INTRODUCTION

Purpose

In terms of process automation, Bridge quantity summary charts differ from general summary charts due to their inclusion of sub-totals for abutment, pier, superstructure and general quantities of a given item. To date, bridge designers have used the blank general summary sheet automation to create the desired chart. However, the sheet's underlying programming does not provide any functionality for the additional quantity breakdown columns, incurring a bit more work and responsibility for the user.

The ODOT standard automated spreadsheet ODOT_BR_EstQ.xlsm had been developed to provide the additional capabilities needed for bridge summary charts.

Overview

ODOT provides only one version of the bridge estimated quantities automation. It contains a cell layout such that, upon import into MicroStation via Auto Table using the ODOT standard Auto Table settings, the chart will appear in the fonts and row/column spacing as are typical for our sheet charts.

In that the bridge estimated quantities chart has not, historically, required an entire plan sheet to itself, the user may adjust the number of rows and the column widths of the Excel sheet as needed for the project at hand so long as the limits of the chart remain within the floating border object that is provided with the spreadsheet. The chart borders of the finished table will be the cell-dependent borders as the independent boundary object is set to "not printable".

Requirements

ODOT_BR_EstQ.xlsm was developed in Excel 2007 for use in MicroStation XM or v8i and Cadig's Auto Table version 3.6.9.0 or later. There are certain considerations for Excel 2007, which are discussed in the Caveats section, page 6.

The default fonts, font sizes, and row heights of this standard spreadsheet, like all ODOT standard Excel sheets designed for Auto Table import to MicroStation, require the use of ODOT's standard Auto Table font mapping and options files in order to ensure that the imports translate to the correct ODOT standard MicroStation text styles, symbology and scale.

The programming uses input files for its item listings and category headings. For items, it uses a data file (type *.dat) extracted from the latest Item Master. The headings files are to have the fixed names "headings.lst" and "bheadings.lst". The program expects to find the items and headings files in the ..\ODOTstd\<version standards>\mdl\data\ subdirectory, where version pertains the sub folder for the particular version of MicroStation being used (e.g. XMstd for MicroStation XM, V8istd for MicroStation v8i).

Please note that since the programming for this spreadsheet is not used by any other workbook, it is integral to the workbook; therefore, no add-in is needed.

HOW TO USE IT

Step by Step

Checking the Font Mapping for AutoTable

In MicroStation, select Cadig>AutoTable>Font Map from the main menu bar. The resulting Font Map dialog that appears on your screen should be identical with the graphic below.
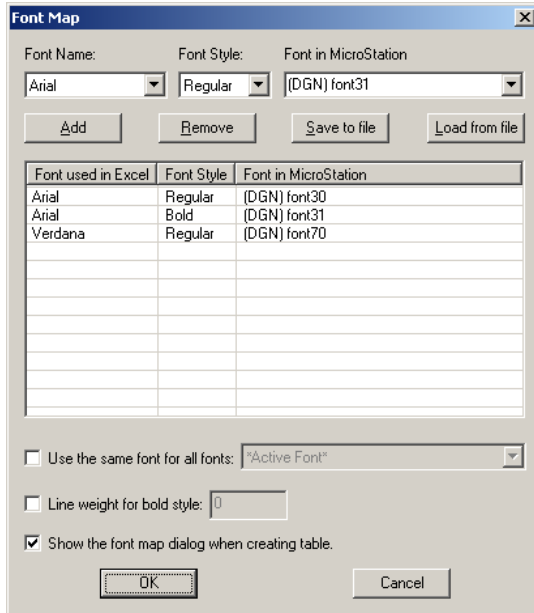
The settings shown are from the ODOT standard font map resource file, ODOT Standard Fonts.afm. If that is not what you see, click on the dialog's "Load from file" button and, in the resulting "Open" window, navigate to ..\ODOTstd\<version standards>\Cadig\AutoTable Standards\ to select ODOT's .afm file.

Running the Automation

Setting Up

Copy file ODOT_BR_EstQ.xlsm to your project directory. Rename it according to available standard conventions (Note: naming guidelines for xls files are not yet formally established – for now, use the CADD naming standards for dgn sheets).

Upon opening, the file should appear as shown in the clip below:
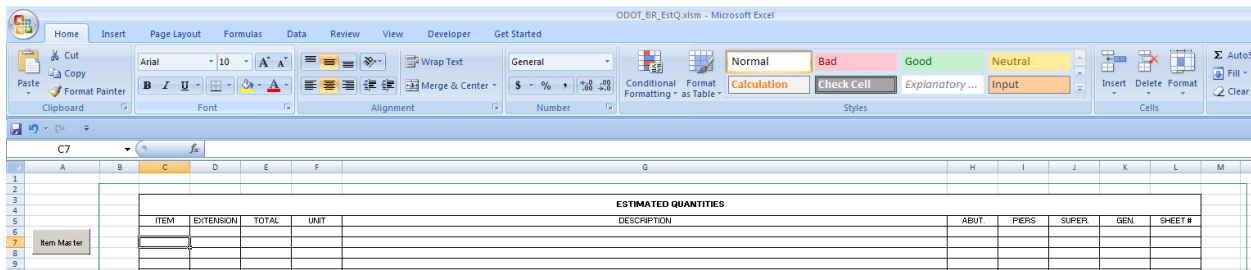
The green line is the cell-independent border that represents the drawing area of a 1:1 scale ODOT plan sheet. The active cell should be in the "ITEM" column, as this is the automation uses the current selected cell as a reference point and assumes that it is always in the item column.

When you are ready to enter headings and items, click on the "Item Master" button, which will activate the program's main interface:
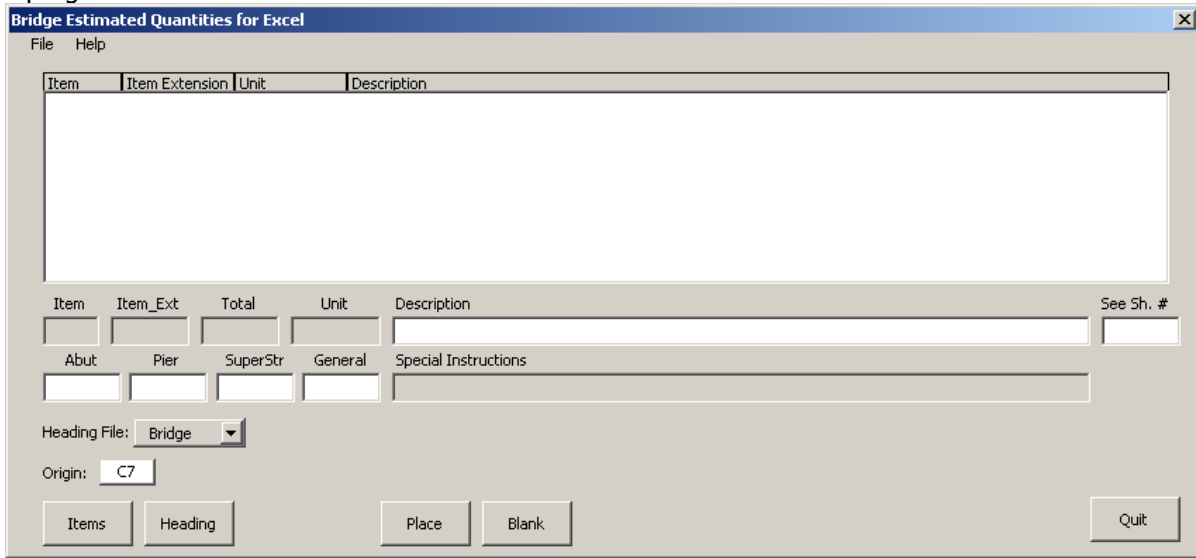

Selecting Items

The program needs to know which items data file it is to use; select File from the form's menu and a Windows file selection dialog will open. Typically, the input files are named EItems*.dat and are found in the ODOTstd\<version standards>\mdlapps\data\ subdirectory, as shown here:
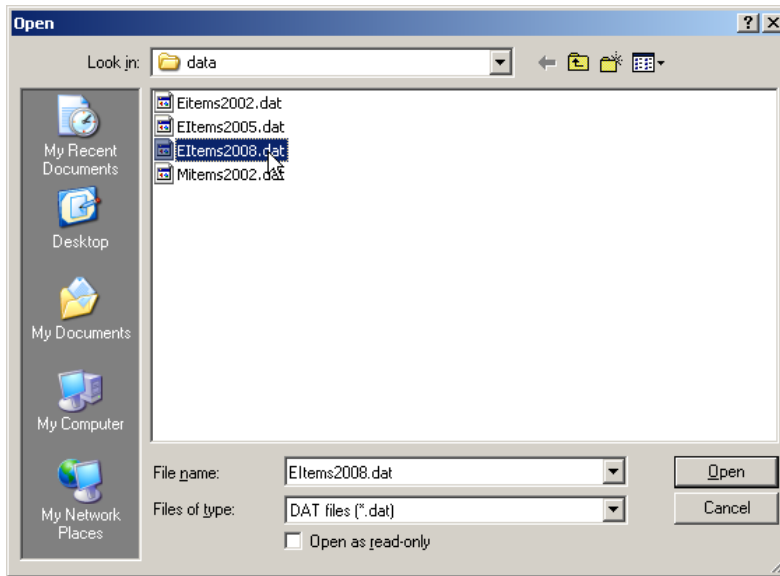
The main list box in the center of the form is not loaded until the user selects a specific Item category. To do this, click on the "Items" button. The Select Item Category dialog box will appear to the upper left of the main interface. Chose the desired category and click on the OK box to load the main form's list box.

Before any information are placed, make sure that the active cell is in the row on which you wish to start placement and that it is also in the "ITEM" column within that row. If it is not so positioned, merely click on the desired cell as shown on the following page.
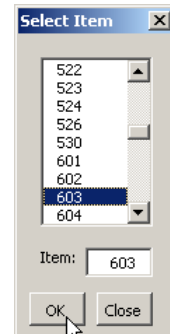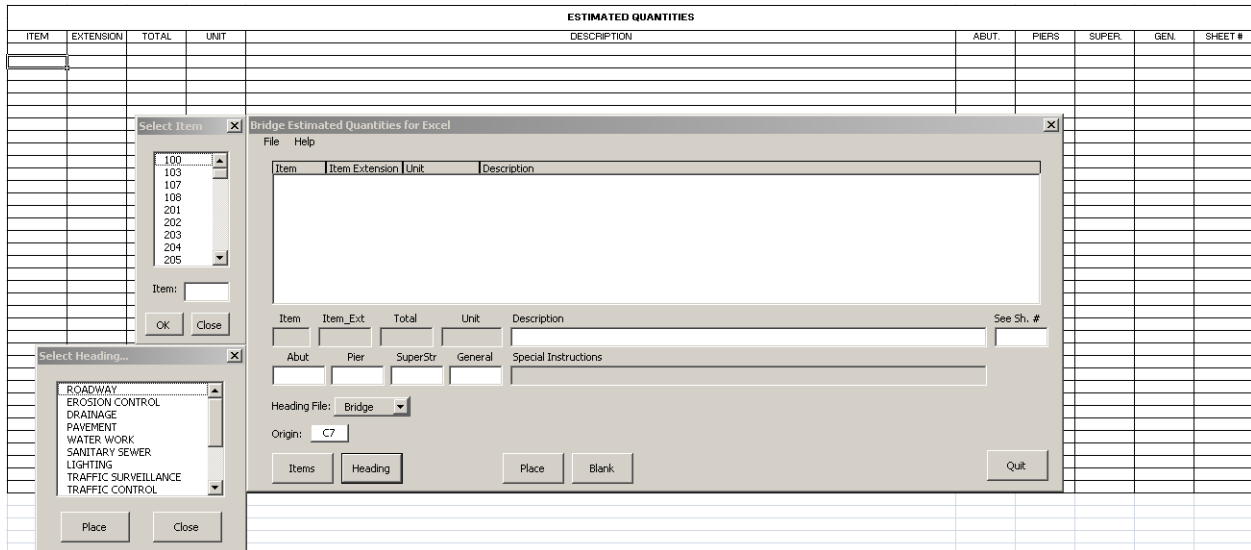
Headings and Blank Lines

Currently, headings are not typically used with bridge item summaries. If you will be using headers in your chart, however, be sure to select the header type from the "Headings File" list box, which is the third item from the bottom of the main form on the left. There are two choices – bridge and general.
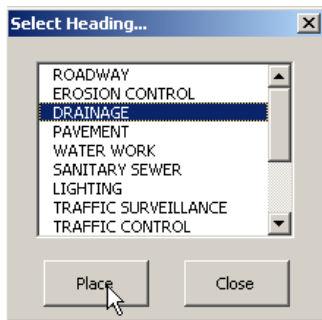

To place a heading, click on the "Heading" button. The Select Heading dialog will appear to the left of the main form, already loaded with the headings appropriate for the "sheet type" indication. In the example to the left, the headings are from the "general" headings file.

Select the desired heading and click the "Place" button. The heading will appear, in bold font and left justified, 4 cells to the right of the origin cell. The origin cell will also advance one row after placement.

To skip a line in the table, click on the "Blank" button.

Hiding or Showing a Subtotal Column

A project may not require all of the quantity breakdown columns. The user may hide/display the unneeded column(s) directly from the main form. Simply right click on the column's associated entry field, then select hide or unhide from the resulting pop-up menu.
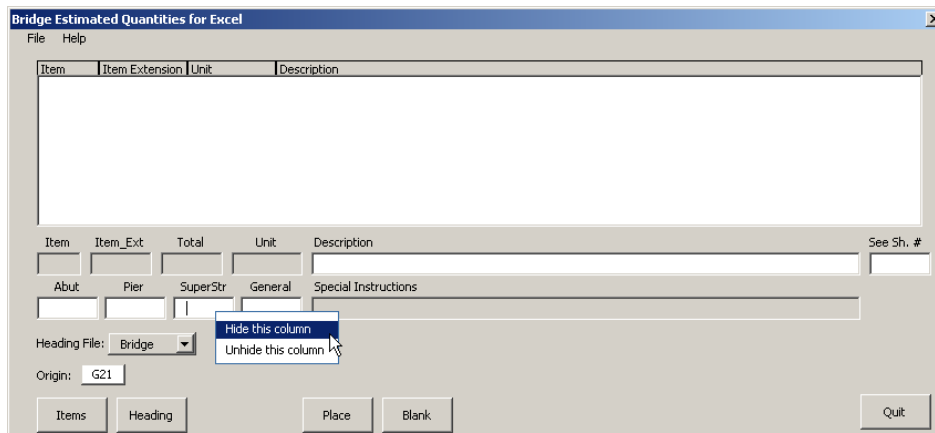
Preparing and Placing an Item

To edit and place an item, click on the item in the main form's list window; the item's information will then appear in the text boxes below the list window. Use the four sub-total boxes to enter the applicable quantity break-downs (the total box is computed for you from these entries), edit the item description as needed, and, optionally, provide a sheet reference number. When you have made your edits, click on the "Place" button to add the item to the spreadsheet. After the text placement, the origin cell value advances one row.

Getting Help

This user document is available during run time by clicking on the "Help" menu item at the upper left of the main form.

Check/Set the Export Options

Before performing the export to MicroStation, be sure to check that the AutoTable options are set to ODOT's custom settings.

For detailed instructions on checking/setting the options, see ODOT's main user guide for Auto table. The short version, however, is as follows:

On the Excel Add-Ins menu tab, select the Auto Table options icon , which will bring up a dialog. Click on the "Templates" button at the lower left of the dialog, and select "Load from File" from the button's drop-down. Select "ODOT AutoTable Options.opt" from the resulting Windows file open dialog to load the ODOT settings into the options dialog. Click on the dialog's OK button to complete the settings.

CAVEATS

Excel Cell Dimensions and Font Sizes

When editing the number and dimensions of the cells in ODOT_BR_EstQ, a mathematical understanding of how the cell sizes are mapped into MicroStation is most useful. A detailed explanation is provided in the ODOT User Guide for AutoTable.

Error Messages

Error messages are issued for the following conditions:

- The Item button is pressed before an input file has been chosen.
- The user attempts to type in the origin cell information.
- The user attempts to place an item, heading or blank line when no origin cell is designated.
- The user has not defined the ODOT standard configuration variable for the version of MicroStation that is being used (e.g. XMstd for XM, V8istd for V8i).

Multiple Sheets

At this time, it is recommended that designers follow the general "one sheet, one file" rule used for MicroStation plan sheets when creating Excel bridge summary sheets.

Program Reference Files and Directories

The programming uses three "reference" files that must exist, and must exist in the same directory paths as Excel VBA found them to be when the referencing was initiated.

The three files and their paths are as follows:

Microsoft Common Dialog Control	c:\WINDOWS\system32\COMDLG32.OCX
Microsoft Internet Controls	c:\WINDOWS\system32\ieframe.dll
Bentley MicroStation DGN 8.9 Object Library	c:\Program Files\Bentley\MicroStation\ustation.exe

These files should exist in the given directories on machines with the ODOT standard Cadd build. For those outside ODOT, the absence of any one of these files will cause VBA to generate a "file not found" error and abort when one attempts to run the program. The error message should contain the name of the missing file.

Typically, it is the OCX or dll file that is not present. The error will also occur if the work station does not have MicroStation or MicroStation is not installed in the above-cited location in the directory.

Working with EXCEL 2007

Make Sure Macros are Enabled...

As the standard workbook itself is a macro enabled Excel file (extension xlsm), there should be no difficulty with getting the programming to run. However, if the working copy is saved as a plain xls file, the user may need to enable macros in order to get the automation to respond to the starting button click.

If the program is not responding to clicking on the "Item Master" button, or you see the title bar message shown below, you will need to enable macros.
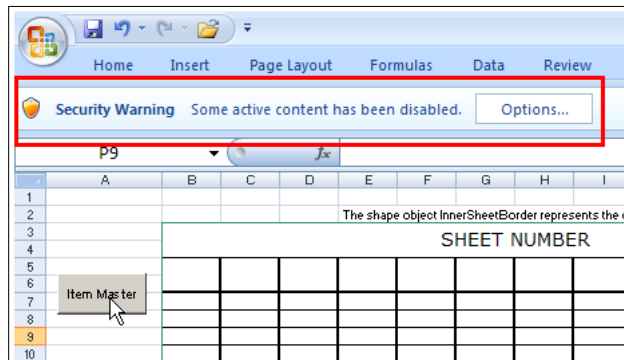
To do so, click on the Options button to the right of the security warning to bring up the Security Options dialog:

If you click on Enable this content, as shown above, and then close the dialog via the OK button, macros will be enabled, but only for this session. In order to enable all macros (and active X) for any and all sessions, you will need to go to the Trust Center, which can be accessed from the link at the lower left of the dialog.

If the program is not responding, but you don't see the security warning, it may be that the Trust Center option that ensures you will get such warnings is not turned on. To check, click the Microsoft Office button, then click on the Excel Options button at the lower right of the Office menu. In the resulting Excel Options dialog, select Trust Center from the left side of the dialog, then click on the Trust Center Settings button which will be mid-way down on the right side of the dialog.

Watch Out for Apparent Sheet Height

Excel 2007 does not necessarily display rows in direct proportion to their height. For example, if you double the row height, what you actually see may be 2.1 times larger. The floating border, however, is

displayed correctly. Therefore, the location of the last row of your chart relative to the floating border may be totally different than how it will appear relative to the bottom of the sheet's inner border once it is imported into MicroStation.

To ensure that your Excel 2007 chart fits within a standard ODOT sheet cell's drawing area, the cumulative row height should be no more than 959.5 points.

Contact Us

If you have any questions, suggestions, or problems please contact the ODOT Office of CADD and Mapping Services CADD Support team or use the following form on the ODOT web site at:

http://www.dot.state.oh.us/Divisions/Engineering/CADDMapping/CADD/Pages/suggestions.aspx