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CONTENTS

List of Figures	vi
Introduction	ix

PART ONE - THE MODELS MODULE

Chapter 1: Modeling Basics1-1

1.1 The Two Kinds of Modeling	1-2
1.2 Quantity Link Functions	1-4
1.3 Parameter Worksheets	1-7
1.4 The Models Database	1-9
1.5 Working With the ASM94A Assemblies Database	1-10
1.6 The Civil Works Assemblies Database (CWSA92)	1-11
1.7 The Link Listing Report	1-15

Chapter 2: Working With Facility Models 2-1

2.1 Copying a Model Into the Project	2-3
2.2 Facility Quantities, Parameters, and Formulas	2-7
2.3 Adjusting Quantities	2-10
2.4 Editing Parameters	2-12
2.5 Model Input Values.....	2-19
2.6 Item Selection	2-22
2.7 Modifying the Facility	2-30
2.8 Linking Quantities	2-32
2.9 Adding Parameters	2-38
2.10 Linking Whole Elements	2-42
2.11 Modeling Sitework.....	2-45

Chapter 3: Working With Task Models 3-1

3.1 Defining the Task.....	3-4
3.2 Entering Titles and Cost Items	3-5
3.3 Building the Parameter Worksheets	3-7
3.4 Linking Quantities	3-18
3.5 Analyzing Alternatives	3-19

Chapter 4: The Models Database 4-1

4.1 Structure of the MODEL1 Database	4-3
4.2 How Quantities Are Linked	4-6
4.3 Adding Models	4-16
4.4 Editing and Deleting	4-24
4.5 Working With Multiple Databases	4-22

Chapter 5: The Link Listing Report 5-1

PART TWO - THE DIGITIZER MODULE

Chapter 6: Digitizer Preparation	6-1
6.1 About the Digitizer Module	6-1
6.2 Establishing User Settings	6-4
6.3 Configuring GOLD for the Digitizer	6-6
6.4 Standard Setup Tables	6-14
6.5 Setting Up the Menu Card	6-24
Chapter 7: Using the Digitizer Module	7-1
7.1 Activating the Digitizer.....	7-1
7.2 Digitizer Screen	7-3
7.3 Resetting the Menu Card	7-6
7.4 Setting the Scale	7-8
7.5 Working With the Digitizer	7-9
7.6 Using the Calculator	7-14
7.7 Working With an Audit Trail	7-17

PART THREE - TOOLS

Chapter 8: 2nd View	8-1
8.1 Setting the Breakdown Structure	8-3
8.2 Selecting 2nd View Columns	8-7
8.3 Creating 2nd View Reports	8-12
8.4 Working With 2nd View in the Project	8-15
8.5 Setting 2nd View Exceptions	8-19
Chapter 9: Material and Vendor Backup	9-1
9.1 Working With Material Backup in the UPB	9-3
9.2 Working With Material Backup in the Project	9-8
9.3 Working With Vendor Records	9-11
9.4 Update UPB From Vendor Backup Utility	9-16
9.5 Material and Vendor Backup Reports	9-17
Chapter 10: Historical Cost Analysis System (HCAS)	10-1
10.1 Working with HCAS Capabilities	10-1
10.2 Running the HCAS Summary Report.....	10-4
Chapter 11: Database Utilities.....	11-1
11.1 Merge Two Databases	11-3
11.2 Extract From Database	11-8
11.3 Compare Two Databases	11-11

11.4 Update UPB With Material Indicators	11-15
Chapter 12: Restructure UPB Functions.....	12-1
12.1 Promote Title - Alt+T Keys	12-2
12.2 Demote Title - Alt+D Keys	12-5
12.3 Move - Alt+F4 Keys	12-6
12.4 Renumbering UPB Items	12-7
PART FOUR - THE MCACES MENU	
Chapter 13: Converting From CACES and MCACES.....	13-1
13.1 Import From CACES ASCII	13-2
13.2 Translate from M-CACES / PLUS	13-3
Chapter 14: Converting to MasterFormat 88.....	14-1
14.1 Converting UPB Items in Other Databases	14-2
14.2 Copying User-Created Items	14-4
Chapter 15: ENG3086 Interface.....	15-1
15.1 Starting an ENG3086 Project	15-4
15.2 ENG3086 Preparer Information	15-8
15.3 ENG3086 Design Information	15-11
15.4 Working With an ENG3086 Project	15-15
15.5 Using 2nd View for an ENG3086 Project	15-20
15.6 Print an ENG3086 Report.....	15-23
15.7 Export to ENG3086 Format.....	15-24
Appendix: ARA Capabilities	A-1
Index	Index-1

LIST OF FIGURES

PART ONE - THE MODELS MODULE

1.1 Link Quantity Window	1-4
1.2 Window Showing Reference Types	1-6
1.3 Parameter Worksheet.....	1-7
1.4 CWSA92 Civil Works Assemblies Level 1 Titles List Screen	1-11
2.1 Title Entry Screen, Project Database	2-5
2.2 Sample Parameter Worksheet	2-8
2.3 Parameter Worksheet With Formula	2-8
2.4 Sample Parameter Worksheet	2-12
2.5 Model Input Values Worksheet.....	2-19
2.6 Model Input Values and Parameter Worksheets.....	2-20
2.7 Sample Parameter Worksheet for Item Selection	2-23
2.8 Sample Worksheet with Item Selection and Quantity Definition	2-26
2.9 Sample Worksheet With Multiple-Criteria Item Selection	2-27
2.10 Item Selection Combined with Model Input Values	2-28
2.11 Link Quantity Window	2-32
2.12 Blank Parameter Worksheet	2-39
3.1 Title Entry Screen, Excavation by Dragline	3-5
3.2 Detail List Screen With Excavation Items	3-6
3.3 EXDUR Worksheet	3-8
3.4 DRLPRO Worksheet	3-9
3.5 DRLPAY Worksheet	3-10
3.6 SHRSWL Worksheet	3-10
3.7 DRACYC Worksheet	3-11
3.8 TRKHRS Worksheet	3-12
3.9 NTRUCK Worksheet	3-12
3.10 TRKCYC Worksheet	3-13
3.11 TLOADT Worksheet	3-14
3.12 TRKPAY Worksheet	3-14
3.13 TRKCAP Worksheet	3-15
3.14 TLOADF Worksheet	3-16
3.15 HAULD Worksheet	3-16
3.16 DUMPTI Worksheet	3-17
4.1 Parameter Worksheet With Single Item	4-8
4.2 Link Quantity Window for a Facility Title	4-11
4.3 Link Quantity Window for System Title	4-11
4.4 Link Quantity Window For Subsystem Title	4-12
4.5 Link Quantity Window For Assembly Title	4-14
4.6 Link Quantity Window For Detail Item	4-15
4.7 Models Database Edit Screen	4-23
5.1 Link Listing Report Example 1	5-2
5.2 Link Listing Report Example 2.....	5-3

PART TWO - THE DIGITIZER MODULE

6.1 User/Administrator Settings Screen	6-4
6.2 Edit Digitizer Setup Screen	6-7
7.1 Digitizer Screen	7-3
7.2 Parameter Worksheet in Audit Trail.....	7-18

PART THREE - TOOLS

8.1 Project Breakdown Screen	8-3
8.2 Select 2nd View Columns Screen	8-7
8.3 2nd View Title Entry Screen	8-16
8.4 2nd View Exceptions Screen.....	8-20
9.1 Material Pricing Backup Screen, Unit Price Database	9-3
9.2 Vendor Screen	9-11
9.3 Update UPB From Vendor Backup Window	9-17
9.4 List Material Backup/Vendor Screen	9-19
9.5 Sample Material Backup Report (Portion)	9-22
9.6 Sample Vendor Report (Portion)	9-23
10.1 Entry of Project Award Amount (Edit HCAS)	10-2
10.2 Entry of Title Level Data	10-3
11.1 Utilities Menu	11-1
11.2 Merge Two Databases Screen	11-4
11.3 Extract From Database Screen	11-8
11.4 Compare Two Databases Screen	11-11
11.5 Update UPB w/Material Indicators Window	11-15

PART FOUR - THE MCACES MENU

13.1 MCACES Menu	13-1
15.1 ENG3086 Preparer Information Screen	15-8
15.2 ENG3086 Design Information Screen	15-11

INTRODUCTION

About GOLD

MCACES GOLD is a versatile and efficient PC program for estimating costs. GOLD can be used by anyone responsible for budgeting or estimating construction projects, or other types of estimating.

About This Manual

The basic features and functions of MCACES GOLD are described in the *MCACES GOLD User Manual*, Volume 1.

The current manual, *Volume 2, Advanced Options*, describes the following advanced features and components of MCACES GOLD:

- Models Module
- Digitizer Module
- Second View Reporting
- Material and Vendor Backup
- Historical Cost Analysis System (HCAS)
- Database Utilities
- MCACES Menu
- ENG3086 Interface

Note: Version 5.30 is also referred to as Version 5.3.

Models Module

The Models Module combines spreadsheet and database capabilities. Using models, you can create detailed cost estimates during early design and monitor costs through all phases of a project. You can also produce budgets for new facilities based on previous estimates, and you can model complex construction tasks and evaluate alternatives quickly and easily.

Digitizer Module

The Digitizer Module enables you to easily configure GOLD to work with any number of industry-standard digitizers. Once implemented, the software allows you to do quantity takeoffs from drawings and automatically place the quantities into an estimate. Additional features include point and trace modes, calculator, and available audit trail.

Tools

The Toolkit is a group of programs and software tools providing advanced estimating functions and database management capabilities. These include:

- A Second View capability for viewing and reporting project costs according to an alternative work breakdown structure, and for producing project comparison reports.
- A Material and Vendor Backup capability that lets you store vendor price quotes for materials and input the lowest, highest, or average material cost into a Project or Unit Price Database item.
- Database utility programs for merging, manipulating, and managing the supporting databases used with GOLD.
- Additional functions for reorganizing Unit Price Databases.

Volume 2 Overview

This volume is divided into the following parts:

- Part One covers the Models Module, including instructions and examples for working with facility and task models, using the Models Database, and producing the Link Listing Report.
- Part Two discusses the Digitizer Module and contains detailed instructions on how to set up and work with the GOLD software in tandem with a digitizer.
- Part Three describes the components and capabilities of the Toolkit.
- Part Four describes the Mcaces Menu, including ENG3086 Interface.

An Appendix and Index are also included. The Appendix describes additional capabilities that are provided if your system includes ARA capabilities.

CHAPTER 1

MODELING BASICS

About the Models Module

The Models Module is an optional enhancement to the basic GOLD software, which combines spreadsheet and database capabilities in a unique way. With the Models Module you can produce detailed cost estimates during early design and monitor costs through all phases of a project.

Using GOLD's modeling capability, you can:

- Budget new buildings and other facilities based on previous estimates.
- Model complex construction tasks and examine alternative scenarios instantly.
- Automatically recalculate quantities and costs by changing one or more variables.
- Use a supplied database of over 40 facility models; and easily add your own actual or theoretical estimates to this database.
- Produce reports that show all linked quantities and parametric data.

Modeling Tools

The Models Module provides its capabilities through a set of software tools. These tools are introduced in this chapter and then explained in detail throughout the rest of Part One.

- Link Quantity function
- Link Element function
- Unlink Element function
- Parameter worksheets
- The Models Database
- The Link Listing Report

Chapter Overview

This chapter introduces the concepts and functions you need to understand to use the Models Module. The following sections are included:

- 1.1 The Two Kinds of Modeling
- 1.2 Quantity Link Functions
- 1.3 Parameter Worksheets
- 1.4 The Models Database
- 1.5 Working With the AMS94A Assemblies Database
- 1.6 The CWSA92 Assemblies Database
- 1.7 The Link Listing Report

1.1 The Two Kinds of Modeling

Introduction

The Models Module provides estimators with the tools to do two different kinds of modeling:

- Facility Modeling
- Task Modeling

Facility Modeling

Facility Modeling is the process of creating an estimate based on a previously estimated actual or theoretical facility.

The model of the previous facility is copied from the Models Database into the Project Database. You then adjust the quantities in the model to match your current estimate.

For example, if you are preparing an estimate for an office building, you would begin by looking up and copying a model of a similar facility. You would then input quantities specific to your project, such as the gross floor area and number of stories. Based on your input, GOLD will automatically adjust subordinate quantities and their resulting costs.

You can enter as much or as little detailed information about your project as you have available. GOLD will supply the rest of the quantities based on your input and on formulas contained in the model. You can thus produce budgets and planning estimates at the earliest stages of a project, and carry them forward, adding more detail, as the project proceeds.

Refer to Chapter 2 for instructions and examples of working with facility models.

Task Modeling

Task modeling has a more concentrated focus than facility modeling. In task modeling, you work with a construction task which constitutes part of an estimate.

You can link any number of variables involved in a task and calculate the resulting quantities and costs. You can then alter one or several variables and immediately recalculate. In this way, you can evaluate any number and combination of task options and see the effects of each.

For example, you might work out all of the interrelated tasks involved in boring a highway tunnel through a mountain. You could use this set of task models to analyze various alternatives for the current project, and you could also save the models in the Models Database and use them in future estimates.

See Chapter 3 for an in-depth discussion of task modeling.

1.2 Quantity Link Functions

Purpose

GOLD calculates the costs of items based on their unit costs and quantities. When you work with models, the quantities of items and title elements are *linked* to some external value. You can control this linkage through the quantity link functions.

Three Functions

GOLD provides three functions on the Compute Menu for controlling the external linkage of item or title quantities:

- Link Quantity (Ctrl+F7) is used to link individual items or titles.
- Link Element (Ctrl+K) can be used to link all of the subtitles and detail items beneath a title in one step.
- Unlink Element (Alt+K) can be used to unlink all subtitles and detail items beneath a title that are linked to their parent quantities.

Link Quantity Window

Accessing the Link Quantity function (Ctrl+F7) displays the Link Quantity Window, which is shown in Figure 1.1.

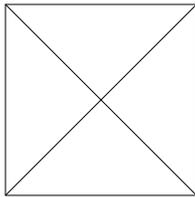


Figure 1.1: Link Quantity Window

Quantity Links for Assemblies and Crews

As discussed in Section 6.9 of Volume 1, when you work with assemblies, the quantities of the assembly cost items are linked to the parent (assembly) quantity.

Similarly, as explained in Section 6.6 of Volume 1, when you use crews as assemblies, the crew member quantities are linked to the assembly duration.

Quantity Links for Models

When you work with the Models Module, the capabilities of the Link Quantity function are expanded in two major ways:

- Linking of title quantities
- Multiple reference types

Linking of Title Quantities

Using the Models Module, you can link the quantities not only of detail items, but of titles in the project hierarchy.

For example, the gross floor area of a building model might be established at title Level 1. The quantity of title elements at subordinate levels can then be linked to the gross floor area.

This linkage across the title hierarchy makes it possible to recompute quantities for an entire estimate by changing one or more of its high-level quantities.

Multiple Reference Types

With the Models Module, you can establish quantity links by referring to a number of external values (in addition to parent quantity and assembly duration). The *reference types* you can use are shown in Figure 1.2.

The most versatile of the reference types is the parameter worksheet, which is discussed in Section 1.3.

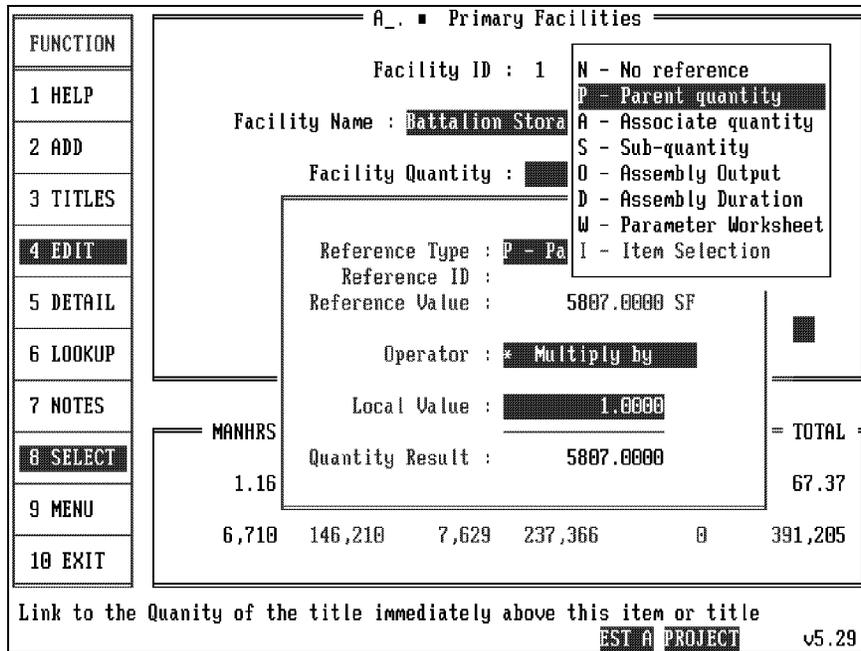


Figure 1.2: Window Showing Reference Types

Linking Whole Elements

The Link Element (Ctrl+K) function provides a one-step method of linking the quantities of all the subtitles and detail items in an element. Using this function is equivalent to using the Link Quantity function on every subtitle and detail item beneath a title and choosing *Parent Quantity* as the reference type.

Unlinking Whole Elements

The Unlink Element (Alt+K) function provides a one-step method of unlinking the quantities of all the subtitles and detail items in an element which are linked to their parent quantities. Titles and items linked to other reference types are not affected. Using this function is the reverse of using the Link Element and is provided so you can undo links created with Link Element.

For More Information

Refer to Sections 2.8 for instructions on using the Link Quantity function. Also, see Sections 2.7 and 3.4 for additional examples of use.

Refer to Sections 2.10 for instructions on using the Link Element function.

1.3 Parameter Worksheets

Definition

A *parameter worksheet* is simply an electronic spreadsheet incorporated within a GOLD Project, Models, or Assemblies Database.

Each worksheet is used to specify or calculate a single quantity value, called a *parameter*.

Parts of the Worksheet

Figure 1.3 illustrates a parameter worksheet used to calculate the Exterior Wall Closure in a model representing a warehouse.

- The rows on the upper part of the worksheet list the *variables* used to calculate the wall closure, along with their values and the mathematical *operators* applied to them.

Together, these variables and operators are referred to as the worksheet *formula*.

- The row at the bottom of the worksheet shows the parameter resulting from the formula and its calculated value.

PROJECT MODEL4 General Purpose Warehouse				
Facility ID : 01				
Facility Name : General Purpose Warehouse				
FUNCTION	Reference	Description	Value	Units Op
1 HELP				
2 A				
3 T				
4 E	1 SAC	Stories Above Grade	1.0000	EA *
	1 FAC	Flr-to-Flr Height Above Grade	18.0000	LF *
	1 PER	Facility Perimeter Length	988.0000	LF =
5 D			0.0000	
6 L			0.0000	
7 N			0.0000	
8 S			0.0000	
9 M			0.0000	
10	EWC	Exterior Wall Closure	17784.0000	SF

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Figure 1.3: Parameter Worksheet

How Parameters Are Used

A parameter calculated on a worksheet can be used in two ways:

- It can serve as a variable on another parameter worksheet.
- It can be the reference value in the Link Quantity Window for a title or cost item. In this case, the title or item is linked to the parameter worksheet, and if the parameter changes, the quantity value of the item or title element will be changed as well.

Editing a Parameter

When you use the Edit Parameter function (Ctrl+P), you can change the value of any variables used in the formula. Changing a value causes GOLD to automatically recalculate the equation and display the new result.

You can also redefine the formula by adding or substituting variables and operators, thereby changing the method used to calculate the parameter.

Model Input

Parameter Worksheets that reference a single parameter can be edited using the Model Input function.

Adding a Parameter

GOLD also gives you the ability to add parameters. When you access the Add Parameter function (Alt+P), a blank parameter worksheet is displayed.

You use this worksheet to enter a single parameter or to enter a formula and calculate a resulting parameter.

Copying Parameter Worksheets

To save you time and data input effort, GOLD allows you to create a new worksheet with parameter data copied from an existing worksheet. You can then edit the copied data as needed to define the new parameter.

Deleting Parameter Worksheets

You can delete existing parameter worksheets just as you can titles or items in a database. First display the worksheet, then press the Ctrl+F4 (Delete) keys.

For More Information

See Sections 2.4 and 2.9 for more information and instructions for editing and adding parameters. Refer to Sections 2.9 and 3.3 for examples.

1.4 The Models Database

Purpose

The Models Database is a storage place for models. You can store both facility and task models in a Models Database, and copy them quickly and easily into the Project Database.

Copying Models Into the Project Database

Once a Project Database has been created, you can use the Lookup function to look up and copy data from the Models Database into the Project Database.

You can copy elements from any level of the Models Database. This means that you can copy in the model of an entire building and use it as the basis of a new building estimate. Or, you can copy only a small portion of a model, perhaps to add it to a estimate that is itself based on a different model.

You can also copy a model with or without supporting detail items. If you copy without detail, you can still adjust costs and recalculate all links (down to the assembly level). This approach allows quick and easy budget preparation.

Adding to a Models Database

You can also add to a Models Database, to save data for later modeling efforts.

GOLD allows you to add to the database at any level. For example, you can copy in an entire, finished estimate from the Project Database and save it to use as a model. Or, you can add data to an existing model by looking up and copying assemblies from the Assemblies Database, cost items from the Unit Price Database, or parts of projects from the Project Database.

Supplied Models Databases

Several Models Databases are currently supplied with the GOLD software. Refer to Chapter 4 for details.

1.5 Working With the ASM94A Assemblies Database

Introduction

In addition to providing the Models Database, the GOLD modeling capability expands what you can do with the Assemblies Database. Specifically, you can do the following:

- Define and change quantity links
- Add and edit parameter worksheets

Quantity Links

In the ASM94A Assemblies Database as released by BSD, all detail items are linked to their parent title at the lowest (assembly) title level.

You can change the links for detail items and also define new links for both items and titles. The procedures you would use are exactly the same as for the Project Database. Refer to Section 2.8 for instructions.

Parameter Worksheets

With the modeling capability you can also define and edit parameter worksheets in the Assemblies Database, and link items or titles to their result values. See Sections 2.4 and 2.9 for instructions on working with parameters.

1.6 The Civil Works Assemblies Database

Description

The Civil Works Assemblies Database (CWSA92) is an MCACES GOLD Assemblies Database supplied with the current release of the software.

This database contains a title structure organized for civil works estimating. It also contains predefined civil works assemblies with their associated parameter worksheets. Additional assemblies can be added by users as needed.

Structure

The CWSA92 Assemblies Database organizes the data according to types of work. Up to four levels of titles are used for breakdown in parts of the database. The Level 1 titles list screen is shown in Figure 1.4:

FUNCTION	ASSEMBLIES MASTER RECORD
1 HELP	B 1 Site Preparation
2 ADD	C 2 N Earthwork 23ea
3 TITLES	D 3 Tunneling \$ 0
4 EDIT	E 4 Piling & Caissons \$ 0
5 DETAIL	F 5 Railroad Work \$ 0
6 LOOKUP	G 6 N Marine Work 1ea
7 NOTES	H 7 Paving Work \$ 0
8 SELECT	I 8 Piped Utilities \$ 0
9 MENU	J 9 Site Improvements \$ 0
10 EXIT	K Q N Quantity Survey Tools 2ea

Figure 1.4: CWSA92 Level 1 Titles List Screen

Pre-defined Assemblies

The predefined civil assemblies in the CWSA92 Assemblies Database are organized in the title structure as shown below. Notes describing each assembly are provided in the database and can be viewed by pressing the F7 (Notes) key from the assembly title entry screen.

Parameter Coding System

Civil works assemblies can use large numbers of parameter worksheets, both for item selection and for the input of parameters and formulas for defining quantities.

The use of a logical coding system for the parameter worksheet IDs makes it easier to locate worksheets when a large number are present. The coding system described below is the one used to develop the parameter worksheets supplied by BSD in the CWSA92 Civil Works Database. This approach is recommended for adding new worksheets to the database.

Code Suffixes

Code suffixes are used to help identify the function of parameter worksheets. Recommended suffixes are listed below. A single code can have more than one suffix, such as: **CE** for total computed efficiency.

A - For those items the user should input directly--*Mandatory*.

B - For those items which a user can consider for use --*Optional*.

C - For those items which will yield intermediate calculation results.

I - For item selection worksheets.

E - For Efficiency related parameters.

R - For the final calculated results.

Basic Input Values

The codes for the basic input values are 0100 through 0199. Examples of the types of items that would be considered basic input values, along with their basic input code ranges are listed below.

Material Swell Factors	0101 A
Material Bearing Factors	0105 B
Material Weight	0102 A
Material Factors	0104 B
Material Fill Factors for Buckets	0111 B
Work time per Hour Expected	0151 A
Distances involved	0181 A
Material Angle Of Repose	0112 B
Expected Spot Times	0191 A
Tool Rated Capacity (Bucket, Blade, etc.:	0161 A

Efficiency Factors

Efficiency factor worksheets should be labeled 0200 through 0299. Some typical examples follow:

Material Difficulty Factors	0203 BE
Equipment Operator Efficiency	0205 BE
Weather Conditions	0221 BE
Grade Corrections Plus or Minus (Up or Down.)	0231 BE
Operational Tactics (such as Slot Dozing)	0251 BE
Rolling Resistance	0211 BE
Coefficient of Traction Factors	0216 BE
Work Time Efficiency	0299 BE

Equipment Factors

Codes 300 through 0999 are assigned to worksheets containing equipment data necessary to feed the calculation worksheets. (Item selection worksheets are coded with three digits instead of four so that the worksheet ID, with its suffix of I, can be displayed in the four-character Sequence ID field.)

Examples of Equipment factor codes include:

Equipment Selection	301 to 349I
Equipment Choices	351 to 399I
Vehicle Payloads	0401 to 0599 A
Unit Volume of Bucket	0601 to 0699 A
Blade Rated Capacity	0701 to 0799 A
Cycle times	0801 to 0899 A
Operational Factors	0910 to 0999 B

Note: Operational Factors might include Physical Maximum Load Factors (For example: How much can be picked up with a bucket and crane? How much can be put into the selected or available haul unit?) and Curve Super Elevation.

Calculations

Codes 01000 through 08000 are reserved for intermediate calculation worksheets. These worksheets provide calculation of values needed as input for the final result worksheets. Examples include the following:

Haul Unit Capacity (LCY)	1001 to 1999 C
Loading Cycle	2001 to 2999 C
Swing or Unit Cycle	3001 to 4999 C
Unit Cycle	5001 to 6999 C
Grade Corrections Plus or Minus	4001 to 4999 C
Overall Efficiency	7501 CE

Results

Result worksheets produce the values needed to calculate the quantities needed by the detail line items. These worksheets generally use the answers derived from the calculation worksheets. They are coded 9000 through 9999 **R**.

Some of the results that can be calculated include the following:

- Total time required for the Equipment to be used.
- Total Work to be done
- Total Number of Units Needed
- Productivity.

1.7 The Link Listing Report

Description

The Models Module expands GOLD's reporting capabilities by providing the Link Listing Report. This report is appropriate for any projects that use the Models Module tools.

The Link Listing Report shows all titles and cost items in a Project Database whose quantities are linked through the Link Quantity function. For each title and item, the report lists the information contained on the Link Quantity Window.

If titles or items are linked to parameter worksheets, these worksheets and their formulas are also shown on the report.

For More Information

Refer to Chapter 5 for more details and examples of this report.

CHAPTER 2

WORKING WITH FACILITY MODELS

Purpose

When you work with a facility model, you create an estimate or budget based on historical data from an existing (actual or theoretical) detailed estimate.

Using facility models enables you to quickly and easily produce an accurate estimate during early planning, and to refine the estimate as more detail information becomes available.

Task List

Working with a facility model generally involves some or all of the following tasks.

Tasks 1 and 2 are all that is necessary to produce budgets or planning estimates. The other tasks might be used if sufficient information is available, or when you refine an initial estimate.

1. You look up and copy a facility model from the Models Database into the Project Database.
2. You edit one or more parameter worksheets to adjust the parameters in the model to fit the quantities in your proposed project.
3. As you refine the estimate, you might change elements of the facility and/or add new elements.
4. If you are creating a detailed estimate, you also add to and/or change the cost items in the facility as detail information becomes available.
5. When you add to a facility model, you generally use the Link Quantity function to define the linkage of all new title elements or items. You might also use this function to redefine the linkage of current items or titles.

In some cases, you might use the Link Element function to link an entire element together in one step.

6. As you modify the facility, you continue to adjust the parameters to reflect more accurate information. You might also find it appropriate to add one or more parameters to the estimate.

Chapter Overview

This chapter explains the functions and procedures you use when working with facility models in the Project Database.

This includes detailed instructions for using parameter worksheets and the Link Quantity function. An extended example, based on a warehouse facility, is developed throughout the chapter.

The following sections are included:

- 2.1 Copying a Model Into the Project
- 2.2 Facility Quantities, Parameters, and Formulas
- 2.3 Adjusting Quantities
- 2.4 Editing Parameters
- 2.5 Model Input Values
- 2.6 Item Selection
- 2.7 Modifying the Facility
- 2.8 Linking Quantities
- 2.9 Adding Parameters
- 2.10 Linking Whole Elements
- 2.11 Modeling Sitework

2.1 Copying a Model Into the Project

Purpose

You look up and copy a model into the Project Database when you want to use that model as the basis for a new estimate (or part of an estimate).

When to Use

Use this procedure after you have created the Project Database and after the project columns and project breakdown structure are defined as needed for your estimate. Refer to Section 5.1 of Volume 1 for instructions on starting a project.

Note: It is usually best to define all six levels of the project breakdown structure. See the Caution below.

Use of Lookup

This procedure involves looking up into the Models Database. You can only look up into the Models Database from the Project Database and the Assemblies. You must be on a project title entry screen in add mode.

Copying With or Without Detail

When you copy a model or part of a model into the Project Database, you are prompted to specify whether or not to include detail items. You have the choice of copying the detail cost items included in the model, or of copying just the titles with their accumulated costs.

- If you are creating one or more budgets or want to model various "what if" scenarios, it will be quicker to copy the model without detail and to work with title levels only (such as systems and assemblies).
- If you are working on a planning estimate that you expect to carry forward to design, you might choose to bring in the titles with detail, to provide a template or checklist for further development of the estimate. Including detail also allows you to recalculate labor and equipment costs using crews.

Costs Not Included in Facility Models

Models stored in a Models Database include Direct Costs only. They do *not* include any contractor markups or other Indirect or Owner Costs.

Facility Models in the MDL92A Database also do not include sitework costs. All sitework costs are stored in the MDL92A Database under a separate Level 1 title called "Sitework Assemblies." See Section 2.11 for more information.

Procedure

Use these steps to look up and copy a model or element of a model from the Models Database into the Project Database. Begin in the Project Database, at the title list screen where you want to place the model or element.

1. With the highlight on any existing title (or the Project Information Record), press the F2 (Add Item) key.

Result: A title entry screen is displayed (Figure 2.1).

2. Press Ctrl+F6 to look up into the Models Database (or display the Lookup Menu and choose the Models option).

Result: The Models Database is accessed and the Level 1 title list screen is displayed.

3. If you want to copy an entire facility (or Level 1 title), highlight the appropriate title.

If you want to copy only an element of a model, search through the database by selecting titles and pressing the Enter key (or using the Find Keyword function) until you find the element you want. Then highlight the element's title on the list screen.

4. Press the F6 key.

Result: The Lookup Menu is displayed with the highlight on the Confirm Lookup option.

5. Press Enter.

Result: GOLD displays the following prompt: *Including Detail Items? Y/N*

6. Enter Y to include detail items or N to copy only the model title and subtitles.

Result: GOLD copies the specified data into the project. The program displays a message to inform you when the copying is complete.

7. Press the Enter key to dismiss the message. Press the F10 (Exit Screen) key to exit to the title list screen.

Caution

If you copy a model or model element containing several title levels to a lower level in the Project Database, you can lose titles at the bottom.

For example, if you copy a facility model with four title levels to Level 2 of a three-level project, you have only two levels (2 and 3) available for placing the four levels of model titles.

When this happens, the lower-level titles are eliminated. If you have chosen to copy detail items, these items are copied. However, the quantity links for the items are lost with the lost titles. This means that the estimate cannot be recomputed by adjusting quantity links and/or parameters.

To avoid losing quantity links:

1. Define the project breakdown structure to include all six available levels.
2. Do *not* copy a model to a level where there are not enough lower level title spaces to accommodate the model's titles.
3. Make sure that the model and project databases both have the same direct cost columns.

Example: Warehouse Facility

As an example, suppose you want to develop a preliminary estimate for a warehouse. You might follow these steps:

1. You create the new project and define the database columns and breakdown structure. (Refer to Volume 1, Chapter 5, for instructions.)
2. Looking up into the Models Database, you select the General Purpose Warehouse facility and copy it back to the Project Database. You decide to copy the model with its supporting detail items.

Note: This example is extended throughout the rest of this chapter.

2.2 Facility Quantities, Parameters, and Formulas

Background

Before you learn about adjusting quantities in a facility model, you should understand something of how these quantities are determined.

Note: The following discussion applies to facility models as contained in the MDL92A Database supplied by BSD. As you become familiar with modeling, you may choose to alter some aspects of the method described here.

Quantity Links

Quantities are linked throughout a facility model. This means that the quantity of every title element and detail item depends on some external factor (called a *reference value*).

In the case of facility models as stored in the MDL92A Database, the reference value is always one of the following:

- A *facility parameter* derived from the actual quantities of the facility that was the source of the model. Parameters are linked to all upper-level titles.
- The quantity of the closest upper-level title (called the *parent title*). Parent quantities are linked to lowest-level titles and detail items.

The linkage of any linked title or item can be viewed and changed through the Link Quantity function (Ctrl+F7). See Section 2.8.

Facility Parameters

To model facilities, GOLD uses a predefined set of parameters, such as the Gross Floor Area, Average Ceiling Height, and so on.

Each facility parameter is defined on a parameter worksheet (Figure 2.2). When you copy a facility model from the Models Database into the Project Database, GOLD automatically copies that model's parameter worksheets as well.

FUNCTION		PROJECT MODEL4 General Purpose Warehouse			
1	HELP	Facility ID : 01			
		Facility Name : General Purpose Warehouse			
2	A	Reference	Description	(Value Units)Op	
3	T		Average Ceiling Height	8.0000 LF	=
4	E			0.0000	
5	D			0.0000	
6	L			0.0000	
7	N			0.0000	
8	S			0.0000	
9	M	ACH	Average Ceiling Height	8.0000 LF	
10					
				EST A PROJECT	v5.29

Figure 2.2: Sample Parameter Worksheet

Facility Formulas

Some facility parameters are independent values and are simply entered as single line items on their worksheets. An example is the average ceiling height (ACH) parameter shown in Figure 2.2.

Other parameters are calculated on their worksheets, using supplied formulas. The formula for Facility Perimeter Length (PER) shown in Figure 2.3 is an example.

FUNCTION		PROJECT MODEL4 General Purpose Warehouse			
1	HELP	Facility ID : 01			
		Facility Name : General Purpose Warehouse			
2	A	Reference	Description	(Value Units)Op	
3	T			(0.0000	N
4	E	W 1 FTP	Footprint Area at Grade	(46741.0000 SF	/
5	D	N	L-FTP	46741.0000 SF) P
6	L	N		0.5000) *
7	N	N	L-PER	988.0000 LF	=
8	S			0.0000	
9	M	PER	Facility Perimeter Length	988.0000 LF	
10					
				EST A PROJECT	v5.29

Figure 2.3: Parameter Worksheet With Formula

The formula can be restated as follows:

$$\text{Estimate Perimeter Length} = (\text{Estimate Footprint Area at Grade} / \text{Library Footprint Area at Grade})^{0.5} * \text{Library Perimeter Length}$$

where the "Estimate" values are those specific to the current project and the "Library" values are ones stored for this model in the Models Database. (These Library values are derived from the original facility that was the source of the model.) Note that raising a value to the power of 0.5 is the same as taking that value's square root.

In other words, the perimeter length parameter of the current facility is projected as the square root of the ratio of the current estimate footprint to the model footprint, multiplied by the model perimeter length.

In effect, the formula estimates the current facility's perimeter by increasing or decreasing the model's perimeter in proportion to the current estimate's footprint area.

Entering Known Values

Once you are actually able to estimate the footprint area for your proposed facility, you would enter that value in place of the formula. But until you enter that value, GOLD will use the formula to compute a reasonable approximation.

For More Information

Refer to Section 4.2 for complete information on the parameters, formulas, and quantity links used in the MDL92A Database.

2.3 Adjusting Quantities

Background

Once you have copied a facility model into the Project Database, you adjust the model's quantities to match those of your proposed project.

Until you change one or more quantities, your estimate quantities will be the same as those stored for the model in the Models Database.

Using Parameter Worksheets

As explained in the previous section, facility quantities for upper-level titles are usually linked to parameters. Adjusting high-level quantities therefore involves editing parameter worksheets.

Section 2.4 gives instructions on editing parameter worksheets. The present section discusses which parameters you would change to adjust facility quantities and provides an example.

Adjusting the Gross Floor Area

The gross floor area (GFA) is the primary parameter used in facility modeling. Most of the other parameters are based in part on the GFA.

Normally, you adjust the GFA of the model to match that of your proposed facility immediately after copying the model into the Project Database. Adjusting the GFA of the model is all that is required to produce a rough estimate. This is the simplest and quickest use of the facility modeling capability.

Changing Other Parameters

If you have figures for other high-level facility parameters, such as the facility perimeter length and number of stories above grade, you would enter them at this stage as well. The more specific information you can enter about your proposed facility, the more accurate your results will be.

Example: Warehouse Facility

To extend the warehouse example begun in Section 2.1, recall that you have copied the General Purpose Warehouse model into the Project Database in order to produce a preliminary estimate. Your next steps might be as follows.

1. Working from a preliminary space plan, you estimate the Gross Floor Area of your proposed facility at 68,000 SF. You enter this value on the GFA parameter worksheet.
2. You also calculate approximate footprint, perimeter, exterior wall, and roof construction quantities based on the plan. You enter these values on the appropriate worksheets.

Result: GOLD recomputes all worksheets and quantities that reference the parameters you have adjusted. The overall costs of the warehouse facility are recalculated to reflect the new quantities.

2.4 Editing Parameters

Purpose

The Edit Parameter function (Ctrl+P) lets you change the value of a parameter by changing the value of one or more of its variables, or by changing the parameter formula.

When to Use

You can use this function whenever you need to change a parameter in a Project or Models Database.

Parameter Levels

A parameter worksheet is always created at a certain level of the database. GOLD considers the parameter *attached* to that level. The parameter worksheet can be accessed from that level and all lower levels.

Worksheets created at the detail level are considered attached to the title level immediately above the detail.

Parameter Worksheet

Choosing the Edit Parameter function displays a window listing all the defined parameters that are available from the current database level. After you select from the listing, the chosen parameter worksheet is displayed. Figure 2.4 shows an example.

Reference	Description	(Value	Units)Op
1 SAG	Stories Above Grade	1.0000	EA	*
4 E W 1 FAG	Flr-to-Flr Height Above Grade	10.0000	LF	*
W 1 PER	Facility Perimeter Length	988.0000	LF	=
		0.0000		
		0.0000		
		0.0000		
		0.0000		
		0.0000		
		0.0000		
		0.0000		
EWC	Exterior Wall Closure	17784.0000	SF	

Figure 2.4: Sample Parameter Worksheet

Adding and Deleting Rows

To add a row in front of an existing row on a parameter worksheet, press Ctrl+N or Shift+Insert.

To delete a row, move the cursor to that row and press Ctrl+D or Shift+Delete. GOLD will prompt you to confirm the deletion.

Maximum Number of Rows

The formula portion of a worksheet can have up to 20 rows. The 20th row must end with an equals sign (=).

Procedure

Follow these steps to edit a parameter in the Project or Models Database. Begin on a title or detail item entry screen, in edit mode.

1. Press Ctrl+P or choose Edit Parameter from the Compute Menu.

Result: GOLD displays a window listing all the parameters available from the current level of the database.

Note: If no parameters are currently defined at this or higher levels, GOLD issues a message informing you that no references are available.

2. Move the highlight to the parameter you want to edit, then press Enter.

Result: The parameter worksheet for the selected parameter is displayed.

3. Type changes on the worksheet as needed to alter values or modify the parameter formula. Press Ctrl+D to delete unneeded rows and Ctrl+N to add rows. Refer to the Field Descriptions below for more details.

Result: Each time you change a value, the parameter is recomputed and the new result shown at the bottom of the screen.

4. When the worksheet has been changed as needed, press the F10 (Exit Screen) key to return to the entry screen.

Result: The changed parameter is saved and all worksheets and quantities dependent on that parameter are recomputed throughout the database.

Field Descriptions

Each parameter worksheet contains one or more rows of variables, with a result row at the bottom of the worksheet. The worksheet fields are described below.

Field	Description
Reference	May contain both a reference type and reference ID. See <i>Reference Field</i> , below.
Description	Name of the variable or parameter. Automatically filled in by the program when you select a valid reference by using the Reference field. For items with no reference, you can enter a description here (at any time). Note: A prefix of L- indicates a standard facility value as stored in the Models Database. See Section 4.2 for details on the facility parameters and formulas.
Parenthesis	This field is available to enter a parenthesis character. In many cases, you need parentheses to group items in a formula. When creating Item Selection Parameter Worksheets, the first left parenthesis field should be filled with a [(left bracket) to indicate the start of Item Selection input and the right parenthesis field should be filled with a] (right bracket) to indicate the end of Item Selection input.
Value	Value of the variable. Copied from the reference value indicated in the Reference field, or entered here if the Reference type is N. Note: If you enter a value for a variable that has a reference type other than N, the program prompts you to confirm that you want the reference type changed to No Reference.
Units	Unit of Measure applied to the value.
Op	Mathematical operator. See <i>Operator Field</i> , below.

Reference Field

The reference field indicates the source of the variable or, on the bottom row, shows the ID assigned to the result parameter. This field can include two parts: a reference type and a reference ID.

Reference Type

The reference types are the same as are used in the Link Quantity Window, and are described below.

Type	Meaning
N - No Reference	The variable value is entered on this worksheet.
P - Parent Quantity	The value equals the Quantity of the parent title. (That is, the title immediately above the level where this parameter is attached.)
A - Associate Quantity	The value equals the quantity of a title at the level where the parameter is attached. When you select this option, a window displays the available associate titles for you to select from.
S - Sub-quantity	The value equals the quantity of a title or detail item at the level below which the parameter is attached. When you select this option, a window displays the available subordinate items or titles for you to select from. Note: In order for detail items to be accessed, they must have a sequence ID defined.
O - Assembly Output	The value equals the Productivity figure established on the lowest-level title entry screen. Used only for parameters attached to lowest title levels.
D - Assembly Duration	The value equals the duration figure established on the lowest-level title entry screen. Used only for parameters attached to lowest title levels. Note: Assembly Output and Duration are used when working with task models and with crews as assemblies.
W - Parameter Worksheet	The value is a parameter computed on another worksheet. When you select this option, a window displays the available parameter worksheets for you to select from

Type	Meaning
I - Item Selection	This is available only in an Item Selection Parameter Worksheet, after a bracket has been input in the left Parenthesis field. It prompts the system to go into the Lookup mode and allows the user to copy back items from a supporting database to serve as a selection list for the worksheet.

Reference ID

The reference ID is a code that identifies the source of the variable. On the bottom row, this field shows the parameter ID that you assign to the result parameter. Up to six characters are allowed.

- If the reference type is W, the reference ID is a parameter worksheet ID. This is followed by a one-digit code at the far right of the field, which indicates the database level to which this parameter is attached.

Example: A reference ID of GFA 1 indicates that the referenced value is the result value on the parameter worksheet with ID GFA, which is attached to title Level 1.

- If the reference type is A, S, O, or D, the reference ID is the database ID of the selected title, or the sequence ID of the selected detail item.
- If the reference type is P, the reference ID is left blank (since there is only one parent title from any point in the database).

Operator Field

The symbol in the operator field specifies the mathematical operation applied to the variable on the current line and on the next.

Valid symbols are:

- = Equals. Always placed at the end of the equation by the program.
- N No operator. Use this code when you need to add an extra line, such as when you need to place double parentheses around a value.
- * Multiply by. (Default).
- M (R) Multiply by (and round to nearest integer).
- + Add to.
- / Divide by. Divide the preceding value by the following value.
- B (R) Divide by (and round to nearest integer).
- \ Divide into. Divide the following value by the preceding value.
- I (R) Divide into (and round to nearest integer).
- Subtract Input Subtract the following value from the preceding value.
- ^ Subtract Ref. Subtract the preceding value from the following value.
- R Round. Round the preceding value to the degree indicated by the following value.
Example: To round the preceding value to the nearest ten, enter 10 as the next value.
Note: The rounding operators require an input value of 1 or in multiples of 10. Choosing to round to the nearest 5, for example, is invalid.
- U Round Up. Round up the preceding value to the degree indicated by the following value.
- D Round Down. Round down the preceding value to the degree indicated by the following value.
- P To Power. Raise the preceding value to the power of the following value.
Note: By entering a decimal percentage with this operator, you can calculate root values. For example, raising a value to the power of 0.5 computes that value's square root, and to a power of 0.3333 computes that value's cube root.
- > Greater of. Take the greater of the preceding and following values.
- < Lesser of. Take the lesser of the preceding and following values.

Deleting Parameter Worksheets

You can delete existing parameter worksheets just as you can titles or items in a database.

1. Display the worksheet.
2. Press the Ctrl+F4 (Delete) keys.
3. Press F10 (Exit Screen) to exit.

Result: The worksheet is marked for deletion and will be removed the next time you pack the database.

Note: Any items, titles, or worksheets that reference this worksheet will retain the result value as previously copied from the worksheet. However, you can not make any new references to a deleted worksheet.

Until the database is packed, you can cancel the deletion of a worksheet by displaying the worksheet and pressing Ctrl+F4 (Delete) again.

Notes on Parameter Worksheets

You can attach notes to existing parameter worksheets just as you can to titles or items in a database. When editing the Parameter Worksheet, press F7 to access the Notes field. Save with F10. These notes will not appear on Project Reports.

2.5 Model Input Values

Definition

A *model input value* is a single parameter used as input to one or more modeling situations. GOLD recognizes a model input value as a parameter defined on a parameter worksheet with a single line of data, an N in the reference field and an equals sign (=) in the Operator (Op) field.

Purpose

Using the model input values feature, you can view and edit on a single screen *all* of the single input value parameters related to any title or detail item.

Model Input Values Screen

Model input values are displayed on a model input values screen. An example is illustrated in Figure 2.5.

FUNCTION	ASSEMBLIES CWSA92 Civil Works Smart Assemblies 92	
1 HELP	2. Earthwork	
2 ADD	2.20. Trenching & Hole Digging By:	
3 TITLES	A 02 Backhoes	\$ 1,364
4 EDIT	B 04 Front End Loaders	\$ 282
5 DETAIL	C 06 Front End Loaders w/Backhoe	\$ 1,375
6 LOOKUP	Model Input Values	
7 NOTES	3 0101 A Shrink/Swell Factor - or + as %	1.1200 %
8 SELECT	3 0102 A Material Weight	3750.0000 LBS/CY
9 MENU	3 0111 B Material Bucket Fill Factors	0.8500 FACTOR
10 EXIT	3 0205BE Equipment Operator Efficiency	0.9600 FACTOR
	3 0601 A Volume of Bucket (Rated)	3.3800 CY
	ASSEMBLIES v5.21	

Figure 2.5: Model Input Values Worksheet

Diagram

Figure 2.6 illustrates how the contents of a model input values screen are derived from parameter worksheets. In the figure, a number of parameter worksheets are defined at a particular title level. Only those worksheets that contain a single-line entry are used as inputs to the model input values screen.

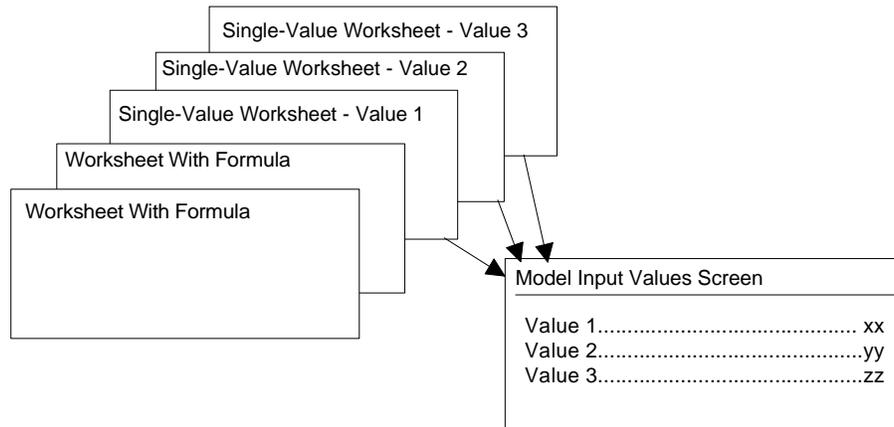


Figure 2.6: Model Input Values and Parameter Worksheets

Creating Model Input Values

In many cases, model input values will already be created and stored as part of the Models or Assemblies Database. However, you can also create your own model input values.

To do so, you create a separate parameter worksheet for each input value. Begin at the title or detail level from which the model input value will be used.

1. Press the Alt+P keys or choose Add Parameter from the Compute Menu.

Result: A blank parameter worksheet is displayed.

2. Fill in the worksheet to define the parameter. Enter a single line of data, with an N in the reference field and an equals sign (=) in the Operator (Op) field.
3. Press the F10 key to add the worksheet.

Result: The worksheet is added and the screen you started from is displayed.

4. Repeat Steps 1 to 3 for each model input value you want to create.

Using the Model Input Values Screen

Use these instructions to view or edit any of the single input values related to a title or detail item. You can begin on the list or entry screen for the relevant title or item.

1. Press Alt+M or choose the Model Input function from the Compute Menu.
Result: The model input values screen is displayed.
2. Use the Arrow keys to move through the fields. You can type new data in the Value field for any of the values you want to change. (Refer to the Field Descriptions below.)
3. After viewing or editing the data, do one of the following:
 - Press the F10 key to exit and save any changes you have made. Saving changes will cause all values dependent on the changed values to be recomputed.
 - Press the Esc key to exit and cancel any changes.

Field Descriptions

This table describes the fields on the model input values screen. The fields are essentially the same as those on parameter worksheets. The fields are described in order from left to right.

Field	Description
Reference	The Reference ID of the parameter worksheet where this model input value is defined.
Description	Description of the parameter, copied from its worksheet.
Value	Result value of the parameter. Copied from the Value field on the bottom row of the parameter worksheet, but you can change the value here.
Units	Unit of measure applicable to the parameter.

2.6 Item Selection

Definition

Intelligent item selection is a feature in MCACES GOLD that allows you to create parameter worksheets that select from a list of detail items depending on input criteria. This enables you to define *item-selection assemblies*, whose component detail items (and their associated costs) will change depending on the criteria entered on the parameter worksheets.

Purpose

In many estimating situations, the cost item needed depends on certain criteria, which may vary. Item selection worksheets make it possible to select different component items for an assembly based on different criteria.

Item Selection Worksheet

Figure 2.7 shows a sample parameter worksheet used for item selection. Notice the following in the figure:

- The top row identifies the criteria for selection of the items. In this case the criteria is 3.5 CY capacity for a dragline bucket, and has been defined directly on this worksheet.

Note: The top row could just as easily *reference* the criteria from another worksheet, as discussed below.

- The following rows list a number of detail items. In this case, the items are dragline bucket items copied from the Equipment Rates Database.
- The criteria row and the item rows are enclosed in square brackets, []. These brackets are used (instead of parentheses) to enclose an item selection operation.
- The bottom row shows the item selected, based on the criteria row. This is the one of the listed items that most nearly matches but is not smaller than the defined criteria. If you were to change the criteria (to model an alternate situation), and GOLD found a better match in the list, that item would be placed on the bottom row instead. The Reference for the item is an ID that you enter as the ID for this worksheet. This ID will be used as the Sequence ID for the cost item as shown on detail entry and browse mode screens. The Reference ID for an Item Selection worksheet cannot exceed 4 characters.

FUNCTION		01_02.03.18_001_ Relocate Water Lines		
1 HELP		LEVEL_6 ID : 003		
		LEVEL_6 Name : Dragline		
2 A		Reference	Description	(Value Units)Op
3 T		N	Criteria to Match	[3.5000 CY N
4 E	I EB35HE003		BUCKET,DRAGLINE, 1.5CY, LTWT	1.5000 CY N
	I EB35HE006		BUCKET,DRAGLINE, 3.0CY, LTWT	3.0000 CY N
5 D	I EB35HE007		BUCKET,DRAGLINE, 3.5CY, LTWT	3.5000 CY N
	I EB35HE010		BUCKET,DRAGLINE, 5.0CY, LTWT	5.0000 CY] N
6 L	N			0.0000 =
				0.0000
7 N				0.0000
				0.0000
8 S				0.0000
				0.0000
9 M				
	BKTI		BUCKET,DRAGLINE, 3.5CY, LTWT	0.0000
10				

OTHER EST A PROJECT v5.30

Figure 2.7: Sample Parameter Worksheet for Item Selection

Pre-Defined Assemblies

In many cases, item-selection assemblies will already be defined for you to use. When this is true, you need only adjust the input criteria in order to change the assembly's component items. See "Modeling With Item Selection," later in this section.

Tasks for Creating an Item-Selection Assembly

To create a new assembly using item selection, you perform the following tasks:

1. You add the title for the assembly at the lowest title level of the Project, Models, or Assemblies Database.
2. Beginning at the title entry screen, you add a parameter worksheet for one or more component detail items of the assembly.

You define each of these worksheets to select a detail item based on match criteria. See "Defining a Parameter Worksheet to Select an Item," below.

Note: Optionally, you can *first* add separate worksheets to define the match criteria to be referenced by the item selection worksheets. This approach makes it possible to later change the assembly items simply by changing model input values. See "Item Selection With Model Input Values," later in this section.

Result: As you add each item selection worksheet, the resulting detail item is automatically added by GOLD beneath the current title. Item selection worksheets may only be used at the lowest title level in your project, model or assembly.

3. Optionally, you can add other detail items to the assembly which will not depend on the item selection worksheets. These items would be part of the assembly regardless of the modeling scenario. You can add these items through the normal F2 Add and F6 Lookup functions.

Defining a Parameter Worksheet to Select an Item

Follow these steps to define a parameter worksheet for item selection in the Project, Models, or Assemblies Database. Begin at the title entry screen for the assembly you are working with.

1. Press Alt+P or choose Add Parameter from the Compute Menu.

Result: A blank parameter worksheet is displayed.

2. Define the item criterion on the first row as follows:
 - Enter N in the Reference field and a Description in the Description field.
 - Enter a left square bracket ([) in the left parenthesis field.
 - Enter the criteria to be matched in the Value field and a unit of measure in the Units field.
 - Enter N in the Op (Operator) field, then press the Tab key to move to the second line.

Note: Alternately, you can reference the criterion from another value using the Reference field. In this case, after choosing the reference you would fill in only the left parenthesis and Op fields.

3. Choose I (Item Selection) in the Reference field on the second line.
4. Press Enter (or Tab).

Result: The Lookup Menu is displayed.

5. Select the database to be used for retrieving the detail items (Unit Price, Labor Rates, or Equipment Rates). Search through the database as needed, then mark the items to be used on the worksheet. Items must be marked with Shift F9, not with a quantity. When the items are marked, choose Confirm Lookup (Alt+L) to copy them back to the current worksheet.

Result: The items are copied to the parameter worksheet and listed, one per row.

6. Fill in a value for each item in the Value field. This value will be compared to the value on the first row to determine which of the items will be selected.
7. Place a right square bracket in the right parenthesis field on the row for the last listed item.

Result: GOLD compares the Value fields and selects the item whose value most closely matches (but is not smaller than) the criteria value. This item's description is placed on the bottom (result row) of the worksheet.

8. To complete the worksheet, enter a Reference ID (up to 4 characters) for the result item in the Reference field on the bottom row. This ID will be entered in the Sequence ID field for the item on detail item entry and browse mode screens. It can also be used to reference this item on another parameter worksheet.
9. Press the F10 key to exit and save the worksheet.

Result: The title entry screen is redisplayed. Also, GOLD enters the result item as a detail item beneath the current title.

Adding Quantity Statements or Computations

The above procedure explains how to define a worksheet for the single purpose of item selection. However, you can also use the same worksheet to define a quantity value for the selected item.

To do so, you enter one or more rows to state or compute the quantity value. These rows must be entered *after* the item selection rows.

Figure 2.8 shows an example worksheet with a quantity in cubic yards stated as a single line item after the item selection operation.

When linking the quantity of a cost item to a parameter worksheet, you must go to the detail item in edit mode and use the Link Quantity function under the Compute menu.

In choosing items with multiple criteria, GOLD compares the criteria for each item to the criteria on the top rows, in the order in which they are entered. The percentage of difference between the criteria is figured in each case and then totaled for each item. The item with the smallest total percentage of difference from the criteria is the one selected.

In the example shown in Figure 2.9, a loader with backhoe and front-end bucket is selected based on the dual criteria of the front end bucket size and the backhoe size.

FUNCTION		01_02.03.18_001_ Relocate Water Lines		
1 HELP		LEVEL_6 ID : 003		
2 A		LEVEL_6 Name : Dragline		
3 T	Reference	Description	(Value Units)Op	
	N	Front Bucket Size	1.2000 CY	N
	N	Backhoe Width	24.0000 IN	N
4 E	I EL50CA001	LDR,BH,WH, 1.00CY FE BKT, 24"DIP	1.0000 CY	N
5 D	N		24.0000 IN	N
	I EL50CA002	LDR,BH,WH, 1.25CY FE BKT, 30"DIP	1.2500 CY	N
6 L	N		24.0000 IN	N
	I EL50CA003	LDR,BH,WH, 1.38CY FE BKT, 30"DIP	1.3750 CY	N
7 N	N		30.0000 IN] =
8 S			0.0000	
			0.0000	
9 M			0.0000	
10		LDR,BH,WH, 1.25CY FE BKT, 30"DIP	0.0000	

OTHER EST A PROJECT v5.30

Figure 2.9: Sample Worksheet With Multiple-Criteria Item Selection

Item Selection With Model Input Values

A final and most useful option is to combine intelligent item selection with model input values. This approach requires you to define separate parameter worksheets for each match criterion referenced by the item selection worksheets. Once the assembly is defined, you can change its component detail items simply by adjusting its model input values.

In the example shown in Figure 2.9, the Front Bucket Size and Backhoe Width criteria could each be defined on their own single-value parameter worksheets. Their values could then be referenced on the first two lines of the illustrated item selection worksheet.

Figure 2.10 illustrates the overall process of using model input values with item selection. In the figure, the parameter, BKTSIZ has been defined on a single-line parameter worksheet and is therefore referenced by the model input values worksheet (A). BKTSIZ is also referenced as the criterion on an item selection worksheet (B). This worksheet is used to select a detail item for Assembly 1 (C). To change the criterion used to select the detail item, you simply edit the quantity value for BKTSIZ on the model input values screen. This change will be reflected on the item selection worksheet and, if appropriate, will cause a different detail item to be selected for Assembly 1.

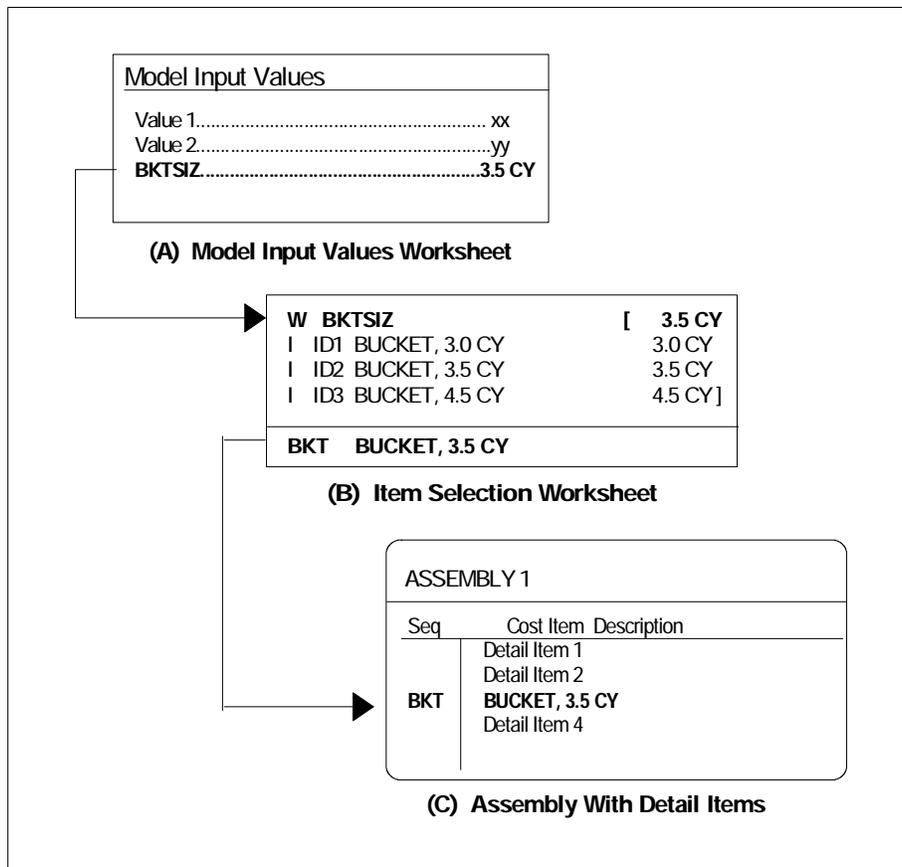


Figure 2.10: Item Selection Combined With Model Input Values

Modeling With Item Selection

Once an item-selection assembly is created, you can model and view the results of different situations simply by changing the criteria on the item selection worksheets, thereby causing GOLD to select different result detail items. The costs for the entire assembly will be recomputed accordingly.

- If the selection criteria are entered on the item selection worksheets, you access each worksheet to change its criterion.
- If, on the other hand, the criteria are entered on their own separate worksheets, you can change the criteria using the model input values screen, as discussed above.

2.7 Modifying the Facility

Background

By copying a facility model into the Project Database and adjusting high-level parameters, you can quickly produce a budget or planning estimate.

If you have additional information available to refine the estimate, or if you later carry the estimate forward to design, GOLD allows you to modify the facility model to whatever degree is appropriate.

Adding and Deleting

As with any Project Database, you can add or delete title elements or individual detail items. Also you can use Lookup to add data from the supporting databases.

Refer to Volume 1, Chapter 6 for complete instructions on adding and deleting from the Project Database.

Working With Detail

If you copied the facility into the Project Database without detail items, you may add detail at any time. Or, you may choose to continue to manipulate summary costs at the title levels, (using the Cost Override field on the title entry screens).

If you copied the facility into the Project Database with its supporting detail, you can add or change detail items as needed.

Working With Assemblies

A particularly efficient way of modifying a facility is to add whole assemblies from either the Assemblies or Models Database. You can add assemblies either as replacements to current assemblies or as additions to the facility.

An assembly's detail items are already linked to the parent (assembly) title. Therefore, after copying in an assembly you need only compute the quantity relationship between the assembly and its parent title in order for the assembly to be linked to the rest of the estimate. (This step is optional, but it allows you to later recompute the assembly's quantities and costs, along with those of the rest of the facility, by changing upper-level parameters. Refer to the warehouse example below.)

Adding Parameters

As you refine your estimate, there may be occasions when you want to add to the parameters currently defined for the facility.

For example, you might wish to define parameters to identify the expected interior partition mix (CMU, metal stud, and demountable) for a particular facility type.

See Section 2.9 for instructions on adding parameters.

Example: Warehouse Facility

Assume that the warehouse you are estimating differs from the General Purpose Warehouse model in that a portion of the floor space will be used for offices. As you refine the estimate, you need to add the appropriate interior partitions.

1. You look up and copy an interior partition assembly for metal stud walls from the Assemblies Database.
2. The area of interior office walls needed is 3700 SF. Instead of simply entering this quantity on the assembly title entry screen, you choose to link the quantity to the rest of the facility, using the Gross Floor Area as the reference for the link.

You therefore calculate the quantity relationship between the office wall area and the GFA of 68000SF:

$$3700 / 68000 = .0544$$

3. You use the Link Quantity function to establish the link. (See Section 2.8 for instructions.)

You select Parameter Worksheet as the reference type and choose the GFA worksheet. You then enter 0.0544 in the Local Value field.

Result: GOLD computes the quantity result of 3700 SF. This quantity is placed in the Quantity field for this assembly. The quantities and costs of all detail items under the assembly are computed accordingly.

2.8 Linking Quantities

Purpose

The Link Quantity function (Ctrl+F7) is used to link the quantity of an item or title element to some external value in the database.

This allows the quantities and costs in an estimate or model to be recomputed whenever one or more of the referenced values is changed.

When to Use

Use this function whenever you need to define or change a quantity linkage in the Project or Models Database.

Determining If a Quantity Is Linked

You can tell if a cost item or title element already has a quantity link by looking at the entry screen. If the Quantity field is not accessible to the cursor, a quantity link is defined.

You can also see a linkage indicator for cost items on the browse mode screen. A capital letter, which identifies the reference type, is shown to the left of the item quantity,

Link Quantity Window

Accessing the Link Quantity function displays the Link Quantity Window, which is shown in Figure 2.11.

FUNCTION	PROJECT PAINTX Paint Shed				
1 HELP	Contract ID : 01				
2 ADD	Contract Name : Paint Shed				
3 TITLES	Contract Quantity : 400.0000 SF				
4 EDIT	Reference Type : W - Parameter Worksheet				
5 DETAIL	Reference ID : GFA 1				
6 LOOKUP	Reference Value : 400.0000 SF				
7 NOTES	Operator : * Multiply by				
8 SELECT	Local Value : 1.0000				
9 MENU	Quantity Result : 400.0000				
10 EXIT	= TOTAL				
	28,100	442	21,554	0	50,103
Type of source for the Reference Value. <F8> to see choices.					
NOTES	EST A	PROJECT	v5.30		

Figure 2.11: Link Quantity Window

Procedure

Follow these steps to use the Link Quantity function. Begin on the entry screen for the title or detail item you want to link.

1. Press Ctrl+F7 or choose Link Quantity from the Compute Menu.

Result: GOLD displays the Link Quantity Window. If the title or item is currently linked, the data defining the link is shown in the window.

2. Type data in the fields as needed to define or change the link. Use the F8 key to see the choices for multiple-choice fields. Refer to the Field Descriptions below for details.
3. When the link is correctly defined, press the F10 (Exit Screen) key to return to the entry screen.

Result: The quantity of the title or item is recomputed and reflected on the entry screen.

Field Descriptions

The following table describes the fields on the Link Quantity Window.

Field	Description
Reference Type	Type of external source used for the link. See <i>Reference Type Field</i> below.
Reference ID	ID of the title, item, or parameter worksheet that is the source of the reference value.
Reference Value	Value external to the item or title, used in combination with the local value to compute the quantity result.
Operator	Symbol for the mathematical operation performed on the reference value and the local value. See <i>Operator Field</i> below.
Local Value	<p>Value specific to this item or title, used in combination with the reference value to generate the quantity result.</p> <p>The local value defines the <i>quantity relationship</i> between the current item or title and the reference value. For example, if you were linking a title element for roofing to the gross floor area of a building, the local value would be the ratio of roof area to gross floor area.</p>
Quantity Result	Result of the computation. The program places this value in the Quantity field on the cost item or title entry screen.

Reference Type Field

The following reference types can be used to link quantities for items or titles.

Type	Meaning
N - No Reference	Indicates that no quantity link is currently used. The quantity is entered on the item or title entry screen.
P - Parent Quantity	The reference value equals the quantity of the parent title. (That is, the title immediately above this item or title in the database hierarchy.)
A - Associate Quantity	<p>The reference value equals the quantity of a title or item at the same database level.</p> <p>When you select this option, a window displays the available associate items or titles for you to select from.</p> <p>Note: In order for detail items to be referenced, they must have Sequence IDs assigned to them.</p>
S - Sub-quantity	<p>The reference value equals the quantity of a title or item at the next lowest level in the hierarchy.</p> <p>When you select this option, a window displays the available subordinate items or titles for you to select from.</p> <p>Not valid for detail items.</p>
O - Assembly Output	<p>The reference value equals the Productivity figure established on the lowest-level title entry screen.</p> <p>Used only for detail items and lowest-level titles.</p>
D - Assembly Duration	<p>The reference value equals the Duration figure established on the lowest-level title entry screen.</p> <p>Used only for detail items and lowest-level titles.</p> <p>Note: Assembly Output and Duration are used when working with crews as assemblies and with task models.</p>

Type	Meaning
W - Parameter Worksheet	<p>The reference value is a parameter computed on a parameter worksheet.</p> <p>When you select this option, a window displays the list of parameters available at the current level of the database for you to select from.</p>
I - Item Selection	<p>This is available only in an Item Selection Parameter Worksheet, after a bracket has been input in the left Parenthesis field. It prompts the system to go into the Lookup mode and allows the user to copy back items from a supporting database to serve as a selection list for the worksheet.</p>

Operator Field

The symbol in the operator field specifies the mathematical operation applied to the reference value and the local value.

Valid symbols are as follows:

- * Multiply by. (Default)
 - M (R) Multiply by (and round to nearest integer).
 - + Add to.
 - / Divide by. Divide the reference value by the local value.
 - B (R) Divide by (and round to nearest integer).
 - \ Divide into. Divide the local value by the reference value.
 - I (R) Divide into (and round to nearest integer).
 - Subtract Input. Subtract the local value from the reference value.
 - ^ Subtract Ref. Subtract the reference value from the local value.
 - R Round. Round the reference value to the degree indicated by the local value .
- Example:** To round the reference value to the nearest ten, enter 10 as the local value.
- Note:** The rounding operators require an input value of 1 or in multiples of 10.
- U Round Up. Round up the reference value to the degree indicated by the local value.

D Round Down. Round down the reference value to the degree indicated by the local value.

P To Power. Raise the reference value to the power of the local value.

Note: By entering a decimal percentage with this operator, you can calculate root values. For example, raising a value to the power of 0.5 computes that value's square root, and to a power of 0.3333 computes that value's cube root.

> Greater of. Take the greater of the reference and local values.

< Lesser of. Take the lesser of the reference and local values.

2.9 Adding Parameters

Purpose

The Add Parameter function (Alt+P) is used to add a new parameter to a Project or Models Database.

When to Use

You use this function whenever you need to add a parameter to a Project or Models Database.

Methods for Adding

You can add a new parameter from scratch, by starting with a blank worksheet, or you can copy data from an existing worksheet to a new one and then edit the data. Copying data from a worksheet can spare you data entry effort if you need to define a parameter with a formula similar to an existing one.

- To add a parameter from scratch, you choose the Add Parameter function from a title or detail item entry screen.
- To add a parameter by copying data, you choose the Add Parameter function from the existing parameter worksheet.

Parameter Levels

A new parameter that you add is attached to the same database level as the title entry screen or parameter worksheet from which you accessed the Add Parameter function. If you accessed the function from a detail-level entry screen, the parameter is attached to the level of that item's parent title.

Once defined, a parameter can be accessed from the title level it is attached to, as well as any lower level.

Parameter Worksheet

Choosing the Add Parameter function from a title or detail item entry screen displays an empty parameter worksheet, as shown in Figure 2.12.

FUNCTION	Reference	Description	Value	Units	Op
1 HELP	N		0.0000		=
2 A			0.0000		
3 T			0.0000		
4 E			0.0000		
5 D			0.0000		
6 L			0.0000		
7 N			0.0000		
8 S			0.0000		
9 M			0.0000		
10			0.0000		

Figure 2.12: Blank Parameter Worksheet

Adding a Parameter From Scratch

Follow these instructions to add a new parameter from scratch, beginning on any title or detail entry screen in edit mode.

1. Press Alt+P or choose Add Parameter from the Compute Menu.

Result: GOLD displays an empty parameter worksheet.

2. Type entries on the worksheet as needed to define the parameter. Refer to the Field Descriptions in Section 2.4 for information.

Result: Each time you add a value, the parameter is recomputed and the new result shown at the bottom of the screen.

3. After defining the parameter, press the F10 (Exit Screen) key to return to the entry screen.

Result: The parameter is added to the list of parameters accessible from this database level and below.

Adding a Parameter By Copying a Worksheet

Use this procedure to add a parameter based on an existing parameter worksheet. Begin on the worksheet that you want to copy the data from.

1. Press Alt+P or choose Add Parameter from the Compute Menu.

Result: GOLD displays a new copy of the worksheet and places the cursor in the UID field on the result row.

2. Enter a new ID of up to six characters to identify the new parameter. Then press the Tab key.

Result: The new ID is stored and the cursor moves to the Units field.

3. Edit the rest of the worksheet data as needed to define the new parameter. You can use the Arrow keys to move from field to field. Refer to the Field Descriptions in Section 2.4 for information.

Result: Each time you change a value, the parameter is recomputed and the new result shown at the bottom of the screen.

4. After defining the parameter, press the F10 (Exit Screen) key.

Result: The parameter is added to the list of parameters accessible from this database level and below.

Example: Warehouse Facility

In the stage of the example discussed in Section 2.7, you saw how an interior partition assembly could be added to a facility and its quantity linked to the GFA parameter worksheet.

A somewhat different method would be to define the interior office wall area as a parameter:

1. Having estimated that the area of office walls needed is 3700 SF, you decide to define this value as a parameter dependent on the GFA of the warehouse.

After calculating the ratio of office wall area to the GFA, you add a new parameter worksheet and fill it in with the following formula:

Reference	Description	Value	Op
GFA 1	Gross Floor Area	68000	*
No Ref	Ratio/Office Walls	.0544	=
IOW	Interior Office Wall	3700	

2. You link the quantity of the interior partition assembly for metal stud walls to the IOW worksheet. using a local value of 1.00.
3. You can now also link other elements of the office wall construction, such as wall finishes and office doors, to the IOW worksheet.

Result: The quantities of these elements will be computed based on the IOW parameter. If you later make a change to either the GFA or IOW worksheet, the quantities of these linked items will be recomputed accordingly.

2.10 Linking Whole Elements

Purpose

The Link Element function (Ctrl+K keys) is used to link the quantities of all subtitles and detail items in an element to their immediate parent titles. This function can be used in the Project or Models Databases.

Description

This function has exactly the same effect as using the Link Quantity function on each subtitle and detail item beneath a title and choosing *Parent Quantity* as the reference type.

GOLD does not change the Quantity value currently defined for each subtitle and detail item. Instead, the program computes the quantity relationship between that quantity value and the parent title's quantity. This relationship or ratio is then entered in the Local Value field on the Link Quantity Window for the subtitle or detail item. (Refer to the warehouse examples in Section 2.7 and below.)

Note: The Link Element function will only link quantities to parent titles that have a value entered in the Quantity field on the title entry screen. Therefore, you must enter quantities for all subtitles in the element in order to link the entire element. (If GOLD encounters subtitles in an element without quantities, it will simply exclude those subtitles and their subelements from the linking process.)

When to Use

There are several cases where you might find it useful to link a whole element together in one step:

Linking an Element to an Estimate

If you are working with an estimate based on a facility model, the quantities of all titles and items copied in from the Models Database are linked. If you define additional project elements for the estimate, you will probably want to link their quantities together as well. In this case, it may be convenient to create the element and then link all the quantities to their respective parent titles at one time.

Creating a Model From a Project

If you have existing GOLD projects without linked quantities and you want to store them in the Models Database to serve as models for future estimates, you can use the Link Element function to quickly link all of the quantities of the estimate together. Refer to Section 4.3 for instructions.

Using a Facility Multiplier

In some cases, you might have estimates containing more than one similar facility. For example, you might have an installation containing several storage buildings. In this case, you might structure the estimate so that one project element represents all costs for a single storage building, and then link the entire element. Once the element is linked, you need only enter a quantity value for the top-level title in order to multiply the costs for however many storage buildings are needed.

Procedure

Follow these steps to use the Link Element function.

1. Display the title entry screen for the top-level title of the element you want to link.

2. Press Ctrl+K or choose Link Element from the Compute Menu.

Result: GOLD prompts you to confirm that you want to link all the quantities in this element.

3. Press Y to confirm.

Result: GOLD prompts you to determine whether any existing quantity links within the element should be preserved or overwritten.

4. Press Y to preserve any existing links or N to overwrite them.

Result: GOLD links the quantities of all subtitles and detail items in the element to their immediate parents. (*Exception:* If there were existing links and you chose Y to preserve them, these links are not changed.)

Example: Warehouse Facility

In the stages of the example previously discussed, an Interior Partition assembly was added to the warehouse facility and its quantity linked through the Link Quantity function.

An alternate approach would be to do the following:

1. You estimate all costs for the interior office space under a separate project element called Interior Office.
2. To quickly link the quantities of the Interior Office element, you use the Link Element function, as described above.
3. To link this element to the rest of the estimate, you figure the ratio of the quantity of the Interior Office title to the Gross Floor Area of the warehouse. Assuming that the Interior Office area is 8100 feet: $8100 / 68000 = .119$. You therefore enter .119 as the local value.

Result: The Interior Office title quantity is linked to rest of the estimate via the GFA. All subtitles and detail items in the Interior Office element are in turn linked via their respective parent titles.

Unlinking Elements

You can also choose the Unlink Quantity (Alt+K) function to unlink title elements. Choosing this function from a title entry screen will unlink all subtitles and detail items in the element which have links to their parent quantities. Other links are not affected. GOLD will prompt you to confirm the action.

2.11 Modeling Sitework

Background

The facility models in the MDL92A Database are defined only to the five-foot line. All site preparation, site improvement, and site utility costs are stored under a separate Level 1 title termed "Sitework Assemblies."

Adding Sitework Costs

You can add sitework costs to a facility by looking up and copying from the Models, Assemblies, or Unit Price Database. Of course, you can also define and input the costs manually in the Project Database.

When to Use

Use the following task list when you want to add sitework cost information from the Models Database to a facility in the Project Database.

Task List

1. Add titles at the appropriate levels of the Project Database for organizing the sitework information.
2. Look up into the Models Database and select and copy the appropriate sitework assemblies.

Result: The assemblies are placed in the Project Database. The cost items below each assembly are linked to the that assembly's Quantity field, which is currently set to 1.

3. Enter the proper quantities for your estimate on the title entry screens for the sitework assemblies.

If appropriate, you can generate these quantities by using the Link Quantity function. Depending on your estimate, it might be valid to link these quantities to the parent quantity, an associate quantity, or to a parameter worksheet (for example to quantities or worksheets that define the site area, site perimeter, or site setback).

Example: Warehouse Facility

Your estimate for the warehouse must include a parking lot with the capacity for fifty cars. To add this element to the estimate, you might proceed as follows:

1. You add a title for Sitework and give it a subtitle for Parking Lot.
2. You look up and copy an Asphalt Parking Lot assembly from the Sitework Assemblies section of the Models Database.
3. The parking lot assembly is priced at \$32 per SY. In order to figure the quantity by the number of cars, you might create a parameter worksheet to make the conversion. Based on an average of 25 SY per CAR, the formula would be:

Reference	Description	Value	Op
No Ref	Number of Cars	50	*
No Ref	SY per Car	25	=
PARLOT	Parking Lot Area	1250	

4. You then link the assembly quantity to the PARLOT worksheet.

Result: The quantities and costs of all the assembly cost items are computed based on the assembly quantity.

Later, if the capacity requirement for the parking lot were to change, you would only need to enter the new figure in the Number of Cars field on the worksheet, and GOLD would adjust all the dependent quantities and costs.

CHAPTER 3

WORKING WITH TASK MODELS

Purpose

Task Modeling is the process of analyzing construction tasks using GOLD parameter worksheets and quantity links.

Setting up task models allows you to quickly and easily recalculate interdependent variables and automatically see the cost results.

Categories of Use

GOLD's task modeling capability can be used to efficiently estimate and recompute any interrelated, integrated construction task. Among the many categories of use are the following:

- Excavation
- Hauling
- Filling
- Compacting
- Placing concrete
- Erecting steel
- Installing equipment

Each of these categories can include many specific tasks.

Examples

Examples of the use of task modeling include the following:

- Excavation tasks, where you need to consider such factors as the quantity and condition of the earth to be moved; equipment types, capacities and time factors; and haul distances.
- Concrete paving work involving various types of roadway paving equipment.
- Structural caisson-drilled pier excavation and placement using different sized drill bits and earth augers for varying depths.
- Erection of high-rise structural steel to determine the time and costs involved in hoisting and erecting at different heights.
- Cost analysis for choosing equipment to use in:
 - structural precast concrete erection
 - glass curtain wall installation
 - tunnel construction.

An instance of the first example, Excavation by Dragline, is illustrated in detail in this chapter.

Program Functions Used

Working with task models involves the same program functions and procedures as facility modeling: parameter worksheets and quantity links.

Task List

The following list shows a typical sequence of tasks you might perform in working with task models.

1. Working in either the Project or Models Database, you define the task or set of tasks to be modeled.
2. You enter the title(s) and cost items necessary to accomplish the task(s).

You then determine the factor or factors needed to define the quantity of these titles and/or cost items. These factors become the top-level task parameters.

Examples: Task Duration, Total Equipment Hours.

3. You place the top-level parameters on worksheets. As you analyze the variables needed to compute these parameters, you create additional parameter worksheets and link them to the top-level worksheets.

This process of analyzing parameters and creating and linking worksheets continues until you have defined all the parameters needed to estimate the task.

4. You use the Link Quantity function to link the cost items and/or titles to the parameter worksheets. In some cases, you might link items or titles to other items or titles that are in turn linked to worksheets.

Result: Generating these links produces the quantity figures for the items and titles, which in turn generates their costs.

5. Once the quantities are established, you can go back and adjust the parameters in order to examine the results of using various alternatives.

As you make these adjustments, you can examine the results on the GOLD screens. You can also print reports of the different alternatives, to be examined and compared later.

6. Finally, if you have been working in the Project Database, you might choose to copy the worksheets and title elements into the Models Database so they can be saved and used for modeling other tasks in the future.

Alternate Method

Once you are familiar with task modeling, you might find it more convenient to reverse Tasks 2 and 3 above. That is, you might build the parameter worksheets first, then add the titles and cost items needed to accomplish the task. That way, you can link each title or item immediately after adding it to the database.

Chapter Overview

This chapter presents an extended example of task modeling. Reference is made to Chapter 7 for basic instructions on using parameter worksheets and the Link Quantity function.

The following sections are included:

- 3.1 Defining the Task
- 3.2 Entering Titles and Cost Items
- 3.3 Building the Parameter Worksheets
- 3.4 Linking Quantities
- 3.5 Analyzing Alternatives

3.1 Defining the Task

Premise

The project used for this extended example involves cutting a new channel to redirect a small river in order to allow for bridge abutment reconstruction. Soil reports indicate the ground is saturated, and this dictates the use of a dragline for excavation. The length of the channel is 400 LF and the estimated volume of excavated material is 40,000 CY.

There is no adjacent location to store the spoils. A local high school, 15 miles away, has a low cleared area in need of fill. The school will allow temporary stockpiling of the spoils in exchange for keeping 4000 CY or 10% of the stockpile quantity.

Task Definition

The portion of this project to be modeled here is limited to the excavation of the channel, the hauling of spoils, and dumping and shaping into a pile at the high school field.

Specifically, the series of task models must estimate the costs to accomplish the following.

- Excavate by dragline 40,000 CY of saturated medium clay earth.
- Load on trucks and transport the spoils 15 miles to the storage site.
- Discharge the spoil at the storage site and, using a bulldozer, shape into a pile.

3.2 Entering Titles and Cost Items

Background

After defining the exact nature of the task to be modeled, the next step is to add the titles and detail cost items needed to estimate the task.

Defining the Title

For the purposes of this example, the Excavation by Dragline task is defined as a single title in the Project Database.

The title is defined on the title entry screen and a quantity figure of 40,000 CY is entered. (Figure 3.1)

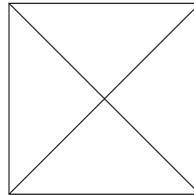


Figure 3.1: Title Entry Screen, Excavation by Dragline

Adding the Detail

After defining the title, you add the detail items necessary to accomplish the task.

For the example task, you look up and copy the following cost items from the Equipment and Labor Rates Databases:

- Dragline bucket (3.5 CY)
- Dragline crawler/crane
- Equipment operator for the dragline crane
- Outside oiler for the dragline crane
- Dump truck bodies (20 CY)
- Dump truck chassis
- Dump truck gates
- Dump truck drivers
- Bulldozer
- Bulldozer blade
- Equipment operator for the dozer

Refer to Sections 6.2 and 6.3 in Volume 1 for instructions on adding cost items to the Project Database.

Note: At this point, you do *not* specify quantities for the items.

Figure 3.2 shows a completed list screen with the detail items.

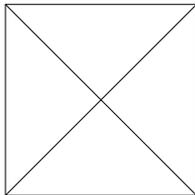


Figure 3.2: Detail List Screen With Excavation Items

Using Crews as Assemblies

A slightly different method for inputting the title and cost items for a task model is to look up and copy a crew from the Crews Database to the lowest title level in the Project Database. This method, copying a crew as an assembly, is discussed in Section 6.6 of Volume 1.

When you copy a crew as an assembly, the crew title becomes a project title and the crew members become detail items beneath that title. These detail items are automatically linked to the Assembly Duration figure defined for the crew at the title level. Since the duration of the task is often what defines the quantities of detail items in a task model, this method can often serve as a useful shortcut.

3.3 Building the Parameter Worksheets

Background

Once the cost items have been added to the Project Database, you are ready to start building the parameter worksheets.

Note: This section presents a top-down analysis of the parameter worksheets used in the Excavation by Dragline task. When actually creating a set of worksheets, you will probably work in a less structured way, adding the worksheets and formulas at different levels as you determine they are needed.

Adding Parameter Worksheets

To create worksheets as discussed in this section, you use the Add Parameter function (Alt+P). Refer to Section 2.9 for instructions on using this function.

Determining the Top-Level Parameters

You isolate the top-level parameters by determining what values are needed to calculate the cost item quantities for the task.

In the Excavation by Dragline example, the equipment and labor costs are determined by the number of hours required to move the 40,000 cubic yards of material. This parameter, termed the Excavation Task Duration, defines the quantity for the dragline crane, dozer, and their crews.

To ensure that a dump truck is always available so that there is no down time for the dragline, more than one truck will be needed. Therefore, the quantity of the truck and truck driver hours will necessitate a second parameter. This parameter, the Total Truck Hours, will be the product of the task duration multiplied by the number of trucks needed.

Therefore, the two top-level parameters are:

- Excavation Task Duration (EXDUR)
- Total Truck Hours (TRKHRS)

Together, these parameters define the quantities for all of the cost items needed to accomplish the task.

Excavation Task Duration

The excavation task duration is determined by the amount of material (40,000 CY) and the amount that the dragline equipment can excavate per unit of time.

$$EXDUR = 40,000 \text{ CY} / \text{Dragline Productivity}$$

The completed parameter worksheet is shown in Figure 3.3. Notice the following:

- The amount of material is referenced as an Associate Quantity from the entry screen for the Excavation by Dragline title.
- The dragline productivity figure is calculated on a separate worksheet.

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2	A	Reference	Description	(Value Units)Op
3	T	1	Excavation by Dragline	(40000.0000 BCY /
4	E	W 1 DRLPRO	Dragline Productivity	95.8904 BCY/HR) U
	N		(Round to nearest whole number)	1.0000 FACTOR =
5	D			0.0000
6	L			0.0000
7	N			0.0000
8	S			0.0000
9	M			0.0000
10		EXDUR	Excavation Duration	418.0000 HRS
		OTHER	EST K PROJECT	v5.29

Figure 3.3: EXDUR Worksheet

Dragline Productivity

The dragline productivity figure is calculated based on the dragline cycle time and dragline payload. Each of these is copied from a separate worksheet.

$$\text{DRLPRO} = \text{Dragline Cycle Time} \setminus \text{Dragline Payload}$$

The worksheet is shown in Figure 3.4.

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2	A	Reference	Description	(Value Units)Op
3	T	1 DRACYC	Dragline Cycle Time	0.0292 HRS \
4	E	1 DRAPAY	Dragline Payload	2.0000 BCY =
5	D			0.0000
6	L			0.0000
7	N			0.0000
8	S			0.0000
9	M			0.0000
10		DRLPRO	Dragline Productivity	95.8904 BCY/HR

OTHER EST K PROJECT v5.29

Figure 3.4: DRLPRO Worksheet

Dragline Payload

The dragline payload is a function of the bucket size and the swell factor of the material.

- The bucket size is entered as a known quantity, based on the selected equipment. If a different bucket is chosen, it must be changed on the cost item entry screen as well as on the parameter worksheet. Alternatively, you can create an Item Selection worksheet to select the correct equipment. See Item Selection in section 2.6.
- The swell factor is entered on a separate worksheet.

The following formula is used, as illustrated in Figure 3.5.

$$\text{DRLPAY} = \text{Bucket Size} / \text{Shrink-Swell Factor}$$

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1 HELP		Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2 A	Reference	Description	(Value Units)Op	
3 T		Bucket Capacity	3.5000 BCY	/
4 E	W 1 SHRSWL	Shrink Swell	1.2500 CY	=
5 D			0.0000	
6 L			0.0000	
7 N			0.0000	
8 S			0.0000	
9 M			0.0000	
10	DRAPAY	Dragline Payload	2.0000 BCY	
		OTHER	EST K PROJECT	v5.29

Figure 3.5: DRLPAY Worksheet

Shrink or Swell Factor

The shrink or swell factor is entered as a single item on its own worksheet (Figure 3.6).

This factor is estimated based on the soil conditions at the site. Some soils, for example, can swell up to 20% when removed from the ground. The difference between in-ground volume and in-truck volume is estimated as this percentage.

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1 HELP		Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2 A	Reference	Description	(Value Units)Op	
3 T		Swell	1.2500 FACTOR	=
4 E			0.0000	
5 D			0.0000	
6 L			0.0000	
7 N			0.0000	
8 S			0.0000	
9 M			0.0000	
10	SHRSWL	Shrink/Swell	1.2500	
		OTHER	EST K PROJECT	v5.29

Figure 3.6: SHRSWL Worksheet

Dragline Cycle Time

The dragline cycle time in minutes is entered on its own worksheet. This figure is derived from the equipment specifications, bucket size, and the swing distance at the site. The figure in minutes is divided by 60 MIN/HR to convert to hours (Figure 3.7).

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2	A	Reference	Description	(Value Units)Op
3	T		Dragline Cycle Time (in minutes)	1.7500 MIN /
4	E	N	Minutes per Hour	60.0000 HRS =
5	D			0.0000
6	L			0.0000
7	N			0.0000
8	S			0.0000
9	M			0.0000
10		DRACYC	Dragline Cycle Time (in hours)	0.0292 HRS
		OTHER	EST K	PROJECT v5.29

Figure 3.7: DRACYC Worksheet

Total Truck Hours

The total truck hours is the second top-level parameter needed to estimate the task. The parameter is figured as follows:

$$\text{TRKHRS} = \text{Excavation Task Duration} * \text{Number of Trucks Needed}$$

As shown in Figure 3.8, both of these variables are figured on separate worksheets.

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1 HELP		Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2 A	Reference	Description	(Value Units)Op	
3 T	1 EXDUR	Excavation Duration	418.0000 HRS	*
4 E	1 NTRUCK	Number of Trucks Needed	10.0000 EA	=
5 D			0.0000	
6 L			0.0000	
7 N			0.0000	
8 S			0.0000	
9 M			0.0000	
10	TRKHRS	Total Truck Hours	4180.0000 HRS	
		OTHER	EST K PROJECT	v5.29

Figure 3.8: TRKHRS Worksheet

Number of Trucks Needed

The job requires that a truck always be available to keep the dragline working. To ensure this, the number of trucks is computed as the truck cycle time divided by the truck load time. The number is then rounded up by 1 to arrive at a whole number. Both of the variables are referenced from other worksheets.

$$NTRUCK = (\text{Truck Cycle Time} / \text{Truck Load Time}) U 1$$

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1 HELP		Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2 A	Reference	Description	(Value Units)Op	
3 T	1 TRKCYC	Truck Cycle Time	1.1334 HRS	/
4 E	1 TLOADT	Truck Load Time	0.1251 HRS) U
	N	(Round to nearest whole number)	1.0000 HRS	=
5 D			0.0000	
6 L			0.0000	
7 N			0.0000	
8 S			0.0000	
9 M			0.0000	
10	NTRUCK	Number of Trucks Needed	10.0000 EA	
		OTHER	EST K PROJECT	v5.29

Figure 3.9: NTRUCK Worksheet

Truck Cycle Time

The truck cycle time is calculated as a function of the loading time, the haul distance, and the different speeds of the truck when loaded and unloaded. The truck load time, haul distance, and dump time are referenced from their own worksheets. The other factors are defined as variables on this worksheet as follows:

- The truck loaded speed is established as 25 MPH.
- The truck unloaded speed is established as 40 MPH

The following formula is used, as shown in Figure 3.10:

$$\text{TRKCYC} = \text{Truck Load Time} + (\text{Haul Distance} / \text{Truck Loaded Speed}) + \text{Truck Dump Time} + (\text{Haul Distance} / \text{Truck Unloaded Speed})$$

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
2	A	Bid Item Name : Diversion Channel Dredging		
3	T	Reference	Description	(Value Units)Op
		W 1 TLOADT	Truck Load Time	0.1251 HRS +
		W 1 HAULD	Haul Distance	(15.0000 MI /
		W 1 TRKLSP	Loaded Speed	25.0000 MPH) +
5	D	W 1 DUMPTI	Dump Time	0.0333 HRS +
		W 1 HAULD	Haul Distance	(15.0000 MI /
6	L	W 1 TRKUSD	Unloaded Speed	40.0000 MPH) =
				0.0000
7	N			0.0000
				0.0000
8	S			0.0000
				0.0000
9	M	TRKCYC	Truck Cycle Time	1.1334 HRS
10				

OTHER EST K PROJECT v5.29

Figure 3.10: TRKCYC Worksheet

Truck Load Time

The truck load time is computed based on the truck payload, the dragline payload, and the dragline cycle time.

The following formula is used:

$$\text{TLOADT} = (\text{Truck Payload} / \text{Dragline Payload}) * \text{Dragline Cycle Time}$$

The worksheet is shown in Figure 3.11.

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2	A	Reference	Description	(Value Units)Op
3	T	1 TRKPAY	Truck Payload	(12.0000 BCY /
4	E	W 1 DRAPAY	Dragline Payload	2.0000 BCY) *
		W 1 DRACYC	Dragline Cycle Time	0.0292 HRS =
5	D			0.0000
				0.0000
6	L			0.0000
				0.0000
7	N			0.0000
				0.0000
8	S			0.0000
				0.0000
9	M	TLOADT	Truck Load Time	0.1251 HRS
10				
		OTHER EST K PROJECT v5.29		

Figure 3.11: TLOADT Worksheet

Truck Payload

The truck payload is estimated by multiplying the truck capacity by the truck load factor (Figure 3.12).

$$\text{TRKPAY} = \text{Truck Capacity} * \text{Truck Load Factor.}$$

Each of these parameters is referenced from its own worksheet.

FUNCTION		PROJECT EXDUR1 Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2	A	Reference	Description	(Value Units)Op
3	T	1 TRKCAP	Truck Capacity	20.0000 CY *
4	E	W 1 TLOADF	Truck Load Factor	0.6000 PCT =
				0.0000
5	D			0.0000
				0.0000
6	L			0.0000
				0.0000
7	N			0.0000
				0.0000
8	S			0.0000
				0.0000
9	M	TRKPAY	Truck Payload	12.0000 BCY
10				
		OTHER EST K PROJECT v5.29		

Figure 3.12: TRKPAY Worksheet

Truck Capacity

The truck capacity is based on the equipment item chosen and is entered as a single variable. In this example, a 20 CY truck is used (Figure 3.13).

PROJECT EXDURA Excavation by Dragline Model

Bid Item ID : 1

Bid Item Name : **Diversion Channel Dredging**

FUNCTION	Reference	Description	(Value Units)Op
1 HELP			
2 A			
3 T			
4 E		Truck Capacity	20.0000 CY =
5 D			0.0000
6 L			0.0000
7 N			0.0000
8 S			0.0000
9 M			0.0000
10	TRKCAP	Truck Capacity	20.0000 CY

OTHER EST K PROJECT v5.30

Figure 3.13: TRKCAP Worksheet

Truck Load Factor

The truck load factor can be calculated based on the truck capacity and the shrink or swell factor; or it can be limited by the loaded truck weight and the local laws governing truck mass.

For example, the figure is established at 60% . This is entered as .60 on the worksheet (Figure 3.14).

FUNCTION		PROJECT EXDURA Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2	A	Reference	Description	(Value Units)Op
3	T		Load Factor	0.6000 FACTOR =
4	E			0.0000
5	D			0.0000
6	L			0.0000
7	N			0.0000
8	S			0.0000
9	M	TLOADF	Truck Load Factor	0.6000 FACTOR
10				
		OTHER	EST K PROJECT	v5.30

Figure 3.14: TLOADF Worksheet

Haul Distance

The Haul Distance is the 15 miles to the high school (Figure 3.15).

Entering this value on its own worksheet allows you to easily change the distance later, for example, if a different dump site were to be considered. Changing the value on the one worksheet will automatically recompute all linked parameters.

FUNCTION		PROJECT EXDURA Excavation by Dragline Model		
1	HELP	Bid Item ID : 1		
		Bid Item Name : Diversion Channel Dredging		
2	A	Reference	Description	(Value Units)Op
3	T		Haul Distance	15.0000 MI =
4	E			0.0000
5	D			0.0000
6	L			0.0000
7	N			0.0000
8	S			0.0000
9	M	HAULD	Haul Distance	15.0000 MI
10				
		OTHER	EST K PROJECT	v5.30

Figure 3.15: HAULD Worksheet

Dump Time

The truck dump time is established as two minutes based on the actual operating speed of the equipment. The figure is divided by 60 to convert the minutes to hours. (Figure 3.16).

PROJECT EXDURA Excavation by Dragline Model			
Bid Item ID : 1			
Bid Item Name : Diversion Channel Dredging			
FUNCTION			
1 HELP			
2 A			
3 T			
4 E			
5 D			
6 L			
7 N			
8 S			
9 M			
10			
	Reference	Description	(Value Units)Op
		Dump Time (in minutes)	2.0000 MIN /
		Minutes Per Hour	60.0000 MIN/HRS =
			0.0000
			0.0000
			0.0000
			0.0000
			0.0000
			0.0000
			0.0000
	DUMPTI	Dump Time (in hours)	0.0333 HRS
OTHER EST K PROJECT v5.30			

Figure 3.16: DUMPTI Worksheet

3.4 Linking Quantities

Background

After the parameter worksheets for a task have been defined, you can use the Link Quantity function to link the quantities of items or titles in an estimate to the parameters.

In the case of the Excavation by Dragline example, only the two top level parameter worksheets, Excavation Task Duration and Total Truck Hours, are directly referenced by estimate quantities.

Creating the Links

To create the links, you access each cost item's entry screen in edit mode, then choose the Link Quantity function (Ctrl+F7).

Select W - Worksheet as the Reference Type, and then choose the appropriate worksheet from the list.

In the example, all items are linked to the EXDUR worksheet, except for the dump truck components and truck driver items, which are linked to TRKHRS.

Refer to Section 2.8 for instructions on using the Link Quantity function.

Using Local Values

In the example, the local value for each item can simply be entered as 1.00, since there is only one of each laborer and piece of equipment in the task (except for the multiple trucks and truck drivers, which have already been factored in to the Total Truck Hours figure).

An option here is to increase the local value by a percentage, say to 1.15, in order to account for lost time due to delays on the job.

Note: Another way to accomplish this would be on the parameter worksheets, say by defining all hours as equal to 50 minutes.

3.5 Analyzing Alternatives

Background

Once task parameters have been defined on worksheets and items in the estimate are linked to them, you can change one or more parameters and immediately see the effects on all linked quantities and costs.

Examples of Use

In the Excavation by Dragline example, you might make changes to the following parameters:

- Length of the channel. Should an alternative channel be considered, you could change the estimated volume of earth to be moved and this would recalculate the excavation duration and all of its linked quantities and costs.
- Size of the equipment. By changing the variables for bucket size or truck capacity, you can redefine the dependent parameters and their linked quantities.

Note: To see valid cost results, you would also change the corresponding equipment items in the database. See Item Selection in Section 2.6.

- Haul Distance. Should a different storage or dump site become available, you could change the haul distance and instantly recompute the truck cycle time, total truck hours, and the resulting costs.

Procedure

Use these instructions to analyze different options for a task model.

1. Edit the parameter worksheet(s) to change the parameter(s) as needed.

Result: The linked values are recomputed throughout the task model.

2. If necessary, change the linked cost items to reflect the changed parameters.

Example: If you change a truck capacity parameter from 20 to 30 CY, you would also select and link a cost item for a 30 CY truck, so that the correct unit cost would be applied.

You can change an equipment item by creating an Item Selection parameter worksheet. See Section 2.6.

3. Examine the changed results on the GOLD cost item and title screens.

You can also print reports to show different alternatives, or send the reports to a text file on disk. Refer to Volume 1, Chapter 23 for instructions on producing reports.

Note: The Link Listing Report provides a listing of all parameter worksheets and quantity links. See Chapter 5 for details.

CHAPTER 4

THE MODELS DATABASE

Purpose

The Models Database stores histories of former projects (actual or theoretical) that you can use as the basis of new estimates. Models Databases may contain both facility and task models. All or part of a model can be copied into the Project Database for use in an estimate.

Functions Like the Project Database

In general, the Models Database is functionally equivalent to the Project Database. This design allows you to easily transfer data between the two types of databases.

This means that the fields on title and cost item entry screens are the same in the Models and Project Databases. It also means that you can perform most of the same functions on a Models Database as you can on a Project Database, including naming columns, setting the breakdown structure, recalculating, and repricing.

The only functions that are *not* permitted with a Models Database are Owner Costs, Adjust Pricing, and generating project reports.

Supplied Models Databases

Several Models Databases are currently supplied with the GOLD software:

- The MDL92A Database contains a library of over 40 facility models representing various types of buildings. This database is provided on a separate set of diskettes from other GOLD databases, and its installation is optional. (You will need at least 22 megabytes (MB) of disk space to load and use the MDL92A Database.) This database is used primarily for developing budget estimates and takeoff checklists prior to design development. It is discussed in this chapter at length as an example of a Models Database storing multiple linked facilities with detailed formulas on parameter worksheets.
- Several much smaller Models Databases contain work breakdown structures for various Department of Defense (DOD) construction estimating tasks. You can look up and copy all or part of these work breakdown structures as the basis for estimates, and you can also add additional title elements to these databases for storing models.
 - The CIVWB3 and CIVWB5 Databases contain the upper three (and five) levels of the U.S. Army Corps of Engineers Civil Works work breakdown structure.
 - The HTWWB3 and HTWWB5 Databases contain the upper three (and four) titles for the Hazardous, Toxic, and Radiological Waste Remedial Action work breakdown structure.
 - The TRACES Database contains the military work breakdown structures for the DOD Tri-Services military construction cost estimating.

Chapter Overview

This chapter describes the structure of the supplied MDL92A Database and explains the facility modeling formulas used in this database. The chapter also provides instructions for adding, deleting, and editing in any Models Database, and discusses the use of multiple Models Databases.

The following sections are included in Chapter 4:

- 4.1 Structure of the MDL92A Database
- 4.2 How Quantities Are Linked
- 4.3 Adding Models
- 4.4 Editing and Deleting
- 4.5 Working With Multiple Databases

4.1 Structure of the MDL92A Database

Introduction

This section describes the structure of the MDL92A Models Database supplied with GOLD.

The MDL92A Database is designed for building construction. Other Models Databases applicable to other types of projects, such as civil works, will have a similar structure and features but follow a different classification scheme.

Accessing the Database

You can access the Models Database by highlighting it on the Main Menu Screen and pressing Enter.

You can also access the database from within the Project Database, by using the Lookup feature. See Section 2.1 for instructions.

Models Master Record

The Level 1 titles screen of every Models Database includes a Models Master Record.

This record is similar to the Project Information Record in a Project Database:

- The record contains the cost totals for the entire database.
- It serves as the starting place for a new database. That is, it is the one record copied when you add a new database through the F2 Add function. (See Section 4.5.)

Building Systems Classification

The MDL92A Database is broken down according to the *building systems* hierarchy. This is the same breakdown scheme as is used in the supplied Army Corps of Engineers' Assemblies Database. (See Volume 1, Section 14.1.)

The building systems classification organizes construction costs according to function, such as substructure, roofing, and so on. This approach makes it possible to estimate costs by function during the planning and early design of a project, before the detailed identification of materials.

Note: You can store an existing GOLD estimate in the MDL92A Database whether that estimate uses the building systems structure or not. For example, you can store estimates organized according to the CSI Divisions. See Section 4.3 for more information.

Level 1: Facilities

In the MDL92A Database, Level 1 is the facility level. Each of the facility models is listed here as a separate title.

Example: ADP Automated Data Processing Building

Level 1 also contains a special title called "Sitework Assemblies." The sitework assemblies that are organized and stored beneath this title can be applied to any facility, as discussed in Section 2.9.

Level 2: Systems

Below each Level 1 title, the Level 2 titles break down the facility costs by building system. The last two-digits of each title's ID at this level are referred to as that title's *system code*.

Example: ADP 05 Interior Construction

Note: All of the building systems are not used for every facility. Therefore, only the relevant systems are listed as titles at Level 2.

Level 3: Subsystems

Beneath each system title, one or more subsystems is listed at title Level 3.

Example: ADP 05.1 Interior Partitions - Fixed

Assembly and Detail Levels

Each subsystem is further broken down into assemblies, listed at title Level 4.

Just as in the Assemblies Database, each assembly represents all the costs required to create a larger piece of a project, or to perform a specific task.

Cost items are stored at the detail level below each assembly.

Note: The original Army Corps of Engineers' mainframe-based library contained an optional level between subsystem and assembly for some systems. This "category" or "assembly group" level was for organization only and was not linked. GOLD's title structure does not use this optional level since the subsystem breakdown is more readable without it.

4.2 How Quantities Are Linked

Introduction

This section explains how the quantities of titles and items are linked in the MDL92A Database. This discussion includes descriptions of the parameters used to link upper-level titles in the database, and of the formulas used to compute certain parameters.

What Linkage Means

Quantities are linked throughout the MDL92A Database. This means that the quantity of every title element and detail item depends on an external factor (called a reference value).

Linkage in the MDL92A Database

In the case of the MDL92A Database (as released by BSD), the reference value is always one of the following:

- A facility parameter measured during the original takeoff of the facility that was the source of the model. Parameters are used at title Levels 1, 2, and 3.
- The quantity of the closest upper-level title (called the parent title). Parent Quantities are used at the Assembly and Detail levels.

Link Quantity Function

At each level, the linkage can be viewed and changed through the Link Quantity function (Ctrl+F7), which is described in Section 2.6.

Facility Parameters

The following table lists the facility parameters used in the MDL92A Database. Each of these parameters is defined on a parameter worksheet, which can be viewed through the Edit Parameter function (Ctrl+P).

Note: All parameters are not used in every facility.

Parameter	Code	UOM
Average Ceiling Height	ACH	LF
Cooling BTU	CBT	BTU
Exterior Wall Closure	EWC	SF

Parameter	Code	UOM
Floor-to-Floor Height Above Grade	FAG	LF
Floor-to-Floor Height Below Grade	FBG	LF
Structural Frame Floor Construction	FSF	SF
Footprint Area at Grade	FTP	SF
Gross Floor Area	GFA	SF
Heating BTU	HBT	BTU
Interior Partitions	IPN	CF
Larger of Heating or Cooling BTUs	LBT	BTU
Percent Full Height Partitions	PCT	PCT (%)
Facility Perimeter Length	PER	LF
Plumbing Fixtures	PFX	EA
Piling Depth	PIL	LF
Stories Above Grade	SAG	EA
Substructure Basement Excavation	SBE	CF
Stories Below Grade	SBG	EA
Substructure Basement Wall	SBW	SF
Substructure Special Foundations	SSF	CF
Stair Construction	STC	EA
Total Stories	STO	EA
Number of Stairwells	STW	EA
Wall Finishes	WFN	CF

Parameters That Are Input

Some of the facility parameters are simply the quantities of the original facility that was the basis for the model.

These parameters appear on their parameter worksheets as a single line item, as on the GFA worksheet shown in Figure 4.1.

FUNCTION		PROJECT MODEL4 General Purpose Warehouse		
1 HELP		FACILITY ID : 01		
		FACILITY Name : General Purpose Warehouse		
2 A	Reference	Description	(Value Units)Op	
3 T		Gross Floor Area	47112.0000 SF	=
4 E			0.0000	
5 D			0.0000	
6 L			0.0000	
7 N			0.0000	
8 S			0.0000	
9 M			0.0000	
10	GFA	Gross Floor Area	47112.0000 SF	

EST A PROJECT v5.30

Figure 4.1: Parameter Worksheet With Single Item

Parameters That Are Calculated

Other parameters are calculated according to specific formulas. These formulas use other parameters in the facility as variables. (See *List of Parameter Formulas*, below.)

Estimate and Library Values in the Formulas

After you copy a facility model into the Project Database, you adjust its quantities to fit your current estimate. Some parameter formulas include the ratio of a current estimate parameter and the equivalent parameter from the original facility that was the source of the model (for example, the current estimate's GFA divided by the GFA of the original facility). On the worksheets, the original facility values are tagged "L-" (for "Library").

Since the model as stored in the Models Database represents the original facility, its estimate and library values are always equal. This remains true unless you choose to change the parameter worksheets, which in effect redefines the model.

List of Parameter Formulas

Cooling BTU

$$CBT = ((\text{Gross Floor Area} / \text{Library Gross Floor Area})^{0.66}) * \text{Library Cooling BTU}$$

Exterior Wall Closure

$$EWC = \text{Stories Above Grade} * \text{Floor-to-Floor Height Above Grade} * \text{Facility Perimeter Length}$$

Structural Frame Floor Construction

$$FSF = \text{Gross Floor Area} - \text{Footprint Area at Grade}$$

Footprint Area at Grade

$$FTP = (\text{Gross Floor Area} / (\text{Stories Above Grade} + \text{Stories Below Grade})) / (\text{Library Gross Floor Area} / (\text{Library Stories Above Grade} + \text{Library Stories Below Grade})) * \text{Library Footprint Area at Grade}$$

Heating BTU

$$HBT = ((\text{Gross Floor Area} / \text{Library Gross Floor Area})^{0.66}) * \text{Library Heating BTU}$$

Interior Partitions

$$IPN = \text{Gross Floor Area} * (\text{Floor-to-Floor Height Above Grade} * \text{Percent of Full Height Partitions} + \text{Average Ceiling Height} * (1 - \text{Percent of Full Height Partitions}))$$

Note: The Percent of Full Height Partitions value is stored as a whole number. It is therefore divided by 100 on the worksheet to yield a percentage.

Larger of Heating or Cooling BTU

$$LBT = \text{Cooling BTU} > \text{Heating BTU}$$

Note: This formula simply uses the > operator to take the larger of the two values.

Facility Perimeter Length

$$PER = ((\text{Footprint Area at Grade} / \text{Library Footprint Area at Grade})^{0.5}) * \text{Library Facility Perimeter Length}$$

Plumbing Fixtures

$$PFX = ((\text{Gross Floor Area} / \text{Library Gross Floor Area})^{0.66}) * \text{Library Plumbing Fixtures}$$

Substructure Basement Excavation

$SBE = \text{Footprint Area at Grade} * \text{Stories Below Grade} * \text{Floor-to-Floor Height Below Grade}$

Substructure Basement Wall

$SBW = \text{Facility Perimeter Length} * \text{Stories Below Grade} * \text{Floor-to-Floor Height Below Grade}$

Substructure Special Foundations

$SSF = \text{Footprint Area at Grade} * \text{Piling Depth}$

Stair Construction

$STC = (\text{Stories Above Grade} + \text{Stories Below Grade}) * \text{Number of Stairwells}$

Total Stories

$STO = \text{Stories Above Grade} + \text{Stories Below Grade}$

Number of Stairwells

$STW = (\text{Footprint Area at Grade} / \text{Library Footprint Area at Grade}) * \text{Library Number of Stairwells}$

Wall Finishes

$WFN = \text{Gross Floor Area} * \text{Average Ceiling Height}$

Facility Quantities

At title Level 1, the quantity of each facility is considered equal to the facility's Gross Floor Area (GFA).

This quantity is established by linking the facility title to the GFA parameter worksheet, with a local value of 1. The link is illustrated in Figure 4.2.

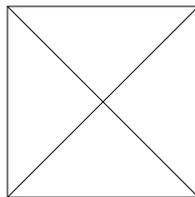


Figure 4.2: Link Quantity Window for a Facility Title

System Quantities

The system quantities at title Level 2 are generally used only for organization and reporting purposes. Like the facility title, each system title is linked to the GFA and given a local value of 1 (Figure 4.3).

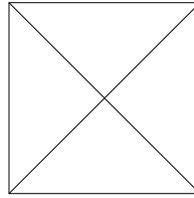


Figure 4.3: Link Quantity Window for System Title

Subsystem Quantities

Subsystem quantities are computed by linking the subsystem title element to one of the facility parameters. Refer to the table below for a listing of the parameters used with each subsystem.

The local value used in the linkage depends on the quantity relationship between the particular subsystem and its defining parameter.

For example, Subsystem 042 Exterior Doors is linked to the Footprint Area at Grade (FTP) parameter. In the Automated Data Processing (ADP) Building model, the FTP of 12,457 SF is multiplied by a local value of .0006. This translates to a quantity relationship of six exterior doors for every 10,000 SF of footprint.

As shown in Figure 4.4, the computation yields a quantity result of 7.4742.

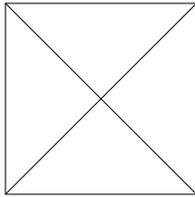


Figure 4.4: Link Quantity Window For Subsystem Title

Table of Subsystem Parameters

This table lists the parameter worksheets used to establish quantity relationships for subsystem elements.

Note: All subsystems not listed here are linked to the GFA parameter.

Subsystem	Parameter Worksheet
011 Standard Foundations	FTP - Footprint Area at Grade
012 Special Foundations	SSF - Substructure - Special Foundations
013 Slabs on Grade	FTP - Footprint Area at Grade
015 Basement Walls	SBW - Substructure Basement Walls
021 Floor Construction	FSF - Structure Frame - Floor Construction
022 Roof Construction	FTP - Footprint Area at Grade
023 Stair Construction	STC - Stair Construction
031 Roofing	FTP - Footprint Area at Grade
041 Exterior Walls	EWC - Exterior Wall Closure
042 Exterior Doors	FTP - Footprint Area at Grade
051 Interior Partitions- Fixed	IPN - Interior Partitions
061 Wall Finishes	WFN - Wall Finishes
081 Plumbing - Domestic	PFX - Plumbing Fixtures Systems
082 Rainwater Drainage	FTP - Footprint Area at Grade
092 Heating Systems	HBT - Heating BTU
093 Cooling Systems	CBT - Cooling BTU
094 Conditioned Air Systems	LBT - Larger of Heating or Cooling BT

Subsystem	Parameter Worksheet
098 HVAC Controls & Instrum	LBT - Larger of Heating or Cooling BTU
099 HVAC Testing, Balancing	LBT - Larger of Heating or Cooling BTU
134 Conveyer Systems	STO - Total Stories

Assembly Quantities

The quantity of each assembly in the database is linked to the quantity of the subsystem to which the assembly belongs.

The parent (subsystem) quantity is multiplied by (or in some cases divided by) a local value. This local value is determined, as it is at the subsystem level, by the quantity relationship in the original facility. The local value generally represents the ratio or percentage of the assembly quantity to the total subsystem quantity.

Example: Under the Exterior Doors subsystem in the ADP facility is an assembly for Exterior Double Leaf Hollow Metal Doors. As shown in Figure 4.5, the subsystem quantity of 7.4742 is multiplied by a local value of 0.2857. In other words, the quantity of exterior double leaf hollow metal doors is estimated at 28% of the total exterior door quantity. The quantity result is 2.1354.

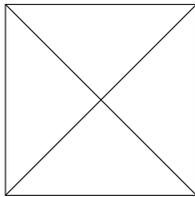


Figure 4.5: Link Quantity Window For Assembly Title

Detail Quantities

The quantities of detail items are linked to their parent assemblies in the same way that assemblies are linked to subsystems. The local value represents the ratio or percentage of the detail item quantity to the assembly quantity.

Example: Under the Double Leaf Hollow Metal Doors assembly is an item for butt hinges. The local value of 1.5 specifies a ratio of 1.5 pairs of hinges for each door leaf (Figure 4.6).

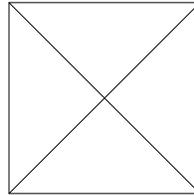


Figure 4.6: Link Quantity Window For Detail Item

4.3 Adding Models

Purpose

You can add models to a Models Database at any time by looking up and copying in existing GOLD estimates or parts of estimates. This allows you to store histories of your projects in a single database.

Task and Facility Models

You can store both task models and facility models in a Models Database.

- To store task models, first define in the Models Database whatever title structure is appropriate for the tasks. Then look up and copy each task model from the Project Database to the lowest title level in the Models Database. (Refer to "Procedure: Copying From the Project Database," below for detailed instructions.)
- Adding facility models can be more complex, as it usually involves multiple levels of titles and quantity links. The tasks and options involved in adding facility estimates to the Models Database are explained in the rest of this section.

Copying From a Project With Multiple Facilities

If the Project Database you are copying from contains more than one facility, you can copy each facility in as a separate model. Simply select the appropriate title element and copy it to Level 1 in the Models Database.

Copying From a Project With a Single Facility

If the Project Database represents a single building or facility containing more than one Level 1 title, you can still copy the whole facility as a model:

1. First add a Level 1 title to the Models Database. Give this title the name of the facility.
2. Copy each title element from Level 1 of the Project Database to Level 2 of the Models Database.

Copying Projects With Extra Title Levels

If you have a facility with more title levels than your Models Database, you can still copy it into the Models Database. However, you may lose one or two title levels at the bottom. Any quantity links to the lost titles will also be lost. However, after the facility has been copied, you can define new links to the remaining titles.

Copying From Projects Without Links

You can copy from any GOLD project into the Models Database, whether or not the project contains linked quantities or parameters.

If you copy a facility estimate with no quantity links into the Models Database, you then have the option of linking its quantities, as discussed below.

Copying in Existing Links and Parameters

When you copy a project or project element containing linked quantities into the Models Database, the quantity links and any parameters are automatically copied as well.

For example, if you have a facility estimate that includes assemblies or crews as assemblies, the linkage of cost items to the assembly titles is preserved when you copy from that project into the Models Database.

Procedure: Copying From the Project Database

Follow these steps to copy a title element from the Project Database into the Models Database.

1. On the GOLD Main Menu screen, select the Project Database you want to copy from so that it is displayed in the database window.
2. Access the Models Database.

Result: The Level 1 title list screen is displayed.

3. Do one of the following:
 - If you want to add the title element at Level 1 of the Models Database, press the F2 (Add Item) key.
 - If you want to add the element at a different level, first display the appropriate title list screen at that title level, then press the F2 key.

Result: A title entry screen is displayed in add mode.

4. Press Ctrl+L or select the Project option from the Lookup menu.

Result: The Project Database is accessed, and the Level 1 title list screen is displayed.

5. Highlight the Level 1 title to be copied, or search through the database until finding and highlighting the title element to be copied.

6. Press the F6 key and then the Enter key.

Result: The selected element is copied into the Models Database. The title entry screen is displayed with the project data shown.

7. Press the F10 (Exit Screen) key to exit.

Result: A title list screen is displayed, with the copied project element now shown as a title.

Linking a Facility in the Models Database

After copying an estimate for a facility into the Models Database, you will probably want to link all of its quantities. This makes it easy to use the facility later as a model for another estimate.

You have two options for linking a facility estimate's quantities:

- You can use the Link Element function. This one-step option lets you quickly link every title and detail item to its immediate parent quantity.
- You can use parameter worksheets and the Link Quantity function to link the facility according to the method used in the MDL92A Database (explained in Section 4.2. and the procedure below). This method is more time-consuming, but it makes it easier to adjust quantities later simply by changing parameter values.

Both of these methods are described in the procedures below.

Procedure: Linking With Link Element

Use this procedure to link the quantities of a facility estimate with the Link Element function, after copying the estimate into the Models Database.

1. Display the title entry screen for the top-level title of the element representing the estimate.
2. Press Ctrl+K or choose Link Element from the Compute Menu.

Result: GOLD prompts you to confirm that you want to link all the quantities in this element.

3. Press Y to confirm.

Result: GOLD prompts you to determine whether any existing quantity links within the element should be preserved or overwritten.

4. Press Y to preserve any existing links or N to overwrite them.

Result: All subtitles and detail items in the facility are linked to their parent quantities. The individual quantities of the subtitles and items are not changed. The ratio of these quantities to their parent quantities are computed by the program and entered as local values on the Link Quantity Window.
(*Exception:* If there were existing links and you chose Y to preserve them, these links are not changed.)

Procedure: Linking With Parameters

Follow these steps to link the quantities of a facility that you have copied into the Models Database, according to the method used in the MDL92A Database.

Note: This procedure assumes your facility is organized according to the building systems hierarchy. If your facility has a different organization, you can adapt the procedure. To do so, you must determine the correct quantity relationship for each title element.

1. At title Level 1, add parameter worksheets for all the facility parameters needed for this facility. Refer to the formulas in Section 4.2 and the existing worksheets in the supplied MDL92A Database to assist you. (You may choose to modify formulas or add new parameters as appropriate for your facility.) Use the actual quantities of your facility as the worksheet values.

Example: Enter the actual gross floor area of the copied facility on the GFA worksheet.

Note: For those facility parameters that use library values (L-), set the library values equal to the actual estimate values.

2. Use the Link Quantity function (Ctrl+F7) to link the facility title to the GFA worksheet. Enter 1.00 as the local value.
3. Link each system quantity to the GFA parameter, again with a local value of 1.00.

Note: This step is optional, but it adheres to the MDL92A Database method, which uses the GFA to provide a per SF cost for each system.

4. For each subsystem title, calculate the local value of that element by dividing the actual facility quantity by the appropriate facility parameter, as listed in Section 4.2

Then use the Link Quantity function to establish the quantity link for that element.

Example: Your facility contains an Exterior Walls subsystem element with a quantity of 23,477 SF. Dividing this by the actual Exterior Wall Closure (EWC) parameter of 25,500 SF yields a local value for this element of 0.92. This local value represents the wall subsystem as a percentage (92%) of the total exterior closure.

5. For each assembly title, calculate the local value of that assembly in relation to its parent (subsystem) quantity.

Then use the Link Quantity function to establish the quantity link for each assembly.

Example: Your Exterior Walls subsystem includes an assembly for a Reinforced Concrete Block Exterior Wall. The parent quantity is 23,477 and the actual assembly quantity is also 23,477, yielding a local value of 1.000. (In other words, 100% of the wall subsystem is reinforced cmu.)

6. If there are detail items in the assemblies that are not already linked, you can link them to their parent quantities in the same way.

Example: The Exterior Wall assembly includes an item for 430 CY of mortar. Dividing this by the parent quantity of 23,477 SF yields a local value of 0.183, that is, a ratio of 0.183 CY of mortar for each SF of reinforced cmu.

4.4 Editing and Deleting

Basic Editing and Deleting

The basic editing and deleting functions work the same in the Models Database as in the other databases. You can modify or delete titles at any level, as well as detail items.

Refer to Section 6.4 in Volume 1 for detailed instructions.

Adding to a Facility Model

One particular way you might choose to modify a facility model is to add title elements or detail items.

- You can look up and copy assemblies from the Assemblies Database. The quantity link between the detail items and the assembly title will be copied as well. You can then define whatever link is appropriate between the assembly title and the rest of the facility.
- You can also look up and copy individual detail items from the Unit Price, Labor Rates, or Equipment Rates Databases. After copying, you can link the quantities of these items to their parent title.

Editing Parameters and Links

Another way that you can modify a model is to change its parameters or quantity links.

- Use the Edit Parameter function (Ctrl+P) to modify parameter values or formulas. You can also add new parameters through the Add Parameter (Alt+P) function.
- Use the Link Quantity function (Ctrl+F7) whenever you want to change the linkage of items or titles.

4.5 Working With Multiple Databases

Purpose

You may want to use multiple Models Databases to store models for different kinds of estimates, or to subdivide the supplied Models Databases to save disk storage space.

Creating a New Models Database

There are three methods available for creating a new Models Database.

- You can use the F2 Add key and the Models Database Edit Screen to add the new database. This method copies only the Models Master Record, column names, and breakdown structure from the present Models Database. Use this method if you want to create a new database from scratch.
- You can use the Copy a Database option on the Services Menu to create a duplicate of the present database. Use this method if you want the new database to be substantially the same as your present one (for example, if you only want to add and/or delete a few facilities.)
- You can use the Extract To function on the Mark Menu to extract whatever portion of the current database you choose and place it in a new database.

Note: The MDL92A Database, with over 40 facility models, currently requires 22 MB of disk space. You may therefore find it useful to extract a few facilities and place them in their own database using this third method.

Using the F2 Add Key

Use this procedure to create a new Models Database from scratch, beginning on the Main Menu Screen.

1. Position the highlight on an existing Models Database. Then press the F2 Add key.

Result: The Models Database Edit Screen (Figure 4.7) is displayed.

2. Fill in a six-character database ID and descriptive name for the database in the respective fields. You can fill in the other fields as needed, or leave the defaults as filled in by the program. (See Section 9.4 in Volume 1 for Field Descriptions.)

After completing the screen, press F10 to exit and save.

Result: The new Models Database is created and displayed in the database window. This new database contains only the Models Master Record.

3. Access the new database and begin adding whatever data you wish.

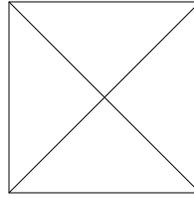


Figure 4.7: Models Database Edit Screen

Using the Copy a Database Method

Follow these steps to create a second Models Database using Copy a Database.

1. Use the Copy a Database option from the Services Menu to create a copy of the current Models Database. (See Section 24.3 in Volume 2 for instructions.) Give the copy a new name reflecting its contents or other purpose.
2. Select the new database so that it appears in the database window on the Main Menu Screen.
3. Access the new database and make whatever additions or edit changes are needed.

Using the Extract To Method

Follow these steps to create a new Models Database using the Extract To option on the Mark Menu.

1. Access the current Models Database. Choose the appropriate title level (normally Level 1), then use the Mark function (Shift+F9) to mark whatever title elements you want to copy to the new database.
2. Press Alt+X or choose the Extract To option on the Mark Menu.

Result: A window is displayed and you are prompted to enter the path and database ID of the new database to be created.

3. Type in the path and ID of the new database. Give it an ID to reflect its contents or other purpose. Then press Enter.

Result: The new Models Database is created and the data you have marked is copied to it. GOLD displays a message informing you when processing is complete.

CHAPTER 5

THE LINK LISTING REPORT

Introduction

The Link Listing Report is an additional project report available only through the Models Module.

Note: This report summarizes the use of quantity links and parameter worksheets in a *Project Database*. Project reports can not be run on a Models Database. However, you can print any element of a Models Database, including its Link Listing information, using the Print Single Element function (Ctrl+E keys). See Volume 1, Section 20.1.

Description

The Link Listing Report is a detailed listing of every linked title in a Project Database. The information shown for each title is the same as that shown on the Link Quantity Window:

- Reference Type
- Reference Value
- Operator
- Local Value
- Quantity Result (with Unit of Measure)

If the Project Database contains titles linked to parameter worksheets, these worksheets and their formulas are also listed on the report.

Producing the Report

To produce a Link Listing Report, you enter Y in the Link Listing field on the Report Selection Screen.

Refer to the Chapter 23 in Volume 1 for detailed instructions on creating reports.

Example 1

Figure 5.1 shows a portion of the Link Listing Report for a project based on the General Warehouse facility model, as described in Chapter 2.

BSD					
PROJECT MODEL1: General Warehouse w/Sitework					
Sample Link Listing Report					
01. General Purpose Warehouse					
** LINK LISTING **					
01. General Purpose Warehouse	REFERENCE	REF VALUE	OPERATOR	LOCAL INPUT	QUANTITY UOM
0102 2 1 Structural Canopy Roof Frame Inc					
	P	51891.8582 SF		0.0768	3985.2947 SF
Pipe Columns At	P	3985.2947 SF	* Multiply by	0.0006	2.3912 TON
Beams & Purlins	P	3985.2947 SF	* Multiply by	0.0070	27.8971 TON
Steel Angle	P	3985.2947 SF	* Multiply by	0.0001	0.3985 TON
Open Web Joists	P	3985.2947 SF	* Multiply by	0.0002	0.7971 TON
Steel Plate	P	3985.2947 SF	* Multiply by	0.0001	0.3985 TON
Anchor Bolts 3/8	P	3985.2947 SF	* Multiply by	0.0130	51.8088 EA
Anchor Bolts 1/2	P	3985.2947 SF	* Multiply by	0.0045	17.9338 EA
Anchor Bolts 5/8	P	3985.2947 SF	* Multiply by	0.0301	119.9574 EA
Wood Blocking	P	3985.2947 SF	* Multiply by	0.0296	117.9647 BF
0102 2 2 Metal Roof Deck At Administratio					
	P	51891.8582 SF		0.0215	1115.6750 SF
1-1/2in Mtl Deck	P	1115.6750 SF	* Multiply by	1.0000	1115.6750 SF
0103 Roofing					
	W GFA 1	47112.0000 SF		1.1102	47112.0000 SF
0103 1 Roofing					
	W FTP 1	46741.0000 SF		1.1102	51891.8582 SF
0103 1 1 Metal Roof Canopy Over Dock Load					
	P	51891.8582 SF		0.0768	3985.2947 SF
Metal Furr'g Stud	P	3985.2947 SF	* Multiply by	0.9619	3833.4550 SF
Roof Dock Canopy	P	3985.2947 SF	* Multiply by	1.0000	3985.2947 SF
Caulking/Sealant	P	3985.2947 SF	* Multiply by	0.1757	700.2163 LF

Figure 5.1: Link Listing Report Example 1

Example 2

Figure 5.2 shows part of the Link Listing report for a project containing the Excavation by Dragline task models discussed in Chapter 3.

This example illustrates how parameter worksheets appear on reports.

BSD					
PROJECT EXCDRG Excavation of River Channel					
Sample Link Listing Report					SETTINGS PAGE 2
Excavation Dragline Example					
** LINK LISTING **					
01. River Diversion	REFERENCE	REF VALUE	OPERATOR	LOCAL INPUT	QUANTITY UOM
01. River Diversion					1.0000 EA
0101 Excavation by Dragline	N 2	0.0000	1.0000		40000.0000 CY
CYEXC 2	Cubic Yards Of Excavation				
	Cubic Yards of Excavation	N D	6387.4020		CY
CYEXC 2	Cubic Yards Of Excavation				6387.4020 CY
DRACYC2	Dragline Cycle Time				
	Dragline Cycle Time	N	1.8500	/ Divide by	MIN
	Minutes Per Hour	N	60.0000		HRS
DRACYC2	Dragline Cycle Time				0.0308 HRS
DRAPAY2	Dragline Payload				
	Bucket Size	N	3.5000	/ Divide by	CY
	Shrink Swell	W SHRSWL2	1.2000		
DRAPAY2	Dragline Payload				2.9167 CY
DRLPRO2	Dragline Productivity				
	Dragline Payload	W DRAPAY2	2.9167	/ Divide by	CY
	Dragline Cycle Time	W DRACYC2	0.0308		HRS

DRLPRO2	Dragline Productivity				94.6981 CY/
DUPMTI2 Dump Time					
	Dump Time	N	2.0000	/ Divide by	HRS
	Minutes Per Hour	N	60.0000		
DUPMTI2 Dump Time					
					0.0333 HRS
EXDUR 2 Excavation Duration					
	Excavation by Dragline	A 01	(40000.0000	/ Divide by	CY
	Dragline Productivity	W DRLPRO2	94.6981)	R Round	CYH
		N	1.0000		HRS
EXDUR 2 Excavation Duration					
					422.0000 HRS

Figure 5.2: Link Listing Report Example 2

CHAPTER 6

DIGITIZER PREPARATION

Chapter Overview

This chapter describes the GOLD Digitizer Module and explains the tasks required to prepare for its use. Five sections are included:

- 6.1 About the Digitizer Module
- 6.2 Establishing User Settings
- 6.3 Configuring GOLD for the Digitizer
- 6.4 Standard Setup Tables
- 6.5 Setting Up the Menu Card

6.1 About the Digitizer Module

Description

The GOLD Digitizer Module, used in conjunction with a digitizer device, allows you to do quantity takeoffs from drawings and to automatically place the quantities into an estimate. The Digitizer Module is an optional portion of the GOLD software.

Features

The GOLD Digitizer Module provides the estimator with the following features:

- Digitized takeoff of quantities with onscreen display of graphic images
- Takeoff of areas, continuous and non-continuous lengths, and cumulative point counts
- Point and trace modes
- Calculator for applying operations to digitized values, and for use as a pop-up calculator within GOLD

- Automatic input of digitized or calculated values onto GOLD screens or optional parameter worksheets
- A menu card that allows you to access digitizer and program functions from the digitizer tablet as well as from the keyboard
- Takeoff audit trail and Audit Report, provided through use of the optional parameter worksheets

Required Hardware

To use the Digitizer Module, your computer system must be equipped with the following:

- A digitizer device, such as those listed under "Software Setup" below
- RS232C-standard serial communications port
- VGA, EGA, CGA, or Hercules-compatible graphics card and monitor

Software Setup

The GOLD Digitizer Module supports a wide range of industry-standard digitizers. Predefined software setup tables are provided for the following types. For digitizers not on this list, you can define your own setup table.

- Altek AC Series
- Calcomp 2X00, 9X00, and Drawing Board
- GTCO Digi-Pad Type 5 and Super L Series
- Hitachi HDG Series
- Kurta IS Series, including XLC
- Numonics Series 2000
- Science Accessories Corporation GP Series
- Summagraphics LCL Series

Preparation Overview

Preparation for use of the Digitizer Module involves installing the required hardware and properly configuring the software. This generally includes the following tasks:

1. Installing the digitizer device. Refer to the documentation provided with your digitizer for instructions.
2. Configuring the digitizer device. The communication parameters used by the digitizer are determined by switch settings on the device. These settings must match the corresponding software settings configured in GOLD (see Task 5 below). Also, a carriage return must always be sent as part of the digitizer coordinate message format. Refer to Section 6.3 and to your digitizer documentation for more information.
3. Installing the digitizer software. If you have purchased the digitizer option, the Digitizer Module is automatically installed when you install the GOLD software. Refer to Volume 1, Chapter 2 for installation instructions.
4. Assigning the digitizer to the user. For a user to access the Digitizer Module, they must have the proper digitizer setup table assigned to them through the User Settings Screen. See Section 6.2.
5. Configuring the GOLD software to work with the digitizer. If you have one of the digitizers for which a setup table is provided, you will not normally need to enter any information except for your screen type. However, if desired, you can make adjustments to the other settings. You can also define a setup table for a digitizer not on the list. Refer to Section 6.3 for instructions.
6. Setting Up the Menu Card. A menu card designed specifically for use with GOLD is provided with the software. See Sections 6.5 and 7.3 for information.

6.2 Establishing User Settings

Purpose

In order for you to use a digitizer, your user permission settings must include assignment of the digitizer. GOLD uses this assignment to load the proper digitizer setup table.

System Administrator

In order to define or change user settings, you must have access to the Admin Menu. That is, you must be a system administrator or a single-user with the Administrative Module installed on your system. Refer to Section 2.4 and Chapter 25 in Volume 1 for more information.

User Settings Screen

The system administrator or other authorized user assigns a digitizer on the User /Administrator Settings Screen (Figure 6.1). Refer to the Volume 1, Section 25.1 for more information on using this screen.

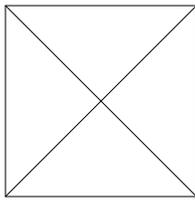


Figure 6.1: User/Administrator Settings Screen

Procedure

Use these steps to assign a digitizer to a user, beginning on the GOLD Main Menu Screen.

1. Press the A key to access the Admin Menu. With the highlight on the Edit Permission Settings option, press Enter.

Result: A window is displayed prompting you to enter the path of the COMPOSER.INI file to be loaded.

2. Type in the path specification for the startup directory of the user of the digitizer.

Result: The User Settings Screen is displayed.

3. Move the highlight to the Digitizer Selection field.
4. Press the F8 SELECT key to see a listing of the available digitizer setup tables. Highlight the setup table to be used and press the Enter key.

Note: Choose *User-Defined* if you need to configure a type of digitizer not on the list.

Result: The selected digitizer table is displayed in the field.

5. Press F10 (Exit Screen) to exit and save.

6.3 Configuring GOLD for the Digitizer

Purpose

In order for GOLD to work with the digitizer, a number of parameters must be correctly set. Most of these parameters have to do with the type of digitizer and the switch settings made on the digitizer. The parameters are stored in a digitizer setup table.

Digitizer Setup Tables

The Digitizer Module is packaged with predefined setup tables for the following types of digitizers:

- Altek AC Series
- Calcomp 2X00, 9X00, and Drawing Board
- GTCO Digi-Pad Type 5 and Super L Series
- Hitachi HDG Series
- Kurta IS Series, including XLC
- Numonics Series 2000
- Science Accessories Corporation GP Series
- Summagraphics LCL Series

If you use one of these digitizers, you will normally not need to edit the setup table, except to enter the Screen Type. However, you can make adjustments to other parameters if needed. You can also create a user-defined table if you have a different type of digitizer.

Note: Section 6.4 lists the predefined setup table entries for each digitizer type.

Setup Screen

You work with digitizer setup data through the Edit Digitizer Setup Table Screen. An example screen is shown in Figure 6.2.

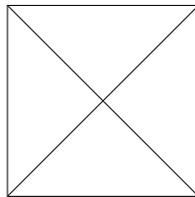


Figure 6.2: Edit Digitizer Setup Screen

Procedure

Use the following steps to edit or add a digitizer setup table. Begin on the GOLD Main Menu Screen.

Note: This procedure assumes that the proper digitizer setup table has been loaded. You accomplish this by assigning the digitizer on the User Settings Screen, as discussed in Section 6.2.

1. Press the A key to access the Admin Menu. Move the highlight to the Edit Digitizer Setup Table option and press Enter.

Result: The Edit Digitizer Setup Screen is displayed.

2. Edit or add information for the digitizer by filling in the fields on the screen. Refer to the Field Descriptions below for more information.
3. After defining the information on the screen as needed, press the F10 (Exit Screen) key to save the data and return to the GOLD Main Menu Screen.

Field Descriptions

Field	Description
Description	The type of digitizer, as specified on the User Settings Screen for this user. Filled in by the program.
<u>Communication Fields</u>	The following fields define the RS232C serial communication setup between the digitizer and GOLD. Digitizers allow you to adjust communication parameters through hardware switches. Whatever settings you use must be exactly the same as defined by the digitizer switches and on this screen.
Comm Port	Serial communications port to which the digitizer is connected. Choices are: <ul style="list-style-type: none"> • COM1 • COM2 • COM3 • COM4
Baud Rate	Baud rate used by the digitizer. Options are: <ul style="list-style-type: none"> • 1200 • 2400 • 4800 • 9600
Data Bits	Number of data bits. Valid values are 5, 6, 7, and 8.
Stop Bits	Number of stop bits. Valid values are 1 and 2.
Parity	Type of parity. Values are Even, Odd, or None.
RTS/CTS	Request to Send/Clear to Send - Indicates whether the digitizer uses RTS/CTS signals (RS232C pins 4 and 5). Values are Yes and No. This field is generally set to Yes.
Echo	Indicates whether or not the digitizer echoes each command sent by the software. Values are Yes and No.

Field	Description
<u>Message Definition Fields</u>	The following fields, on the right side of the screen, define the format and content of messages that pass information between the digitizer and GOLD. Refer to <i>Defining Message Formats</i> below for more information.
Digitizer Message Length	Total number of characters in the message that the digitizer sends to GOLD to specify coordinate positions. Up to 64 characters can be used.
Coordinate Data Length	Within the digitizer coordinate message, the number of characters used to specify the X and Y coordinates. This includes a sign character (+ or -) if used.
X Coordinate Position	In the digitizer coordinate message, the position of the first character of the X coordinate.
Y Coordinate Position	In the digitizer coordinate message, the position of the first character of the Y coordinate.
Sign Position	In the digitizer coordinate message, the position of the character used to indicate plus or minus in the X and Y coordinates. Enter 0 if no sign character is used.
Command Prefix	Character used as a prefix before each command that the software sends to the digitizer. For this and the next two fields, only one character is actually defined. Four character spaces are provided on the screen so that you can type in the decimal equivalents of ASCII control characters, preceded by a back slash. The back slash instructs the software to convert the following digits into a control character. For example, you would type \027 to define the Esc character.
Command Prompt	Character sent by the digitizer after receiving the Command Prefix, to indicate the digitizer is ready to receive the command. This field is blank for most digitizers.

Field	Description
Command Suffix	Character used at the end of each command that the software sends to the digitizer.
Command Separator	Character used to separate each command that the software sends to the digitizer.
Command Delay	Time delay (in units of 1/18 second) that GOLD waits after sending the Reset command.
Normal Delay	Time delay (in units of 1/18 second) that GOLD waits after sending commands other than the Reset command.
<u>Screen Type and Sound Fields</u>	
Screen Type	Type of DOS video mode used. This is determined by the type of monitor on the system. Choices are: <ul style="list-style-type: none"> • VGA, 16 color • EGA color • CGA, Black and White • Hercules-compatible, Black and White
Sound Volume	Determines the volume of the sound emitted from the computer when you use the digitizer. The higher the number, the louder the sound. Valid entries are 0-20, with 0 indicating no sound.
<u>Command Message Fields</u>	The following fields, located at the bottom of the screen, define the character strings used to send a specific command or set of commands from GOLD to the digitizer. Individual commands in a string are separated by the Command Separator character defined above. <i>See <i>Defining Message Formats</i>, below, for more details.</i>
Initialize Setup String	Character string used to initialize the digitizer (that is, prepare it to work with GOLD). Used in conjunction with the Query and Reset Strings described below.

Field	Description
Point Mode	Character string used to place the digitizer in Point Mode.
Trace Mode	Character string used to place the digitizer in Trace Mode.
Query Command	Character string used by GOLD to query the digitizer to determine if it is available. Used in conjunction with the Reset and Initialize strings. To activate the digitizer, GOLD sends these strings in the following order: <ol style="list-style-type: none"> 1. Query Command 2. Reset Command 3. Initialize Setup String
Reset Command	Character string used to reset the digitizer during the startup sequence.

Defining Message Formats

The following discussion provides technical information to help you configure a digitizer for use with GOLD. This discussion refers specifically to the Message Definition and Command Message fields. To use these fields, you need to know the format and codes used by your digitizer to exchange messages with the computer. Refer to the documentation provided with your digitizer to obtain this information.

ASCII Format

Generally, digitizers can transmit and receive data encoded in either binary or ASCII format. GOLD uses ASCII format for communicating with the digitizer.

Coordinate Messages

A digitizer works by sending X and Y coordinates to the computer each time a point is digitized. The coordinates are encoded, along with additional information, in a message.

Example: The following example shows a typical ASCII-encoded message as used by the GTCO Type 5 and Super L Series digitizers:

```
118092 03392<CR><LF>
```

where:

The first 1 is the code indicating the cursor or pen button used.

The next 18092 is the X coordinate (five characters in length).

A space separates the X and Y coordinates (optional, as determined by switch settings).

03392 defines the Y coordinate (five characters in length).

The Carriage-return <CR> and Line Feed <LF> characters complete the message (determined by switch settings on the Digitizer and required by GOLD).

For a digitizer sending the above message, the relevant Message Definition Fields would have the following entries:

- Digitizer Message Length = 14. (Fourteen characters including the space, CR and LF).
- Coordinate Data Length = 5.
- X Coordinate Position = 2. That is, the X coordinate begins at character position 2 in the string.
- Y Coordinate Position = 8. The Y coordinate begins at position 8.
- Sign Position = 0. No sign character is used.

Command Messages

The term command messages refers here to all messages sent by GOLD to the digitizer. These messages override the hardware switch settings on the digitizer. This allows you to set the hardware switches for another application program and still use the digitizer with GOLD.

Your digitizer manual will include the commands that a program can send in ASCII mode to the digitizer.

Example: The following example shows how the Trace Mode command is sent to the GTCO Type 5 and Super L Series digitizers:

1. GOLD sends the Command Prefix as defined for the GTCO Type 5:

/001

2. The digitizer is placed in command mode. It sends the Command Prompt back to the computer:

>

3. On receiving the Command Prompt, GOLD issues the Trace Mode command, followed by the Command Suffix:

LN/027

Result: The digitizer is now in trace mode.

6.4 Standard Setup Tables

Introduction

This section lists the standard configuration settings provided for each type of digitizer as released by BSD. These listings are provided in case you change one or more settings on the Edit Digitizer Setup Screen and then want to restore the original entries.

Note: The Screen Type and Sound Volume fields are not listed as these depend on your type of computer and your preference, respectively.

Altek AC Series

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
RTS/CTS	Yes
Echo	No
Digitizer Message Length	
Coordinate Data Length	
X Coordinate Position	
Y Coordinate Position	
Sign Position	
Command Prefix	
Command Prompt	
Command Suffix	

Field	Entry
Command Separator	
Command Delay	9
Normal Delay	2
Initialize Setup String	
Point Mode	
Trace Mode	
Query Command	
Reset Command	

Calcomp 2X00, 9X00, Drawing Board

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	Even
RTS/CTS	Yes
Echo	No
Digitizer Message Length	14
Coordinate Data Length	5
X Coordinate Position	3
Y Coordinate Position	8

Calcomp 2X00, 9X00, Drawing Board, Continued

Field	Entry
Sign Position	0
Command Prefix	\027
Command Prompt	
Command Suffix	\013
Command Separator	;
Command Delay	9
Normal Delay	1
Initialize Setup String	%V9;%Vm1;%K0;%Q;%N1;%A1;%B1;%Z1;%^6;%L1;%JLL;%P;%W10;%JR1000,0;
Point Mode	%P;
Trace Mode	%U;
Query Command	%VS;
Reset Command	%VR;

GTCO Digi-Pad Type 5 and Super L Series

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
RTS/CTS	Yes
Echo	Yes

Field	Entry
Digitizer Message Length	14
Coordinate Data Length	5
X Coordinate Position	2
Y Coordinate Position	8
Sign Position	0
Command Prefix	\001
Command Prompt	>
Command Suffix	\027
Command Separator	;
Command Delay	9
Normal Delay	3
Initialize Setup String	IN;AB;HR;R5;PI;SI;CI;LI;AS;IP;AD;
Point Mode	PT;
Trace Mode	LN;
Query Command	SZ;
Reset Command	RS;

Hitachi HDG Series

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	8
Stop Bits	1
Parity	None
RTS/CTS	Yes
Echo	No
Digitizer Message Length	15
Coordinate Data Length	5
X Coordinate Position	1
Y Coordinate Position	7
Sign Position	0
Command Prefix	
Command Prompt	
Command Suffix	
Command Separator	;
Command Delay	9
Normal Delay	2
Initialize Setup String	3;
Point Mode	4;
Trace Mode	5;

Field	Entry
Query Command	
Reset Command	

Kurta IS Series

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	7
Stop Bits	2
Parity	Odd
RTS/CTS	Yes
Echo	No
Digitizer Message Length	12
Coordinate Data Length	5
X Coordinate Position	2
Y Coordinate Position	7
Sign Position	0
Command Prefix	
Command Prompt	
Command Suffix	
Command Separator	;
Command Delay	9
Normal Delay	2

Kurta IS Series, Continued

Field	Entry
Initialize Setup String	I;F;R1;
Point Mode	B;
Trace Mode	A;
Query Command	3;
Reset Command	5;

Numonics Series 2000

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	7
Stop Bits	2
Parity	Even
RTS/CTS	Yes
Echo	No
Digitizer Message Length	18
Coordinate Data Length	6
X Coordinate Position	3
Y Coordinate Position	11
Sign Position	0
Command Prefix	:
Command Prompt	

Field	Entry
Command Suffix	\013
Command Separator	;
Command Delay	9
Normal Delay	3
Initialize Setup String	BP0;PB0;SW;RS1;EN;TM20;
Point Mode	PT;
Trace Mode	SW;
Query Command	
Reset Command	Z;

Science Accessories Corporation GP Series

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	7
Stop Bits	2
Parity	Odd
RTS/CTS	Yes
Echo	No
Digitizer Message Length	14
Coordinate Data Length	5
X Coordinate Position	2
Y Coordinate Position	9

Field	Entry
Sign Position	0
Command Prefix	@
Command Prompt	
Command Suffix	!
Command Separator	;

Command Delay	9
Normal Delay	2
Initialize Setup String	10002;22002;3112112;62;72200;
Point Mode	3100000;
Trace Mode	3200000;
Query Command	10000;
Reset Command	Z;

Summagraphics LCL Series

Field	Entry
Comm Port	COM1
Baud Rate	9600
Data Bits	7
Stop Bits	2
Parity	Even
RTS/CTS	Yes
Echo	No

Field	Entry
Digitizer Message Length	19
Coordinate Data Length	5
X Coordinate Position	2
Y Coordinate Position	9
Sign Position	0
Command Prefix	\027
Command Prompt	
Command Suffix	
Command Separator	;
Command Delay	9
Normal Delay	2
Initialize Setup String	MA;M1;R2;C2;W0;F0;d0;
Point Mode	M1;
Trace Mode	M2;
Query Command	a;
Reset Command	Z;

6.5 Setting Up the Menu Card

Purpose

The *menu card* distributed with the Digitizer Module enables you to access digitizer functions and other program functions using the digitizer pad. This is particularly useful when you need to change digitizer modes or use the calculator. It also permits you to navigate through the GOLD software from the digitizer pad.

Description

The menu card is a 10-1/2-inch wide grid with cells representing most of the keys found on your keyboard, plus additional cells specific to digitizer functions.

Placement of the Card

To function properly, the menu card must be placed on the digitizer tablet in as close to a horizontal position as possible.

Resetting the Card

The reset procedure is used to inform the GOLD software of the coordinates of the card on the digitizer tablet. Knowing these coordinates allows GOLD to interpret the signal sent when you select a cell on the card as a command rather than as a point on a drawing.

You perform this procedure when you first begin using the Digitizer Module, and whenever you need to move the menu card on the tablet.

Refer to Section 7.3 for instructions.

CHAPTER 7

USING THE DIGITIZER MODULE

Chapter Overview

This chapter describes the use of the GOLD Digitizer Module. The following sections are included:

- 7.1 Activating the Digitizer
- 7.2 Digitizer Screen
- 7.3 Resetting the Menu Card
- 7.4 Setting the Scale
- 7.5 Working With the Digitizer
- 7.6 Using the Calculator
- 7.7 Working With an Audit Trail

7.1 Activating the Digitizer

Purpose

Before you can access the Digitizer Module, GOLD must establish communication with your digitizer. This process is termed activating the digitizer.

Status Indicator

Whenever the digitizer is activated, the status area at the bottom of the screen displays "DIGI" as an indicator.

When to Use

You must use this procedure the first time you start GOLD and need to use the digitizer.

Once the digitizer has been activated the first time, GOLD will be set to reestablish communication with the digitizer every time you start the program and enter a database (provided the digitizer is turned on and functioning properly). You will *not* have to activate the digitizer again unless it has been disconnected, or turned off, or has malfunctioned.

Procedure

Follow these steps to activate your digitizer from GOLD. This procedure assumes that GOLD is running and that your digitizer device is properly connected and configured with the software.

1. From the Main Menu Screen, highlight any database in the database window and press the Enter key.

Result: The database is loaded and the Level 1 title list screen is displayed.

2. Press Ctrl+T or choose Digitizer On/Off from the Tools Menu.

Result: GOLD activates the digitizer. The DIGI status indicator is displayed in the status area at the bottom of the screen.

Reactivating the Digitizer

If the digitizer is not turned on or not connected when GOLD tries to establish communication, an error message will be displayed to inform you that communication has failed. At this point, GOLD will automatically deactivate the digitizer.

To reactivate the digitizer, do the following:

1. Make sure the digitizer is properly connected to your computer and is turned on.
2. Press Ctrl+T.

Result: GOLD activates the digitizer. The DIGI status indicator is displayed in the status area at the bottom of the screen.

Note: Some types of digitizers do not echo commands. If your digitizer is of this type, GOLD will not be signalled that the digitizer is not properly receiving messages. In this case, GOLD will not issue an error message and will not automatically deactivate the digitizer.

Therefore, if you cannot operate your digitizer but the DIGI status light is lit, do the following:

1. Make sure the digitizer is properly connected to your computer and is turned on.
2. Press Ctrl+T to deactivate.

3. Press Ctrl+T again to reactivate.

Result: GOLD activates the digitizer. The DIGI status indicator is displayed in the status area at the bottom of the screen.

7.2 Digitizer Screen

Purpose

The Digitizer Screen provides visual feedback of the actions you perform with the digitizer. The screen is shown in Figure 7.1.

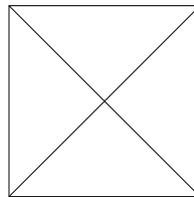


Figure 7.1: Digitizer Screen

Parts of the Screen

The Digitizer Screen is divided into two areas:

- The *graphic area* is the large area that covers the left side of the screen. This area provides a graphic image of points, lines, and shapes as you digitize them.
- The *data area* on the right of the screen is used to display information about the current takeoff or calculation. Refer to the Field Descriptions below.

Accessing the Screen

The Digitizer Screen is displayed whenever you access the Digitizer Module. You can access the Module by pressing Alt+C on the keyboard or by touching any of the following cells on the menu card:

- Cuml
- Segl
- Area
- Count
- Calc

Refer to Sections 7.5 and 7.6 for more information.

Field Descriptions

The data window on the Digitizer Screen displays the following information:

Field	Description
<u>Calculation fields</u>	These fields, located immediately below the GOLD Digitizer title, display the values and operators entered when you use the calculator function. Between 9 to 27 rows of values can be entered, depending on the video mode used. See Section 7.6 for instructions on using the calculator.
Result field	This unlabeled field, immediately below the calculation fields, shows the current takeoff value or the result of the current calculation. This is the value returned to the entry field on the GOLD screen when you exit the Digitizer Module.

Field	Description
Takeoff	<p>Displays whichever of the following Digitizer Module functions is currently in use:</p> <ul style="list-style-type: none"> • Cuml • Segl • Area • Count • Calc <p>Note: Calc is also displayed when you are resetting the menu card, and Segl is also displayed when you are setting the scale.</p> <p>See Section 7.5 for descriptions of these functions.</p>
Mode	<p>Indicates whether the digitizer is being used in point mode or trace mode. See Section 7.5.</p>
Current Length field	<p>This unlabeled field immediately below the Mode field is used only with the Segment function. It shows the length of the currently digitized line segment (while the Result field shows the accumulated total of all digitized segments).</p>
Points	<p>Shows the number of points that have been digitized during the current takeoff.</p> <p>Note: The maximum number of points that can be digitized at one time is 500. Exceeding this number causes the takeoff calculation to be cancelled.</p>
Scale	<p>The scale currently in use, represented as a ratio of 1 to another number. Default is 1/10. See Section 7.4 for instructions on setting the scale.</p>
<u>Coordinates fields</u>	<p>These two fields at the bottom of the screen show the currently digitized X and Y coordinates.</p>

7.3 Resetting the Menu Card

Purpose

You reset the menu card to communicate to the GOLD software the position of the menu card on the digitizer tablet. This function allows GOLD to read the cells on the menu card as the equivalent of keystrokes, rather than as points to be digitized.

When to Use

Use the Reset function when you first set up your digitizer, and whenever you have moved the menu card on the tablet.

Procedure

This procedure assumes that the digitizer has been activated. You can begin on the Digitizer Screen, or on any screen within a GOLD database.

1. Be sure the menu card is positioned horizontally on the digitizer tablet.
2. Press Ctrl+R, or select Relocate Menu from the Tools Menu.

Note: Once the menu card has been set the first time, you can also access the Reset function by pressing the Reset cell on the menu card.

Result: The Digitizer Screen is displayed (if it was not already displayed). The program prompts you to digitize the corners of the menu card in the following order: upper left, upper right, lower right.

3. As prompted, digitize the outside corners of the following *cells* on the card: ESC, /, and ENTER.

Results:

- GOLD displays each set of coordinates in the digitizer window on the screen.
- After you have digitized the third corner, GOLD stores the coordinates as the location of the menu card. This data is saved until the next time you reset the card.
- If you started from the Digitizer Screen, the screen remains displayed. If you started from a different GOLD screen, that screen is redisplayed.

Checking Placement of the Card

For proper operation, the menu card must be placed in as nearly a horizontal position as possible on the tablet. While using the Reset function, you can check the placement by noting the Y coordinates displayed when you touch the upper left and upper right corners of the card. The last few digits of these two Y coordinates should be as close to the same as possible, which indicates that they are in approximately the same horizontal line. A small amount of variance will not affect operation.

7.4 Setting the Scale

Description

The Scale function establishes the scale used by the Digitizer Module. Use this function whenever you need to set or change the scale of the drawings you are digitizing.

The scale is displayed in the Scale field on the Digitizer Screen. The default scale is 1/10.

Procedure

This procedure assumes that the digitizer has been activated.

1. If the Digitizer Screen is not already displayed, press Alt+C to display the screen.
2. Touch Scale on the menu card, or press Alt+7 on the keyboard.

Result: The program prompts you to enter the scale from the keyboard or the menu card.

3. If you know the scale of the drawing, you can enter the appropriate number on the keyboard or menu card.

Example: If one inch on the drawing equals 20 feet, you can simply enter 20.

4. If you want to apply the scale directly from the drawing:
 - Digitize two points on the drawing.
 - Enter the length that is represented by the segment between the two points.
 - Press the Enter key or touch the Enter cell on the menu card to accept the length.
5. Proceed with other digitizer functions.

7.5 Working With the Digitizer

Work Flow

The work flow for using the digitizer with GOLD includes the following actions:

1. Working in a Project Database, you position the cursor in a field suitable for receiving takeoff data. This may be a Quantity field on a browse mode or entry screen, or a Value field on a parameter worksheet.

Caution: Be sure the cursor is in one of these fields before accessing the Digitizer Module. Accessing the Digitizer Module from fields other than these can result in invalid data being copied back to your estimate.

2. You use the menu card or keyboard to access the Digitizer Module. You can access the Module by pressing Alt+C on the keyboard or by touching any of the following cells on the menu card:
 - Cuml
 - Segl
 - Area
 - Count
 - Calc

Result: The Digitizer Screen is displayed.

3. If needed, you reset the menu card and/or set the scale. Refer to Sections 7.3 and 7.4, respectively, for instructions.
4. You use the digitizer to take off the needed quantity. You can digitize in either point mode or trace mode, as described below.
5. Optionally, you can place the quantity in the calculator and perform operations to produce a computed value based on the quantity. See Section 7.6 for instructions on using the calculator.
6. You return the takeoff or computed value to the browse mode screen, entry screen, or parameter worksheet. You can use either the menu card or keyboard to return the value. See the Function Descriptions and Examples below.

Point Mode and Trace Mode

The Digitizer Module allows you to use your digitizer in either of two modes:

- In *point mode*, a single set of coordinates is sent to the computer each time you touch a point on the drawing. This is the default mode and can be used for the Cumulative, Segment, Area, and Count functions.
- In *trace mode*, you hold the cursor or stylus button down and trace lines on the drawing. The digitizer continuously sends point coordinates to the computer as a preset rate, which is determined by the digitizer setup (approximately 10 points per second). Trace mode is used with the Cuml and Area functions and *not* with the Segment and Count functions. Trace mode is intended primarily for measuring perimeters and areas involving curved lines.

Note: You can use point mode to achieve similar results by digitizing points close together on curved lines.

Tip on Using Trace Mode

If you use trace mode, the more slowly you move the digitizer stylus or cursor the more points will be digitized and the more accurate your takeoff will be. You can look at the graphic area on the screen to see how closely the takeoff matches the original drawing, and adjust your speed accordingly.

Switching Modes

While digitizing, you can switch between point mode and trace mode by entering Alt+1 from the keyboard or by touching the Point/Trace cell on the menu card.

Using the Menu Card as a Keyboard

While working with your digitizer, you can use the menu card as a keyboard. That is, you can access most GOLD program functions by pressing the cells on the menu card as if they were keys.

For key combinations, simply press the cell representing the Alt, Ctrl, or Shift key followed by the cell for the second key in the combination.

Restriction: If you exit the GOLD database and invoke one of the database menu options, the Digitizer Module will become inactive. When this happens, the DIGI status light will go out. You will not be able to use the menu card until you return to a GOLD database.

Function Description Table

This table describes the functions available while using the Digitizer Module. You access these functions by pressing the corresponding cell on the menu card. Most of the functions can also be accessed from the keyboard (once the Digitizer Module is accessed) by pressing the key or key combination shown in parenthesis.

Function (Keys)	Description
PT/TR (Alt+1)	Point/Trace. Switches between point mode and trace mode. Note: The Digitizer Module is in point mode whenever it is first accessed.
Cuml (Alt+2)	Cumulative. Causes the digitizer to measure the lengths between a series of continuous points. Used to measure perimeters.
Segl (Alt+3)	Segment Length. Causes the digitizer to measure a series of non-continuous line segments and to total the result. The length of the current segment is shown in the Current Length field (below the Mode field) and the accumulated total is shown in the Result field.
Area (Alt+4)	Causes the digitizer to measure the area defined by the points you digitize. After digitizing three or more points, touch Calc to enclose the area and display the result. Caution: When doing an area takeoff of an irregular shape, you must digitize points around the outer perimeter of the shape without crossing any lines. If you cross lines, the computed result will be invalid.
Count (Alt+5)	Causes the digitizer to count the total number of points digitized.
Calc (Alt+6)	Accesses the Calculator. See Section 7.6 for instructions.
Scale (Alt+7)	Used to set the scale of drawings. See Section 7.4.

Function Key(s)	Description
Reset (Alt+8)	Used to reset the coordinates of the menu card on the digitizer pad. See Section 7.3.
Cls (Alt+9)	Clear Screen. Clears the entire Digitizer Screen, including the graphic area and calculator fields.
Undo (Alt+0)	Erases the last digitized point. You can use this function repeatedly to erase up to the last ten points.
Cls I	Clear Screen Image. Clears the graphic area.
Cls C	Clear Screen Calculator. Clears only the calculator fields.
Help (F1)	Displays a Help window listing available functions.
Enter and F10 (On both the menu card and keyboard)	Exits to the GOLD screen that was displayed prior to the display of the Digitizer Screen. Returns the current takeoff or calculated value to the current field on that screen, and places the cursor in the next field.
Right Arrow and Left Arrow (Menu card and keyboard)	Same as the Enter function except that the cursor remains in the same field as the returned value on the GOLD screen.
Down Arrow (Menu card and keyboard)	Same as the Enter function except that the cursor moves to the next entry field down on the GOLD screen.
Up Arrow (Menu card and keyboard)	Same as the Enter function except that the cursor moves to the previous entry field on the GOLD screen.
Esc (Menu card and keyboard)	Exits to the GOLD screen that was displayed prior to the display of the Digitizer Screen, without returning any value.

Example: Perimeter Takeoff Using Point Mode

This example shows the steps you would use to take off a perimeter quantity using point mode. The procedure assumes that the digitizer has been activated.

1. You position the cursor in an appropriate Quantity field on a GOLD entry or browse mode screen, or in the Value field on a parameter worksheet.
2. At the digitizer, you touch the Cuml cell on the menu card.

Result: The Digitizer Screen is displayed and the Cuml function is evoked.

3. You digitize the points on the drawing representing each place where the perimeter changes direction.

Result: The outline of the perimeter appears in the graphic area of the screen. The accumulated length is displayed in the Result field.

4. After digitizing all the corners of the perimeter, you touch the Enter cell.

Result: The GOLD screen is displayed with the perimeter length stored in the appropriate field.

Example: Area Takeoff Using Trace Mode

This example shows how to take off an area containing curved edges using trace mode. The procedure assumes that the digitizer has been activated.

1. You position the cursor in an appropriate Quantity field on a GOLD entry or browse mode screen, or in the Value field on a parameter worksheet.
2. At the digitizer, you touch the Area cell on the menu card.

Result: The Digitizer Screen is displayed and the Area function is evoked.

3. You touch the PT/TR cell on the menu card to enter trace mode.
4. Using trace mode, you trace along the curved surfaces of the area. When you come to straight lines, you use point touches to digitize the two ends of the straight segment. (That is, you lift the button at the beginning of the straight segment and touch the button at the end of the segment.)

Continue in this way until the entire perimeter has been digitized.

Result: The takeoff area is shown in the graphic area on the screen.

5. You touch the Calc cell on the menu card.

Result: The Area value is calculated and displayed in the Result field.

Note: This step is optional.

6. You touch the F10 cell.

Result: The GOLD screen is displayed with the area value stored in the appropriate field.

7.6 Using the Calculator

Purpose

The calculator is used to apply mathematical operations to a digitized value and then to enter the result on a GOLD screen. It can also be used to see the result of an area takeoff before it is entered on the GOLD screen. Finally, the calculator can be used as a pop-up calculator from the GOLD software, apart from any other digitizer functions.

Accessing the Calculator

Assuming the digitizer is activated, you can access the calculator in any of the following ways:

- If the Digitizer Screen is already displayed, you can touch the Calc cell on the menu card or press Alt+6 on the keyboard.
- If the Digitizer Screen is *not* displayed, you can Press Alt+C or on the keyboard or choose the Calculator option from the Tools Menu.

Result: The Digitizer Screen is displayed (if it was not already displayed), and *Calc* is displayed in the Takeoff field.

Using With Takeoff Values

You can use the calculator to apply factoring or formula adjustments to take off quantities. Follow these steps to use the calculator with a takeoff value:

1. Use the Cuml, Segl, Area, or Count function to take off a quantity value.

Result: The takeoff value is displayed in the Result field.

2. Touch the Calc cell on the menu card.

Result: Calc is displayed in the Takeoff field. The takeoff value is displayed in the Result field.

3. Use the keyboard or the menu card to enter the additional values and operators (+, -, *, /) for the calculation.

Result: As you place an operator at the end of each line, the result is calculated and displayed in the Result field.

4. End the calculation by placing an equals sign (=) at the end of the last line.

5. Touch Enter or F10 to transfer the result to the GOLD screen.

Example

To estimate the total amount of concrete needed for a floor, you might use the digitizer and calculator as follows:

1. Use the Area function to take off the area, say 12971 SF.
2. Use the Calc function to multiply this value times 0.67 FT (to account for a depth of 8 inches).

$$12971 \text{ SF} \times 0.67 \text{ F} = 8690.57 \text{ CF}$$

3. Use the Calc function to divide the result by 27 to convert the CF to CY

$$8690.57 \text{ CF} / 27 = 321.8729 \text{ CY}$$

4. Use the Calc function to multiply this result by 1.03 to add a 3% waste factor.

$$321.8729 * 1.03 = 331.5291 \text{ CY}$$

Using as a Pop-up Calculator

You can also use the calculator in pop-up fashion to make quick calculations from within the GOLD software. This usage does not involve other digitizer functions. However, the DIGI status light must be displayed for you to use the calculator.

1. From an entry field on any database screen, press Alt+C or choose Calculator from the Tools Menu.

Result: The Digitizer Screen is displayed with Calc shown in the Takeoff field.

2. Enter the values and operators (+, -, *, /) for the calculation, using either the keyboard or menu card.

Result: As you place an operator at the end of each line, the result is calculated and displayed in the Result field.

3. End the calculation by placing an equals sign (=) at the end of the last line.
4. Touch Enter or F10 to copy the result back to the GOLD screen.

7.7 Working With an Audit Trail

Purpose

An audit trail is a record of the takeoff quantities used in an estimate. This record can include the database IDs of items using the quantity, the takeoff function and mode used, and any factoring or formula adjustments applied. The audit trail can be printed in a report.

Requires Parameter Worksheets

To create an audit trail, you must have access to parameter worksheets. That is, your GOLD system must include the optional Models Module. Refer to Chapters 1 through 5 for detailed information on the Models Module.

Developing an Audit Trail

You develop an audit trail by creating worksheets to store takeoff quantities. The recommended approach is to create one worksheet for each takeoff quantity. You can apply calculations to the takeoff quantity as needed on that worksheet. You can then use the Link Quantity function to link titles or detail items to the worksheet, and you can also reference the worksheet result in other worksheets.

Note: Refer to Sections 2.4 and 2.9 for detailed instructions on working with parameter worksheets.

1. Use the Add Parameter function (Alt+P) to create the worksheet.
2. Tab to the Value field on the first row.
3. Access the Digitizer Module and perform the takeoff using the Cuml, Segl, Area, or Count function. Touch Enter or press the Enter key to return the takeoff quantity to the Value field on the parameter worksheet.
4. Use Shift+Tab to move back to the Description field on the first row. Enter a description of the takeoff quantity. You can include the takeoff function and mode used, as well as the name of the quantity and any other descriptive details. Include whatever information that you want included in the audit trail and report.

Note: To enter a description longer than the field, you can simply insert additional rows above the first row, as in the example below. Press Shift+Insert or Ctrl+N to insert a row.

5. If you are applying calculations or factoring, enter the formula on the subsequent lines of the worksheet. If not, leave the takeoff value as the result value of the worksheet.
6. Use the Link Quantity function to link titles or detail items to the worksheet as needed. You can also reference the worksheet from other worksheets.
7. Repeat Steps 1 through 6 for each takeoff quantity in the estimate.

Example Worksheet

Figure 7.2 shows a parameter worksheet used as part of an audit trail. The worksheet uses digitizer input and computes the gross floor area of a fifty-story office building.

- The first variable is the area takeoff value input through the digitizer. Note that an extra row has been added to accommodate the description. The description lists the takeoff function and mode used, as well as the name of the value.
- The second variable is the number of stories, which is multiplied by the floor area. (For simplicity, the example assumes all floors have the same footprint.)

FUNCTION		PROJECT MODEL4 General Purpose Warehouse			
1	HELP	FACILITY ID : 01			
2	A	FACILITY Name : General Purpose Warehouse			
3	T	Reference	Description	(Value Units)Op	
4	E	N	Area, Trace Mode, Gold Digitizer	0.0000	N
		N	Floor Area, Digitizer	(12796.5700 SF	*
5	D	N	Number of Floors	3.0000) U
			Rounded up /nearest whole number	1.0000	=
6	L			0.0000	
7	N			0.0000	
8	S			0.0000	
9	M			0.0000	
10		GFA	Gross Floor Area	38390.0000 SF	

DIGI EST A PROJECT v5.30

Figure 7.2: Parameter Worksheet in Audit Trail

Printing the Report

Once you have created an audit trail using parameter worksheets, you use the Link Listing Report to print the audit trail. This report shows the contents of all worksheets in the estimate. It also lists all titles and detail items that are linked to parameter worksheets or other reference values. As such, this report provides a detailed listing of all takeoff quantities and descriptive information as you have entered it in the audit trail.

Refer to Chapter 5 for instructions on printing the Link Listing Report.

CHAPTER 8

2ND VIEW

Purpose

The 2nd View capability is used to produce an optional alternative view of a Project Database. You can use this capability to produce summary reports with a reorganized or resorted title hierarchy and a different set of cost columns.

You can also use 2nd View to produce reports comparing two or more projects with similar structures.

Examples of Use

You can use the 2nd View capability to produce project comparisons. For example, you might want to compare several estimates done at different stages of a project. Using 2nd View, you could produce a single report summarizing project costs as defined in each of the estimates.

2nd View can also be used to report a project's costs according to an alternate title structure. For example, you might have an estimate with several facilities, each organized by the building systems hierarchy. Each facility would be a title at Level 1, with the building systems listed as Level 2 titles. By designating title Level 2 as the first level of the 2nd View, you could produce a report that summarized the project's total costs for each system.

Alternately, you might use 2nd View to produce a construction bid schedule from an estimate that is structured according to a dissimilar code of accounts or work breakdown structure. You could use 2nd View to resort the code of accounts structure to specific bid items. Using the Adjusted Unit Cost column type, you could also make last-minute adjustments and overrides to the bid schedule unit prices.

Task List

Working with the 2nd View capability involves the following tasks:

1. You use the Set Breakdown Structure option on the Prepare Menu to define the 2nd View order of project title levels.
2. You define the cost columns and "shadow" columns for the 2nd View, using the Select 2nd View Columns Screen.
3. If there are any title elements that you do not want to arrange as defined by the Set Breakdown Structure option, you can redefine their place in the 2nd View of the project through the Set 2nd View Exceptions option.
4. You use the GOLD Report Writer to generate the 2nd View structure by creating a preliminary 2nd View Report. Alternately, you can generate the structure manually by adding the desired titles in 2nd View.
5. You use the 2nd View function inside the Project Database to view the alternate project structure, add or edit 2nd View title names, and/or enter adjusted unit costs or title-level cost overrides. You can then produce a finished 2nd View Report that includes the title names and any other changes you have made.

Chapter Overview

This chapter provides instructions for each of the tasks involved in using the 2nd View capability:

- 8.1 Setting the Breakdown Structure
- 8.2 Selecting 2nd View Columns
- 8.3 Creating 2nd View Reports
- 8.4 Working With 2nd View in the Project
- 8.5 Setting 2nd View Exceptions

8.1 Setting the Breakdown Structure

Purpose

Setting the Breakdown Structure is the first thing you must do in order to use the 2nd View capability. By entering a 2nd View order for the project breakdown structure, you define which title levels to include in the 2nd View, and their arrangement. This effectively allows you to rearrange the title hierarchy and re-sort the project costs accordingly. (Refer to Example 1 in this section.)

If you are using 2nd View to produce project comparisons, you would normally enter the same order for 2nd View as for the primary or main view of the project. (See Example 2.)

Set Breakdown Structure Screen

You apply a 2nd View order to project title levels on the Set Breakdown Structure Screen, which is shown in Figure 8.1.

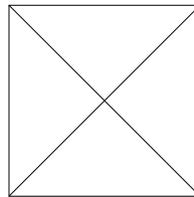


Figure 8.1: Set Breakdown Structure Screen

2nd View Order Field

The 2nd View Order field specifies whether a project title level is included in the 2nd View of the project, and in what order that title level's ID segment is placed in 2nd View titles. (Refer to the Example below.)

You can designate any number of levels to include and in any order.

Example 1: Rearranging a Project

A project is organized with the following breakdown structure:

ID	Length	Trail Sep	Level Title	2nd View Order
Level 1	3	-	Bid Item	0
Level 2	2	N	Systems	0
Level 3	1	.	Subsystems	0
Level 4	1	N	Work Groups	0
Level 5	1	.	Assemblies	0

A typical element of this project looks like the following:

001- Motor Vehicle Shop
001-09 Electrical
001-092. Lighting and Power
001-092.1 Lighting
001-092.14. Lighting Fixtures Installed
Detail Cost Items

Assume you make the following entries in the 2nd View Order fields:

ID	Length	Trail Sep	Level Title	2nd View Order
Level 1	3	-	Bid Item	3
Level 2	2	N	Systems	1
Level 3	1	.	Subsystems	2
Level 4	1	N	Work Groups	0
Level 5	1	.	Assemblies	0

Once you have defined this as the 2nd View order and then generated the 2nd View title structure (as described in Section 8.4), the above element would be reorganized in 2nd View as shown below. Notice that the title length segments for Levels 1 and 4 have been deleted, and that the other segments are arranged in the title IDs in the order specified in the 2nd View Order fields.

09 Electrical 092. Lighting and Power 092.001- Motor Vehicle Shop

Example 2: Creating Project Comparisons

You can also use 2nd View to compare the costs in two or more estimates for the same construction project, made at different stages of design, or in several projects using similar work breakdown structures.

In this case, you need to create a 2nd View order only for the first of the projects you want to compare. GOLD will assume the same order for the other projects.

Generally, you would enter the 2nd View order for the first project to match the main view breakdown structure, as in the following example. You can, however, choose an alternate order, and GOLD will use it in creating the comparison report.

ID	Length	Trail Sep	Level Title	2nd View Order
Level 1	3	-	Bid Item	1
Level 2	2	N	Systems	2
Level 3	1	.	Subsystems	3
Level 4	1	N	Work Groups	4
Level 5	1	.	Assemblies	5

Refer to the following sections for instructions on choosing cost columns and generating 2nd View Reports for project comparisons.

Procedure

Follow these steps to designate the 2nd View order of project title levels. Begin on the Main Menu Screen with the highlight on the Project Database.

1. Press P to select the Prepare Menu. Press B to choose the Set Breakdown Structure option.

Result: The Set Breakdown Structure Screen is displayed.

2. Press the Tab or Arrow keys until the cursor is positioned in the 2nd View Order field for the first title level you want to include in the 2nd View. Enter a number to designate this title level's order in the 2nd View hierarchy.

Repeat Step 2 for each title level to be included in the 2nd View.

3. When the 2nd View order is correctly defined, press the F10 (Exit Screen) key (or the Page Down key if you want to proceed to the Select 2nd View Columns Screen).

Result: You are prompted to confirm that you want to set the 2nd View order for the project.

4. Press the F10 or Page Down key again to confirm.

Result: The 2nd View breakdown is processed and the codes set. The program displays either the Main Menu Screen or the Select 2nd View Columns Screen, depending on your choice in Step 3.

8.2 Selecting 2nd View Columns

Purpose

Once you have established the 2nd View order for a Project Database, you select the cost column types to be used for showing costs in 2nd View.

GOLD offers a number of column types for 2nd View, as well as types of "shadow columns," which reference the main columns you select.

Select 2nd View Columns Screen

You use the Select 2nd View Columns Screen (Figure 8.2) to specify the type and report-width of 2nd View cost columns. You also use this screen to determine the width of the Quantity column on the 2nd View Report.

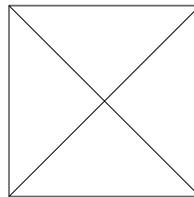


Figure 8.2: Select 2nd View Columns Screen

Shadow Columns

Shadow columns are secondary columns that you can designate for second view. A shadow column always contains values relative to its associated main column.

The shadow column values are shown below the main column costs on second view screens, and are printed to the right or left of the main columns on reports.

Procedure

Use this procedure to designate 2nd View columns and shadow columns for a project. Begin on the Main Menu Screen with the highlight on the Project Database.

1. Press P to display the Prepare Menu, then press E to choose the Select 2nd View Columns option.

Result: The Select 2nd View Columns Screen is displayed.

2. Type entries in the fields on the screen to define the 2nd View column information as needed. Press the F8 key to select from a list of choices for multiple-choice fields. Refer to the Field Descriptions and descriptions of column types below for information.
3. After defining the 2nd View columns, press the F10 (Exit Screen) key to return to the Main Menu Screen.

Field Descriptions

This table describes the fields on the Select 2nd View Columns Screen. Except for the Quantity Column Width field, the fields are repeated for the up to five columns you can define.

Field	Description
Quantity Column Width	The width, in number of characters, of the Quantity column on 2nd View Reports. Valid values are 0 - 25 characters. Enter 0 if you do not want the column printed.
Col Type	One-character code indicating the type of 2nd View cost column. Refer to "Column Types" below for descriptions.
Rep Width	The width of the indicated column on reports. Valid values are 0 - 40. Enter 0 if you want the column displayed on title entry screens in 2nd View but not printed on reports.
Title	Title to appear with the column values on screens and reports. The program fills in a default title based on your selection in the Col Type field. You can edit this default if you wish.

Field	Description
Shadow	One-character code indicating the type of shadow column to be displayed and printed with the indicated column. See "Shadow Column Types" below for descriptions.

Column Types

Following are the codes and descriptions for the main cost column types available for 2nd View screens and reports.

D - Total Direct Cost

The total project Direct Cost as accumulated for each 2nd View title. Includes subcontractor markups but not prime contractor markups. In other words, the cost to the prime contractor.

C - Total Contract Cost

The total of Direct and Indirect Costs for each 2nd View title. Includes both sub and prime contractor markups. In other words, the cost to the project owner.

P - Total Project Cost

The total of Direct, Indirect, and Owner costs for each 2nd View title.

E - Escalated Contract Cost

This column shows escalated cost values for the 2nd View titles. The Escalation, as defined on Owner Cost Screens, is rolled in to each column's total cost..

This column type is used in ENG3086 estimates, as described in Chapter 15. It can also be used to publish other, custom reports that show costs at a future point in time.

A - Adjusted Unit Cost

This column allows you to enter an adjusted unit cost for 2nd View titles. When you choose this code, the program creates an Adjusted Unit Cost column. You can then access the Project Database, invoke the 2nd View function, and enter an adjusted unit cost for some or all titles.

For example, if the calculated unit costs for a title came to 23.17 per SF, you might choose to round the cost to \$23 per SF by entering 23 in the Adjusted Unit Cost field on the 2nd View title entry screen.

T - Total Previous Times Quantity

GOLD multiplies the column value to the left of this column times the Quantity figure for the title and places the result in this column. This column type is designed to be used in conjunction with the Adjusted Unit Cost column type. By defining this type to the right of a type A column, you can compute an adjusted total cost for each 2nd View title based on the adjusted unit cost.

R - Running Total of Columns

This column shows the running total of all columns to the left. You can use this type to show a total of Contract Costs plus Owner's Contingency. To do so, place an R-type column to the right of type C (Total Contract) and Y (Contingency) columns.

F - Add Project Total From

This column type is used to produce project comparisons. The projects you compare should have approximately the same breakdown structures (title levels and IDs). For example, you can use this column type to compare projects for the same estimate produced at various stages of design.

When you enter code F or select it from the F8 choice window, GOLD displays a window listing Project Databases in the current project directory. Highlight the project you want to compare to the present project, and press the Enter key.

Result: GOLD will fill this cost column with the calculated total project cost from the selected project for each corresponding title.

Y - Contingency Cost

This column type shows the contingency cost for the 2nd View title. The method of contingency calculation is specified in the main view at the appropriate Owner Cost Screens. To use this column type, you must have designated Contingency as an Owner Cost type in the main view of the project.

Note: For ENG3086 estimates, contingency is defined on the ENG3086 Design Information Screen. See Section 15.3.

Shadow Column Types

Following are the shadow column types you can associate with the main 2nd View columns.

P - Percent of Line Total

The shadow column shows what percentage the main column value is of the total of the main column value and all column values to its left. In other words, the main column value represents this percentage of the accumulated line total to this column.

You can use this shadow type with a Y-type column to display contingency as a percent of each title element total.

C - Percent of Column Total

The value in the shadow column shows what percentage the main column value is of the total column value of its parent title. The percentages in all type C shadow columns under a particular parent title add up to 100%.

R - Unit Cost Right of Total

The shadow column shows the unit cost of the main column value to the *left* of the shadow column. (That is, the unit cost is placed to the right of the total cost.)

L - Unit Cost Left of Total

The shadow column shows the unit cost of the main column value to the right of the shadow column. (That is, the unit cost is placed to the left of the total cost.)

8.3 Creating the 2nd View Report

Purpose

Once you have defined a 2nd View order and selected 2nd View columns, you can run the GOLD Report Writer in order to actually generate the 2nd View title structure for the Project Database.

You also use the procedure presented here whenever you want to produce the 2nd View Report.

Creating the 2nd View Title Structure

The GOLD Report Writer is used generate the 2nd View title structure for a Project Database. Therefore, in order to *automatically* create a 2nd View of a project, you must run the 2nd View Report, as described below.

Note: You can use the Set 2nd View Exceptions option to alter the automatic order. See Section 8.5. You can also create the 2nd View structure manually by invoking the 2nd View function in the Project Database and manually entering 2nd View titles. Refer Section 8.4 for details.

About the 2nd View Report

The 2nd View Report provides a comprehensive listing of the project's 2nd View. It includes whatever title levels you have specified for 2nd View on the Set Breakdown Structure Screen, and reports costs in the columns and shadow columns as designated on the Select 2nd View Columns Screen.

If you are using 2nd View for project comparisons, the report shows the comparative costs (in column type F) for two or more Project Databases that you have selected. (See the description of column type F in Section 8.2.)

Procedure

Follow these steps to generate a 2nd View structure for a Project Database and/or to run the 2nd View Report. Begin on the Main Menu Screen with the highlight on the Project Database.

1. Press R to display the Reports Menu. Press R again to choose the Select Reports to Print option.

Result: The Report Selection Screen is displayed.

2. Press the Tab or Arrow keys to move the cursor to the 2nd View Report field. Enter Y in that field.

Note: If you want to generate other reports, enter Y in the appropriate fields to specify the reports and the title levels to be included. (See Volume 1, Section 23.6 for information. Otherwise, enter N in all the other report selection fields.

3. Press the Page Down key.

Result: The Run Reports Window is displayed.

4. Type in any field entries as needed if you want to add a secondary report title or change the destination of the report(s). (Refer to Section 23.7 in Volume 1 for information on the Run Reports Window.)

5. Press the Page Down key.

Result: The report(s) are printed or else saved to a disk file, as specified. GOLD displays a message informing you when processing is complete.

Notes on Automatically Creating the 2nd View

The automatic creation and naming of the 2nd View titles uses logic as follows.

- GOLD names 2nd View titles based on the name of the first corresponding main view title that it encounters. For example, the defined 2nd View order might dictate that GOLD re-sort the project so that title Level 2 becomes Level 1. However, there may be more than one Level 2 title in main view with the same Level ID. (For instance, there may be Level 2 titles with Database IDs 0101 and 0201 under the respective Level 1 titles 01 and 02. In this case, GOLD will use the name of title 0101 when creating the 2nd View title at Level 1.)
- Some detail items may have no title in 2nd View. If the 2nd View order you defined on the Set Breakdown Structure Screen did not include all title levels, there may be detail items directly under some titles in main view which do not have a corresponding 2nd View title. In this case, the costs associated with these cost items will be listed as "Not Identified" on the 2nd View Report.

Once the 2nd View title structure has been created, you can change title names or add new titles within the project to more accurately reflect your intended report. Refer to the next section for details.

Resetting the 2nd View Order

Each time you run 2nd View reports, GOLD will re-sort costs to the established 2nd View title structure (if one already exists), adding new elements as required. However, running the 2nd View Report will not overwrite existing 2nd View title elements.

If you want to reset the existing 2nd View order to completely replace it with a new order, do the following:

1. From the Main Menu Screen, access the Prepare Menu and select the Set Breakdown Structure option.

Result: The Set Breakdown Structure Screen is displayed.

2. Type the new order in the 2nd View Order fields, or type all zeroes to clear the existing order. Then the press the F10 key.

Result: GOLD prompts you to confirm changing the order.

3. Press the F10 key again to confirm.

Result: GOLD returns you to the Main Menu Screen.

Note: You do not have to use this procedure if you use the ENG3086 capability to produce a report or export file. See below.

8.4 Working With 2nd View in the Project

Purpose

Once the 2nd View title structure is created, you can use the 2nd View function within the Project Database to examine the structure and work with the data.

Alternately, you can choose to create the 2nd View title structure manually (before generating the 2nd View Report) through the use of the 2nd View function.

2nd View Function

You access 2nd View through the 2nd View function (Ctrl+S), located on the Go To Menu. Once you have defined a 2nd View order on the Set Breakdown Structure Screen, this function is available from all title list and entry screens in the Project Database.

When you access the 2nd View function, GOLD automatically displays the Level 1 title list screen in 2nd View. The "2nd View" status indicator at the bottom of the screen remains lit as long as you are in 2nd View.

Functions Available in 2nd View

When working in 2nd View, you can add titles as described below, and you can edit information for existing 2nd View titles.

Although detail costs are accumulated to 2nd View titles, you cannot add or edit detail records in 2nd View. You also cannot copy, move, merge, or extract records, and you cannot perform lookups.

2nd View Title Entry Screen

You work with title information on the 2nd View title entry screen (Figure 8.3). The screen is similar to the normal-view title entry screen, except that it contains fewer fields.

FUNCTION	001- BUILDING CONSTRUCTION
1 HELP	System ID : 02
2 ADD	System Name : SUBSTRUCTURE
3 TITLES	System Quantity : 371725.0000 SF
4 EDIT	Cat Code :
5 DETAIL	Cost Override : No
6 LOOKUP	
7 NOTES	
8 SELECT	CONTRACT ADJ UNIT TOTAL
9 MENU	346,154 0.95 353,139
10 EXIT	0.93 0.00 0.00
	EST A 2ND VIEW v5.30

Figure 8.3: 2nd View Title Entry Screen

Creating the 2nd View Structure Manually

If you access 2nd View before creating the 2nd View title structure, the Level 1 title list screen shows only the Project Information Record. To create the 2nd View title structure manually, do the following:

1. With the highlight on the Project Information Record, use the Add (F2) function to begin adding titles at Level 1. Fill in the title entry screen as needed. Refer to the Field Descriptions below.
2. To add additional titles at Level 1, use the F2 Add function.
3. To add subtitles under any title, use the Add Subtitle (Shift+F3) function.
4. Continue adding titles and subtitles until the structure is defined.

Editing 2nd View Titles

To edit information for a 2nd View title, highlight the title on the list screen and press the F4 Edit key.

As explained in the previous section, when you automatically generate the 2nd View title structure, GOLD uses the first title name it encounters. Therefore, you may want to edit some titles to change the Name field.

You also edit title information in the following cases:

- You have defined Adjusted Unit Cost as a column type and you want to enter the adjusted unit cost for the title.
- You have defined Unit Cost Right of Total or Unit Cost Left of Total as a shadow column type. In order to generate unit costs for these columns, you can use the quantity automatically generated from the main view of the project, or you can enter a new value in the Quantity field for the 2nd View title.

Field Descriptions

This table describes the fields on the 2nd View title entry screen and how they are used. The ID, Name, and Quantity fields are labeled with the name of the title level.

Field	Description
ID	<p>The part of title's 2nd View database ID assigned at this level. (The title's full ID consists of this entry plus the IDs of any higher-level titles under which this title belongs.)</p> <p>This field is filled in by the program when the 2nd View title structure is generated automatically. If you create the structure manually, you fill in the ID when you add the title.</p>
Name	<p>The descriptive name of the title. Filled in by GOLD if the 2nd View title structure is automatically created. You can change the name as needed.</p>

Field	Description
Quantity	<p>Quantity of this element of the project. The program fills this field with a zero when the 2nd View structure is created.</p> <p>If you have defined a shadow cost column of Type R or L (unit cost right or left of total), you can enter a quantity for the title element in this field and GOLD will generate and display a unit cost.</p>
Category Code	<p>This field may show the Category Code as copied from the main view for the title. (The Category Code field is used in main view as part of the Department of Defense ENG3086 Interface.)</p>
Cost Override	Reserved.
<u>Cost Fields</u>	<p>The figures for the cost columns and shadow columns selected on the Select 2nd View Columns Screen are shown in the cost fields at the bottom of the screen.</p> <p>If you chose Adjusted Unit Price as a column, you enter the adjusted cost on the screen. The other fields show the values for the defined column types as calculated for the current title.</p>

8.5 Setting 2nd View Exceptions

Purpose

The Set Breakdown Structure Screen lets you define the 2nd View order by rearranging the title-level segments within all project title IDs. (See Example 1 in Section 8.1). This broad approach allows you to quickly reorganize a project into a 2nd View.

However, there may be cases when you need to refine the broad approach and move particular title elements to different places in the 2nd View. The Set 2nd View Exceptions option can be used to redefine the ID and Description for up to 32 title elements in 2nd View.

When to Use

Use the procedure presented here *after* you have set the 2nd View order and chosen cost columns but *before* you have actually created the 2nd View title structure (as discussed in Section 8.3).

Note: If you define the exceptions after the 2nd View title structure has been created, the exception title elements will be present at their former locations with zero costs and at their new locations with actual costs. You can manually delete the elements from their old locations if you choose.

2nd View Exceptions Screen

You define exceptions on the 2nd View Exceptions Screen, which is shown in Figure 8.4.

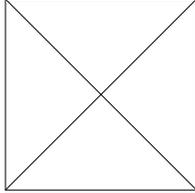


Figure 8.4: 2nd View Exceptions Screen

Example

Assume that you have project structure (in main view) that includes the following title element.

001- Building Construction
 001-09 Electrical
 001-092. Special Electrical Systems
 001-092.3 Telephone System
 Detail Cost Items

The 2nd View Order fields for this project are defined as follows:

ID	Length	Trail Sep	Level Title	2nd View Order
Level 1	3	-	Bid Item	0
Level 2	2	N	Systems	1
Level 3	1	.	Subsystems	2
Level 4	1	N	Work Groups	3

In 2nd View, the element would then be as follows:

001-09 Electrical 001-092. Special Electrical Systems 001-092.3 Telephone System
--

Suppose that you want to show the costs for the Telephone System in 2nd View under a separate Level 1 title called Communication System . You could accomplish this by defining the title as an exception, and giving it an unused Level 1 title ID (say 015). To do so, you would enter the following on the 2nd View Exceptions Screen.

<u>Item Description</u>	<u>Original ID</u>	<u>New ID</u>
Communication System	0010923	015

Lowest Title Levels

You can define 2nd View exceptions for title elements at any level. However, in 2nd View, the excepted elements are always moved to the lowest title level. This means that:

- The title you define as an exception becomes a title at the lowest level in 2nd View.
- Its subtitles are erased.
- The costs shown for that title will be the totalled costs of all detail items in the element.

Order of Entering Exceptions

You have the option of defining two or more titles within the same element as exceptions. That is, you can define a title as an exception and one or more of its subtitles as exceptions with different destinations (New IDs). If you use this option, the order of entering the titles on the 2nd View Exceptions Screen becomes critical.

Enter the lowest level title in the element first. Then enter the higher level titles, in order up to the highest level. Refer to the following example.

Example

In this example, the Level 2 title is listed first and is therefore relocated as an exception first. GOLD then relocates the remaining subtitles of the 01 element.

Item Description	Original ID	New ID
Level 2 title	0103	0204
Level 1 title	01	05

If the titles were listed in the reverse order, GOLD would first process the Level 1 title and would move all element 01, including 0103 to the new location in 2nd View. The second entry for title 0103 would then not be found and would be ignored.

Procedure

Use these instructions to set 2nd View exceptions. Begin on the Main Menu Screen with the highlight on a Project Database for which you have already defined a 2nd View order.

1. Press P to access the Prepare Menu. Move the highlight to the 2nd View Exceptions option and press Enter.
Result: The 2nd View Exceptions Screen is displayed.
2. For each title element you want to define as an exception, enter an Item Description, Original ID, and New ID. Refer to the Field Descriptions that follow.
3. After filling in the screen, press the F10 key to exit and save the exceptions.

Field Descriptions

Field	Description
Item Description	The name of the title in its <i>new</i> location in the 2nd View structure. Can be the same as or different from the title's original name.
Original ID	Database ID of the title in its original location in the project. Note: This is the original location in the <i>main</i> view, not the 2nd View.
New ID	Database ID of the title in its new exception location in the 2nd View.

CHAPTER 9

MATERIAL AND VENDOR BACKUP

Purpose

The Material and Vendor Backup capability allows you to store backup information on material prices and vendors. This information can be recorded and updated in both the Project and Unit Price Databases. Changing a material backup record can automatically change the material prices of the associated cost item.

Material and Vendor Files

This capability makes use of two kinds of files:

- The Material Backup File stores material price quotes for up to five vendors for each detail item that has an associated backup record.
- The Vendor File stores the name, address, and contact information for each vendor.

Separate Material Backup and Vendor Files are stored for each Unit Price Database and for each Project Database that makes use of the backup capability.

Supplied Data Files

If you use the Army Corps of Engineers Unit Price Database, the Corps' UPB Vendor and Material Backup Files are supplied for your use. You can edit these files as needed. You can also create your own Material Backup and Vendor Files from scratch.

List of Options

The Material and Vendor Backup capability allows you to do the following:

- Working in the Unit Price Database, you can add and edit material backup records for cost items. Each backup record can contain up to five vendor price quotes. You can input the item's material cost as the lowest, highest, or average price of the quotes, or you can override these choices and enter the price directly.
- Working in the Project Database, you can also add and edit material backup records for UPB items. When you change a record, you have the option of saving the change to the Backup File for the project, the Backup File for the Unit Price Database, or both.
- When working in either the Project or Unit Price Database, you can access the Vendor File to view and change data about vendors, and to add new vendors. You can use the Find Keyword function to search the Vendor File for specific vendor IDs or names.
- You can use the Update UPB from Vendor Backup Utility to reset the Unit Price Database so that material prices on backup records are shown as the original database prices.
- Through the GOLD Report Writer, you can produce reports listing the contents of the Backup and Vendor Files associated with Project and Unit Price Databases. You can also choose to print vendor backup data for project cost items in the Project Detail Report.

Chapter Overview

This chapter describes the Material and Vendor Backup capability in detail. The following sections are included:

- 9.1 Working With Material Backup in the UPB
- 9.2 Working With Material Backup in the Project
- 9.3 Working With Vendor Records
- 9.4 Update UPB From Vendor Backup Utility
- 9.5 Material and Vendor Backup Reports

9.1 Working With Material Backup in the UPB

Overview

Each cost item in the Unit Price Database that includes a material cost can have a material backup record associated with it. Working in the Unit Price Database, you can edit the material backup associated with an item and also add a backup record to an item that does not have one.

Material Pricing Backup Screen

You edit and add material backup records using the Material Pricing Backup Screen. An example is shown in Figure 9.1.

Figure 9.1: Material Pricing Backup Screen, Unit Price Database

Effects of the Screen

The entries on the Material Pricing Backup Screen determine the material unit cost of the associated detail item.

When you add or change a material backup record, it has the same effects as changing the Material cost on the detail item entry screen. That is, besides inputting a new value in the Material cost field, the action sets the UPB Override field to *Material* (or to *Both* if it was *Labor*) and updates the Material Price Updated field.

Adding and Editing Material Backup Records

Follow these steps to add or edit a material backup record for a detail item in the Unit Price Database. Begin on the entry screen for the item, in add or edit mode.

1. Press Ctrl+B or choose Material Backup from the Tools Menu.

Results:

- If a backup record for the item exists, the Material Pricing Backup Screen is displayed.
- If no backup record exists, you are first prompted to confirm that you want to add material backup for this item. Press Y to confirm.

Result: A blank Material Pricing Backup Screen is displayed.

2. Type entries in the fields on the screen as needed to define or change the backup record. Refer to the Field Descriptions below for more information.

Note: If you need to enter a new vendor reference, you can either enter the vendor's ID or use the Find Keyword function to search for it. See "Adding a Vendor Reference to a Record" below. If you need to delete a vendor reference, place the cursor in the ID field for that vendor and press the Space Bar to blank the field.

3. When the fields are filled in as needed, press F10 to exit and save.

Result: The detail item entry screen is redisplayed. The item's material price reflects the data on the backup screen.

Adding a Vendor Reference to a Record

If you are adding a new material backup record or a new vendor to an existing record, you need to enter the vendor's ID as stored in the Vendor File.

If you know the ID, you can type it into the ID field and press the Enter key. GOLD will then automatically fill in the Name. If you do not know the ID, you can use the Find Keyword function to search the Vendor File, as described below.

Note: If the vendor you need to reference is not in the Vendor File, you can add a new record for that vendor. See Section 9.3 for instructions on working with vendor records.

To use the Find Keyword function to search the Vendor File, do the following:

1. Position the cursor in the ID field on the first available (empty) row.
2. Press Alt+F7 (Find Keyword).

Result: The Find Keyword Window is displayed, with fields where you can type in a vendor ID and/or description. A third field indicates that it is the Vendor File attached to the Unit Price Database that will be searched.

3. Enter a vendor ID or partial ID in the Match ID field or the vendor's name or a key word in the Description field, or both.

Note: The name need not be an exact match. The program will search for and retrieve approximate matches.

4. Press the Page Down key.

Result: GOLD performs the search and displays a window listing close matches to your entry from the Vendor File.

5. Move the highlight to select the vendor you want, then press the Enter key.

Result: The chosen vendor is placed on the Material Pricing Backup Screen. You can now add the price quote from this Vendor and continue adding or editing the record.

Field Descriptions

This table describes the fields on the Material Pricing Backup Screen as it appears in the Unit Price Database. The first four fields listed make up the vendor reference. These fields are not labeled on the screen. They are repeated for the up to five vendors that can be referenced for any item.

Field	Description
Source ID	A three-character ID from the Vendor File that identifies the source of the vendor listing. Any vendors that you add are tagged USR. Other codes can be generated by the developer of the database, such as MIL to indicate Military source in the Army Corps of Engineers' Unit Price Database.
Vendor ID	ID of up to ten characters used to identify the vendor in the Vendor File. Default is the vendor's telephone number. See Section 9.3 for more information on the Vendor File.
Name	Name of the vendor as stored in the Vendor File.
Price	Unit material price quoted by the vendor, per the Unit of Measure for the item.
Lowest	The lowest unit material price quoted for the item, from the vendor references above.
Highest	The highest unit material price quoted for the item, from the vendor references above.
Average	The average (mean) of all the unit material prices quoted for the item.
Unit of Measure	The unit of measure for the item, copied from the detail item entry screen. This field is repeated for the Lowest, Highest, and Average prices.
Print	In the Unit Price Database, this field is set to No by the program and cannot be changed. See Section 9.2 for the use of this field in the Project Database.

Field	Description
Use	Indicates which of the three prices is selected as the default for the Quote field (see below). Choices are: Lowest, Highest, Average, and Override. Choosing Override allows you to directly enter a price in the Quote field.
Save To	Specifies where the record is saved. Set to Unit Price by the program and cannot be changed. See Section 9.2 for the use of this field in the Project Database.
Date Revised	The last date the Material Pricing Backup Screen was changed. Filled in by the program with the current system date, but can be altered by the user. If the material backup record is saved, this date will be reflected in the Material Price Updated field on the item entry screen.
Quote	Material Price that is actually used for the item. The entry in this field depends on your choice as defined by the Use field. If you set the Use field to Override, you can enter the price directly in this field.

Backup Records for Modifiers

Material backup records can also be stored for modifiers in the Unit Price Database. To access a backup record, first display the modifier entry screen, then press Ctrl+B (Material Backup).

The material backup procedures are the same for modifiers as for UPB items. Changes made on the Material Backup Screen will change the Adjust Material Price field on the Modifier Entry Screen. The modifier's material cost will be changed whether it is applied as a percent or an amount. The value of the Apply Mat'l & Shipping as field on the Modifier Entry Screen (Percent or Amount) determines whether the quote on the Material Backup Screen is entered as a percentage or amount. If it is entered as a percentage, "Per UOM" is not displayed on the Material Backup Screen for the modifier.

Refer to the Volume 1, Section 10.5 for information on working with modifiers.

Note: Material Backup records can *not* be stored for modifiers in the Project Database, only in the Unit Price Database. See the next section for more information on material backup in the project.

9.2 Working With Material Backup in the Project

Overview

While working in the Project Database, you can add or edit material backup records for cost items. If you add a backup record to an item with a UPB ID, you have the option of saving the record to the Backup File for the Project, for the Unit Price Database, or both.

Also, when you add a vendor reference to a backup record, you can choose to search in the Vendor File attached to the Project Database or to the current Unit Price Database.

See Previous Section

The procedures for working with material backup are much the same in the Project Database as in the Unit Price Database. Only the differences are described below. Refer to the previous section for basic instructions.

Material Pricing Backup Screen

When displayed in the Project Database, the Material Pricing Backup Screen allows you to access two additional fields:

- Print field
- Save To field

Print Field

The print field specifies whether the material backup and vendor information associated with this backup record in the Project Database should be printed in the Detail Report for the project. Values are Yes or No.

See Section 9.5 for details on material backup and vendor reports.

Save To Field

The Save To field specifies whether the backup record you have added or edited in the Project Database should be saved to a Backup File specific to this project, or the Backup File for the current Unit Price Database, or both.

Note: If you add a new vendor while working on the backup record, the Save To field will also determine whether the vendor record is saved to a Vendor File specific to this project, or the Vendor File for the Unit Price Database, or both.

Using the Save To Field

If you have copied into the Project Database a Unit Price Database item that already has a material backup record attached, then when you select the Backup Material function, the title at the top of the window will say "Material Pricing Backup - Unit Price." In this case the Save To field will default to the Unit Price Database.

If you are working with a user-created item in the Project, or add a material backup record to a UPB item that does not already have one, then the title at the top of the window will say "Material Pricing Backup - Project." In this case, the Save To field will default to the Project Database.

In either of these cases, you can change the default. That is, you can set the Save To field to save the material backup record to the Project, Unit Price Database, or both.

Caution on Updating in the Project

If you update a material backup record in the Project Database, you can save the change to both the Project and Unit Price Databases, as noted above. However, if you have the same UPB items in more than one place in your project, the changed material price will only be saved for the specific item location from which you have accessed the Material Pricing Backup Screen.

Therefore, to ensure proper pricing of material in this situation, do the following:

1. Update all material backup records in the Unit Price Database, *or* perform the update in the project, but be sure to save the changes to the Unit Price Database (by choosing "UPB" or "Both" in the Save To field).
2. Reprice material costs for the project from the Unit Price Database *after* you have changed all material backup records. Refer to Volume 1, Sections 12.2 or 22.4, for instructions on repricing material.

Adding a Vendor Reference to a Record

As explained in Section 9.3, separate Vendor Files can be stored for each Project Database as well as for the Unit Price Database. A Vendor File is created for a Project Database if you add vendor records while working in that project.

If your Project Database has its own Vendor File, then the procedure for adding a vendor reference to a material backup record differs slightly from that explained in Section 9.1. The difference is that you can choose to search either the Vendor File for the Project Database or for the Unit Price Database.

Do the following, beginning on the Material Pricing Backup Screen.

1. Position the cursor in the ID field on the first available (empty) row.
2. Press Alt+F7 (Find Keyword).

Result: The Find Keyword Window is displayed. The field to the right of the Match ID field indicates which database's Vendor File will be searched (Project or Unit Price).

3. If you want to search the Vendor File for the database not shown in the field, press the Tab key to move the cursor to that field. Then press the Space Bar to switch to the other database, and press Enter.
4. Continue the search procedure as usual:
 - Enter a vendor ID or partial ID in the Match ID field or the vendor's name or a key word in the Description field, or both.
 - Press the Page Down key.

Result: GOLD performs the search and displays a window listing close matches to your entry from the Vendor File.

5. Move the highlight to select the vendor you want, then press the Enter key.

Result: The chosen vendor is placed on the Material Pricing Backup Screen.

9.3 Working With Vendor Records

Overview

A vendor record stores the name, address, and other contact information for a single vendor. A vendor record must be stored for each vendor referenced by a material backup record in a database.

You can add or edit vendor records from either the Unit Price or Project Database, starting from either a detail item entry screen or Material Pricing Backup Screen

Vendor Files

Separate Vendor Files are stored for each Unit Price Database. When you add a vendor record in the Project Database, a separate Vendor File is also created and stored for that Project Database.

Vendor Screen

You work with vendor records through the Vendor Screen, as shown in Figure 9.2.

Figure 9.2: Vendor Screen

Adding Vendor Records

Follow these steps to add a vendor record in either the Unit Price or Project Database. Begin on either a detail item entry screen, or the first available (blank) line of the Material Pricing Backup Screen for a detail item.

1. Press Alt+V (Add Vendor).

Result: A blank Vendor Screen is displayed.

Note: If you are working in the Project Database and no Vendor File exists, GOLD will first prompt you to confirm that you want to add one. Press Y to confirm.

2. Fill in the fields on the screen as needed to define the vendor. See the Field Descriptions below for information.
3. After filling in the fields, press F10 to exit and save.

Results:

- If you accessed the Vendor Screen from a detail item entry screen, the record is saved to the Vendor File for the current database (Unit Price or Project). The entry screen is redisplayed.
- If you accessed the Vendor Screen from a Material Pricing Backup Screen, GOLD prompts you to specify whether you want the new vendor referenced by the material backup record for the current item. Enter Y to confirm referencing the new vendor or N to deny.

Result: The vendor record is saved to the Vendor File for the current database. The Material Pricing Backup Screen is redisplayed, with the new vendor added to the references or not, depending on your entry of Y or N.

Editing Vendor Records

Use these procedures to edit existing vendor records in either the Unit Price or Project Database. You can begin on either a detail item entry screen or the Material Pricing Backup Screen for an item.

From a Detail Entry Screen

1. Press Ctrl+V or select Edit Vendor from the Tools Menu.

Result: The Find Keyword function is evoked. A window is displayed with fields for you to enter an ID and/or description for the vendor.

2. Enter an ID or partial ID and/or a vendor name or key word.

Note: The name need not be an exact match. The program will search for and retrieve approximate matches.

3. Press the Enter key.

Result: GOLD searches the database and displays a window listing close matches to your entry from the Vendor File.

4. Move the highlight to select the vendor you want, then press the Enter key.

Result: The Vendor Screen for the chosen vendor is displayed.

5. Edit the vendor information as needed. Refer to the Field Descriptions below.

6. After entering the changes, press F10 to exit and save.

Result: The record is saved to the Vendor File for the current database. The detail item entry screen is redisplayed.

From a Material Pricing Backup Screen

1. Move the highlight to the ID of the vendor whose record you want to edit.

2. Press Ctrl+V (Edit Vendor).

Result: The Vendor Screen for the chosen vendor is displayed.

3. Edit the vendor information as needed. Refer to the Field Descriptions below.

4. After entering the changes, press F10 to exit and save.

Result: The Material Pricing Backup Screen is redisplayed. Your entry in the Save To field on this screen will determine which Vendor File(s) (Project, Unit Price Database, or both) the changed record is saved to.

Deleting Vendor Records

You also have the option of deleting a vendor record, as follows:

1. Display the Vendor Screen, as described in the Editing procedures above.

2. Press Ctrl+F4 (Delete).

Result: The record is marked for deletion. This vendor will now be excluded from all reports and will be shaded in Find Keyword listings. The record will be physically removed from the Vendor File when the associated database is packed.

Note: If you delete a Vendor from the Unit Price Database, you are first prompted to confirm the deletion. Press Y to confirm.

Field Descriptions

This table lists the fields on the Vendor Screen. If you are adding a vendor, all of the fields are optional except for the Vendor ID and Name.

Field	Description
Vendor ID	<p>This field is only accessible when you are adding a vendor record. The field contains two parts.</p> <p>The first part is the 3-character <i>source ID</i>, filled in by the program, which identifies the original source of the vendor listing. Any vendors that you add are tagged USR. Other codes can be generated by the developer of the database, such as MIL to indicate Military source in the Army Corps of Engineers' Unit Price Database.</p> <p>The second part is the actual database ID of the vendor, which can be up to 10 characters in length. The default is the vendor's telephone number. That is, if you leave this field blank when adding a vendor, the program will prompt you to confirm that you want the telephone number (entered below) to be saved as the vendor ID.</p>
Name	Name of the vendor firm as displayed on the Material Backup Screen.
Address	Mailing address. Three lines of up to 32 characters may be used.
Zip	Zip code of the vendor.
Telephone	Telephone number, including area code.

Field	Description
Ext	Telephone extension, if used.
Contact	Name of the contact person at this vendor.
Fax No.	Vendor fax number, including area code.
Date	Filled in by the program. The date this vendor record was added or last updated.
CSI Divisions	<p>These fields are used in the Unit Price Database only. The fields correspond to the 16 CSI Divisions of the Unit Price Database, plus two additional fields to the left and right. The additional fields are used to accommodate any UPB items whose IDs fall outside the CSI Divisions (that is, the first two numbers of the item's database ID is 00 or 17 or higher).</p> <p>Valid field values are Y and blank.</p> <p>A Y in a field indicates that one or more detail items having database IDs within that CSI Division have referenced this vendor in their material backup records.</p> <p>See "Using the CSI Division Fields" below.</p>

Using the CSI Division Fields

The CSI Division fields are filled in with Y by the program whenever the vendor has been referenced by an item in the Unit Price Database whose ID places that item in the corresponding CSI Division.

Example: If item 05120 001 has a material backup record that references this vendor, a Y will appear for Division 5.

In the Unit Price Database, you can remove one or more Ys from the CSI Division fields. By removing a Y from a field, you can cause references to this vendor to be removed from all items with IDs within that CSI Division. When the references are removed, the program will recompute material prices for the items accordingly. GOLD prompts you to confirm before removing the vendor references.

9.4 Update UPB From Vendor Backup Utility

System Administrators Only

In order to access the Update UPB From Vendor Backup Utility, you must have both the System Toolkit and the Administrative Module. See the Appendix in this volume for more information.

Purpose

The Update UPB From Vendor Backup Utility is used to perform a batch update of the Unit Price Database. This update sets the material price for all items equal to whatever price is specified by that item's material backup record.

Note: In most cases the material price of the item will already be set to what is specified in the material backup record. However, there may be cases where a user has overridden the backup record and entered a material price directly on the cost item entry screen.

The batch update also resets the UPB Override field to None, enters the date you specify in the Material Price Updated field, and records the current material price in the Default Material Price field. In other words, this utility makes the price information in the material backup records the standard pricing for the database.

Update Window

Choosing this utility from the Utilities Menu displays the Update UPB From Vendor Backup Window (Figure 9.3).

Figure 9.3: Update UPB From Vendor Backup Window

Procedure

Use this procedure to update a Unit Price Database to show material backup information as the standard material pricing . Begin on the Main Menu Screen with the highlight on the Unit Price Database you want to update.

1. Press the U key to access the Utilities Menu. Move the highlight to the Update UPB From Vendor Backup option, then press Enter.

Result: The Update UPB From Vendor Backup Window is displayed.

2. Edit the fields on the screen, if necessary, to define the update process. Refer to the Field Descriptions below.
3. When the fields are filled in as needed, press the Page Down key.

Result: GOLD prompts you to confirm the update.

4. Press Y to confirm.

Result: The selected Unit Price Database is updated. The program displays a message to inform you when processing is complete.

Field Descriptions

Following are the fields on the Update UPB From Vendor Backup Window.

Field	Description
Dated	<p>This field can be used to exclude items whose material price was updated after a certain date. Items with a date later than this (recorded in the Material Price Updated field) will not be affected by the batch update process.</p> <p>The default is the current date.</p>
Include/Exclude User-Applied Overrides	<p>Indicates whether items will be included in the batch update based on the value in the UPB Override field. Items with a value of <i>Material</i> or <i>Both</i> will be included or excluded as specified here.</p>
Material Price Updated	<p>Date to be recorded in the Material Price Updated field for all items included in the update. Default is the current system date.</p>

9.5 Material and Vendor Backup Reports

Overview

The Material and Vendor Backup capability provides two reports:

- The Material Backup Report lists the material pricing backup information for all or selected items with backup records in a Project or Unit Price Database.
- The Vendor Backup Report contains complete information for all or selected vendors in the Vendor File associated with a Project or Unit Price Database.

Both of these reports are accessed through the List Material Backup/Vendor option on the Reports Menu.

In addition, you can choose to print vendor backup information in the Project Detail Report for each cost item in the project that has a backup record.

List Material Backup/Vendor Screen

You generate the Material Backup and Vendor Reports through the List Material Backup/Vendor Screen, accessed from the Reports Menu. The screen is shown in Figure 9.4.

Figure 9.4: List Material Backup/Vendor Screen

Generating the Reports

Use this procedure to generate a Material Backup or Vendor Backup Report. Begin on the Main Menu Screen, with the highlight on the Project or Unit Price Database.

1. Press R to access the Reports Menu. Then press M to select the List Mat'l Backup/Vendor option.

Result: The List Material Backup/Vendor Screen is displayed.

2. Fill in the fields on the screen to choose the reports and specify their content. See the Field Descriptions below.
3. After filling in the fields, press the Page Down key.

Result: The Run Reports Window is displayed.

4. If you want to change the print device, type the change and press Enter. (See Section 23.7 in Volume 1 for instructions on using the Run Reports Window).

5. When the window shows the correct information for running the report(s), press the Page Down key.

Result: The report(s) are printed or sent to a disk file, as specified. The program displays a message informing you when the processing is complete.

6. Press the Enter key to dismiss the message and return to the Main Menu Screen.

Field Descriptions

Field	Description
Heading	Title to appear on the top of every page of the reports. Typically used to specify the content of the listings.
Listing Type	Type of report to print. Choices are: <ul style="list-style-type: none">• Material Backup• Vendor Backup

Field	Description
Vendor ID Match	<p>Specifies the ID or partial ID of vendors to be included in the report.</p> <p>Example: If your vendor IDs are entered as the vendor phone numbers, you can choose to include only the vendors in a specific area code by entering the first 3 digits of the ID.</p> <p>Leave this field blank to include all vendors.</p>
UPB ID Match	<p>Specifies the ID or partial ID of UPB items to be included in the report.</p> <ul style="list-style-type: none"> • For the Material Backup Report, this field can be used to list backup information for only a single item or range of items • For the Vendor Report, this field can be used to list only those vendors applied to a single item or range of items. <p>Example: By entering two digits in this field, you can limit listings to a single CSI Division.</p> <p>Leave this field blank to include all items.</p>
Source(s)	<p>These fields can be used to include or exclude items with specific source IDs from the listing. Choose Include or Exclude in the first field, then enter one or more source IDs in the fields that follow.</p>
Pricing Date	<p>These fields let you include or exclude items according to the date their material prices were last updated. Choose Include or Exclude and then enter a date in the second field.</p> <p>The default is to include all items updated on the present date or earlier.</p>

Material Backup Report

A portion of a sample Material Backup Report is shown in Figure 9.5..

For each item with a material backup record, this report shows the value of the Material Price Updated field and the Lowest, Highest, and Average prices. The actual material price used is shown in the Quote column. The report also lists each vendor referenced by the material backup record for the item, in a one-line-per-vendor format. Backup data is listed for modifiers as well as for base UPB items.

MATERIAL BACKUP		BSD UPB Material Backup NAT91A MATCHING 03 VENDOR MATCHING ALL National FY91 Unit Price Book			PAGE 237			
ID	NAME	CITY/STATE	DATE	LOW	HIGH	AVG	QUOTE	
04210 0000 Brick Masonry								
04210 1000 Standard Size Brick With Running Bond								
04210 1100 Face Brick, Red								
MIL 04210 1101	Veneer (6.4/Sf)	SF	06/18/91	1.13	1.41	1.27	1.27	
4049347628	Peters Brick & Tile	Tucker, GA. 30084	06/18/91		(404)924-6628		1.28	
2053280525	Feltcher & Associates	Birmingham, AL. 35203	06/18/91		(205)321-1125		1.41	
4047553541	Fox Brick Company	East Point, GA. 30344	06/18/91		(404)756-3641		1.13	
MIL 04210 1102	Cavity Wall (6.4/Sf)	SF	06/18/91	1.13	1.41	1.27	1.27	
4049347628	Peters Brick & Tile	Tucker, GA. 30084	06/18/91		(404)924-6628		1.28	
2053280525	Feltcher & Associates	Birmingham, AL. 35203	06/18/91		(205)321-1125		1.41	
4047553541	Fox Brick Company	East Point, GA. 30344	06/18/91		(404)756-3641		1.13	
MIL 04210 1103	9 In Solid Wall Construction	SF	06/18/91	2.24	2.80	2.53	2.53	
4049347628	Peters Brick & Tile	Tucker, GA. 30084	06/18/91		(404)924-6628		2.54	
2053280525	Feltcher & Associates	Birmingham, AL. 35203	06/18/91		(205)321-1125		2.80	
4047553541	Fox Brick Company	East Point, GA. 30344	06/18/91		(404)756-3641		2.24	
04210 1200 Common Brick								
MIL 04210 1201	Select Common For Veneers	SF	06/18/91	1.12	1.39	1.24	1.24	
4049347628	Peters Brick & Tile	Tucker, GA. 30084	06/18/91		(404)924-6628		1.21	
2053280525	Feltcher & Associates	Birmingham, AL. 35203	06/18/91		(205)321-1125		1.39	
4047553541	Fox Brick Company	East Point, GA. 30344	06/18/91		(404)756-3641		1.12	

Figure 9.5: Sample Material Backup Report (Portion)

Vendor Report

This report lists the complete information as stored in the Vendor File. This includes the vendor's ID, name, complete address and telephone number, fax number and contact person, as well as the date the record was last updated.

BSD UPB Vendor Report NAT91A MATCHING 03 VENDOR MATCHING ALL National FY91 Unit Price Book				PAGE 7
VENDOR LISTING				
SRC ID	NAME	ADDRESS	DATE/TEL./FAX	
MIL 4042357011	Cool Valley Steel Co Inc	P. O. Box 5524	10/09/91 (404)235-7011 FAX-40	
MIL 4042427360	Tony Dean Automation Fire Suppress.	Rome, GA 30161- 5611 Bay Cricle Suite 200	06/25/91 (404)242-7360 (999)999-9999	
MIL 4042428324	Bill Brown ELST Company	Norcross, GA 30071 6471 Peachtree Industrial Bld Atlanta, Ga.	06/25/91 (404)242-8324	
MIL 4042469867	Bradon Wise Columbus Wallcovering	30360 2912 Courtyard Drive, Nw Norcross, Ga	06/25/91 (404)246-9867 (999)999-9999	
MIL 4042510296	Mitchell Thomas Foley-Wick Products Co	30071 P. O. Box 1501	06/25/91 (404)251-0296 FAX-40	
MIL 4042522523	Mary Sickler Black Engineering Sales	Newman, GA. 30264 P. . Box 2227	06/25/91 (404)252-2523	
MIL 4042556000	Todd Black Suburban Paint/wallpaper	Atlanta, GA. 30328 142 Hilderbrant Road Atlanta, Ga	06/25/91 (404)255-6134 (999)999-9999	
MIL 4042559382	Todd Architectural & Eng. Sys.	30328 361 Blanton Road Nw	06/25/91 (404)255-9382	
MIL 4042561256	Formwork Exchange, Inc. Brooks Miller	Atlanta, GA 30342 240 Landsend Road Atlanta, GA 30328	06/25/91 (404)256-1256 (404)255-3542	

Figure 9.6: Sample Vendor Report (Portion)

Printing Vendor Backup Data on the Detail Report

On the Project Detail Report, you can print vendor backup data for any or all project cost items that have material backup records. The same fields are presented for each vendor as in the Material Backup Report: that is, one line per vendor including the vendor's price quote. The vendor listings are set off with a header, which identifies the content of each column.

To print vendor information on the Detail Report, do the following:

1. Set the Print field to Yes on the Material Pricing Backup Screen of all items for which you want the vendor data printed.
2. Generate the Detail Report. See Volume 1, Chapter 23 for instructions.

CHAPTER 10

HISTORICAL COST ANALYSIS SYSTEM (HCAS) REPORTING

Description

The HCAS Reporting Capability provides the ability to produce a report from MCACES GOLD which contains the content and is in the format required by the Historical Cost Analysis System (HCAS). The HCAS report is sorted and summarized by HTRW RA-WBS and Category Code. It shows the first three levels of the RA-WBS structure.

The HCAS Reporting Capability includes the following features:

- An HCAS Entry / Edit Screen entitled **HCAS Reporting** used to enter or modify HCAS data entries.
- An HCAS report, which will be generated after HCAS entries have been made to an MCACES Project database.
- A Help Screen which provides the definition of each of the five characters comprising the HCAS Category Code.

10.1 Working With HCAS Capabilities

Entry of Project Award Amount

The Project Award Amount will be reported in HCAS. MCACES Gold software will automatically adjust Award Amounts in proportion to the Government Estimate breakdown by prorating the Government Estimate Amounts using the ratio of the Actual Award Amount divided by the Government Estimate Amount.

To enter the Project Award Amount for the first time:

- Select the appropriate MCACES project database which reflects the Government (Bid) Estimate Amount.
- Be certain that all indirect costs and Escalation have been correctly applied, and that the project has been recalculated. Owner costs other than Escalation should be zeroed out for this application.
- Position the cursor at the Project Information Record.
- Choose Edit from the Add/Edit Menu or press the F4 key.
- Choose Edit HCAS Data from the Tools Menu or press the Alt+H keys.

- Enter the Project Award Amount. When the Project Award Amount is entered at the Project Information Record, each lower level title will automatically display the pro-rated award amount for that title. To override that amount see the following section.
- Press the F10 key to exit and save the Project Award Amount.

An example screen is shown in Figure 10.1:

FUNCTION	PROJECT HTWEXM HTRW EXAMPLE ESTIMATE																		
1 HELP	Project ID : HTWEXM																		
2 ADD	Project Name : HTRW EXAMPLE ESTIMATE																		
3 TITLES	HCAS Reporting																		
4 EDIT	HCAS Category Code : HCAS WBS Identifier : Government Estimate Cost : 18952593 Award Amount : 18952593																		
5 DETAIL																			
6 LOOKUP																			
7 NOTES																			
8 SELECT	<table border="1"> <thead> <tr> <th>MANHOURS</th> <th>LABOR</th> <th>EQUIPMNT</th> <th>MATERIAL</th> <th>SUBCONTR</th> <th>TOTAL</th> </tr> </thead> <tbody> <tr> <td>54236.68</td> <td>944377.33</td> <td>860424.25</td> <td>1.62E+006</td> <td>6.95E+006</td> <td>1.04E+007</td> </tr> <tr> <td>54,237</td> <td>944,377</td> <td>860,424</td> <td>1,623,364</td> <td>6,946,808</td> <td>10374973</td> </tr> </tbody> </table>	MANHOURS	LABOR	EQUIPMNT	MATERIAL	SUBCONTR	TOTAL	54236.68	944377.33	860424.25	1.62E+006	6.95E+006	1.04E+007	54,237	944,377	860,424	1,623,364	6,946,808	10374973
MANHOURS	LABOR	EQUIPMNT	MATERIAL	SUBCONTR	TOTAL														
54236.68	944377.33	860424.25	1.62E+006	6.95E+006	1.04E+007														
54,237	944,377	860,424	1,623,364	6,946,808	10374973														
9 MENU																			
10 EXIT																			

Enter the HCAS Award Amount for this item

EST A PROJECT v5.29

Figure 10.1: Entry of Project Award Amount

Entry / Edit of HCAS Title Level Data

To enter HCAS Title Level Data:

- Position the cursor at the appropriate Title Record.
- Choose Edit from the Add/Edit Menu or press the F4 key.
- Choose Edit HCAS Data from the Tools Menu or press the Alt+H keys.
- Enter the HCAS Category Code.
- If desired, modify the WBS Identifier and Award Amount fields. The automatically pro-rated award amount may be overridden at any title level.
- Press the F10 key to exit and save any entries / changes made.

Note: It is important to restrict the use of the HCAS Category Code to titles that should be included in the HCAS Report. If an HCAS Code is input on both a title and its subtitle, totals from both titles will appear on the HCAS Report and will be added into the total, resulting in a number higher than what the total should be.

An example screen is shown in Figure 10.2.

FUNCTION	33. HTRW REMEDIAL ACTION																		
1 HELP	SYSTEM ID : 01																		
2 ADD	SYSTEM Name : MOBILIZATION & PREPARATORY WORK																		
3 TITLES	HCAS Reporting																		
4 EDIT	HCAS Category Code : ██████████ HCAS WBS Identifier : 3301 ██████████ Government Estimate Cost : 90936 Award Amount : 90936																		
5 DETAIL																			
6 LOOKUP																			
7 NOTES																			
8 SELECT	<table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr> <th style="text-align: center;">MANHOURS</th> <th style="text-align: center;">LABOR</th> <th style="text-align: center;">EQUIPMNT</th> <th style="text-align: center;">MATERIAL</th> <th style="text-align: center;">SUBCONTR</th> <th style="text-align: center;">TOTAL</th> </tr> </thead> <tbody> <tr> <td style="text-align: right;">848.00</td> <td style="text-align: right;">28435.12</td> <td style="text-align: right;">20854.08</td> <td style="text-align: right;">7455.00</td> <td style="text-align: right;">0.00</td> <td style="text-align: right;">56744.20</td> </tr> <tr> <td style="text-align: right;">848</td> <td style="text-align: right;">28,435</td> <td style="text-align: right;">20,854</td> <td style="text-align: right;">7,455</td> <td style="text-align: right;">0</td> <td style="text-align: right;">56,744</td> </tr> </tbody> </table>	MANHOURS	LABOR	EQUIPMNT	MATERIAL	SUBCONTR	TOTAL	848.00	28435.12	20854.08	7455.00	0.00	56744.20	848	28,435	20,854	7,455	0	56,744
MANHOURS	LABOR	EQUIPMNT	MATERIAL	SUBCONTR	TOTAL														
848.00	28435.12	20854.08	7455.00	0.00	56744.20														
848	28,435	20,854	7,455	0	56,744														
9 MENU																			
10 EXIT																			

Enter the HCAS Category Code EST A PROJECT v5.29

Figure 10.2: Entry of Title Level Data

Changing the Award Amount at the Project Information Record

Once HCAS category codes have been input, the ratio between the Government Estimate Cost and the Award Amount is set. There are two ways to change this ratio. One is to go into each title that has an HCAS Code applied and input a revised Award Amount for that title. To change the Award Amount at the Project Information Record, and have that new ratio implemented at the lowest title level, go into each HCAS title and input a 0 in the Award Amount field. Save each change with F10 or Page Down. These titles will now display the new pro-rated Award Amount from the Project Information Record.

10.2 Running the HCAS Summary Report

Once HCAS data has been entered, selecting any report to print will generate an HCAS Summary Report. This will appear immediately before the error listing near the end of the report output. No report switches need be turned on for the HCAS report to be generated.

Invoking the HCAS Category Code Help Screen

- While in the HCAS Title Entry / Edit Screen (see above), move to the HCAS Category Code field.
- Press the F1 key to invoke the HCAS Help Screen. The breakdown of each Category Code digit is explained by scrolling through the information provided.
- Press the F10 key to exit Help.

CHAPTER 11

DATABASE UTILITIES

Description

The *Database Utilities* are a set of easy-to-use programs for managing the supporting databases used with GOLD. They are accessed through the Utilities Menu (Figure 11.1).

FUNCTION	PREPARE	REPORTS	SERVICES	ADMIN	UTILITIES	MCACES	DOS
1 HELP					Merge Two Databases		
2 ADD					Extract From Database		
3 TITLES					COmpare Two Databases		
4 EDIT					Update UPB w/Matl Indicator		
5 DETAIL					Update UPB From Vendor Backup		
6 LOOKUP	DATABASE	DIRECTORY	ID	NAME	MCACES	GOLD	
7 NOTES	Project	C:\GOLD530...	MILEXM	Storage Building			
8 SELECT	Models	C:\GOLD530...	TRACES	TRACES Work Breakdown Structure			
	Assemblies	C:\GOLD530...	ASM94A	17-Building Assemblies Library			
	Unit Prices	C:\GOLD530...	NAT92A	1992 National UPB / Repriced 94			
9 MENU	Crews	C:\GOLD530...	NAT94A	1994 National Crews Database			
	Labor Rates	C:\GOLD530...	NAT94A	1994 National Labor Rates			
10 EXIT	Equip Rates	C:\GOLD530...	NAT93A	Eq Rates EP 1110-1-8, Aug. 1993			
							C:\GOLD530
Merge records from two databases							
UNIT PRICES v5.30							

Figure 11.1: Utilities Menu

List of Database Utilities

The Database Utilities include the following programs:

- Merge Two Databases
- Extract From Database
- Compare Two Databases
- Update UPB With Material Indicators

Other Utilities Menu Options

The remaining options on the Utilities Menu are described elsewhere in the GOLD documentation, as follows:

- Update UPB From Vendor Backup is part of the Material and Vendor Backup capability and is discussed in Section 9.4.

Available Databases

The Database Utilities are used only with certain types of databases. This table summarizes which Utilities can be used with which databases:

These Utilities...	Can Be Used With These Databases Types...
Merge Two Databases Extract From Database Compare Two Databases	Unit Price Labor Rates Equipment Rates
Update UPB With Material Indicators	Unit Price

Note: Merge and Extract options are available for the other types of databases through the Merge From and Extract To functions on the Mark Menu. Refer to Sections 18.7 and 18.8 in Volume 1.

Selecting a Database

Before using one of the Database Utilities, you first select the type of supporting database to work with. Do this by highlighting a database in the database window before selecting the utility from the Utilities Menu.

Chapter Overview

This chapter provides instructions for using each of the Database Utilities:

- 11.1 Merge Two Databases
- 11.2 Extract From Database
- 11.3 Compare Two Databases
- 11.4 Update UPB With Material Indicators

11.1 Merge Two Databases

Purpose

The Merge Two Databases Utility combines all of the records from two databases of the same type. You can use this utility on Unit Price, Labor Rates, and Equipment Rates Databases.

Source and Target Databases

The two databases that you merge are called the *source* and the *target*. You have the option of copying the source records into the target, or of leaving the target intact and creating a third distinct database that combines the source and the target.

Duplicate Records

Normally, items with the same database IDs are not allowed. Therefore, this utility gives you the option of merging the data from two duplicate records into one record in various ways

However, if you have the Administrative Module installed on your system you do have the option of allowing duplicate records in the merged database. See the Appendix in this volume for more information.

Merge Screen

You execute this utility through the Merge Two Databases Screen, which is shown in Figure 11.2.

Field Descriptions

This table describes the fields on the Merge Two Databases Screen.

Note: The fields under UPB Detail Duplicates are used only when merging Unit Price Databases.

Field	Description
<u>Database Path, ID and Date</u>	
Source	<p>The DOS path and 6-character database ID of the database whose records are to be copied. This database will not be changed by the merge.</p> <p>The date is filled in by the program with the database issue date, once a valid path and ID are entered.</p>
Target	<p>The DOS path and 6-character database ID of the database whose records are to be combined with the source records. Default is the currently selected database.</p> <p>The Date field shows the issue date for the database. You can enter a different date if you want to specify the overwriting of material prices in a Unit Price Database based on a date. (See the description of the Overwrite Material Price field, below.)</p>
Result	<p>The DOS path and 6-character database ID of the database that results from the merge. Default is the same as the target. If you want the target database left unchanged, type in a different ID and/or path for the result.</p> <p>The Date field shows the date that will be recorded as the issue date for the result database.</p>
Name of Result	<p>Name given to the resulting database. This name will be displayed in the Name column in the database window when the result database is selected.</p>

Field	Description
<u>UPB Detail Duplicates</u>	
Allow Duplicate Records	<p>Indicates whether records with duplicate database IDs are to be allowed in the result database.</p> <p>If No is entered in this field, the remaining fields on the screen become accessible. These fields let you specify which data the program will overwrite when it merges two items with duplicate IDs.</p> <p>Note: This field is set to No by the program and can only be changed if you have the Administrative Module as well as the System Toolkit. Refer to the Appendix in this volume for more information..</p>
Overwrite Material Price	<p>Specifies whether the material price of an item in the target is overwritten by the material price of a duplicate item in the source. Codes are:</p> <p>T - NO; Always Use Target. Do not overwrite. Use the material price in the target database in all cases.</p> <p>X - All Except User Overrides. Overwrite the material prices in the target with those in the source, except for those items where a user override has been applied to the material price.</p> <p>N - Use Price with Newer Date. The utility compares the Material Price Updated fields of the matching items. The price of the item with the more recent date is used.</p> <p>(Continued on next page)</p>

Field	Description
Overwrite Material Price (Continued)	<p>D - All Target Date or Older. The utility refers to the Target Date field at the top of the screen. Items in the target database with this or an earlier date in the Material Price Updated field have their material prices overwritten. Other items do not.</p> <p>Example: You could use this code to overwrite 1990 prices in the target with 1991 prices in the source, but still keep any prices in the target that were entered since the beginning of 1991.</p> <p>S - YES; Always Use Source. Overwrite the material price in the target with the material price in the source for all duplicate items.</p>
Overwrite Labor/Equip/Output	<p>Specifies whether labor and equipment unit costs and crew output figures in the target database are overwritten by the costs and output of duplicate items in the source. Codes are:</p> <p>T - NO; Always Use Target. Do not overwrite. Use the values in the target database in all cases.</p> <p>X - All Except User Overrides. Overwrite the values in the target with those in the source, except for those items where a user override has been applied.</p> <p>S - YES; Always Use Source. Overwrite the values in the target with those in the source for all duplicate items.</p>
Overwrite Description/Notes	<p>Determines whether the description and Notes attached to items in the target are overwritten by those of duplicate items in the source. Codes are:</p> <p>T - NO; Always Use Target. Do not overwrite. Use the descriptions and Notes in the target database.</p> <p>S - YES; Always use Source. Overwrite the description and Notes in the target with those in the source for all duplicate items.</p>

11.2 Extract From Database

Purpose

The Extract From Database Utility creates a new empty database and then copies in certain records that you specify from an existing database. You can use the Extract Utility on Unit Price, Labor Rates, and Equipment Rates Databases.

Description

The database that you extract the records from is called the *source*, and the new database that is created is called the *result*. You can extract records based on a range of database IDs, and you can also choose to include or exclude items based on their source IDs.

Extract Screen

Choosing this utility from the menu displays the Extract From Database Screen, which is shown in Figure 11.3.

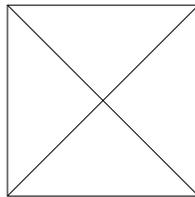


Figure 11.3: Extract From Database Screen

Procedure

Follow these steps to extract records from a database. Begin on the Main Menu Screen with the highlight on the type of database you want to work with.

1. Press the U key to access the Utilities Menu. Move the highlight to the Extract From option, then press Enter.

Result: The Extract From Database Screen is displayed.

2. Type entries in the fields on the screen as needed to specify the extraction process. Refer to the Field Descriptions below for details.

3. After filling in the screen as needed, press Page Down.

Result: The program prompts you to confirm the action.

4. Type Y to confirm.

Result: The new database is created and the specified records copied into it. When processing is finished, the Main Menu Screen is displayed.

Field Descriptions

This table describes the fields on the Extract From Databases Screen.

Field	Description
<u>Source</u>	
Path and ID	The DOS path and 6-character database ID of the database whose records are to be extracted. Default is the database currently highlighted in the database window.
Name and Date	The Name of the source database and the issue date. Filled in by the program.
<u>Result</u>	
Path and ID	The DOS path and 6-character database ID of the new database to be created.
Name and Date	Name of the new database and the issue date. The program fills in the name and date of the source database as defaults, but you can change the entries as needed.

Field	Description
<u>Extract Options</u>	
Extract Range	<p>These fields let you specify a range of database IDs to define which items will be extracted. Enter the first ID of the range in the From field and the last ID in the To field.</p>
Source(s)	<p>These fields are used to include or exclude items with specific source IDs. Choose Include or Exclude in the first field, then enter one or more source IDs in the fields that follow.</p> <p>Example: To extract all items except those that are user-created, you would choose Exclude and then enter USR as the one source.</p>
Last Price Update	<p>These fields let you include or exclude items according to the last time their pricing was changed. For Unit Price Databases, the program refers to the Material Price Updated field. For Labor and Equipment Rates Databases, the Last Update field is used.</p> <p>Choose include or exclude and then enter a date.</p> <p>The default is to include all items updated earlier than the current date.</p> <p>Example: To extract only the items updated since the beginning of 1991, you would choose exclude and enter 12/31/90 as the date.</p>

11.3 Compare Two Databases

Purpose

The Compare Two Databases Utility performs a record-by-record comparison of two databases of the same type, and produces a report listing the differences.

Description

This utility compares the currently selected database with its original version (or with any other database of the same type that you specify).

You can use the utility to compare two Unit Price, Labor Rates, or Equipment Rates Databases.

Report Contents

You can choose a report that lists only the items not found in the specified database, or all items with a cost variance greater than a range that you enter. Which cost is tested for the variance depends on the type of databases being compared.

When you compare...	The utility tests the variance of...
Unit Price Databases	material prices.
Labor Rates Databases	total hourly labor rates.
Equipment Rates Databases	total equipment rates (average single-shift rates).

Compare Screen

Choosing the Compare Utility from the menu displays the Compare Two Databases Screen (Figure 11.4).

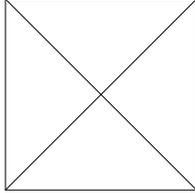


Figure 11.4: Compare Two Databases Screen

Procedure

Use these instructions to produce a report comparing two databases. Begin on the Main Menu Screen with the highlight on a database that you want to compare with another database.

1. Press the U key to access the Utilities Menu. Move the highlight to the Compare option, then press Enter.

Result: The Compare Two Databases Screen is displayed.

2. Type entries in the fields on the screen as needed. Refer to the Field Descriptions below for details.
3. After filling in the screen, press Page Down.

Result: The Run Reports Window is displayed.

4. Type information in the fields on the window as needed to add a secondary report title or change the print device. (See Volume 1, Section 23.7 for details.)

When the window shows the correct information for running the report, press the Page Down key.

Result: The utility prompts you to confirm the comparison.

5. Type Y to confirm.

Result: The report is printed or sent to a text file on disk, as specified in the window. The program displays a message to inform you when processing is complete.

Note: If no differences are found between the two databases, the program displays a message to inform you of this, and does not generate a report.

6. Press F10 to exit to the Main Menu Screen.

Field Descriptions

This table describes the fields on the Compare Two Databases Screen.

Field	Description
<u>Original Database</u>	
Path and ID	The DOS path and 6-character database ID of the database to be compared with the current database.
Name and Date	The name and issue date of the original database. Filled in by the program once a valid ID is entered.
<u>Current Database</u>	
Path and ID	The DOS path and 6-character database ID of the database currently selected in the database window. Filled in by the program.
Name and Date	The name and issue date of the current database. Filled in by the program.

Field	Description
<u>Compare Report Options</u>	
Report Content	<p>Specifies which items are to be listed in the report. Values are:</p> <ul style="list-style-type: none"> • Item Not Found in Original. List all cost items found in the current database that have no matching ID in the original. • Cost Variance Exceeding Range. List all items in the current database whose costs compared to those of matching items in the original database show a variance greater than a certain percentage. You then enter the percentage of variance in the next field. (Items in the current database with no matching ID in the original are <i>not</i> listed.) <p>Note: Which cost is checked for variance depends on the type of database. See <i>Report Contents</i> above.</p>
Variance Range	<p>The percentage to be used when comparing the costs of matching items in the two databases.</p> <p>Items with costs that differ more than this percentage will be listed on the report if you choose the Cost Variance option in the field above.</p>

11.4 Update UPB With Material Indicator

Purpose

This utility updates the material prices in the current Unit Price Database according to the material adjustment percentages entered on title entry screens. (These adjustment percentages are also referred to as material indicators.)

Prerequisite: Setting the Indicators

Before using this utility, you must enter adjustment percentages on one or more title entry screens in the Unit Price Database. The utility will use these percentages to update the material prices of all cost items below that title.

These percentages are entered in the Percent Difference field on the lower part of the entry screen. Entering a percentage automatically sets the Pending field on that screen to Yes.

Refer to Section 10.3 in Volume 1 for detailed instructions.

Update Window

Choosing this utility from the menu displays the Update UPB w/Material Indicators Window (Figure 11.5).

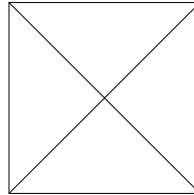


Figure 11.5: Update UPB w/Material Indicators Window

Procedure

Use this procedure to update the material prices of a Unit Price Database with material indicators. Begin on the Main Menu Screen with the highlight on the Unit Price Database in which the material indicators have been entered.

1. Press the U key to access the Utilities Menu. Move the highlight to the Update UPB With Material Indicators option, then press Enter.

Result: The Update UPB w/Material Indicators Window is displayed.

2. Press Enter to accept the current date in the first field, or type a new date and then press Enter.

Items that have a date later than this (recorded in the Material Price Updated field) will not be changed by the update.

3. Choose Include or Exclude for the second field.

If you choose Exclude, items that have had their material prices changed by user overrides will not be changed by the update.

4. Press Enter.

Result: The utility prompts you to confirm the update.

5. Type Y to confirm.

Result: All items with material indicators pending have their prices updated by the specified percentages. The program informs you when processing is complete.

6. Press F10 (Exit Screen) to return to the Main Menu Screen.

CHAPTER 12

RESTRUCTURE UPB FUNCTIONS

Purpose

The Restructure UPB functions enable you to rearrange elements and detail items in a Unit Price Database. (An *element* is defined as a title with all of its subtitles and detail items.) Within certain logical limits, elements can be moved to different levels of a hierarchy and/or different sections of the overall database.

Available Functions

Three Mark Menu options are included in the Restructure UPB capability:

- Promote Title (Alt+T) raises an element up one level.
- Demote Title (Alt+D) lowers an element by one level
- Move (Alt+F4) moves an element to a different part of the database and renumbers the element (changes the database IDs all titles and detail items). This is the same Move function that is available in the Project and other databases as described in Volume 1, Section 18.5. However, its use in the Unit Price Database differs significantly.

In addition, the Restructure UPB capability allows you to change the IDs of detail items, and therefore change their position in the Unit Price Database.

ARA Version Only

In order to access the Restructure UPB functions you must have Assigned Responsible Agency (ARA) version of MCACES GOLD. See the Appendix in this volume for more information.

Chapter Overview

This chapter describes the use of Restructure UPB capabilities and provides examples. The following sections are included:

- 12.1 Promote Title - Alt+T Keys
- 12.2 Demote Title Alt+D Keys
- 12.3 Move - Alt+F4 Keys
- 12.4 Renumbering UPB Items

12.1 Promote Title - Alt+T Keys

Purpose

The Promote Title function moves a single Unit Price Database element up one level. The database IDs (UPB IDs) within the element are not changed.

Effect of Promoting a Title

When you promote a title, that title and all of its subtitles are raised up one level in the database hierarchy.

The database IDs of subtitles and detail items are not changed by the Promote function. Therefore, titles at the same level as a title that is promoted and which have higher numbered IDs than that title, become subtitles to the promoted title. Titles at the same level that have lower IDs remain as subtitles under their former parent title.

Example

Assume you are working in CSI Division 16 and that your Unit Price Database has, in part, the following title structure:

```
16000 0000 Electrical
  16050 0000 Basic Materials and Methods
    16101 0000 General
    16102 0000 Cable Installation Methods
      16102 1000 Plowed In
      16102 2000 Trenched
      16102 3000 Pulled
      16102 4000 Layed In
    16110 0000 Raceways
    16111 0000 Conduits
    16112 0000 Bus Ducts
    16113 0000 Underfloor Ducts
    16114 0000 Cable Trays
    etc.
  16200 0000 Power Generation
  16300 0000 Power Transmission
  16400 0000 Service and Distribution
  16500 0000 Lighting
  etc.
```

If you chose to promote title 16102 0000-Cable Installation Methods, the new partial structure would be as follows:

16000 0000 Electrical
16050 0000 Basic Materials and Methods
16101 0000 General
16102 0000 Cable Installation Methods
16102 1000 Plowed In
16102 2000 Trenched
16102 3000 Pulled
16102 4000 Layed In
16110 0000 Raceways
16111 0000 Conduits
16112 0000 Bus Ducts
16113 0000 Underfloor Ducts
16114 0000 Cable Trays
etc.
16200 0000 Power Generation
16300 0000 Power Transmission
16400 0000 Service and Distribution
16500 0000 Lighting
etc.

Notice that the Level 3 titles beginning with 16111 0000-Raceways, which were formerly subtitles to Basic Materials and Methods, have now become subtitles to the promoted title, Cable Installation Methods. Element 16101 0000-General is now the only subtitle element to Basic Materials and Methods. This is because the Promote Title function does not renumber subtitles, and the program always places subtitles under the parent title with the closest database ID.

You need to be aware of this aspect of the Promote Title function in order to avoid creating an illogical organization.

Procedure

Follow these steps to promote a title element in the Unit Price Database:

1. On the title list screen, highlight the title you want to promote.
2. Press Alt+T or choose Promote Title from the Mark Menu.
Result: GOLD prompts you to confirm promoting the title.
3. Enter Y to confirm and then press the Enter key.

Result: The title and all its subtitles are raised one level in the database.

Restrictions

The following restrictions apply when using the Promote Title function. The program will not promote a title in violation of these restrictions, and instead will issue an error message.

- You cannot promote a title element from the highest title level (Level 1).
- You cannot promote a title if the action would place subtitles and detail items directly beneath the same title. GOLD does not permit subtitles and detail to reside directly under a title.

12.2 Demote Title - Alt+D Keys

Purpose

The Demote Title function moves a single Unit Price Database element down one level.

Effect of Demoting a Title

When you demote a title, that title and all of its subtitles are moved down one level in the database. The database IDs within the element are not changed.

Procedure

1. On the title list screen, highlight the title you want to demote.
2. Press Alt+D or choose Demote Title from the Mark Menu.

Result: GOLD prompts you to confirm demoting the title.

3. Enter Y to confirm and then press the Enter key.

Result: The title and all its subtitles are lowered one level in the database.

Restrictions

The following restrictions apply when using the Demote Title function. GOLD will not demote a title in violation of any of these restrictions and will instead issue an error message.

- You cannot demote a title element if the operation would place any subtitles below Level 6, since only six title levels are allowed in a database.
- You cannot demote a title if the process would place any subtitles below a title that has detail items. Detail items and subtitles cannot reside directly under the same title.
- You cannot demote the first title element beneath any particular parent title. This is because demoting a title makes that title a subtitle to the immediately preceding title at its current level. The first title at any level has no title at the same level preceding it.

12.3 Move - Alt+F4 Keys

Purpose

The Move function is used to move a title element from one part of the Unit Price Database to a different part. The new location (called the *target*) must be on the same database level as the original location. This function renumbers all database IDs in the element.

Description

When you invoke the Move function, GOLD searches the selected element and determines the number of characters that all database IDs in that element have in common. (This can be the first 2 through 9 characters of the database ID.) You are then prompted to enter this number of characters to specify the new location of the element.

Procedure

1. On the title list screen, highlight the title for the element you want to move.
2. Press Alt+F4 or choose the Move function from the Mark Menu.

Result: You are prompted to enter a new ID to specify the new location of the title element in the database.

3. Enter the characters to specify the new ID, then press the Enter key.

Result: GOLD prompts you to confirm the move operation.

4. Press Y to confirm and then press the Enter key.

Result: The title and all its subtitles and detail items are moved to the target location in the database.

Restrictions

The following restrictions apply when using the Move function in the Unit Price Database. GOLD will not move an element in violation of these restrictions and will instead issue an error message.

- You cannot move a title to a different level. Use the Promote or Demote function to change levels.
- You cannot move an element to a location where any titles or detail items already reside. In other words, the new database IDs created by the move cannot overwrite the IDs of existing titles or items.

12.4 Renumbering UPB Items

Description

The Restructure UPB functions also allow you to change the database IDs (UPB IDs) of detail items in the Unit Price Database. Since detail items are sorted in numerical order according to their UPB IDs, changing an ID causes the program to place the item in a new location in the database.

You can change a UPB ID on either the browse mode screen or the detail item entry screen.

Caution

When you change the UPB ID of an item, the program does *not* check to be sure there is no item with a duplicate ID. To guard against giving two items the same ID, it is best to edit IDs on the browse mode screen.

That way, when you press the Up or Down Arrow key to move the cursor, GOLD will automatically place the item in its new location. If there is already an item with the same ID, the changed item will be placed next to its duplicate and the duplication will be easily seen.

Procedure

1. On the browse mode screen, move the highlight to the UPB ID field for the item you want to renumber.
2. Type the new UPB ID.
3. Press the Down Arrow or UP Arrow key.

Result: The cursor moves to the next item (down or up) on the screen. The renumbered item is placed in its new location in numerical order in the database.

CHAPTER 15

ENG3086 INTERFACE

Purpose

The ENG3086 Interface enables cost engineers to use GOLD to prepare ENG3086 budget estimates. These estimates can be uploaded in ASCII format to the ENG3086 Module of the DD1391 Processor System.

You can also download an estimate from the ENG3086 Module and work with it in GOLD.

Capabilities

Specifically, the ENG3086 Interface provides the cost engineer with the tools to do the following:

- Import an ASCII-format file of project information produced by the ENG3086 Module, with or without previously-generated costs and category breakdown information.
- Create a GOLD ENG3086 Project Database using the import file, with standard ENG3086 titles. Alternately, you can start a GOLD ENG3086 project without importing, by copying from or adding a project based on the new Military Project Template (MILTM2).
- Use MCACES Menu screens to add or edit descriptive information about the ENG3086 project.
- Build the project using the familiar Add, Edit, and Lookup functions.
- Use the GOLD 2nd View capability to distribute escalation costs over the project elements, as required for ENG Form 3086 reporting.
- Produce a report of the estimate in the required ENG3086 format.
- Export the ENG3086 project to an ASCII file that can then be uploaded to the ENG3086 Module.

Task List

Working with the ENG3086 Interface involves the following tasks.

1. You start the ENG3086 project in one of two ways:
 - By importing an ASCII file generated by the ENG3086 Module.
 - By starting the project in GOLD, based on the MILTM2 Military Template. You can create the project through either the Copy a Database option on the Services Menu or the F2 Add function.

See Section 15.1 for instructions.

2. You use two screens accessible from the MCACES Menu to add or edit preparer and design information relevant to the estimate. See Sections 15.2 and 15.3.
3. You enter project costs using the GOLD Add, Edit, and Lookup capabilities, as with any Project Database. Refer to Section 15.4 for more details.
4. A 2nd View for the ENG3086 estimate is created automatically when the project is created (using any of the methods discussed in Task 1) If you need to relocate certain specific costs (such as "Special Features"), you can do so by adding to the Exceptions Table. The use of 2nd View is discussed in Section 15.5.

Note: You can use the 2nd View Exceptions option before the 2nd View is actually generated. When the 2nd View is generated, the exceptions you've defined will be incorporated in the 2nd View title structure.

5. Whenever necessary, you can produce an ENG3086 Listing of the project, as described in Section 15.6.
6. When needed, you can export the estimate to an ASCII file, which can be uploaded to the ENG3086 Module of the DD1391 system. See Section 15.7 for instructions.
7. At a later time, you can re-import the estimate from the ENG3086 Module and update the estimate in GOLD.

Using MILTM2

A new version of the Military Project Template is provided with GOLD 5.30. This version, called MILTM2, incorporates the TRACES WBS. The template is designed to be used for all Military Construction projects. All ENG3086 estimates are created based on MILTM2, whether the project is started by an import or from within GOLD.

- See Section 15.1 for information on creating projects using MILTM2.
- See Section 15.4 for information on Owner Cost options in MILTM2-based projects.

Chapter Overview

This chapter provides instructions on using the ENG3086 Interface. The following sections are included. Sections 15.1 - 3 and 15.6 - 7 correspond to options on the MCACES Menu.

- 15.1 Starting an ENG3086 Project
- 15.2 ENG3086 Preparer Information
- 15.3 ENG3086 Design Information
- 15.4 Working With an ENG3086 Project
- 15.5 Using 2nd View for an ENG3086 Project
- 15.6 Print an ENG3086 Report
- 15.7 Export to ENG3086 Format

15.1 Starting an ENG3086 Project

Overview

You can start an ENG3086-compatible project in MCACES GOLD in the following ways:

- Use the Import From ENG3086 Format option to import information that was prepared using the ENG3086 Module and then stored in an ASCII file.
- Create the project in GOLD based on MILTM2 and using either Copy a Database or F2 Add.

You can also import data from an ENG3086 ASCII file to an existing Gold project.

This section provides instructions for all of these procedures.

Creating a Project by Importing

In order to create a project by importing, you must begin with an ASCII file exported from the ENG3086 Module of the DD1391 System. The following import procedure automatically creates the GOLD Project Database, using the ASCII file and information contained in the MILTM2 template.

1. Beginning on the Main Menu Screen, with the highlight on the Project Database, press the C key to access the MCACES Menu. Then press F to choose the Import From ENG3086 Format option.

Result: A window is displayed with two fields for you to enter information.

2. In the first field, enter the DOS path and file name of the import file. (Change the default as needed.) Then press the Enter key.
3. In the second field, enter the DOS path and six-character database ID of the GOLD Project Database to be created by the import. Then press the Enter key.

Result: A new Project Database is created, containing the ENG3086 title structure as imported from the file. The descriptive data about the estimate is then copied from the ASCII file to the Project Database.

Note: Before you can work with the new GOLD project, you must select it so that it is displayed on the project line in the database window. (Refer to Section 8.1 in Volume 1 if you need instructions.)

Importing to an Existing GOLD Estimate

Use this procedure to copy data from an ENG3086 Module ASCII file to an existing GOLD ENG3086 Project Database. You have the option of copying:

- All data from the ASCII file, including title structure and cost information, *or*
- Only header information. Header information includes descriptive and date fields and also Escalation indexes and contingency and SIOH percentages. (See Section 15.4 for more information on this data.)

Begin the procedure on the Main Menu Screen, with the highlight on the Project Database.

1. Press the C key to access the MCACES Menu. Then press F to select the Import From ENG3086 Format option.

Result: A window is displayed with two fields for you to enter information.

2. In the first field, enter the DOS path and file name of the import file. (Change the default as needed.) Then press the Enter key.
3. The second field shows the DOS path and six-character database ID of the GOLD Project Database where the imported data will be copied. The path of the currently selected project is shown as the default.

Enter the path and ID of the existing ENG3086 Project Database where you want the data copied (if it is not already shown). Then press the Enter key.

Result: GOLD prompts you to specify whether to include the cost estimate data (titles and costs).

4. Enter Y to copy titles and costs from the import file, or N to copy only the header information. Then press the Enter key.

Note: If you entered Y, GOLD prompts you to confirm overwriting the existing Project Database with the new information. Enter Y to confirm.

Result: The data from the ENG3086 ASCII file is copied as specified to the Project Database.

Creating a Project From MILTM2

GOLD also enables you to create an ENG3086 Project Database without using an import file, by basing the project on the military project template (MILTM2), or on an existing ENG3086 project.

This capability is provided so that you can make any Military Construction estimate (that is, any one based on MILTM2) into an ENG3086-compatible estimate. In order to do so, you *must* import the header information from an ENG3086 ASCII file at some point. This is the only way to produce an ENG3086 estimate that can be exported back to the DD 1391 System.

Copy or Add Options

You can create the ENG3086 project using either the Copy a Database option on the Services Menu or the F2 Add function.

- Using Copy a Database copies an entire project, including ENG3086 Header Information (if any). When you copy from MILTM2, this also copies the TRACES title hierarchy. This is described in the following procedure.
- Using F2 Add copies only the project columns, breakdown structure, and 2nd View information. F2 Add does not copy any actual titles or header information.

Procedure: Copying From MILTM2

Follow these steps to create an ENG3086 Project Database by copying from the MILTM2 project template. Begin on the GOLD Main Menu Screen.

1. Select the MILTM2 template so that it is displayed and highlighted in the database window.
2. Press the S key to select the Services Menu, then Y to choose the Copy a Database option.

Result: A window is displayed and GOLD prompts you to enter the database to copy. The path and ID of MILTM2 are shown as the defaults.

3. Press Enter to accept MILTM2 as the database to be copied.

Result: A second window is displayed, prompting you to enter the path and ID of the new Project Database to be created by the Copy.

4. Fill in the 6-character ID of the new project you want to create. (You can also change the default path if necessary.) Then press Enter.

Result: The database is copied. A message informs you when processing is complete.

5. Press Enter to dismiss the message.

Note: To work with the new project, you must first select it using the Select a Database option.

15.2 ENG3086 Preparer Information

Purpose

The ENG3086 Preparer Information option is used to display general information about an ENG3086 estimate as imported from the ENG3086 Module. It is also used to edit or add specific information about the cost engineer preparing the estimate in GOLD.

ENG3086 Preparer Information Screen

Accessing the ENG3086 Preparer Information option displays the ENG3086 Preparer Information Screen, as shown in Figure 15.1:

FUNCTION	ENG3086 PREPARER INFORMATION
1 HELP	Form Number : 99999 Type of Currencu : DOLLAR Perm. Project # : 99999 Currencu Exchange Rate : 1.00
2 ADD	Fiscal Year : 1991 Installation : Fort Sumpter
3 TITLES	Proj. Title 1 : Storage Building Proj. Title 2 :
4 EDIT	Proj. Cat Code : 14377 Type of Const. : Permanent Location : South Carolina
5 DETAIL	Area Cost Factor : 82.00
6 LOOKUP	Prepared by : John Q. Manager Office : EN-C Phone : 404/876-9999
7 NOTES	Creation Date : 12/15/1990 Revision Date : 04/25/1991
8 SELECT	
9 MENU	
10 EXIT	

Ratio of the currencu to one U.S. Dollar EST A PROJECT v5.28

Figure 15.1: ENG3086 Preparer Information Screen

Procedure

Use this procedure to view or enter ENG3086 preparer information. Begin on the Main Menu Screen with the highlight on a Project Database that contains ENG3086 information.

1. Beginning on the Main Menu Screen, with the highlight on the Project Database, press the C key to access the MCACES Menu. Then press E to choose the ENG3086 Preparer Information option.

Result: The ENG3086 Preparer Information Screen is displayed.

2. View or edit the fields as needed. Refer to the Field Descriptions below.
3. When you are ready to leave the screen, press the F10 key.

Result: Any data you have changed is saved. The Main Menu Screen is redisplayed.

Field Descriptions

This table describes the fields on the ENG3086 Preparer Information Screen. Most of this data is supplied by the ENG3086 Module. Only a few of the fields can be altered in GOLD.

Field	Description
Form Number	Form Number of the estimate as generated by the ENG3086 Module.
Permanent Proj. #	Permanent Project Number of the estimate as generated by the ENG3086 Module.
Type of Currency	Type of currency used in the estimate. Examples: U.S. Dol (U.S. Dollars) Marks
Currency Exchange Rate	Exchange rate of the chosen currency to U.S. dollars. If the currency type is other than U.S. Dol, you can enter or change the rate in this field. Note: The rate entered here must match the exchange rate entered in the Units per U.S. Dollar field on the Project Database Edit Screen. See Section 9.4 in Volume 1 for more information on currency conversion.
Fiscal Year	Fiscal year of the estimate.
Installation	Name of the installation.
Proj. Title 1	First part of the project title.
Proj. Title 2	Second part of the project title.
Proj. Cat Code	Construction Category Code associated with the estimate.

Field	Description
Type of Const.	Type of construction.
Location	Location of the construction project.
Area Cost Factor	Area cost factor for the location.
Prepared by Name	Name of the cost engineer preparing the estimate in GOLD.
Office	Office of the cost engineer preparing the estimate in GOLD.
Phone	Phone number of the cost engineer preparing the estimate in GOLD.
Creation Date	Original creation date of the estimate.
Revision Date	Date of last revision. The date must be entered in MM\DD\YYYY format.

15.3 ENG3086 Design Information

Purpose

The ENG3086 Design Information option is used to enter descriptive information specific to the design of an ENG3086 estimate.

ENG3086 Design Information Screen

Accessing the ENG3086 Design Information option displays the ENG3086 Design Information Screen, as shown in Figure 15.2.

FUNCTION	ENG3086 DESIGN INFORMATION
1 HELP	Designed by : The Architect/Engineer Partnership
2 ADD	Address : 1433 N. Dakota Avenue
3 TITLES	Location : Charlotte, North Carolina 26202
4 EDIT	Basis of Estimate : Submittal Dated 15 Mar 91
5 DETAIL	% Design Complete : 60.00%
6 LOOKUP	% Concept Complete : 100.00%
7 NOTES	Concept Comp. Date :
8 SELECT	Cost Basis Date : MAR 1991
9 MENU	Cost Basis Index : 1010
10 EXIT	Const Start Date : JUN 1991
	Escalation : 2.04%
	Const End Date : JAN 1992
	Contingency : 5.0000%
	Const. Midpoint : SEP 1991
	Midpoint Index : 1055
	SIQH : 6.0000%
	Firm or organization designing the project
	NOTES EST A PROJECT v5.28

Figure 15.2: ENG3086 Design Information Screen

Design Notes

From any field on the ENG3086 Design Information Screen you can use the Notes (F7) function to access a Design Notes window. You can then add or edit Design Notes specific to this ENG3086 estimate. These Design Notes are exported as part of the ASCII export file. The notes are also printed in the ENG3086 Listing Report.

Procedure

Use this procedure to view or enter ENG3086 design information. Begin on the Main Menu Screen with the highlight on a Project Database that contains ENG3086 information.

1. Beginning on the Main Menu Screen, with the highlight on the Project Database, press the C key to access the MCACES Menu. Then press 3 to choose the ENG3086 Design Information option.

Result: The ENG3086 Design Information Screen is displayed.

2. View or edit the fields as needed. Refer to the Field Descriptions below.
3. When you are ready to leave the screen, press the F10 key.

Result: Any data you have entered or changed is saved. The Main Menu Screen is redisplayed.

Field Descriptions

This table describes the fields on the ENG3086 Design Information Screen.

Field	Description
Designed by Name	Name of the Architect or Engineering firm designing the project.
Address 1 and Address 2	First and second parts of the design firm's address.
Basis of Estimate	Use this field to enter a reference to the document or documents used to prepare the estimate.
%Design Complete	Percentage of the final design work that is currently complete. Imported from the ENG3086 ASCII file, but you can change the value here.

Field	Description
%Concept Complete	<p>Percentage of the concept design work that is currently complete. Imported from the ENG3086 ASCII file.</p> <ul style="list-style-type: none"> • If the % Design Complete value is 35% or greater, then the % Concept Complete value is set to 100%. • If the % Design Complete value is less than 35%, then the % Concept Complete is calculated to a value less than 100%. <p>If you change the % Design Complete value in GOLD, GOLD will recalculate the % Concept Complete value accordingly.</p>
Concept Comp. Date	<p>Scheduled date for completion of 35% of the concept design. Must be filled in if the value in the % Design Complete field is less than 35%.</p> <p>Format is MMM YYYY.</p>
Cost Basis Date	<p>Date (month and year) on which the estimate is based. Format is MMM YYYY.</p>
Cost Basis Index	<p>Cost index that matches the Cost Basis Date entered above.</p>
Const. Start Date	<p>Month and year that construction of the project is scheduled to begin. Format is MMM YYYY.</p>
Const. End Date	<p>Month and year that construction of the project is scheduled to end. Format is MMM YYYY.</p>
Const. Midpoint	<p>Scheduled construction midpoint date, filled in by the program.</p>
Midpoint Index	<p>Index value of the Construction Midpoint date. Filled in by the program, but you can change the value if needed.</p>

Field	Description
Escalation	<p>Percentage of the contract costs (Primary and Secondary Facilities) applied for Escalation. The program calculates this value by dividing the Midpoint Index by the Cost Basis Index.</p> <p>Example: If the Cost Basis Index is 1770 and the Midpoint Index is 1918, then $1918 / 1770 = 1.0836$. The Escalation percent is then 8.36%.</p> <p>See "Owner Costs" in Section 15.4 for more information on Escalation.</p>
Contingency	<p>Percentage of the escalated contract costs to be added for Contingency.</p> <p>See "Owner Costs" in Section 15.4 for more information.</p>
SIOH	<p>Percentage of the sum of the escalated contract costs plus Contingency to be added for Government Supervision, Inspection, and Overhead Costs.</p> <p>See "Owner Costs" in Section 15.4 for more information.</p>

15.4 Working With an ENG3086 Project

Overview

In general, you add and edit costs in an ENG3086 estimate just as you do in any GOLD Project Database. This means that you can add and edit titles and detail items, and you can look up and copy from the supporting databases.

However, in order for the estimate to be exported back to the ENG3086 Module, certain requirements must be met:

- The estimate must adhere to the required ENG3086 title structure (as described below). The 2nd View Exceptions Tables function may be used to export the correct titling structure, when exporting an ENG3086 Format. (Refer to Section 15.5 for more information.)
- Valid Category Codes must be entered on each primary facility title entry screen at title Level 2. You can use the Find Keyword function (Alt+F7) from the Cat Code field to search for and select Category Codes.
- All Units of Measure entered on title and detail item screens must be from the list of DOD-approved units. Again, you can use the Find Keyword function (from the Unit of Measure field) to search and select from the list of valid units.
- Facility Demolition costs must be entered in a certain position in the title hierarchy. Also, a space and upper-case "D" must be used as the last two characters of the Name fields of any titles that represent demolition costs.
- Costs must be defined, for Escalation, Contingency, and SIOH. These costs are treated as Owner Costs by GOLD and are created when you first create the ENG3086 project. You use fields on the ENG3086 Design Information Screen to enter data for these costs. Three additional "Owner Costs" associated with 3086 budgets are automatically created as titles at Level 1.

Note: The standard GOLD method of entering Owner Costs can also be used in the same estimate. Which Owner Costs are computed and applied depends entirely on which reporting process you use. See "Owner Costs," below.

Required Title Structure

To be successfully exported to the ENG3086 Module, a project must have a 2nd View title structure matching the structure shown below. (It is the 2nd View that is actually exported.)

A_ Primary Facilities
B_ Support Facilities
01 Electric Service
02 Water, Sewer, and Gas
03 Steam and/or Chilled Water Distribution
04 Paving Walks, Curbs, & Gutters
05 Storm Drainage
06 Site Improvement/Demolition
07 Communications Systems
08 Other
E_ Category E Equipment (Medical)
G_ Installed Equipment
H_ Design Cost

If using the Copy command with MILTM2, the titles under Supporting Facilities may be moved to the correct titling structure using the Exceptions Table function. See Section 15.5 for details.

Entering Units of Measure

ENG3086 projects require specific units of measure. On all title entry screens where you enter a unit of measure, the units must be on the list approved by the DOD.

You can use the Find Keyword (Alt+F7) function to search and select from the valid units of measure. The procedure is the same as that for searching for Category Codes (explained below), except that you start with the cursor in the Unit of Measure field.

Entering Category Codes

The appropriate Category Codes must be entered for each primary facility title that you define at title Level 2. Use the Category Code field on the title entry screen to enter each code.

If you do not know the correct Category Code, you can use the Find Keyword function to search for it, as follows:

1. Position the cursor in the Category Code field and press the Alt+F7 (Find Keyword) keys.

Result: The Keyword Search window is displayed.

2. To narrow the search, enter a partial description in the Description field, or partial Category Code in the ID field.

Note: If you do not narrow the search, GOLD will retrieve only the first 26 Category Codes, in numerical order.

Press the Enter key.

Result: The list of Category Codes is displayed in a window on the screen.

3. Use the Arrow keys to move the highlight to the Category Code you need. Then press the Enter key.

Result: The selected code is copied to the Category Code field.

Note: Refer to Army Regulation AR415-28 (Exhibit 6) for a description of the Army category codes.

How GOLD Checks Category Codes

When you produce the ENG3086 Listing or export the estimate data to an ASCII file, the Category Codes are checked against the list of DOD-approved Category Codes. If any primary facility titles are found that do not have correct Category Codes applied, GOLD will respond as explained below.

When Printing the ENG3086 Listing

When printing the ENG3086 Listing, if GOLD finds any:

- Missing or Invalid Category Codes, it will print the listing and list the invalid codes as errors in the Error Report, at the end of the listing.

When Exporting the ENG3086 File

When performing an export, if GOLD finds any:

- Missing or Invalid Category Codes, it will report the error to ERRORS.TXT, display an error message on screen, and cancel the export process.

In this case, you can use the View Reports Using View option on the Reports Menu to view the ERRORS.TXT file and identify the invalid code(s).

Demolition Costs

Facility demolition costs are handled separately in the ENG3086 Module. For these costs to be properly exported from GOLD, they must be entered in a specific place in the title structure.

Specifically, the demolition costs must be placed at the Level 3 title B_17_02 Site Demolition and Relocation, in the hierarchy illustrated below. Also, the title must be coded with a space and an upper case "D" as the last two characters in the title's Name field, as is done in the MILTM2 template.

B_ Support Facilities
17 Site Preparation
02 Site Demolition & Relocation D

Owner Costs

Note: The following information specifies how Owner Costs are defined and computed for ENG3086 reporting (that is, when you produce the ENG3086 listing report or ASCII export file). ENG3086 estimates can also be computed and reported on using Owner Costs defined by the standard GOLD method, based on the Edit Owner screen. See "Alternative Owner Cost Method" at the end of this section.

Six categories of costs are considered "Owner Costs" in ENG3086 estimates:

- Escalation
- Contingency
- SIOH
- Category E (Medical) Equipment
- Installed Equipment
- Design Cost

The first three of these costs are defined on the ENG3086 Design Information Screen. The other three costs are created as Level 1 titles, as discussed above under "Required Title Structure."

Escalation

Escalation is calculated using indexes, which are imported as part of the ASCII import file. You can enter new indexes on the ENG3086 Design Information Screen, and GOLD will recalculate the Escalation percentage (which is shown in the Escalation field on the Design Information Screen).

This Escalation percentage is applied against the costs for Primary and Support Facilities (that is, contract costs) when the ENG3086 Listing or the export file is produced.

Contingency

Contingency is calculated based on a percentage that is part of the import file. This percentage is displayed and can be changed in the Contingency field on the Design Information Screen.

When GOLD produces the ENG3086 Listing or export file, this Contingency percentage is multiplied by the escalated contract costs to arrive at a Contingency amount. This amount is reported on a separate line, and is then added to the contract costs.

SIOH

Similarly, SIOH is calculated based on an imported percentage, which you can change in the SIOH field on the Design Information Screen.

The SIOH percentage is multiplied by the subtotal of the escalated contract costs plus Contingency to arrive at an SIOH amount. This amount is reported on its own line and then added.

Equipment and Design Costs

As mentioned above, Category E Equipment, Installed Equipment, and Design Costs are created as separate titles at Level 1 of the ENG3086 estimate.

These amounts are normally entered as lump sums using the GOLD title-level Cost Override feature. However, you may divide them into work breakdown structures, showing subtitles, if you choose.

These costs are added in after Contingency and SIOH, when the report or export file is produced.

Note: Category E Equipment costs are only used for ENG3086 estimates with a 500-series project category code. Therefore, if the value of the Project Category Code field on the ENG3086 Preparer Information Screen does not have 5 as the first character, and costs are entered for the third title element at Level 1, GOLD will list an error on the ENG3086 Listing and will *not* permit you to export the project.

Alternative Owner Cost Method

Estimates created using MILTM2 can also have Owner Costs defined by the standard GOLD method, based on the Owner Cost columns and the Edit Owner function. These Owner Costs are applied when you run any of the standard GOLD project reports, available from the Reports Menu.

- See Volume 1, Section 7.6 for information on defining Owner Costs.
- See Volume 1, Chapter 23 for information on generating reports.

Note: Because of the different methods of computing Owner Costs, the total estimate costs will may be different in the standard GOLD reports and in the ENG3086 Listing and export file.

15.5 Using 2nd View for an ENG3086 Project

Purpose

The 2nd View capability is used with ENG3086 estimates for the following purposes:

- The 2nd View Exceptions Function supplied with MCACES GOLD may be used to relocate costs from the TRACES WBS to the title structure required for ENG3086 reporting.
- The Exceptions Table can have user-defined entries to relocate certain title elements to different cost categories in the ENG3086 Listing and Export file.
- The 2nd View Adjusted Contract Escalated cost column shows escalated cost values for all title elements, as required by ENG Form 3086.

2nd View Is Automatic

The 2nd View is automatically created when you create an ENG3086 estimate, as described in Section 15.1. This 2nd view includes Adjusted Contract Escalated as the single 2nd view column, as required for ENG Form 3086. It also includes any entries made in the Exceptions Table for converting the TRACES WBS used in the primary view to the required title for structure ENG3086 reporting and export.

Handling Special Features as Exceptions

You use the Set 2nd View Exceptions option to relocate specific title elements within the 2nd view. One of the reasons for using this option is for cases where you need to isolate *Special Features* for separate identification in the ENG3086 estimate.

Generally, Special Features are items that, if included in the cost estimate for the regular Primary Facility, would distort the unit cost beyond what is considered reasonable. For example, you might need to move certain Primary Facility assemblies or cost items to a separate title called Special Foundations to account for significant extra costs required for foundation work on a particular facility.

To handle such a case, you would define a Special Foundations title as an exception on the 2nd View Exceptions Screen. This title would then be shown on the ENG3086 Listing and in the Export file as a separate Primary Facility.

Other examples of special features include the following:

- EMCS Connections
- Emergency Generators
- Central Energy Plant
- Hazardous and Toxic Waste Removal
- Intrusion Detection Systems
- Survival Measures (personnel fallout shelters)

Using 2nd View for Other Purposes

The ENG3086 Interface uses the 2nd View capability to create the ENG3086 Listing Report and export file. When you are working with an ENG3086 estimate, you can also use 2nd View for its other functions, that is, to create project comparisons or reports with alternate cost breakdowns.

However, each time you create a 2nd View report, your ENG3086 report structure will be deleted. You can re-create the structure simply by choosing to generate the ENG3086 Listing Report or the export file (as described in the next two sections.)

Similarly, each time you create the ENG3086 Listing or export file, your existing 2nd View report format will be overwritten. You can re-create it by checking and reestablishing the desired settings on the Set Breakdown Structure Screen, Select 2nd View Columns Screen, and Set 2nd View Exceptions Screen.

Refer to Chapter 8 for more details.

15.6 Print ENG3086 Report

Description

The ENG3086 Report is a project report produced by GOLD, which shows the same information as the ENG3086 report produced by the DD1391 Processor System.

Costs on the ENG3086 Report are always shown in U.S. Dollars, regardless of the type of currency used in the estimate. The currency type and exchange rate used in the estimate are printed on Page 2 of the Report.

Procedure

Follow these steps to produce the ENG3086 Report. Begin on the Main Menu Screen with the highlight on a Project Database containing ENG3086 information.

1. Press the C key to access the MCACES Menu, then press N to choose the ENG3086/MDS/FDG Report option.

Result: The Run Reports Window is displayed.

2. In the Print Device field, enter the printer port of the printer or the path and file name of a text file where the Listing report is to be sent. (See Section 23.7 in Volume 1 for details on the Run Reports Window.)

Then press the Page Down key.

Result: The Report is processed and printed or sent to a file, as specified.

15.7 Export To ENG3086 Format

Purpose

Use the Export To ENG3086 Format option to export a GOLD project estimate in 3086 format to an ASCII file. This file can then be uploaded to and read by the ENG3086 Module on the DD1391 Processor System.

Currency Conversion

Project costs are exported in U.S. Dollars, regardless of the type of currency used in the estimate. If you use a different currency, GOLD will convert the currency using the exchange rate entered on the ENG3086 Preparer Information Screen.

Procedure

Follow these steps to export an ENG3086 estimate to an ASCII file. Begin on the Main Menu Screen with the highlight on the Project Database that you want to export the data from.

1. Press the C key to access the MCACES Menu. Then press X to choose the Export To ENG3086 Format option.

Result: A window is displayed and you are prompted to enter the path and file name of the ASCII file to be created by the Export. A default path is provided.

2. Type over the default as needed to change the path and/or file name. Then press the Enter key.

Result: GOLD displays a series of messages as the export data is computed. Then the ASCII file is created and the ENG3086 information is copied to it.

Note: If GOLD detects errors during processing, it will display an error message. Certain errors will cause the Export to be canceled. To find out the specifics of errors, you can use the View Reports Using Viewer option on the Reports Menu and view the file ERRORS.TXT.

INDEX

Note: For topics not covered here, see the Index for Volume 1.

Numeric

2nd View

- 2nd View Exceptions, 8-19
 - 2nd View function, 8-15
 - 2nd View Order field, 8-3 to 8-6, 8-14
 - breakdown structure, setting, 8-3 to 8-6
 - cost columns, 8-7 to 8-11
 - creating 2nd View structure, 8-12 to 8-14, 8-16
 - examples, 8-1
 - project comparisons, 8-5, 8-10, 8-12
 - purpose, 8-1
 - report, 8-12
 - resetting order, 8-14
 - shadow columns, 8-11
 - Task List, 8-2
 - title structure, creating, 8-12 to 8-14, 8-16
 - working with, 8-15 to 8-18
- 2nd View function, 8-15
- 2nd View Order field, 8-3 to 8-6, 8-14
- 2nd View Report, 8-12
- 3086, *see* ENG3086

A

- About this manual, ix to x
- Activity ID, 10-3
- Activity Cost, 10-3
- Add Parameter, 1-8, 2-38 to 2-41
- Add Vendor, 9-12
- Adjusting Material Prices. *See Unit Price Database.*
- ARA (Area Responsible Agency)
 - Capabilities, A-1.
- Area takeoff, 7-11, 7-13
- Assemblies. *See also* Volume 1.

- adding to facilities, 2-30, 4-21
 - expanded capabilities with Modeling, 1-10
 - in Models Database, 4-14, 4-21
- Assemblies Database, added capabilities with Models, 1-10
- ASM94A, 1-10
 - CWSA92, 1-11
- Assembly Duration, 2-15, 2-35
- Assembly Output, 2-15, 2-35
- Associate Quantity, 2-15, 2-35
- Audit Trail, Digitizer Module, 7-17 to 7-19

B

- Backup Material, 9-4, 9-8
- Budgets, using models for, 2-3
- Building systems classification, 4-4. *See also* Volume 1.

C

- CACES, importing from, 13-2
- Calculator (Digitizer Module), 7-14 to 7-16
- Category Codes, 8-18
- Compare Two Databases, 11-11 to 11-14
- Comparing projects, 8-5, 8-10, 8-12
- Composer PLUS, 13-3
- Compute Menu. *See also* Volume 1.
 - Add Parameter, 1-8, 2-38 to 2-41
 - Edit Parameter, 1-7 to 1-8, 2-12 to 2-18
 - Link Element, 2-42 to 2-44, 4-18
 - Link Quantity, 1-5, 2-32 to 2-37, 3-18, 4-19 to 4-20
 - Unlink Element, 2-44
- Contingency. *See also* Volume 1.
 - in 2nd View, 8-10
- Contingency cost column, 8-10
- Convert to MasterFormat 88, 14-1 to 14-5
- CSI Division fields, 9-15

CSI Divisions. *See also Volume 1.*
on Vendor Screens, 9-15
Currency conversion, *See Volume 1.*
CWSA92 Assemblies Database, 1-11

D

Database Utilities

Compare Two Databases, 11-11 to 11-14
description, 11-1
Extract From Database, 11-8 to 11-10
Merge Two Databases, 11-3 to 11-7
Update UPB With Material Indicators, 11-15 to 11-16

DD1391 Processor System, 15-1

Demote Title, 12-5

DIGI status indicator, 7-2

Digitizer. *See also Digitizer Module.*

activating, 7-1
preparation for use of, 6-3
reactivating, 7-2
Setup Tables, 6-14 to 6-23
supported types, 6-2
working with, 7-9 to 7-14

Digitizer Module

area takeoff example, 7-13
audit trail, 7-17 to 7-19
calculator, 7-14 to 7-16
Digitizer Screen, 7-3 to 7-5
features, 6-1
functions, 7-11
hardware requirements, 6-2
menu card, 6-24, 7-6 to 7-7, 7-10
message formats, 6-11 to 6-13
perimeter takeoff example, 7-13
point mode, 7-10
preparing to use, 6-3
scale, setting, 7-8
software setup, 6-6 to 6-13
trace mode, 7-10
work flow, 7-9

Digitizer On/Off, 7-2

Digitizer Screen, 7-3 to 7-5

E

Edit Digitizer Setup Table, 6-6 to 6-11
Edit Parameter, 1-7 to 1-8, 2-12 to 2-18
Edit Vendor, 9-12 to 9-13

Element. *See also Volume 1.*

definition, 12-1
linking 2-42 to 2-44
unlinking, 2-44

ENG3086

2nd View, use of, 15-21 to 15-22
Category Codes, 15-16
creating, 15-4 to 15-7
Demolition Costs, 15-18
Design Information, 15-11 to 15-14
design notes, 15-11
Export to ENG3086 Format, 15-24
header information, 15-5
Import from ENG3086 Format, 15-4
MILTM2, using with, 15-6
Owner Costs in, 15-18 to 15-20
Preparer Information, 15-8 to 15-10
Print ENG3086 Report, 15-23
purpose, 15-1
requirements of, 15-15
starting an estimate, 15-4 to 15-7
Task List, 15-2
special features, 15-21
title structure, 15-16
units of measure in, 15-16

Escalated Contract Costs, 8-9

Escalation. *See also Volume 1.*
cost column in 2nd View, 8-9

Estimates

budget, 2-3
planning, 2-3
Export to ENG3086 Format, 15-24
Extract From Database, 11-8 to 11-10

F

Facility formulas, 2-8, 4-6 to 4-15

Facility modeling

adding assemblies, 2-30

adding parameters, 2-38

adjusting quantities, 2-10

copying from Models Database, 2-3

definition, 1-2

formulas, 2-8

linking a facility as a model, 4-18 to 4-19

modifying a facility, 2-30

purpose, 2-1

sitework, 2-45

task list, 2-1

Facility multiplier, 2-43

Formulas

for facilities, 2-8, 4-6 to 4-15

on worksheets, 1-7

G

GOLD, about, ix. *See also Volume 1.*

Gross Floor Area (GFA), 2-10

H

Historical Cost Analysis System (HCAS)
Reporting, 10-1

I

Import from CACES ASCII, 13-2

Import From ENG3086 Format, 15-4

Item Selection Parameter Worksheets, 2-22 to 2-29

L

Library values, 2-9, 4-8

Link Listing Report, 5-1 to 5-3

Link Element

examples, 2-42 to 2-44

procedures, 2-43, 4-18

purpose, 2-42

uses, 2-42, 4-18

Link Quantity

for assemblies and crews, 1-5

field descriptions, 2-34 to 2-36

linking a facility as a model, 4-19 to 4-20

for models, 1-5

procedure, 2-33

purpose, 1-4, 2-32

for task models, 3-18

for titles, 1-5

reference types, 2-35

Link Quantity Window, 2-32

List Material / Backup Vendor, 9-19

Local Value, 2-34, 3-18

Lookup. *See also Volume 1.*

into Models Database, 2-3

into Project Database, 4-17

Loss of titles, 2-5 to 2-6

M

Manual, about, ix

MasterFormat 88, about, 14-1 to 14-4

Material Backup. *See also Vendor Backup.*

files, 9-1

Material Backup Report, 9-22

Material Pricing Backup Screen, 9-3 to 9-7

for modifiers, 9-7

options list, 9-2

purpose, 9-1

in the Project Database, 9-8 to 9-10

in the Unit Price Database, 9-3 to 9-7 reports, 9-19 to 9-23

Material Backup Report, 9-22

Material price quotes. *See Material Backup.*

Material prices, adjusting. *See Material Prices, updating.*

Material prices, updating, 9-3 to 9-7, 9-16 to 9-18, 11-15. *See also Volume 1.*

Material Pricing Backup Screen, 9-3 to 9-7

Material vendors. *See Vendor Backup.*

MCACES GOLD. *See GOLD.*

MDL92A Models Database. *See also Models Database.*

- assembly level, 4-5, 4-14
- classification scheme, 4-4
- detail level, 4-5, 4-15
- facility level, 4-4, 4-10
- facility parameters, 4-6 to 4-7
- formulas used in, 4-9
- quantity links, 4-10 to 4-15
- structure of, 4-3
- subsystem level, 4-4, 4-12 to 4-14
- system level, 4-4, 4-11

Menu card (Digitizer Module)

- description, 6-24
- functions, 7-11 to 7-12
- setting, 7-6 to 7-7
- using as keyboard, 7-10

Merge Two Databases, 11-3 to 11-7

Models. *See also Facility Modeling, Task Modeling, Models Database.*

- copying into Project Database, 2-3 to 2-6
- converting an estimate to, 4-16 to 4-20
- two kinds, 1-2

Models Master Record, 4-3

Models Database. *See also MDL92A Models Database.*

- adding models, 4-16 to 4-20
- edit screen, 4-22 to 4-23
- deleting, 4-21
- editing, 4-21
- functions, 4-1
- Models Master Record, 4-3
- using multiple, 4-22 to 4-24
- purpose, 4-1
- supplied with GOLD, 4-2

Models Database Edit Screen, 4-22 to 4-23

Model Input, 2-19 to 2-21

Models Module

- About, 1-1
- Assemblies Database with, 1-10
- capabilities, 1-1
- reports, 5-1 to 5-3
- tools, 1-1

Modifiers. *See also Volume 1.*

- material backup for, 9-7

Move (in UPB), 12-6

O

Operator field, 2-17, 2-34

Owner Costs. *See Volume 1.*

P

Parameters

- adding, 2-38, 3-7 to 3-17
- editing, 2-12 to 2-18
- facility, 2-7, 4-6 to 4-7
- how used, 1-8
- levels attached to, 2-12

Parameter worksheets

- adding, 2-38, 3-7 to 3-17
- as audit trail, 7-17 to 7-19
- as reference type, 2-15, 2-31
- copying, 2-40
- definition, 1-7
- deleting rows, 2-13
- deleting worksheets, 2-18
- editing, 2-12 to 2-18
- examples, 2-8, 3-7 to 3-17
- field descriptions, 2-14 to 2-17
- Item Selection, 2-22 to 2-29
- Model Input, 2-19 to 2-21
- operator, 2-17
- levels attached to, 2-12
- notes, 2-18
- parentheses on, 2-14
- Reference Field, 2-14 to 2-16
- sample, 2-12

Parent Quantity, 2-15

Perimeter takeoff, 7-13

PLUS, translating from, 13-3
Point mode, 7-10
Printing. *See Reports.*
Project comparisons, 8-5, 8-10, 8-12
Promote Title, 12-2 to 12-4

Q

Quantity links. *See also Link Quantity function.*
for facilities, 2-7
in MDL92A Database, 4-6 to 4-15
for tasks, 3-18
whole elements, 2-42
Quantity Result, 2-34
Quotes for material. *See Material Backup.*

R

Reference Field, 2-14 to 2-16
Reference ID, 2-16, 2-34
Reference Type, 1-5, 2-15, 2-34
Reference Value, 2-34
Reports. *See also Volume 1.*
2nd View Report, 8-12
ENG3086 Report, 15-23
Link Listing Report, 5-1 to 5-3
Material and Vendor Backup, 9-19 to 9-23
Result database, 11-5, 11-9
Restructure UPB Functions, 12-1 to 12-7
Root operations, 2-17, 2-36
Rounding, 2-17, 2-36 *See also Volume 1.*

S

Scale, setting for Digitizer, 7-8
Second View. *See 2nd View (on page Index-1).*
Select 2nd View Columns, 8-7
Set 2nd View Exceptions, 8-19 to 8-23

Set Breakdown Structure Screen, 8-3.
See also Volume 1.
Shadow columns, 8-7, 8-11
Sitework, 2-45 to 2-46
Sub-quantity, 2-15, 2-35
Square root, 2-17, 2-36
System Administrator, A-1. *See also Volume 1.*

T

Takeoff, with Digitizer, 7-9 to 7-14
Target database, 11-3
Task Modeling
defining a task, 3-4
definition, 1-3
entering titles and items, 3-5
examples of use, 3-2
linking quantities, 3-18
parameter worksheets, 3-7 to 3-17
purpose, 3-1
task list, 3-2
Tools Menu. *See also Volume 1.*
Add Vendor, 9-12
Backup Material, 9-4, 9-8
Calculator, 7-14 to 7-16
Digitizer On/Off, 7-2
Edit HCAS Data, 10-1
Edit Vendor, 9-12 to 9-13
Get From Table *See Volume 1.*
Relocate Menu, 7-6
Trace mode, 7-10
Translating from Composer PLUS, 13-3

U

Unit of measure. *See Volume 1.*

Unit Price Database. *See also Volume 1.*
adjusting material prices, 9-3 to 9-7, 9-16 to 9-18, 11-15
demoting titles, 12-5
material backup in. *See Material Backup.*
material prices, updating, 9-3 to 9-7, 9-16 to 9-18, 11-15
moving elements, 12-6
promoting titles, 12-2 to 12-4
renumbering items, 12-7
restructure functions, 12-1 to 12-7
utilities for. *See Utilities Menu.*
vendor backup in. *See Vendor Backup.*

Unlink Element, 1-6, 2-44

UPB. *See Unit Price Database.*

Update UPB From Vendor Backup, 9-16 to 9-18

Update UPB w/Material Indicators, 11-15 to 11-16

User Settings. *See also Volume 1.*
Digitizer setup, 6-4 to 6-5

Utilities Menu

Compare Two Databases, 11-11 to 11-14

Extract From Database, 11-8 to 11-10
illustration of, 11-1

Merge Two Databases, 11-3 to 11-7

Update UPB w/Material Indicators, 11-15 to 11-16

Update UPB From Vendor Backup, 9-16 to 9-18

V

Vendor Backup. *See also Material Backup.*

accessing vendor records, 9-12 to 9-13
adding a vendor, 9-12

adding a vendor reference, 9-5
deleting a vendor, 9-13
options list, 9-2
printing vendor data on Detail Report, 9-23
purpose, 9-1
reports, 9-19 to 9-23
Vendor Files, 9-11
Vendor Screen, 9-11
Vendor Report, 9-23
Vendors. *See Vendor Backup.*

W

Worksheets. *See Parameter Worksheets.*