Bidtab IV Maintenance

Contents

Introduction to Bidtab IV Maintenance

The ability to actively research historical bid tabulation data is the principle feature of Bidtab IV. Using the functions provided on the *Research Historical Bid Prices Form*[1], an estimator has instant access to historical data by simply clicking on an item in their estimate. Doing so automatically generates a database query and the bid tabulations for similar items are displayed in a list. The use of Standard Pay Items makes this deceptively simple process possible.

The purpose of this module is to discuss the methods that are used to establish and maintain relationships between the pay items used in engineer's estimates and the Standard Items and the techniques that can be used to create unique *Perspectives* that link similar Standard Items together. Bidtab IV provides two forms to perform these functions:

- *The Maintain: Conformed Pay Items Form* is used to associate pay-items to Standard Items.
- *The Maintain: Perspectives Form* is used to cross-reference similar Standard Items to create "*Perspectives*".

You should have a thorough knowledge and understanding of all Standard Specifications and Pay-Items used over the years for at least one particular Mode before using either of these forms.

Evolution of a Research Query

Before we discuss how to use the maintenance forms it is important that you have a thorough understanding of how research queries are constructed and why *Standard Pay Items* are an integral component in every database query.

Structured Query Language

Bidtab IV uses Structured Query Language (SQL) to access the Bid tabulation data. SQL is a specialized programming language for sending queries to databases. Most industrial-strength and many smaller databases use SQL. SQL allows Bidtab IV to communicate with a Microsoft Access database as well as an Oracle database.

Even though SQL is quite powerful, it has its limitations, not the least of which is that it is only able to fetch records that you explicitly define in a query. As you will see, this presents a problem to retrieving bid tabulation data because item numbers and descriptions are not intrinsically matched.

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[1] See Bidtab IV Estimating Module for a complete discussion of this topic.

Conformed Item Numbers and Descriptions

The dBASE program developed by the Northern Region in the 1980's, uses SQL queries to fetch the data to print the extremely popular *Cost Summary Books* that list all of the bid results for particular Pay-Item and Description combinations.

What most people don't know is that ***a lot of time and effort was spent to keep the database cleaned up***. Completely separate fields were inserted into the database to provide a place to store *conformed* Pay Item Numbers and Pay Item Descriptions. This was necessary because minor variations in either the pay item number or the description would scatter bid results throughout the book and make it impossible to effectively query the database with any certainty that you could find the information you were looking for. *Conforming* the pay items solved this problem, but at great expense. Consider the following example:

Lets say an estimator used item

        401 (2)   AC-5, Asphalt Cement

Which is not exactly the same as:

        401 (2)   AC-5 Asphalt Cement   (No comma)

In order to have this item printout in the same section as the second item shown, somebody would have to manually change the **conformed description** to "*AC-5 Asphalt Cement*" (without the non-conforming comma).

If this example by itself represented the whole problem, it could easily be solved with clever SQL queries. Unfortunately, the conformance issue runs much deeper. To illustrate this, let's look at a few more actual examples taken right out of the Bidtab IV database. For example, consider pay item 1000d:

ItemNumber	Description	Count
1000d	INSET RUNWAY THRESHOLD	1
1000d	MEDIUM INTENSITY THRESHOLD LIGHT, L-861SE	1
1000d	New Hi, Int, Runway, Marker Lt. L-862	1
1000d	NEW HIGH INTENSITY RUNWAY EDGE LIGHT, L-862	1
1000d	New High Intensity Runway Marker Light L-862	1
1000d	New High Intensity Runway Marker Light, L-862	5
1000d	New Highway Intensity Runway Marker Light, L-862	1
1000d	Runway Marker Light, L-862	2

Each of these descriptions for item 1000d is unique in some way but it does appear that item 1000d describes some kind of a runway marker light so someone could conform the descriptions for the 7 occasions a nonconforming description was used.

Now let's take a look at another example, this time using item 203 (11):

ItemNumber	Description	CountOfDescr
203 (11)	Benching In Bedrock	3
203 (11)	Borrow , Type A	1
203 (11)	Borrow, Type A	1
203 (11)	Borrow, Type D (Approx. 97,000 cu.yds.)	1
203 (11)	Borrow, Type E	1
203 (11)	Controlled Blasting	4
203 (11)	Ditch Excavation	1
203 (11)	Ditch Reconditioning	1
203 (11)	DITCH CLEANOUT	1
203 (11)	EMBANKMENT	13
203 (11)	Excavation and Embankment	1
203 (11)	Fluff Blasting	1
203 (11)	Footer Excavation	1
203 (11)	Foundation Course	1
203 (11)	GLENN HIGHWAY PIPE LINE CROSSING, REPAIRS	1
203 (11)	Linear Ditching	1
203 (11)	Linear Grading	5
203 (11)	OBLITERATION OF ROADWAY	1
203 (11)	Rock Bolts	2
203 (11)	Rock Excavation	1
203 (11)	Rock Stabilization	2
203 (11)	Rock Stablization	2
203 (11)	Shot Rock	1
203 (11)	SHOT ROCK BORROW	1
203 (11)	Shot Rock Embankment	2
203 (11)	Shoulder Excavation	7
203 (11)	Shoulder Reconstruction	2
203 (11)	SLOPE GRADING	1
203 (11)	SMALL CREEK CLEANING	1
203 (11)	SPREAD EXISTING ROADWAY	2
203 (11)	SURFACE COURSE	1
203 (11)	SURFACE MATERIAL	2
203 (11)	TEMPORARY BUTTRESS ACCESS	1
203 (11)	UNCLASSIFIED EXCAVATION	8
203 (11)	Unclassified Excavation (Approx. 5,100 C.Y.)	1
203 (11)	Unclassified Excavation (Approx.3075 C.Y.)	1
203 (11)	Waterfall Reconstruction	2

It's pretty obvious that the occurrence of a particular Item-Number with a particular Item-Description may be a *completely random event*! *Conforming* this list may take awhile!

Conforming Pay Items

To overcome the limitations and the enormous task of maintaining conformance Bidtab IV uses numeric References to Standard Pay Items. This seems like a natural thing to do because *conformance* implies an adherence to a Standard of some sort.

In Bidtab IV each Pay Item can be cross-referenced to a unique Standard Pay Item Identification-Number. **Neither the item number nor Description must match those of the Standard Pay Item**. If a Standard Pay Item is inserted into an estimate this relationship is automatically established. On the other hand, when a Non-Standard Pay Item is inserted, its relationship to a Standard Pay Item will have to be established using the techniques described here.

Referring back to the example for Pay-item 203 (11),on the previous page, you may choose to Cross Reference all of the Pay-Items with descriptions that are similar to:
- *Borrow, Type X* to Standard Pay Item *203 (5), BORROW, Type A*
- *Shoulder Excavation* to Standard Pay Item *203 (3), Unclassified Excavation*
- *Unclassified Excavation etc.* to Standard Pay Item *203 (3), Unclassified Excavation*
- And so forth.

In this manner, each pay item in each estimate is *conformed to a Standard Pay Item*.

When you execute a Research Query for an item in your estimate, (let's call it the Source Item), the query will fetch bid results for all items in the database that have the same Standard Item reference ID as the Source Item. The query will not even attempt to find words that match the description or matching item-numbers. So, following along with our example, let's say that you insert a new item into your estimate as follows:

Pay Item: *987(2.4.3abc), Create Big Hole* that is conformed to Standard Item *203(3), Unclassified Excavation*

When you issue a research query for this item you should expect to see all bid results for all items that have been cross-referenced to Standard Item 203(3) which will include any bids for the 203(11) items we cross-referenced earlier:

203 (3)	Unclassified Excavation in the road
203 (11)	Shoulder Excavation
203 (11)	UNCLASSIFIED EXCAVATION
203 (11)	Unclassified Excavation (Approx. 5,100 C.Y.)
203 (11)	Unclassified Excavation (Approx.3075 C.Y.)

As you can see, using Standard Item Cross-references allows the queries to return much better results. In fact it's almost as if have an intelligence of their own!

Perspectives

A Pay-Item can only be referenced to one Standard Pay Item. This would not present a problem if there were only one Book of Standard Items. Unfortunately there are many Standard Books with pay-items that describe very similar work. To overcome this situation Bidtab IV provides a means to link Standard Pay Items together using what is referred to as a *Perspective*[2].

In Bidtab a Perspective defines a relationship between Standard Items. The need for a Perspective is brought about by the fact that each Pay-Item in each estimate can only be associated with a single Standard Item even though there may be many Standard Items in other books that describe similar work. To overcome this limitation and broaden your Research Query Results you can define a Perspective that will link similar Standard Items together.

To further your understanding, consider the following simple example:
- We have three similar Standard Items in three different Standard Books: One, Two and Three. Their Descriptions are "*Base Course*", "*Aggregate Base Course*" and "*Surfacing, Base Course*"
- A *Perspective* has been created that Links these Standard Items together.

Say we insert a Pay Item that is cross-referenced to Standard Item "*Base Course*" in Book One. When we issue a research query we can expect the following results:
- *Without using the Perspective*: Only bids from Projects 11, 12 and 13 are displayed.
- *Using The Perspective*: Bids from all listed projects are displayed because the Perspective ties them together.

Book One	Book Two	Book Three
Base Course	*Aggregate Base Course*	*Surfacing, Base Course*
Project 11	Project 21	Project 33
Project 12	Project 22	Project 34
Project 13		Project 35
		Project 36
		Project 36
		Project 37

So, what happens if we decide to use a *Non-Standard Item* named "*Base Course*" in our estimate?

When we execute the Research Query:
- The database tries to find exact matches to the item number and item Description. If you're lucky, you will get the results for Projects 11, 12 and 13.
- If you put an extra space in between the words "Base" and "Course", or have an extra space after "Course", which is really hard to detect, then nothing will be found.

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[2] Users who have the *Cross-Reference Standard Items* permission can create perspectives. Everyone may use them.
Bidtab IV has several automated tools to efficiently create a *Perspective* but they are not discussed in this module.

Perspectives are of very powerful feature in Bidtab IV. There is no practical limitation on how many Perspectives you create. Here are a few ideas:

- Create a *Perspective* that links only Airport pay-items. The pay items in the New Standard Specifications For Airport Construction are radically different from the old Standard Specifications Book yet you still manage to get them built using the same old stuff you always used. Using a Perspective will allow you to retain the valuable bid information from the old book while using the new spec book.

- Create another that is for only Highways items.
- Create a broad perspective that links all similar Items in all books together.
- Create a really handy Cost Summary Book
  1. First, create a Summary Book that contains Items with really broad descriptions like: *Asphalt Products, Crushed Aggregates, Culvert.*
  2. Then create a *Perspective* that links standard-items from all of your real books to the Summary Books Items.

How you view the data all depends on your perspective.

MAINTAIN: Conformed Pay Items Form

The *Maintain: Conformed Pay Items Form* is used to establish relationships between the pay items that were used in engineer's estimates, to Standard Pay Items. It includes the following major components:

- The Data Filters Pane at the top left.
- The Source List, which is directly below the data filters pane.
- The Transfer List at the top right.
- The Standard Items List on the lower right.

Basic Procedures

The routine you will use to conform pay items is as follows:

- Select a Book of Standard Items.
- Set appropriate data filters.
- Left-Click on a Standard-Item ID number (in the FIND Column of the Standard Items List) to search the database for similarly named non-conforming items. These Items will be displayed in the Source List.
- Select the Pay Items you wish to conform from the Source List.
- Right-Click in the Source Selection to display the popup menu and select Reference to Standard Item.

The Standard Items List

- To change which Standard Book or Standard Chapter is listed, Click on the Blue box highlighting the title. A Dialog Form will appear where you can select a different Book or Chapter. (The Dialog Form can also be used to edit Chapters or Books)

- To Edit Standard Items, Right-Click on the Standard Items Grid and select Add, Edit Standard Pay Items from the Popup Menu. A Dialog Form will be displayed where you can edit the items.

- To FIND non-conformed Items Like This Item either Click on the Standard Item ID number, in the left column, or from the popup menu select the *Find Items Like This* menu item. A query will be executed looking for unassigned items where the Description is similar to the selected Standard Item. The Items will be displayed in the Source List.
- To SHOW which Items are already conformed to a Standard Item, click on the item's pay unit displayed in the Left column or make the appropriate selection from the Popup Menu. The Source List will be updated with all pay items that are conformed to the selected Standard Item.
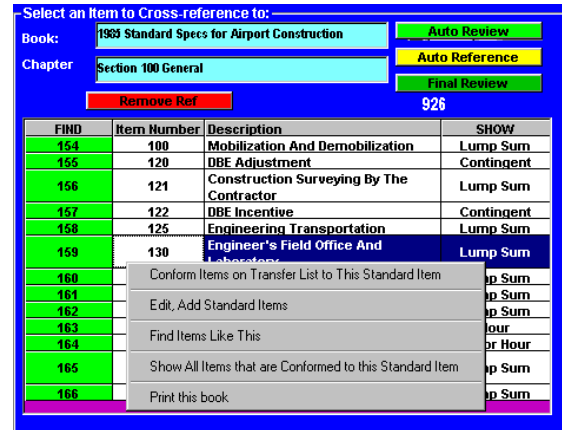
The Standard Items List (Automatic Features)

- Click the *Remove Ref* Command Button to remove all exiting references to all of the Standard Items in the Chapter(s) displayed.
- Click the *Auto Review* or *Final Review* Command Button to review all of the Standard Items in the Chapter. Red highlights in the FIND column indicate there are non-conformed items with a similar description in the database. Green highlights in the SHOW column indicate that pay-items have been conformed to the standard item.

- Click the *Auto Reference* Command Button to let the program conform items to the Standard Items in the Chapter(s). Using the Filters you have set, References will be created if the item number, description and Pay units for the non Conformed Item match exactly those of a standard item. Yellow highlights in the FIND column indicate that assignments were made. Green highlights in the SHOW column indicates that pay items were found which were already conformed to the standard item.
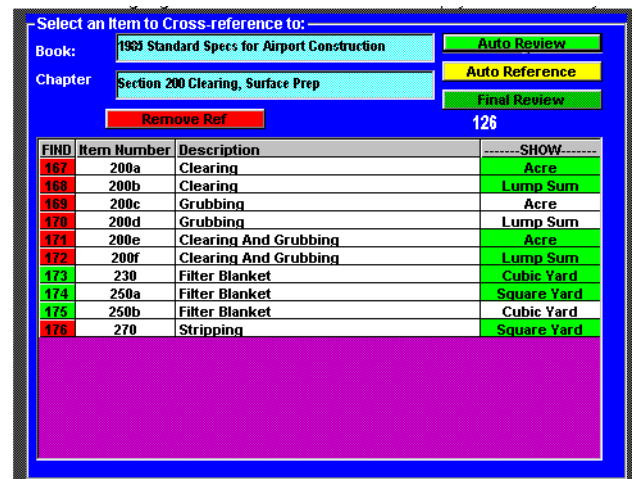
Data Filters Pane

The Data Filters Pane is used to set the data filters that will
be used to find Pay Items that have not been conformed to
a Standard Pay Item.
To Use:

- Click on green text boxes to open a dialog form and select either region or mode.
- Click on the red text boxes to clear any filter.
- The Slider represents the Percentage of records displayed (from 10 to 100 percent). It is used to populate the source list without regard to the Pay Item descriptions. After setting the slider, click the Re-query command button to update the source list.
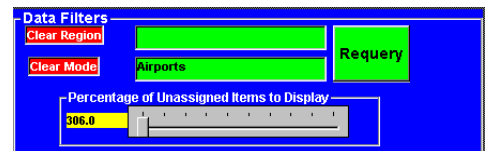
The yellow text box next to the slider often contains a number, which indicates the
number of records listed in the Source List

Source List

The Source List displays the results of FIND and SHOW Queries initiated from the
Standard Item List and from the *Review Do Not See Anymore List* command button.
Features:

Source Pane Headings

♦ "Items Kinda Like:..." then the list contains the results of a FIND query.
♦ "Pay Items Assigned to:..." then the list contains the results of a SHOW query.
♦ "DO-NOT-SEE-ANYMORE-ITEMS" then the items in the List are ones you no
   longer wanted to try and assign to a standard item. This list was displayed because
   you clicked the *Review Do Not See Anymore List* command button.   To return to
   listings of unassigned Items you must click on the *Review Unassigned Items*
   command button . The Source Pane Heading will then say "UNASSIGNED ITEMS"
   to confirm your change back to the default mode.

Source Pane Menu

Right-Click to display the popup Menu: (if multiple items have been selected, only the
first two selections are available)

♦ "Reference to Standard Item..." :assigns the item and removes it from the source list
♦ "Move to Transfer List":
♦ "Using This Item, Create a New Item in Chapter:..." in case it becomes obvious that a
   new standard item is needed.
♦ "Show Project Descriptors" This selection opens up the Project Description Form for
   the item selected.

You can sort the List by Clicking on a Column Heading.

MAINTAIN: Perspectives Form

This form is used to create and maintain Perspectives. In Bidtab a Perspective defines a relationship between Standard Items. There is no practical limitation on how many Perspectives you create In Bidtab. You may have a Perspective that links only Airport pay-items, another which is for Highways items or a broad perspective that links all similar Items in all books together. It all depends on your perspective!
The Perspectives Form includes the following major components:
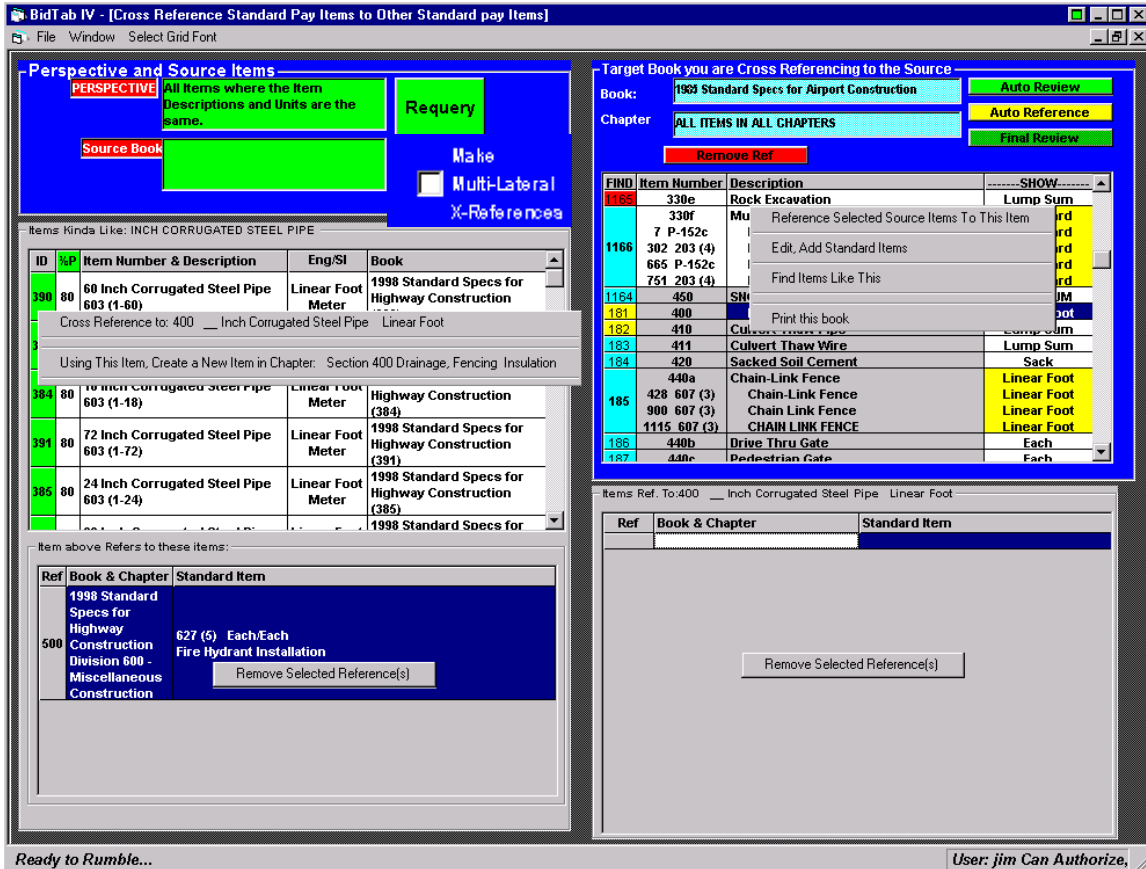
- The *Data Filters Pane* at the top left. This is where you select the Perspective you are working on and the Source book of Standard Items you are cross-referencing.
- The *Source List*, which is directly below the data filters pane, displays the results of a FIND items like query initiated from the Standard Items List.
- The *Source References List* is directly below the Source List and displays the Standard Items the Source Item References.
- The *Target Standard Items List* is in the upper right and displays the list of Standard Items you are referencing to the Source Items.
- The *Target References List* is directly below the Target List and displays the Target Item References..

Basic Procedures

1. Select a Perspective.
2. Select a Source Book
3. Select a Target Book
4. Left-Click on the FIND column in one of the Target Book Items. This will locate all items in the Source where the Source-Item Descriptions are *Kinda-Like* the Target Item you Selected. The Items found are displayed on the Source Grid.
5. Select Items from the Source Grid.
6. Right-Click on the Source Grid to display the popup menu. Click Cross Reference to:... and a cross reference is created between the Selected Source Item(s) and The Target Item.

Data Filters Pane
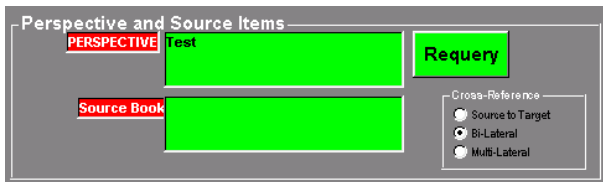
Select a *Perspective* by clicking on the Green text box in the Data Filters Frame. (clear the selection by clicking on the Red Text Box). A dialog form will open where you can either select an existing Perspective or create a new one.

Select a *Source Book* to Cross reference using the Green Text box below the Perspective. The Source Grid will fill with all of the Book's Items. If a Source Book selection is not made then all books are automatically included in the queries.(the default setting)

Cross Referencing Methods

Bidtab can create cross-references in three ways:
1. *Source to Target* create one reference.
2. *Unilateral* cross referencing only creates two references. One from the source item to the target item. The second from the Target Item to the Source item.
3. *Multi-Lateral* Cross referencing creates cross references as in the unilateral case and then extends the cross referencing to automatically create references to references. A detailed example of this is included in the chapter titled *Advanced Topics*. Check the *Make Multi-Lateral X-References Box* if you want to use this feature.

The Target Standard Items List

- To change which Standard Book or Standard Chapter is listed, Click on the Blue box highlighting the title. A Dialog Form will appear where you can select a different Book or Chapter. (The Dialog Form can also be used to edit Chapters or Books)

- To Edit Standard Items, Right-Click on the Standard Items Grid and select Add, Edit Standard Pay Items from the Popup Menu. A Dialog Form will be displayed where you can edit the items.

♦ To FIND Standard Items in other Books that are similar in description to the selected item, either click on the Standard Item ID number, in the left column, or from the popup menu select the *Find Items Like This* menu item. A query will be executed and the Items will be displayed in the Source List.

The second column in the Source list, labeled "%P", contains either an "X" or a number. An "X" indicates the Item is already cross referenced to the Standard Item. A number indicates the percentage of words in the description that match those in the Standard Item.

- To SHOW which Items are already cross-referenced to a Standard Item, just click on the item. The Target References List, below the list of standard items, will be updated with all Standard Items that are cross referenced to the selected Standard Item.

Printing Books of Standard Items

Access the Standard Items Popup menu with a right-click on the list of items.

Print the Standard Book by selecting *Print this Book.*

Print the References for the items displayed in the list using *Print this Perspectives Cross references…* from the menu.

Only Cross References for the *Perspective* and *Source* you are using will be printed:

The Standard Items List (Automatic Features)

- Click the *Auto Review* or *Final Review* Command Button to review all of the Standard Items in the Chapter displayed.

Bidtab will step through each Standard Item and display all of the items that have already been cross referenced to each Standard Item.

In addition, Bidtab executes a FIND query for the Standard Item and color codes the first column with the probability that uncross-referenced items were found that match the Standard Items Description with the following probabilities:

- ♦ Red: 100% of the words in the Standard Item Description were found.
- ♦ Magenta: 70%
- ♦ Yellow: 50%
- ♦ Blue : less than 50%

Remove Ref

- ♦ Click the *Remove Ref* Command Button to remove all exiting references to all of the Standard Items in the Chapter(s) displayed.

- ♦ Click the *Auto Reference* Command Button to let the program automatically step through the Standard Items displayed and assign cross references. The following dialog form is displayed:

The Source List

When you select item(s) from the Source list, a pop-up menu will appear that will allow you to:

- ♦ Cross Reference the selected Source Items to the Targeted Standard Item.
- ♦ Create new Standard Items in the Targeted Chapter using the selected items as a template.

If you click on the first column of a Source Item. The *Source Items Reference List* will appear below the *Source Items list* and display the Standard Items the Source Item References.

Removing References

A popup menu on the *Reference List allows you to Remove Selected References*.

Advanced Topics

Perspective: Cross Referencing Methods Example

Bidtab can create cross-references using three methods:
Consider the following existing Table of references for Items 100 and 900:

Source Item 100	Target Item 900
222	898
333	276
444	987
	456
	789

1. ***Source to Target Cross-referencing*** creates only one reference:

Source Item 100	Target Item 900
222	898
333	276
444	987
900	456
	789

2. ***Unilateral cross referencing*** only creates two references. One from the Source item to the Target item. The second from the Target Item to the Source item. Using Unilateral cross referencing of Item 100 to Item 900 would result in the following references:

| Item 100	Item 900
222	898
333	276
444	987
900	456
	789
	100

3. ***Multi-Lateral Cross referencing*** creates cross references as in the unilateral case and then extends the cross referencing to automatically create references to references. Using Multi-Lateral cross referencing of Item 100 to Item 900 would result in the following references:

| Item 100	Item 900
222	898
333	276
444	987
900	456
	789
	100
898	*222*
276	*333*
987	*444*
456	
789	

Authoring a New Standard Book, using Items from An Existing Book.

In this example, a new Standard Items Book is Created from the existing *2001 Standard Specs for Airport Construction*. The Items in the new book will be reorganized into chapters by the Unit of Measure.
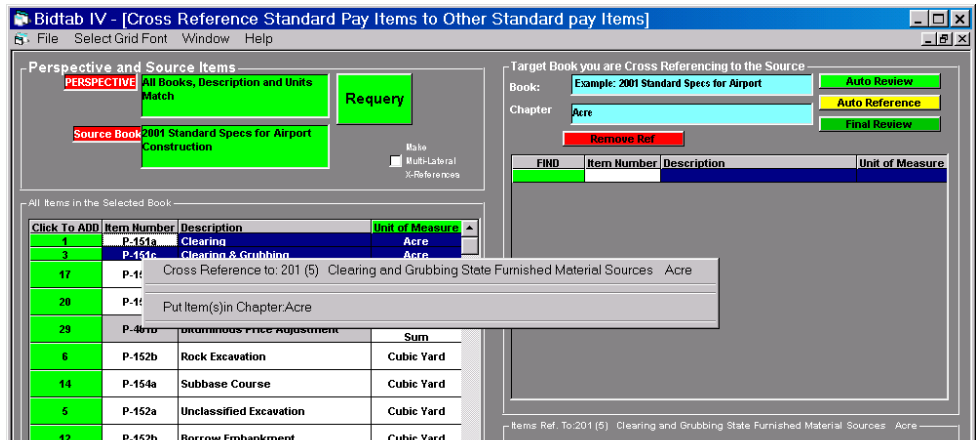
1. Select the Source Book:
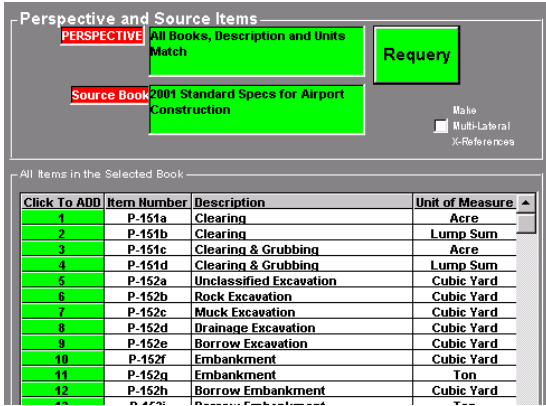
2. Create the New Book and Chapters.
3. Select the First Chapter from the new book: *Acre*
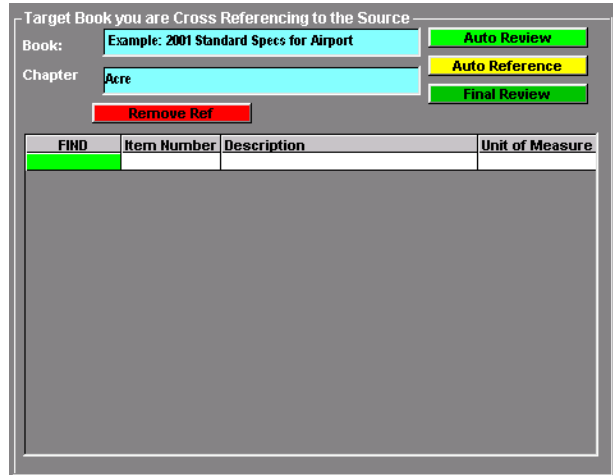
4. Sort the Source Items by Clicking on the column heading "*Unit of Measure*"
5. Select the Items with *Acre* Pay Units.

6. Click *Put Items in Chapter: Acre*

7. *The Items are added to the Chapter*

8. Select the next Chapter, Contingent Sum, and repeat steps 5-8.