

**PDH Course G286**

# **The Bid Process**

*T. E. McLaughlin, PE*

Rev. October 2014

**PDH Online | PDH Center**

5272 Meadow Estates Drive  
Fairfax, VA 22030-6658  
Phone & Fax: 703-988-0088

[www.PDHcenter.com](http://www.PDHcenter.com)

[www.PDHonline.org](http://www.PDHonline.org)

An Approved Continuing Education Provider

# The Bid Process

T. E. McLaughlin, PE

## Course Content

### A. REVIEW OF THE OVERALL BIDDING & PROCUREMENT PROCESS

#### Outline of the Process

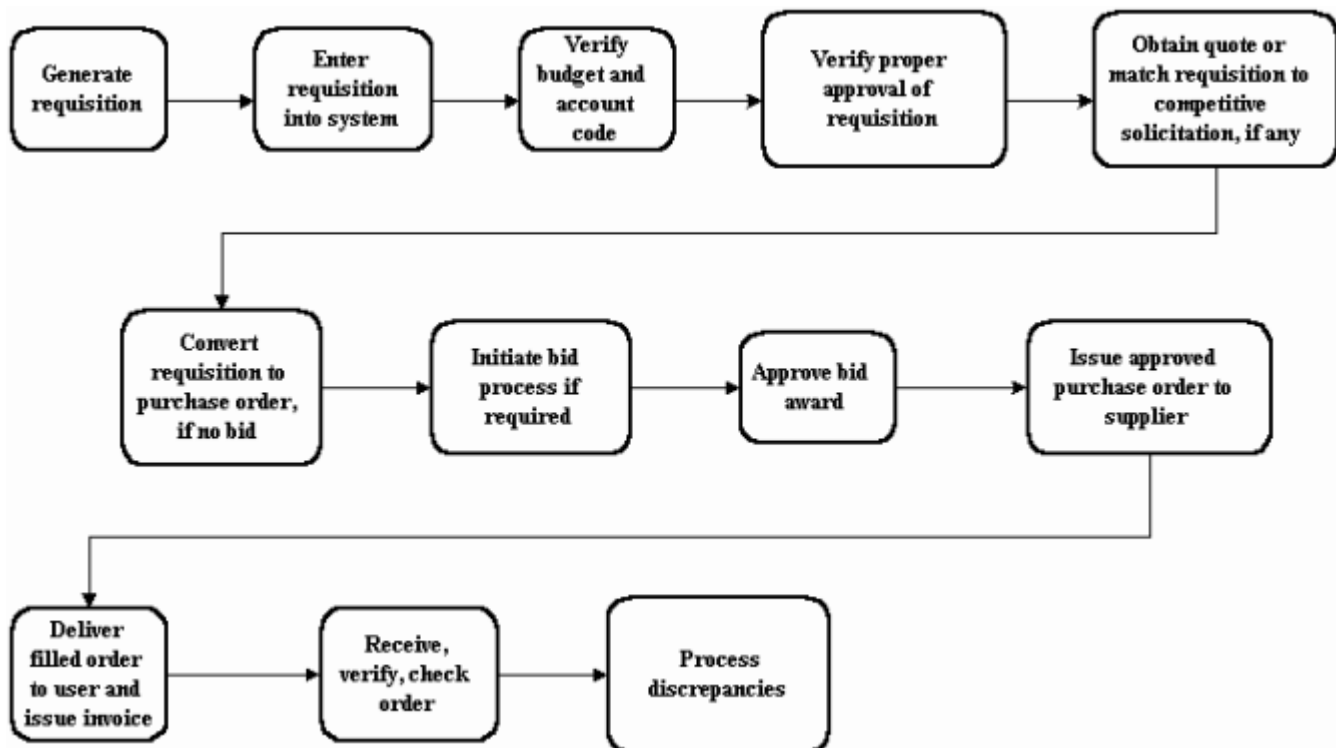
Most of us are involved with purchasing nearly every week, whether it's buying gas, groceries, or setting up a bid for complex machinery or for a construction project.

Review the web site and flow charts for a purchasing operation at the link below - :

<http://www.bai.berkeley.edu/BFS/BuyToPay/processFlowDiagram.htm>

[http://www.acq.osd.mil/dpap/ccap/cc/jcchb/HTML/chap\\_5.html](http://www.acq.osd.mil/dpap/ccap/cc/jcchb/HTML/chap_5.html)

[Note that some "pdf" web pages will only open in Internet Explorer. Check the browser settings.]



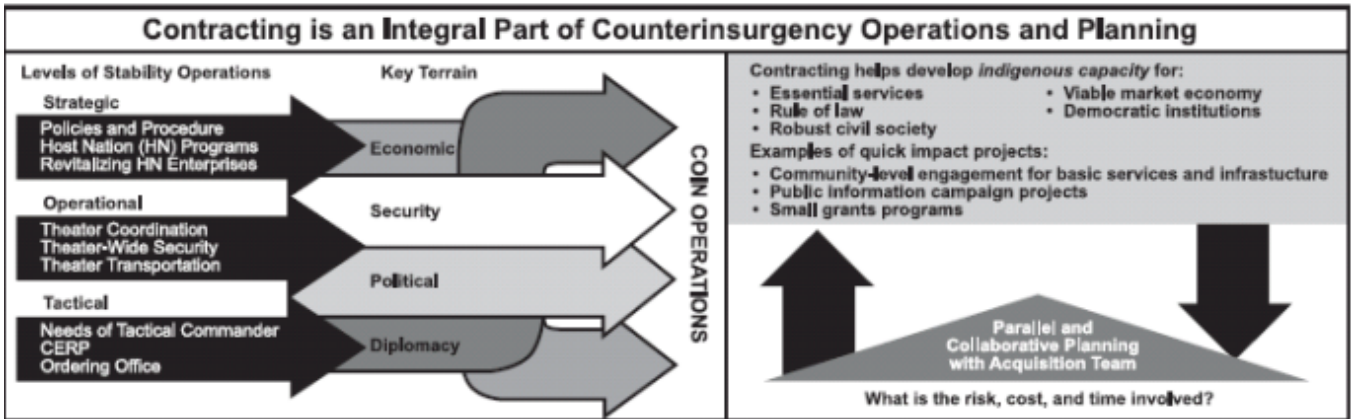
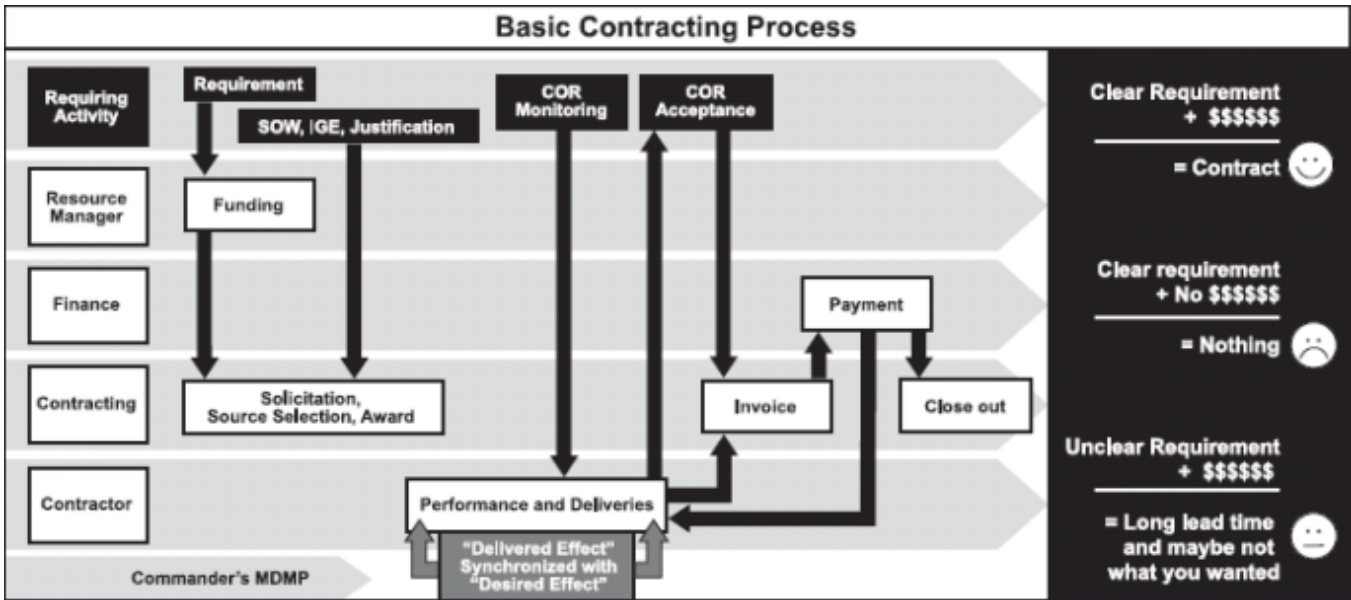


Figure 5. Basic Contracting Processes

**1. Statement of Work:**

One of the first things to be accomplished when setting up a bid is to formulate a statement of work (SOW), scope of work, or scope of services as the situation demands. This statement may refer to a variety of additional components, specifications, drawings, delivery dates, jobsite, delivery location, unloading procedures, etc. In order to provide a satisfactory statement of work, collaboration with an engineering department or engineering personnel may be required, and it may be best to review the work with the designer prior to attempting to formulate the SOW. Review the document on "Writing an Effective Scope of Work" at the web page below:

<http://www.ism.ws/files/Pubs/Proceedings/HIHaining.pdf>

Be aware of these key components of a good scope of work:

1. Describe in detail exactly what is required;
2. Refer to plans, specifications, and other applicable documents;
3. Specify packaging and delivery location/method;
4. Indicate or refer to a production schedule;
5. Indicate a final delivery date or time frame for completion;
6. Check the completed scope to make sure there are no conflicts with other documents such as contract text, specifications, or drawings.

If the supplier or provider of services doesn't understand exactly what is being requested, in what form it is to be delivered, and how delivery is to be accomplished, you cannot expect to receive a deliverable the way you need it. This also affects bid prices and product quality. Hence, we see all components are tied together and are equally important in formulating a SOW and preparing a bid package. It cannot be overemphasized that the SOW should address the work or product desired, and should not attempt to duplicate, reiterate, or copy the contract terms. This may involve some editing and collaboration with the contract administrator or purchasing manager, depending on the size of your organization.

**2. Prequalification of Bidders:**

Pre-qualification of bidders is desirable for large projects, for suppliers of technical components, for engineered products, for large quantities of a particular product, or for any situation which requires a substantial investment in the work prior to delivery. For example, the Connecticut DOT (ConnDOT) requires bidders on its transportation projects to be pre-qualified, but doesn't make specific note of this process on its DOING BUSINESS WITH CONNDOT web page:

<http://www.ct.gov/dot/cwp/view.asp?a=2288&Q=300688&dotNav=>

Review their current construction contracting forms under the heading "Forms" in the Contractor Resources section. Then go to the web page below and check the forms which are required prior to becoming pre-qualified:

<http://www.ct.gov/dot/cwp/view.asp?a=2288&q=259250>

After you have reviewed these ConnDOT bidding and prequalification forms, compare them to the NY State DOT process indicated in the following paragraph.

The New York State Department of Transportation DOES NOT pre-qualify bidders on its transportation projects, but it does require post-bid qualification. Review the NY State DOT's Important Information for Bidders at the web page below:

<http://www.dot.ny.gov/bids-and-lettings/construction-contractors/important-info>

Check also the General Information on the following web page:

<http://www.dot.ny.gov/bids-and-lettings/construction-contractors/general-info>

Review carefully the requirements for submission of a bid on NY State DOT's projects. Be prepared to answer questions on the items listed. Also note that New York State has an electronic bid submission system. It is linked at the left side of the web page noted above.

Florida has a separate web site for entities doing business with the State of Florida:

<http://dms.myflorida.com/mfmp>

Electronic pre-registration is required, and bids are submitted electronically. In addition, the Florida DOT (FDOT) pre-qualifies bidders for transportation projects:

<http://www.dot.state.fl.us/cc-admin/faq.shtm>

[http://www.dot.state.fl.us/cc-admin/PreQual\\_Info/prequalified.shtm](http://www.dot.state.fl.us/cc-admin/PreQual_Info/prequalified.shtm)

Be prepared to answer test questions comparing NYSDOT to FDOT & ConnDOT bid processes, including prequalification, bid submission, and forms required for bids.

### **3. Request for Proposals:**

Now let's look at the request for proposals/request for bids/request for quotations, (RFP/RFQ), which is the next step in our main objective, obtaining a proposal. Review the information at the following web page:

<http://www.ism.ws/files/Pubs/Proceedings/WhittingtonIC.pdf>

The RFP/RFQ is a fundamental component of a successful bid process and contract. It must be clearly understood by all bidders, there must be no ambiguity, and you can never, ever assume a bidder will be able to know by experience or by being in business for some length of time exactly what you want if you don't spell it out in writing. Any assumptions required by the bidders will inevitably lead to change orders, poor product, or unusable results. Ambiguity is to be avoided at all costs. The RFP/RFQ should complement the specifications and drawings, if any, and bid items must be synchronized with the specifications. If possible, include a specification reference for each bid item to avoid a scavenger hunt for the bidder. This also protects the procuring entity from unnecessary change orders and unexpected surprises during the delivery phase. In a competitive bid process, you can be sure the low bidder will make use of any error or ambiguity in order to obtain a change order. An experienced bidder will conceal his knowledge concerning

fundamental omissions and errors in the RFP/RFQ, and use this information as a weapon against the purchasing or contracting agency before the contract is completed.

Review the information at the web page noted above, and be prepared to answer questions about the issues and terms listed therein.

**4. Bid Opening:**

Receiving and opening the bids is the next-to-last phase in the bid process. Established buyers and governmental agencies will have a bid opening procedure in place; this usually involves a set date and time for bid submission, public opening of the bids, reading the contents of each sealed bid envelope, and public posting of the bid results. Private bid openings can lead to a variety of problems including: suspicion of “bid shopping;” allowing a favored vendor adjust his bid to be lower than the lowest submitted bid; and using the bids to establish a project budget, then allowing a group of preferred bidders to re-bid the project.

Electronic online bidding with open display of the results is one way to eliminate these problems. Go to the web page below and review the information concerning online bidding:

<http://www.ism.ws/pubs/Proceedings/confproceedingsdetail.cfm?ItemNumber=11548>

Note the advantages of online bidding, and be prepared to answer test questions on bid opening procedures. Be sure to review the information from the Virginia DOT bid opening procedure indicated below in the next section.

**5. Bid Review / Bid Analysis:**

Bid Analysis may be performed by hand comparison, spreadsheet analysis, or by using one of the online electronic bid submission programs, which automatically produce a spreadsheet comparison. Hand-entry of paper bid results into a spreadsheet program leads to the possibility of numerous clerical entry errors, the need to check each entry more than once, and consumes a considerable amount of time. The NYSDOT posts weekly summaries of their lettings on their Construction Opportunities Results web page:

<http://www.dot.ny.gov/doing-business/opportunities/const-results>

Six years of bid results are currently available. Note that only a total is given for each bidder.

ConnDOT also posts letting results as MSWord documents linked from the following web page:

<http://www.ct.gov/dot/cwp/view.asp?a=2288&q=259258>

The links provide both current and previous bid results, and again, only totals are shown for each bidder.

The Virginia DOT posts transportation bid letting results on the following web page:

<http://www.virginiadot.org/business/const/bidresults-list.asp>

After reviewing the bid results available on this page, click the “Bid Tabulations” link at the top right area of this page to see letting results for a specific date. Pick a date and review the tabulations for that letting and “reading.” Note that only the bid totals are shown, no unit prices.

Florida has a slightly different system. Letting results are available immediately following the bid opening. Review the information and links on the web page below:

<http://www3.dot.state.fl.us/TrnsportLASBidLetting/>

Historical construction cost data is available from the FDOT’s State Estimates Engineer at the following web page:

<http://www.dot.state.fl.us/specificationsoffice/Estimates/Default.shtm>

This web page has links to the “Basis of Estimates” Manual as well as the detailed historical cost data and cost per mile for transportation projects.

For purposes of this course we will assume the contract for procurement is a standard document which is not newly-generated for each bid; the only items which are unique to a particular contract package are the scope of work, bid proposal, drawings, and special specifications which are item-specific for that particular bid package. Private firms which do not have a canned or pre-prepared, standard contract text document may need to enlist legal assistance in preparing such a document.

Concluding our initial review of the bidding process, review the following web pages and information offered:

<http://www.ism.ws/files/Pubs/Proceedings/HBIBHaining.pdf>

<http://www.ism.ws/files/Pubs/Proceedings/CJCrowderHill.pdf>

<http://www.ism.ws/pubs/Proceedings/confproceedingsdetail.cfm?ItemNumber=11144>

Pick out the key issues discussed on these pages, and be prepared to answer test questions on key issues. Remember that a bad or unsuccessful bidding process can damage the credibility of the bidding agency, and will ultimately result in higher procurement costs. If you put projects or procurement items out for bid which consistently have errors,



conflicts, and inconsistencies, you have made the procuring agency a target for low-ball bidders who will ruthlessly pick your bid apart for errors, and then ask for an endless stream of change orders. This is especially true if you work for a public agency or a government procurement system.

## B. SCOPE OF WORK

In this section we review some “scope of work” descriptions and look for problems. Test questions will refer to these examples. Please review the details carefully:

### First example - bushings:

#### SCOPE OF WORK - BUSHING MANUFACTURE AND DELIVERY

1. Supplier shall furnish 3,000 each finished bronze bushings as shown on the attached diagram and engineering drawing.
2. Bushings shall be delivered in one shipment to the Company.
3. Bushings shall be as specified, and shall be packaged to insure no damage is incurred during shipment or from delivery.
4. Total order shall be delivered no later than 60 days after execution of purchase order by Company.

What’s wrong with this scope? If you were the Vendor, what would you be looking for? What drawing is being referenced? What is the title and effective date of the drawing? Are specifications for the bushings on the drawing, or are they listed in a separate document? Does this Company have more than one location? Where is delivery to take place? What does the phrase “no damage from delivery” mean, exactly? Can the bushings be shipped insured, or should the Vendor deliver them with his own truck and personnel? Can the firms being considered for production of the bushings produce them in 60 days? This time frame may be unreasonable if special tooling must be fabricated prior to commencing actual production. All these questions should be answered by the details of the scope. It would appear this original scope is totally inadequate to produce a satisfactory result.

Here is a revised scope of work which should eliminate the problems noted above:

#### **SCOPE OF WORK - BUSHING PRODUCTION ORDER**

- 1. Vendor shall furnish 5,000 ea. bushings, bronze material, to ZZZZ Corp. Main Office in Dayton, OH, as detailed on drawing attached hereto, with specifications as shown on drawing.**
- 2. Material specifications shall be AMPCO Metals Alloy 674, as shown on AMPCO spec sheet, or equivalent.**
- 3. All bushings shall be delivered not later than 60 days after approval of proof run of 100 units.**
- 4. In any case, order shall be completed not later than 90 days after issuance of purchase order to Vendor.**



Shipping is not specified. It is the Vendor's responsibility to get the parts to the delivery location indicated. The purchase order can indicate specific delivery details since the delivery location is noted. We have drawing and specification references, material specifications, and the Scope refers to a proof run of 100 units. If the Vendor needs clarification of the proof run, it can be indicated on the purchase order with a specified delivery date. What two items have been left ambiguous?

[hints – proof run approval time, type of finish, location of finish, hardness, surface hardness]

## Bushing detail:



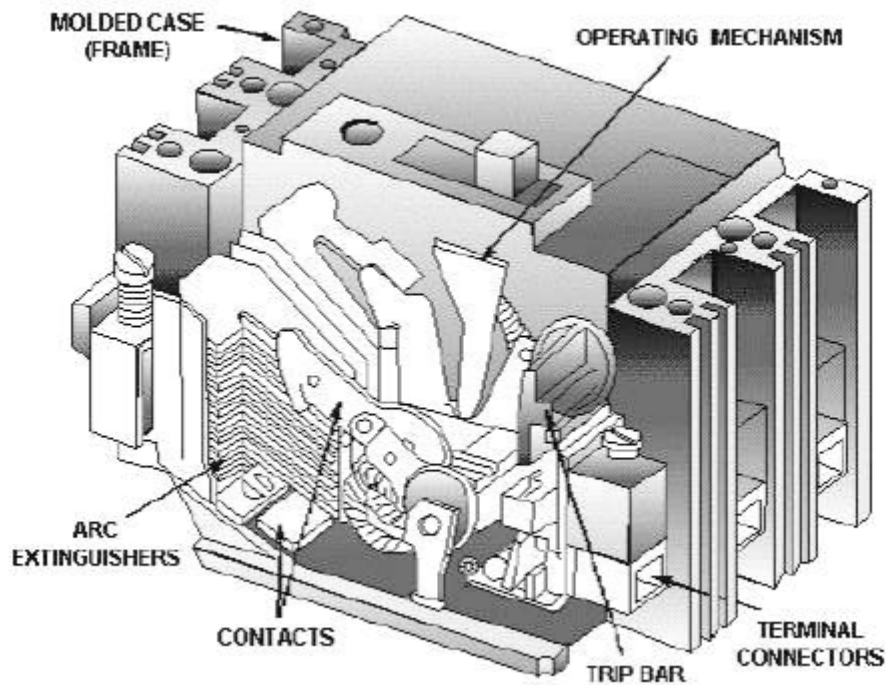
Check the bronze material specifications [Alloy 674] at:

[http://www.ampcometal.com/common/datasheets/us/A673\\_E\\_US.pdf](http://www.ampcometal.com/common/datasheets/us/A673_E_US.pdf)

**Second Example - Circuit Breakers:**

**SCOPE OF WORK - CIRCUIT BREAKERS FOR STOCK**

***Contraband Manufacturing Inc. requires 500 ea. A/C circuit breakers for production stock, to be delivered to its facility in Bayonne, NJ, not later than 15 days after execution of a standard purchase order. Vendor shall furnish new circuit breakers in original factory packaging, shipped insured delivery, to the Company. The circuit breakers shall be as specified, and shall be warranted free from defects for a period of one year from date of execution of purchase order. Refer to attached manuf. specification sheet.***



Go to the web link below and review the general information, including stocking info. -

<http://www.schneider-electric.com/products/us/en/50300-circuit-breakers/50330-molded-case-circuit-breakers/1853-powerpact-m-frame-molded-case-circuit-breakers/>

What is the first problem with this scope of work for a private bid, as shown.?

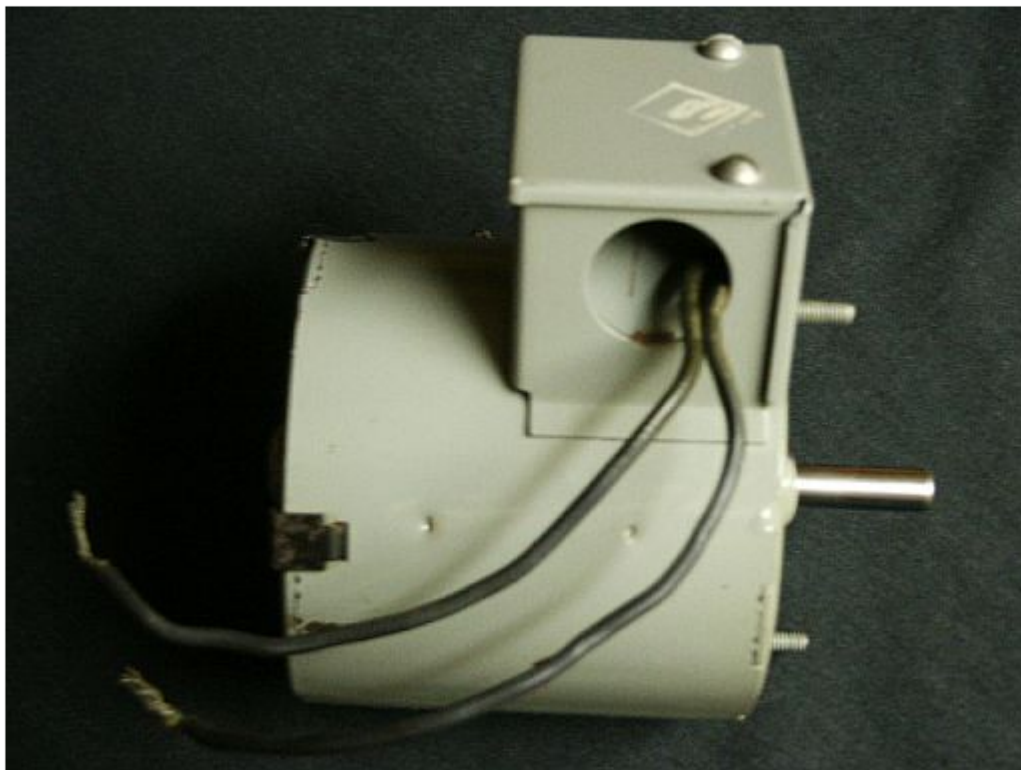
Assume this same scope is being used for a government agency purchase. The second problem is the manufacturer-specific component; the assumption is that only Square-D breakers will work in the system for which they are being purchased. Unless prior arrangements had been made with the government purchasing personnel, they would probably reject the scope immediately because a generic specification has not been used. The original problem also remains to be resolved.

---

### **Third Example - Electric Motor:**

In order to procure a new motor, you first have to determine the specifications, then check with a manufacturer or several manufacturers to see if such a motor is currently in production. If the design is for a new machine or system, the engineer/designer should have provided motor specifications. If not, there is a lot of work to be done. If you are dealing with a replacement motor, you will most likely need to discuss the specifications with a technician and then prepare a set of specifications yourself. For a typical small motor, you will need some of the following items: [this list is by no means complete...]

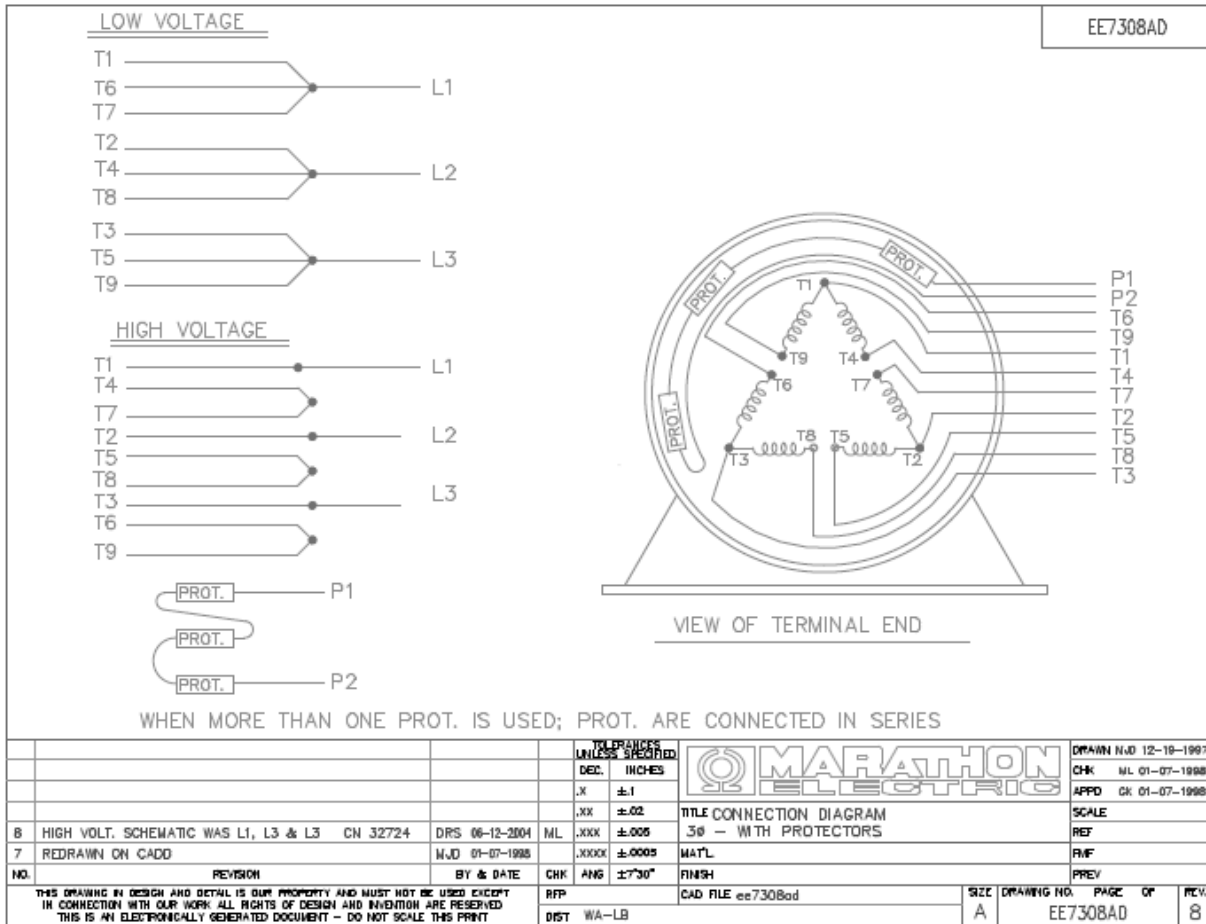
- 1. shaft size (all dimensions), shaft on both ends? sealed bearings or oil holes?**
- 2. shaft material? (stainless with specification?, carbon steel?, or “as supplied” ?)**
- 3. shaft keyway? flat on shaft? special shaft configuration such as threads?**
- 4. motor mounting? motor type? (synchronous is shown) rpm? explosion-proof?**
- 5. motor horsepower? continuous duty? intermittent duty? overload ok?**
- 6. type of winding insulation? electric power requirements? contactor required?**
- 7. temperature operating range? does motor need ventilation? type of ventilation?**



Click the link below to compare specs for larger motors -

<http://www.marathonelectric.com/MMPS/details.jsp?item=444TTGN16580>

Note the insulation details, and explosion-proof ratings. The motor in the pictures above has Class A insulation, while the motors referenced in the link are explosion-proof. These are just a few of the types of details required to specify an electric motor for purchase. Note the wiring diagram for a 3-phase explosion-proof motor:



### Motor Diagram courtesy of Marathon Electric Company, Wausau, WI

If the contracting agency with which you are working doesn't allow a specific item (such as motor) and manufacturer to be listed with the words "or approved equal," then you are basically specifying a motor or other component from the ground up. This is an extremely complicated and time-consuming process, as you can see. A manufacturer's representative may be able to help.

### C. RFP/RFQ - Request for Proposals / Request for Quotation

#### US NAVY Ship Acquisition Report:

Download the U.S. Government **GAO Report concerning Navy Ship Acquisition** from the following web page:

<http://www.gao.gov/new.items/d081061t.pdf>

Review Table 1 on page 7 of this Report, and consider how it relates to an RFP/RFQ for any technical product or system. Review the following issues for test questions:

- 1. Work removed from scope to stay within budget.**
- 2. Contract price adjustments for events/products outside Vendor's control.**
- 3. Specifying products or components which are not fully developed or are not fully operational. Have you specified components which weren't even designed at time of issuance of the RFP?**
- 4. Are adequate funds available to complete the purchase as contemplated?**
- 5. When was the last cost estimate reviewed? Is it still valid? Should the estimate be totally revised?**

---

**Delaware Dept. of Safety & Homeland Security invitation to bid:**

Review the bid solicitation on the following pages, issued by the State of Delaware. Note the details carefully – contact person & name; date for submittal; requirements for submittal; location of submittal; specifications for equipment; bid bond required; warranty. Note the key elements (for test questions) in this “advertisement” -

- a. Bid submission date and time;**
- b. Location for submission of bids;**
- c. Type of bid submission, i.e. sealed bid, open bid, etc.**
- d. Short description of equipment being advertised, along with bid quantity;**
- e. Contract completion time;**
- f. Reference to other addenda by internet link.**
- g. Invitation to bid was issued by the Delaware Dept. of Safety and Homeland Security.**

Complete bid solicitation is at this link -

[http://bidcondocs.delaware.gov/SHS/SHS\\_12007ThermalCamera\\_ITB.pdf](http://bidcondocs.delaware.gov/SHS/SHS_12007ThermalCamera_ITB.pdf)



**CONTRACT NO. SHS-12-007-ThermalCam.**

**ALL BIDDERS:**

The enclosed packet contains an "INVITATION TO BID" for **Thermal Imaging Camera**. The invitation consists of the following documents:

**INVITATION TO BID - CONTRACT NO. SHS-12-007-ThermalCam.**

- 1 DEFINITIONS and GENERAL PROVISIONS
- 2 SPECIAL PROVISIONS and SPECIFICATIONS
- 3 BID QUOTATION REPLY SECTION
  - A - NO BID REPLY FORM
  - B - BID BOND
  - C - NON-COLLUSION STATEMENT AND ACCEPTANCE
  - D - QUOTATION SUMMARY
  - E - OFFICE OF MINORITY AND WOMEN BUSINESS ENTERPRISE (OMWBE) APPLICATION

In order for your bid to be considered, the bid quotation reply section shall be executed completely and correctly and returned in a sealed envelope clearly displaying the contract number, by January 25, 2013, 1:00 PM, EST.

**Bids shall be submitted to:**

**Department of Safety and Homeland Security  
Attention Central Fiscal Office, Suite 220  
300 Transportation Circle  
DOVER, DE 19901**

Please review and follow the information and instructions contained in the general and special provisions section of the invitation. Should you need additional information, please email Beth Moran at, [beth.moran@state.de.us](mailto:beth.moran@state.de.us).

**3. CONTRACT PERIOD:**

Each vendor's contract shall be valid for one (1) year beginning March 1, 2013 through February 28, 2014. Each contract may be renewed for one (1) additional year through negotiation between the contractor and Department of Safety and Homeland Security. Negotiation must be initiated no later than ninety (90) days prior to the termination of the current agreement.

**A. KEY ITB DATES/MILESTONES**

The following dates and milestones apply to this ITB and subsequent contract award. Vendors are advised that these dates and milestones are not absolute and may change due to unplanned events during the bid proposal and award process.

Activity	Due Date
ITB Availability to Vendors	January 2, 2013
Written Questions Due No Later Than (NLT)	January 16, 2013
Written Answers Due/Posted to Website NLT	January 18, 2013
Bids Due NLT	January 25, 2013 1:00PM EST
Public Bid Opening	January 25, 2013 1:00PM EST
Bid Evaluation	TBD
Contract Award	Will occur within 30 days of bid opening

**B. INQUIRIES & QUESTIONS**

We welcome your interest in working with us, and we will be pleased to answer any questions you may have in formulating your response to this Invitation to Bid.

Revised: 6/29/2012 jms



**Florida DOT Bid Solicitation Notice:**

We now review more complex bid solicitation notices for a group of highway projects:

[http://www.dot.state.fl.us/cc-admin/Lettings/Letting\\_Project\\_Info.shtm](http://www.dot.state.fl.us/cc-admin/Lettings/Letting_Project_Info.shtm)

**Choose a date/project.** These “Bid Solicitation Notices” list several projects, and include complete sets of bid items and quantities for each project. Are the key elements discussed above for the Delaware “Advertisement for Bids” included in the Florida solicitations? Is the Florida solicitation issued by a State Official identified by name? Is this information on another page containing general bid information?

**Military Sealift Command Procurement:**

Go to the following web page for FedBizOpps.gov procurement, and then search for Department of the Navy/Military Sealift Command, and choose a solicitation:

<http://www.fbo.gov/index?s=opportunity&mode=list&tab=list>

Click on one of the solicitation links and review it to see what it contains. The standard Navy form should be included. Check the last page of the document to determine if it has been issued by an authorized official. It should have the same basic elements as the Delaware DOT “Advertisement for Bids.” An example is shown below -

[http://www.fbo.gov/index?s=opportunity&mode=form&id=a6497f825bd304cbc0d8121bed1c290a&tab=core&\\_cview=1](http://www.fbo.gov/index?s=opportunity&mode=form&id=a6497f825bd304cbc0d8121bed1c290a&tab=core&_cview=1)

<http://www.fbo.gov/utils/view?id=0e1347260efe9840ae7ade371f7b30e6>

**This is the synopsis of the bid solicitation:**

**Military Sealift Command Synopsis**

Action Code: Presolicitation  
Date: 22 OCT 2014  
Year: Fiscal Year FY15  
Contracting Office Zip Code: 23511  
Classification Code: 20  
Contracting Office Address: 471 East C Street, Norfolk, VA  
Subject: GEA Westfalia (Lube oil/fuel purifiers)  
Proposed Solicitation Number: N32205-15-T-3252  
Closing Response Date: TBD  
Contact Point or Contracting Officer: Donnie Leger (757) 443-5900, Donnie.leger@navy.mil  
Contract Award and Solicitation Number: TBD  
Contract Award Dollar Amount: TBD  
Contract Line Item Number: TBD  
Contract Award Date: TBD  
Contractor: TBD

Description: Military Sealift Command intends to award a firm fixed price purchase order for on a Brand Name basis for the procurement of Lube Oil/Fuel Purifiers from GEA Westfalia of Northvale, New Jersey on the T-AKE Class ship. GEA Westfalia is the Original Equipment Manufacturer (OEM) and ONLY OEM parts will be accepted.

Destination information: Norfolk, VA and San Diego, CA

Delivery schedule: TBD

All responsible sources may submit a bid, proposal, or quotation which shall be considered by the agency.

Solicitation will be posted on FEDBIZOPPS on or about 24 October 2014.

**Typical contract language is included in the description of the solicitation:**

**SHIP & BASE ACCESS (APR 2013)**

Vendors are responsible for correctly submitting forms/applications. Vendors are encouraged to monitor email using “Request a Read Receipt” function and to confirm receipt of facsimile transmissions.

Due to enhanced security measures, ship and base access is required for pre-award ship visits (e.g. ship-check) and for contract performance. Specifically the following permissions are required:

1. El Paso Intelligence Center (EPIC) personnel screening requirement
2. Base/Repair Facility Access Request
3. Vehicle Access Request
4. Ship Access List (vendor-provided)

All forms are available for download on the MSC contracts webpage at <http://www.msc.navy.mil>. Click on “Contracts” in the upper right corner. Click on “Online Library of Common Documents” for all forms.

**EPIC:** Required for access to MSC vessels. Complete EPIC form strictly adhering to format requirements. For CONUS East and Gulf Coast repairs, forward request to [msc.norfolk.epic@navy.mil](mailto:msc.norfolk.epic@navy.mil) and for CONUS West Coast and HI repairs, forward to [MSC.SSUSD.EPIC@navy.mil](mailto:MSC.SSUSD.EPIC@navy.mil) EPIC personnel screening requests are desired seven calendar days prior to performance start date. Requests will be managed as expeditiously as circumstances permit. Vendor will be notified by MSC of personnel who are denied access to the vessel.

**Base/Repair Facility Access:** Permit is required to access Navy facilities. Base/Repair Facility Access Request is desired seven days prior to ship check or performance start date. Submit forms per the document instruction and to the Port Engineer. A courtesy copy (CONUS West Coast performance locations only) to Ermanno Magliulo, Engineering Director, at [ermanno.magliulo@navy.mil](mailto:ermanno.magliulo@navy.mil) will be appreciated.

RAPIDGate® is being implemented for access to DoD facilities in CONUS, HI, Guam and Puerto Rico. Vendor is responsible to acquire RAPIDGate® status and destination base individual access badge(s) activation prior to performance start date. Delays that may result from inadequate planning are contractor responsibility. Vendor instructions and program information is available at <http://www.RAPIDGate.com> or tel. 877.727.4342. RAPIDGate® access requires (in succession) (1) Individual Base Commander approval for vendor to access base, (2) Successful vendor RAPIDGate® company annual enrollment, (3) Company employee individual enrollment and possession of RAPIDGate® identification badge for single base or multiple base (enterprise) access. Vendor is responsible to confirm that each employee held annual RAPIDGate® badge is active for the specific facility and performance period in accordance with RAPIDGate® User Agreement (<http://www.RAPIDGate.com>).

Enclave Access request may be selected on the “Naval Base Point Loma (NBPL) Access Request Form.”

**Vehicle Access:** Required for vehicle access to Navy facilities. Follow supplemental instructions on Base Access forms or base-specific vehicle access forms.

## D. BID OPENING

We discussed “bid opening” in some detail in Section C, above, and noted problems associated with the bidding process. We also noted that the bid opening information can be processed by hand on paper, or can be processed electronically via the internet. The web site shown below is one method for streamlining the entire process and saves time and personnel costs by making all bidding and contract documents available online to authorized personnel.

<http://construction.com/bidmanagement/Default.asp>

Note the features at the Dodge web site; then go to the Florida State MFMP web site below and compare the systems:

[http://www.dms.myflorida.com/business\\_operations/state\\_purchasing/myfloridamarketplace/mfmp\\_vendors](http://www.dms.myflorida.com/business_operations/state_purchasing/myfloridamarketplace/mfmp_vendors)

If bids are opened electronically and the results posted on the internet the same day, it may help to remove the suspicion of “bid shopping,” and the inevitable undesirable results.

You have already read about “bid rigging” in Section C, above. Go to the following web pages and compare the information; be prepared to answer test questions concerning the clues which may indicate bids have been rigged, or that you have received “cover bids.”

[http://www.justice.gov/atr/public/guidelines/disaster\\_primer.htm](http://www.justice.gov/atr/public/guidelines/disaster_primer.htm)

<http://www.justice.gov/atr/public/guidelines/211578.htm>

## E. BID ANALYSIS

The Dodge “Project Document Manager” referenced in Section D, above, [first link] is one private software system for managing bids and project documents. This document management process can be custom-built for any firm who has need, and has availability of an online server with spreadsheet programs and adequate storage capacity for the project’s documents. Bids can be analyzed by hand or with a combination of hand entries on paper and manual spreadsheet entry if the pay items are not too numerous. For more complicated projects, electronic data systems are almost mandatory.

Let’s look again at the Florida DOT’s online bid storage data at the following web page:

[http://www.dot.state.fl.us/cc-admin/Lettings/Letting\\_Project\\_Info.shtm](http://www.dot.state.fl.us/cc-admin/Lettings/Letting_Project_Info.shtm)

Current letting information is available as well as breakdowns of unit prices for bids.

The web page below lists bid items from the Florida DOT's Basis of Estimates Manual with a moving-average state-wide cost for each bid item used during the past 12 months. This information allows an instant comparison, by hand, of any active bid items in a current bid on a project using the same pay items. The project manager or purchasing representative can compare unit prices on a current bid to determine if it fits within a statistical range for that particular item. Local area bid prices can also be used to analyze a current bid using data found on this web page:

<http://www.dot.state.fl.us/specificationsoffice/documents.shtm>

Look at the menu items at the middle left side of the page and note the link to the Historical Cost Information. All this information helps the analyst determine if the unit bid prices fall within a normal statistical range for a particular bid item, and allows an informed decision to be made concerning suitability and acceptability of a particular bid. This information also provides a designer with the basis for making his initial engineering estimate for a project, and allows the contracting agency a starting point for acceptance or rejection of a bid or group of bids. If you are letting a private project and have no cost data or other historical data on which a preliminary estimate can be based, it is necessary to break the work down to its essential elements and estimate material, labor, equipment, and expenses for each item. Otherwise, you are at the mercy of your bidders, and will have to trust them not to overprice the work. This level of detail may not be important for small, fabricated components, but for large, complex projects, it is essential.

**Statistical Analysis of Bid Results:**

Let's look at a recent, actual, New Jersey DOT project and the total bid prices submitted. We have six bids, and for our purposes we will assume all six are valid, bondable submittals with no legal errors. We are going to base the analysis on the total bid prices only, and not delve into the individual unit prices. The six bids are as follows:

- 1. Agate Construction.....\$9,991,138.12
- 2. Pierson Construction.....\$10,199,999.99
- 3. Midlantic Construction.....\$10,312,998.29
- 4. Marbro Inc.....\$10,621,117.00
- 5. Earle Asphalt.....\$11,187,113.13
- 6. Crossing Construction.....\$13,667,033.80

### BID OPENING 11-29-2007

Maple Ave. (Pennsauken)/ Chapel Ave., NJ Transit Bridges,  
Contract No. CAM983410: Grading, Paving & Structures,  
Township of Pennsauken and Cherry Hill, Camden County,  
100% State, PE5809314, CE5809319, DP07157.

Contractor	Bid Amount
Agate Construction Co. Inc. Ocean View NJ (1)	\$9,991,138.12
Richard E. Pierson Construction Co. Inc. Woodstown NJ (2)	\$10,199,999.99
Midlantic Construction LLC Manasquan NJ	\$10,312,998.29
Marbro Inc. Montclair NJ	\$10,621,117.00
Earle Asphalt Company Farmingdale NJ	\$11,187,113.13
Crossing Construction Co. Inc. Washington Crossing PA	\$13,667,033.80

Note: Bids and bidders are subject to examination. Amounts and ranking may change in accord with NJDOT Standard Specifications--section 102 "Bidding Requirements and Conditions" and section 103 "Award and Execution of Contract".

(1) Apparent lowest bid      (2) Apparent second lowest bid

Division of Procurement

Bureau of Construction Services

It would appear that Pierson has an affinity for using 9's, and Earle likes the number 13. These apparent "good luck" numbers didn't provide either firm with any benefit.

**First**, calculate the overall average bid price:

$$\text{Average Bid Price} = [\text{sum of all bids, total } \$\$] / 6 = \$10,996,566.72$$

By inspection, we see that Marbro and Earle are closest to the average total price. This leads to the question: "What did Agate leave out?"

We can also see that the four lowest bids are all within approx. \$300,000 of each other, or closer (2.7% of average bid price). Crossing Construction's bid is 22% higher than Earle, using Earle as a base. This would lead one to conclude that Crossing's bid is too high to be statistically realistic.

**Second**, calculate the percentage deviation from the average bid price using the average as a base:

$$\text{Deviation [percentage]} = 100 \times [\text{Bid Price} - \text{Average price}] / [\text{Average price}]$$

1. **Agate** = - 9.1%
2. **Pierson** = - 7.2%
3. **Midlantic** = - 6.2%
4. **Marbro** = - 3.4%
5. **Earle** = + 1.7%
6. **Crossing** = + 24.3%

Assuming no evidence of abnormality in the bids, and using 10% of average as a guide, we can see the five lowest bids appear to be within the normal range for acceptable bids. We do not have the engineer's cost estimate for a benchmark in evaluating the bids. Normally governments use a range of 10% of the government or engineer's estimate as a cutoff point in determining the acceptability of a bid on a large project; it is important to have this information available prior to analysis, and perhaps prior to placing the bid on the street.

Another way to analyze the results is to calculate the median value (we have no actual median value because there are an even number of bids) of the bids. To do this we take the Midlantic and Marbro bids and average them:

$$[ \$10,312,998.29 + \$10,621,117.00 ] / 2 = \$10,467,057.65 = \text{Median of bid prices}$$

**Third**, calculate the percentage deviation based on the median value shown immediately above:

1. **Agate** = - 4.55%
2. **Pierson** = - 2.55%
3. **Midlantic** = - 1.47%
4. **Marbro** = + 1.47%
5. **Earle** = + 6.88%
6. **Crossing** = + 30.6%

This distribution is similar to the previous set calculated using the average. Here we see the low and high are about -5% and +7% about the calculated median price if we throw out the high bid from Crossing Construction. This is a fairly tight distribution, and usually indicates a competitively bid project with no major flaws in the bid documents.

On speculation, it is conceivable that Crossing Construction didn't really want this job, but bid on it anyway hoping to make a windfall profit if they, somehow, were low bidder. Or, Crossing Construction may have just submitted a courtesy bid with no intention of being low bidder.

One could continue to analyze these bid results using standard deviation, draw a gaussian curve, plot the points, etc. There appears not to be any need to do so in this case because there aren't enough data points (bids) available to make a continued analysis worthwhile. It would be more productive to take the 3 lowest bidders and compare their unit prices item by item using a spreadsheet program.

As described earlier in this Section E, line-by-line bid item comparison using a spreadsheet is the most effective method of analyzing bid results, however it is time-consuming. Look at the letting results for the New York State DOT at the following web page:

<http://www.dot.ny.gov/doing-business/opportunities/const-tabulations>

Spreadsheet bid tabulations are available for a period of three years for all the New York State DOT lettings.

This is similar to the Florida DOT's data and allows the analyst to compare unit prices between the bidders as well as compare historical unit prices, depending on availability of data. A much better picture of the bid results can be obtained using this method, as well as allowing the analyst to pick out line items on which a contractor has heavily marked-up a unit price which is associated with an item having a small bid quantity.

This is one of the "suspicious indicators" mentioned in the [U.S. Justice Department article on Bid Rigging](#), linked above in Section D ["primer" article].

Before taking the test, review all the "suspicious indicators" noted in the article just referenced.

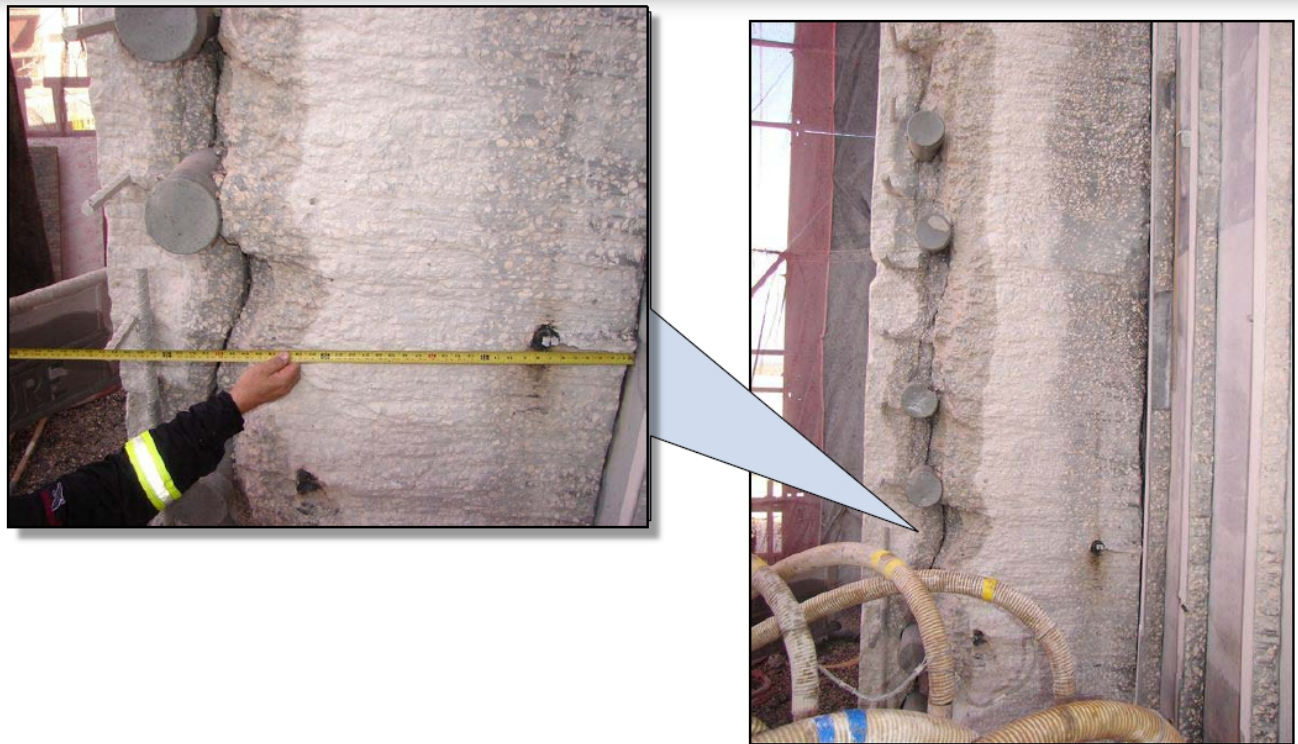
And finally, in a review of the consequences of ambitious, money-saving measures taken by inexperienced personnel, working outside their area of expertise, consider the following situation with the Crystal River, FL nuclear generating station -

<http://www.tampabay.com/news/business/energy/amid-pricey-ripples-from-failed-florida-nuclear-plant-minority-investors/2186912>

This is what happened when the owner, Progress Energy, decided the low bidder was unnecessary and undertook the project internally with little expertise in construction.



Photos of the concrete fracturing after bar cutting are shown below -



**END OF COURSE**

**Revised October 29, 2014**