AURA Cost Book Policy and Procedure Manual

For

Construction Proposals

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I. PURPOSE

This manual provides a minimum standardized approach to cost estimating policies and procedures that include price/cost analysis, documentation, communication and review with respect to cost books for construction proposals. Procedures may be modified, as needed, utilizing sound professional judgment in the case of unique projects, agency requirements or if project-specific conditions warrant. Projects that are funded through federal agencies that require AURA to adhere to the Federal Acquisition Regulations (FARs) should review the FARs relative to contract pricing including FAR Part 15 "Contracting by Negotiation" for additional specific requirements.

Included are procedures that describe how to document costs such as labor, travel, direct materials, other equipment and indirect costs using generally accepted best practices. Basis of estimates should be developed in accordance with standard cost and price analysis practices outlined in this manual to ensure price reasonableness.

Costs estimates shall be updated and reviewed (where applicable and practical) within 6 months prior to proposal submission, at each major review (including Preliminary Design Reviews (PDR), Final Design Reviews (FDR) and prior to any agency Construction Reviews) and as otherwise required by the funding agency.

Each project is unique. A Project Estimator must understand the project work scope and then account for all the activities necessary to complete it to accurately develop an estimate of the construction costs for a project. Larger, more complex projects should include more extensive analysis commensurate with risk during the scoping phase to develop a more accurate cost estimate.

II. DEFINITIONS

Allowance – Additional resources included in an estimate to cover the cost of known but undefined requirements for an activity or work item. Allowances are part of the base cost.

Basis of Estimate (BOE) – The reference material methodology used to develop the cost for individual items of work based or products, full systems or, the complete proposal price. A proper basis of estimate addresses the cost of each individual component (labor, materials, equipment, including sub-award and sub-awardee markups) appropriate to complete the work.

Cost Analysis - The review and evaluation of individual or system level cost elements, the basis of estimate for these elements, and comparisons to other estimates or real costs to analyze a particular cost. This should include where appropriate, proposed profit or fee of an offeror's cost or pricing data or information other than cost or pricing data and the judgmental factors applied in projecting from the data to the estimated costs.

Construction – A combination of engineering, procurement, erection, installation,

assembly, demolition, integration and commissioning (when appropriate) and/or fabrication to create a new facility or to alter, add to, rehabilitate, dismantle, or remove an existing facility; includes alternation and repair (dredging, excavating, and painting) of buildings, structures, or other real property and construction, demolition and excavation conducted as part of environmental restoration or remediation.

Construction Engineering (CE) – The project management effort (budget/cost) of taking a project from contract execution through construction and project completion.

Construction Contingency – Unallocated funds included in the bid price usually established as a percentage of the base cost to account for uncertainties in quantities, unit costs, and minor risk events related to quantities, work elements, or other project requirements during construction.

Cost Estimate – A prediction of quantities, cost, and/or price of resources required by the scope of an asset investment option, activity, or project. As a prediction, an estimate must address risks and uncertainties. Estimates are used primarily as inputs for budgeting, cost or value analysis, decision making in business, asset and project planning, or for project cost and schedule control processes. Cost estimates are determined using experience and calculating and forecasting the future cost of resources, methods, and management within a scheduled time frame. (Source: Copyright 2007, AACE International, Inc., AACE International Recommended Practices, 10S-90)

Cost or Pricing data - All the facts that, as of the date of the price agreement or estimate, prudent buyers and sellers would reasonably expect to affect the price significantly.

Cost Realism - means - Is defined as the process of independently evaluating specific elements of each Offeror's cost estimate to determine whether the estimated cost elements are: realistic for the work to be performed; reflect a clear understanding of the requirements; and are consistent with the unique methods of performance and materials described in the Offeror's technical proposal.

Engineering Cost Estimate - An estimate developed by a highly experienced Project Estimator or expert in the scope of work to be estimated. Documentation of the estimate includes why specific assumptions or judgments were made due to experience.

Estimate – A quantitative assessment of the likely amount or outcome. Usually applied to project costs, resources, effort, and durations and is usually preceded by a modifier (i.e., preliminary, conceptual, order-of-magnitude, etc.). It should always include some indication of accuracy (e.g., +_x percent). (Source: *A Guide to the Project Management Body of Knowledge* (*PMBOK Guide*) PMBOK Third Edition)

Experience Estimates - Estimates based on personal experience and subjective judgments by a Project Estimator. Similar to ICE estimates.

Historical Bid-Based Estimate – An estimate developed from historical AURA project bids and may be modified to reflect project specific conditions.

Mobilization – A calculation presented as a percentage of the total of the construction cost estimate representing the cost to cover preconstruction

expenses, preparatory work, and operations (e. g. Moving equipment on site and staging).

Parametric Estimate– An estimate of the cost of a project or a part of a project based on one or more project parameter. Historical bid data is used to define the cost of a typical transportation facility segment, such as cost per lane mile, cost per interchange or cost per square foot. Historical percentages can be used to estimate project segments based on major project parameters. This method is often used in early estimating, such as planning and scoping estimates.

Risk – A measure of the potential inability to achieve overall project objectives within the defined cost, schedule, and technical constraints.

Risk-Based Estimate – A simple or complex cost model based on inferred and probabilistic relationships among cost, schedule, and events related to the project. It uses the historical data and/or cost based estimating techniques and the expert's best judgment to develop a Base Cost or the cost of the project if the project proceeds as planned. Risk elements (opportunities or threats) are then defined and applied to the Base Cost through modeling to provide a probable range for both project cost and schedule.

Price - The cost plus any fee or profit applicable to the estimate or quote.

Price Analysis - The process of examining and evaluation a proposed price to determine fairness and reasonableness without evaluating its separate cost elements. Price analysis always involves some form of comparison with other prices.

Project Estimator - Person responsible for estimating a specific Work Breakdown Structure (WBS) lowest level cost form.

Statement of Work - a narrative description of contracted products or services.

Work Breakdown Structure (WBS)- A product-oriented grouping of project elements that organizes and defines the scope of work of the project organizing the elements representing the work to be accomplished.   Each descending level represents an increasingly detailed definition of the project components.

III. PROCEDURES

A. Responsibility of the Project

Each project shall establish written policies and procedures for the project and staff for the management, development and control of costs in accordance with Professional Project Management (PPM) best practices. These shall include where applicable, but not limited to:

- Cost Estimating Plan
- Cost Control Plan
- Cost Management Plan
- Contingency Management Plan
- Communications Management Plan
- Procurement Management Plan

- Quality Assurance and Quality Control Plan
- Risk Management Plan
- Integrated Change Control Plan
- Project Staffing Plan
- Scope Control Plan
- Safety Plan

Other Project Management Plans to be developed and used in the cost estimation process if applicable are:

- Documents and Drawings Control Plan
- Glossary of Terms and Abbreviations
- Project Execution Plan: Overview
- Project Execution Plan: Science Case
- Project Execution Plan: Technical Description
- Project Execution Plan: Management Plan
- Configuration Management Plan
- Schedule Control Plan
- Spares Plan
- Commissioning Plan
- Project Closure Plan

B. Cost Estimating Process

All cost estimates will includes some form of cost/price analysis. Cost estimates shall be prepared in a clear, consistent, comprehensive format that facilitates reviewing the details and assumptions made throughout the cost estimate process. The estimate details shall clearly reflect any productivity factors used and any historical unit rates and other rates from national or site-specific databases.   Cost estimates must have supporting backup documentation in an accessible central location including an explanation of the assumptions and calculations on which the estimate is based. When using Project Management Control System (PMCS) Software, the project must make all documentation available for audit by the US Government or its designated agent.   It is acceptable to use a document control system to reference any backup supporting documentation.   However, if the system performs calculations for cost book estimates, reconciliation from Basis-of-Estimate (BOE) input to finale estimates must be easily verifiable.

Project Estimators will ensure price reasonableness by utilizing some form of price or cost analysis as per 2 CFR Part 215.45 for proposed direct and material costs.

The cost and pricing data must be accurate, complete and the judgment factors used in projecting from the data to the estimates must be stated in sufficient detail. Unless otherwise approved by the funding agency the cost/price analysis

will be considered *current* if performed with *six months* or less prior to the submission of cost proposal or receipt of an award.

C. Determining the Cost Estimate Basis

Cost estimating is one of the most important steps of a cost/price analysis. A cost estimate establishes the baseline of the project cost at different stages of development of the project. All projects benefit from following a well-defined process in developing project cost estimates. Each level of estimate may require different estimating inputs, methods, techniques and tools.

Cost estimate data shall be communicated to both the project management and the funding agency. The communication approach determines what estimate information should be communicated, who should receive this information, how the information should be communicated, and when the information should be communicated. Cost estimate information should be included when the communication plan is developed as part of the project management process. Often the words are as important as the numbers. The Cost Estimate Plan document can be used effectively as a communication tool to convey key information about the project to others.

A Cost Estimate Plan (CEP) ensures a comprehensive estimate of the project cost and establishes guidelines for preparing and updating the cost estimate. This includes engineering, design, analysis, procurement, fabrication, assembly installation, commissioning and management. The basis of the Plan is called the Basis-of-Estimate (BOE) and is organized according to the project Work Breakdown Structure (WBS) and prepared according to the established CEP. The CEP is used to establish budgets that may be used in the Project Management Control System (PMCS) to compare actual costs with established budgets for work accomplished. Other characteristics of the CEP include:

1. Uniform formats and procedures for estimators
2. Approved estimating methodologies
3. Estimates that are performed at the lowest WBS level
4. Basis-of-Estimates (BOE) that describes the rationale behind each estimate
5. Assigned risk factors to each WBS component using a standard methodology

A detailed cost estimate should be developed beginning at the lowest WBS level working its way up to the upper levels for a total, "rolled up" WBS cost estimate. Inflation factors should be applied in a manner clearly established in the PEP/CEP to provide a "then year" estimate with all cost elements adjusted to the anticipated year of expenditure.

Cost estimates are "activity based" processes for determining the resources required for each activity in the schedule. The development of budget elements and activities are driven by the project scope. Each activity should have an identifiable unit of measure and discrete quantities if applicable.

D. Items to be included in the Cost Estimate Plan

The task of cost estimating, by its very nature, requires the application of prudent judgment. A description of the steps in the cost estimating process is presented below.

1. Common elements of cost estimates should be consistent and should generally meet the following criteria:

    a. Estimates should be organized by a Work Breakdown Structure (WBS) and should include a WBS Dictionary and Technical Scope and a detail description of the work identifying the activities.   The WBS should be consistent between the technical definition, cost estimate and schedule.   The use of a common WBS should be considered for consistency between projects within a program WBS.

    b. Estimates should be based on a specific Statement of Work (SOW). The Technical Scope Detail should describe the project purpose, design parameters and supporting detail including applicable codes, specifications, quality assurance requirements, drawings, data sheets, bill of material, engineering data and other necessary items to define the scope of work.

    c. Cost estimates should be consistent with the project WBS, developed at a schedule activity level and list a clear and concise definition of activities where costs are to be estimated and should:

        i.   use appropriate cost estimating techniques

        ii. have clear documented appropriate costs

        iii. include historical costs and life-cycle costs

        iv. have estimates produced by *qualified* estimators

        v.   include a base escalation on an appropriately defined schedule

        vi. contain contingency to ensure confidence level of estimate - The contingency must be well defined, separately tracked and may include funding agency approval when required.

        vii. provide identification of activities for estimates - The project scope of work should be divided in accordance to the WBS and schedule. Dividing the estimate elements provides the following:

        viii. allow for portions of the work to be assigned to individual organizational elements that can:

        1) assign resources using cost estimating relationships
        2) will increase efficiency of planning and scheduling of work
        3) allow for changes to cost estimates to be easily incorporated

d. Elements in the estimate should be easily traceable to the corresponding activities in the schedule utilizing the WBS and include,

    i. Activity-based estimates that have discrete quantifiable units of work associated with each work element.

    ii. Level of Effort (LOE) estimates that are activities that cannot be associated with quantifiable units of work and are expressed as a defined level of expenditure over time.

    iii. Resources should be defined including the labor, material, equipment, services and any other budget items required to perform the specific scope of work.

    iv. Apply quantities to estimate activities including a unit of measure. If a level of effort is used, a quantity may be "one" with a unit measure of "lot."

    v. All qualifications and assumptions should be documented including the assumed conditions in the scope of work, the type of work expected, the amount of work expected, the source of materials, the conditions in which the work is to be performed and any other information that could significantly impact the scope direction.

    vi. Assignment of resources to scheduled activities according to a detailed work scope so that all costs are identified.

E. Developing the Basis-of-Estimate (BOE)

The Basis-of-Estimate (BOE) should include elements for direct and indirect costs, contingency and escalation. The BOE should include detailed estimates with information arranged by the WBS or account and fiscal year within the period of performance. Information should be commensurate with the available technical work scope and include at minimum if applicable:

1. Quantities
2. Production rates
3. Total labor hours

4. Labor categories

5. Labor rates including direct or hourly labor rates, fringe benefit rates and labor burdens and total labor costs

6. Material unit costs and total material costs

7. Sub-contract/sub-award unit costs and sub-contract total cost and cost element totals

8. Allowances

9. Exclusions

The Basis Of Estimate (BOE) form or input worksheets for submission into the cost book or PMCS should be designed to be able to be systematically replicated, checked, verified or validated. Worksheets, calculations, and other pertinent documentation for price/cost reasonableness should be well referenced, organized and easily auditable and accessible. If the project is using Project Management Control System software (PMCS), documentation must include an explanation of the parameters for producing costs. Documentation should specifically show example calculations, tables or other cost reasonableness assumptions. These include but are not limited to:

1. Salary, benefits and labor burden rate tables

2. Travel per diems, average costs for specific travel locations or explanations of determining reasonableness for the travel.

3. Indirect rates and how they are calculated or applied within the program.

4. Risk and Contingency rate tables

F. BOE Content Organization

A specific outline of items to be included as direct and indirect cost should be determined by the AURA financial system and the project however generally they should include:

1. Direct costs. These costs include any costs that can be attributed solely to a particular project or activity, including labor, travel, materials, sub-contracts/sub-awards, other necessary items and equipment.

   a. Direct Labor -This category covers all of the types of labor -- engineering (delineating different levels as appropriate), support staff, etc. -- that will be directly charged to the work scope. The estimator is free to group labor in any categories that assist in managing the scope of work as long as the costs are accumulated for the same categories that are used for estimating purposes. A "time-phased breakdown" of labor hours and rates reflects the fact that the

process of estimating and analyzing labor costs normally considers hours and rates separately.

b. Labor Hours - Price labor hours are adjusted to include paid leave such as sick leave, vacations, holidays, etc. There are 2080 hours paid during a normal annual year. For estimating purposes paid leave hours should be reduce to 1750 hours annually, or as stated and justified in the CEP, to represent actual annual productivity. In cases where AURA has performed the same or similar work in the past, the number of labor hours incurred will be considered factual data and must be documented. When AURA has no previous experience in performing the work to be proposed the estimate of labor hours must be made by breaking down the projected work into its constituent parts and projecting the labor hours necessary to perform each part of the work scope. In most cases, each part of the work scope can be compared to similar work scopes that the AURA has performed in the past and this data can be used to support the estimate. Even if AURA has never performed the specific work to be proposed, there will be factual (auditable) information regarding the labor rates that have been paid to the various categories of employees to be used. This information must be included as part of the Projects Estimator's cost or pricing data.

c. Labor Rates - All labor rates should include the prevailing salary, wage rates and labor burdens. Salary, as a rule, is expressed as an annual rate of pay and wages as an hourly rate. For AURA staff labor categories, salaries and rates can be obtained from the annual AURA Human Resources Salary Grade Table or provided by AURA Payroll either may be used as an acceptable source.   The Project should ensure that the documentation includes a table of labor categories with the above aforementioned information.

    Labor rates should be consistent, be provided for all years proposed, and delineate the escalation factor used. Care should be taken to ensure that the hours proposed are properly spread across affected years.

    Sub-awardee labor rates are based on their documented rates. (See section e)

d. Travel shall be itemized to include the number of trips, the number of people traveling, the estimated cost of trip including transportation and per diem cost of each traveler, and brief description. Rates should be consistent with current published GSA per Diem rates. When the GSA per diem is not specified and an average cost per trip is provided by a PMCS system, documentation as to the price

reasonableness should be easily verifiable.

    e. Subcontracts and Sub-Awards should be identified and a total estimated cost for each such package of work shall be included A cost/price analysis for each possible subcontract/sub-award must be documented should be in accordance with the <u>AURA Cost and Price Analysis procedures.</u>

    f. Equipment and Other Direct Costs (EODC) should be defined. The scope of work may require a variety of costs to obtain more accurate cost allocation. Such costs are frequently sporadic in nature varying greatly from one work effort to another; however, Project Estimators need to submit data on such costs. Material costs, if any, shall be itemized and supported on the basis for pricing materials such as catalog prices, vendor quotes, shop estimates, invoice prices, or prior AURA Center accounting system information etc.   Pricing should take into account any historical, current trends or special impacts on the project. <u>(Refer to Appendix for further acceptable documentation)</u>

2. Indirect costs are incurred by AURA and AURA Centers for common or joint objectives that cannot be specifically identified with a particular activity or project. Depending on the type of project these cost may include:

    a. General and Administrative (G&A) costs such as accounting, procurement, payroll, human resources etc.
    b. Facilities and Administrative (F&A) costs such as space, utilities, operating equipment, vehicles, warehouse, safety and security.

If applicable, the allocation base for general and administrative expense is total expense before G & A. Projects should identify the percentage used for G & A and the items to which it is applied. AURA Central Administrative Services should provide the Project with the most current approved G&A Rates and a schedule of proposed future G&A costs for the term of the project. Indirect rates should be defined for consistent application and appropriate for any given project scope and year. Central Administrative Services (CAS) should include the method of computation and application of labor burden expenses, including cost breakdown and showing trends and budgetary data as necessary to provide a basis for evaluation of the reasonableness of proposed burden rates.

Indirect cost rates and other burden rates are calculated annually, based on actual expenditures for the prior fiscal year. Rates are submitted to the NSF (for G&A and Labor Burden Rates) and the AURA Cognizant

Agency for (AURA F&A) for review and approval in the current year and applied in the next fiscal year. Accordingly, rates charged to a given project are subject to change each fiscal year.

Below are the types of rates that may apply. AURA Centers should contact AURA Center Central Administrative Services for specific use of rates.

a. General & Administrative (G&A): Applied to Modified Total Direct Costs (MTDC). MTDC is defined as expenditures by programs other than payments exceeding $25,000 in a fiscal year on individual purchases and sub-awards.

b. Labor Burden: Applied to direct labor costs including full benefits (see Labor Recharge Rate below). Burden rates include G&A, plus the additional costs of supervision, clerical support, miscellaneous materials, and the operating cost of building areas used by employees.

c. Labor Recharge Rate: Applied to the hourly pay rate of employees who charge time to projects or programs. The rate recoups the cost of employee benefits and paid time off (holidays, vacation, and sick leave). The costs are considered direct labor subject to indirect rates; therefore, each hour charged to a project will be increased by the appropriate labor recharge rate and that combined amount is subject to a labor burden rate.

d. AURA Facilities and Administrative Rate. In addition to G&A and Labor Burden rates as noted above, the AURA F&A is applied to total costs of the project. The Project should contact AURA Central Administrative Services (CAS) to obtain current AURA rates and documentation.

The Project Estimator should include the appropriate rates on the BOE form. Where PMCS input programs automatically apply rates, established input tables should be readily available for verification and calculation for each BOE. Cost Book summaries should include Fringe Benefits, NOAO Labor Burdens, G&A and AURA F& A. Each item should be noted separately or easily verifiable through source documentation. (Refer to Appendices for further documentation examples)

3. Contingency and management reserve are added estimates in preparation for undefined future events. Appendix B, 2CFR Part 230.9 COST PRINCIPLES FOR NON-PROFIT ORGANIZATIONS (OMB CIRCULAR A–122) states the following:

"Contingency provisions. Contributions to a contingency reserve or any similar provision made for events the occurrence of which cannot be

foretold with certainty as to time, intensity, or with an assurance of their happening, are unallowable. The term "contingency reserve" excludes self-insurance reserves (see Appendix B to this part, paragraphs 8.g. (3) and 22.a (2)(d)); pension funds (see paragraph 8.i): and reserves for normal severance pay (see paragraph 8.k.)"

However most federal funding agencies agree that construction project cost proposals should identify and include some form of contingency risks.

Contingency is an allowance to mitigate risk to a project for unknown scope. All contingency shall be clearly identified and the basis of estimate shall be documented and defined. Reasonableness of the contingency shall be established through probable burn-down pans or other analysis establish in the PEP or CMP in accordance with funding agency requirements

Projects should develop a written contingency plan to include but not limited to:

a. Budget Contingency

b. Schedule Contingency

c. Scope Contingency

Contingency Management s Procedures are to include:

a. Change Requests

b. Change Control Board and Recommendation

c. Project Management Plan

Project estimates will clearly show contingency costs separate from the general estimate. General estimates will need to be clearly documented as to why the contingency risk as been applied.

4. Contingency Plans and Use of Contingency

   All Contingency Plans will include a provision for Funding Agency Approval and Use of Contingency with the minimum requirements as follows:

   a. All proposed changes or proposed use of contingency that will be made known to the funding agency (posted via a change control database or similar) prior to authorization.

   b. Prior approval for use by the cognizant Program Officer if required by the funding agency.

5. Estimate Project Contingency

Project estimators are responsible for ensuring that each estimate has the appropriate and justifiable contingency applied. Contingencies should be estimated at the same bottom up level as the cost estimate.

Contingency should not be used as an alternative to risk management where every effort is made to eliminate unknowns and manage risks.

Contingency is determined by evaluating the need based on risks and estimating requirements to implement a recovery plan should the unexpected occur.

Risk estimates are used to calculate the contingency. Statistical modeling can be used to provide a check of the estimate. There are several methods for determining impact; flat, risk analysis and Monte Carlo Simulation.

Things that affect the need and amount of contingency pertain to the effectiveness of risk mitigation strategies. The following should be considered when developing risk mitigation strategies:

    a. Past performance of similar projects

    b. Contractor capabilities

    c. Technology and reliability requirements

    d. Security

    e. Environmental or site conditions including weather location etc.

    f. Scheduling to meet critical milestones

    g. Construction constraints

    h. Other - such as Permits, waste management

6. Escalation

Project estimates should be based on current year dollars by assigning an inflation rate per year for each of the different project cost elements. The selected year of expenditure should reflect a realistic scenario taking into account project planning and permitting durations, as well as construction timeframe.

Escalation rates should be applied to each task-based estimate and to its incremental contingency.

Labor should include any escalation for burden rates including G&A.

All escalation should be clearly documented and auditable.

G. Preparing the Basis-of-Estimate (BOE)

A required component of the base estimate step is the preparation of a Basis of Estimate document that describes the project and includes underlying assumptions, cautionary notes, and exclusions. The basis of estimate should

also be based upon, and include as an attachment for reference, the associated schedule for all remaining project activities. The schedule will be cursory and very broad in its coverage for conceptual level base estimates.

1. Preparing the BOE

   This activity covers the development of estimated costs for all components of a project, excluding future escalation. These components may be estimated using different techniques depending on the level of scope definition and the size and complexity of the project. The number and detail of components estimated may vary depending on the project development phase. For example, in the scoping phase the cost estimate covers preliminary engineering and construction. As the design progresses and more details are known, pieces of the estimate become more detailed. Key inputs to this activity include project scope details, Historical Databases and other cost databases, knowledge of Market Conditions, and use of Inflation Rates.

2. BOE Documentation

   Documentation should contain, at a minimum, the following:

   a. Description of the cost elements or activities to be completed with the scope of the work

   b. Description of cost estimate techniques, quantities and applicable rates

   c. Sources of information such as historical costs, industry standards, published price lists or catalogues, costs databases, etc.

   d. Allowances, assumptions and exclusions

   e. Calculated contingency

   f. Calculated escalation

   g. Estimate history including documentation as to revision to an existing base or change orders

   h. The name and certification of the Project Estimator and Project Reviewer of the cost estimate

3. Furthermore the BOE documents should include the estimate assumption(s), exclusion(s) and criteria used in producing document. Items to be documented are:

   a. Cost estimate purpose

   b. WBS and scope of work

   c. Code or chart of accounts

   d. Project requirement milestones, special conditions etc.

e. Description of assumptions and exclusions

f. Backup data including historical data, cost estimating relationship (CER) quotes and other sources of information

g. Basis of direct cost

h. Basis of indirect cost

i. Basis of escalation

j. Basis of contingency and contingency plan and risk analysis or risk management plan.

Some form of Price/Cost Analysis should be performed for all estimates and be fully documented in support of the BOE.

H. Price/Cost Analysis

Price/Cost Analysis is a crucial step in the BOE process. Every procurement or proposal estimate action must contain a documented price reasonableness determination. This determination can be reached through several avenues depending upon the individual procurement and information available. A Price Analysis shall be conducted on all procurements over the AURA small threshold of $5000.00. The Project Estimator is responsible for determining whether an offer is fair and reasonable, which is defined as what a prudent person would pay for a product or service under similar market conditions with buyers and sellers free to bargain.

A fair and reasonable price is one that is fair to both parties involved in the acquisition considering the promised quality and timeliness of the Offeror's performance. However not every price analysis produces a reasonable cost. A Cost Analysis shall be conducted when Cost or Pricing Data are required or when Price Analysis fails to show the price to be fair and reasonable. Estimators shall document the fair and reasonable price determination and should provide backup to support his/her determination.

Typically, there is no one single price that is "fair and reasonable," but there exists a range of acceptable prices, considering the character of the marketplace in which the supply or service is normally sold and the degree of competition available. Market research, current market price/conditions, previous purchases, catalogs, advertisements, similar items in a related industry, value analysis, the estimator's personal knowledge of the items being purchased, or any other reasonable bases should all be considered when making a determination of price reasonableness.

Below is a chart showing a comparison of types of cost, cost realism and profit analyses.

Comparison of Price, Cost, Cost Realism, and Profit Analyses

	Price Analysis	Cost Analysis	Cost Realism Analysis	Profit/Fee Analysis
What is it?	The process of examining and evaluating an Offeror's proposed price to determine if it is fair and reasonable without evaluating its separate cost elements and proposed profit/fee. Price analysis always involves some sort of comparison with other prices; e.g., comparing an Offeror's proposed price with the proposed prices of competing Offerors or with previously proposed prices for the same or similar items.	The review and evaluation of the separate cost elements and profit/fee in an Offeror's proposal and the application of judgment to determine how well the proposed costs represent what the cost of the contract should be, assuming reasonable economy and efficiency.	The process of independently evaluating specific elements of each Offeror's cost estimate to determine whether the estimated cost elements are: • Realistic for the work to be performed; • Reflect a clear understanding of the requirements; and • Are consistent with the unique methods of performance and materials described in the Offeror's technical proposal. The most probable cost estimate is a product of a Cost Realism Analysis.	The process of examining the proposed profit or fee to determine if it is reasonable in light of the associated risks.
When must you perform it?	On all procurements over the AURA small threshold of $5000.00 to determine if the overall price is fair and reasonable.	When cost or pricing data is required as per AURA policy. Also may be used to evaluate information other than cost or pricing data to determine cost reasonableness or cost realism.	When cost-reimbursement contracts are anticipated. Also may used it on Fixed Price incentive sub-contracts or sub-awards or, in exceptional cases, on other competitive Fixed Price sub-contracts/sub-awards when the Offerors may not fully understand new requirements, there are quality concerns, or past experience indicates Contractors' proposed costs have resulted in quality/service shortfalls.	When cost analysis is performed.

I. Price Analysis

Price Analysis is the process of examining and evaluating a proposed price without evaluating its separate cost elements. Below are several accepted techniques that can be used to perform Price Analysis:

1. Comparison of proposed prices received in response to the solicitation or request for quote. Normally, adequate price competition establishes the reasonable price or price range.

2. Comparison of previously proposed prices and previous sub-contract or sub-award prices with current proposed prices for the same or similar items, if both the validity of the comparison and the reasonableness of the previous price(s) can be established.

3. Use of parametric estimating methods/application of rough yardsticks (such as dollars per pound or per horsepower, or other units) to highlight significant inconsistencies that warrant additional pricing inquiry.

4. Comparison with competitive published price lists, published market prices of commodities, similar indexes, and discount or rebate arrangements.

5. Comparison of proposed prices with Independent Government Cost Estimates (IGCEs).

6. Comparison of proposed prices with prices obtained through market research for the same or similar items.

7. Analysis of pricing information provided by the Offeror to include obtaining detailed cost pricing.

For estimates in which cost or pricing data are not obtained, documenting price reasonableness may require the utilization of more than one price analysis technique. As many techniques as necessary to support price reasonableness should be utilized and documented. The first two techniques (1 and 2 above) are preferred, but if Project Estimator determines that information on competitive proposed prices or previous contract prices is not available or insufficient to determine fair and reasonable pricing, he/she may use any of the remaining techniques as appropriate to the individual estimate.

(Refer to the APPENDICIES for further documentation requirements)

J. Price Analysis Techniques

1. Adequate Price Competition.

   a. This is the most preferred price analysis technique, as competition usually yields the best obtainable price.

b. Two or more recent quotes must be obtained which meet the purchase requirement.

c. Estimates will be based on whose quote represents the best value where price is a substantial factor in source selection.

d. If adequate price competition exists, make a summary of all quotes received and document the Price Analysis.

e. It is important that the reasonableness of the estimate be supported and documented whether through adequate price competition or other analyses.

f. If there are unusual circumstances where additional information is necessary to determine the reasonableness of price, the Project Estimator shall, to the maximum extent practicable, obtain the additional information from sources other than the Offeror. Additionally, the Project Estimator may request other than cost or pricing data to determine the cost realism of or to evaluate competing approaches.

2. Historical Prices.

a. Prices paid for the same item in the past are a reasonable basis for Price Analysis in the present. Comparison with prices for the same or like items should be used whenever possible. The comparative analysis should include comments verifying the reasonableness of previous prices and adjustments made for quantity, time, breaks in production, etc. and adjusted to reflect changes in market conditions, economic conditions, quantities, terms, and conditions. If historical pricing is available, the Project Estimator must be sure to not only provide the historical pricing but also to provide evidence of fair and reasonable determination of the last price paid. If there is a substantial cost or technical difference, the documentation must explain why the comparison is still valid as a basis for the price reasonableness determination.

3. Parametric Estimates.

a. This technique incorporates cost estimating relationships and rules of thumb, based on historical data.

b. Parametric estimating uses this relationship to calculate an estimate for activity parameters, such as scope, cost, budget, and duration. This technique can produce higher levels of accuracy depending upon the sophistication and the underlying data built into the model. To properly evaluate the proposal, the Project Estimator must be able to identify any features of the quote that could affect the cost estimating relationship, such as added parts and equipment, etc.

These features would be quantified and the price adjusted accordingly.

    c. If used, the nature of parametric estimates and the source of the data should be documented.

4. Catalogs or Market Prices.

    a. Catalogs and published price lists are usually a product of a competitive market place. Catalog prices must be regularly maintained, specify current or last sales price, and be published or otherwise available for inspection.

    b. The use of a commercial price/parts list in and of itself does not justify the price to be fair and reasonable. The Project Estimator must also confirm and document that quantities at the prices listed and consider whether or not a price reduction is warranted because of the purchase quantity. Before the price can be determined reasonable, they should also be aware of any discounts, rebates, or the best price and should consider prices paid under similar contracts in which the item may not have been considered commercial.

    c. Differences should be documented between the catalog item and the item to be procured, and the price/cost impact of those differences. The commercial prices used as a comparison should be stated in the documentation and catalogs or price lists should be included as attachments.

5. Engineering Cost Estimate (ECE)

    a. An ECE is usually developed by highly experienced project staff such as an expert in the filed to determine the expected cost of producing an end item or providing a service. The ICE should include material, labor hours, and labor rates at a minimum. An ICE is used when no other pricing method is available.

    b. When an ECE is used, the Project Manager should understand that the estimator made certain assumptions. These assumptions should be noted and have some basis of documentation. They should be thoroughly reviewed to understand the assumptions made, the source of the information, and the pricing methods applied.

6. Similar Products

    a. The current market price of similar supplies or services to those being procured can be established through market research. Market research to determine price reasonableness involves contacting commercial entities with the capabilities to perform the contract and obtaining the current market prices for the same or similar items under the same conditions stipulated in the proposal received.

b. This method is most commonly used for items that are readily available from commercial sources but that must be purchased to the maximum extent practicable. When using this method, the Project Estimator should compare the proposed price with prices received through market research and describe and document the market research conducted. When independent techniques fail to establish a fair and reasonable price, the Project Estimator may be asked to support the proposed price by supplying pricing information such as sales history to other customers, proposal history, or information other than cost or pricing data.

7. Software Estimations

a. Large and complex software systems are notoriously difficult to estimate. Industry and academic studies indicate that software estimates are routinely too low by a factor of 100% at Concept Design Review and 50% at Preliminary Design Review. Any software estimation process used as basis for estimate should combine formal requirements and design models such as Unified Modeling Language1 with industry leading methods for defining and estimating software such as Function Point Analysis (FPA)2, and the Constructive Cost Model (CoCoMo)3. Further, these estimates should be calibrated by comparison with similar systems and if possible with past or prototype projects conducted by the same team that will form the nucleus of the construction team, employing the same methods, tools, personnel, and technologies as the real system

1 UML infrastructure specification defines the foundational language constructs required for UML 2.3 UML Superstructure, which defines the user level constructs required for UML 2.3 Both are at: http://www.omg.org/spec/UML/2.3/
2 Albrecht, A.J. "Measuring Application Development Productivity", Proceedings of the Joint SHARE, GUIDE, and IBM Application Development Symposium, October 1979
3 Boehm, B. "Software Engineering Economics", Prentice-Hall, Englewood Cliffs, NJ 1981

K. Documenting Price Reasonableness

1. When using other than cost or pricing data, Project Estimator must ensure that the BOE as written, documents the following:

   a. The exception for not obtaining cost or pricing data.

   b. Price reasonableness, without reliance on information that is not documented unless properly referenced and retained in the contract file.

   c. The comparisons and differences in the item being procured and any items being compared. A determination of price reasonableness cannot be made without adequate supporting documentation, and without adequate price.

2. Common pitfalls to be aware of when determining price reasonableness:

   a. Not performing market research appropriate to the circumstances of the procurement.

b. Accepting catalog prices without additional review or verification of items actually being sold at prices listed.

c. Not justifying prior prices used for comparison as reasonable.

d. Prices justified as competitive when no competition was performed and a sole source is not justified.

e. Accepted costs that were not supported or warranted.

f. Failure to request discounts based upon quantity buys.

g. Failure to make adequate efforts to use competition.

h. Contract files not properly documented to support determination justification.

3. Identify the Price Analysis technique(s) used to determine whether each Offeror's pricing is fair and reasonable pricing. Show that the application of each technique.

If competitive, determine if the competition meets the requirements of an adequate price competition. Include a spreadsheet or form.

Example Price Analysis Form:

Offerors	Base Year	Option Year 1	Option Year 2	Option Year 3	Option Year 4	Total
Project Cost Objective						
Offerors 1						
Offerors 2						
Offerors 3						
Offerors 4						
Offerors 5						

4. Identify any other relevant factors that might affect price, such as performance in an AURA facility, travel costs, or proposed subcontractor costs.

L. Cost Analysis

Cost analysis is the review and evaluation of the separate cost elements and profit in a quote or estimate (including cost or pricing data or information other than cost or pricing data), and the application of judgment to determine how well the proposed costs represent what the cost should be, assuming reasonable economy and efficiency.

1. Cost Analysis is required in the following situations:

    a. When *Price Analysis* does not provide sufficient basis to determine whether a price is fair and reasonable.

    b. When cost or pricing data are required for to establish reasonableness and the procurement value exceeds $650,000.

    c. Whenever Cost Analysis is performed, the Project Estimator should also perform a Price Analysis if practical as a Cost Realism check on the supplier's cost data.

2. Insufficient Price Analysis

Normally, competition and catalog prices suffice in determining price reasonableness. However, in certain circumstances it may be appropriate to perform a Cost Analysis on competitive or catalog-priced contracts.

The following chart illustrates examples of situations in which Cost Analysis is recommended due to insufficient Price Analysis information:

SINGLE SOURCE	COMPETITION	CATALOG PRICE
Contracts that contain a complex work statement or technical specifications	Cost-Reimbursable Contracts	Special Tooling or Test Equipment
High dollar supplies or services	Construction Projects	Highly Customized or Modified Products
Award modifications	Maintenance & Repair contracts	Transportation Services and Travel Costs

3. Sample Cost Analysis

For use in analyzing cost and pricing data or for analyzing data that are other than cost or pricing data. Show in columnar format a summary of all offers received:

	Project Cost Objective	Offeror 1	Offeror 2	Offeror 3	Offeror 4	Offeror 5
Cost						
Profit/Fee						
Total Cost						

Provide a top-level comparison of each Offeror's cost proposal and the Project's cost objective. Present a summary comparison of the following data in columnar format:

a. Offeror's proposed cost

b. Audit recommendation

c. Technical recommendation

d. Project Objective Costs

Columns can be combined if there are no distinguishing differences between the data or may be added if other sources of input are provided from the Project Team.

Sample Cost Analysis Summary Form

ITEM	Offeror 1	Audit Recommendation	Technical Recommendation	Project Objective	Ref
DIRECT LABOR					(a)
DIRECT LABOR O/H					(b)
MATERIAL					(c)
MATERIAL O/H					(g)
SUBCONTRACTS/AWARDS					(d)
OTHER DIRECT COSTS					(e)
SUBTOTAL					
G&A					(b)
SUBTOTAL					
FCCM					(b)
PROFIT/FEE					(f)
TOTAL PROPOSAL					
TOTAL					

The Project Estimator should attach to the spreadsheets any backup showing the details behind the summary including any proposed data. For instance, if multiple subcontractors were proposed, the spreadsheet would reveal the granularity behind each one while the summary would show the sum of all subcontractor proposed costs.   If done electronically, backup can be scanned and notated in the document control system.

The labor mix should be thoroughly supported by the Offeror's narrative Basis Of Estimate (BOE). Supporting information provided by the Offeror should include individual rates, composite rates, and escalation factor used.

a) Mix of Management and Technical Hours. Other common areas of interest would be the proposed distribution of management and technical hours. For instance, when very senior individuals are proposed and the work is highly technical, one would not expect to see a large percentage of management hours also proposed.

b) On-Site vs. Off-Site. Care should be taken to review the number of hours proposed for on-site versus off-site work. Typically, the overhead applied to

non-company site personnel is much lower than hours worked at the Contractor's facility. This is a direct result of the fact that employees working at a non-Contractor site are not incurring the cost of facilities (e.g., desk space). Labor overhead can significantly affect the bottom line.

Other Direct Rates. Unlike indirect rates discussed below, a review of actual direct labor rates is rarely an indicator of an Offeror's ability to project direct labor rates. Often, Offerors bid composite labor rates. Labor category pools are in a constant state of flux owing to individuals of varying salary ranges entering and leaving the specific labor pool due to promotions, reassignments, resignations, or growth of the pool. Accordingly, a review of historical rates rarely provides substantive data. Where an Offeror's proposed rates are not based on composite salary ranges, they should provide a summary of the proposed rates per year and the BOE.

Material Overhead and Indirect Costs. (Often referred to as Material Handling Charges). While it is acceptable for an Offeror to apply a material handling charge if their disclosed practices so state, they should not be adding further markup or profit to material prior to estimating the proposed material costs. **Indirect Costs.** Indirects may be addressed as separate paragraphs and/or in a table. Whether each indirect cost element is a separate paragraph or not, the information must still be detailed. Provide a summary of the proposed rates per year and the BOE rates.

If rates vary by more than a few percentage points, the Project Estimator should provide an explanation. Examples of plausible explanations include the following:

- The company restructured or purchased another company and initial projections did not include a realignment or acquisition.

- A key piece of business in which the Offeror was the incumbent was factored into the projections and the work was lost to another competitor.

- The Offeror should provide rationale associated with all material proposed. The list of material should detail how the estimates were derived (e.g. vendor estimates, historical prices, or a prime Contractor conducted competition).

- Most large businesses will have undergone a Contractor Purchasing System Review (CPSR) or similar activity, and should provide the date on which their system was approved. Regardless of whether or not the Offeror has an approved purchasing system, material shall be proposed and purchased in the same manner that would be applied by a prudent businessperson. For example, it is typically a good indicator of whether proposed material costs are reasonable for the purposes of negotiation. Given the downward pricing associated with

most computer parts and equipment, however, historical pricing is not always a reasonable method by which to estimate such materials. Obtaining a current written estimate would present more accurate computer equipment pricing. Never assume that all material costs increase over time.

- In a sole source environment, the project estimator should inquire if discounts were passed on to AURA and/or if efforts were made to combine purchases to obtain quantity discounts.

- For large dollar purchases, the Offeror should be conducting a competition among vendors to ensure the best possible pricing. If the Offeror has adjusted the material cost for inflation purposes, it should be detailed in the Offeror's proposal and be subject to negotiations.

c) Offeror's Disclosed Practices. Offerors have great flexibility in establishing accounting systems; however, costs must be allocated consistently and deviations should not occur.

d) Manufacturing Efforts or Follow-On Work. In the event of manufacturing efforts or follow-on work, historical actual hours should be obtained. Historical details should serve as key reference points and minimize the discussion.

e) Other Direct Costs (ODCs) Other Direct Costs (ODCs) are costs not included as part of proposed material or subcontractor costs. In most cases, ODCs will consist of travel or consultant costs. Depending upon the scope of work, travel can amount to a large percentage of the total proposed cost. The Contractor should ensure that proposals state how the travel costs were developed and provide detail for all proposed trips. Offerors should not propose travel costs in a lump sum unless the procurement is structured in such a way that "NTE" (not-to-exceed) costs would be negotiated/definitized at a later date as the travel occurs. **Scrap Factors**. With large manufacturing projects that rely heavily on raw material, scrap factors may be proposed and should be subject to negotiations. The Offeror should be able to provide supporting data that speak to actual scrap rates. Any scrap factors should also be adjusted for "learning" similar to learning curves associated with manufacturing labor. In essence, one would except that the availability of scraps would decrease over time as workers become more efficient.

f) Profit/Fee Profit percentage is a calculation of which a large component is the reward of a higher percentage of profit based upon the risk that the offer or is willing to assume. Fixed price efforts are the most advantageous from AURA's perspective since they shift the risk to the Offeror. However,

the Project Estimator Officer must ensure that that profit is legitimate and that inflated labor rates are not factored into the equations allowing the potential for the Offeror to earn windfall profits.

IV. APPENDICES

A. Price Analysis Checklist

The following worksheet is provided as an example of the appropriate documentation to be obtained to support a proposed budget or quotation.

Price Analysis was conducted based on one or more of the following (attach documentation). If using an electronic PMCS system the written documentation of some form should be referenced for review.

_____ Written quotations from 2 or more vendors; Internet Screen Shots, working URL links, electronic or fax formats are acceptable.

_____ Documented phone quotations; indicate the name of the contact person, phone number and other pertinent information.

_____ Published price lists from 2 or more vendors; Internet screen shots, Working URL Links or fax formats are acceptable.

_____ Previous purchases by AURA of same or similar item(s) from this or another vendor (attach copies of applicable quotations, bids, or purchase orders, CASNET reports).

_____ Previous purchases by other AURA projects of same or similar item(s) from this vendor (attach copies of applicable quotations, bids, or purchase orders)

_____ Comparison to in-house estimate (attach estimate) and document experience.

B. Cost Analysis Checklist

The following worksheet is provided as an example to ensure appropriate documentation is obtained to support the proposed budget or quotation.

If a cost analysis is required the following should be conducted:

Cost Analysis was conducted based on one or more of the following (attach documentation):

_____**Salaries/Wages**: Attach supporting documentation of the individual's actual base rate. If the proposed rate includes an escalation factor, identify that factor and attach the subcontractor's justification for its inclusion. Attach the subcontractor's justification for direct charging of administrative or clerical personnel. Support documentation for salaries and wages may include copies of payroll forms or reports. If such documentation is not available, the following certification signed by an authorized representative of the subcontractor will be

required: "The salary and wage information provided is true and correct and represents the current and actual base rate of each individual proposed."

___**Fringe Benefits**: Attach supporting documentation for fringe benefits Support documentation for fringe benefits may include a copy of the federally-negotiated fringe benefit rate agreement or a copy of the published rates. If such documentation is not available, the following certification signed by an authorized representative of the subcontractor will be required: "The fringe benefit information provided is true and correct and represents the current and actual fringe benefits of each individual proposed."

___**Consultants**: Identify the name, rate and number of hours/days for each consultant. Determine that the purpose and cost are appropriate. Attach supporting documentation for the rates used. Support documentation for consultant rates may include a copy of the consultant's published rates or a statement signed by the consultant indicating the rate normally charged for the services provided.

___**Travel**: For each trip, provide the cost elements proposed for airfare, hotel, per diem, etc., as well as the purpose of the trip. Attach supporting documentation. Support documentation for travel costs may include a copy of the current federal government per diem rates

___**Materials and Supplies:** Attach supporting documentation for items with unit costs of $5,000 or more.

___**Other Direct Costs**: Examples are computing services or time, communications, student fees, etc. Attach supporting documentation for rates and costs used. Verify the need, and attach a justification for direct charging an item, if necessary.

___**Equipment**: Equipment means an article of nonexpendable, tangible personal property having a useful life of more than two years and an acquisition cost that equals or exceeds $5000. Attach supporting documentation for each item. Support documentation for equipment may include copies of published catalog prices or copies of previous expense vouchers.

___**Other Costs, Profit, or Fees:** Please explain/justify. Attach supporting documentation. Support documentation for other direct costs may include copies of published rates or copies of previous expense vouchers. Support documentation for other costs or fees may include copies of published catalog prices or copies of previous expense vouchers.

___**Indirect Costs or Overhead:** Attach a copy of the subcontractor's federally negotiated indirect cost rate agreement if available. Support documentation for indirect costs is the federally negotiated indirect cost rate agreement. If the subcontractor does not have a rate agreement, (1) sufficient information should

be attached indicating how the rate used was determined and (2) if the rate was accepted and paid previously by AURA.

C.   **Cost/Price Analysis Reasonableness Certification**

"I have reviewed the price and cost data provided by the Subcontractor and have determined that the costs proposed are necessary and reasonable.

Project Estimator	Date

(If using an electronic PMCS system, the estimator's name and date of the estimate should be indicated)

D. Direct Labor Estimate Worksheet

Below is a sample labor worksheet. Projects shall include the following information at a minimum in and accordance with their respective center rate applications. However they may use discretion in presentation formats as necessary.

E. Indirect Costs Application Worksheet

Below is a sample indirect cost application worksheet. Projects shall include the following information in accordance with their respective center rate applications may use discretion in presentation formats as necessary.

Instructions to Complete the Indirect Costs Application Worksheet

1. Year. Enter *Base* or *Then Year*

2. Enter the relevant WBS account number.

3. Enter a short description of the Scope of Work

4. Enter the relevant labor categories that will be needed to perform the work to the specific WBS account. Enter their hourly rates, benefit rates and total. Enter the currently approved G&A rate and Facilities rates. AURA Central Administrative Services will supply the approved or projected rates.   Add the rates and multiply the %Total Rate by the $Total to get the $Total Burdened Hourly Rate.   Enter the amount of hours estimated for each job category to complete the work for the base year.   Multiply the # of Hours by the $ Total Burdened Hourly Rate.   This will produce the $ Total Labor.

5. Sub-Total line items where applicable. Refer to Sample A for applicability.

6. Materials/Supplies. Enter the Unit and $Cost per Unit of cost items.   Multiply the Unit by the $Cost per Unit to determine the $Total Cost. Enter the % G&A rate. Multiply the $Total Cost by the % G&A rate to determine the $Total Cost with G&A. Note that only up to the first $25,000 per purchase order per year is allowed. If calculation is over $25,000, enter $25,000.

7. Sub-Total line items where applicable. Refer to Sample A for applicability.

8. Sub-Awards. List the awards and enter the Total Award Costs. Enter the % G&A rate. Multiply the $Total Award Cost by the % G&A rate to determine the $Total Cost with G&A. Note that only up to the first $25,000 per award per year is allowed. If calculation is over $25,000, enter $25,000.

9. Sub-Total line items where applicable. Refer to Sample A for applicability.

10. Travel. List each trip or category of trips and $Cost per Trip. Multiply the # of trips by $Cost per Trip to determine the $ Total Travel Cost.   Enter the %G&A rate and multiply to obtain the $Total Cost with G&A.

11. Sub-Total line items where applicable. Refer to Sample A for applicability.

12. Other Direct costs. Enter other direct costs by Units and $Cost per Unit to obtain the $Total Cost. Enter the %G&A rate and multiply to obtain the $Total Cost with G&A.

13. Sub-Total line items where applicable. Refer to Sample A for applicability.

14. Sub-Total Without AURA F&A or Contingency. Add line items in #3, #5, #7, #9 and#11 where applicable. Please refer to Sample (A) for applicability.

15. AURA F&A Rate. Enter the sub-total of costs and the AURA %F&A rate. AURA Central Administrative Services will supply the approved or projected rates. Multiply the sub-total of costs with the current or project rate to obtain the $Total Cost with AURA F&A Rate.

16. Contingency and/or escalation.   Enter Total Cost with AURA F&A Rate, the Risk Factor and the %Contingency Rate and multiply the rates to obtain a $Total Risk and Contingency rate.   Multiply the $Total Risk and Contingency Rate to obtain a Total Risk and Contingency Cost.

17.   Enter the Total Cost with Contingency/ Risk in column i.

Complete a worksheet for the *Base Year* and the *Then Years* accordingly.   Apply escalation rates to salaries, benefits, and G&A, Facilities Rates and AURA F&A rates as provided by AURA Central Administrative Services. Please be advised that there may be separate rates for different location sites.   Contact AURA Central Administrative Services for further instructions on how to apply site specific and/or multi-site rates.

Sample (A) Completed Worksheet

Below is a completed sample worksheet. Please be note that the rates, salary and other information are fictitious and for presentation only.