ 4,000
	Interior Renovation/Reconstruction	1	al	$ 10,000.00	$ 10,000
	Sheathing	1,200	sf	$ 6.00	$ 7,200
	Trusses (with Rigging)	10	ea	$ 850.00	$ 8,500
	Rough Carpentry Total:				**$ 29,700**

Subtotal Wood, Plastics, and Composites: $ 29,700

St. Thomas' Episcopal Church October 18, 2021

Option No. 3 - Tower Removal with New Hip Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
07 00 00	**THERMAL AND MOISTURE PROTECTION**				
07 31 00	**Shingles and Shakes**				
	New Slate Roof (New Addition Only)	1,200	sf	$ 16.50	$ 19,800
	Synthetic Roof Underlayment	12	sq	$ 22.88	$ 275
	Bituminous Roof Underlayment	12	sq	$ 110.13	$ 1,322
	Shingles and Shakes Total:				**$ 21,396**
07 61 00	**Metal Roof**				
	Copper Cricket Replacement	150	sf	$ 34.00	$ 5,100
	Copper Standing Seam Metal Roof	400	sf	$ 34.00	$ 13,600
	Metal Roof Total:				**$ 18,700**
07 62 00	**Metal Flashing**				
	Step Flashing	45	sf/lf	$ 21.50	$ 968
	Copper Flashing	10	sf	$ 52.50	$ 525
	Copper Gutter	40	lf	$ 30.00	$ 1,200
	Copper Downspout	30	lf	$ 23.50	$ 705
	Drip Edge Flashing	100	lf	$ 4.00	$ 400
	Metal Flashing Total:				**$ 3,798**
07 90 00	**Joint Protection**				
	Sanding, Backer Rod, and Sealant (S)	16	lf	$ 13.50	$ 216
	Joint Protection Total:				**$ 216**

Subtotal Thermal and Moisture Protection: $ 44,110

ESTIMATED TOTAL PROJECT COST: $ 312,067

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 1 - New Asphalt Shingle Roof

Class 5 Estimate **Division Breakdown**

DIV	DESCRIPTION	Estimated Cost
02 00 00	EXISTING CONDITIONS	$39,560
06 00 00	WOOD, PLASTICS, AND COMPOSITES	$4,000
07 00 00	THERMAL AND MOISTURE PROTECTION	$44,076
Base Construction Costs:		**$87,636**
General Conditions and Requirements (20%)		**$17,527**
Contractor Fee (10%)		**$8,764**
Recommended Project Contingency (25%)		**$21,909**
Total Estimated Project Cost		**$135,836**

Project Schedule:

Design: 2 Months
Bid/Procurement: 2 Months
Construction: 6 Weeks Summer 2022

Drawings and Documentation Reviewed:

1. St. Thomas Episcopal Church - Roof Plan A1.0

Scope of Work:

1. The estimate is a Class 4 estimate with the purpose of conceptual study or feasibility with an estimated accuracy of +/- 20%.
2. The cost estimate consists of Q3 2021 market values. The pricing does not include potential changes in the price index measures for labor or materials. The projected escalation for 12 months is 14%; 24 months is 22%.
3. The project cost is contingent on finding a qualified bidder to perform the work.
4. Remove existing slate and metal roofs (excluding roof systems included in the Tower Repair Project). Roof materials to be removed include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof or
5. Install new asphalt shingle roof system (excluding area included in the Tower Repair Project). New roof system to include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and asphalt shingles. Install new copper gutters and downspouts.
6. Project delivery is assumed to be a General Contractor competitive bid method.
7. Work is to be performed during business hours and non-business hours.
8. Environmental remediation (if required) will be performed as part of the General Contractor's Contract.
9. An allowance for damaged roof sheathing was provided.

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 1 - New Asphalt Shingle Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
02 00 00	EXISTING CONDITIONS				
02 40 00	Demolition and Structure Moving				
	Dumpster Fees	6	wk	$ 850.00	$ 5,100
	Demolition Debris Removal and Disposal Fees	60	tn	$ 81.00	$ 4,860
	Existing Roof, Gutter, and Flashing Removal	6,600	sf	$ 3.50	$ 23,100
	Staging	1	al	$ 6,500.00	$ 6,500
	Demolition and Structure Moving Total:				$ 39,560
				Subtotal Existing Conditions:	$ 39,560
06 00 00	WOOD, PLASTICS, AND COMPOSITES				
06 10 00	Rough Carpentry				
	Damage Roof Decking Replacement (Allowance)	1	al	$ 4,000.00	$ 4,000
	Rough Carpentry Total:				$ 4,000
				Subtotal Wood, Plastics, and Composites:	$ 4,000

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 1 - New Asphalt Shingle Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
07 00 00	**THERMAL AND MOISTURE PROTECTION**				
07 31 00	**Shingles and Shakes**				
	Asphalt Shingles	66	sq	$ 325.00	$ 21,450
	Synthetic Roof Underlayment	66	sq	$ 22.88	$ 1,510
	Bituminous Roof Underlayment	14	sq	$ 110.13	$ 1,553
	Cricket Replacement	1	al	$ 1,750.00	$ 1,750
	Shingles and Shakes Total:				**$ 26,263**
07 50 00	**Membrane Roofing**				
	EPDM Membrane Roof	63	sf	$ 16.00	$ 1,000
	EPDM Membrane Adhesive	1	gal	$ 105.00	$ 105
	Membrane Roofing Total:				**$ 1,105**
07 61 00	**Metal Flashing**				
	Drip Edge Flashing	335	lf	$ 2.88	$ 963
	Copper Gutter	350	lf	$ 30.00	$ 10,500
	Copper Downspout	180	lf	$ 23.50	$ 4,230
	Rubber Roof Transition Flashing	125	lf	$ 2.13	$ 266
	Metal Flashing Total:				**$ 15,959**
07 90 00	**Joint Protection**				
	Joint Sealant	1	al	$ 750.00	$ 750
	Joint Protection Total:				**$ 750**

Subtotal Thermal and Moisture Protection: $ 44,076

ESTIMATED TOTAL PROJECT COST: $ 87,636

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 2 - New Metal Standing Seam Roof

Class 5 Estimate **Division Breakdown**

DIV	DESCRIPTION	Estimated Cost
02 00 00	EXISTING CONDITIONS	$41,260
06 00 00	WOOD, PLASTICS, AND COMPOSITES	$4,000
07 00 00	THERMAL AND MOISTURE PROTECTION	$85,564
Base Construction Costs:		**$130,824**
General Conditions and Requirements (20%)		**$26,165**
Contractor Fee (10%)		**$13,082**
Recommended Project Contingency (25%)		**$32,706**
Total Estimated Project Cost		**$202,777**

Project Schedule:

Design: 2 Months
Bid/Procurement: 2 Months
Construction: 8 Weeks Summer 2022

Drawings and Documentation Reviewed:

1. St. Thomas Episcopal Church - Roof Plan A1.0

Scope of Work:

1. The estimate is a Class 4 estimate with the purpose of conceptual study or feasibility with an estimated accuracy of +/- 20%.
2. The cost estimate consists of Q3 2021 market values. The pricing does not include potential changes in the price index measures for labor or materials. The projected escalation for 12 months is 14%; 24 months is 22%.
3. The project cost is contingent on finding a qualified bidder to perform the work.
4. Remove existing slate and metal roofs (excluding roof systems included in the Tower Repair Project). Roof materials to be removed include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof or slate tiles.
5. Install new standing seam roof system (excluding area included in the Tower Repair Project). New roof system to include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof panels. Install new copper gutters and downspouts.
6. Project delivery is assumed to be a General Contractor competitive bid method.
7. Work is to be performed during business hours and non-business hours.
8. Environmental remediation (if required) will be performed as part of the General Contractor's Contract.
9. An allowance for damaged roof sheathing was provided.

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 2 - New Metal Standing Seam Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
02 00 00	EXISTING CONDITIONS				
02 40 00	Demolition and Structure Moving				
	Dumpster Fees	8	wk	$ 850.00	$ 6,800
	Demolition Debris Removal and Disposal Fees	60	tn	$ 81.00	$ 4,860
	Existing Roof, Gutter, and Flashing Removal	6,600	sf	$ 3.50	$ 23,100
	Staging	1	al	$ 6,500.00	$ 6,500
	Demolition and Structure Moving Total:				$ 41,260
				Subtotal Existing Conditions:	$ 41,260
06 00 00	WOOD, PLASTICS, AND COMPOSITES				
06 10 00	Rough Carpentry				
	Damage Roof Decking Replacement (Allowance)	1	al	$ 4,000.00	$ 4,000
	Rough Carpentry Total:				$ 4,000
				Subtotal Wood, Plastics, and Composites:	$ 4,000

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 2 - New Metal Standing Seam Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
07 00 00	**THERMAL AND MOISTURE PROTECTION**				
07 50 00	**Membrane Roofing**				
	EPDM Membrane Roof	63	sf	$ 16.00	$ 1,000
	EPDM Membrane Adhesive	1	gal	$ 105.00	$ 105
	Cricket Replacement	1	al	$ 1,750.00	$ 1,750
	Membrane Roofing Total:				**$ 2,855**
07 60 00	**Metal Roofing**				
	Standing Seam Metal Roof	6,600	sf	$ 10.00	$ 66,000
	Metal Roofing Total:				**$ 66,000**
07 61 00	**Metal Flashing**				
	Drip Edge Flashing	335	lf	$ 2.88	$ 963
	Copper Gutter	350	lf	$ 30.00	$ 10,500
	Copper Downspout	180	lf	$ 23.50	$ 4,230
	Rubber Roof Transition Flashing	125	lf	$ 2.13	$ 266
	Metal Flashing Total:				**$ 15,959**
07 90 00	**Joint Protection**				
	Joint Sealant	1	al	$ 750.00	$ 750
	Joint Protection Total:				**$ 750**

Subtotal Thermal and Moisture Protection: $ 85,564

ESTIMATED TOTAL PROJECT COST: $ 130,824

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 3 - New Slate Roof

Class 5 Estimate **Division Breakdown**

DIV	DESCRIPTION	Estimated Cost
02 00 00	EXISTING CONDITIONS	$42,110
06 00 00	WOOD, PLASTICS, AND COMPOSITES	$4,000
07 00 00	THERMAL AND MOISTURE PROTECTION	$129,671
Base Construction Costs:		**$175,781**
General Conditions and Requirements (20%)		**$35,156**
Contractor Fee (10%)		**$17,578**
Recommended Project Contingency (25%)		**$43,945**
Total Estimated Project Cost		**$272,461**

Project Schedule:

Design: 2 Months
Bid/Procurement: 2 Months
Construction: 9 Weeks Summer 2022

Drawings and Documentation Reviewed:

1. St. Thomas Episcopal Church - Roof Plan A1.0

Scope of Work:

1. The estimate is a Class 4 estimate with the purpose of conceptual study or feasibility with an estimated accuracy of +/- 20%.
2. The cost estimate consists of Q3 2021 market values. The pricing does not include potential changes in the price index measures for labor or materials. The projected escalation for 12 months is 14%; 24 months is 22%.
3. The project cost is contingent on finding a qualified bidder to perform the work.
4. Remove existing slate and metal roofs (excluding roof systems included in the Tower Repair Project). Roof materials to be removed include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof or slate tiles.
5. Install new slate roof system (excluding area included in the Tower Repair Project). New roof system to include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and slate roof tiles. Install new copper gutters and downspouts.
6. Project delivery is assumed to be a General Contractor competitive bid method.
7. Work is to be performed during business hours and non-business hours.
8. Environmental remediation (if required) will be performed as part of the General Contractor's Contract.
9. An allowance for damaged roof sheathing was provided.

St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 3 - New Slate Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
02 00 00	**EXISTING CONDITIONS**				
02 40 00	**Demolition and Structure Moving**				
	Dumpster Fees	9	wk	$ 850.00	$ 7,650
	Demolition Debris Removal and Disposal Fees	60	tn	$ 81.00	$ 4,860
	Existing Roof, Gutter, and Flashing Removal	6,600	sf	$ 3.50	$ 23,100
	Staging	1	al	$ 6,500.00	$ 6,500
	Demolition and Structure Moving Total:				**$ 42,110**
				Subtotal Existing Conditions:	**$ 42,110**
06 00 00	**WOOD, PLASTICS, AND COMPOSITES**				
06 10 00	**Rough Carpentry**				
	Damage Roof Decking Replacement (Allowance)	1	al	$ 4,000.00	$ 4,000
	Rough Carpentry Total:				**$ 4,000**
				Subtotal Wood, Plastics, and Composites:	**$ 4,000**

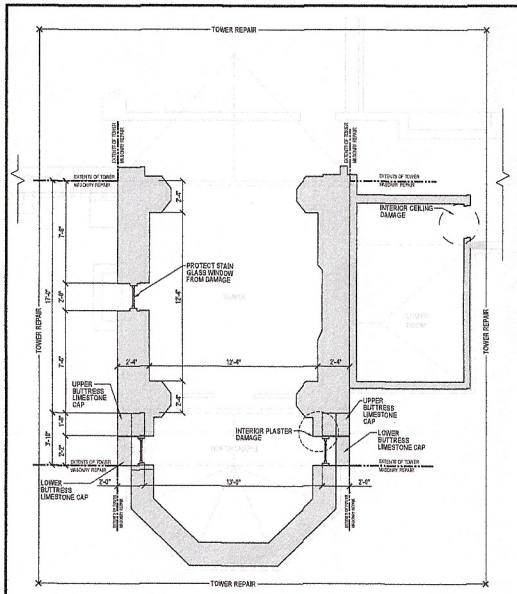
St. Thomas' Episcopal Church October 18, 2021

Roof Option No. 3 - New Slate Roof

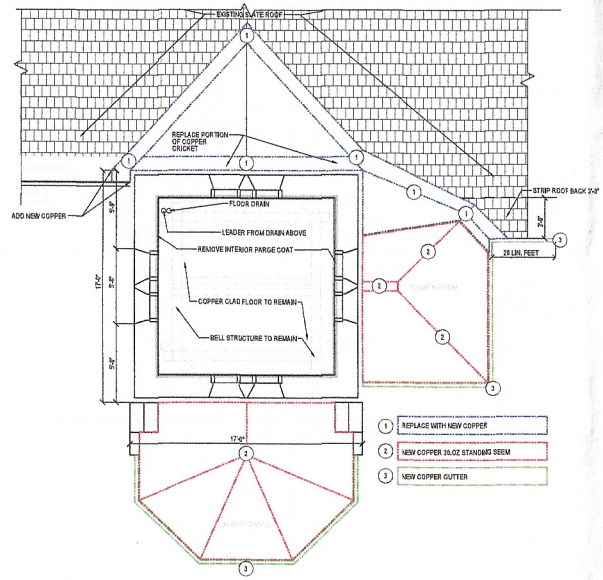
Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
07 00 00	**THERMAL AND MOISTURE PROTECTION**				
07 31 00	**Shingles and Shakes**				
	New Slate Roof	6,600	sq	$ 16.50	$ 108,900
	Synthetic Roof Underlayment	66	sq	$ 22.88	$ 1,510
	Bituminous Roof Underlayment	14	sq	$ 110.13	$ 1,553
	Shingles and Shakes Total:				**$ 111,963**
07 50 00	**Membrane Roofing**				
	EPDM Membrane Roof	63	sf	$ 16.00	$ 1,000
	EPDM Membrane Adhesive	1	gal	$ 105.00	$ 105
	Membrane Roofing Total:				**$ 1,000**
07 61 00	**Metal Flashing**				
	Drip Edge Flashing	335	lf	$ 2.88	$ 963
	Copper Gutter	350	lf	$ 30.00	$ 10,500
	Copper Downspout	180	lf	$ 23.50	$ 4,230
	Rubber Roof Transition Flashing	125	lf	$ 2.13	$ 266
	Metal Flashing Total:				**$ 15,959**
07 90 00	**Joint Protection**				
	Joint Sealant	1	al	$ 750.00	$ 750
	Joint Protection Total:				**$ 750**

Subtotal Thermal and Moisture Protection: $ 129,671

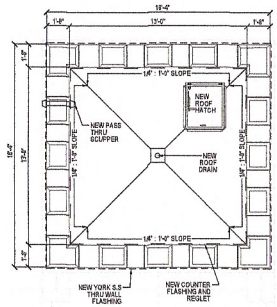
ESTIMATED TOTAL PROJECT COST: $ 175,781



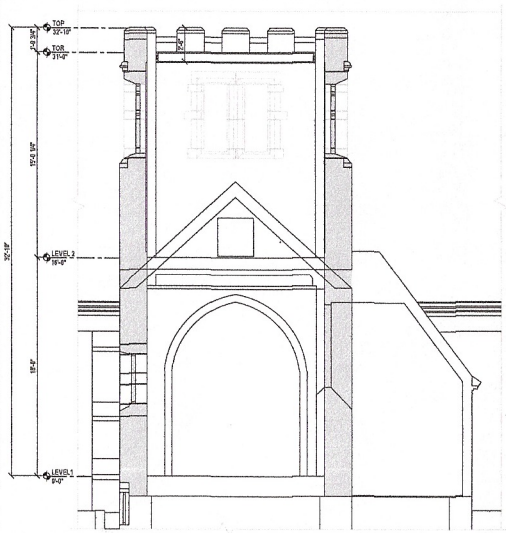
1 TOWER 1ST FLOOR
1/4"=1'-0"



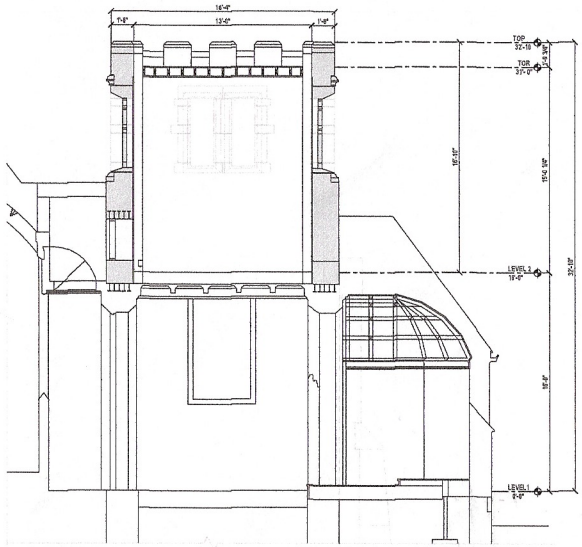
2 TOWER @ 2ND FLOOR AND ADJACENT ROOF WORK
1/4"=1'-0"



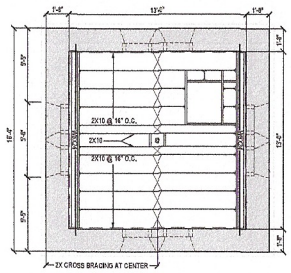
5 TOWER ROOF PLAN
1/4"=1'-0"



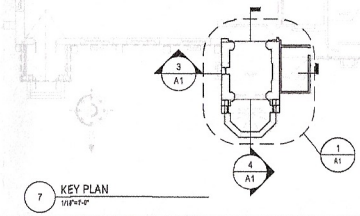
3 TOWER SECTION
1/4"=1'-0"



4 TOWER SECTION
1/4"=1'-0"



6 TOWER ROOF FRAMING PLAN
1/4"=1'-0"



7 KEY PLAN
1/16"=1'-0"

PRICING DOCUMENTS

NOT FOR CONSTRUCTION

Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS
PO BOX 2589, SOUTH PORTLAND MAINE, 04116
PHONE: 207.400.0086

St. Thomas Episcopal Church
33 Chestnut St, Camden, Maine 04843

Tower Repair Documents

REVISIONS

DRAWN BY: RJH
CHECKED BY: TSD
DATE: 09-27-2019
ISSUED: PRICING DOCUMENTS

PLANS, SECTIONS AND KEY PLAN

A1

SCALE: AS NOTED
PROJECT NUMBER: 018.2-19

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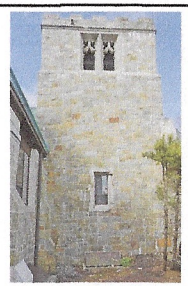
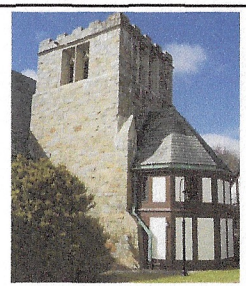
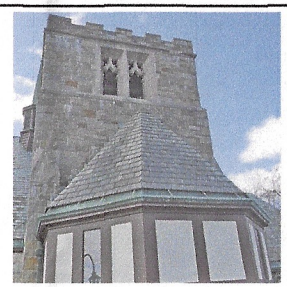


A IMAGE OF TOWER LOOKING EAST



B IMAGE OF TOWER LOOKING NORTH EAST



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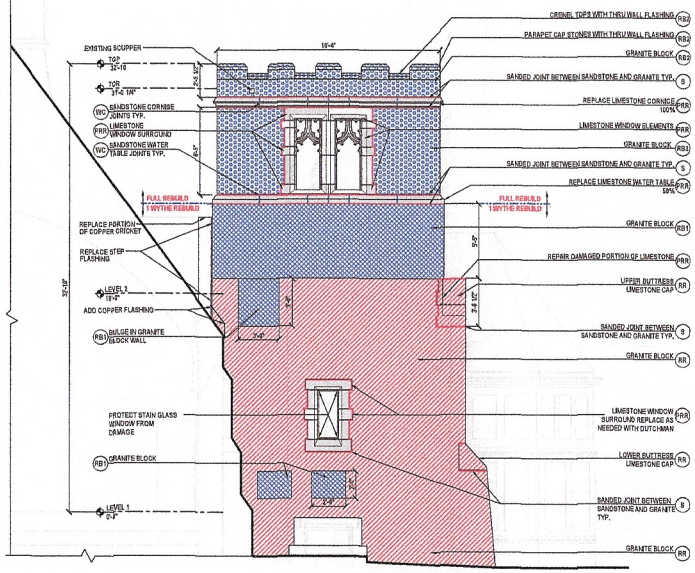
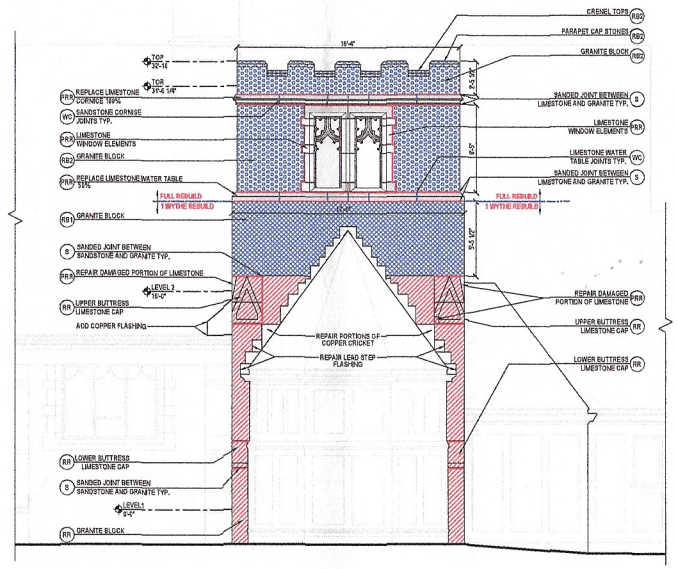


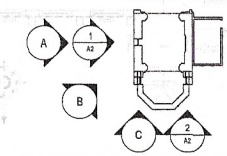
1 EAST TOWER ELEVATION
1/4"=1'-0"



2 NORTH TOWER ELEVATION
1/4"=1'-0"

RR	RB1	RB2	PRR	E	S	WC	CL
RAKE OUT AND REPOINT	REBUILD MASONRY 1 WYTHE	REBUILD MASONRY FULL DEPTH	PATCH REPAIR, AND OR REPLACE LIMESTONE ELEMENT	EPOXY	BACKER ROD AND SEALANT	WEATHER CAP	CLEAN MASONRY
RAKE OUT & RE-POINT: RAKE OUT ALL EXISTING MORTAR JOINTS WITHIN DESIGNATED AREA TO A MINIMUM DEPTH OF 1" UNLESS OTHERWISE NOTED. RE-POINT MORTAR JOINTS WITH AN APPROVED MORTAR RECIPE, TOOL JOINT TO MATCH APPROVED MOCK-UP. REMOVE RESIDUAL MORTAR FROM SURFACE OF MASONRY IMMEDIATELY. DO NOT LET MORTAR HARDEN ON THE SURFACE OF MASONRY. MORTAR MUST CURE A MINIMUM OF 7-10 DAYS PRIOR TO FINAL WASHING (CURING TIME MAY VARY DEPENDING ON WEATHER CONDITIONS). WASH MASONRY WITH SPECIFIED PRODUCT LISTED IN THESE DOCUMENTS. ADDITIONAL WASHES MAY BE NECESSARY TO OBTAIN THE DESIRED APPERANCE. FINAL APPERANCE WILL MATCH MOCKUP IN ALL LOCATIONS	**REBUILD:** REMOVE AND REBUILD INDICATED MASONRY WITHIN DESIGNATED AREA 1 WYTHE DEEP UNLESS OTHERWISE NOTED. REBUILD USING EXISTING MATERIALS IF POSSIBLE. MATCH EXISTING MATERIALS. REASSEMBLE TO MATCH EXISTING CONFIGURATION AT ALL LOCATIONS. INSTALL HELICAL WALL TIES BY HELIFIX CORP. AS PER THE DETAILS. LAY NEW MASONRY TRUE AND PLUMB WITH APPROVED MORTAR RECIPE. REMOVE RESIDUAL MORTAR FROM ADJACENT MATERIAL IMMEDIATELY. DO NOT LET HARDEN ON MASONRY SURFACE. MORTAR MUST CURE FOR AT LEAST 7-10 DAYS PRIOR TO FINAL WASH (CURING TIME MAY VARY DEPENDING ON WEATHER CONDITIONS). WASH MASONRY WITH SPECIFIED PRODUCT LISTED IN THESE DOCUMENTS. ADDITIONAL WASHES MAY BE NECESSARY TO OBTAIN THE DESIRED APPERANCE. FINAL APPERANCE WILL MATCH MOCKUP IN ALL LOCATIONS IN ALL AREAS MARKED AS REBUILD.	**REBUILD:** REMOVE AND REBUILD INDICATED MASONRY WITHIN DESIGNATED AREA TO FULL DEPTH UNLESS OTHERWISE NOTED. REBUILD USING EXISTING MATERIALS IF POSSIBLE. MATCH EXISTING MATERIALS. REASSEMBLE TO MATCH EXISTING CONFIGURATION AT ALL LOCATIONS. LAY NEW MASONRY TRUE AND PLUMB WITH APPROVED MORTAR RECIPE. REMOVE RESIDUAL MORTAR FROM ADJACENT MATERIAL IMMEDIATELY. DO NOT LET HARDEN ON MASONRY SURFACE. MORTAR MUST CURE FOR AT LEAST 7-10 DAYS PRIOR TO FINAL WASH (CURING TIME MAY VARY DEPENDING ON WEATHER CONDITIONS). WASH MASONRY WITH SPECIFIED PRODUCT LISTED IN THESE DOCUMENTS. ADDITIONAL WASHES MAY BE NECESSARY TO OBTAIN THE DESIRED APPERANCE. FINAL APPERANCE WILL MATCH MOCKUP IN ALL LOCATIONS IN ALL AREAS MARKED AS REBUILD.	**PATCH MASONRY:** REMOVE LOOSE, SCALING OR SPALLING MASONRY. PREPARE MASONRY AS PER MANUFACTURERS RECOMMENDATION. PATCH WITH PRODUCT **REPAIR MASONRY:** EPOXY DUTCHMAN AND PIN LIMESTONE ELEMENTS **REPLACE MASONRY:** ALL INDICATED LIMESTONE ELEMENTS ARE TO BE REPLACED WITH NEW TO MATCH EXISTING IF THEY CANNOT BE PROPERLY EPOXYED AND PATCHED	**EPOXY:** CONTRACTOR WILL APPLY TWO-PART EPOXY RESIN TO REPAIR MASONRY ELEMENTS. IF MATERIAL IS FRACTURED INTO LOOSE PIECES OR MISSING FILL THE VOID WITH A DUTCHMAN WITH MATERIAL TO MATCH EXISTING. DRILL AND EPOXY 3/8" S.S. THREADED ANCHORING RODS INTO BEDRIDS AS NEEDED PART OF THE REPAIR. IF THE CAUSE OF CRACKING IS DUE TO STRUCTURAL LOADING, CONTACT BUILDING ENVELOPE SPECIALISTS FOR ADDITIONAL REPAIR ALTERNATIVES. IF SECTION OF STONE IS LOOSE, REMOVE, CLEAN, AND EPOXY IN ORIGINAL LOCATION (SEE 1/B6S) FOR PRODUCT INFORMATION	**SEALANT:** INSTALL NEW CLOSED CELL FOAM BACKER ROD AS REQUIRED AFTER REPOINTING. INSTALL SEALANT PER THE DETAILS AND MANUFACTURERS SPECIFICATIONS. CONTRACTOR WILL COORDINATE A FULL TEST APPROVAL WITH SEALANT MANUFACTURERS REP FOR WARRANTY PURPOSES AND SUBMIT A COPY TO JBES. ALL SEALANT JOINTS TO BE SHADED TO MATCH MORTAR. (SEE 1/B6S) FOR PRODUCT INFORMATION	**WEATHER CAP:** LEAD STONE FLASHING STRIPS PROVIDE AND INSTALL PER MANUFACTURERS SPECIFICATIONS.	**CLEAN MASONRY:** APPLY PRODUCT TO INDICATED MASONRY AS PER MANUFACTURERS SPECIFICATIONS. (SEE 1/B6S) FOR PRODUCT INFORMATION

3 NOTES AND LEGEND
1/8"=1'-0"



4 KEY PLAN
3/32"=1'-0"

PRICING DOCUMENTS

NOT FOR CONSTRUCTION

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SPECIALIZED BUILDING CONSULTANTS
PO BOX 2589, SOUTH PORTLAND MAINE, 04116
PHONE: 207-400.0086

St. Thomas Episcopal Church
33 Chestnut St, Camden, Maine 04843

Tower Repair Documents

REVISIONS

DRAWN BY: RJH
CHECKED BY: TSD
DATE: 09-27-2019
ISSUED: PRICING DOCUMENTS

TOWER ELEVATIONS, PROJECT NOTES, IMAGES AND KEY PLAN

A2

SCALE: AS NOTED
PROJECT NUMBER: 018.2-19

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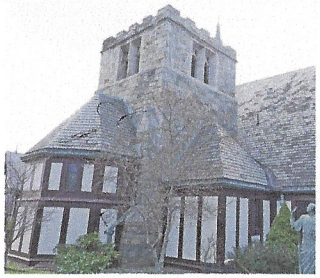
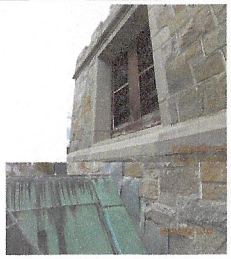
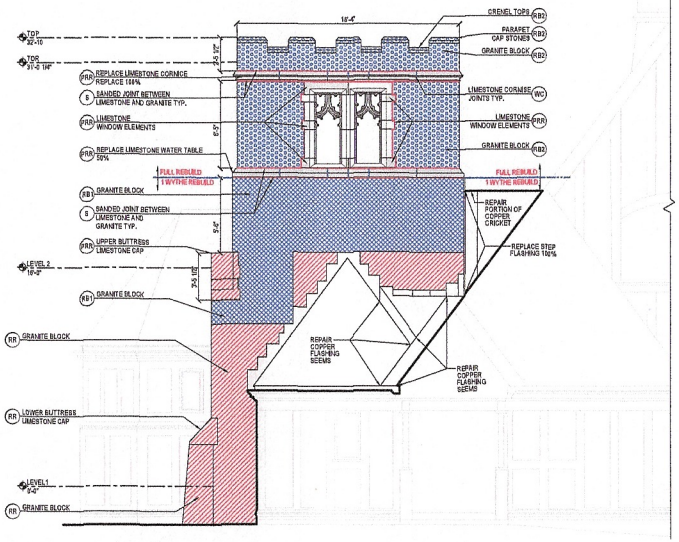


A IMAGE OF TOWER LOOKING NORTH WEST

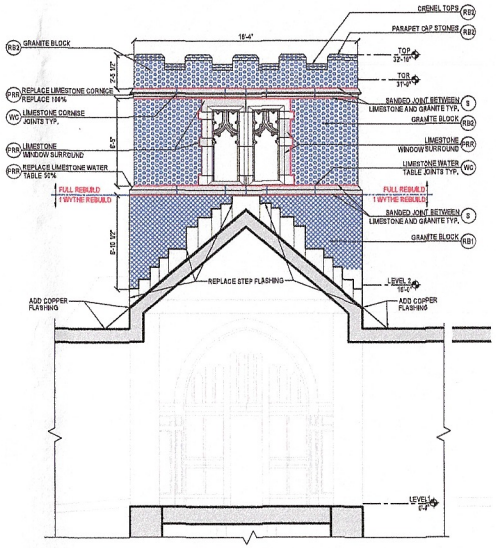
B IMAGE OF TOWER LOOKING WEST



C IMAGE OF TOWER LOOKING SOUTH



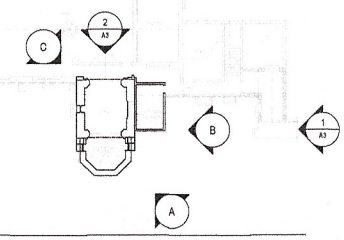
1 WEST TOWER ELEVATION
1/4"=1'-0"



2 SOUTH TOWER ELEVATION
1/4"=1'-0"

RR	RB1	RB2	PRR	E	S	WC	CL
RAKE OUT AND REPOINT	REBUILD MASONRY 1 WYDTH	REBUILD MASONRY FULL DEPTH	PATCH REPAIR , AND OR REPLACE LIMESTONE ELEMENT	EPOXY	BACKER ROD AND SEALANT	WEATHER CAP	CLEAN MASONRY
RAKE OUT & RE-POINT: RAKE OUT ALL EXISTING MORTAR JOINTS WITHIN DESIGNATED AREA TO A MINIMUM DEPTH OF 1" UNLESS OTHERWISE NOTED. RE-POINT MORTAR JOINTS WITH AN APPROVED MORTAR RECIPE. TOOL JOINT TO MATCH APPROVED MOCKUP. REMOVE RESIDUAL MORTAR FROM SURFACE OF MASONRY IMMEDIATELY. DO NOT LET MORTAR HARDEN ON THE SURFACE OF MASONRY. MORTAR MUST CURE A MINIMUM OF 3-10 DAYS PRIOR TO FINAL WASHING (CURING TIME MAY VARY DEPENDING ON WEATHER CONDITIONS). WASH MASONRY WITH SPECIFIED PRODUCT LISTED IN THESE DOCUMENTS. ADDITIONAL WASHES MAY BE NECESSARY TO OBTAIN THE DESIRED APPEARANCE. FINAL APPEARANCE WILL MATCH MOCKUP IN ALL LOCATIONS	**REBUILD:** REMOVE AND REBUILD INDICATED MASONRY WITHIN DESIGNATED AREA 1 WYTHE DEEP UNLESS OTHERWISE NOTED. REBUILD USING EXISTING MATERIALS IF POSSIBLE. MATCH EXISTING MATERIALS. REASSEMBLE TO MATCH EXISTING CONFIGURATION AT ALL LOCATIONS. INSTALL HELICAL WALL TIES BY HELIFIX CORP. AS PER THE DETAILS. LAY NEW MASONRY TRUE AND PLUMB WITH APPROVED MORTAR RECIPE. REMOVE RESIDUAL MORTAR FROM ADJACENT MATERIAL IMMEDIATELY. DO NOT LET HARDEN ON MASONRY SURFACE. MORTAR MUST CURE FOR AT LEAST 7-10 DAYS PRIOR TO FINAL WASH (CURING TIME MAY VARY DEPENDING ON WEATHER CONDITIONS). WASH MASONRY WITH SPECIFIED PRODUCT LISTED IN THESE DOCUMENTS. ADDITIONAL WASHES MAY BE NECESSARY TO OBTAIN THE DESIRED APPEARANCE. FINAL APPEARANCE WILL MATCH MOCKUP IN ALL LOCATIONS IN ALL AREAS MARKED AS REBUILD.	**REBUILD:** REMOVE AND REBUILD INDICATED MASONRY WITHIN DESIGNATED AREA TO FULL DEPTH UNLESS OTHERWISE NOTED. REBUILD USING EXISTING MATERIALS IF POSSIBLE. MATCH EXISTING MATERIALS. REASSEMBLE TO MATCH EXISTING CONFIGURATION AT ALL LOCATIONS. LAY NEW MASONRY TRUE AND PLUMB WITH APPROVED MORTAR RECIPE. REMOVE RESIDUAL MORTAR FROM ADJACENT MATERIAL IMMEDIATELY. DO NOT LET HARDEN ON MASONRY SURFACE. MORTAR MUST CURE FOR AT LEAST 7-10 DAYS PRIOR TO FINAL WASH (CURING TIME MAY VARY DEPENDING ON WEATHER CONDITIONS). WASH MASONRY WITH SPECIFIED PRODUCT LISTED IN THESE DOCUMENTS. ADDITIONAL WASHES MAY BE NECESSARY TO OBTAIN THE DESIRED APPEARANCE. FINAL APPEARANCE WILL MATCH MOCKUP IN ALL LOCATIONS IN ALL AREAS MARKED AS REBUILD.	**PATCH MASONRY :** REMOVE LOOSE, TENDER OR SPALLING MASONRY. PREPARE MASONRY AS PER MANUFACTURERS RECOMMENDATION. PATCH WITH PRODUCT **REPAIR MASONRY :** EPOXY, DUTCHMAN AND PIN LIMESTONE ELEMENTS **REPLACE MASONRY :** ALL INDICATED LIMESTONE ELEMENTS ARE TO BE REPLACED WITH NEW TO MATCH EXISTING IF THEY CANNOT BE PROPERLY EPOXIED AND PATCHED	**EPOXY:** CONTRACTOR WILL APPLY THE SAFAST EPOXY RESIN TO REPAIR MASONRY ELEMENTS. IF MATERIAL IS FRACTURED INTO LOOSE PIECES OR MISSING FILL THE VOID WITH A DUTCHMAN WITH MATERIAL TO MATCH EXISTING. DRILL AND EPOXY 3/8" S.S. THREADED ANCHORING PINS INTO ELEMENTS AS NEEDED PART OF THE REPAIR. IF THE CAUSE OF CRACKING IS DUE TO STRUCTURAL LOADING CONTACT BUILDING ENVELOPE SPECIALISTS FOR ADDITIONAL REPAIR MEASURES. IF SECTION OF STONE IS LOOSE, REMOVE, CLEAN, AND EPOXY IN ORIGINAL LOCATION. (SEE 1/BES) FOR PRODUCT INFORMATION	**SEALANT:** INSTALL NEW CLOSED CELL FOAM BACKER ROD AS REQUIRED AFTER RE-POINTING. INSTALL SEALANT PER THE DETAILS AND MANUFACTURERS SPECIFICATIONS . CONTRACTOR WILL COORDINATE A FULL TEST APPROVAL WITH SEALANT MANUFACTURERS REP FOR WARRANTY PURPOSES AND SUBMIT A COPY TO BES. ALL SEALANT JOINTS TO BE SAUSED TO MATCH MORTAR. (SEE 1/BES) FOR PRODUCT INFORMATION	**WEATHER CAP:** LEAD STONE FLASHING STRIPS PROVIDE AND INSTALL PER MANUFACTURERS SPECIFICATIONS.	**CLEAN MASONRY:** APPLY PROCLEAN TO INDICATED MASONRY AS PER MANUFACTURERS SPECIFICATIONS. (SEE 1/BES) FOR PRODUCT INFORMATION

3 NOTES AND LEGEND
1/8"=1'-0"



4 KEY PLAN
3/32"=1'-0"

PRICING DOCUMENTS

NOT FOR CONSTRUCTION

Building Envelope Specialists
SPECIALIZED BUILDING CONSULTANTS
PO BOX 2589, SOUTH PORTLAND MAINE, 04116
PHONE: 207.400.0086

St.Thomas Episcopal Church

33 Chestnut St, Camden, Maine 04843

Tower Repair Documents

REVISIONS

DRAWN BY: RJH
CHECKED BY: TSD
DATE: 09-27-2019
ISSUED: PRICING DOCUMENTS

TOWER ELEVATIONS,PROJECT NOTES AND KEY PLAN

A3

SCALE: AS NOTED
PROJECT NUMBER : 018.2-19

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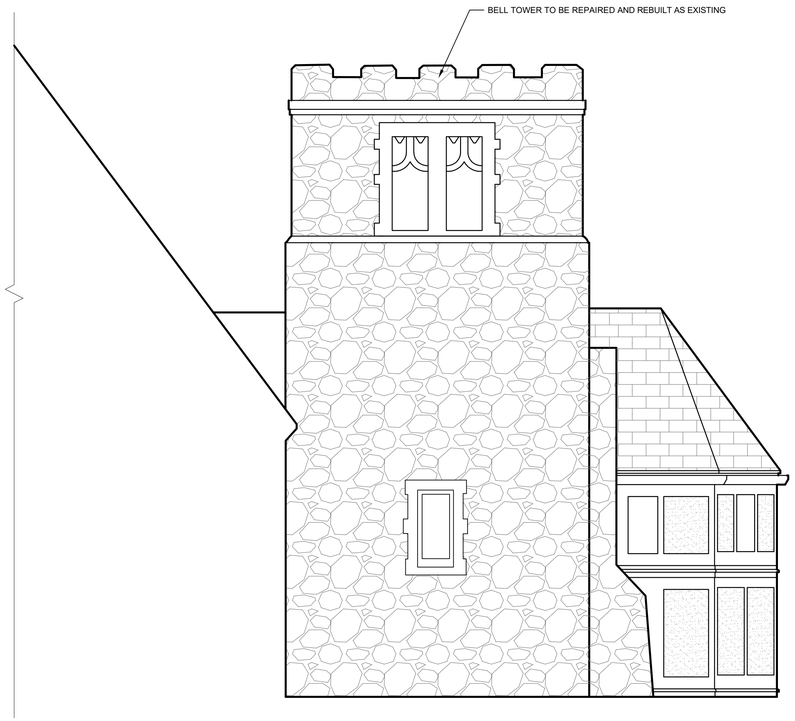


EAST ELEVATION
OPTION 1 MAY 17, 2021

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

NORTH ELEVATION
OPTION 1 MAY 17, 2021

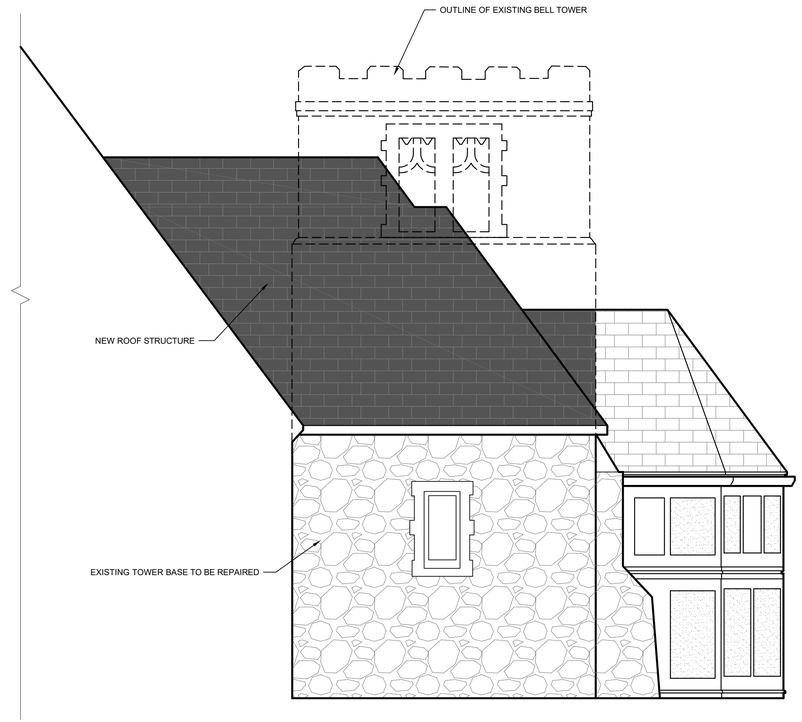
0 2' 4' 8'
SCALE: 1/4" = 1'-0"

WEST ELEVATION
OPTION 1 MAY 17, 2021

0 2' 4' 8'
SCALE: 1/4" = 1'-0"

ST THOMAS' EPISCOPAL CHURCH
33 CHESTNUT STREET
CAMDEN, MAINE

OPTION 1
MAY 17, 2021



EAST ELEVATION

OPTION 4 MAY 17, 2021

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

NORTH ELEVATION

OPTION 4 MAY 17, 2021

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

WEST ELEVATION

OPTION 4

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

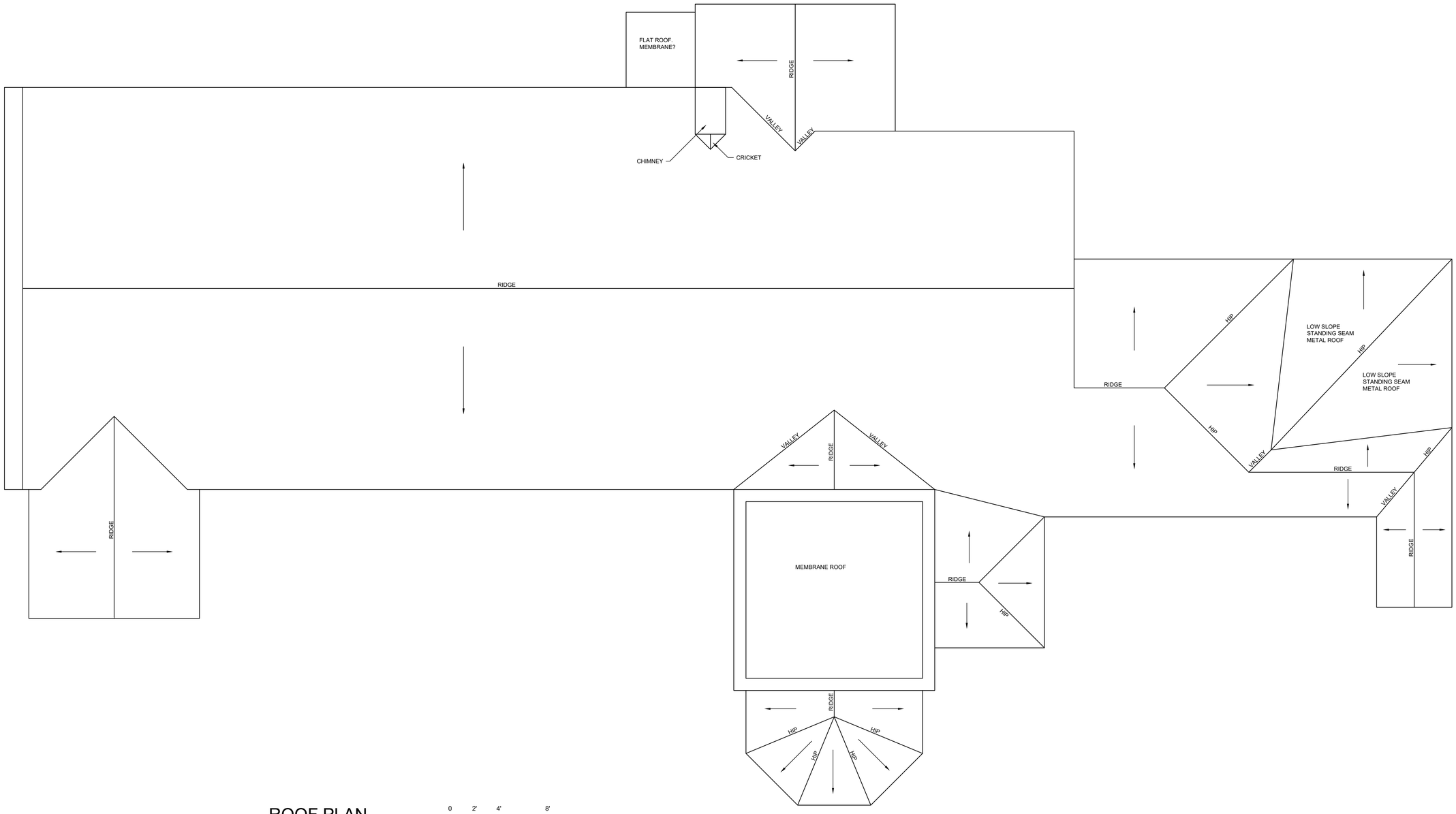
ST THOMAS' EPISCOPAL CHURCH

33 CHESTNUT STREET

CAMDEN, MAINE

OPTION 2

MAY 17, 2021



ROOF PLAN

0 2' 4' 8'

SCALE: 1/4" = 1'-0"

Chuck Campbell Architect PLLC
127 UNION ROAD
Waldoboro, Maine 04572
TEL (207)557-0448
e-mail cmcarch@midcoast.com

PROJECT: ST THOMAS' EPISCOPAL CHURCH

ADDRESS: 33 CHESTNUT STREET
CAMDEN, MAINE

NO.	REVISIONS	DATE

SHEET TITLE: ROOF PLAN

SCALE: AS INDICATED

DATE: SEPTEMBER 14, 2021

PROJ. ID. ST THOMAS

A1.0

Index

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- Building Envelope Specialists – Assessment and Proposal
- Building Envelope Specialists – Summary of Exterior Masonry Condition
- Building Envelope Specialists – Summary of Mortar Analysis
- Highbridge Materials Consulting – Mortar Analysis Report
- Building Envelope Specialists – Project Budget
- Gnazzo – Masonry Repair Budget

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- Building Envelope Specialists – Findings Report
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- Bell Tower Repair Opinion of Probable Cost
- Roofing Options
- AACE International Recommended Practice No. 18R-97 - COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE PROCESS INDUSTRIES

CHUCK CAMPBELL ARCHITECT PLLC

Date: December 7, 2021

To: Edmund Hartt

From: Chuck Campbell

Chuck Campbell Architect PLLC

The reroofing of the existing church is being considered as an addition to the scope of work for the bell tower renovation. The following is a discussion of the 4 options for reroofing. All of the options are based on 6,600 sq.ft. of roofing.

The first option is asphalt shingles. The estimated project cost for asphalt shingles is $135,836. Assuming a 20 year life span, this works out at $1.02 per sq.ft. per year. The annual maintenance would include gutter cleaning and a roof inspection. Repair any areas that need repair. The repair of asphalt shingles is fairly easy but the chance of needing repair is greater. The roof would need to be reroofed in approximately 20 years.

The second option is standing seam metal roofing. The estimated project cost for the standing seam metal roofing is $202,777. Assuming a 50 year life span, this works out to $.61 per sq.ft. per year. The annual maintenance would include gutter cleaning and a roof inspection. Repair any areas that need repair. The repair of a standing seam metal roof is more difficult but the need for repair should be minimal. The roof would need to be reroofed in approximately 50 years.

The third option is faux slate. The estimated project cost for faux slate is $226,426. Assuming a 50 year life span, this works out at $68 per sq.ft. per year. The annual maintenance would include gutter cleaning and a roof inspection. Repair any areas that need repair. The repair of a faux slate is difficult but the need for repair should be minimal. The roof would need to be reroofed in approximately 50 years.

The fourth option is slate. The estimated project cost for slate is $272,461. Assuming a 100 year life span, this works out at $.41 per sq.ft. per year. The annual maintenance would include gutter cleaning and a roof inspection. Repair any areas that need repair. The repair of a slate is difficult but the need for repair should be minimal. The roof would need to be reroofed in approximately 100 years.

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St. Thomas' Episcopal Church December 7, 2021

Roof Option No. 4 - New Slate Roof

Class 5 Estimate **Division Breakdown**

DIV	DESCRIPTION	Estimated Cost
02 00 00	EXISTING CONDITIONS	$42,110
06 00 00	WOOD, PLASTICS, AND COMPOSITES	$4,000
07 00 00	THERMAL AND MOISTURE PROTECTION	$99,971
Base Construction Costs:		**$146,081**
General Conditions and Requirements (20%)		**$29,216**
Contractor Fee (10%)		**$14,608**
Recommended Project Contingency (25%)		**$36,520**
Total Estimated Project Cost		**$226,426**

Project Schedule:

Design: 2 Months
Bid/Procurement: 2 Months
Construction: 9 Weeks Summer 2022

Drawings and Documentation Reviewed:

1. St. Thomas Episcopal Church - Roof Plan A1.0

Scope of Work:

1. The estimate is a Class 4 estimate with the purpose of conceptual study or feasibility with an estimated accuracy of +/- 20%.
2. The cost estimate consists of Q3 2021 market values. The pricing does not include potential changes in the price index measures for labor or materials. The projected escalation for 12 months is 14%; 24 months is 22%.
3. The project cost is contingent on finding a qualified bidder to perform the work.
4. Remove existing slate and metal roofs (excluding roof systems included in the Tower Repair Project). Roof materials to be removed include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and metal roof or slate tiles.
5. Install new faux slate roof system (excluding area included in the Tower Repair Project). New roof system to include: Roof underlayment (both synthetic and bituminous), drip edge, step flashing, and faux slate roof tiles. Install new copper gutters and downspouts.
6. Project delivery is assumed to be a General Contractor competitive bid method.
7. Work is to be performed during business hours and non-business hours.
8. Environmental remediation (if required) will be performed as part of the General Contractor's Contract.
9. An allowance for damaged roof sheathing was provided.

St. Thomas' Episcopal Church December 7, 2021

Roof Option No. 3 - New Slate Roof

Div. No.	Description	Quantity Units	Quantity UOM	Unit Cost	Estimated Cost
02 00 00	**EXISTING CONDITIONS**				
02 40 00	**Demolition and Structure Moving**				
	Dumpster Fees	9	wk	$ 850.00	$ 7,650
	Demolition Debris Removal and Disposal Fees	60	tn	$ 81.00	$ 4,860
	Existing Roof, Gutter, and Flashing Removal	6,600	sf	$ 3.50	$ 23,100
	Staging	1	al	$ 6,500.00	$ 6,500
	Demolition and Structure Moving Total:				**$ 42,110**
				Subtotal Existing Conditions:	**$ 42,110**
06 00 00	**WOOD, PLASTICS, AND COMPOSITES**				
06 10 00	**Rough Carpentry**				
	Damage Roof Decking Replacement (Allowance)	1	al	$ 4,000.00	$ 4,000
	Rough Carpentry Total:				**$ 4,000**
				Subtotal Wood, Plastics, and Composites:	**$ 4,000**
07 00 00	**THERMAL AND MOISTURE PROTECTION**				
07 31 00	**Shingles and Shakes**				
	New Faux Slate Roof	6,600	sq	$ 12.00	$ 79,200
	Synthetic Roof Underlayment	66	sq	$ 22.88	$ 1,510
	Bituminous Roof Underlayment	14	sq	$ 110.13	$ 1,553
	Shingles and Shakes Total:				**$ 82,263**
07 50 00	**Membrane Roofing**				
	EPDM Membrane Roof	63	sf	$ 16.00	$ 1,000
	EPDM Membrane Adhesive	1	gal	$ 105.00	$ 105
	Membrane Roofing Total:				**$ 1,000**
07 61 00	**Metal Flashing**				
	Drip Edge Flashing	335	lf	$ 2.88	$ 963
	Copper Gutter	350	lf	$ 30.00	$ 10,500
	Copper Downspout	180	lf	$ 23.50	$ 4,230
	Rubber Roof Transition Flashing	125	lf	$ 2.13	$ 266
	Metal Flashing Total:				**$ 15,959**
07 90 00	**Joint Protection**				
	Joint Sealant	1	al	$ 750.00	$ 750
	Joint Protection Total:				**$ 750**
				Subtotal Thermal and Moisture Protection:	**$ 99,971**
				ESTIMATED TOTAL PROJECT COST:	**$ 146,081**

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COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE PROCESS INDUSTRIES

TCM Framework: 7.3 – Cost Estimating and Budgeting

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COST ESTIMATE CLASSIFICATION SYSTEM – AS APPLIED IN ENGINEERING, PROCUREMENT, AND CONSTRUCTION FOR THE PROCESS INDUSTRIES

TCM Framework: 7.3 – Cost Estimating and Budgeting

February 2, 2005

PURPOSE

As a recommended practice of AACE International, the Cost Estimate Classification System provides guidelines for applying the general principles of estimate classification to project cost estimates (i.e., cost estimates that are used to evaluate, approve, and/or fund projects). The Cost Estimate Classification System maps the phases and stages of project cost estimating together with a generic maturity and quality matrix, which can be applied across a wide variety of industries.

This addendum to the generic recommended practice provides guidelines for applying the principles of estimate classification specifically to project estimates for engineering, procurement, and construction (EPC) work for the process industries. This addendum supplements the generic recommended practice (17R-97) by providing:

- a section that further defines classification concepts as they apply to the process industries;
- charts that compare existing estimate classification practices in the process industry; and
- a chart that maps the extent and maturity of estimate input information (project definition deliverables) against the class of estimate.

As with the generic standard, an intent of this addendum is to improve communications among all of the stakeholders involved with preparing, evaluating, and using project cost estimates specifically for the process industries.

It is understood that each enterprise may have its own project and estimating processes and terminology, and may classify estimates in particular ways. This guideline provides a generic and generally acceptable classification system for process industries that can be used as a basis to compare against. It is hoped that this addendum will allow each user to better assess, define, and communicate their own processes and standards in the light of generally-accepted cost engineering practice.

INTRODUCTION

For the purposes of this addendum, the term process industries is assumed to include firms involved with the manufacturing and production of chemicals, petrochemicals, and hydrocarbon processing. The common thread among these industries (for the purpose of estimate classification) is their reliance on process flow diagrams (PFDs) and piping and instrument diagrams (P&IDs) as primary scope defining documents. These documents are key deliverables in determining the level of project definition, and thus the extent and maturity of estimate input information.

Estimates for process facilities center on mechanical and chemical process equipment, and they have significant amounts of piping, instrumentation, and process controls involved. As such, this addendum may apply to portions of other industries, such as pharmaceutical, utility, metallurgical, converting, and similar industries. Specific addendums addressing these industries may be developed over time.

This addendum specifically does not address cost estimate classification in nonprocess industries such as commercial building construction, environmental remediation, transportation infrastructure, “dry” processes such as assembly and manufacturing, “soft asset” production such as software development, and similar industries. It also does not specifically address estimates for the exploration, production, or transportation of mining or hydrocarbon materials, although it may apply to some of the intermediate processing steps in these systems.

The cost estimates covered by this addendum are for engineering, procurement, and construction (EPC) work only. It does not cover estimates for the products manufactured by the process facilities, or for research and development work in support of the process industries. This guideline does not cover the

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significant building construction that may be a part of process plants. Building construction will be covered in a separate addendum.

This guideline reflects generally-accepted cost engineering practices. This addendum was based upon the practices of a wide range of companies in the process industries from around the world, as well as published references and standards. Company and public standards were solicited and reviewed by the AACE International Cost Estimating Committee. The practices were found to have significant commonalities that are conveyed in this addendum.

COST ESTIMATE CLASSIFICATION MATRIX FOR THE PROCESS INDUSTRIES

The five estimate classes are presented in figure 1 in relationship to the identified characteristics. Only the level of project definition determines the estimate class. The other four characteristics are secondary characteristics that are generally correlated with the level of project definition, as discussed in the generic standard. The characteristics are typical for the process industries but may vary from application to application.

This matrix and guideline provide an estimate classification system that is specific to the process industries. Refer to the generic standard for a general matrix that is non-industry specific, or to other addendums for guidelines that will provide more detailed information for application in other specific industries. These will typically provide additional information, such as input deliverable checklists to allow meaningful categorization in those particular industries.

	Primary Characteristic	***Secondary Characteristic***			
ESTIMATE CLASS	**LEVEL OF PROJECT DEFINITION** Expressed as % of complete definition	**END USAGE** Typical purpose of estimate	**METHODOLOGY** Typical estimating method	**EXPECTED ACCURACY RANGE** Typical variation in low and high ranges [a]	**PREPARATION EFFORT** Typical degree of effort relative to least cost index of 1 [b]
Class 5	0% to 2%	Concept Screening	Capacity Factored, Parametric Models, Judgment, or Analogy	L: -20% to -50% H: +30% to +100%	1
Class 4	1% to 15%	Study or Feasibility	Equipment Factored or Parametric Models	L: -15% to -30% H: +20% to +50%	2 to 4
Class 3	10% to 40%	Budget, Authorization, or Control	Semi-Detailed Unit Costs with Assembly Level Line Items	L: -10% to -20% H: +10% to +30%	3 to 10
Class 2	30% to 70%	Control or Bid/ Tender	Detailed Unit Cost with Forced Detailed Take-Off	L: -5% to -15% H: +5% to +20%	4 to 20
Class 1	50% to 100%	Check Estimate or Bid/Tender	Detailed Unit Cost with Detailed Take-Off	L: -3% to -10% H: +3% to +15%	5 to 100

Notes: [a] The state of process technology and availability of applicable reference cost data affect the range markedly. The +/- value represents typical percentage variation of actual costs from the cost estimate after application of contingency (typically at a 50% level of confidence) for given scope.

[b] If the range index value of "1" represents 0.005% of project costs, then an index value of 100 represents 0.5%. Estimate preparation effort is highly dependent upon the size of the project and the quality of estimating data and tools.

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Figure 1. – Cost Estimate Classification Matrix for Process Industries

CHARACTERISTICS OF THE ESTIMATE CLASSES

The following charts (figures 2a through 2e) provide detailed descriptions of the five estimate classifications as applied in the process industries. They are presented in the order of least-defined estimates to the most-defined estimates. These descriptions include brief discussions of each of the estimate characteristics that define an estimate class.

For each chart, the following information is provided:

- **Description:** a short description of the class of estimate, including a brief listing of the expected estimate inputs based on the level of project definition.
- **Level of Project Definition Required:** expressed as a percent of full definition. For the process industries, this correlates with the percent of engineering and design complete.
- **End Usage:** a short discussion of the possible end usage of this class of estimate.
- **Estimating Methods Used:** a listing of the possible estimating methods that may be employed to develop an estimate of this class.
- **Expected Accuracy Range:** typical variation in low and high ranges after the application of contingency (determined at a 50% level of confidence). Typically, this results in a 90% confidence that the actual cost will fall within the bounds of the low and high ranges.
- **Effort to Prepare:** this section provides a typical level of effort (in hours) to produce a complete estimate for a US$20,000,000 plant. Estimate preparation effort is highly dependent on project size, project complexity, estimator skills and knowledge, and on the availability of appropriate estimating cost data and tools.
- **ANSI Standard Reference (1989) Name:** this is a reference to the equivalent estimate class in the existing ANSI standards.
- **Alternate Estimate Names, Terms, Expressions, Synonyms:** this section provides other commonly used names that an estimate of this class might be known by. These alternate names are not endorsed by this Recommended Practice. The user is cautioned that an alternative name may not always be correlated with the class of estimate as identified in the chart.

CLASS 5 ESTIMATE	
Description: Class 5 estimates are generally prepared based on very limited information, and subsequently have wide accuracy ranges. As such, some companies and organizations have elected to determine that due to the inherent inaccuracies, such estimates cannot be classified in a conventional and systemic manner. Class 5 estimates, due to the requirements of end use, may be prepared within a very limited amount of time and with little effort expended—sometimes requiring less than an hour to prepare. Often, little more than proposed plant type, location, and capacity are known at the time of estimate preparation. **Level of Project Definition Required:** 0% to 2% of full project definition. **End Usage:** Class 5 estimates are prepared for any number of strategic business planning purposes, such as but not limited to market studies, assessment of initial viability, evaluation of alternate schemes, project screening, project location studies, evaluation of resource needs and budgeting, long-range capital planning, etc.	**Estimating Methods Used:** Class 5 estimates virtually always use stochastic estimating methods such as cost/capacity curves and factors, scale of operations factors, Lang factors, Hand factors, Chilton factors, Peters-Timmerhaus factors, Guthrie factors, and other parametric and modeling techniques. **Expected Accuracy Range:** Typical accuracy ranges for Class 5 estimates are - 20% to -50% on the low side, and +30% to +100% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances. **Effort to Prepare (for US$20MM project):** As little as 1 hour or less to perhaps more than 200 hours, depending on the project and the estimating methodology used. **ANSI Standard Reference Z94.2-1989 Name:** Order of magnitude estimate (typically -30% to +50%). **Alternate Estimate Names, Terms, Expressions, Synonyms:** Ratio, ballpark, blue sky, seat-of-pants, ROM, idea study, prospect estimate, concession license estimate, guesstimate, rule-of-thumb.

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Figure 2a. – Class 5 Estimate

CLASS 4 ESTIMATE	
Description: Class 4 estimates are generally prepared based on limited information and subsequently have fairly wide accuracy ranges. They are typically used for project screening, determination of feasibility, concept evaluation, and preliminary budget approval. Typically, engineering is from 1% to 15% complete, and would comprise at a minimum the following: plant capacity, block schematics, indicated layout, process flow diagrams (PFDs) for main process systems, and preliminary engineered process and utility equipment lists. **Level of Project Definition Required:** 1% to 15% of full project definition. **End Usage:** Class 4 estimates are prepared for a number of purposes, such as but not limited to, detailed strategic planning, business development, project screening at more developed stages, alternative scheme analysis, confirmation of economic and/or technical feasibility, and preliminary budget approval or approval to proceed to next stage.	**Estimating Methods Used:** Class 4 estimates virtually always use stochastic estimating methods such as equipment factors, Lang factors, Hand factors, Chilton factors, Peters-Timmerhaus factors, Guthrie factors, the Miller method, gross unit costs/ratios, and other parametric and modeling techniques. **Expected Accuracy Range:** Typical accuracy ranges for Class 4 estimates are -15% to -30% on the low side, and +20% to +50% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances. **Effort to Prepare (for US$20MM project):** Typically, as little as 20 hours or less to perhaps more than 300 hours, depending on the project and the estimating methodology used. **ANSI Standard Reference Z94.2-1989 Name:** Budget estimate (typically -15% to + 30%). **Alternate Estimate Names, Terms, Expressions, Synonyms:** Screening, top-down, feasibility, authorization, factored, pre-design, pre-study.

Figure 2b. – Class 4 Estimate

CLASS 3 ESTIMATE	
Description: Class 3 estimates are generally prepared to form the basis for budget authorization, appropriation, and/or funding. As such, they typically form the initial control estimate against which all actual costs and resources will be monitored. Typically, engineering is from 10% to 40% complete, and would comprise at a minimum the following: process flow diagrams, utility flow diagrams, preliminary piping and instrument diagrams, plot plan, developed layout drawings, and essentially complete engineered process and utility equipment lists. **Level of Project Definition Required:** 10% to 40% of full project definition. **End Usage:** Class 3 estimates are typically prepared to support full project funding requests, and become the first of the project phase "control estimates" against which all actual costs and resources will be monitored for variations to the budget. They are used as the project budget until replaced by more detailed estimates. In many owner organizations, a Class 3 estimate may be the last estimate required and could well form the only basis for cost/schedule control.	**Estimating Methods Used:** Class 3 estimates usually involve more deterministic estimating methods than stochastic methods. They usually involve a high degree of unit cost line items, although these may be at an assembly level of detail rather than individual components. Factoring and other stochastic methods may be used to estimate less-significant areas of the project. **Expected Accuracy Range:** Typical accuracy ranges for Class 3 estimates are -10% to -20% on the low side, and +10% to +30% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances. **Effort to Prepare (for US$20MM project):** Typically, as little as 150 hours or less to perhaps more than 1,500 hours, depending on the project and the estimating methodology used. **ANSI Standard Reference Z94.2-1989 Name:** Budget estimate (typically -15% to + 30%). **Alternate Estimate Names, Terms, Expressions, Synonyms:** Budget, scope, sanction, semi-detailed, authorization, preliminary control, concept study, development, basic engineering phase estimate, target estimate.

Figure 2c. – Class 3 Estimate

CLASS 2 ESTIMATE	
Description: Class 2 estimates are generally prepared to form a detailed control baseline against which all project work is monitored in terms of cost and progress control. For contractors, this class of estimate is often used as the "bid" estimate to establish contract value. Typically, engineering is from 30% to 70% complete, and would comprise at a minimum the following: process flow diagrams, utility flow diagrams, piping and instrument diagrams, heat and material balances, final plot plan, final layout drawings, complete engineered process and utility equipment lists, single line diagrams for electrical, electrical equipment and motor schedules, vendor quotations, detailed project execution plans, resourcing and work force plans, etc. **Level of Project Definition Required:** 30% to 70% of full project definition. **End Usage:** Class 2 estimates are typically prepared as the detailed control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program.	**Estimating Methods Used:** Class 2 estimates always involve a high degree of deterministic estimating methods. Class 2 estimates are prepared in great detail, and often involve tens of thousands of unit cost line items. For those areas of the project still undefined, an assumed level of detail takeoff (forced detail) may be developed to use as line items in the estimate instead of relying on factoring methods. **Expected Accuracy Range:** Typical accuracy ranges for Class 2 estimates are -5% to -15% on the low side, and +5% to +20% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances. **Effort to Prepare (for US$20MM project):** Typically, as little as 300 hours or less to perhaps more than 3,000 hours, depending on the project and the estimating methodology used. Bid estimates typically require more effort than estimates used for funding or control purposes. **ANSI Standard Reference Z94.2-1989 Name:** Definitive estimate (typically -5% to + 15%). **Alternate Estimate Names, Terms, Expressions, Synonyms:** Detailed control, forced detail, execution phase, master control, engineering, bid, tender, change order estimate.

Figure 2d. – Class 2 Estimate

CLASS 1 ESTIMATE	
Description: Class 1 estimates are generally prepared for discrete parts or sections of the total project rather than generating this level of detail for the entire project. The parts of the project estimated at this level of detail will typically be used by subcontractors for bids, or by owners for check estimates. The updated estimate is often referred to as the current control estimate and becomes the new baseline for cost/schedule control of the project. Class 1 estimates may be prepared for parts of the project to comprise a fair price estimate or bid check estimate to compare against a contractor's bid estimate, or to evaluate/dispute claims. Typically, engineering is from 50% to 100% complete, and would comprise virtually all engineering and design documentation of the project, and complete project execution and commissioning plans. **Level of Project Definition Required:** 50% to 100% of full project definition. **End Usage:** Class 1 estimates are typically prepared to form a current control estimate to be used as the final control baseline against which all actual costs and resources will now be monitored for variations to the budget, and form a part of the change/variation control program. They may be used to evaluate bid checking, to support vendor/contractor negotiations, or for claim evaluations and dispute resolution.	**Estimating Methods Used:** Class 1 estimates involve the highest degree of deterministic estimating methods, and require a great amount of effort. Class 1 estimates are prepared in great detail, and thus are usually performed on only the most important or critical areas of the project. All items in the estimate are usually unit cost line items based on actual design quantities. **Expected Accuracy Range:** Typical accuracy ranges for Class 1 estimates are -3% to -10% on the low side, and +3% to +15% on the high side, depending on the technological complexity of the project, appropriate reference information, and the inclusion of an appropriate contingency determination. Ranges could exceed those shown in unusual circumstances. **Effort to Prepare (for US$20MM project):** Class 1 estimates require the most effort to create, and as such are generally developed for only selected areas of the project, or for bidding purposes. A complete Class 1 estimate may involve as little as 600 hours or less, to perhaps more than 6,000 hours, depending on the project and the estimating methodology used. Bid estimates typically require more effort than estimates used for funding or control purposes. **ANSI Standard Reference Z94.2 Name:** Definitive estimate (typically -5% to + 15%). **Alternate Estimate Names, Terms, Expressions, Synonyms:** Full detail, release, fall-out, tender, firm price, bottoms-up, final, detailed control, forced detail, execution phase, master control, fair price, definitive, change order estimate.

Figure 2e. – Class 1 Estimate

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COMPARISON OF CLASSIFICATION PRACTICES

Figures 3a through 3c provide a comparison of the estimate classification practices of various firms, organizations, and published sources against one another and against the guideline classifications. These tables permits users to benchmark their own classification practices.

INCREASING PROJECT DEFINITION

AACE Classification Standard	ANSI Standard Z94.0	AACE Pre-1972	Association of Cost Engineers (UK) ACostE	Norwegian Project Management Association (NFP)	American Society of Professional Estimators (ASPE)
Class 5	Order of Magnitude Estimate -30/+50	Order of Magnitude Estimate	Order of Magnitude Estimate Class IV -30/+30	Concession Estimate Exploration Estimate Feasibility Estimate	Level 1
Class 4	Budget Estimate -15/+30	Study Estimate	Study Estimate Class III -20/+20	Authorization Estimate	Level 2
Class 3		Preliminary Estimate	Budget Estimate Class II -10/+10	Master Control Estimate	Level 3
Class 2	Definitive Estimate -5/+15	Definitive Estimate	Definitive Estimate Class I -5/+5	Current Control Estimate	Level 4
Class 1		Detailed Estimate			Level 5 Level 6

Figure 3a. – Comparison of Classification Practices

INCREASING PROJECT DEFINITION

AACE Classification Standard	Major Consumer Products Company (Confidential)	Major Oil Company (Confidential)	Major Oil Company (Confidential)	Major Oil Company (Confidential)
Class 5	Class S Strategic Estimate	Class V Order of Magnitude Estimate	Class A Prospect Estimate Class B Evaluation Estimate	Class V
Class 4	Class 1 Conceptual Estimate	Class IV Screening Estimate	Class C Feasibility Estimate Class D Development Estimate	Class IV
Class 3	Class 2 Semi-Detailed Estimate	Class III Primary Control Estimate	Class E Preliminary Estimate	Class III
Class 2	Class 3 Detailed Estimate	Class II Master Control Estimate	Class F Master Control Estimate	Class II
Class 1		Class I Current Control Estimate	Current Control Estimate	Class I

Figure 3b. – Comparison of Classification Practices

INCREASING PROJECT DEFINITION

AACE Classification Standard	J.R. Heizelman, 1988 AACE Transactions [1]	K.T. Yeo, The Cost Engineer, 1989 [2]	Stevens & Davis, 1988 AACE Transactions [3]	P. Behrenbruck, Journal of Petroleum Technology, 1993 [4]
Class 5	Class V	Class V Order of Magnitude	Class III*	Order of Magnitude
Class 4	Class IV	Class IV Factor Estimate	Class II	Study Estimate
Class 3	Class III	Class III Office Estimate		Budget Estimate
Class 2	Class II	Class II Definitive Estimate		
Class 1	Class I	Class I Final Estimate	Class I	Control Estimate

[1] John R. Heizelman, ARCO Oil & Gas Co., 1988 AACE Transactions, Paper V3.7
[2] K.T. Yeo, The Cost Engineer, Vol. 27, No. 6, 1989
[3] Stevens & Davis, BP International Ltd., 1988 AACE Transactions, Paper B4.1 (* Class III is inferred)
[4] Peter Behrenbruck, BHP Petroleum Pty., Ltd., article in Petroleum Technology, August 1993

Figure 3c. – Comparison of Classification Practices

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ESTIMATE INPUT CHECKLIST AND MATURITY MATRIX

Figure 4 maps the extent and maturity of estimate input information (deliverables) against the five estimate classification levels. This is a checklist of basic deliverables found in common practice in the process industries. The maturity level is an approximation of the degree of completion of the deliverable. The degree of completion is indicated by the following letters.

- None (blank): development of the deliverable has not begun.
- Started (S): work on the deliverable has begun. Development is typically limited to sketches, rough outlines, or similar levels of early completion.
- Preliminary (P): work on the deliverable is advanced. Interim, cross-functional reviews have usually been conducted. Development may be near completion except for final reviews and approvals.
- Complete (C): the deliverable has been reviewed and approved as appropriate.

	ESTIMATE CLASSIFICATION				
General Project Data:	**CLASS 5**	**CLASS 4**	**CLASS 3**	**CLASS 2**	**CLASS 1**
Project Scope Description	General	Preliminary	Defined	Defined	Defined
Plant Production/Facility Capacity	Assumed	Preliminary	Defined	Defined	Defined
Plant Location	General	Approximate	Specific	Specific	Specific
Soils & Hydrology	None	Preliminary	Defined	Defined	Defined
Integrated Project Plan	None	Preliminary	Defined	Defined	Defined
Project Master Schedule	None	Preliminary	Defined	Defined	Defined
Escalation Strategy	None	Preliminary	Defined	Defined	Defined
Work Breakdown Structure	None	Preliminary	Defined	Defined	Defined
Project Code of Accounts	None	Preliminary	Defined	Defined	Defined
Contracting Strategy	Assumed	Assumed	Preliminary	Defined	Defined
Engineering Deliverables:					
Block Flow Diagrams	S/P	P/C	C	C	C
Plot Plans		S	P/C	C	C
Process Flow Diagrams (PFDs)		S/P	P/C	C	C
Utility Flow Diagrams (UFDs)		S/P	P/C	C	C
Piping & Instrument Diagrams (P&IDs)		S	P/C	C	C
Heat & Material Balances		S	P/C	C	C
Process Equipment List		S/P	P/C	C	C
Utility Equipment List		S/P	P/C	C	C
Electrical One-Line Drawings		S/P	P/C	C	C
Specifications & Datasheets		S	P/C	C	C
General Equipment Arrangement Drawings		S	P/C	C	C
Spare Parts Listings			S/P	P	C
Mechanical Discipline Drawings			S	P	P/C
Electrical Discipline Drawings			S	P	P/C
Instrumentation/Control System Discipline Drawings			S	P	P/C
Civil/Structural/Site Discipline Drawings			S	P	P/C

Figure 4. – Estimate Input Checklist and Maturity Matrix

REFERENCES

ANSI Standard Z94.2-1989. **Industrial Engineering Terminology: Cost Engineering**.
AACE International Recommended Practice No.17R-97, **Cost Estimate Classification System**.

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