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HOW TO ESTIMATE THE COST OF MASONRY TUCKPOINTING

Candidate Number: **0711015**

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Throughout the course of this paper the author will discuss the steps taken to formulate the cost of masonry tuckpointing. In the region around Cincinnati, OH the term tuckpointing refers to the process of repairing mortar joints between masonry. In other parts of the country this process may also be referred to as Repointing.

The tuckpointing process begins with removing mortar between failed masonry joints. After the mortar is removed or raked, the joint must be washed or vacuumed out to remove any loose mortar. Before new mortar is added, the joint should be dampened. Mortar should be added in lifts no greater than 1/3" or 3/8" (as directed by the specifications), which allows for the mortar to correctly bond to the surrounding masonry and minimizes shrinkage which causes cracks to form. After one lift of mortar is added, the mason must wait until moisture from the mortar begins to be drawn into the surrounding masonry. This process has occurred once the joint has reached thumbprint hardness (the mortar is strong enough to not give, but

soft enough to still show a finger print). Then, a second lift should be added. In a two inch deep joint, the mason will add six lifts to ensure the mortar will cure properly. Once the joint has been filled, the final lift should be tooled, or finished, per the specifications. The area should then be cleaned. See the below graphic which highlights the tuckpointing process and tools used.

Types and Methods of Measurement

Plan and Specifications review

Tuckpointing is normally shown on the elevation drawings. Elevation drawings are the best place to find a quick understanding of the amount of tuckpointing on a certain project. The size of the project will allow the estimator to begin to determine the best approach to estimating the project.

Elevation drawings are nearly always full of a variety of notes from doors and windows to downspouts and lintels. The estimator must read through all of the elevation drawing notes in order to determine the entire scope of the project. Coordination with other trades will affect cost and the more information which is known about a project the more precise an estimate can be. Find the notes pertaining to tuckpointing on the drawing note list and then locate those note numbers or letters on the drawing. The use of a highlighter will help the estimator easily understand the location and amount of work to be done.

Drawings typically use heavier, darker line types to indicate new or proposed work. For example, when a concrete walk is shown to be removed and replaced, the drawings normally will show this clearly as a solid black line with 100% of the walk within the line to be replaced. Tuckpointing is not always displayed in this manner. An area may be outlined in solid black which tells the estimator there is new work to be done, but the drawing note will call out to tuckpoint 20% of the area as the architect or engineer has determined that portion of elevation only needs 20% of the wall face area to be tuckpointed. Another note may call out to tuckpoint 100% of the wall face area. These notes are very important to keep separate. If a 10' x 50' portion of wall has a note calling out to tuckpoint 20% of the wall face area and the estimator assumes this portion of wall is to receive 100% tuckpointing, the estimator almost certainly has cost their employer a job. If the plan calls out to tuckpoint the area 100% with a drawing full of 20% tuckpointing notes and the estimator takes the note off at 20% of the total area, the estimator may have just landed his employer a job which is destined to lose money. Various levels of mortar joint repair can also be signified on drawings or specifications. If joints are badly damaged, the entire depth (full depth) of mortar may need to be removed and replaced.

Specification review is included in this paper under the types and methods of measurement header as the tuckpointing process will be spelled out in the maintenance of masonry spec section or a similar section which the architect determines to be the best fit for the tuckpointing scope. Standard practice tuckpointing methods call for mortar to be removed and

replaced at minimum, 2 to 2-1/2 times the width of the joint.[1] The specifications could call for entirely different removal and replacement procedures. Drawing notes could refer to a tuckpointing schedule found in the specifications. A tuckpointing schedule could call out for several separate tuckpointing procedures. One drawing note could equate to the standard practice of 2 to 2-1/2 times the width of the joint while another drawing note could equate to removing the mortar 3 times the width of the joint.

Access equipment such as pole scaffolding is taken off by the square feet of work area. Estimating the cost of man lifts requires the estimator to know what height the equipment must reach in order to perform the work. The estimator must also take into account the length of time in which access equipment is needed and ground access around the site. Most equipment including lifts and scaffolding are rented by day (DAY), week (WK), or month (MTH).

Quantity Takeoff and Calculations

Tuckpointing is, in itself a very lineal item and accordingly is quantified by the lineal foot (LF), though most drawings will show tuckpointing as an area, leaving the estimator to determine the amount of LF per the noted area. For standard modular brick with dimensions of 3-5/8"W x 2-1/4"H x 7-5/8"L[2], the estimator can figure 5.5 LF per square feet (SF) of wall area. The ratio of 5.5 LF of joint per SF of wall built with standard modular brick is a standard ratio used in the

[1] U.S. Department of the Interior, *The Preservation of Historic Architecture, The U.S. Government's Official Guidelines for Preserving Historic Homes* (Guilford, CT: The Lyons Press, 2004), 25.
[2] Richard T. Kreh, Sr., *Masonry Skills*, Fifth Edition (Clifton Park, NY: Delmar Learning, 2003), 18.

trade. As the estimator will normally be required to make the calculation of what is shown on the drawing (SF), to a usable unit of measure (LF), a site visit is required to estimate a project responsibly.

When estimating tuckpointing stone structures, irregular sized brick, or concrete block, the best method of understanding the amount of mortar joints per square feet of wall face area is to visit the project site with a tape measure and pencil in hand. At the site make a pencil mark on one stone. This will be your starting point to determine the answer to the LF per SF question. With your tape measure in hand, start from the pencil point and measure out horizontally 4'. At the 4' point, mark the stone with your pencil. From that mark, use your tape to measure up 4' vertically and make a mark. The estimator is creating a 4'x4' square box. Once finished with marking the stone at 4 equal points, proceed to measure the joints (in LF) within the newly created 16 SF box. Once the estimator is finished measuring the LF of joints, simple math will result in an accurate amount of LF per square feet of wall area. Why a 4' square? A one foot square is too small to acquire an accurate ratio and anything over a four foot square is difficult to accomplish without an assistant. This method has worked reliably and consistently for the author on several tuckpointing bids and has been a tool that has helped win several of those bids. Once the LF to SF relationship is found, the estimator can head back to the shop to perform the square feet quantity takeoff.

The use of computer takeoff software is extremely helpful in this field; allowing the estimator to more quickly and accurately takeoff the wall face areas to which the tuckpointing ratios can be applied.

After completing the takeoff and having the amount of LF of joints to tuckpoint, the estimator will need to calculate the amount of tuckpointing mortar. Mortar should be taken off by the cubic foot (CF). In order to calculate the amount of CF of mortar needed to complete a project, the estimator must know all three dimensions of the mortar joint. The average brick joint is 3/8" wide and using the standard practice which is to tuckpoint to a depth 2 times the width of the joint the estimator knows the joint depth needs to be 3/4". Let's use a length of 1,000 feet as an example.

Description	**Quantity**	**Unit of Measure**
Length of Joint	1,000	LF
Width of Joint	0.375	Inches
Depth of Joint	0.750	Inches

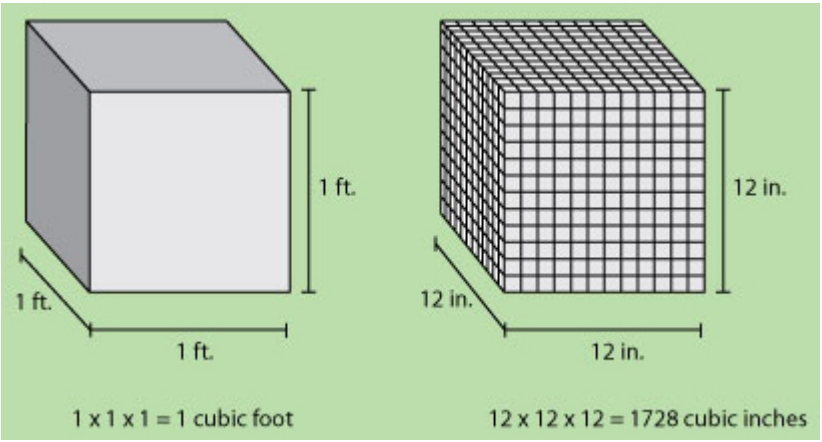
In order to calculate the amount of mortar needed, all units of measure need to be the same.

Description	Quantity	Unit of Measure
Length of Joint	12,000	Inches
Width of Joint	0.375	Inches
Depth of Joint	0.750	Inches

The next step is to multiply all three dimensions

Length of Joint	Width of Joint	Depth of Joint	Total Cubic Inches
12,000	0.375	0.750	3,375.00

In order to find the amount of CF, the estimator needs to know how many cubic inches are in a CF. One CF is 12”x12”x12”, which equals 1,728 Cubic inches. See the graphic below.



[3]

[3] http://www.utdanacenter.org/k12mathbenchmarks/elementary/measurement.php

The estimator needs to divide the amount of cubic inches by 1,728 in order to find the amount of CF.

Cubic Inches	**Cubic Inches per Cubic Foot**	**Volume of Mortar Joint in Cubic Feet**
3,375.00	1,728.00	1.953

At a width of .375 inches and a depth of .75 inches there are 1.953 CF in 1,000 LF of standard brick joints.

Tuckpointing mortar material is sold by the bag. Bags are sold in 40 pound to 80 pound (LB) weights. Mortar is not sold by volume or CF. When mixed with water, a 60 LB bag of standard mortar will provide approximately 0.50 CF and an 80 LB bag will yield approximately .70 CF. In order to find how many bags are needed, simply take the estimated CF and divide by the amount of CF per bag. Purchasing mortar by the bag is not the only option. The estimator can figure to have sand delivered to the site by the truck load, then purchase cement and lime by the bag (the three main ingredients to tuckpointing mortar) and have the mortar parts mixed on site by a mason tender.

Special Factors which Affect Pricing

There are several factors which affect pricing such as a high percentage of material waste, type of mortar specified, type of masonry, mortar testing, weather and geographic location, working platforms, tools used to remove mortar, spot tuckpointing, and the size of the job.

From the time the mortar is mixed, to the time it is placed, the author figures at a minimum 25% more mortar than calculated will be needed to complete the project. This high waste factor needed is due to the nature of the work. Not all joints in the field are the exact width estimated, nor will the joints be ground out exactly to the depth estimated. Also, mortar can be wasted if too much is mixed and not used and/or mortar drops off the mortar hawk (metal trowel used to hold mortar before placing it into the joint) and never makes it into the joint.

Mortar types vary which can greatly affect pricing. The author will discuss this topic in the overview of labor and material section.

Based on the information regarding mortar types, the estimator needs to account for slower production when working around stone than when working around brick. The stone mortar joints will be physically harder than the brick mortar joints. These joints will be tougher to grind out and therefore labor production will be slower when working around stone.

Mortar testing is performed to understand the components of the existing mortar. If the existing components are known, then the new mortar can be designed match the existing mortar in strength and color. If mortar testing is to be performed it will be found in the specifications. Mortar testing is not inexpensive and therefore the estimator must know if testing is required and who, (the owner or contractor) is required to pay for the testing.

Weather is always an unknown, but the estimator can make an educated guess based on time of year and geographic location where the work is to be performed. Tuckpointing is best performed when temperatures are between 40^{o} and 95^{o}. If performed during "hot weather, tuckpointing should be done on the shady side of the building to slow the setting; the wall should be covered in burlap or a tarpaulin while the mortar sets."[4] If the temperature will be below 40^{o}, cost needs to be added in order to account for temporary heating the outside work area.

Working from the ground lends the quickest labor production followed by hydraulic scaffolding (large work platforms which rise by the push of a button), pole scaffolding, and lastly and the slowest working platform, powered aerial work platforms, also known as "man-lifts" in the trade. The estimator must use their historical data to find the differences in production from working from these various platforms.

[4] London, Mark, *Masonry, How to Care for Old and Historic Brick and Stone* (Washington D.C., The Preservation Press, 1988), 112

Specifications will call out what mortar removal method is allowed. On many historic tuckpointing projects, only hammer and chisel are acceptable, as the worker is less likely to damage the surrounding masonry than if using a mechanical grinder. Work is slower when using hand tools but the finished product will have a cleaner look. Mechanical grinders remove the mortar with greater speed, but surrounding stone can be easily damaged leading to costly repairs. Mechanical grinders are the most cost effective way to remove mortar if the mason is experienced in using such tools.

Drawings which call out to tuckpoint 20% of an area, or to tuckpoint a joint with a crack greater than $1/16^{th}$ of an inch, require the mason to spend time thinking about what needs tuckpointed, which consumes time and money. If the specifications require to tuckpoint 100% of an area, the mason can work the entire time, instead of stopping to figure out which joints need tuckpointed and which do not.

The size of project and scheduled duration will determine the amount of masons and mason tenders required to perform the work. The estimator needs to treat both the small and large projects with the same detail.

Overview of Labor, Material, Equipment, Indirect Costs, and Approach to Markups

Tuckpointing is very labor intensive, and typically labor is the majority of the cost on most tuckpointing projects. Depending on the work location along a building (if access equipment is necessary or not), labor can account for 90% of the cost of a tuckpointing job. On the typical tuckpointing project, a typical crew ratio consists of one mason tender or laborer to every three masons. The mason tender is responsible to help set up scaffolding, mix mortar, haul mortar to masons, and any other miscellaneous work which may need to be done. On a small project, the above ratio can be moved to two masons to one mason tender.

There are five main ASTM mortar types. Mortar types are selected by the architect or engineer based on the permeability and hardness of the surrounding masonry. Type S has a pounds per square inch (PSI) of 1,800 and would be used for stone tuckpointing (stone itself is hard), while Type N has a PSI of 750 and is used for brick tuckpointing (brick is much softer than stone). Higher PSI equates to harder (and more brittle) material. If the joint mortar is harder than the masonry, the masonry will fail instead of the mortar joints[5]. Each type of mortar contains different amounts of Portland cement, lime, sand, and other add mixtures. Because of these different components, mortar pricing can vary greatly. The estimator must know what type of mortar is to be used as this will affect the cost of the material.

[5] U.S. Department of the Interior, *The Preservation of Historic Architecture, The U.S. Government's Official Guidelines for Preserving Historic Homes* (Guilford, CT: The Lyons Press, 2004), 23.

Most of the equipment cost used during tuckpointing is used for access such as lifts and scaffolding. Very few projects allow the mason to work at ground level. If scaffolding is required, the estimator must account time for workers to set up, move, and take down scaffolding. On small projects which require scaffolding, more than half of the cost of the project can be taken up on renting, setting up, moving, and taking down scaffolding. Swing stage scaffolding may require added support at the roof level and takes more time to move than standard scaffolding. The cost of access equipment is why using simply an all inclusive unit price (per LF or SF) to estimate tuckpointing should be avoided by the estimator. Other equipment needed includes mainly small tools, such as buckets, wheel barrows, mixing instruments, chisels, hammers and mechanical grinders.

Indirect cost can include the following: safety equipment, weather impacts, and coordination with other trades. These all can vary significantly from company to company and on a job to job basis, and are accounted for in many different ways, for example a lump sum allowance (line item in the estimate) or as a percentage of direct costs. In the enclosed sample estimate, the hourly rate for each type of labor includes an amount of $1.25 to cover indirect costs.

Markups for overhead and profit also vary significantly from company to company and on a job to job basis. Jobs with higher risks and less competition tend to have higher markups than jobs with lower risks and more competition. Profit margin is typically determined by each contracting firm's leadership and is usually based upon the need for work.

Special Risk Considerations

Working high off the ground in a lift or on scaffolding should always be partnered with safety. The estimator needs to be aware of all OSHA standards and include any associated cost. If working from a lift, OSHA regulation 1926.453(b)(2)(iv) calls for the worker to be tied off to the lift.[6] The estimator must account for the cost of a safety harness and lanyard. Working from scaffolding does not require a worker to be tied off if the railings meet all OSHA guidelines. Grinding or raking out mortar joints also cause safety concerns due to the dust generated, causing the need for breathing protection equipment. The mason should wear masks to allow for a healthy air intake level.

If the estimator plans to use labor rates which correspond with the use of mechanical grinders to remove mortar from joints, an allowance should be included in the estimate for removal and replacement of damaged masonry.

Ratios and Analysis

Historic data is a great tool to allow the estimator to double check the estimate. By considering all costs except access equipment cost, the estimator should have a very good idea of the cost per LF to tuckpoint mortar joints. Cost per LF greatly depends on joint width, depth, and surrounding masonry type. The estimator should have knowledge of what it takes to complete the work per joint type. Another good double check is to think about the job in LF per 8 hour man day. The estimator should take the total LF of joint on a project and divide that amount by

[6] http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10754

the number of mason man hours. The resulting labor production rate should provide the estimator a good double check when compared to past projects of similar type and quantity. The estimator should not include mason tender hours in this double check as the mason tender will not be performing any actual tuckpointing work. It is necessary that the estimator includes mason tender hours in his project as we discussed above as they are an integral part of the process. If a mason is required to stop his work to mix mortar the labor production will drop dramatically.

Miscellaneous Pertinent Information

Review specifications and understand the work being done in the field around the tuckpointing project. Some projects may simply require 100% tuckpointing across the entire building. If this is the case the estimator must review the proposed elevations as well as existing elevations as new openings could be part of the project and these openings will not be tuckpointed.
The author cannot emphasize the importance of access equipment enough. Be aware of the surrounding ground and understand what equipment is necessary to perform the work safely and accurately.

Many articles and books available for review which allows the estimator to better perform their takeoff and estimate. Self education is the estimator's greatest friend.

Sample Sketch

Please see the enclosed sample sketch, labeled as Exhibit A

Sample Takeoff and Estimate

This takeoff and estimate involves one elevation drawing along with field measurements to determine lineal footage of mortar joints to be tuckpointed. On the attached sample sketch tuckpointing is itemized into three distinct levels or types of tuckpointing. Assigning levels to this type of work is customary to the particular architect who prepared this sketch, but not necessarily customary throughout the trade. Level one requires removal and replacement of the mortar joint to full depth; level two requires removal and replacement of the mortar joint to a depth of 2 inches, but not less than 2-1/2 times the width of the joint; level three requires removal and replacement of the mortar joint to a depth of the width of the joint plus 1/8" but not less than 1/2".[7] In order to accurately take the quantities off, the estimator must first spend time reviewing all exterior drawings (besides elevation views) to ensure all scope is covered. The estimator must also visit the site to determine the ratio of lineal feet of joints per square foot of wall face area as discussed above under the types and methods of measurement section of this paper. The sample cost estimate herein illustrates the level 2 type of tuckpointing.

[7] RAP Associates, Inc. in conjunction with Cornette/Violetta Architects, Cincinnati, OH, Cincinnati Zoo & Botanical Garden, Reptile House – Exterior Restoration Specifications

Sample Takeoff

Quantity Survey	SF Quantity	LF per SF	LF Quantity	Joint Width by inches	Joint Depth by inches	Joint Length by inches (LF Quantity x 12)	Cubic Inches	Cubic Feet (Cubic Inches / 1,728)
Level 1 Tuckpointing (full depth)	400	3.5	1400	0.75	8.00	16,800.00	100,800.00	58.33
Level 2 Tuckpointing (2.5 x width)	1200	3.5	4200	0.75	2.00	50,400.00	75,600.00	43.75
Level 3 Tuckpointing (width + 1/8")	800	3.5	2800	0.75	0.88	33,600.00	22,050.00	12.76

Sample Cost Estimate

Please see the enclosed sample cost estimate, labeled as Exhibit B.

The sample cost estimates is based upon tuckpointing of level 2 as described on the enclosed sample sketch. The building height is 30’ at the tallest point from ground level. The entire stone building wall is not to receive tuckpointing. The project is made up of several areas amounting to 1,200 SF of wall face area to be tuckpointed. Level 2 tuckpointing is very labor intensive as the joints are to be raked out to 2” deep. Mechanical grinders will not be used on this project per specifications. The estimator must factor in the cost of remove mortar with hammer and chisel. Mortar will need to be pointed back in several lifts to ensure proper curing as discussed above in types and methods of measurement.

The author has provided two sample estimates in order to show the reader the role access equipment can play on costs. The estimator must consider multiple methods of completing the same project. Sometimes the most beneficial way of deciding which direction to take the estimate is to perform multiple estimates. This process will show the best direction clearly.

The first estimate is based on using post scaffolding as the means to access work. Labor production will be higher on scaffolding than from lifts as the masons can move along the wall with ease. Also, more masons can work together on scaffolding and there is less safety cost involved than from a lift as discussed in the indirect cost portion of this paper. The estimator has added time to erect and dismantle scaffolding as required to complete the project.

The second estimate is built upon using man lifts as the means to access work. The author will use only two masons and one laborer to complete the work. The estimate places two masons in a lift and they will work as a team, chipping out mortar first, then replacing the mortar into the joint. Tuckpointing from lifts is a slower process than from scaffolding. Each mason is required to be tied off to the lift, requiring more safety cost than from scaffolding. This known added cost will be accounted for in the small tools equipment cost line item.

Glossary of Terms

Term	Definition
Hawk	Flat metal with an attached handle used to hold wet mortar before placing it into the joint
Mason	Someone who works with masonry and associated material such as brick, stone, and mortar
Mason Tender	Someone who labors to provide assistance to masons
Mortar	A mixture of sand, cement, lime, and water.
OSHA	Acronym for Occupational Safety and Health Administration
Pole Scaffold	Temporary work platform built from poles and planks
Rake	The process of removing mortar from joints.
Tool	The process of finishing a mortar joint

References

Websites

http://www.utdanacenter.org/k12mathbenchmarks/elementary/measurement.php

http://www.osha.gov/pls/oshaweb/owadisp.show_document?p_table=STANDARDS&p_id=10754

Books

U.S. Department of the Interior, *The Preservation of Historic Architecture, The U.S. Government's Official Guidelines for Preserving Historic Homes* (Guilford, CT: The Lyons Press, 2004)

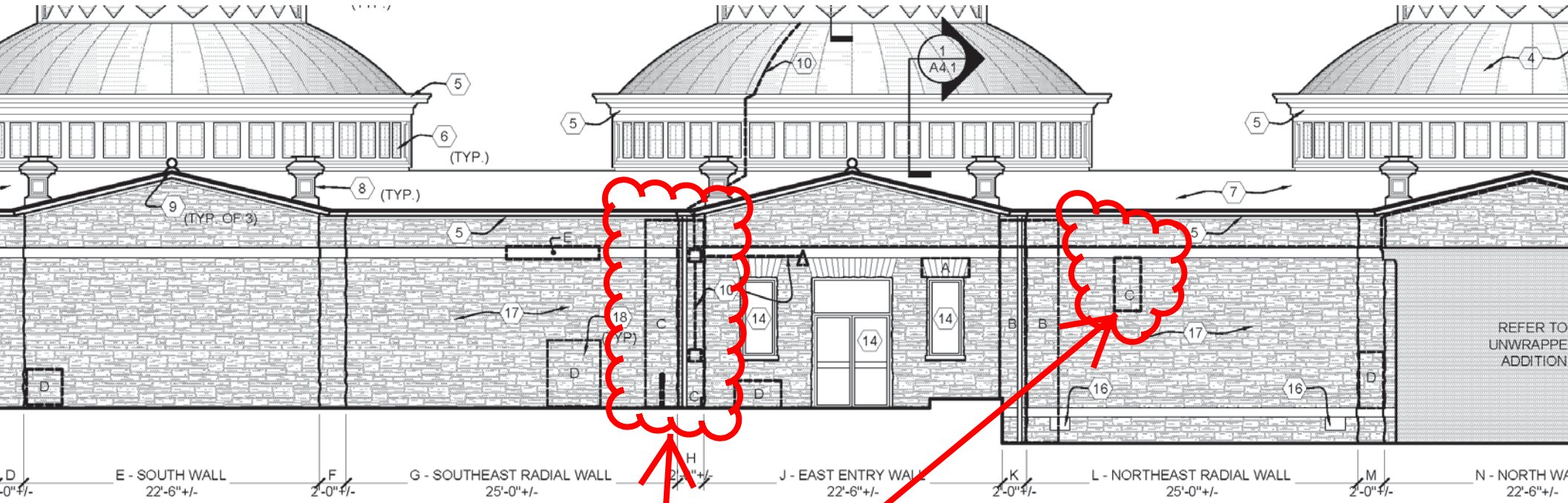
Richard T. Kreh, Sr., *Masonry Skills*, Fifth Edition (Clifton Park, NY: Delmar Learning, 2003)

London, Mark, *Masonry, How to Care for Old and Historic Brick and Stone* (Washington D.C., The Preservation Press, 1988)

Drawings and Specifications

Cornette/Violetta Architects in conjunction with RAP Associates, Inc., Cincinnati, OH, Cincinnati Zoo & Botanical Garden, Reptile House – Exterior Restoration Specifications and Drawing A3.0

Sample Sketch - Exhibit A



OTUNDA

Tuckpointing Level 2 (cond. C on plan) is used in the sample estimate. This view illustrates the need to perform a quantity takeoff in square feet of wall face area. A site visit is also necessary to determine the ratio of linear feet to square feet of mortar joints. The wall face takeoff and the ratio are then used to determine the actual quantity of mortar joints to tuckpoint.

Tuckpointing Schedule

COND.	SCOPE OF WORK
A	REPLACE EXISTING STEEL LINTEL
B	100% TUCKPOINT LEVEL 3
C	100% TUCKPOINT LEVEL 2
D	100% TUCKPOINT LEVEL 1
E	STONE MOVEMENT

The view shown on this sample is only a portion of the entire project and is included to illustrate the takeoff methods required to develop a cost estimate.

Sample Estimate - Exhibit B.1

Sample Cost Estimate

Estimate Parameters — **With pole scaffolding as means of work access**

Quantity — **4,200 LF of joints .75" wide x 2" deep**

Crew — **1 Mason Tender and 3 Masons**

Tuckpointing Production — **300 LF per 8 hr crew day**

Tuckpointing 4,200 LF / 300 LF = 14 days

Tuckpointng Duration — **14 days**

Scaffolding Production — **1 days each assemble/disassemble**

Scaffold Duration — **2 days**

Production rates and crews based on historical data

Tuckpointing Labor				
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Mason Tender x 1	112	HRS	$ 35.00	$ 3,920.00
Mason x 3	336	HRS	$ 45.00	$ 15,120.00
		LABOR sub total		**$ 19,040.00**
Scaffold Labor				
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Mason Tender x 1	16	HRS	$ 35.00	$ 560.00
Mason x 3	48	HRS	$ 45.00	$ 2,160.00
		LABOR sub total		**$ 2,720.00**
		LABOR Total		**$ 21,760.00**
Material				
Description	**Quantity**	**Unit**	**Unit Price**	**Total Cost**
Tuckpointing Mortar Type S	63	BAG	$ 5.00	$ 315.00
43.75 CF / .70 CF per bag =		Material Waste	25%	$ 78.75
62.5 Eighty Pound Bags		**MATERIAL total**		**$ 393.75**
Equipment				
Description	**Quantity**	**Unit**	**Unit Price**	**Total Cost**
Scaffolding Rental	4	Week	$ 500.00	$ 2,000.00
Stake Truck	4	Week	$ 350.00	$ 1,400.00
Misc small tools	512	Man Hours	$ 4.00	$ 2,048.00
		EQUIPMENT total		**$ 5,448.00**

Labor is the vast majority of the total cost

Please note

Production rates and crew sizes are variable depending on width and depth of mortar joints, job site location, and job site conditions. No two tuckpointing porjects are exactly alike.

Unit Price for small tools is based on historical data of cost per man hour.

ITEMIZATION	**% of total cost**	
Labor total	**79%**	$ 21,760.00
Material total	**1%**	$ 393.75
Equipment total	**20%**	$ 5,448.00
Estimate Sub Total	**100%**	**$ 27,601.75**
Office Overhead	**7.5%**	**$ 2,070.13**
Profit	**12.5%**	**$ 3,450.22**
Estimate Total		**$ 33,122.10**

Sample Estimate - Exhibit B.2

Sample Cost Estimate

Estimate Parameters — **With lifts as means of work acess**

Quantity — **4,200 LF of joints .75" wide x 2" deep**

Crew — **1 Mason Tender and 2 Masons**

Tuckpointing Production — **180 LF per 8 hr crew day**

(production is slower working from a lift than scaffolding)

Tuckpointing 4,200 LF / 180 LF = 23.33 days

Tuckpointng Duration — **24 days**

Lift Rental — **One 40' articulated man lift for 5 weeks**

Production rates and crews based on historical data

Tuckpointing Labor				
Description	**Quantity**	**Unit**	**Unit Cost**	**Total Cost**
Mason Tender x 1	192	HRS	$ 35.00	$ 6,720.00
Mason x 2	384	HRS	$ 45.00	$ 17,280.00
		LABOR total		**$ 24,000.00**
Material				
Description	**Quantity**	**Unit**	**Unit Price**	**Total Cost**
Tuckpointing Mortar Type S	63	BAG	$ 5.00	$ 315.00
43.75 CF / .70 CF per bag =		Material Waste	25%	$ 78.75
62.5 Eighty Pound Bags		**MATERIAL total**		**$ 393.75**
Equipment				
Description	**Quantity**	**Unit**	**Unit Price**	**Total Cost**
40' Articulated Lift Rental	5	Weeks	$ 800.00	$ 4,000.00
Stake Truck	5	Weeks	$ 350.00	$ 1,750.00
Misc small tools	576	Man Hours	$ 4.25	$ 2,448.00
		EQUIPMENT total		**$ 8,198.00**

Labor is still the majority of the total cost

Please note

Production rates and crew sizes are variable depending on width and depth of mortar joints, job site location, and job site conditions. No two tuckpointing porjects are exactly alike.

Unit Price for small tools is based on historical data of cost per man hour.

ITEMIZATION	**% of total cost**	
Labor total	**74%**	$ 24,000.00
Material total	**1%**	$ 393.75
Equipment total	**25%**	$ 8,198.00
Estimate Sub Total	**100%**	**$ 32,591.75**
Office Overhead	**7.5%**	**$ 2,444.38**
Profit	**12.5%**	**$ 4,073.97**
Estimate Total		**$ 39,110.10**