PERCEPTION® MAT-PAC

Managing Drawings

&

Bills of Material

A Training Tutorial

This training tutorial outlines the basic features of the *PERCEPTION* system for managing drawings and bills of material.
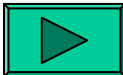
It is a supplement to the user manual entitled "*PERCEPTION Material Planning, Purchasing & Inventory Control,*" which provides more details for the user.

Before using this tutorial, the user should first view the preliminary *PERCEPTION* training tutorial, "Getting Started.*"

Other related training tutorials for material control are the following:

1. Starting From Scratch: Material Planning, Purchasing & Inventory Control

2. Starting A New Project

3. Material Requisitions

4. Purchase Orders

5. Work Order Pallets

6. Tool Room Control

7. Developing A Parts Catalog

8. Managing Stock Inventories

9. Receiving & Warehousing

10. Withdrawing Material to Production

11. Managing Vendor Invoices

12. Managing Customer Billings

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Drawings

Material requirements for a project can begin with requisitions.

However, requisitions can be <u>preceded by engineering drawings and their bills of material (BOMs).</u>

Drawing BOMs can be entered manually or via down-loading this detail information from CAD systems.

Detailed instructions for down-loading drawing BOMs from CAD systems are provided in the following user manual:
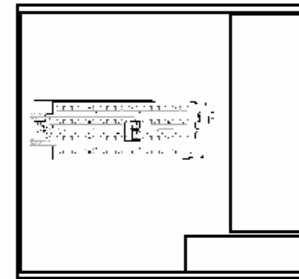
"PERCEPTION MAT-PAC Material Planning, Purchasing & Management Control,"

which provides more details for the user.

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Drawings
Linked to Requisitions

With *PERCEPTION*, a drawing BOM can be used to <u>generate</u> one or more requisitions.

Drawing Bill of Material

Material Requisition

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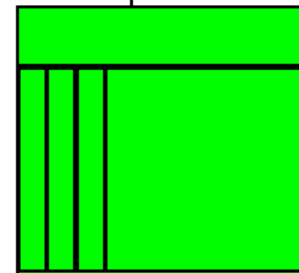
Drawings
Linked to Work Order Pallets

With *PERCEPTION*, a drawing BOM can be used to **generate** one or more work order pallets.

The pallets then can be used to **generate** a requisition.

Drawing Bill of Material

Work Order Pallet

Material Requisition

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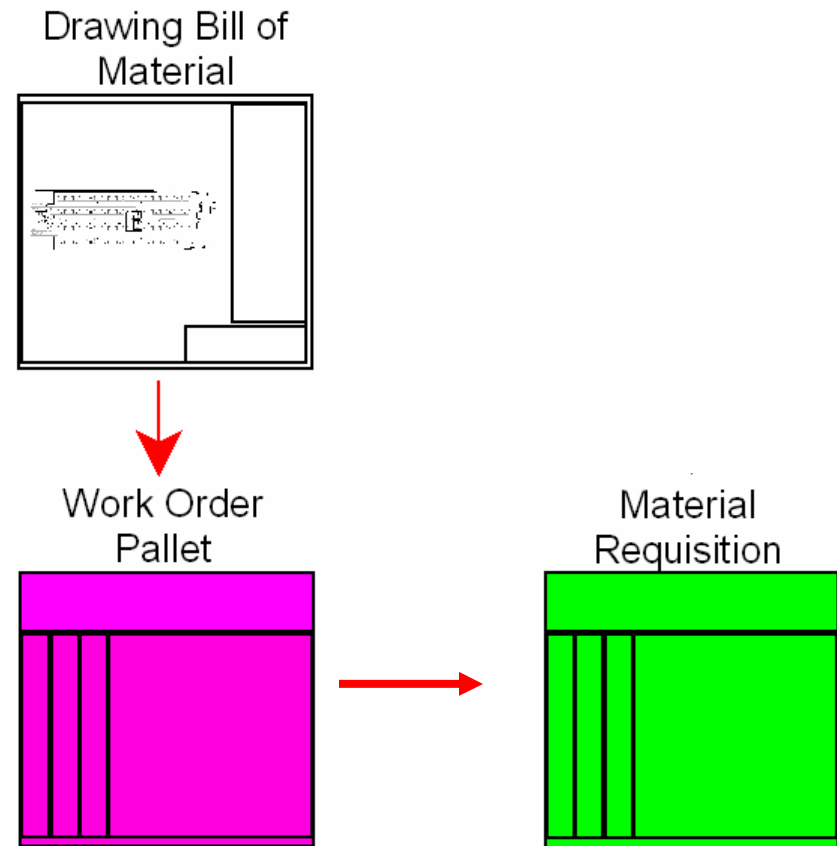
Creating Drawings

Drawings consist of the drawing header record and detail bills of material records.

Drawings can either be imported or entered directly into *PERCEPTION* using the Drawings Worksheet.

The drawings window can be accessed either via the drill-down features or directly by selecting *Environment/Engineering/Drawings* from the main menu.

	Contract	Project	Drawing	Description	Drawing File Name	Group	Account	Coa Grp	Coa Sgrp	Coa
1	1999-01	DES-1	1999-01			2	200	Mech		
2	A-DEMO	01	10-01	Drawing for Tutorial		2	262			
3	A-DEMO	01	10-10	Deck Lighting Diagram	D:Program Files\Spar\Deck Lig	4	400			
4	A-DEMO	01	10-15	Machinery Systems Material List		3	300			
5	A-DEMO	01	100-100	General Arrangement		1	100			
6	A-DEMO	01	100-200	Midship Section		1	100			
7	A-DEMO	01	100-300	Machinery Arrangement		1	100			
8	A-DEMO	01	100-400	Cabin Plan		1	100			
9	A-DEMO	01	100-500	Preliminary Block Plan		1	100			
10	A-DEMO	01	100-600	Shell Expansion		1	100			
11	A-DEMO	01	100-700	Sections		1	100			
12	A-DEMO	01	100-800	Construction Profile		1	100			
13	A-DEMO	01	200-100	Rough Cutting Plan		2	200			
14	A-DEMO	01	200-110	Fab & Assembly Lane Plan		2	200			
15	A-DEMO	01	200-120	Block Plan		2	200			
16	A-DEMO	01	200-130	Shipwright Dimension Plan		2	200			
17	A-DEMO	01	200-140	Hull Block Erection Plan		2	200			
18	A-DEMO	01	200-150	Flat Panel Assembly Plan		2	200			
19	A-DEMO	01	200-160	Flat Panel Sub-Assy Plan		2	200			

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The procedures for retrieving, adding, changing and deleting drawings, including setting global default values, are the same as those outlined in *General System Operation*, "*Getting Started With PERCEPTION.*"

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The primary key combination that <u>must be unique</u> for each drawing on the database (indicated by blue labels on the detail window) is the following:

1. Contract ID (must be previously defined)
2. Project number (must be previously defined)
3. Drawing number (maximum 20 alphanumeric characters)

CAD Drawings may reference CAD drawings by entering the file name with directory path into the "Drawing File Name" data field.

To view the drawing, click on this data field, use the right mouse button for the pop-up menu and select *Open Referenced File*.

PERCEPTION will use any type of file (local path, intra-net, URL) as long as the software available to open the file has been registered on the user's computer.

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Identifying Drawing WBS

The WBS structure for the drawing (SWBS, PWBS, and/or COA) comprises the secondary reference keys (indicated by red labels on the detail window below) and may be defined to whatever level of the WBS is appropriate for the drawing.

Reports can be generated across any combination of these reference fields to suit specific reporting requirements.

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The Detail Drawing window provides most of the information available at the header level of the drawing.

It is made available by double clicking on the desired drawing in the Drawing worksheet.

Drawing Approvals

The user may specify that the drawing be "Approved" when all of the drawing's BOM items have been entered and are considered complete.
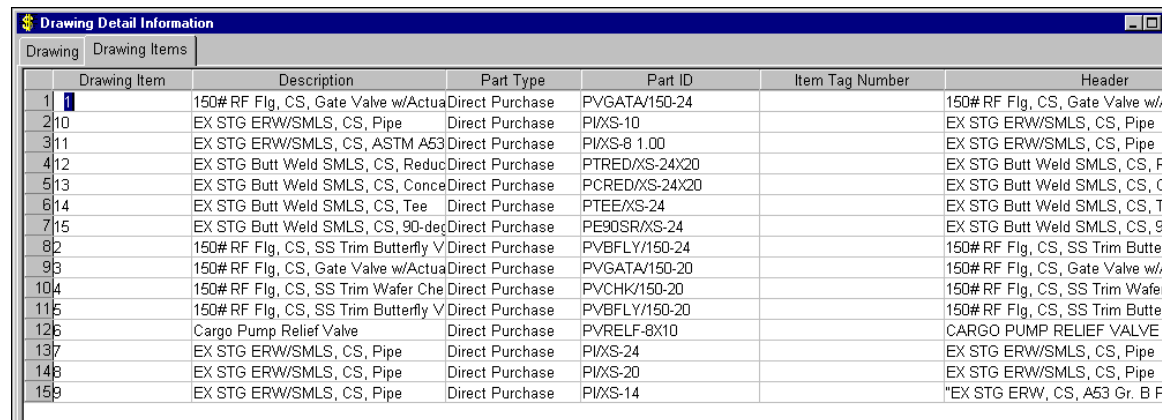
Note: When the drawing has been formally flagged as approved, the drawing information cannot be changed. Adding, changing and deleting BOM items will be prevented by the system.

Setting the approval flag to "No" allows the user to make changes.

Creating Drawing BOMs

When the drawing header information is complete, add BOM items by clicking on the Drawing Items tab of the Drawing Detail window.

This will display the BOM item worksheet:

Identifying BOM Items

Each BOM item is identified by the following primary key combination that <u>must be unique</u> for each drawing item on the database is the following:

1. **Contract ID (must be previously defined)**
2. **Project number (must be previously defined)**
3. **Drawing number (maximum 20 alphanumeric characters)**
4. **BOM item number (maximum 8 alphanumeric characters)**

After a BOM item has been added, its details can be displayed by double clicking on the item.

This displays the BOM Item Detail window:

Other BOM items belonging to the same drawing can be viewed or modified from this same window by using the scroll buttons

on the tool bar.

The WBS structure provides secondary reference keys on the BOM items as well as on the drawing.

By default, the BOM item is initially set with the same WBS as the drawing header.

If required, the user may modify the WBS for selected BOM items.

Referencing Parts Catalog

Several data elements will be updated automatically based on user entries.

For instance, when a valid Part ID is entered on a BOM line item, all relevant data will be automatically updated from the Parts Catalog.

An easy method of adding new BOM items is to use the *Add Parts* feature.

If the Part ID field is left blank, the system will generate a Part ID for that item that consists of the concatenation of the project, drawing, and BOM item.

This system-generated Part ID will not be added to the Parts Catalog.

This system-created Part ID belongs exclusively to this BOM item and is used by the other material control documents such as requisitions and pallets.

If the Part ID is not being used, the <u>tag number</u> can track the item.

The BOM item has both a "Description" and a "Header" field:

The "Description" has no practical limit to the length of text that can be entered.

The "Header," on the other hand, is limited to a total of 40 characters. Most reports that list BOM items use only the "Header," <u>not</u> the "Description."

When a valid Part ID is entered for the BOM item that corresponds to a part in the Parts Catalog, the system copies the part description to the BOM item "Description."

The system then fills in the "Header" field with the first 40-characters of the description. The user can modify both of these data fields manually

Later, when the BOM items have been approved and are being processed by purchasing, a summary of the purchasing information is displayed in the detail BOM window.

This purchasing information includes quantities requisitioned, ordered, received, and returned to vendor ("RTV").

Approving Drawings and BOMs

Approving a drawing BOM item will enable the item to be added as a requisition item and/or pallet item (unless the business rule for this requirement has been turned off).

If the drawing header record is approved, the system will approve <u>all</u> of its BOM items automatically. When a drawing is approved, it is updated with the ID of the user in the "Approved By" field and the current date in the "Date" field.

Individual items also can be approved without the approval status of other items.

However, backing out the "Approved" status on the drawing header record <u>will not cause the items to be backed out accordingly</u>.

<u>The items must be backed out individually as "Not Approved."</u>

Deleting
Drawings & BOM Items

Drawings and/or individual BOM items can be deleted only if:

1. They are not approved and

2. No requisition or pallets have been created using the drawing.

With *PERCEPTION*, different documents can be used to create other documents, all depending on specific needs of a project.
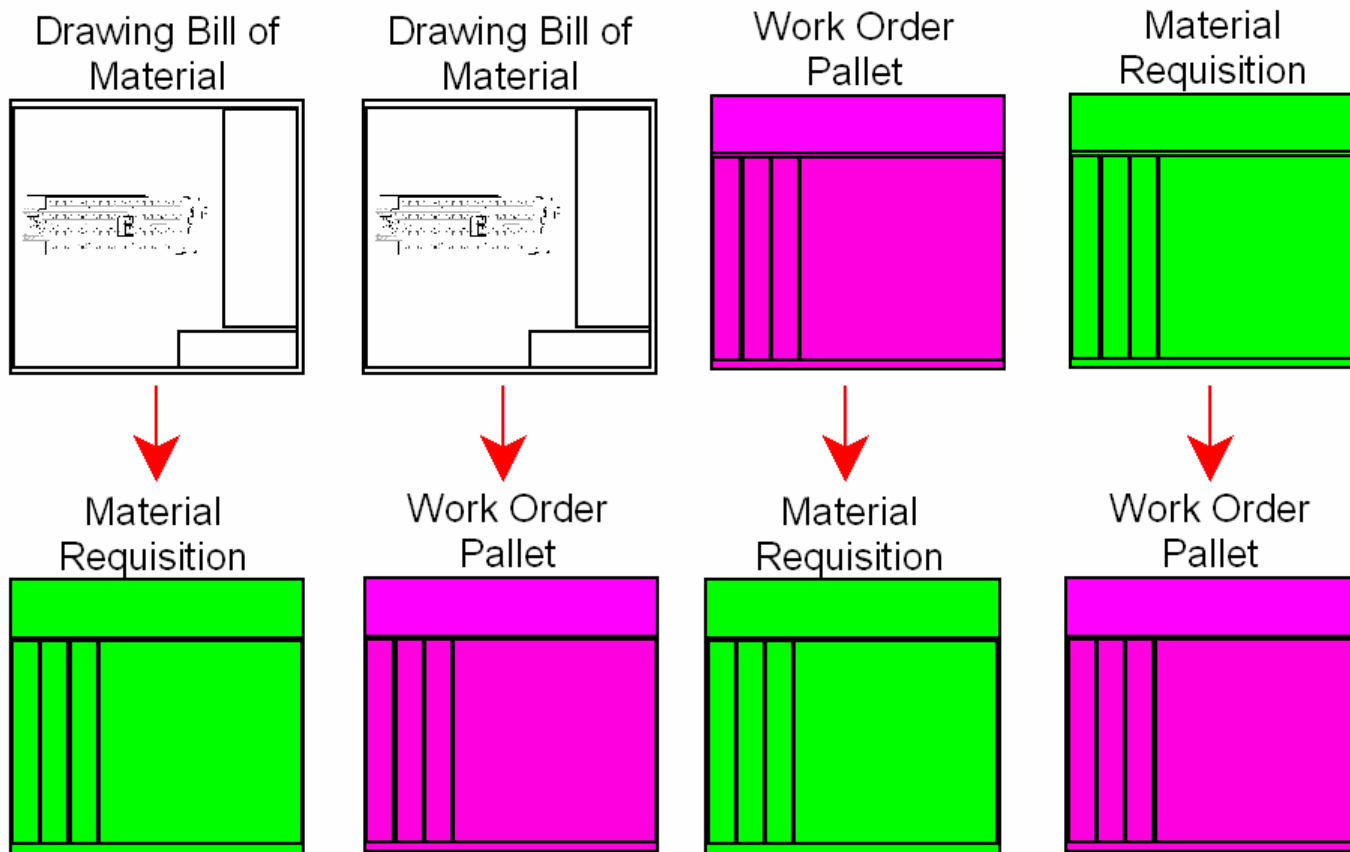
Creating Material Requisitions From Drawings

Requisitions can be generated directly from a drawing and it's BOMs.

From the drawing worksheet (*Environment/Engineering/Drawings*), select the drawings for the requisition.

Then click on the *Define Requisition* button **on the tool bar.**

The system will display the window for creating a requisition from the drawing BOMs:

1. **Requisition:** Enter the requisition number (it may also be an existing requisition, but the *Append to Existing Open Req* option must be clicked on), or select the *Auto Increment.*
2. **Activity Center & Activity:** If identified on the drawing, this information is automatically set by the system.
3. **Work Center & Work Order:** If identified on the drawing, this information is automatically set by the system.
4. **Need Date:** The date determined by the system according to the scheduling rules.

5. **Option, Auto Increment Req. Number**: Unless the user wishes to manually define each requisition, this option allows the system to automatically define a new requisition as the next higher requisition number for the project.

6. **Option, Append To Existing Open Req**: If the drawing BOMs are to be added to an existing requisition, this option must be turned on.

7. **Option, Include Zero Quantity Items**: Normally (by default), only drawing BOMs whose quantity is less than the quantity requisitioned are included as requisition items.

8. **SWBS, PWBS & COA Requisition Item Assignments**: The user can assign these WBS elements to the requisition items as defined on the drawing.

Enter the desired requisition number, or click on the option to *Auto Increment Req Number* **(the system will use the next higher number on the database for the project).**

If the user assigns the requisition to either a valid <u>planning activity</u> **(requires a valid activity center to be defined) or a valid** <u>work order</u> **(requires a valid work center to be defined), the** <u>**Need Date**</u> **for the requisition will be set accordingly.**

Otherwise, the <u>Need Date</u> **can be defined manually.**

All other purchasing schedules (Required-In-Yard, PO Action Date, and Planned PO Date) are computed by the system using company default process times.

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Once all desired options have been selected, click on the *Define Requisition* button, and <u>the system will then create the requisition.</u>

Creating Work Order Pallets From Drawings

Production Pallets can be generated directly from a drawing and its BOMs.

From the drawing worksheet (*Environment/ Engineering/Drawings*) select the drawings for the pallet.

Then click on the *Define Pallet* button **on the tool bar.**

The system will display the window for creating a pallet from the drawing BOMs:

1. <u>Pallet</u>: Enter the pallet number (it may also be an existing pallet, but the *Append to Existing Open Pallet* option must be clicked on), or select the *Auto Increment Pallet/Item Number*.
2. <u>Activity Center & Activity:</u> If identified on the drawing, this information is automatically set by the system.
3. <u>Work Center & Work Order:</u> If identified on the drawing, this information is automatically set by the system.
4. <u>Need Date:</u> The date determined by the system according to the scheduling rules.

5. **Option, Auto Increment Pallet/Item Number:** Unless the user wishes to manually define each pallet, this option allows the system to automatically define a new pallet as the next higher pallet number for the project.

6. **Option, Append To Existing Open Pallet:** If the drawing BOM items are to be added to an existing pallet, this option must be turned on.

7. **Option, Include Zero Quantity Items:** Normally (by default), drawing items whose quantity is less than their quantity pallet are included as pallet items.

8. **SWBS, PWBS & COA Requisition Item Assignments:** The user can assign these WBS elements to the pallet items as defined on the drawing.

If assignment is made to either a valid <u>planning activity</u> (requires a valid activity center to be defined) or a <u>work order</u> (requires a valid work center to be defined), the <u>Need Date</u> for the pallet will be set accordingly.

Otherwise, the <u>Need Date</u> can be defined manually.

Once all desired options have been selected, click on the *Define Pallet* button, and the system will then create the pallet.

Drawing Drill-Down Options

When the Drawings worksheet is open, a pop up menu will be displayed when the right mouse button is applied to any of the listed drawings.

The _Drill-Down_ selections will display the various access points to information related to the drawing

Choose Drill Down

Select Drill Down

DETAILS
Drawing Items (BOMs)
Activities to Complete Drawing
Requisitions
Requisition Items
Pallets
Pallet Items
Work Orders
Work Order Subtasks

OK   Cancel

This drill-down feature provides the user with considerable capabilities to directly inspect the status of everything related to the drawing, from purchasing (via requisitions) to production.

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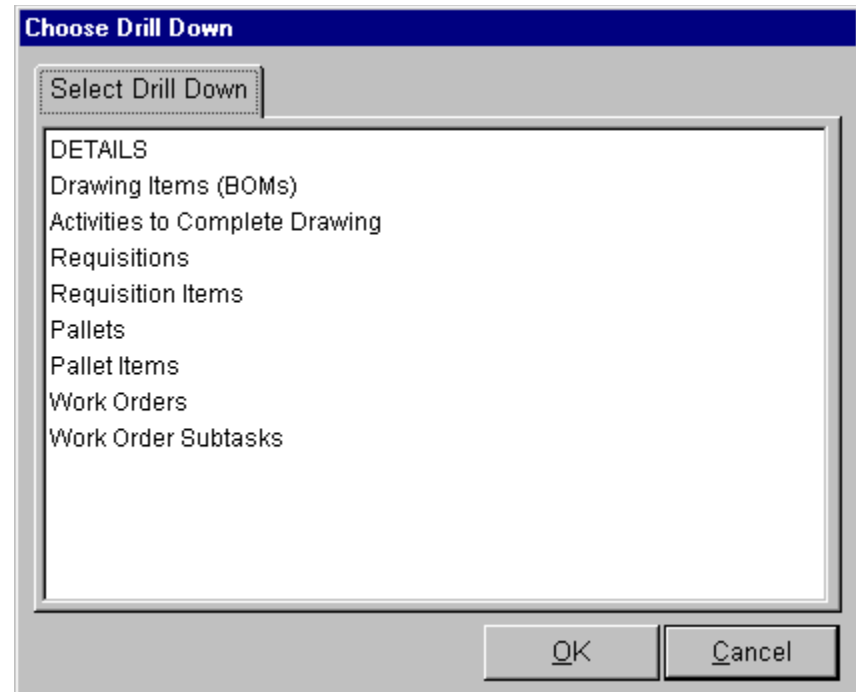
If the BOM item is a "Stock" item and has been linked to the Parts Catalog (via the Part ID), the "Unit Price" that is displayed is the current unit price for that stock part on the catalog.

If not a stock item, the unit price is the weighted average of purchase order prices currently recorded for that item.

A BOM item can be linked to one or more requisitions.

Multiple requisitions are linked by way of the user allocating the BOM required quantity to the requisition requirements.

These requisitions, in turn, can be linked to one or more purchase orders.

The unit price is computed by the system only on the basis of those item quantities that have been linked to purchase orders with a unit price.
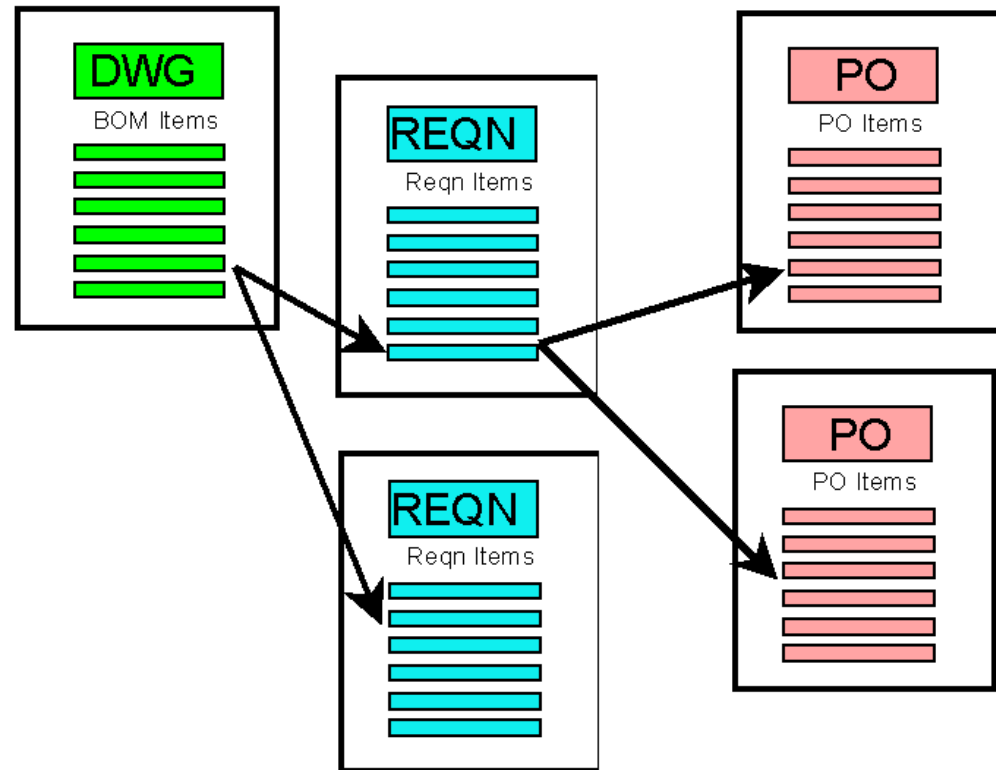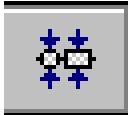
Note that the actual quantity "<u>Used</u>" also is tracked by the system and can be compared to the quantity required by the drawing.

This feedback can be used to update drawings for <u>as-built bills of material</u>.

Attaching Planning Activities To Drawings

Drawings may be attached to schedule planning activities so that they can have the same schedules as the planning activities.

Highlight one or more drawings in the drawing worksheet to be attached, and then click on the *Attach/Detach Planning Activity* **button** **on the toolbar.**

The system will display a pop up window in which the user can identify the planning activity and its work center.

An option allows the user to indicate if the planning activity's WBS (SWBS, PWBS and/or COA) also should be assigned to these drawings.

Detailed instructions for developing planning activities are provided in the following tutorial:

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Integrated Scheduling

Detailed instructions for developing material requisitions are provided in the following tutorial:

PERCEPTION MAT-PAC

Material Requisitions

Tracking Drawing Changes

Drawing "Change Code" is a coding scheme that can be defined by the user to help catalog various types of changes made to drawings, such as the following:

      O-1: Owner Change (proposed)
      O-2: Owner Change (authorized, not adjudicated)
      O-3: Owner Change (adjudicated)
      Y-1: Internal Change (required)
      Y-2: Internal Change (re-work)
      Y-3: Internal Change (cost/schedule benefit)

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Interfacing With CAD System

Drawing BOMs can be imported from various CAD systems. "*Getting Started With PERCEPTION*" describes various methods for importing data from third party software products.

In addition, "*Cost Estimating With CAD Systems*" describes special features for downloading CAD data onto the *PERCEPTION* database.