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## **Attachment 1.1**

### **Opinion of Probable Construction Cost (OPCC) Process**

One of the most critical steps prior to successfully validating the lump sum price for Phase 2 services on a PDB contract is to require the Design-Builder to submit their estimate for the cost of the work at various pricing milestones as the design progresses. The Design-Builder shall submit an estimate to VDOT at each pricing milestone using the Opinion of Probable Construction Cost (OPCC) process. Level of efforts for the OPCC process will vary depending on the Phase or level of plan development.

Pricing milestones will occur at the time the Design-Builder submits a proposal and associated cost estimate to the Department. Pricing milestones allow VDOT to review and resolve pricing disagreements early in the PDB process, rather than wait until the end when the Phase 2 Proposal is submitted. Pricing milestones may occur:

- At the conclusion of Phase 1A prior to submittal of the Design-Builder’s Phase 1B Proposal
- During Phase 1B as design development progresses (i.e. 30% or 60% plan development)
- Acceptance and execution of Early Work Packages (if necessary)

VDOT will accomplish validation of the cost estimate by comparing the Design-Builder’s cost estimate for the work with the cost estimate developed by an Independent Cost Estimator (ICE) and VDOT’s Estimating Engineer (EE). After each pricing milestone, VDOT and the Design-Builder will reconcile cost and scope using an open book basis.

#### **Task 1: Cost Model**

Successful price reconciliation in PDB relies on the ability of all parties to thoroughly understand the basis of the Design-Builder’s cost estimate. It is critical that the Design-Builder clearly documents all assumptions, pricing and labor rates that were used to price the work. This documentation is maintained to capture a history and basis of pricing changes. To this end, the Design-Builder will be expected to be open and transparent about how the work was estimated.

The cost model shall include a narrative summarizing the key pricing assumptions for each OPCC. The cost model narrative includes such things as: type of equipment proposed to perform the work, assumed production rates, crew sizes, shifts per day, hours per shift, risk assumptions, assignment of risks, assumed weather delays, and supporting subcontractor quotes. Other assumption regarding risk (assumptions and/or assignment), weather delays, and ancillary factors will also be documented. The cost model shall be updated by the Design-Builder prior to developing each estimate.

#### **Task 1A: Estimating Instructions**

Estimating instructions and guidelines are included in Exhibit 1. These instructions outline how the estimates will be developed between multiple estimating parties. This ensures that all parties

are using the same format for work products and facilitates consistency between different estimating teams and cost comparisons during pricing reconciliation.

## **Task 2: Estimate Workshop**

The Design-Builder shall schedule and lead an Estimate Workshop prior to issuance of each Estimate Package. Workshops attendees should include at a minimum the VDOT PM, EE, ICE, and technical experts who have insight into the project (e.g., geotechnical, bridge, construction, environmental, etc.).

The objective of the Estimate Workshop is to:

1. Ensure a constructible and cost-effective design that is consistent with the design intent,
2. Ensure that the design complies with standards,
3. Endeavor to confirm that all work has been included and described in sufficient detail for that stage of design to ensure complete pricing of work,
4. Allow all parties to provide feedback on the constructability of the plans
5. Discuss assumptions on means and methods, and construction staging or sequencing of work that affects cost,
6. Reconcile quantities between the designer and estimators,
7. Identify any errors, omissions, ambiguities, or other items that need to be corrected, and
8. Identify major project risks, propose mitigating actions, allocate risks to the party who is in the best position to manage the risk, and how risk is influencing the estimate.

## **Task 3: Estimate Package**

The Design-Builder shall prepare an Estimate Package for each pricing milestone identified during Phases 1A and 1B and provide the package to the VDOT PM for distribution to the ICE and EE. Each Estimate Package shall include the estimating instructions, plans, quantity take-offs, proposed pay items, measurement/payment definitions, and any specifications appropriate for the level of design.

## **Task 4: Preparation and Submission of Estimates**

At each pricing milestone the Design-Builder updates the Estimate Package (if necessary) based on input from the Estimate Workshop. The following cost estimates are then independently prepared by the Design-Builder, ICE, and VDOT's EE:

- A) Design-Builder's Estimate: The Design-Builder prepares their estimate at each pricing milestone. The Design-Builder's Estimate is made available to all estimating parties (ICE and EE) and VDOT's PM.
- B) Independent Cost Estimate: The Independent Cost Estimator (ICE) prepares an estimate for the work at each pricing milestone. The purpose of the Independent Cost Estimate is to validate that the Design-Builder's cost for the work is reasonable and fair and to help support the Project Team in developing a design that is cost effective. The ICE reports to, and receives oversight from the VDOT PM. The Independent Construction Estimate is

- made available to all parties, including the Design-Builder, and will be used in comparison to the Design-Builder's Estimate to reconcile estimates.
- C) Engineer's Estimate: The Engineer's Estimate is prepared at each pricing milestone. VDOT's Estimating Engineer (EE), or a consultant working under their direction, will be responsible for the Engineer's Estimate at each pricing milestone. The Engineer's Estimate is not made available to the ICE or Design-Builder but is made available to the VDOT PM.

Estimates prepared by the Design-Builder and ICE shall be a production-based, contractor-style estimate prepared using typical contractor-style estimating software. Although the estimates are prepared using a production-based, contractor-style approach, costs provided to VDOT should be rolled up into unit costs or lump sum items.

The ICE, VDOT's EE, and Design-Builder shall each submit their estimate directly to the VDOT PM.

#### **4.1 Subcontracted Work**

At early pricing milestones, the estimates may include "plug or placeholder" prices, or estimated costs based on past relevant experience, for the work the Design-Builder intends to subcontract (as noted in their subcontracting plan). As design progresses, the estimates will contain actual quotes for subcontracted work. To ensure competitive pricing for the subcontracted work, the Design-Builder will be required to attempt to solicit at least three quotes for all subcontracted work. If obtaining at least three quotes for any subcontracted work is not possible, the Design-Builder will be required to provide documentation to the VDOT PM justifying why three quotes are not obtainable. The VDOT PM may also request that the Design-Builder consider self-performing the work, if possible, in order to help ensure competitive pricing.

Unless otherwise authorized in writing by the VDOT PM, the subcontractor quotes received by the Design-Builder shall only be shared with the EE, ICE, and VDOT PM. The ICE may solicit quotes for subcontracted work in order to independently validate the cost of subcontracted work. Prior to the ICE soliciting any quotes, the Design-Builder and VDOT PM should contact subcontractors to notify them that they may be contacted by the ICE, and strongly encourage them to work with the ICE. The ICE will be allowed to share all quotes with the VDOT PM, EE, and Design-Builder. Ultimately, the Design-Builder is responsible for selecting the subcontractors they use to perform the subcontracted work.

#### **4.2 Disadvantaged Business Enterprise (DBE)/On-the-Job Training (OJT)**

The VDOT PM will provide updates to the VDOT Civil Rights Division throughout preliminary design in order to inform them about the status of the project. Prior to Phase 1B, the VDOT PM will provide Civil Rights appropriate information to clearly understand the scope of work. Civil Rights will establish, as applicable, DBE and OJT goals prior to any subsequent estimates. The Design-Builder shall update their subcontracting/supplier plan, as needed, and all estimating parties shall account for the goals/requirements for ensuing pricing milestones.

#### **Task 5: Preparation of Variance Reports**

During each pricing milestone, the Design-Builder's Estimate will be compared with the estimates prepared by the ICE and the EE. The VDOT PM will develop a variance report. The variance report shows the Design-Builder's Estimate and the Independent Cost Estimate. The variance report **will not include** the Engineer's Estimate.

## **Task 6: Pricing Reconciliation Meeting**

The VDOT PM will schedule a pricing reconciliation meeting at each pricing milestone. Price reconciliation meetings will be limited to key VDOT project management staff and estimating staff that are directly reconciling differences between the ICE, EE and the Design-Builder's Estimate. All participants in the price reconciliation meeting(s) will sign a Confidentiality Agreement stating that they will not disclose any information from the meeting(s). The VDOT PM and the Design-Builder oversee the reconciliation meetings, with the intent to reconcile pricing differences between the Design-Builder's Estimate and the Independent Cost Estimate. The reconciliation process gives all parties the opportunity to understand each other's perspectives about pricing assumptions, risk assignment, and construction means and methods. The EE will participate in these meetings but will not disclose their estimate.

The ICE and EE will inform the VDOT PM of any potential cost savings opportunities. The VDOT PM may share this information with the Design-Builder. It is the responsibility of VDOT to help ensure the ICE and EE remain independent during reconciliation meetings.

Once VDOT and the Design-Builder agree upon changes to the pricing assumptions, the Design-Builder will make adjustments to the cost model and the schedule to reflect these changes and resubmit them to the VDOT PM, ICE, and EE. This information is then documented in the project file. Any pricing changes will be carried forth to the next pricing milestone or the Phase 2 Proposal. During the reconciliation process, the ICE and/or EE may adjust their pricing assumptions and estimate as necessary.

### **6.1 Open Book Process**

Open book pricing is a collaborative, transparent cost estimating process utilized by VDOT and the Design-Builder to achieve a Phase 2 lump sum price below the established Guaranteed Maximum Price. The open book pricing process is used to achieve agreement on final design and construction costs during the Proof of Concept (Phase 1A) and Project Development (Phase 1B) phases of a PDB procurement.

“Open Book Basis” means allowing the Department to review all underlying assumptions, records, stand-alone subcontractor quotes, and other data associated with each element of pricing, or any adjustment thereto, including assumptions as to costs of the work, schedule, composition of equipment spreads, equipment rates, labor rates, production rates, estimating factors, design and productivity allowance, contingency and indirect costs, risk pricing, discount rates, interest rates, inflation and deflation rates, operating costs, burdens, encumbrances, profit, turnover, mark-ups, fees, charges, levies, incentives, and other items reasonably required by the Department to satisfy itself as to the reasonableness and accuracy of the amounts proposed by the Design-Builder.

Through open book pricing, the Design-Builder's Estimates are negotiated in a completely transparent manner, with none of the costs hidden, embedded, or inflated. Transparency means full, confidential disclosure of all the details and may include third party verification by the Department, if required. The process is truly an open book that provides confidence in the price throughout the process.

During the reconciliation process, VDOT may ask the Design-Builder to share or review with them certain items or materials containing information that clarifies how the proposed pricing was

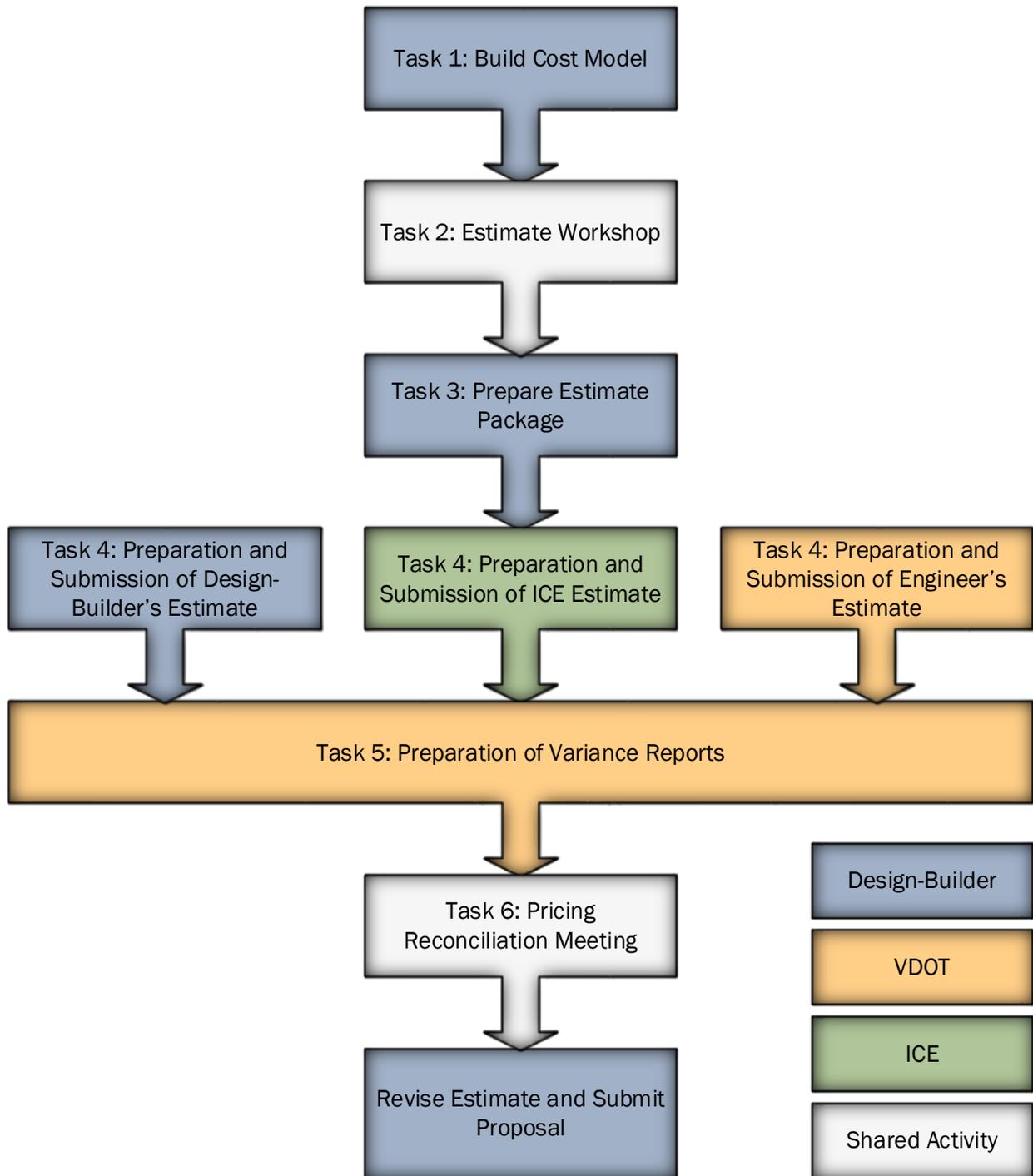
derived in order to help reconcile differences between the ICE, EE and the Design-Builder's Estimate. All materials of this nature will be reviewed in an open-book format and remain in the possession of the Design-Builder unless the Design-Builder agrees to release it to VDOT. **VDOT may not retain a copy of these materials, either electronic or in hard copy.**

Not everything on a project is entirely predictable, especially in the early stages. Undefined risks shall be quantitatively assessed and evaluated as a project contingency amount. The actual contingency should be seen as a project cost before any add-ons are included to create a lump sum price for Phase 2.

VDOT and the Design-Builder may not be able to resolve all price differences for certain pay items or for the overall price during the pricing reconciliation meeting. The VDOT PM and the Design-Builder will decide to (a) acknowledge differences, move forward with design, and attempt to continue reconciling differences during later estimates or the Phase 2 Proposal, or (b) agree that reconciliation is not possible and terminate the contract to allow VDOT to procure the construction of the project through some other method. If there are ongoing work packages at the time of termination, the Design-Builder may be allowed to continue work on active work packages until complete.

VDOT's PDB model closes the open book pricing process after acceptance of the Phase 2 Proposal. The Design-Builder proceeds with final design and construction at its own risk of meeting the agreed upon lump sum price.

**Figure 1: Opinion of Probable Construction Cost (OPCC) Process**



# **EXHIBIT 1**

## **ESTIMATING INSTRUCTIONS**

# **Estimating Instructions**

**Virginia Department of Transportation**

**State Project No.: 0095-076-341**

**Contract ID No.: C00120460DB117**

## TABLE OF CONTENTS

<b>1.0 GENERAL.....</b>	<b>2</b>
<b>2.0 TOTAL PROJECT COST .....</b>	<b>2</b>
<b>3.0 DIRECT AND INDIRECT COSTS.....</b>	<b>2</b>
<b>3.1 DIRECT COSTS .....</b>	<b>2</b>
<b>3.2 INDIRECT COSTS.....</b>	<b>5</b>
<b>4.0 LIST OF BID ITEMS .....</b>	<b>7</b>
<b>5.0 LABOR RATES .....</b>	<b>7</b>
<b>6.0 EQUIPMENT RATES.....</b>	<b>7</b>
<b>7.0 MATERIAL &amp; SUBCONTRACTOR PLUGS.....</b>	<b>7</b>

## **ESTIMATING INSTRUCTIONS**

### **1.0 GENERAL**

1. To assist in developing estimates that are comparable, a standard approach for assigning and assembling costs is outlined below. A breakdown of the bid items shall be included in this instruction book. It is important for comparison purposes that all parties (Design-Builder, Independent Construction Estimator (ICE) and VDOT) are using the exact same list of bid items and resource costs at the Pricing Reconciliation Meeting.
2. Comparison estimates shall be based upon the most current Project Schedule.

### **2.0 TOTAL PROJECT COST**

Total Project Cost will be the total of the cost categories as shown below.

- a. Burdened Labor
- b. Permanent Materials
- c. Construction Materials
- d. Subcontracts
- e. Hourly Hauling and Trucking
- f. Equipment and operating expenses
- g. Indirect and General Conditions

### **3.0 DIRECT AND INDIRECT COSTS**

Project costs will be divided into two groups, direct and indirect costs. The direct project costs will be grouped by types of work or areas of work (earthwork, drainage, bridges, etc.), and the indirect project costs will include job site supervision above the foreman level, office staff, office facilities and any costs not covered by the direct costs.

#### **3.1 DIRECT COSTS**

All direct costs will be categorized into one of the following categories:

##### **LABOR**

1. Direct Labor Rates are the Lead Contractor's best estimate of the current labor market in the area. The fringes reflect the cost to implement a health and welfare program to satisfy current laws. These are up for discussion and adjustment.
2. The labor rates shall be included in these instructions. Labor rates are stated as wage

rates and fringes (health insurance, union dues, etc.) Workman’s compensation, payroll taxes, labor insurances, or overtime premiums are not included. Fringes, Payroll Taxes and Workman’s Compensation shall be added to the cost of the wage rate by using the percentages agreed upon. Fringes are not subject to these taxes or premiums.

3. Taxes and insurance will be carried at **XX%** of all unburdened direct labor. Hourly and weekly salaried indirect labor will have an additional **XX%** added to the taxes and insurance to cover miscellaneous expenses such as additional medical, life insurance, disability insurance, retirement/pension/401k, etc. on hourly and weekly salaried employees. The following breakdown applies:

**DIRECT**

FICA	X.XX %
FUTA	X.XX %
SUTA	X.XX %
HEALTH	X.XX %
MISC	X.XX %
TOTAL	X.XX %

**INDIRECT for all monthly and weekly salaried employees**

FICA	X.XX %
FUTA	X.XX %
SUTA	X.XX %
HEALTH	X.XX %
MISC	X.XX %
TOTAL	X.XX %

**INDIRECT for all Supervision assigned to the project at a monthly rate**

4. Markup shall be **XX%** of actual monthly wage. This markup will include payroll taxes (FICA, FUTA, and SUTA), worker’s compensation insurance, general liability, medical insurance, life insurance, disability insurance, and 401k matches.
5. Vacation and holidays for employees assigned to the project will be included in the burdened rate.
6. Fringes are included in craft trades and included in the burdened rate.
7. Labor dollars should include overtime and shift premiums in the item. A **XX-hour** work week calendar will be used for all direct cost work on the project. Additional calendars may be required for certain work activities.
8. Direct labor includes all hourly and weekly employees up to and including foreman. Vehicles costs for foreman shall be considered as a direct cost.

9. The cost of project management, staff engineering, administration, and office clerical will be carried as an indirect cost.

## **EQUIPMENT**

1. Rental rates shall include basic rental and ownership cost of equipment, all repairs excluding maintenance, abuse and vandalism.
2. Equipment operating expenses shall include fuel, lube, parts for maintenance repairs, tires, and ground engaging components.
3. Costs of all mechanics and their vehicles.
4. Equipment support operators and their vehicles (fuel and lube), the costs of a mechanics shop and additional equipment repair areas.
5. Fuel should be included in the bid at the following cost per gallon:  
  
**Diesel (On-Road) \$X.XX/Gallon**  
**Diesel (Off-Road) \$X.XX/Gallon**  
**Gasoline \$X.XX/Gallon**
6. All crane usage, including mobilization/demobilization, should be carried in the direct cost bid activity in which that crane work occurs.

## **PLUG PRICE FOR MATERIALS**

1. Plug prices for permanent and construction materials shall include hauling cost to job site.
2. Material plug prices are assumed costs for [YYYY].
3. Material conversion and waste factors shall be established.

## **SUBCONTRACTORS**

1. Subcontractor plugs shall include work complete, including all material, equipment, labor, taxes and other costs to do the work associated with that item. Major subcontractor item costs may require additional clarification and further breakdown.
2. Plug prices for subcontractors are assumed to be firm for the duration of the project inclusive of escalation.
3. G&A will not be applicable to total loaded external design costs.

## **OTHER**

1. Cost for office space shall include all costs associated with jobsite offices for the project team, Owner and QA/QC (as applicable), including all sundry items for all offices. This item does not include other shops or temporary structures used on the project.
2. Quality Assurance and external or subcontracted Quality Control are direct cost items.

## **MOBILIZATION & MOVING EQUIPMENT**

1. Includes the cost of all equipment not specifically accounted for in the direct items or other indirect items.
2. Includes moving equipment to and from the site.
3. Includes on-site lowboy moves.

## **3.2 INDIRECT COSTS**

All indirect costs will be categorized into one of the following categories:

### **PROJECT MANAGEMENT**

1. All project management above the foreman level, all staff engineering, administrative staff, and the mechanical supervisory staff shall be included as indirect. The monthly rates shall not include any escalation in rates to project completion.
2. Vehicles assigned to these personnel.
3. Relocation, temporary housing and living allowances of Lead Contractor staff, including the expenses associated with travel for personnel listed in this item.
4. All education, training or recruiting required for the project.

### **EQUIPMENT REPAIR & MAINTENANCE**

1. Other equipment, including fuel, lube, maintenance, etc. not specifically accounted for in the direct items or other indirect items.

### **INSURANCE, TAXES & PERMITS**

1. The cost of all insurances and taxes chargeable per the project except payroll taxes and applicable sales taxes which are included in the direct cost of the work
2. Adjustment of General Liability, Workers Comp, and Umbrella Insurance per insurance quotation.

3. Builder's Risk policy.
4. Property taxes on equipment.
5. Railroad insurance.
6. Contractor License Tax.
7. Any permits, fees or bonds that the project must pay for that are not covered elsewhere.

### **HEALTH & SAFETY**

1. The cost of drug testing, safety training, safety incentives, and safety supplies along with the cost of any safety inspections other than the safety manager whose salary is included above. Additionally, the cost of any vehicles for a non-salaried safety inspection and any third party costs.

### **TEMPORARY CONSTRUCTION**

1. Costs of a carpenter shop and additional staging areas.
2. Cost for transportation to jobsite for workers
3. Incidental dewatering, project lighting, construction power (other than office)

### **ESCALATION**

1. Any increase in projected costs that are not included in the direct costs. Proposed wage rates are assumed to be good for the calendar year [YYYY]. Labor/Equipment escalations will be determined during bid closeout.

### **SMALL TOOLS**

1. Cost for Small Tools shall be included. Small tools are defined as tools or equipment costing less than \$XXX. Any other tools shall be adjusted in the direct costs.

### **OTHER**

1. Relocation, temporary housing and living allowances including the expenses associated with travel for personnel listed in this item.
2. Performance and Payment Bond for the Lead Contractor.

### **PROJECT CONTINGENCY**

1. Contingency will be established at the beginning of the estimating process and will be updated as design/pricing progresses.

#### **4.0 LIST OF BID ITEMS**

To be furnished separately.

#### **5.0 LABOR RATES**

To be furnished separately.

#### **6.0 EQUIPMENT RATES**

To be furnished separately.

#### **7.0 MATERIAL & SUBCONTRACTOR PLUGS**

To be furnished separately.