

# Chapter 15 - Tab Sheets

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.

## Files Used

Three files are used to create the final tab sheet for printing. These are:

- **Trnsport\_Itemlist.csv** – This file contains the list of pay item codes from the Colorado Department of Transportation Master Item Code Book (Spec Year 05). This file is located in the **C:\Workspace\Workspace-CDOT\_XM\Standards-Global** folder and is automatically updated by ServerCop.
- **JPC#SPEC\_Tabulation of ????.xls** – This is the file where the quantity data is entered. The first part of the file name is the project code and the three to four letter abbreviation of the specialty group. The last part of the name describes the type of data to be entered. For example, the 88888DES\_Tabulation of Guardrail.xls contains quantities and pay items related to guardrail. These files are located in the **C:\Projects\JPC#\Group\Drawings\Tabs** folder.
- **JPC#SPEC\_TabMisc##.dgn** – This file contains the sheet border for the printable tabulation sheet. This file can be modified to contain project specific information (project code, RE cell, etc.). It can also be copied if more tabulation sheets are required. This file is located in the **C:\Projects\JPC#\Group\Drawings\Tabs** folder.

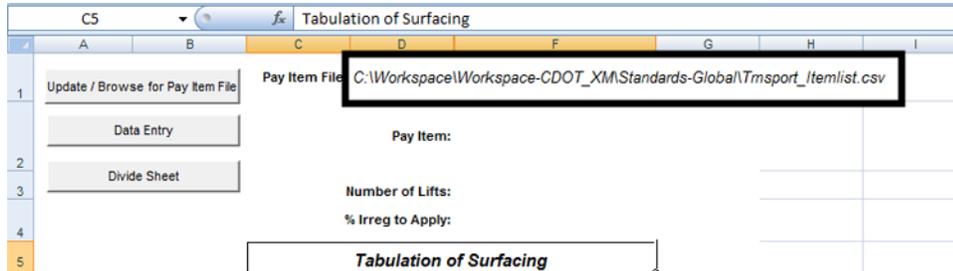
## Entering Data into the Spreadsheet

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.

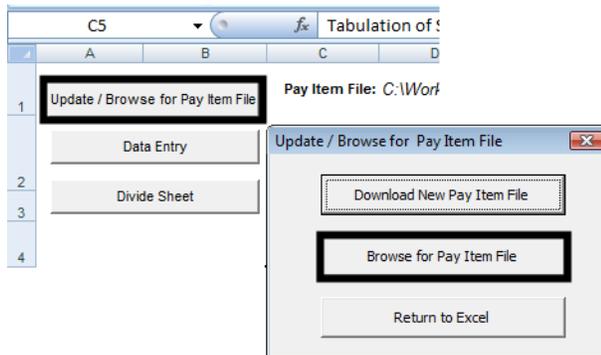


- Verify that the text on line 1 to the right of the buttons is black. Red text indicates that the pay item list file is not found in the specified location.

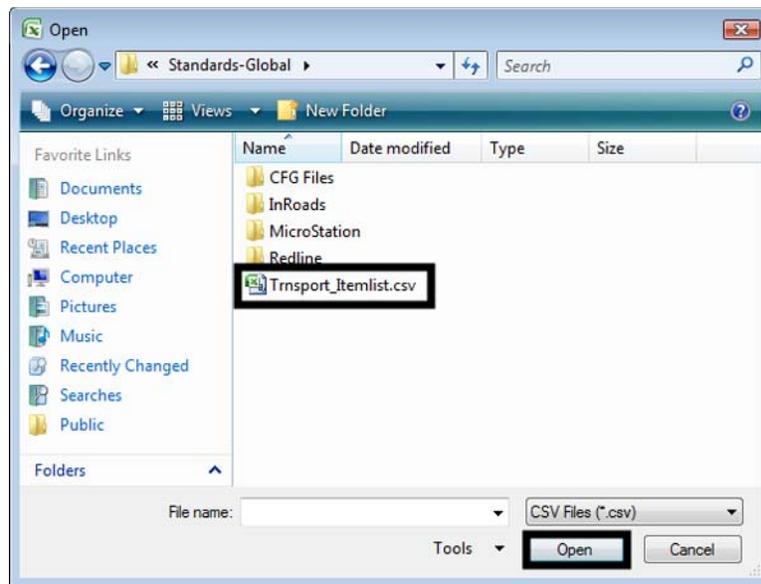


**Note:** If the text is red, the location of the pay item list file must be specified. To specify the location:

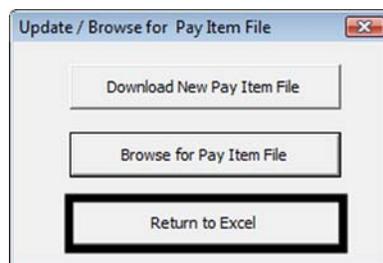
- <D> the **Update / Browse for Pay Item File** button. This displays the **Update / Browse for Pay Item File** dialog box.
- In the **Update / Browse for Pay Item File** dialog box, <D> the **Browse for Pay Item File** button. This displays the **Open** dialog box.



6. In the **Open** dialog box, navigate to the location of the pay item list file, highlight it and <D> **Open**.

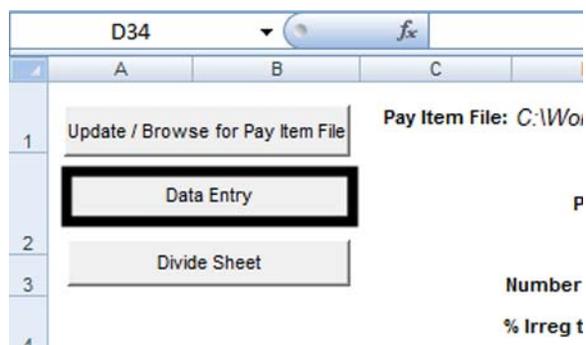


7. In the **Update / Browse for Pay Item File** dialog box, <D> the **Return to Excel** button to dismiss the **Update / Browse for Pay Item File** dialog box.

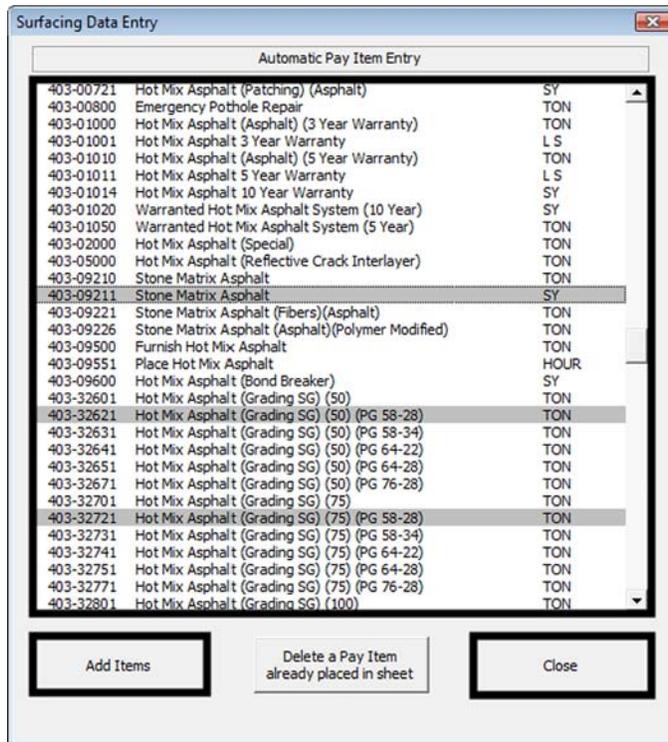


The next step is to add pay items to the spreadsheet. Adding pay items automatically updates the Surfacing Sheet with the proper number of columns in the correct order. The pay items do not have to be selected in order, they will be sorted by the program each time a new pay item is added. To add pay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

8. <D> the **Data Entry** button. This displays the **Surfacing Data Entry** dialog box.



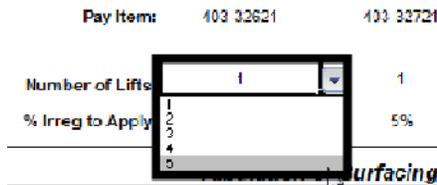
9. Select the desired pay items from the list. Multiple pay items can be highlighted by holding the Ctrl key then selecting the pay items. (Note: holding the Ctrl key and dragging through several items will deselect previously selected items.)
10. <D> the **Add Items** button to update the spreadsheet with the selected pay items.
11. <D> **Close** to dismiss the **Surfacing Data Entry** dialog box.



12. 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.

**Note:** 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:

13. <D> in the **Number of Lifts** cell below the desired pay item.
14. 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)				
		LIFT				
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:

15. <D> in the % Irreg to Apply cell below the desired pay item.
16. Key in the desired percentage.

Number of Lifts:	
% Irreg to Apply:	5%

**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:

17. <D> in the first available From cell ( on row 10 if this is a new sheet).
18. 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.
19. 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.
20. Key in the quantity. Tab to additional columns that have quantities for the station extents entered and key in their values.
21. Repeat steps 18 through 20 for each set of station extents.

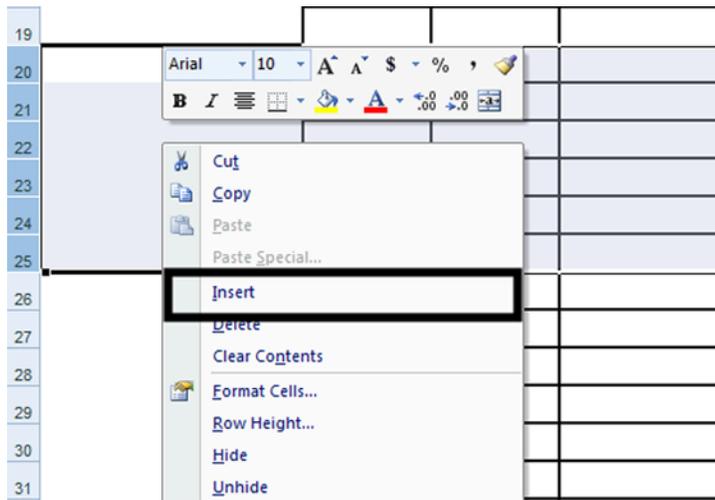
The quantities are automatically totaled and the irregularity factors are applied as each entry is made.

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

22. <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:

23. Highlight the number of blank rows to be added.
24. <R> and select **Insert** from the menu. The additional rows are added above the highlighted rows.



## Preparing the Spreadsheet for Linking

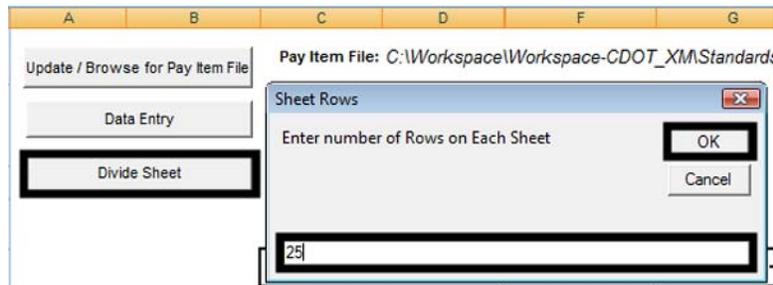
Once the data is entered into the Surfacing Sheet, it can be prepared for linking to the MicroStation sheet border file. If the table is small enough to fit within the sheet border, then no further processing is required. However, if the table is too long and/or too wide, additional actions are required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

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



The number of data lines in the master sheet is divided by the number of lines specified for each sub sheet and new worksheet are created and populated with data from the Surfacing Sheet table. These are named Sub Sheet 1, Sub Sheet 2, etc. and it is the tables on the sub sheets that are linked to the MicroStation sheet border files. Additionally, the Sub Sheet Totals worksheet is created which contains a table with the sub sheets' total lines and a grand total.

Note: 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 desired xls file should then be copied the required number of times.

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.

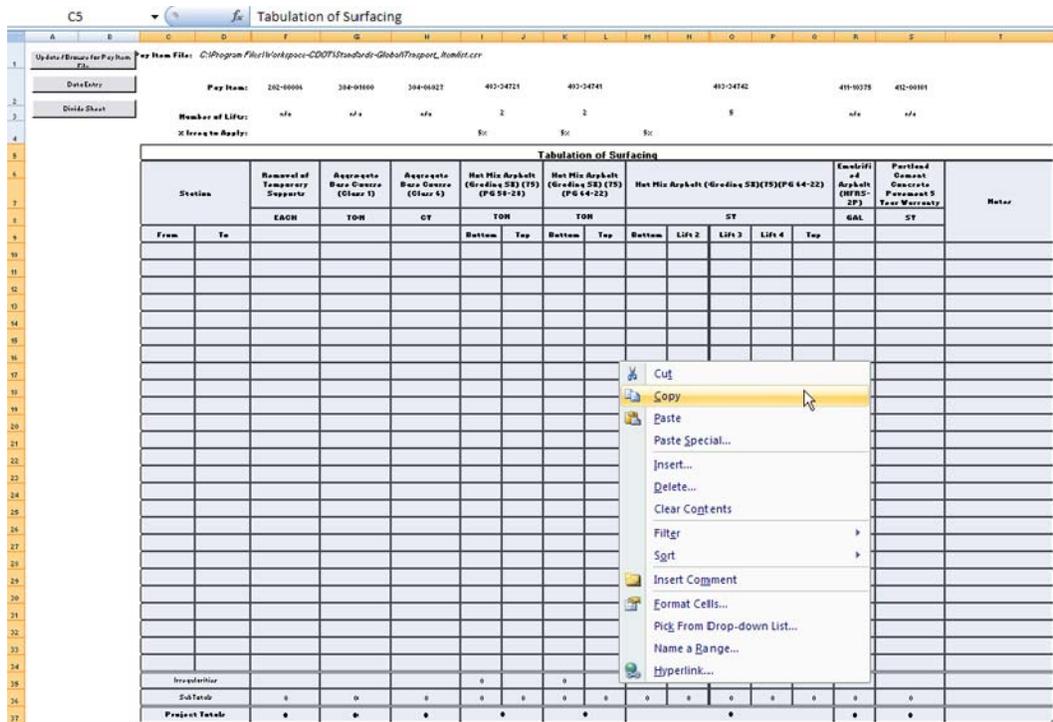
10. Save and close the original file.
11. Open the copied file.
12. Repeat steps 5 through 9, deleting the pay items that appear on the original sheet.
13. Repeat steps 1 through 12 if a third or subsequent sheets are required.

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.

## Preparing the Excel Document

Once the data is entered and the sheets divided, the tables can be linked to the MicroStation sheet borders.

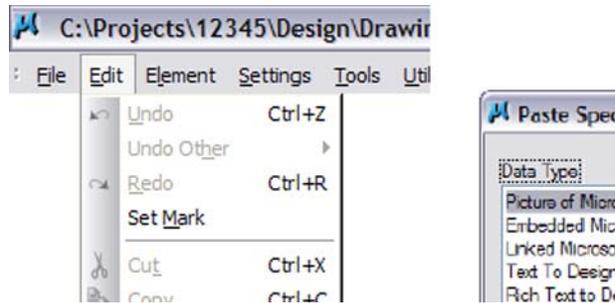
1. Once the data is entered into the tab sheet, **Highlight** the information you would like to link to the MicroStation file and copy to the clipboard by right clicking within the highlighted area and selecting **Copy**.



## Linking Excel Documents

1. Open the MicroStation tabulation file. These files are located in the ...\**Drawings** folder of each specialty group within the project directory.

- From the MicroStation file menu, select **Edit > Paste Special**. In the **Paste Special Dialog Box**, <D> **Linked Microsoft Office Excel 2003 Worksheet** and <D> **Paste**.



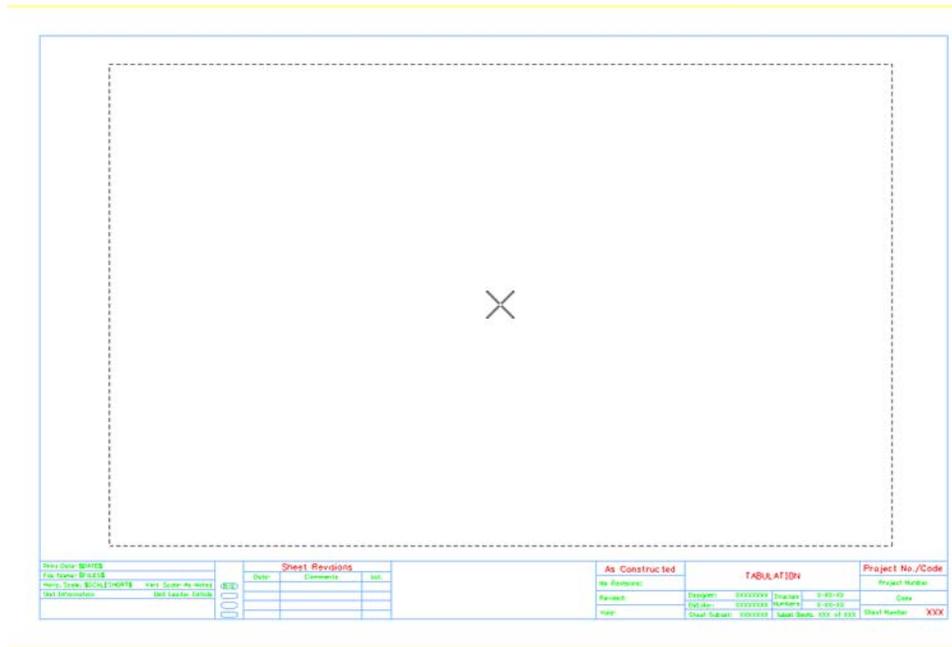
- This brings up the **Paste OLE Object** dialog box. Select **Link** in the **Paste as:** option, **By Size** as the **Method:** and enter a **Scale** of **8.5**.



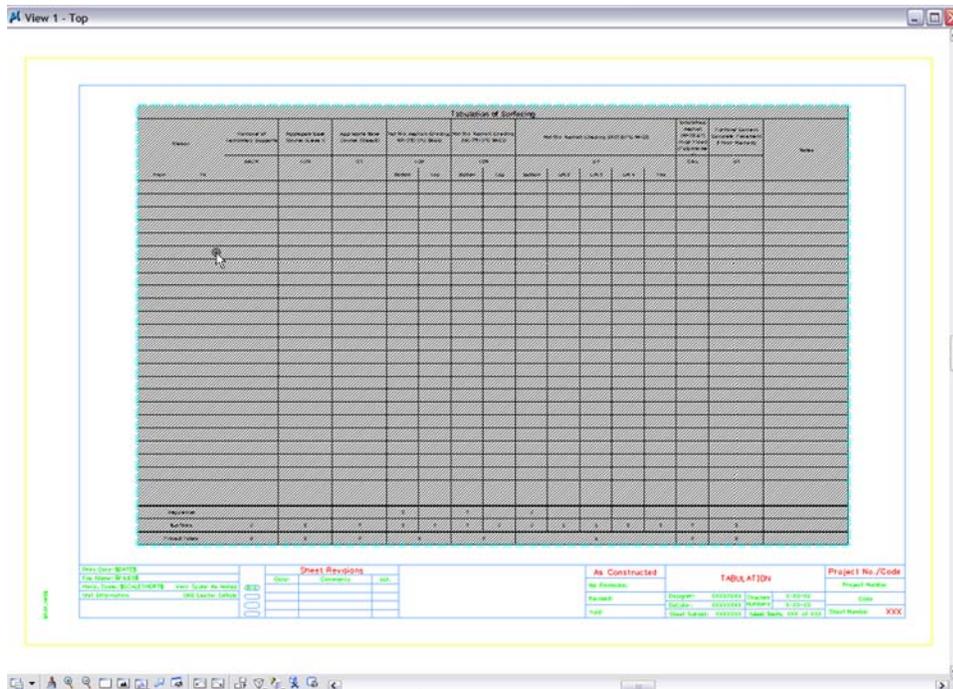
- The Arial font is the default font used in the standard CDOT Excel tab sheet documents. The Arial 10 pt font in Excel is equivalent to CDOT Standard Text (.07”), and the Arial 12 pt font is equivalent to CDOT Title Text (.10”) for a 1”=1’ drawing when the Excel file is placed at a Scale of 8.5 as noted above.

**Note:** To insert a standard spreadsheet into a border that is not at a 1”=1’ scale, multiply the scale of the Border by 8.5 to calculate the scale for the Excel link.

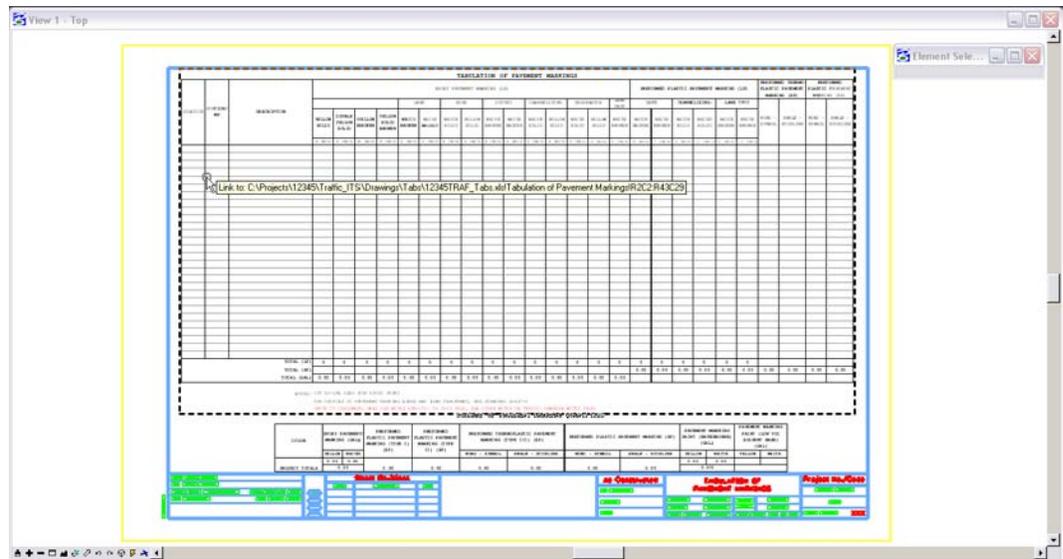
- The limits of the selected Excel data to be placed in the MicroStation sheet will display in the MicroStation Window. Select the origin point for the Excel File and <D> to place the file. The location of the link can easily be adjusted after it is placed.



**Note:** The link will display with hatching which indicates that the Excel file containing the linked data is currently open. If you close out of your Excel file, the hatching will go away.



**Note:** Do not resize the linked window with the handles, as the text size will also resize and will not plot as desired.

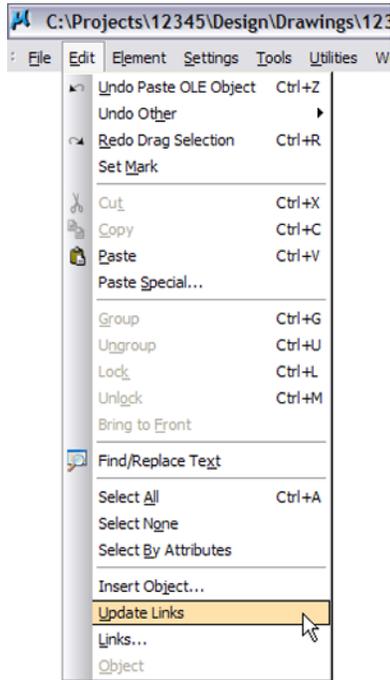


6. Hover over the linked image to display the location of the Excel file.
7. Double click the link to open the Microsoft Excel document. Edit the Excel file, close the file, and the updates will be displayed in the MicroStation file.

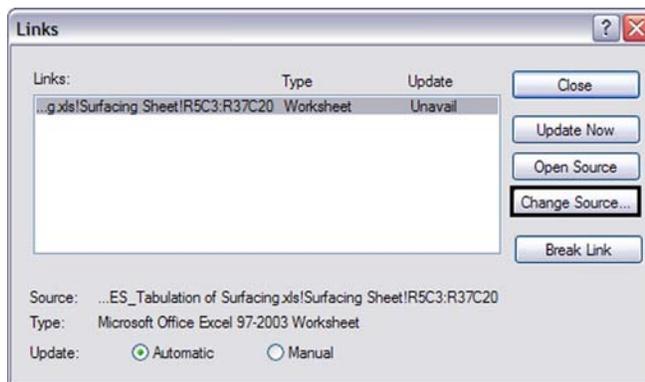
## Updating Document Link Source and Properties

1. If an Excel document has been moved or renamed, you will need to update the existing link. This is also the case for MicroStation files with links that were created with the **Create Project Directory** program. These files are linked to the Excel files in the standard template directory and need to be updated to link to the Excel files in the **Project Directory Structure**.

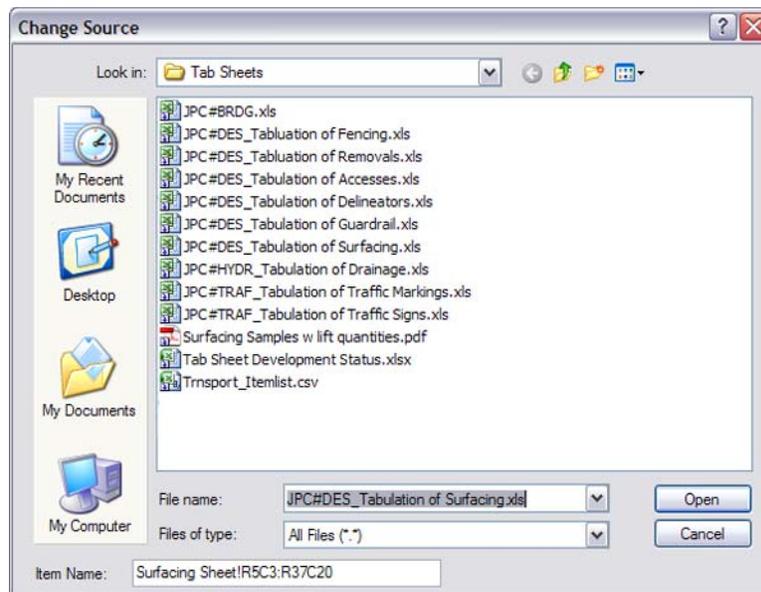
- From the MicroStation menu, select **Edit > Links...**



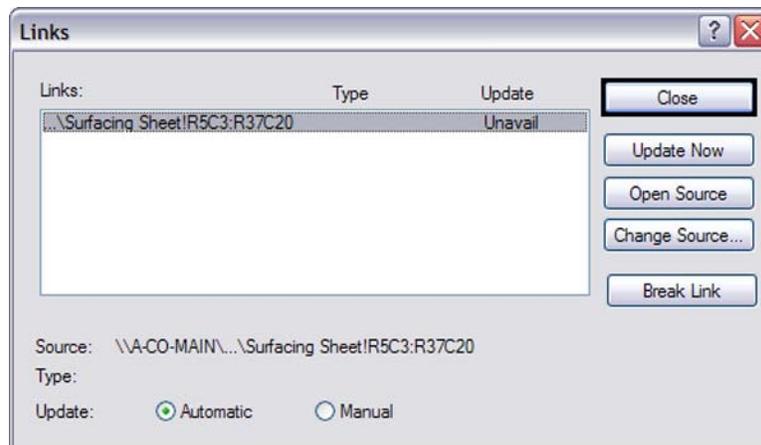
- This will bring up the **Links** dialog box. Select an available document link and **<D> Change Source**.



4. This brings up the **Change Source** dialog box. Navigate to and select the correct Excel file and <D> **Open**.



5. Once a new source is chosen the **Links** dialog box will return. Continue to select additional documents to update the link or <D> **Close** to exit the **Update Links Dialog** box.



**Note:** Select either to have the link update manually or automatically by selecting the method you prefer. If a **Manual** update is chosen, <D> **Update Now** button to update the file manually.

