Tabulation of Surfacing

Several of the standard CDOT tab sheets have recently been updated to automate various data entry and calculation aspects of the spreadsheet. The following instructions illustrate how to use the *Tabulation of Surfacing* tab sheet located in the *C:\Projects\JPC#\Design\Drawings\Tabs* folder of the project. Once the tab sheet is completed according to the following instructions, refer to *A Practical Guide for Using InRoads*, Chapter 15 - Tabs Sheets for instructions on how to link the tab sheet to a MicroStation drawing for inclusion in a plan set.

Getting Started

The two files you will need to complete these instructions are: 1) *JPC#DES_Tabulation of Surfacing.xls*, and 2) *Trnsport_Itemlist.csv*. Following is a description of these two files.

- *Trnsport_Itemlist.csv* –This file contains the list of Pay Item codes from the most recent CDOT Pay Item listing. This file is included in the standard CDOT workspace and is located in the *C:\Workspace\Workspace-CDOT_V8i\Standards-Global* folder. When changes are made to the CDOT Pay Item listing, this file is automatically updated on each machine by ServerCop.

- *JPC#DES_Tabulation of Surfacing.xls* – This is the file where the quantity data is entered. For new projects, this file is copied to the *C:\Projects\JPC#\Design\Drawings\Tabs* folder of the project and renamed by replacing JPC# with the project code number specified during the project setup.

  If you would like to use this file in an existing project, manually copy the file *JPC#DES_Tabulation of Surfacing.xls* from *C:\Workspace\Workspace-CDOT_V8i\Project Template\Design\Drawings\Tabs* folder to the *C:\Projects\JPC#\Design\Drawings\Tabs* folder and rename the file by changing JPC# to the project code number.
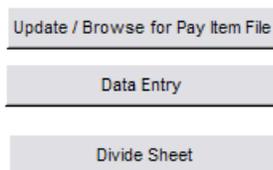
1. Open the *JPC#DES_Tabulation of Surfacing.xls* file.

   Note: Some computers may generate a *Security Warning* that *Macros have been disabled* followed by an *Options* button.

If this happens, click the **Options** button and toggle on **Enable this content** as shown below. Click **OK** to continue using the spreadsheet with the macros enabled.

One of the main updates to the tab sheets is the addition of uniform buttons to manage the Pay Item file being used, access to a data entry sheet, and splitting up a large spreadsheet into sheets that can be links to the MicroStation border file. You will notice the following buttons in the upper left hand corner of each tab sheet:

The following instructions will illustrate the functionality of each of these buttons.

Update/Browse for Pay Item File

The first step in using the *JPC#DES_Tabulation of Surfacing.xls* file is to make sure it is using the correct Pay Item file. The current Pay Item file used by the tab sheet is listed at the top of the worksheet as shown below.

      1.   Verify the correct *Pay Item File:* is being used.

The tab sheet should default to the last Pay Item file attached to the spreadsheet. For a new file, the spreadsheet should use the ***Trnsport_Itemlist.xls*** file located in the ***C:\Workspace\Workspace-CDOT_V8i\Standards-Global*** folder.

Note: The text for the Pay Item file should be black. Red text indicates that the Pay Item file is not found in the specified location. The Data Entry button will not work without a valid Pay Item file.

The ***Update/Browse for Pay Item File*** button is used to:

♦ Correct the path of the Pay Item file location when it is listed in red text

♦ Choose a new Pay Item file due to a new Pay Item request

As the project progresses, there may be a need to request an additional Pay Item. Once the request has been granted, be sure to request a new Pay Item file and place it in the project folder structure.

Important! If you place the new file in the standard ***C:\Workspace\Workspace-CDOT_V8i\Standards-Global*** folder it will be overwritten the next time ServerCop runs.

2. To choose a different Pay Item file, **<D>** the **Update/Browse for Pay Item File** button.
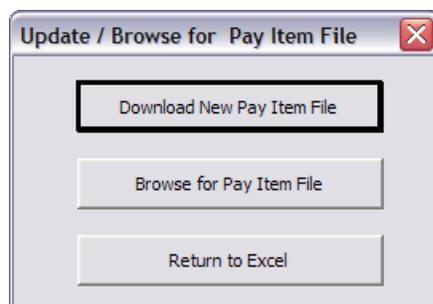
   This displays the ***Update/Browse for Pay Item File*** dialog box.
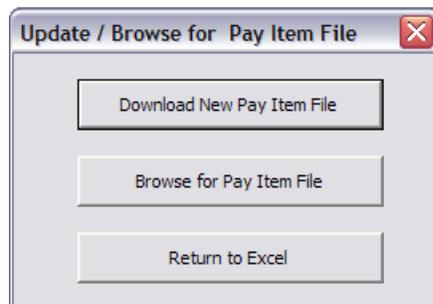
Download New Pay Item File

The standard ***Trnsport_Itemlist.xls*** file is also posted on the internet. When a new Pay Item list file is generated, there is a delay between the time it is posted to the internet and when it is included in the CDOT configuration.

1. **<D>** the **Download New Pay Item File** button to access the most current Pay Item file.

This will bring up a spreadsheet in Excel.

2. **Save** the file to a known location, preferably *\Specification* folder in the project directory.
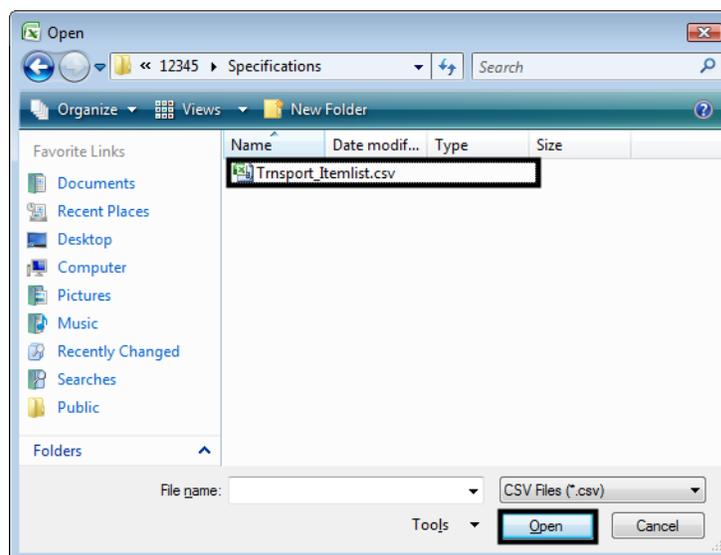
Browse for Pay Item File

Next, load the new/updated Pay Item file.

1. Back in the *Update/Browse for Pay Item File* dialog box, **<D>** the **Browse for Pay Item File** button. This displays the *Open* dialog box.
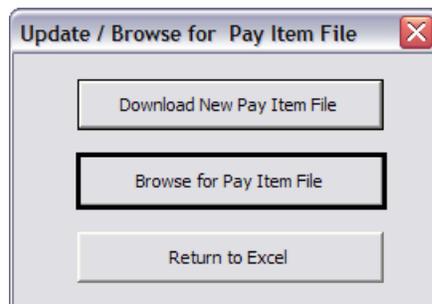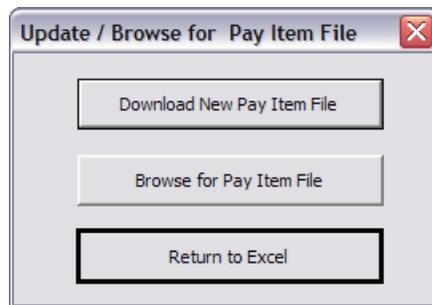

2. In the *Open* dialog box, navigate to the location of the Pay Item list file, highlight it, and **<D> Open**.


After choosing Open, the *Update/Browse for Pay Item File* dialog box should display again.

3. In the *Update/Browse for Pay Item File* dialog box, **<D>** the **Return to Excel** button to dismiss the Update/Browse for Pay Item File dialog box and return to the spreadsheet.

4. Verify that the new Pay Item list is attached to the spreadsheet by once again looking at the filename and path of the Pay Item list next to the *Update/Browse for Pay Item File* button.
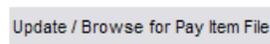
5. Save the *JPC#DES_Tabulation of Surfacing.xls* file so that the Pay Item file remains attached to the spreadsheet.

Data Entry

Once the design is completed, pay quantities can be gathered and entered into summary sheets. There are many methods of calculating quantities and many formulae used. Once the quantities have been computed, they are entered into tab sheets and linked to MicroStation sheet border file for printing. This module describes the process of entering calculated quantities into the tab sheet and attaching the sheet to the sheet border for printing.

Entering Data into the Spreadsheet

The process of inputting data into the spreadsheet is similar for all of the tab sheets. The examples below use the DES_Tabulation of Surfacing.xls.

1. Open the ***DES_Tabulation of Surfacing.xls*** file.

2. **<D>** the **Surfacing Sheet** tab at the bottom of the Excel window. This is where all the work in this file is performed.
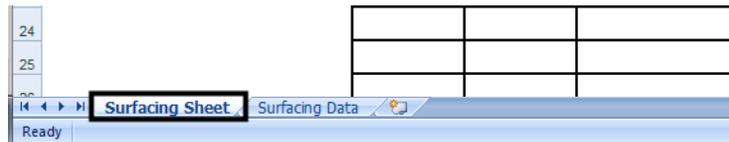

3. Verify that the text on line 1 to the right of the buttons is black. Red text indicates that the Pay Item list file is not found in the specified location.
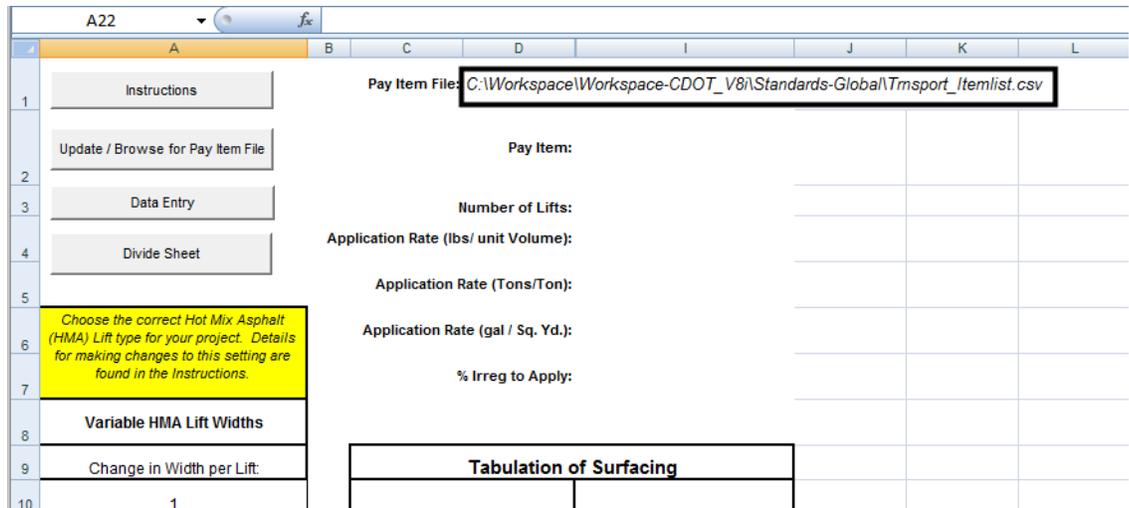

If the text is red, the location of the Pay Item list file must be specified. To specify the location:

4. **<D>** the **Update / Browse for Pay Item File** button. This displays the ***Update / Browse for Pay Item File*** dialog box.

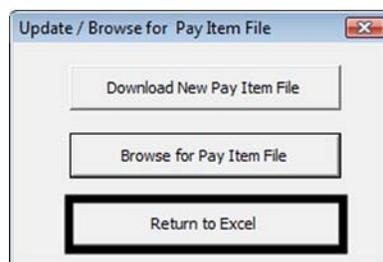5. In the *Update / Browse for Pay Item File* dialog box, **<D>** the **Browse for Pay Item File** button. This displays the *Open* dialog box.
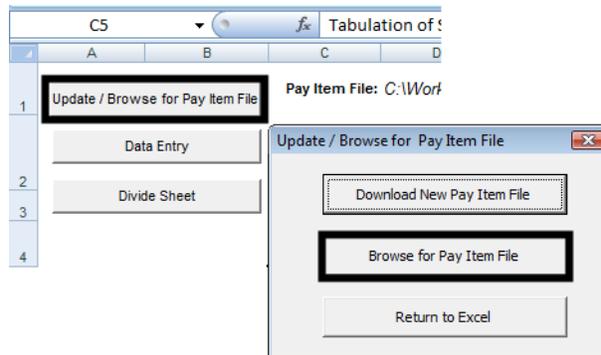
6. In the *Open* dialog box, navigate to the location of the Pay Item list file, highlight it and **<D> Open**.
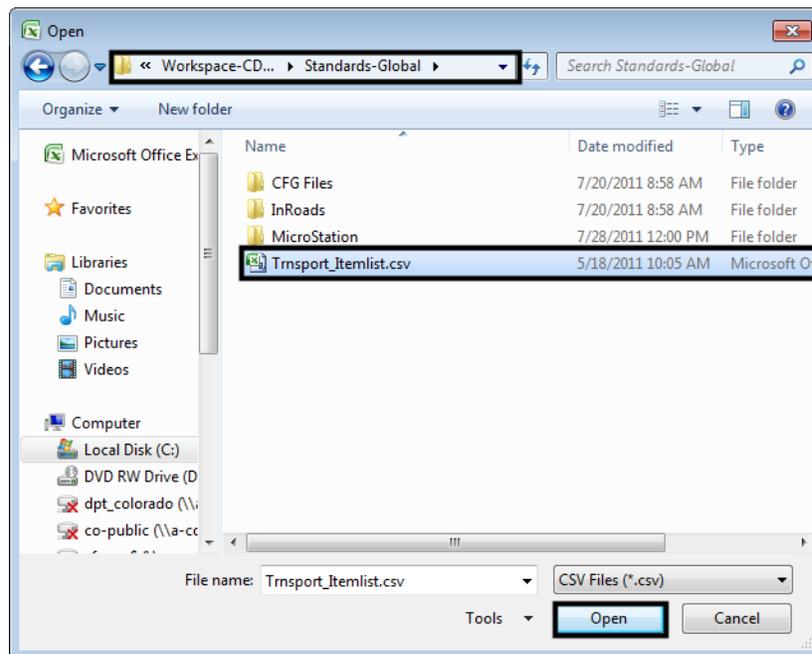
7. In the *Update / Browse for Pay Item File* dialog box, **<D>** the **Return to Excel** button to dismiss the *Update / Browse for Pay Item File* dialog box.

The next step is to add Pay Items to the spreadsheet. Adding Pay Items automatically updates the Surfacing Sheet with the proper number of columns in the correct order. The Pay Items do not have to be selected in order, they will be sorted by the program each time a new Pay Item is added. To add Pay Items:

8. **<D>** the **Data Entry** button. This displays the *Surfacing Data Entry* dialog box.
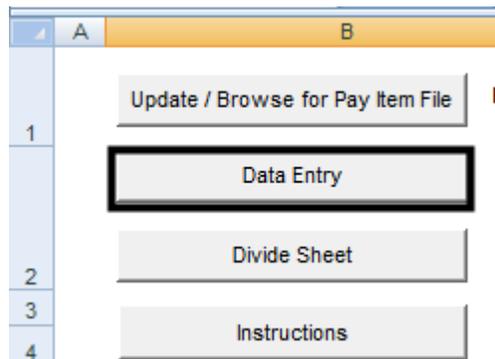
9. Select the desired category from the *Pay Item Category* area. This will filter the list of items to show only those Pay Items from the selected category.
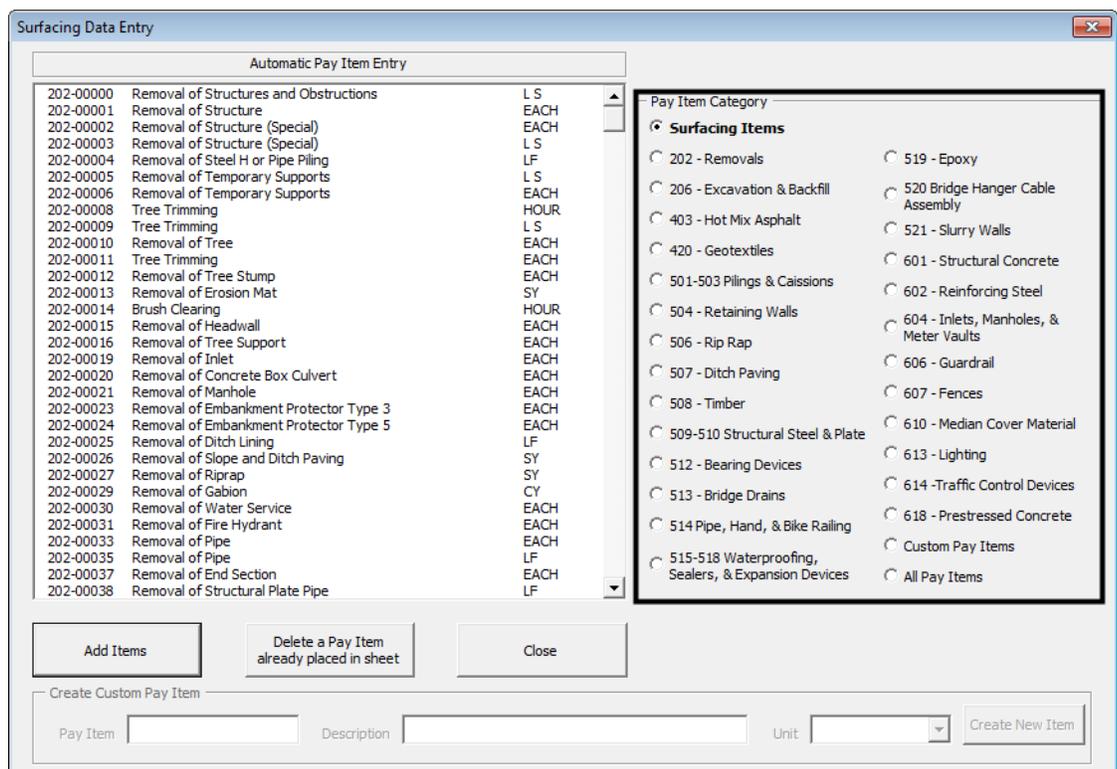
Note: Clicking on the *All Pay Items* category will show a listing of Pay Items across all Pay Item categories.

10. Select the desired Pay Items from the list. Multiple Pay Items can be highlighted by holding the Ctrl key then selecting the Pay Items. (Note: holding the Ctrl key and dragging through several items will deselect previously selected items.)

11. **<D>** the **Add Items** button to update the spreadsheet with the selected Pay Items.

12. **<D> Close** to dismiss the *Surfacing Data Entry* dialog box.
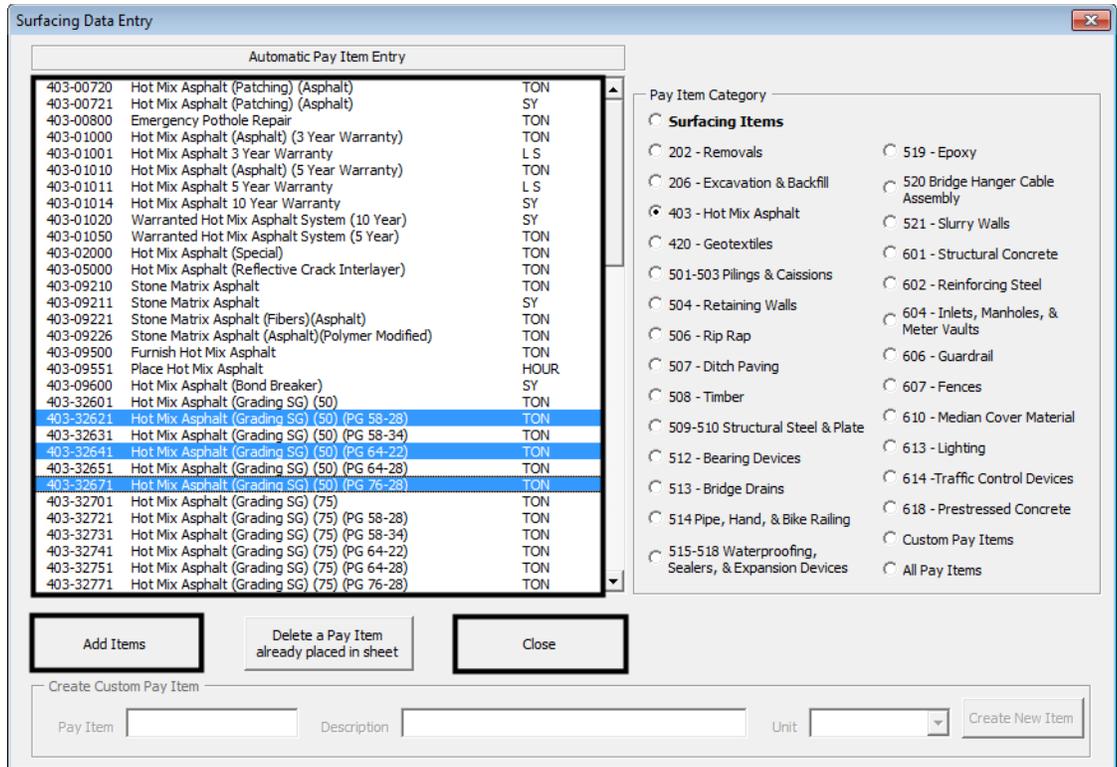
13. Additional items can be added as explained in steps 8 through 11. The columns are resorted, keeping the column contents with the proper Pay Item.

Pay Items, like hot mix asphalt, activate an additional field above the table to specify the number of lifts used for construction. The default value for this field is 1. To specify a different number of lifts:

14. **<D>** in the **Number of Lifts** cell below the desired Pay Item.

15. Use the drop down menu to select the desired number (from 1 to 5).

The table is updated, adding the specified number of columns under the Pay Item heading. The lift columns are numbered from bottom to top, with the first lift named ***Bottom*** and the last lift named ***Top***. The middle lifts are named ***Lift 2*** through ***Lift 4***.

Tabulation of Surfacing						
Station		Hot Mix Asphalt (Grading SG) (50) (PG 58-28)				
		TON				
From	To	Bottom	Lift 2	Lift 3	Lift 4	Top

Each Asphalt Pay Item also has an irregularity factor that is applied to the total quantity for the Bottom lift. The default value is 5%. To change the irregularity factor:

16. **<D>** in the **% Irreg to Apply** cell below the desired Pay Item.

17. Key in the desired percentage.

% Irreg to Apply:	5%	0%	0%	0%

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Note: If the value is deleted from the function line before entering the new value, enter either; the whole number percentage value with the "%" sign, or the decimal equivalent without the "%" sign. Entering the whole number value without the "%" sign will result in a value 100 times larger than the desired value.

Next, quantity data is added to the sheet. The spreadsheet does not do any calculations. Quantity calculations must be done prior to entering the data into the spreadsheet. To add quantity data to the spreadsheet:

18. **<D>** in the first available From cell (on row 10 if this is a new sheet).

19. Key in the desired starting (***From***) ***Station*** number for the quantity and press the ***Tab*** key.

   Note: The "+" sign is automatically inserted into the station number if it is not keyed in. Also, stations are rounded to the nearest whole station.

20. Key in the desired ending (***To***) ***Station*** number for the quantity and press the ***Tab*** key. Continue pressing the Tab key until the cursor is in the desired Pay Item column.

21. Key in the quantity. Tab to additional columns that have quantities for the station extents entered and key in their values.

22. Repeat steps 18 through 20 for each set of station extents.

   The quantities are automatically totaled and the irregularity factors are applied as each entry is made.

   If there are a large number of station extents to enter, additional lines to the table may be required. To add additional lines:

23. **<R>** on a row number that is within the table (below the headings) that is blank and select Insert from the menu. This adds a row above the selected row number.

To add multiple rows:

24. Highlight the number of blank rows to be added.

25. **<R>** and select **Insert** from the menu. The additional rows are added above the highlighted rows.
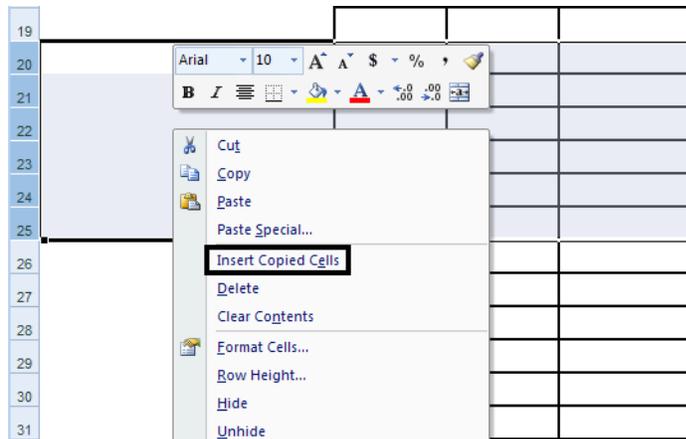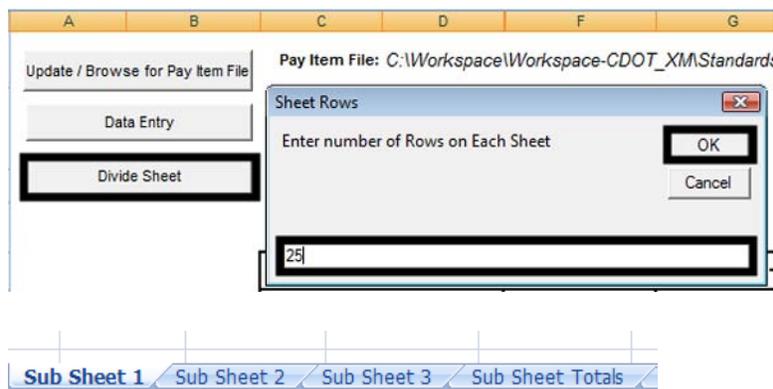
Divide Sheet

Once the data is entered into the Surfacing Sheet, it can be prepared for linking to the MicroStation sheet border file. If the table is small enough to fit within the sheet border, then no further processing is required. However, if the table is too long and/or too wide, additional actions are required to make tables that fit the sheet borders.

Dividing Long Sheets

Sheets with too many rows are divided to create sub-tables of data and an additional sheet totals table. To create the sub-tables:

1. **<D>** the **Divide Sheet** button. This displays the *Sheet Rows* dialog box.

2. Key in the desired number of rows of data to be included on each sub sheet.

3. **<D>** the **OK** button.

♦ The number of data lines in the master sheet is divided by the number of lines specified in the *Sheet Rows* dialog box and new worksheets are created and populated from the original data on the Surfacing Sheet.

    Note: The number of rows specified in the *Sheet Rows* dialog box includes any blank lines that will be created to separate Pay Items on the Sub Sheets.

♦ The new worksheets are named *Sub Sheet 1*, S*ub Sheet 2*, etc. Additionally, the *Sub Sheet Totals* worksheet is created which contains a table with the sub sheets' total lines and a grand total.

♦ The tables on the sub sheets are the tables that get linked to the MicroStation sheet border files.

    Important! If the table needs to be re-divided, delete the Sub Sheet and Sub Sheet Totals worksheets prior to executing the command. Failure to do so could result in erroneous Sub Sheets and Sub Sheet Totals.

Dividing Wide Sheets

There is no command to automatically divide sheets by the number of columns. Ideally, the number of columns that can fit in a border should be determined before data entry. That number is then divided into the total number of Pay Items to determine how many xls files will be needed. The xls file that contains all Pay Items should then be used as the template to create the required number of divided sheets.

However, if the table is deemed to be too wide after data is entered, use the following procedure:

1. Determine the number of columns that will fit on the sheet.

2. **Save** the original file.

3. Select **File > Save As** from the menu bar. Name the new file the same as the original, changing the end number to make it unique.

4. Reopen the original file.

5. On the *Surfacing Sheet* worksheet, **<D>** the **Data Entry** button.

6. In the *Data Entry* dialog box, **<D>** the **Delete a Pay Item already placed in sheet** button. This displays the **Delete Item** dialog box.

7. From the **Delete Item** dialog box, highlight the first Pay Item to be removed from the first sheet.

8. **<D>** the **Delete Item** button. This removes the Pay Item column and any data in that column from the *Surfacing Sheet* worksheet.

9. Repeat steps 7 and 8 until only the Pay Items for the first sheet are left.

10. Save and close the original file.

11. Open the copied file.

12. Repeat steps 5 through 9, deleting the Pay Items that appear on the original sheet.

13. Repeat steps 1 through 12 if a third or subsequent sheets are required.

If sheets need to be divided by both length and width, divide them by width first. This is because the Sub Sheets are not automatically updated by the addition or deletion of Pay Items.