

Section 20 - Cost Planning

The detailed bill of quantities may be presented in a cost plan format, which breaks down the bill into summary construction elements. For example, in the case of buildings this could be cost per square metre of floor area. In civil engineering it could be cost per cubic metre of concrete for bridges. The following methods are available for presenting cost plan data:

- **Macro cost plan** - This utility may be used to create a detailed cost plan, making use of macro worksheets. This method allows subsequent creation of a fully detailed bill of quantities by exploding the macro detail.
- **Page cost per unit cost plan** - This utility may be used to derive costs per unit for ranges of pages and also an average rate. This method relies on the elements of work concerned spanning whole numbers of consecutive pages.


This section of the Candy manual contains the following topics:

- Macro worksheets - Sheet 20.01 to 20.04
- Macro cost plan display - Sheet 20.04 to 20.05
- Macro cost plan report - Sheet 20.05
- Exploding macros - Sheet 20.06
- Page cost per unit definition - Sheet 20.07 to 20.08
- Page cost per unit analysis - Sheet 20.08

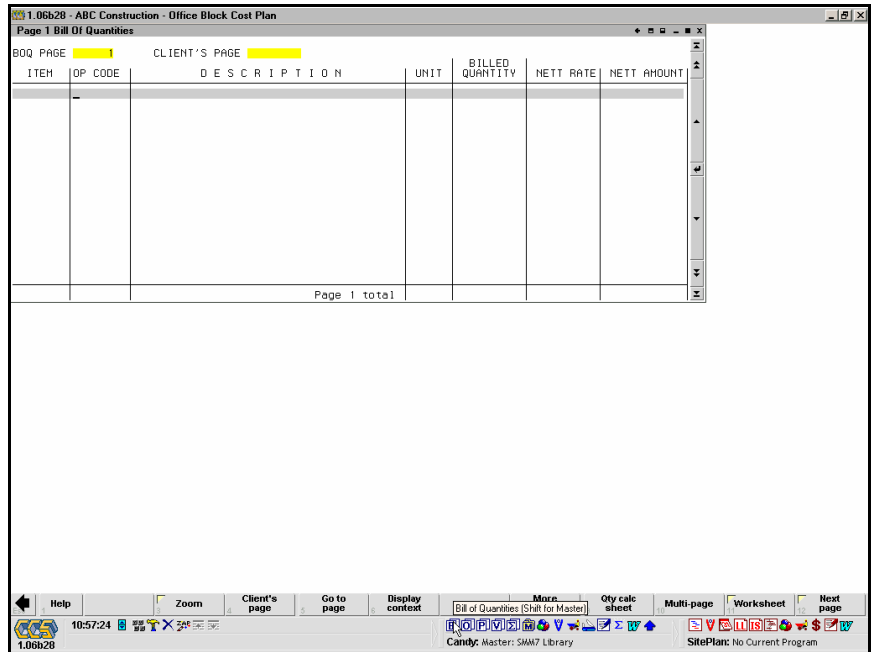
Macro Worksheets

Macro worksheets are normally used to price composite items that involve more than one trade or operation, examples of which are manholes or caissons.

A special use of macro worksheets is to describe a cost plan structure. The example that we are going to use here is an office block. At the highest level the total cost per square metre of floor area is reported, but this may be broken down into construction elements such as substructure, structure and finishes.

Use the  button to display the bill of quantities in your favoured layout.

Note: The setting up of scroller documents is covered in **Candy Manual Section 7 - Scrollers**.

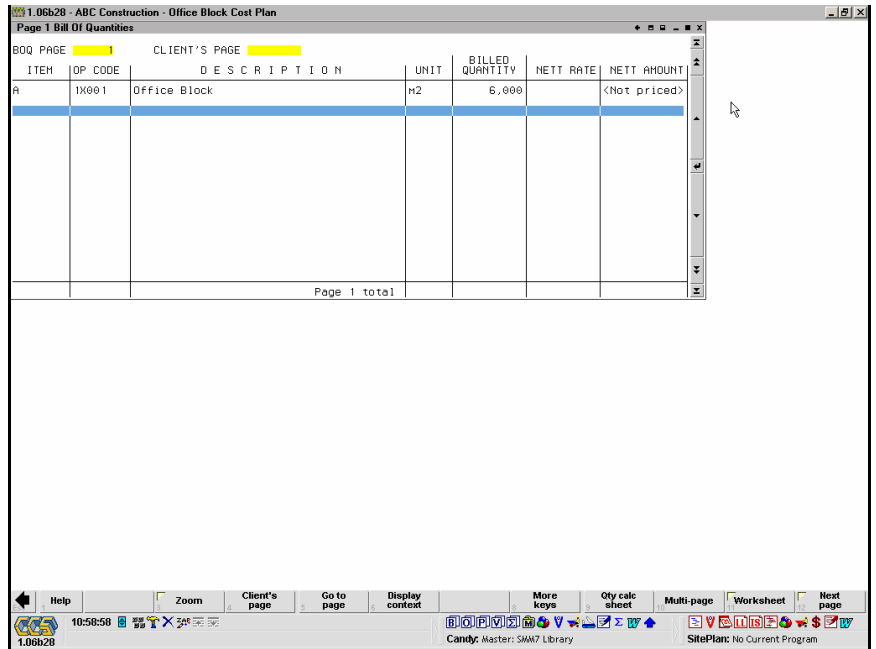


The screenshot shows a software window titled "1.06b28 - ABC Construction - Office Block Cost Plan". The main area displays a "Page 1 Bill Of Quantities" table with the following columns: ITEM, OP CODE, DESCRIPTION, UNIT, BILLED QUANTITY, NETT RATE, and NETT AMOUNT. The table is currently empty. The status bar at the bottom shows the time as 10:57:24 and the file name as 1.06b28.

Create a **Level 1** macro Op Code (1st character 1), with the unit that you want reported at this level and the appropriate quantity, in this case the gross floor area of the example office block.

This page represents the highest level of summary for your office cost plan. You may have more than one entry on this page, for example for separate office blocks within an overall development.

Note: The 2nd character for a macro Op Code must be a valid trade code. In this example the trade code X has been set up specifically for cost plan macro Op Codes.



The screenshot shows the same software window as above, but now the table contains one entry. The entry is highlighted in blue and has the following values: ITEM: A, OP CODE: 1X001, DESCRIPTION: Office Block, UNIT: m2, BILLED QUANTITY: 6,000, NETT RATE: <Not priced>, and NETT AMOUNT: <Not priced>. The status bar at the bottom shows the time as 10:58:58 and the file name as 1.06b28.

Display the worksheet for the macro Op Code either by Double Clicking on the nett rate or by using the **Worksheet** softkey.

The macro worksheet is displayed, on which the next level of breakdown for the office block may be created.

The screenshot displays two windows from a software application. The top window, titled '1.06b28 - ABC Construction - Office Block Cost Plan', shows a 'Page 1 Bill Of Quantities' table. The table has columns for ITEM, OP CODE, DESCRIPTION, UNIT, BILLED QUANTITY, NETT RATE, and NETT AMOUNT. A single row is visible with ITEM 'A', OP CODE '1X001', DESCRIPTION 'Office Block', UNIT 'M2', BILLED QUANTITY '6,000', and NETT AMOUNT '<Not priced>'. The bottom window, titled '1X001 Macro', shows a macro configuration screen for 'Office Block'. It includes a 'Pricing Qty' field set to '6,000,000' and a 'Macro Qty Recalc' field. Below this is a 'Locals Names Formula' section with a table that mirrors the BOM table structure. The software interface includes a menu bar with options like 'Help', 'Variables', 'Zoom', 'Formula', 'Go to macro', 'More keys', 'Pricing qty', 'Display rate', 'Worksheet', and 'Next macro'. The system tray at the bottom shows the time '11:03:25', the user 'Candy', and the program 'SitePlan: No Current Program'.

Create the required **Level 2** macro Op Codes (1st character 2), with the unit that you want reported at this level and the appropriate quantity, in this case the gross floor area of the example office block.

If you are calculating the total cost for each of these elements, which we are in this example, the pricing quantity must be used in order to calculate the correct unit rate for the macro worksheet.

In this case entering the gross floor area in the pricing quantity would calculate a cost per m2 for each element on this worksheet.

*Note: All of the mechanisms that are available for creating Op Codes and copying Op Codes from a master job are available on a macro worksheet. Refer to **Candy Manual Section 2 - Bill Creation** for more information.*

The screenshot shows the Candy software interface. The main window displays a 'Page 1 Bill Of Materials' table with the following data:

ITEM	OP CODE	DESCRIPTION	UNIT	BILLED QUANTITY	NETT RATE	NETT AMOUNT
A	1X001	Office Block	m2	6,000		<Not priced>

Below the BOM table, a '1X001 Macro' window is open, showing a table of sub-elements:

ITEM	OP CODE	DESCRIPTION	UNIT	QUANTITY	NETT RATE	NETT AMOUNT
A	2X001	Demolition	m2	6,000		<Not priced>
B	2X002	Asbestos Removal	m2	6,000		<Not priced>
C	2X003	Substructure	m2	6,000		<Not priced>
D	2X004	Superstructure	m2	6,000		<Not priced>
E	2X005	Finishes	m2	6,000		<Not priced>
F	2X006	Furniture & Fittings	m2	6,000		<Not priced>
G	2X007	Services	m2	6,000		<Not priced>

The process is continued using subsequent macro Op Codes level 3, 4 etc. until the required level of breakdown is described for each construction element.

Where appropriate, the correct unit and quantity should be used for a construction element, which can be different to the gross floor area of the office.

Note: You do not need to use level 1 macro Op Codes on the bill page, but the level at which you start determines the number of subsequent levels you may use.

The screenshot shows the Candy software interface with the BOM table and two macro worksheets. The BOM table is the same as in the previous screenshot. The '1X001 Macro' window shows the sub-elements table. The '2X003 Macro' window shows a table of sub-elements for 'Substructure':

ITEM	OP CODE	DESCRIPTION	UNIT	QUANTITY	NETT RATE	NETT AMOUNT
A	3X001	Site Preparation	m2	10,000		<Not priced>
B	3X002	Foundations	m2	2,500		<Not priced>

Quantity Calculation

The quantities that are used on macro worksheets may be entered manually or calculated using either a formula or a quantity calculation sheet.

With the cursor on an item, notice the blue fields and the blue line in the top part of the worksheet.

In the blue fields up to eight parameters or variables can be entered.

On the blue line, a formula can be entered which uses the defined variables to calculate a quantity.

The formula displayed on the blue line only applies to the item on which the cursor is currently positioned.

ITEM	OP CODE	DESCRIPTION	UNIT	QUANTITY	NETT RATE	NETT AMOUNT
A	3X001	Site Preparation	M2	10,000	<Not priced>	
B	3X002	Foundations	M2	2,500.00	<Not priced>	

A quantity calculation sheet is available for each quantity on a macro worksheet.

Double Click on a quantity to display its calculation sheet.

An example of a build up of a quantity is shown here.

Use the **Store** softkey to save a quantity calculation sheet.

LINE	CALCULATION	FACTOR	x	RESULT	REMARKS	LOCATION
1	50 Building Width x 50 Building Breadth			2,500.00	Building Footprint	
2	100 Carpark Width x 50 Carpark Breadth			5,000.00	Carpark Area	
3	10 x 50			500.00	Landscape Area 1	
4	10 x 50			500.00	Landscape Area 2	
5	10 x 100			1,000.00	Landscape Area 3	
6	10 x 50			500.00	Landscape Area 4	
TOTAL				10,000.00	2 Decimals	

Global Variables

The calculated quantities on a macro worksheet are specific to that worksheet. If something changes, which affects a quantity calculation, you might have to check and alter every calculation.

You can set up **Global Variables** for certain key parameters in your cost plan. These global variables can then be used in the quantity calculation on macro worksheets.

In this example the quantity is calculated from a formula, which uses a global variable.

Note: Refer to **Candy Manual Section 1 - Candy Basics** for more information about global variables.

CODE	DESCRIPTION	UNIT	VALUE	FORMULA
BFP	Building Footprint	M2	2500	
CA	Carpark Area	M2	5000	
GFA	Gross Floor Area	M2	5000	
LA	Landscape Area	M2	2500	
SA	Site Area	M2	10000	

ITEM	OP CODE	DESCRIPTION	UNIT	QUANTITY	NETT RATE	NETT AMOUNT
A	3X001	Site Preparation	m2	10,000	<Not priced>	
B	3X002	Foundations	m2	2,500.00	<Not priced>	

In this example the quantity is calculated from a quantity calculation sheet, which uses several global variables.

Note: A global variable may also be used in the **Pricing Quantity** field, which divides the total value of a macro worksheet to derive a unit rate.

CODE	DESCRIPTION	UNIT	VALUE	FORMULA
BFP	Building Footprint	M2	2500	
CA	Carpark Area	M2	5000	
GFA	Gross Floor Area	M2	5000	
LA	Landscape Area	M2	2500	
SA	Site Area	M2	10000	

LINE	CALCULATION	FACTOR	x	RESULT	REMARKS	LOCATION
1	[BFP]			2,500.00	Building Footprint	
2	[CA]			5,000.00	Carpark Area	
3	[LA]			2,500.00	Landscape Area	
TOTAL				10,000.00	2 Decimals	

ITEM	OP CODE	DESCRIPTION	UNIT	QUANTITY	NETT RATE	NETT AMOUNT
A	3X001	Site Preparation	m2	10,000	<Not priced>	
B	3X002	Foundations	m2	2,500.00	<Not priced>	

Include Macro Bill In Cost Plan

You may mark any macro worksheet for inclusion in a macro cost plan.

On the macro worksheet, use the **More Keys** softkey followed by the **Provisional Mark** softkey Shifted.

Notice that the word **Cost Plan** is now displayed in the top left corner of the worksheet heading.

*Note: The **Provisional Mark** softkey Shifted removes the cost plan marker. Any macro item on a bill page or on a macro worksheet, which has had its worksheet marked for inclusion in a cost plan, is displayed in green text.*

ITEM	OP CODE	DESCRIPTION	UNIT	BILLED QUANTITY	NETT RATE	NETT AMOUNT
A	1X001	Block 1	m2	6,000	1,488.87	8,453,220.00

ITEM	OP CODE	DESCRIPTION	UNIT	QUANTITY	NETT RATE	NETT AMOUNT
B	2X001	Demolition	m2	6,000	35.97	215,820.00
B	2X002	Asbestos removal	m2	6,000	16.67	100,020.00
C	2X003	Substructure	m2	6,000	75.41	452,460.00
D	2X004	Superstructure	m2	6,000	664.99	3,989,940.00
E	2X005	Finishes	m2	6,000	390.83	2,344,980.00
F	2X006	Furniture & fittings	m2	6,000	50.00	300,000.00
G	2X007	Services	m2	6,000	175.00	1,050,000.00

Macro Cost Plan Display

An analysis for the macro cost plan may be calculated and viewed on the screen prior to reporting.

From the **CCS Menu** follow the path **Candy System** to **Estimating** to **Finalisation** to **Cost Plan** and select **Macro Cost Plan Display**.

Menu Stack 6999 x

- Job Manager
- Main Menu
- Candy System Menu
- Estimating Menu
- Finalisation Menu
- Cost Plan Menu
- Page Cost Per Unit
- Page Cost Per Unit Analysis
- Macro Cost Plan Display**
- Macro Cost Plan Report

An analysis for the macro cost plan may be calculated and viewed on the screen prior to reporting.

The macro cost plan document calculates and presents an analysis for the macro cost plan on the screen prior to reporting. The following fields are displayed:

Bill Information

- **Item** - The item number for an element in either the bill or a macro bill.
- **Op Code** - The Op Code for an element in either the bill or a macro bill.
- **Description** - The Op Code description for an element in either the bill or a macro bill.
- **Unit** - The Op Code unit for the highest level of macro in each element in either the bill or a macro bill.

Gross Floor Area

- **Quantity** - The billed quantity that is used on the bill page, for the highest level of macro in each chain, which is used to calculate the rate per unit for the

CODE	DESCRIPTION	UNIT	GROSS FLOOR QUANTITY	AREA RATE	AMOUNT
X001	Block 1	m2	6,000	1,488.87	8,453,220.00
X001	Demolition	m2	6,000	35.97	215,820.00
X002	Asbestos removal	m2	6,000	16.67	100,020.00
X003	Substructure	m2	6,000	75.41	452,460.00
X001	Site preparation	m2	6,000	131,600.00	789,600.00
X002	Foundations	m2	6,000	53.48	320,875.00
X004	Superstructure	m2	6,000	664.99	3,989,940.00
X005	Finishes	m2	6,000	390.83	2,344,980.00
X006	Furniture & fittings	m2	6,000	50.00	300,000.00
X007	Services	m2	6,000	175.00	1,050,000.00
BILL TOTAL					8,453,220.00

section of work.

- **Rate** - The calculated nett rate for each section of work, which is calculated by dividing the Quantity into the Amount for each section.
- **Amount** - The calculated nett amount for each section of work is displayed in this set of fields. As each section steps down a level, its value is displayed in a separate column.

Element

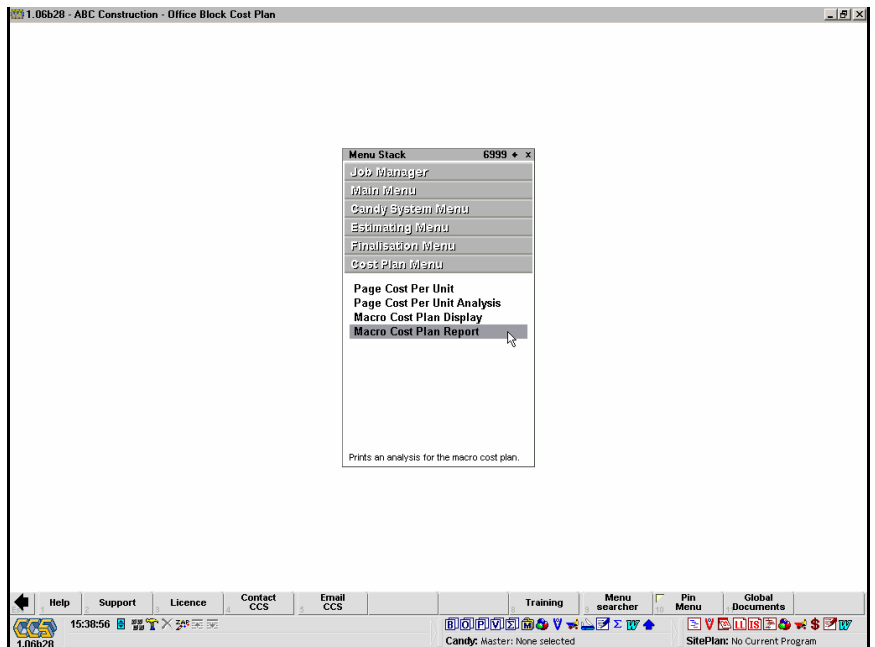
- **Unit** - The Op Code unit that is used on the macro bill page for each element.
- **Quantity** - The quantity that is used on the macro bill page for each element, which is used to calculate the rate per unit for each element.
- **Rate** - The calculated nett rate for each element, which is calculated by dividing the Element Quantity into the Element Amount for each element.
- **Amount** - The calculated nett amount for each element.

UNIT	GROSS FLOOR QUANTITY	AREA	RATE	AMOUNT	ELEMENT UNIT	QUANTITY	RATE	AMOUNT
M2	5,000	1,408.87		215,820.00	M2	5,000	35.97	215,820.00
M2	5,000	35.97		100,020.00	M2	5,000	15.57	100,020.00
M2	5,000	15.57		452,460.00	M2	5,000	75.41	452,460.00
M2	5,000	21,353		131,000.00	M2	10,000	13.10	131,000.00
M2	5,000	53.48		320,875.00	M2	2,500	128.35	320,875.00
M2	5,000	654.39		3,989,940.00	M2	5,000	654.39	3,989,940.00
M2	5,000	390.83		2,344,380.00	M2	5,000	390.83	2,344,380.00
M2	5,000	50.00		300,000.00	M2	5,000	50.00	300,000.00
M2	5,000	175.00		1,050,000.00	M2	5,000	175.00	1,050,000.00
				8,453,220.00				


Macro Cost Plan Report

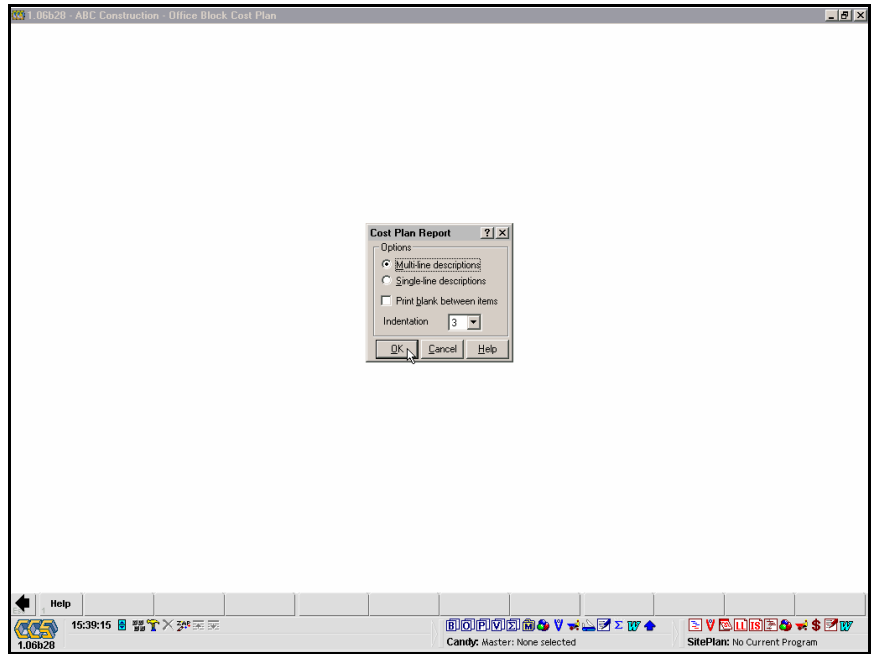
This report prints an analysis for the macro cost plan.

From the **CCS Menu** follow the path **Candy System** to **Estimating** to **Finalisation** to **Cost Plan** and select **Macro Cost Plan Report**.



The macro cost plan report selector is displayed, on which various options are available.

- **Multi-line descriptions** - Prints full, multiple line descriptions. Use this option for external or presentation reporting.
- **Single-line descriptions** - Prints only the first line of multiple line descriptions. Use this option for internal or draft reporting.
- **Print blank between items** - Prints a blank line between each cost plan description.
- **Indentation** - Use the  button to select the required level of indentation for the cost plan report. For example, if you select level 3, then amounts from the 3rd highest, 2nd highest, and highest levels of macro are printed in separate columns. Amounts for the 4th highest down are printed in one column.

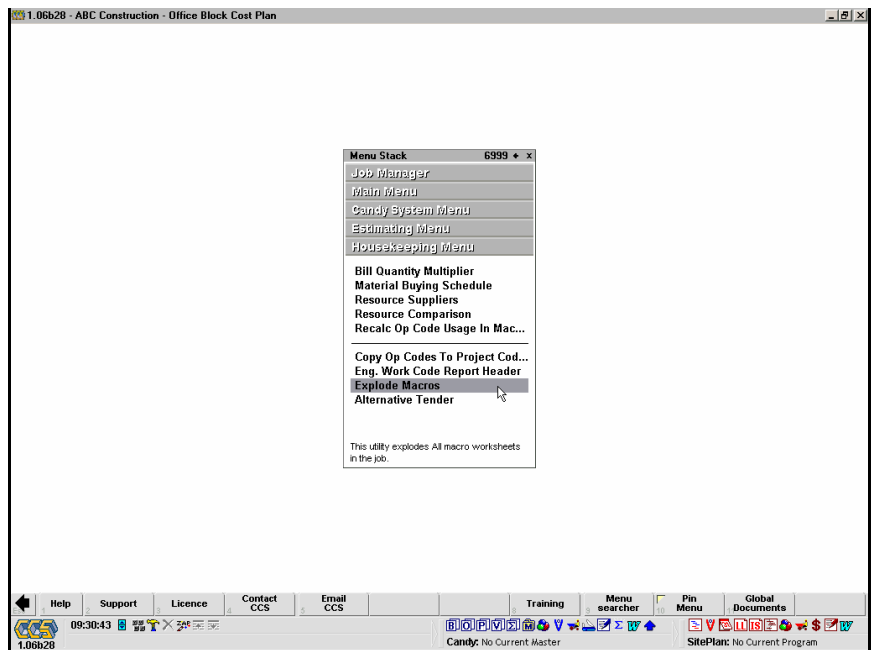


Exploding Macros

At some point you may wish to convert your cost plan into a fully detailed bill of quantities.

There is a utility that explodes **All** macro worksheets in the job.

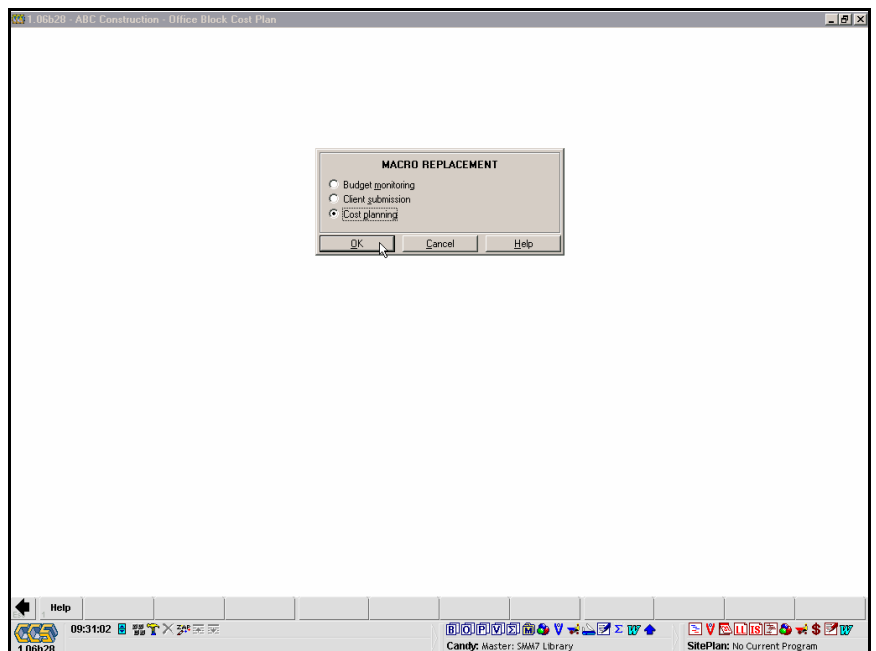
From the **CCS Menu** follow the path **Candy System** to **Estimating** to **Housekeeping** and select **Explode Macros**.



The macro replacement selector is displayed, on which the following options are available:

- **Budget monitoring** - Select this option to replace All macros in the bill, using options A2; B1; C1; D1; E1; F1 and G2 from the table below.
- **Client submission** - Select this option to replace All macros in the bill, using options A3; B1; C1; D1; E3; F1 and G2 from the table below.
- **Cost planning** - Select this option to replace All macros in the bill, using options A1; B2; C2; D2; E2; F2 and G1 from the table below.

Note: No worksheets are altered or deleted by this process, however, it is recommended that you take a copy or backup of your job before proceeding.



		1	2	3
A	Convert bill macro	Comment	Simple marked included	Delete
B	Macros within macro	Delete	Convert to heading	Convert to Simple marked included
C	Simples within macro	Recode	Retain previous code	Recode each code unique
D	Consolidate quantity within a macro	Yes	No	
E	Selling rates	Copy selling rate to macro replacement	No change	Calculate selling rate for new Op codes to retain
F	Op Code order	Sort into trade	Retain original order	
G	Header within macro	Retain		Delete

Page Cost Per Unit Cost Plan

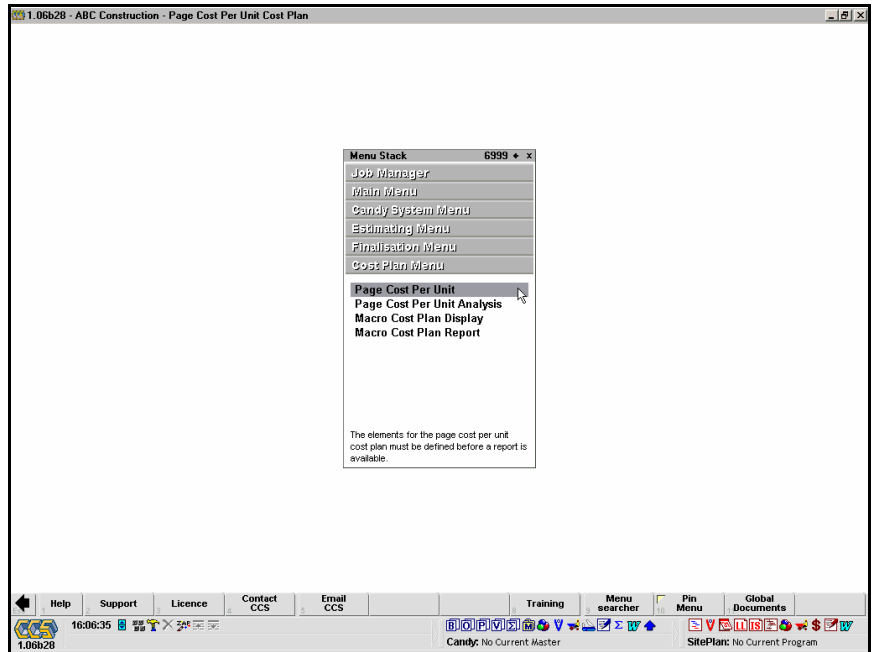
This utility may be used to derive costs per unit for ranges of pages and also an average rate.

For example, in the case of buildings this could be cost per square metre of floor area. In civil engineering it could be cost per cubic metre of concrete for bridges.

The elements for the page cost per unit cost plan must be defined before a report is available.

From the **CCS Menu** follow the path **Candy System** to **Estimating** to **Finalisation** to **Cost Plan** and select **Page Cost Per Unit**.

Note: This method relies on the items of work concerned spanning whole numbers of consecutive pages.



The cost per unit definitions document is displayed, on which the following fields are available:

- **Page** - The last CCS page of a section of work for which a unit rate is required is entered in this column.
- **Description** - A 40 character field to name the section of work.
- **Unit** - A six character field to define the unit for the section of work.
- **Qty** - A six digit field to enter the quantity to be used to calculate the rate per unit for the section of work.
- **Unit2** - A six character field to define the unit for an alternative quantity for the section of work.
- **Qty2** - A six digit field to enter an alternative quantity to calculate the rate per unit. This quantity does not produce a bottom line total.

The screenshot shows a table titled 'Cost Per Unit Definitions' with the following columns: PAGE, DESCRIPTION, UNIT, QTY, UNIT, and QTY2. The table is currently empty.

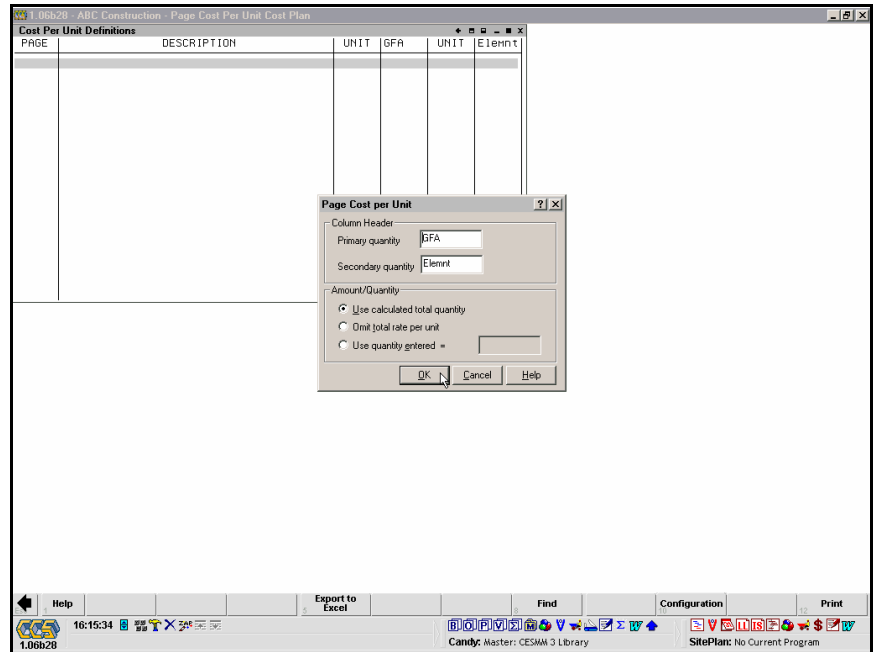
PAGE	DESCRIPTION	UNIT	QTY	UNIT	QTY2

Use the **Configuration** softkey to display the Page Cost Per Unit selector.

On this selector the column headers for **Qty** and **Qty2** may be defined. Clearing these fields displays the default column headers.

The following options are available:

- **Use calculated total quantity** - Select this option to use the sum of the primary and secondary quantities for calculation of the overall rate/unit.
- **Omit total rate per unit** - Select this option to not print a total rate/unit at the bottom of the report.
- **Use quantity entered** - Select this option to use the quantity entered in the field provided for calculation of the overall rate/unit.



Consider a bill of quantities comprising three sections, a preliminary section followed by two structures.

- Preliminaries - pages 1 to 2
- Ventilation shaft - pages 3 to 6
- Sub station - pages 7 to 10

Enter the information as in this example.

Note: Sections for which no total is required must be entered and the quantity left blank.

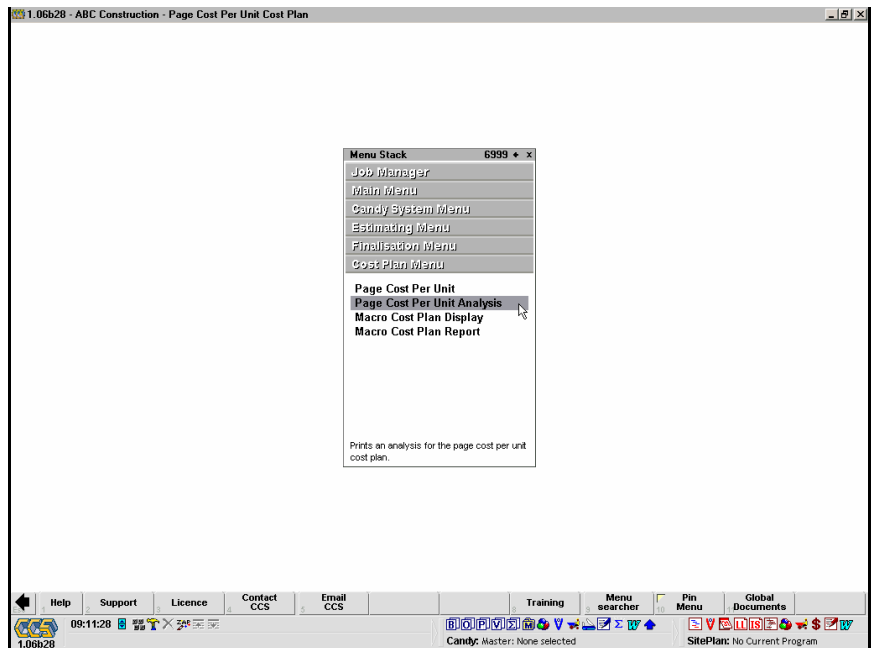
Entering a zero quantity does not calculate a rate for that section but the total monetary value is included in the overall total and therefore affects the average rate.

PAGE	DESCRIPTION	UNIT	GFA	UNIT	E
2	Preliminaries				
6	Ventilation Shaft	M2	1200	No	2
10	Sub Station	M2	2600	No	1


Page Cost Per Unit Analysis

This report prints an analysis for the page cost per unit cost plan.

From the **CCS Menu** follow the path **Candy System** to **Estimating** to **Finalisation** to **Cost Plan** and select **Page Cost Per Unit Analysis**.



The rate selector is displayed, on which any one of the Nett, Gross or Selling rate must be specified on which to base the calculation.

Select the required rate and use the  button to display the printing sheet, from which the report may be printed, previewed or exported.

