

How to estimate the cost of doors frames and hardware installation for large projects (health care, sports venue etc.)

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Gary Gilbert has been in the construction trades since 1977 when at age 16 he started building houses. He began working in the commercial trades upon graduating High School in 1979. After 10 years working up through the ranks to the top foreman position he began working in the office as an estimator / project manager. In 2002 becoming a vice president while maintaining a hands on approach to estimating tasks within the company.

Gary has estimated and completed door estimates for many projects including bidding and completing three major hospitals in the Cincinnati area, Great American Ballpark and a large college housing complex. Just these few completed projects had an approximate total of 8,000 door openings.

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BRIEF DESCRIPTION:

This technical essay will quantify a method for estimating portions of division 8 sections 081200 Metal frames, 081300 Metal Doors, 081400 Wood Doors & 087000 Door Hardware. Specifically, we will look at estimating the labor hours for large quantity doors projects in an expedient manner with high accuracy that also allows the estimator to turn over a useable tracking spreadsheet to the project manager upon award.

TYPES OF DOCUMENTS AND METHODS OF MEASUREMENTS:

Typically, the door schedule is the main tool for this method of estimating. The other portions of the plans that are required are the details for the doors & frames. If the door schedule is on the plan pages rather than in the specification book, the details are normally on the pages adjacent to the schedule. All measurements for this type of estimate deal almost strictly with quantities. No other measurements other than size & weight of the doors and distance to the offloading area impact this type of estimating exercise.

THE TAKEOFF OF MATERIAL:

Due to the extensive nature and pricing structure of the material in a large quantity door and hardware project, it is imperative to contact reliable material suppliers that are capable of understanding and preparing a quantitative estimate to give a complete price for the entire package of frames, doors and hardware for a specific project. The brand of the hollow metal units as well as hardware plays an important role in determining the suppliers to contact in a specific geographical area. Many suppliers have special pricing discounts on particular brands and while other companies can often provide prices as well, it is important to know and understand which suppliers are capable of providing the best and lowest price rate as well as the ability to complete their own quantity estimates. Past experience of working with a material supplier must also play a large role in the final estimate number however this will be gone into with more detail in a later portion of this paper. It is normal for a material supplier to supply their estimated quantities of the number of door frames, hollow metal doors and wood doors with a lump sum number for all hardware. It is important to always compare the quantities of each of the quantified units against your final counts when determining the best and lowest supplier to be included with your total bid.

PRIOR TO BEGINNING THE TAKEOFF:

The first step in completing the estimate is to examine the bid documents. Insure that all information provided is the latest issue. Often, on large projects the job is bid in multiple phases to allow the structure to be started long before the finish drawings are complete. Insure that there are no previous addendums that may have been issued which alter the documents in hand.

Review any scope of work documents if this is a project with a CM (construction manager) that is bidding the project out in multiple phases. Some specific items to look for are:

- Is the CM purchasing the materials and this bid package only includes installation and materials and equipment for installation? If the CM is providing the material, whose responsibility is it for quantity verification and security upon delivery?
- Are the frames being set under this bid package or under the associated wall installers (mason or drywall contractor)?

This also includes reviewing all of the pertinent specification sections to determine the specific brands and types of hardware that will be required for a specific project. It is normal on larger projects to see automatic door hardware; this is a specialty type of installation and normally entails coordination between the owner's security contractor, electrical contractors, alarm contractors, an automatic operator sub contractor (normally under your bid package) and the doors and hardware material supplier. This exercise does not delve into this specific item of work due to the extensive coordination required to complete it. Suffice it to say that the time required for coordination meetings with all involved parties normally takes longer than

anticipated as there are often expectations from the owner for the function that require extensive knowledge of specific pieces from each of the responsible trades. This paper will explain about accounting for the actual labor hours for only the installation process.

As explained in the material takeoff section, determining the list of material suppliers to contact to quote large quantity projects is of the utmost importance. A supplier that is not capable of providing the submittals in a timely manner due to a short office staff or the inability of managing the material or shipping due to a small warehouse facility or truck size needs to be determined prior to sending out the bid invitation. Financial stability must also be a major consideration as the ability to complete the project through the final stages is a major component. Knowing your suppliers and their specific abilities are a major component of arriving at the correct number at bid day and achieving a successful project. A low bid material supplier that cannot provide the material when it is required for any reason can cost much more than the potential savings of using their number.

SEASONAL AND WEATHER IMPACT ON THE BID:

Seasonal weather has minimal to no impact on the installation of the doors and hardware as these normally must be installed in a conditioned environment. The installation of the frames is often impacted slightly by weather as these normally are installed before the final skin of the building is complete. Exterior frames and especially frames set in masonry are necessary early in the construction schedule to allow other trades to progress in a logical sequence. All of these factors need to be accounted for in the estimate. IMPORTANT NOTE: Wood doors are highly

susceptible to damage from excessive heat, cold or humidity swings. It is imperative that the building be conditioned prior to bringing wood doors or door components on site.

SCHEDULING IMPACT ON THE BID:

The phasing of delivery for the submittals and material for frames in masonry walls (which normally must be installed as the walls are erected) and exterior doors and hardware often must be expedited due to other trades requirements and the overall weather tightness and security for the project building. These have an impact on several factors in the bid including having multiple submittal entries, multiple deliveries of materials and multiple mobilizations for labor. Another large consideration that must be anticipated is multiple deliveries from the supplier. Often they specifically quote one delivery each for the frames, doors and hardware with a cost per delivery if more are required. This will also mean that you must have staff on site to accept, count and review the delivery even when you may have no other work on site. The schedule of the project must always be reviewed to ascertain how it impacts the many facets of the quote and include the necessary funds to accommodate the required schedule.

BEGINNING THE LABOR PORTION OF THE ESTIMATE:

After the selection of the material suppliers has been made and the invitations to bid sent to appropriate suppliers, it is time to begin the labor portion of the estimate.

The method discussed in this paper is estimating the installation prices for doors, frames and hardware based on quantities. To begin the estimate, it is obvious that determining the actual

quantities of each component is imperative. For this estimate, our main tool is the door schedule.

If it is possible, request the door schedule be provided in a spreadsheet format to you. This eliminates a great deal of work preparing the estimate and allows you to begin looking at other portions of the project.

If getting the spreadsheet is not possible, the most expedient method of completing this estimate is creating a spread sheet of your own. There are specific pieces of information on these schedules that are extremely important and must be included both for the estimate itself and for the project manager in the future after the project is awarded.

These pieces are: The opening number, a brief description of the room the opening goes to (Kitchen, ICU Patient Room, Nurse Manager, etc.), the jamb section (normally a section view on the door frame detail page which will indicate the wall type the frame is installed in) and most importantly, the hardware set number.

These pieces of the spreadsheet are important as each (other than the room name) has an impact on the labor hours to complete the estimate correctly.

The opening number allows you to verify that all openings are entered. It is also advisable to get a count of the openings shown on the documents and compare this against the final number of openings in your spreadsheet to insure that all openings have been entered.

The jamb section detail number indicates the type of wall construction each frame is installed in.

Example of a portion of a door schedule

DOOR & RELITE SCHEDULE

OPENING:		FRAME:			HWRE
DOOR NO.	ROOM NAME	HEAD	JAMB	SILL	SET
PE-091.1	STAIR		7/A6.12		26
PE-201	MECH		7/A6.12		75
PE-201.1	MECH		7/A6.12		75
PE-201.3	MECH		7/A6.12		75
PE-201.4	MECH		7/A6.12		75
PE-201.5	MECH		7/A6.12		75
PE-201.6	MECH		7/A6.12		75
PE-202.2	MECH		7/A6.12		30
PF-101	VEST		6/A6.12		12
SF-090	STAIR		7/A6.12		26
LE-091	STAIR		7/A6.12		26
LE-100.2	MECH		7/A6.12		75
LE-102.2	MECH		7/A6.12		75
LF-090	STAIR		7/A6.12		26
LF-092	STAIR		7/A6.12		26
LF-105	ELEC		7/A6.12		4
LF-105.1	ELEC		7/A6.12		42
LF-106.1	MECH		7/A6.12		42
LF-107	MECH		7/A6.12		30
LF-116.2	ELEC		7/A6.12		4
LF-118	HSKP STOR		7/A6.12		41
LF302.1	VEST		6/A6.12		14
LF-652	PAT SERV ELEV		7/A6.12		48
SJ-401.1	GENERATOR		7/A6.12		30
SJ401.2	GENERATOR		7/A6.12		45
OE-091	STAIR		7/A6.12		26
OF-090	STAIR		7/A6.12		26
OF-092	STAIR		7/A6.12		26
OF-501.2	KITCHEN		6/A6.12		19
OF-651	ELEV LOBBY		7/A6.12		48
OF-652	PAT SERV ELEV		6/A6.12		48
OG-324	CORR		6/A6.12		30
OG-410	PARTS STORAGE		6/A6.12		7
OG-413	CALIBRATION		6/A6.12		76
1.00E-91	STAIR		7/A6.12		26
1.00E-124	ICU PAT ROOM		6/A6.12		41
1.00E-125	ICU PAT ROOM		6/A6.12		41
1.00E-126	ICU PAT ROOM		6/A6.12		41
1.00E-146	ICU PAT ROOM		6/A6.12		41
1E-147.1	ANTE		6/A6.12		18
1E-147.2	ANTE		6/A6.12		18
1E-148.1	ANTE		6/A6.12		18
1E-148.2	ANTE		6/A6.12		18
1.00E-225	CNS OFF		6/A6.12		1
1.00E-227	FILE CTM		6/A6.12		7
1.00E-228	CTM OFF		6/A6.12		1
1.00E-229	NURSE MNGR		6/A6.12		1
1E-231.1	CONF STAFF		6/A6.12		8

Example of a spreadsheet created for quantifying items

DOOR & RELITE SCHEDULE

Opening #		DOOR OR RELITE:	FRAME:					Hdwre set
DOOR NO.	ROOM NAME					JAMB		
PE-091.1	STAIR					7/A6.12	26	
PE-201	MECH					7/A6.12	75	
PE-201.1	MECH					7/A6.12	75	
PE-201.3	MECH					7/A6.12	75	
PE-201.4	MECH					7/A6.12	75	
PE-201.5	MECH					7/A6.12	75	
PE-201.6	MECH					7/A6.12	75	
PE-202.2	MECH					7/A6.12	30	
PF-101	VEST					6/A6.12	12	
SF-090	STAIR					7/A6.12	26	
LE-091	STAIR					7/A6.12	26	
LE-100.2	MECH					7/A6.12	75	
LE-102.2	MECH					7/A6.12	75	
LF-090	STAIR					7/A6.12	26	
LF-092	STAIR					7/A6.12	26	
LF-105	ELEC					7/A6.12	4	
LF-105.1	ELEC					7/A6.12	42	
LF-106.1	MECH					7/A6.12	42	
LF-107	MECH					7/A6.12	30	
LF-116.2	ELEC					7/A6.12	4	
LF-118	HSKP STOR					7/A6.12	41	
LF302.1	VEST					6/A6.12	14	
LF-652	PAT SERV ELEV					7/A6.12	48	
SJ-401.1	GENERATOR					7/A6.12	30	
SJ401.2	GENERATOR					7/A6.12	45	
OE-091	STAIR					7/A6.12	26	
OF-090	STAIR					7/A6.12	26	
OF-092	STAIR					7/A6.12	26	
OF-501.2	KITCHEN					6/A6.12	19	
OF-651	ELEV LOBBY					7/A6.12	48	
OF-652	PAT SERV ELEV					6/A6.12	48	
OG-324	CORR					6/A6.12	30	
OG-410	PARTS STORAGE					6/A6.12	7	
OG-413	CALIBRATION					6/A6.12	76	
1.00E-91	STAIR					7/A6.12	26	
1.00E-124	ICU PAT ROOM					6/A6.12	41	
1.00E-125	ICU PAT ROOM					6/A6.12	41	
1.00E-126	ICU PAT ROOM					6/A6.12	41	

Example of a hardware schedule with hours

M. HW-18

1. Hinges	1
2. Patient Latch	1.5
3. Stop	.5
4 Closer	.75
5. Kick plate	.75
6 Door Edge plates	<u>1.5</u>
	6 hrs.

N. HW-19

1. Pivots	3
2. Lockset (LL) Classroom F84	1.5
3. Closer	.75
4. Stop	.25
5. Kick plate (adhesive applied)	<u>.25</u>
	5.75 hrs.

O. HW-20

1. Hinges	1
2. Exit device 9975L-F	5
3. Closer	.75
4. Stop	.25
5. Kick plate	.75
6. Cylinder	<u>.25</u>
	8 hrs.

P. HW-21

1. Hospital Hinges Hager 612	1
2. Double lipped strike	1
3. Lockset privacy F76	1
4. Stop	<u>.25</u>
	3.25 hrs.

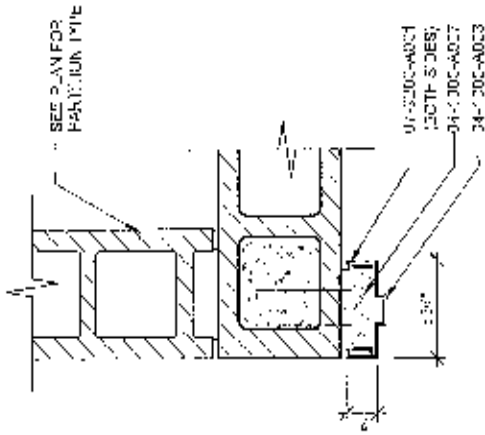
Q. HW-22

1. Hinges	1
2. Closer	.75
3. Stop	<u>.25</u>
	2 hrs.

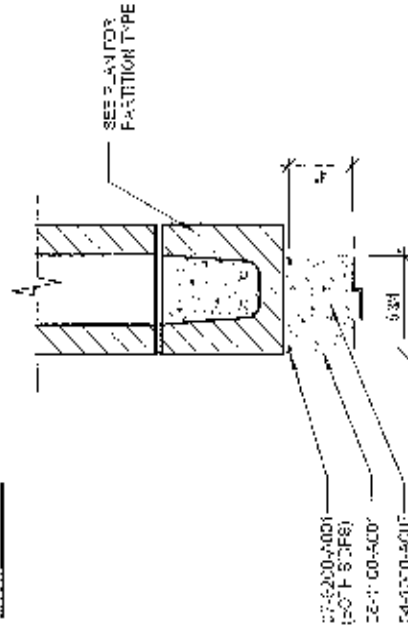
R. HW-23

1. Hinges	1
2. Closer	.75
3. Exit device 99EO	5.5
4. Electric power transfer	1.5
5. Power supply	2.5
4. Kick plate	.75
5. Weather stripping (screw on)	1.5
6. Threshold	<u>.75</u>
	14.25 hrs.

Examples of frame sections

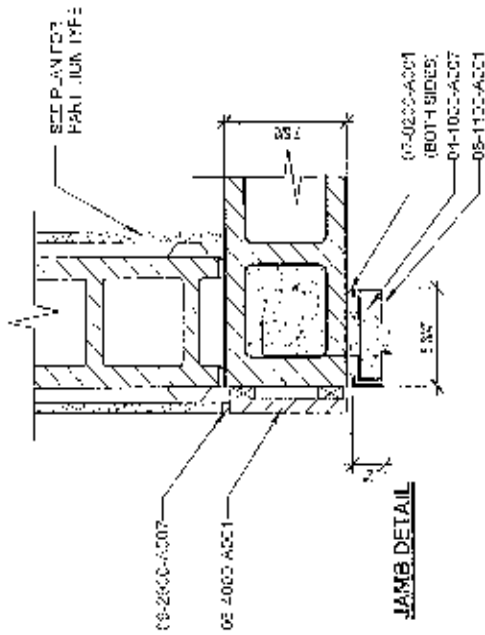


JAMB DETAIL

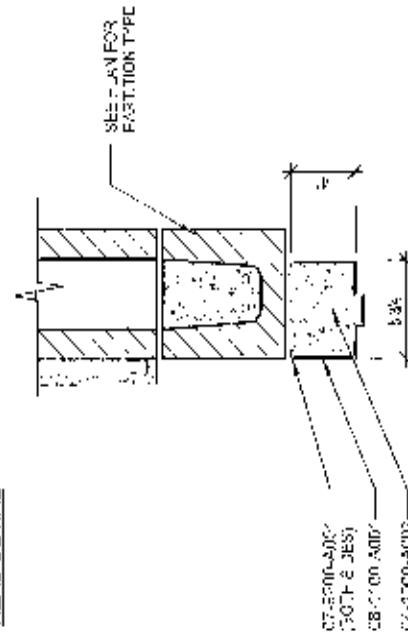


HEAD DETAIL

HEAD - JAMB
DETAIL
SCALE: 1/2" = 1'-0"



JAMB DETAIL



HEAD DETAIL

HEAD - JAMB
DETAIL
SCALE: 1/2" = 1'-0"



CREATING THE LABOR HOUR ESTIMATE PER DOOR:

After beginning the spread sheet (or downloading it if available) it is wise to again verify that all doors on the project are included in the sheet. This can be done in many ways such as counting one column of doors and multiplying it by the number of columns on a plan page or the number of specification pages the schedule covers.

The next step is to review the hardware sets shown in the hardware schedule which are either shown in the specifications (normal) or on the plan pages following the schedule. There can be between 50 and 200 different hardware sets on a single job. Each of these has a different timeframe to install based on the type of hardware and the individual pieces included in each set. Each piece of hardware requires a specific amount of time to install. Assemble the hours to install each individual hardware set. For each set, it is best to assume the door installation is included with the hinges. Include time to "tweak" the door's fit in the frame. Review each piece of hardware including the brand, series number and model number. The series number of a lockset will determine if the lockset is a simple cylindrical set, a more complicated mortise lockset or a complicated panic hardware device. Each different style of lock obviously requires a different amount of time to install. The internet has made investigating the manufacturer, series and model significantly easier. Many pieces of hardware such as kick plates are fairly consistent in labor hour installation time frame regardless of size or style. There is no substitution for hands-on experience installing these pieces to help determine the time required. Getting historical information based on past projects refines the time frame for each individual piece as well.

R.S. Means is a great system to double check your labor units. Total the labor time frame for each hardware set by assigning a labor factor to each piece of hardware in that set. Some doors will be able to be completed in an hour or two; others may take several days if there are double door units with vertical rod panic devices, closers, armor plating, etc. Always remember to add additional time for double door units to adjust the doors to meet each other. NOTE: Always remember to include time in each hardware set labor hour unit to get the door and hardware from the lock up room (discussed later in the paper) to the individual opening taking into consideration distance, floor changes (will a lift or elevator be available?) can a cart be used, etc.

CREATING THE LABOR HOUR ESTIMATE PER FRAME:

If the door frame installation is part of the bid package the following needs to be included. Door frames in masonry take considerably longer to install than those in a drywall partition due to the spreaders and kickers required to be installed to hold the frames in place as the masonry is laid around them and the frames are filled with mortar. Obviously a double door frame takes more time to install than a single door frame as well due to the added precision to keep both sides of the frame perfectly plumb in all directions as well as keeping the wider door head from bending or bowing. Each of these need to be considered as the hours per frame installation are considered. Again, the time to get the frames from the lock up room to the opening needs to be considered.

ASSEMBLYING THE BID COMPONENTS:

The next item of work in the estimating process is to create the estimate spreadsheet using the door schedule worksheet developed earlier. A block needs to be inserted for each different hardware set. The number of each hardware set must be inserted into a block. This is usually easiest to complete under or next to the door schedule spreadsheet information.

The next step is to create a "count if" formula using the hardware set number and referencing back to the hardware set column of your spreadsheet.

EXAMPLE OF A "COUNT IF" SECTION OF THE SPREADSHEET

P	Q	R	S
Hardware Set	Total count of each set	Labor Hrs	Total Hrs
18	=SUMIF(\$L\$4:\$L\$273,P10)/P10	6	=Q10*R10
19	=SUMIF(\$L\$4:\$L\$273,P11)/P11	5.75	=Q11*R11
20	=SUMIF(\$L\$4:\$L\$273,P12)/P12	8	=Q12*Q13
21	=SUMIF(\$L\$4:\$L\$273,P13)/P13	3.25	=Q13*R13
22	=SUMIF(\$L\$4:\$L\$273,P14)/P14	2	=Q14*R14
23	=SUMIF(\$L\$4:\$L\$273,P15)/P15	14.25	=Q15*R15
24	6	4.5	27
25	3	6.5	19.5
26	7	2	14
27	15	2.5	37.5
28	8	3	24
29	4	11	44
30	48	2.5	120
31	4	5	20
32	8	12	96
33	2	3	6
34	6	3.5	21
35	1	9.5	9.5
36	3	3	9
37	6	3	18
38	6	12	72
39	2	5.5	11
40	14	3	42
41	5	5.5	27.5
42	7	7	49
43	11	3	33
44	10	12	120
45	5	2.5	12.5
46	12	11	132
47	1	5.5	5.5
48	3	8.5	25.5
49	14	2.5	35
50	17	2	34
	=SUM(Q10:SQ42)		=SUM(S10:S42)
	↑		↑
	Total number of openings formula		Total hours for the hardware sets

Formula to count each hardware type in column "L"

COMPLETING THE QUANTIFICATION PORTION OF THE ESTIMATE

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Once the “count if” section of the spreadsheet is created for each separate hardware set it is important to create a total of the number of hardware sets which have been counted and compare that against the total number of openings on the project to insure no openings or hardware sets have been missed.

Assuming that all sets and openings are accounted for, it is now time, in the adjacent column across from each hardware set, to insert the total hours to install each door and hardware which was arrived at earlier in the estimate. Be careful to insure the correct hours are associated with the correct set in each line as inserting the quantity of data can easily get off in sequence and finding the spot it became wrong takes a good deal of time. Check every few lines to insure everything lines up. NOTE: Sometimes hardware sets are not actually used on a project even though they are listed in the hardware sets.

The remaining formula to insert in the columns is a simple cell multiplied by cell formula to multiply the quantity of a specific hardware set by the number of hours that specific set will take to install. At the bottom, simply total the hours in this column. This will be the amount of time that the doors and hardware installation should take.

If the frame installation is part of your contract then the quantity of frames installed in masonry walls verses drywall partitions must be counted. This is where the list of door jamb details which was filled out on the spreadsheet comes into play. Create a similar type of “count if” formula as detailed above for each door jamb type. Insert the amount of time it will require to get each frame from lock up, transport it to the opening (again remembering travel path,

obstacles, etc.) set it, brace it (if applicable) AND return to the frame after the associated contractor (drywall installer or mason) has completed their work to insure that the door frame is still plumb in all directions, the door head is still square with both side jambs and both jamb sides are parallel with each other in all directions.

NOTE: Part of the value of creating the spreadsheet of each door by number comes into play here as a very useful checklist for all doors and frames can be created from the initial spreadsheet for a multitude of tracking options including checking that the frames are acceptable or listing the ones that are no longer set correctly due to problems created.

The number of double door frames must also be quantified as they take more labor hours to set due to their size and the tighter tolerance requirements to get the two leaves of a double door unit to line up with each other. This can be completed in a number of ways including determining which hardware sets are for double door units and quantifying this or if you are certain that all door frames are to be set by your company, simply adding time to each double door set of hardware to cover the added time for installing the frame as well.

Another factor that often impacts some doors on site is oversize and lead lined (at X-ray rooms) doors. These doors will require more than one man to move around while hanging and thus must be accounted for. Normally these oversize doors also have special hardware sets to compensate for their added weight and thus can be accounted for within the hardware set labor estimate. If the hardware sets do not differentiate, the most efficient method is simply counting the number of oversize units shown in the door schedule and including the additional labor hours required as a lump labor hour add to the overall takeoff.

ACCEPTING AND CATALOGGING THE MATERIAL AND COVERING MISCELLANEOUS COSTS

For installing doors frames and hardware there are various costs for several additional items which are shown below:

Consumables; Installation of hardware requires drill bits, hole saws, screw tip points and other miscellaneous items which wear out, break or require replacement. Be sure to include adequate monies in the estimate to cover these items based on the type of hardware and doors you are installing. Remember that door frames that are grout filled will require additional taps and drill bits due to accelerated dulling. These need to be expressed in a dollar figure.

Equipment; In addition to numerous drills, occasionally saws, planes, hammer drills and other assorted power hand tools are required. Carts, pallet jacks and other means of moving material around the site need to also be accounted for. Often, lulls or other lifting equipment may be necessary to unload material off of trucks into the jobsite. All of these costs need to be included in the estimate as a dollar figure.

Creating a lock up room and method of storing the material: Determine (with the entity running the project) where the lock up room(s) will be. Determine the amount of labor and material it will require to create a secure room to store the material and tools. Discuss how the items will be stored to allow items to be removed as they are needed (often creating a method of storing doors on their edge will create a better situation if the phasing or logistics of a project will not allow an entire pallet of doors to be moved into an area). These costs are part of the “art” portion of estimating and cannot be quantified in any data base. Be sure to also include any removal / repair costs that may be required for this portion of the estimate. It is important

to try to choose a room or area of the project that is centralized as much as possible or in a location that makes it easy to distribute the individual openings such as adjacent to an elevator or central corridor. Obviously the location of this room impacts the time it will take to stock it from the delivery truck as well as distribute the material to each opening.

Accepting and cataloging the material: Accepting the material costs are based on the overall quantity of each piece, the logistics of the jobsite and the means and methods to complete the move from the delivery truck to the lock up room(s). This piece of the estimate is once again, based on the estimator's intuition and knowledge and is not something that can be simply pulled out of any data base.

There are numerous ways to quantify and catalog all parts of a project to insure all the hardware components are delivered and accounted for. My personal preferred method is to have a person or people pull all components of each opening together from the boxes of individual hardware types and shrink wrap them all into one bundle writing the door number on the total package. This allows an installer to pick up a bundle of hardware and proceed to an opening to install everything. This also gives you ample time to discover if a component has not yet been delivered prior to actually needing it to complete the installation. The time it takes to pull all components of the hardware set as well as the cost of the shrink wrap, shelves or whatever other items are needed for this work need to be included. This is more easily completed once a good working knowledge of the total hardware types is known. This cost can be quantified in each individual hardware set as well. It is simply a matter of preference to determine the most efficient method for each individual estimator.

ASSEMBLYING THE FINAL BID

As with any bid, the final step is assigning labor costs to all the hours in the estimate, totaling all the miscellaneous material prices, equipment costs, general conditions, etc, and assembling these costs and determining the best material supplier bid with the appropriate mark ups.

The material bids must be looked at with great scrutiny. With this type of estimate it is normally half to two thirds of the total price.

It is normal for a supplier to list out the number of door frames, wood door leaves and metal door leaves, and a lump sum for all associated hardware. It is important to review the quantities given with your take off quantities to insure that everyone is reviewing and bidding on the same information. Different suppliers have different methods of completing a project. It is important to read all the qualifications and exclusions on each quote. If the project is to be completed in multiple phases and a supplier has quoted only one delivery, you must make the determination if you are able to accept all material at once and if you do, what will the added cost to you be. Past experience with a supplier is also important; are they large enough to handle the project? Will they be able to stage the material in their warehouse or will everything need to be drop shipped to you? Will they have each door number marked on each box of hardware or will you need to sort each piece of hardware from a large package shipped from the factory?

Often the lowest bid may not be the best value. It is important to know your supplier and how they operate to be able to determine the best value to include with your quote. Only calling qualified suppliers was reviewed in the “The takeoff of material” section of this paper. Often however you will receive unsolicited quotes from additional suppliers that need to be reviewed as well to insure you have the best bid possible giving you the best chance of winning the bid while still making projected profits. Often there is not time to do a thorough examination of their abilities. This is part of the unscientific part of estimating as a determination must be made of the number to include with the final quote.

To each of these independent costs, appropriate markups need to be added to become the profit for the project. This is also the time that any general conditions costs above and beyond those noted above need to be quantified and included. Some of these are clean up costs, supervision from the office and in the field, trucking, disposal fees if applicable, necessary permits, etc.

Once all known costs, markups, general conditions, etc. are completed and totaled, any necessary contingencies can be added if desired to help cover unforeseen conditions. The total of all these components is the final bid.

From the matrix	Total openings	Total takeoff hours
	785	4253

Keying schedule meeting
Accept & carry doors

12
266

Assume 20 minutes each
Assume 10 minutes each

Accept & carry hardware

133

Accept & count frames & turn over for install by others	48
Assemble hardware sets	200
Create lockup rooms & dismantle	96
Coordination of electric hardware	32
Adjust doors at 3 months	133
Re-work lock up room	8

Assume 3 deliveries 2 days each
 Assume 15 minutes each
 4 days each includes tear down
 Assume 10 minutes per opening

		hour charge rate		
Total Hours		5181	\$ 59.50	\$ 308,269.50
Low material bidder				
Misc. material for each opening (average)		785	\$ 5.00	\$ 3,925.00
Material for lock up rooms		Budget number		\$ 1,800.00
Equipment rental and costs		Based on time on site		\$ 9,450.00
General Conditions (condensed list)				
Plans - purchase sets	4 sets	\$ 200.00		\$ 800.00
Permits	By CM			\$ -
Insurance-Bld's Risk Hauling	1 allowance			\$ -
Cleanup (General)	3 months @	80.00	240 #	\$ 14,280.00
Cleanup (Final)	24 hr	1.00	24 #	\$ 1,428.00
Dumpster or Disposal	by CM			\$ 0
Safety Equipment	1 unit			\$ 1,500.00
Temporaries: Phone	8 months	\$ 100.00		\$ 800.00
Electric	by CM			\$ 0
Heat	by CM			\$ 0
Water	4 months	\$ 100.00		\$ 400.00
Trailer	None allowed			0
Small Tools, Etc.	1 allowance			\$ 10,000.00
Scaffold/Hoist	By CM			0
Supervision-HGC	250 hours		75	\$ 18,750.00
Supervision-Foreman	800 hours		60	\$ 48,000.00
Total General conditions			7%	\$ 99,458.00
Total base bid based on the information above				\$ 1,407,902.50

EXAMPLE OF A SPREADSHEET TO ASSEMBLE THE FINAL BID

23 **ARY:**

Closer: A mechanical device to softly close a door that is in the open position.

Door light: An opening in a door with glass installed.

Door schedule: A spreadsheet style matrix showing all necessary information about a door opening including the door number, room name, door size, hardware set, door material, jamb section, head section and fire rating if applicable.

Hardware: Pieces of equipment installed on a door to cause it to function as intended including hinges, locksets, door closers, kick plates, door stops, smoke seals and other items.

Hardware schedule: A listing of all the hardware sets on a project usually found in the specification book.

Hardware set: A specific list of individual hardware pieces that are to be included on a specific door opening to cause it to function in a specific manner.

Hinges: Devices to attach a door to a stationary frame to allow it to open and shut freely.

Jamb section: A look through the side of a door frame detailing the wall construction and how each frame fits into it.

Kick plate: A protective plate usually at the bottom portion of a door.

Lockset: A device to secure a door in a closed position. A lockset can have many functions from a storeroom set which always must have a key to open it to a passage set which cannot be locked. NOTE: Most commercial building codes require that any door in the path of egress always be unlocked from the egress side.

Opening: A complete unit consisting of a door, a frame and all associated hardware.

Panic device: Also known as a “crash bar” or “push bar” it is a lockset with a continuous bar across the door to allow the lock to retract when the bar is pushed. This is useful in the case of an emergency.

R.S. Means: One brand of estimating books.

Side light: A framed opening to the side of a door with glass installed.

Stop: Usually a door bumper mounted to either the floor or wall to stop the door from hitting another object. Overhead stops mount to the door and frame at the top to arrest the door without a bumper.