

# PRICE + TIME BIDDING

## A+B

### *Guidelines*

#### A. Introduction

The Department first introduced A+B Bidding in 1996. A+B bidding is a method of awarding a project based on both cost and time. Each bid submitted consists of two parts:

- The A portion of the bid is the sum bid for the contract work items.
- The B portion of the bid is the time in calendar days proposed by the bidder to complete the project or a portion of the project, multiplied by a daily road user cost determined by the Department.

The contract is awarded based on the sum of the A portion and the B portion of the bid. The contract amount after award is limited to the A portion of the bid.

A disincentive provision is incorporated into the contract (based on road user costs) should the Contractor fail to complete the work in the length of time bid. An incentive provision is also included to pay for acceleration costs and to reward the Contractor for earlier completion.

Experience has shown that A+B bidding is an effective way to reduce construction induced congestion and delays by allowing the cost of work and time to be balanced through the open competitive bidding process. Benefits of A+B include:

- encourages potential Contractors to develop even more detailed well thought out plans in order to bid on the time to complete a project or project phase. Since the time bid by each Contractor is based on their own capabilities to perform the work, the more efficient Contractors can generally bid shorter times.
- encourages Contractors to schedule their operations to maximize the efficiency of their work crews and equipment in order to meet the time bid.
- encourages Contractors to work overtime, double shifts and at night to reduce construction time.
- encourages Contractors to develop innovative ways to reduce construction duration at the lowest cost during bid preparation and during construction.
- road user costs and inconvenience are minimized.
- reduces the number of congestion related complaints from the road users and local communities.
- congestion related pollution and environmental impacts are reduced.

## Guidelines for Developing A+B Provisions

Some of the guidance below is based on guidelines for the development and use of I/D provisions, contained in FHWA Technical Advisory T 5080.10 titled Incentive/Disincentive for Early Completion, dated February 8, 1989.

### **1. Project Selection**

The use of A+B Bidding provisions is primarily intended for critical projects or critical project phases where traffic inconvenience and delays must be held to a minimum. User delay costs or public benefit must be significant enough to warrant construction acceleration. If UDOT staff and the Contractors staff are working double shifts and/or overtime to complete a project or phase and there is no apparent user delay or reason to expedite the work, Contractors, UDOT staff, and the public, may question why they are rushing to finish. This is not cost effective or good for morale. Generally, the use of these provisions should be limited to those projects or project phases that would severely disrupt highway traffic. As a guide, user delay and other documented delay costs should be at least \$3,000 per day to warrant the use of incentive provisions.

The following characteristics are associated with projects appropriate for A+B bidding:

- high traffic volume facilities generally found in urban areas,
- projects that will complete a gap in a significant highway system,
- major reconstruction or rehabilitation on an existing facility that will severely disrupt traffic,
- major bridges out of service,
- projects with lengthy detours of high volumes of traffic,

A+B bidding may be used for projects or phases which produce user delay costs less than \$3,000/day if extraordinary concerns exist such as interference with public events or significant public interest and benefit.

If the established contract time is longer than necessary for a good contractor to finish using normal effort, unnecessary prolonged delays and impacts are imposed on the public. On the other hand, if established contract time is too short, the contractor is forced to increase the bid to compensate for acceleration costs. A+B bidding provides an opportunity for the contractor to balance the time required to complete the work with the costs associated with doing the work. It is extremely important in all cases that the user costs established in the contract accurately represent the projected user costs.

When selecting projects for A+B bidding, the total B portion of the bid must be an amount large enough to influence the bidding. If a very large project has a very short B portion completion time, the time element may have little impact on the overall results of the bidding. For example, a \$30,000 B portion (10 days X \$3,000/day) would have minimal effect on a \$20 million project (A portion) due to its small percentage of the total A+B bid. On the other hand, a \$1,250,000 B portion (250 days X \$5,000/day) on a \$5 million project (A portion) may provide too much influence on how the bid is structured and how the work proceeds because the relative

value of the B portion is so high. The B(time) portion of the bid shouldn't exceed 10-15% of the total cost of the work to avoid undesirable emphasis on time over the actual cost of the work.

## **2. Project Development**

It is essential that a project's suitability for A+B bidding be identified during the early stages of project development. During the development of A+B projects, extra effort should be made to ensure that the design, specifications, schedule, etc., are compatible and appropriate for the project. A field change to correct mistakes in plans can be very costly in both time and money on an A+B project. The plans and specifications should indicate any unusual conditions or restrictions the Contractor may be required to work under, such as prohibiting jack hammering, pile driving or heavy equipment operation during the night due to noise problems.

During the preconstruction phase of the project, all affected parties (e.g., local officials, police, Regional functional groups, businesses, schools, utility companies, railroads, etc.) should be involved in the project development. It is essential that designers work closely with the Region Construction group regarding schedules, wording of the special provisions, etc.

Pre-design field reviews are essential since "as built" plans or old construction plans may not be reliable, due to maintenance operations or field changes not recorded on the plans. Also, a pre-bid meeting may be necessary to discuss the I/D phase and any unusual features of the project with prospective bidders.

### **A. Special Note: Description of B Portion Work**

The contract must clearly define what constitutes the start and the completion of the B portion work. Both may differ from the start or completion of the project. For example, the B time might not begin until a detour is implemented, a bridge closed or traffic is otherwise impacted. This allows the Contractor time to fabricate and deliver steel, obtain mix design approval, do other pre-construction planning, etc. However, it is necessary to define in detail what is expected of the Contractor. This can be done through the plans and by detailed description in the special provisions. Work to be completed must be clearly stated. Completion of items such as paving up to, and including, base course, signing, lighting, signals, striping, curb, shoulder, etc., should be addressed. Off-road items such as landscaping, sidewalks or other items that could be performed without disrupting traffic should also be addressed. If the intent is to get the roadway open to traffic as soon as possible, off-road items may be excluded from the B portion work.

Counting days for the B portion work can begin with the lane closure or event that results in user delay, or with the award notification, or with a combination thereof.

#### **A.1 Begin B portion work with lane closure or event that results in user delay**

Under this condition, B portion work begins with an event such as closing a bridge or the first lane closure(s) and ends with an event, i.e., when the bridge is reopened or all work requiring lane closures is complete.

This is the preferred method of starting the B portion work if the goal is to minimize user delay associated with a certain situation. The Contractor should be allowed the flexibility to prepare for the lane closure period and select a start date that will result in the shortest period of time, within the overall time limits of the contract. Bridge replacement projects with an off-site detour are ideally suited for this situation. The counting of B portion workdays should start when the Contractor closes the bridge to traffic and end when the bridge is reopened to traffic. This encourages the Contractor to take care of all shop drawing submittals, ordering and delivery of materials, and other preparatory work such that the timing of the closure is based on the critical path of the actual construction. If the B portion work starts with the notice to proceed, the Contractor may close the bridge earlier than necessary, resulting in additional user delay. One thing to consider in this situation is the amount of time that can be allowed before starting the B portion work. If the Contractor waits too long before starting the work, the time bid may end after the contract completion date or some other milestone date. If the B portion work must be complete by a certain date, then the Contractor must be informed in the contract what the consequences are for not completing the work by that date. One option is to indicate in the special note that the disincentive period will begin on a certain date regardless of the time bid. In other words, if the Contractor fails to begin the work in time to complete by the milestone or contract completion date, all incentive payments must be forfeited.

#### A.2 Begin “B” portion work with notification to proceed

In some cases, the goal is to achieve the B portion milestone date as soon as possible, by having the Contractor mobilize and begin working immediately. The starting point could then be tied to the notice to proceed. Standard wording in the special provision for this situation could be:

“The counting of consecutive calendar days for the B portion work shall begin 10 calendar days after the date of the Notice to Proceed.”

The 10 day period (or whatever number of days is appropriate) is not meant to be a day that any physical work begins; it is an agreed date to begin counting.

#### A.3 Begin “B” portion work with either an event that results in user delay or tied to notification to proceed.

This option still gives the contractor the flexibility desirable in a.1 while also allowing the Department to demand the B portion work begin within a reasonable time period. Standard wording in the special provision for this situation could be:

“The counting of consecutive calendar days for the B portion work shall start on the earlier of the following dates 1) 60 calendar days after the date shown on the Notice to Proceed, or, 2) when the Contractor first restricts traffic....”

Again the 60 day period (or whatever number of days appropriate) is not meant to be a day that any physical work begins; it is an agreed date to begin counting the B portion of contract.

b. Multiple B Phases

Periodically, projects include multiple phases with varying degrees of user delay. Furthermore, projects may not be completed in one season, but the roadway must be fully open for the winter months.

For example, assume Phase 1 of a project is "pave westbound" and phase 2 is "pave eastbound", and the project is let early enough to allow the Contractor to complete both phases in one season. If the user delay is the same for each direction and we want both phases completed in one season, separate B portions may not be required.

If this same project is let late in the season and both phases are in the same B portion work and can not be done concurrently, some Contractors may bid one season, while others may bid 2 seasons. A Contractor that bids one season would have a significantly lower B portion bid because they are not including the winter months within their bid. The one season bid may require late season paving. If there are any significant increases in the B portion work during construction of Phase 1, the Contractor would most certainly request an extension of time which would result in the performance of Phase 2 in the second season.

The need for multiple B portions must be determined on a project-specific basis in consideration of the problems and objectives of the situation. All options must be considered when developing the description of the B portion work. A general guide is to tie the B portion work to the user delay. If there is no user delay during the winter, this period should not be included in the B portion work. If the user delay for westbound is different than eastbound, they should be separate B portions. If the roadway is closed or restricted during the winter with a measurable user impact, the winter should be included in the B portion time frame.

c. Utilities and Railroads

Utility, Railroad or other third party work within the B portion requires additional effort by designers and construction staff in order to minimize potential for delays. If possible, arrangements should be made to have this third party work done prior to the start of B portion work. If this is not possible, special provisions must be included in the contract describing the time frames allowed for any Utility, Railroad or other third party agreement. It is essential that these time frames be consistent with the description of B portion work and the Designer's schedule. Conflicts between these third party schedules and the time specified for the B portion work must be avoided. Underground utilities within the B portion phase should be located

with the highest possible degree of accuracy if there is contract work that could potentially interfere with these utilities.

e. Special notes regarding time restrictions

If the contract contains work hour restrictions, milestone dates or other time restrictions, consideration must be given to the location of these requirements. Restrictions in various special provisions, on different plan sheets, and in several specifications could lead to confusion. Consider combining time restrictions in a separate special provision and appropriate cross- references.

3. Determination of the Daily Cost

The daily cost must be determined by estimating the user cost associated with the construction or delay in delivering the product. This can be done by using “Delay User Cost” (DUC) developed by BYU for UDOT or by using “Delay E”, written by Martin Knopp and made available by him to UDOT. The B component may be adjusted downward from the maximum values obtained from a delay analysis. It is important to remember that the daily cost must be sufficient to encourage the Contractor to develop innovative ideas, work efficiently and complete the project in a timely manner, but not so large as to induce undue risk to the contractor. Extreme risk will lead to undesirable bids and even a lack of interested bidders.

- a. Typically the contract has an incentive/disincentive clause in it. The daily I/D amounts must be equal to the daily user costs estimated for the B portion of the work. The contract should provide for disincentives to continue until the specified work is complete.
- b. A cap on the amount of incentive paid under A+B provisions is required for budgeting and other fiscal reasons. As a general guideline, the maximum number of days of incentive for each incentive period could be limited to 10 % of the number of days estimated by the Engineer rounded to the nearest whole day. In addition, the sum of all incentives for a single contract should also be limited. As general guideline, use 5% of the Engineer’s estimated contract amount as a maximum. Although this cap limits the number of days of incentive payment, keep in mind that the Contractor must bid on the time in order to get the project, and it is to their advantage to bid fewer days in order to be the lowest bidder. The daily cost disincentive will also encourage completion on or ahead of schedule. The Engineer’s estimate must include the appropriate amount for the maximum incentive for the contract. If a contract contains multiple B phases, the sum of all maximum incentives must be included in the estimate for budgeting purposes.

4. B Portion Work Time Determination

When determining the maximum duration for the B portion time period, the Designer must consider to what extent, and at what cost, construction can be compressed from a normal construction schedule. Normal construction time is generally based on a highly qualified Contractor working five days a week, eight hours a day, while an accelerated time should be based on the performance of the same Contractor working extended or extra shifts with additional workers and crews for six or seven days a week. However, the use of a continuous seven-day workweek is cautioned against, because extended periods of work without days off

may result in reduced efficiency and morale, and high turnover rates for both Contractor and inspection personnel. The maximum duration for the B portion time period should be based on an accelerated but achievable work schedule. If the completion date is impossible to meet, the Contractor will not even try to earn the incentive. In fact, unreasonable completion dates may discourage potential bidders from bidding.

It is important to establish a maximum acceptable duration for the B portion of the contract so that the contractors don't bid a duration that is unacceptable for the project goals.

To accurately determine the B portion time period, Designers should develop a schedule using the critical path method. This will ensure that the maximum duration specified is achievable, and that any other time related contract provisions are incorporated and consistent, i.e., utility schedule, railroad involvement, seasonal limitations, work restrictions, etc.

The season of the year in which the project will be constructed should also be considered in determining the B portion time.

#### 5. Constructability Review

On any project where the Designer intends to use A+B bidding, the Special Provisions, supporting analyses, CPM schedule, and Limitation of Operations should be developed and coordinated with the Region Construction Group.

#### 6. Information Required With the PS&E Submission

- a. Special Provisions for A+B bidding (see Attachments)
  - i. Section 02221S (Bidding Contract Time)
  - ii. Section 00515M (Award and Execution of Contracts)
  - iii. Section 00555M (Prosecution and Progress)
  - iv. Section 00570M (Definitions)

The above provisions are generic special provisions that need to be modified to fit each project circumstances. There are either blanks to be filled in or highlighted narratives that provide suggestions to consider.

## **SPECIAL PROVISION**

**(\*\*\*PROJ NUM\*\*\*)**

### **SECTION 00221S**

## **BIDDING CONTRACT TIME**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

- A. This contract contains a procedure for bidding contract time which is part of the Price + Time bidding process, and which provides an incentive/disincentive to the Contractor for completing project milestones within the time established by the Contractor.

This section describes how the Time component is to be priced, and how time is used to provide an incentive/disincentive to the Contractor for timely completion of project milestones. See 00515M AWARD AND EXECUTION OF CONTRACTS regarding how the bid items related to time affects determination of the low bidder.

There is no physical work to be accomplished under this item. Time is a bid item, but it is not a pay item. No payment will be made under the time related bid items

#### **1.2 RELATED SECTIONS**

- A. 00515 Award And Execution Of Contracts

#### **1.3 TIME COMPONENT**

- A. Determine the bid price for the time component as follows.
1. Measure contract time in Calendar
  2. Determine the number of consecutive Calendar Days required between each Start Milestone and Finish Milestone in the table below. When determining the number of Calendar Days, consider all requirements of the contract. Include the day of the Start Milestone and Finish Milestone in the number of calendar days.
  3. When determining the number of calendar days for column G make certain that the work can be accomplished within the minimum and maximum number of calendar days indicated in columns E and F. Bids with calendar days that are outside the corresponding limits in column E and F are considered non-

responsive.

- B. If the Bidder does not submit a bid for the time component, the Department will consider the bid non-responsive.
- C. Negative amounts are not permitted for the time related bid items.
- D. Bidders are advised not to spread anticipated time costs within other items of the contract, as unbalancing will occur and the bid proposal may be rejected.
- E. Note any special cases wherein contract time will not be charged.*

A	B	C	D	E	F	G
TIME Bid items	START MILESTONE	FINISH MILESTONE	TIME- RELATED COST-RATE	MINIMUM	MAXIMUM	CALENDAR DAYS
			Dollars per calendar day <i>(see note 8)</i>	Calendar days	Calendar days	Calendar days
1 <i>(see note 4)</i>	April 15, 2004 <i>(see note 1)</i>	Substantial Completion of EB-I-84 <i>(see note 5)</i>	\$6,000	90	169	_____
2 <i>(see note 4)</i>	April 15, 2005 <i>(see note 2)</i>	Substantial Completion of WB-I-84 <i>(see note 6)</i>	\$6,000	90	169	_____
3 <i>(see note 3)</i>	First Lane Closure for Long Bridge	Substantial Completion of Long Bridge-	\$6,000	120	169	_____
4 <i>(see note 7)</i>	First Lane Closure for Short Bridge	Substantial Completion of Box Culvert	\$500	30	60	_____

**NOTE 1:** Do not close any lanes at any location on the project prior to April 15, 2004. Time charges for Time Segment 1 commence on April 15, 2004 regardless of whether or not lane closures commence on that date.

**NOTE 2:** Do not close Lanes of WB I-84 between milemarker \_\_\_\_\_ and \_\_\_\_\_ prior to April 15, 2005. Time charges for Time Segment 2 shall commence on April 15, 2005 regardless of whether or not lane closures commence on that date.

**NOTE 3:** Time Segment 3 may occur simultaneously with Time Segment 1, or 2, or 4.

**NOTE 4:** Time Segment 1 shall not occur simultaneously with Time Segment 2.

**NOTE 5:** Complete all work requiring lane closures for Time Segment 1 by October 1, 2004.

**NOTE 6:** Complete all work requiring lane closures for Time Segment 2 by October 1, 2005.

**NOTE 7:** Do not work on Time Segment 4 simultaneously with Time Segment 1 or 2.

**NOTE 8:** Accrual of the Time Related Cost Rates for any given Time Segments is

*independent of the other Time Segments, even when multiple Time Segments are occurring simultaneously. For example, if on a given day the Contractor is performing work on Time Segments 3 and 4 simultaneously, charges for the Time Related Cost Rate of both Time Segment 3 and 4 will accrue.*

#### **1.4 INCENTIVES/DISINCENTIVES RELATED TO “TIME”**

- A. Determine contract time related charges by multiplying the number of calendar days accrued for each time Segment by the appropriate time Related Cost Rate for each Time Segment, and summing the products.
- B. A tally of accrued time charges shall be kept throughout the life of the project, and compared each month to the time related bid items
- C. Payments/deductions to the Contractor will be based on the difference between the time related bid amounts and the actual time charges assessed. Payment for the incentive, or a deduction for the disincentive, will be made in the project accounting system
- D. **INCENTIVE.** If a milestone is determined by the Department to be achieved before the number of calendar days stated in the bid (Column G in the table above), then the Contractor will be paid at the Rate in shown in Column D above for each calendar day of the difference between the number of calendar days submitted at bid and the actual number of calendar days used to achieve the milestone. The maximum dollar amount eligible for incentive payment is *\$ Fill in by Region*
- E. **DISINCENTIVE** - Failure to achieve any milestone within the number of calendar days stated by the contractor in the bid (Column G in the table above) will result in charges as shown in Column D of table above being assessed for every calendar day in excess of time until the milestone is achieved

**SPECIAL PROVISION**

**(\*\*\*PROJ NUM\*\*\*)**

**SECTION 00515M**

**AWARD AND EXECUTION OF CONTRACTS**

**1.2 CONSIDERATION OF BID PROPOSALS:  
PRICE + TIME BIDDING**

*Delete Subsection A of Article 1.2 CONSIDERATION OF BID PROPOSALS and replace with the following:*

- A. This project uses a Price + Time bidding process. Price + Time bidding (1) provides for determination of the low Bidder to be based on the price of construction, plus the user costs associated with contract time; and (2) provides an incentive/disincentive to the Contractor for completion of project time-related milestones based on durations established by the Contractor at the time of bid.

The Department opens the Bid Proposals using the current version of EBS (electronic bid system) then compares them on the basis of the summation of the products of the quantities and unit bid prices. The low bid is determined by using a Price + Time (P+T) bidding method, as follows:

1. The bid will consist of a Price component and a Time component.
2. The Price component is the sum of the products of the quantities and unit bid prices for the pay items in the contract.
3. The time component is the sum of all of the time related bid items
4. The bid amount, for purposes of bid comparisons to determine the low bidder, is determined by summing the Price component with the amount bid for time components, as shown in the following equation:

$$\text{Bid amount} = \text{Price} + \text{Time}$$

This summation is only used to determine the successful bidder. It is not used to determine the award amount nor final payment to the contractor when the project is completed.

6. Department makes the results of the comparisons available to the public.

7. The unit bid prices govern if a discrepancy exists between unit bid prices and extensions.

**SPECIAL PROVISION**

**(\*\*\*PROJ NUM\*\*\*)**

**SECTION 00555M**

**PROSECUTION AND PROGRESS**

*SECTION 1.9, LIMITATION OF OPERATIONS, is supplemented with the following:*

**D. LANE CLOSURES PROHIBITED**

*In order to provide for the efficient flow of public traffic on SR \_\_\_\_\_, and on I-84 and its ramps and frontage roads, there are times when the Contractor shall keep all lanes open without restrictions of any kind. Therefore, the Contractor shall not obstruct, divert, delay, detour, or in any other way hinder the flow of any lane or shoulder in accordance with the following:*

***Region to describe in detail the appropriate limitations of operations***

August 19, 2004

**SPECIAL PROVISION  
ISTP-15-8(107)339**

**SECTION 00570M**

**DEFINITIONS**

*Replace Subparagraph A.85, Article 1.3 TERMS with the following:*

85. **Time Related Cost (Time component)** - A bid component related to time for which there is no pay.

END OF SECTION