



Microsoft Dynamics AX 2012 R3

July 2014

Warehouse Management System Implementation Guide

White paper

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Additional resources

Use the following links to access blog posts on subjects not covered in this document or resources that provide supplemental guidance:

- [Warehouse management online Help on TechNet](#)
- [Upgrading code that relies on available and reserved inventory quantities in AX 2012 R3](#)
- [Manual packing functionality in Warehouse management available in AX 2012 R3](#)
- [Warehouse Key Performance Indicators in Microsoft Dynamics AX 2012 R3](#)
- [Warehouse and Transportation management vs. the "old" Advanced warehouse management](#)
- [Serial Number Tracking for Service and Warranty in Microsoft Dynamics AX R3](#)

Additional resources will be added in future versions of this document.

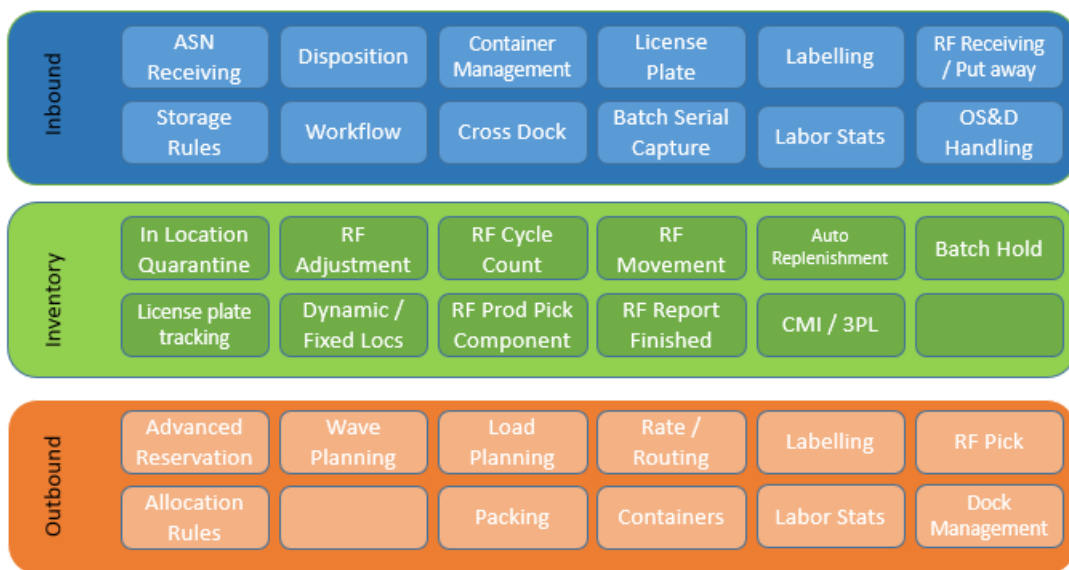
Introduction

The purpose of the Microsoft Dynamics AX Warehouse Management System Implementation Guide is to provide functional and technical guidance to users who want to implement or use the Warehouse Management System provided as part of the Microsoft Dynamics AX 2012 R3 solution. The document walks you through a case study to implement warehouse management for a fictitious company, and contains explanations of concepts and descriptions of fields used in the warehouse forms. This document is a supplement to the [Online Help for Warehouse management](#) that's available on TechNet.

Warehouse Management for Microsoft Dynamics AX is an integrated warehousing solution for advanced distribution and order fulfillment that adds to the current capabilities of Microsoft Dynamics AX to support distribution companies and logistics providers.

This is a module solution that integrates advanced supply chain capabilities seamlessly into your new or existing Microsoft Dynamics AX system. It's designed to support best-practice logistics and fulfillment services without having to purchase and interface a separate Warehouse Management system. The solution is native to the Microsoft Dynamics AX client, and provides a uniform appearance and behavior to business users who are familiar with the Microsoft Dynamics AX user interface.

Overview of features



1 Setup requirements

1.1 Understanding the Warehouse Management parameters

Use the **Warehouse management parameters** form to set up the Warehouse Management parameters that are provided as part of the Microsoft Dynamics AX 2012 R3 solution.

1.1.1 General Warehouse Management parameters

To open the **Warehouse management parameters** form, follow this navigation path:

Warehouse Management > Setup > Warehouse management parameters

The screenshot shows the 'Warehouse management parameters (1 - ceu)' form. The left-hand navigation pane lists several categories under 'General': Loads, Location directive failures, Cycle counting, Filters, Reports, Packing, Print management, and Number sequences. The main area is titled 'Set up parameters for Warehouse management' and contains the following sections and parameters:

- Company information:** G51 company prefix: [Text input field]
- Location profiles:** User location: [Dropdown menu with 'USER' selected]
- Location types:** Staging location type: [Dropdown menu with 'STAGE' selected]; Final shipping location type: [Dropdown menu with 'BAYDOOR' selected]
- Receiving exceptions:** Code for missing items from ASN: [Dropdown menu]
- Barcodes:** Bar code setup: [Dropdown menu]
- License plates:** Default license plate unit: [Dropdown menu]
- Auto release to warehouse:** Value type: [Dropdown menu with 'None' selected]; Fulfillment rate: [Text input field with '0.00']
- Wave processing:** Wave processing batch group: [Dropdown menu]; Process waves in batch: [Checkbox, unchecked]; Create wave processing history log: [Checkbox, checked]; Create containerization history log: [Checkbox, checked]; Wait for lock (ms): [Text input field with '0']

At the bottom of the form, there is a footer note: 'The batch group that is used for wave processing jobs' and a 'Close' button.

The **Warehouse management parameters** form contains the following general parameters.

Parameter	Description
-----------	-------------

Parameter	Description
Company information	Used to automatically generate license plates. This can be the default prefix of the license plate number.
Location profiles	A user location must be specified as a location profile. This is the location that is used when goods are in transit in the warehouse. For example, a user will collect goods from the receiving bay and move to the picking location when the stock is in a location profile and being transported. An inventory inquiry will show that it is attached to the user, which is the default profile.
Location types	These are the default staging and shipping locations that are defined at a parameter level. The override for staging and shipping locations are defined on the location directives.
Receiving exceptions	This shows the packing structure that is created and the code that will be used if the structure does not contain what it is on load. This is basically to stop misalignment between the load and the packing structure that is created out of the ASN (Advanced Shipment Notification).
License plates	This is the location storage limit that is set on location stocking limits. If you have three different pallets that are almost the same and you can fit these in three pallet locations, you can run that location as the default license plate unit.
Auto release to warehouse	You can automate the process of releasing sales orders to the warehouse. This means that you can set the parameter level for a fulfillment rate based on either quantity or price. You are then able to set a threshold for that fulfillment type. For example, if you set quantity fulfillment type you can set the threshold for automatic release at a minimum of 80% of the ordered quantity that is available and then ship the line.
Wave processing	You can either automatically create a wave template at time of release of the sales order to the warehouse, or you can create a template via the wave threshold fulfillment rate, or it can be manually triggered via periodic and sent to a batch. The parameter setting here defines the default batch that is required to run the wave template creation, or if there are multiple batches to create the wave template, how the logs are created in the system.

The screenshot shows the 'Warehouse management parameters (1 - usmf)' window. The left sidebar lists navigation options: General, Loads, Location directive failures, Cycle counting, Filters, Reports, Packing, Print management, and Number sequences. The main area is titled 'Set up parameters for Warehouse management' and contains the following sections:

- Location types**
 - Receiving exceptions
 - Barcodes
 - License plates
 - Auto release to warehouse
 - Wave processing
- Adjustments**
 - Default adjustment type code: [Dropdown]
- Work**
 - Retain temporary work table:
 - Create work creation history log:
 - Default work user ID: [RF Gen]
 - Work priority: [50]
 - Unregister receipt when canceling work:
- Batches**
 - Number of days to mix batches: [0]
- Mobile device**
 - Mobile device note type: [Note]
 - Scanned quantity limit: [100,000.00]
 - Use mobile device session logging:
 - Number of stored errors: [100]
 - Default warehouse transfer journal: [ITrf]
- Returns**
 - Default return order journal: [Dropdown]
- Inventory status**
 - Default inventory status ID: [Available]
 - Use default status for sales orders and transfer orders:

At the bottom, there is a footer: 'Select or view the bar code setup ID' and a 'Close' button.

The Warehouse management parameters form contains the following adjustment parameters.

Parameter	Description
Adjustments	The default adjustment type code that is used when inventory is adjusted. Currently, the default is Cycle count, but you can set up a default that is more meaningful.
Work	<ul style="list-style-type: none"> Retain temporary work table - When the work template creates the work, a series of temporary work tables is created. After work is complete, then the completed work tables are updated. The temporary tables do not have to be retained when work has been completed. Create work creation history log – This is a log file that is accessed from the inquiries form in warehouse management. This provides feedback on items where work has not been created, and on work that is successfully created. Default work user ID - This is the default user when logging on to the mobile device. Work priority - For all types of work, a priority can be defined. Typically this is managed in the “all work screen”. As a default, for all work created, a work priority can be set in the parameters and assigned to individual work items. Unregister receipt when canceling work - When you perform a product receipt through the mobile device, this creates a registered work item for the receipt. If selected, if you cancel the work item, the receipt is no longer registered.

Parameter	Description
Batches	An option in the location profile allows for mixed inventory batches. For example, if the number of days to mix batches is set to 30 days, when a location is proposed and a batch already exists, then a new batch will be accepted in that location if the expire date difference is no more than 30 days.
Mobile device	The mobile device enables messages to display on the users screen.
Returns	When performing a sales return, this is the default journal that is used for the movement of stock.
Inventory status	<ul style="list-style-type: none"> • Default inventory status ID - The inventory status default can be set at the parameter level, warehouse level, or stocking level. • Use default status for sales orders and transfer orders – If selected, the status is automatically applied to sales orders or transfer orders.

1.1.2 Additional Warehouse Management parameters

The screenshot shows a software window titled "Warehouse parameters (1 - ceu)". On the left is a navigation pane with options: General, Loads, Location directive failures, **Cycle counting**, Filters, Reports, Packing, Print management, and Number sequences. The main area is titled "Set up Cycle Count parameters".

Movement journal parameters
 Default cycle counting adjustment type code:

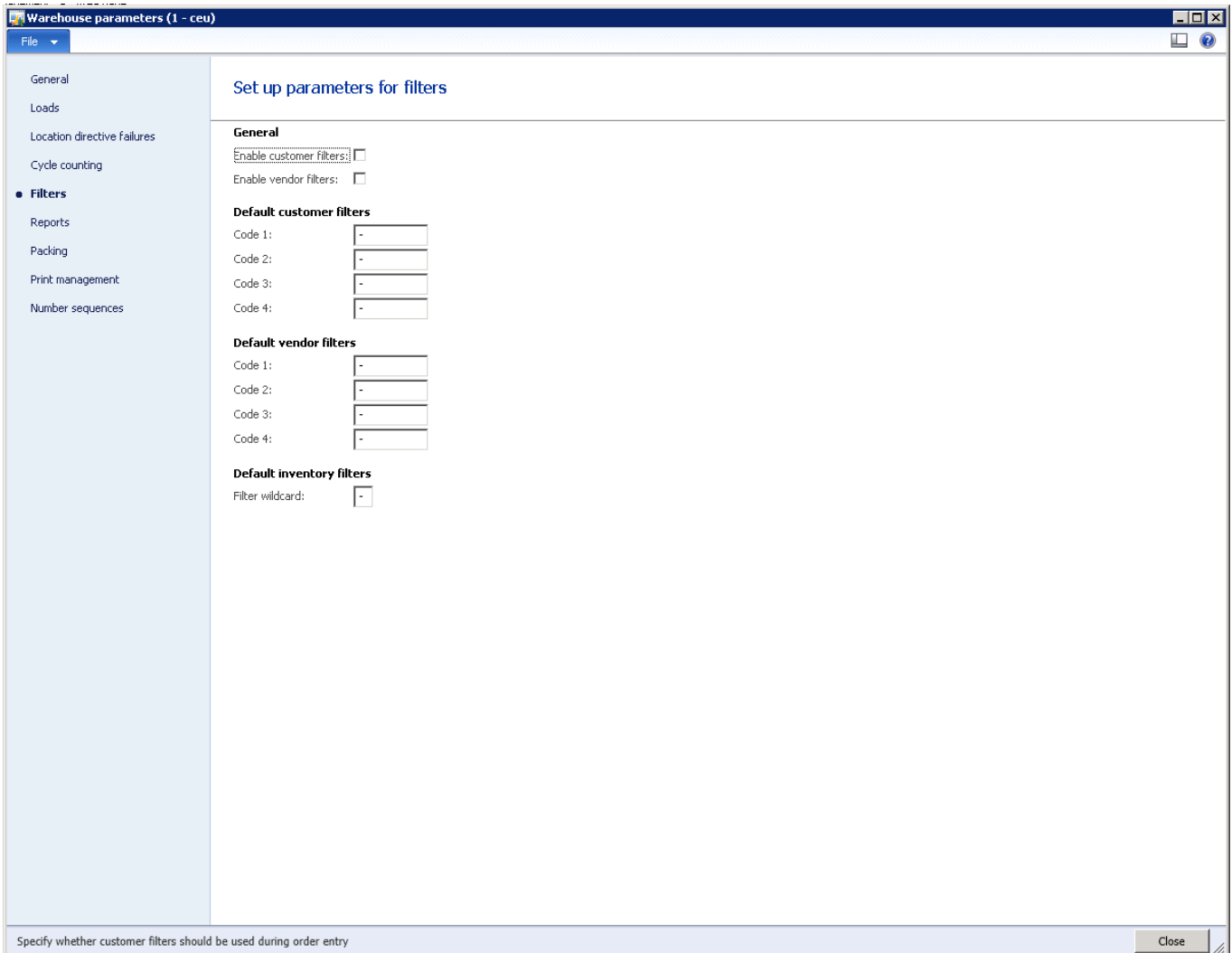
Work class
 Default cycle count work class ID:
 Default cycle count work priority:

At the bottom, there is a status bar that reads "The default adjustment type code for cycle counting" and a "Close" button.

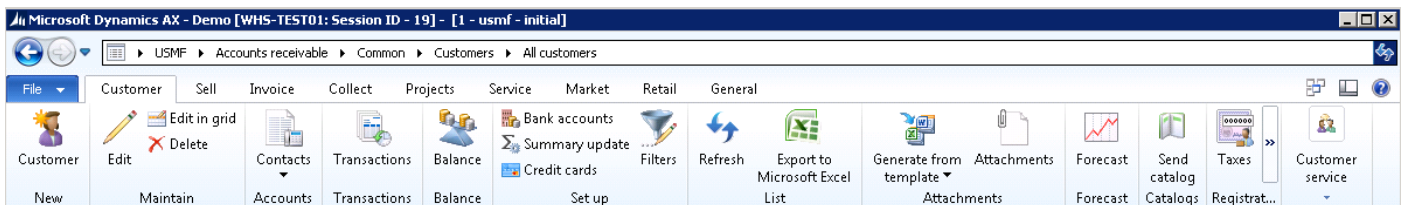
The **Warehouse management parameters** form contains the following cycle counting parameters.

Parameter	Description
Movement journal parameters	When you make an adjustment in cycle counting, this is the default inventory adjustment code that is used on all cycle count adjustments.

Parameter	Description
Work class	<ul style="list-style-type: none"> • Default cycle count work class ID - A work class ID that is used to create specific work in the warehouse for cycle counting. The default count work class ID is shown in the illustration. • Default cycle count work priority - This is the default priority that is given to cycle count work. This number can be higher or lower than the default work priority that is specified in the general parameters.

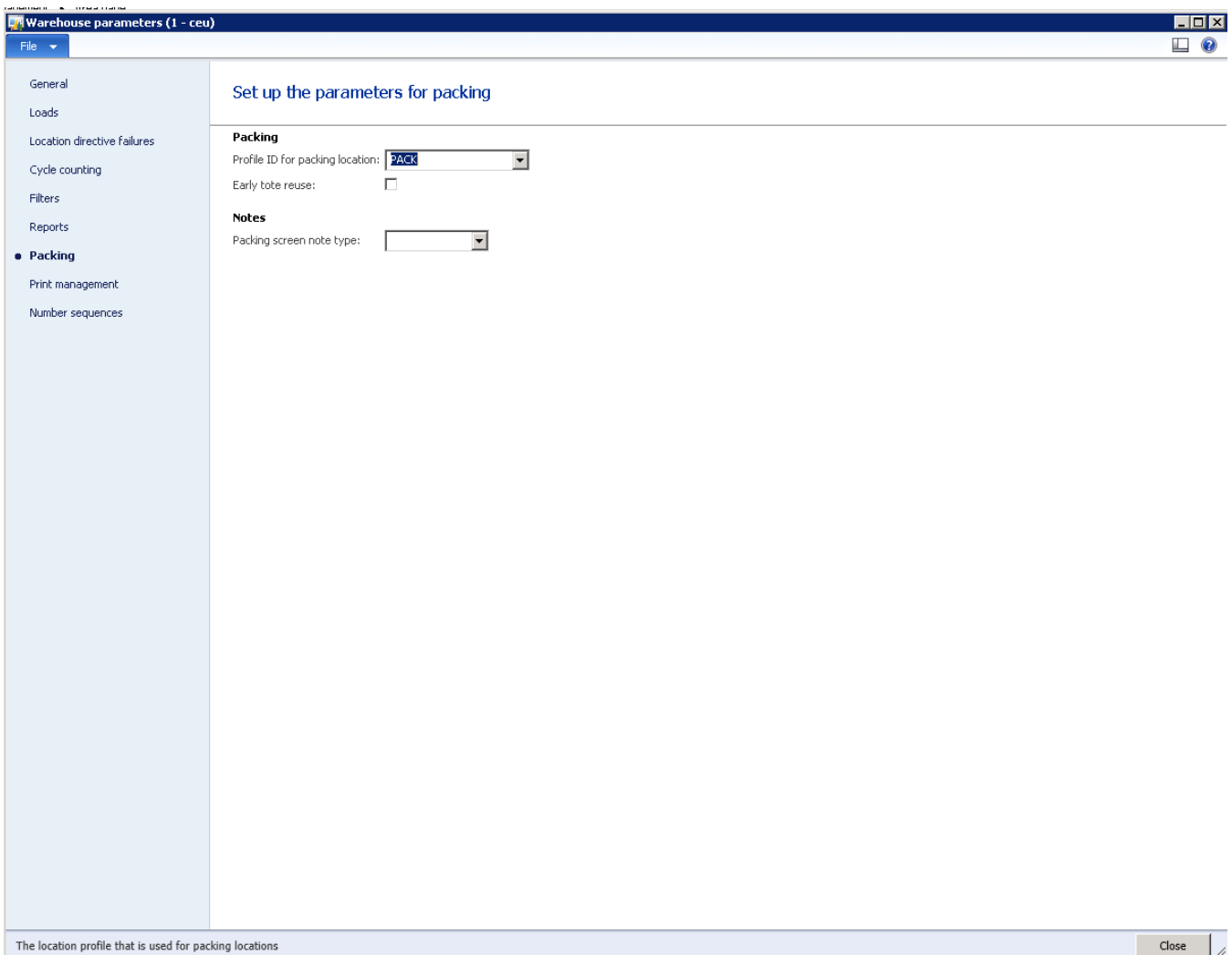


Filters and filter groups are covered later in this document. You can use the parameter setting to define whether filters are enabled for customers and for vendors. This will turn on the filter in the customer/vendor master record.



The Warehouse management parameters form contains the following label parameters.

Parameter	Description
Labels	<ul style="list-style-type: none"> • Default label report name - Used if a custom report was not specified in the label printer configuration. • Label format - The default format used if a label was not specified in the label printer configuration. • Default label print settings - Lets you set up the default print media to use when printing labels.
Bill of lading	On a mobile device, you can attach a bill of lading default note type. This is the default document handling for the note.
Picking list	This is the picking list note type that can be attached using the mobile device.
Load report	This is the default load report note.



The Warehouse management parameters form contains the following packing parameters.

Parameter	Description
Profile ID for packing location	Used as part of manual packing flow.
Early tote reuse	Used to process work in packing flow, when you put goods in the packing location. This generates a temporary License plate ID that is used instead of the actual ID in the work header.
Packing screen note type	Documents that you can attach to shipments. In the manual packing flow, these notes will display on the Pack screen.

Warehouse management parameters (1 - usmf)

File

General
Loads
Location directive failures
Cycle counting
Filters
Reports
Packing
Print management
● Number sequences

Set up number sequences for Warehousing for AX.

Reference	Number sequence code	Sales tax book section	
Load ID	Ware_136		
Shipment ID	Ware_156		
Work transaction ID	Ware_176		
Work ID	Ware_196		
Work voucher	Ware_216		
Work creation number	Ware_236		
License plate	Ware_256		
Label ID	Ware_276		
Work creation ID	Ware_296		
Work grouping ID	Ware_316		
Wave ID	Ware_336		
Release to warehouse ID	Ware_356		
Bill of lading ID	Ware_376		
Container transaction ID	Ware_396		
Temporary tote ID	Ware_416		
Wave processing ID	Ware_436		
Cluster ID	Ware_456		
Container ID	Ware_476		
Containerization process ID	Ware_496		
Warehouse receipt ID	Ware_501		

The identification number for the load

Set up print management of the various external sheets for the order

Close

The Warehouse management parameters form contains the following number sequence parameters.

Parameter	Description
Load ID	A unique identifier for Warehouse Management loads.
Shipment ID	A unique identifier for Warehouse Management shipments.
Work transaction ID	A unique identifier assigned to user transactions that are performed against work for labor tracking
Work ID	A unique identifier for work headers.
Work voucher	This is placeholder required for Warehouse Management. This must be able to handle a large number.
Work creation number	Used each time work creation is run. This number should be large enough to handle the number of times that work is created in the company.
License plate	Used for license plate generation, as detailed above. The ID must be 9 digits, without text.
Label ID	A unique identifier assigned to each label that is printed through the mobile device.
Work creation ID	A unique identifier that is used every time that work is built, to group a series of work headers together by build.
Work grouping ID	When a user groups work together during mobile device transactions, a unique transaction is automatically assigned to the group.

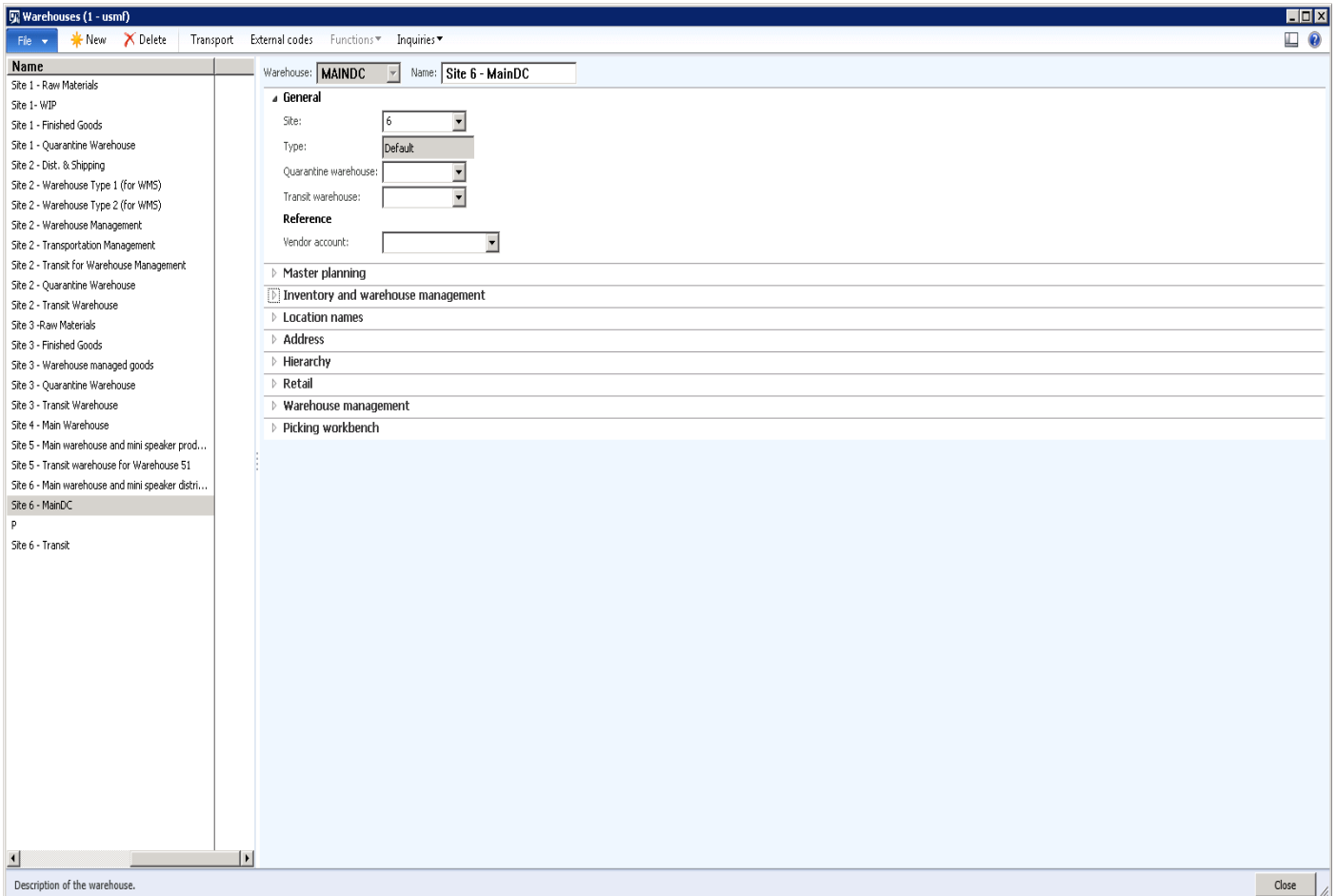
Parameter	Description
Wave ID	A unique identifier that is assigned to waves.
Release to warehouse ID	Each time a group of orders/loads are released to the warehouse, the release is assigned a unique ID for tracking purposes.
Bill of Lading ID	Each bill of lading (BOL) that generated in Warehouse Management receives a unique ID.
Container transaction ID	This is a unique ID that is assigned during container close.
Temporary tote ID	This is the license plate that is assigned when a tote is set down in a packing station.
Wave processing ID	A unique ID that is assigned to a wave when the wave is executed.
Cluster ID	A unique ID that can be automatically generated for a work cluster.
Container ID	A unique ID that is generated for a container that is created during containerization.
Container build ID	Each time a containerization wave step is executed, a unique ID is generated for tracking purposes.

1.2 Setting up the warehouse

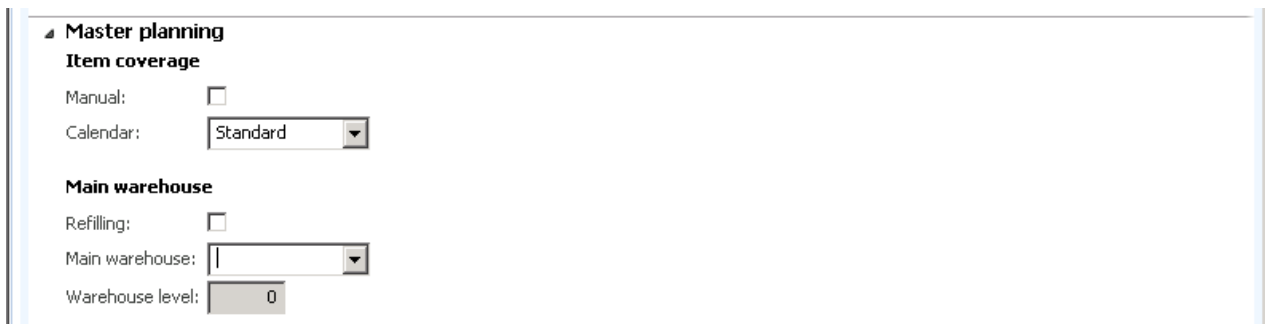
In order to use warehouse management in Microsoft Dynamics AX, you must create a warehouse and enable this for more advanced or specialized warehouse management activities. Traditional warehousing, where no automatic pick and put away rules exist, does not require this step.

Warehouse management

1. Click **Warehouse Management > Setup > Warehouse Setup > Warehouses**.
2. Click **New**.
3. Create a new warehouse called MAINDC, which represents the Main Distribution Center for the warehouse process. In this example, the default is site 1.



4. Expand the Master Planning FastTab.



In this example, the default for **Calendar** is Standard.

5. Expand the Inventory and warehouse management FastTab.



The setup area refers mainly to the previous WMS II solution, not everything will be used in Warehouse Management.

6. Expand the Location names FastTab.

Location names

Aisle
 Include aisle: **Position**
 Include bin:
 Format:

Rack
 Include rack: **Example**
 Format: Location:

Level
 Include shelf:
 Format:

Not required for the new WMS solution

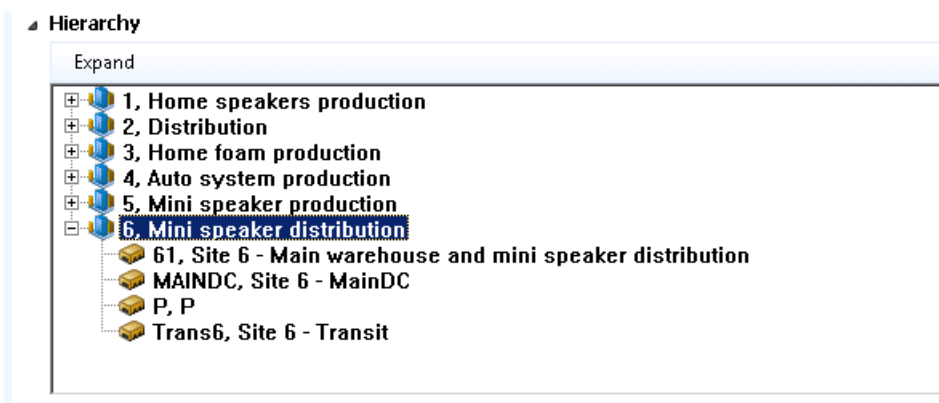
Location names are not required when you use the Warehouse Management System that is provided as part of Microsoft Dynamics AX 2012 R3.

7. Expand the Address FastTab.

Name or description	Address	Purpose	Primary
Warehouse Address	3007, 160th Av SE Bellevue WA	Delivery	Yes

Here you can update your warehouse delivery address. You can add more addresses, if needed.

8. Expand the Hierarchy FastTab.



This is a list of your warehouses in alphanumeric/numeric order under the site that you created. Note that MAINDC is visible because it was created in previous steps.

9. Expand the Retail FastTab.

Retail
Location replenishment
 Weight:
 Store:

Replenishment hierarchies

Not discussed in this Guide

Negative inventory
 Financial negative inventory:
 Physical negative inventory:

Storage dimensions
 Default location:
 Default pallet ID:

Return
 Default return location:
 Default return pallet:

The retail content shows additional parameter settings for Microsoft Dynamics AX for Retail. These fields will not be discussed in this guide.

10. Expand the Warehouse management FastTab.

Warehouse management

Use warehouse management processes:	<input checked="" type="checkbox"/>	Consolidation	
<u>Print BOL before confirming shipment:</u>	<input type="checkbox"/>	Consolidate shipment at release to warehouse:	<input checked="" type="checkbox"/>
Reservations		Inventory	
Reserve only warehouse in production bill of material:	<input type="checkbox"/>	Default inventory status ID:	<input type="text" value="Available"/>
Reserve inventory at load posting:	<input type="checkbox"/>	Inventory status change	
Reserve inventory when releasing to warehouse:	<input type="checkbox"/>	Remove reservations and markings:	<input type="text" value="None"/>
Cycle counting		Remove inventory blocking:	<input type="checkbox"/>
Allow pallet moves during cycle counting:	<input checked="" type="checkbox"/>	Labor standards	
Check digits		Allow labor standards:	<input checked="" type="checkbox"/>
Use unique check digits:	<input type="checkbox"/>		
Reduce picked quantity			
Decrement load line:	<input checked="" type="checkbox"/>		

Field	Description
Use warehouse management process	Select this check box to enable warehouse management. This will make MAINDC an advanced warehouse.
Print BOL before confirming shipment	Select this check box to print the bill of lading before confirmation of the shipment.
Reservations	<ul style="list-style-type: none"> Reserve only warehouse in production bill of material - If you're using production, select this check box if you want to reserve the inventory for raw material lines on a production order at the warehouse level, and ignore all other dimensions. Reserve inventory at load posting – If selected, inventory reservations can be automatic or manual, or automatic, but only at the time of load posting.

Field	Description
Cycle counting	Select this check box to enables users to move pallets while a cycle count is in progress.
Check digits	Select this check box if you want to check digits in the warehouse.
Reduce picked quantity	Select this check box if the load line should be decremented when the work is canceled.
Consolidation	Select this check box if you want to automatically consolidate shipments. In the location directive action you can use the consolidate strategy.
Inventory	This ID can be used either at the parameter, warehouse, or inventory level.
Labor standards	Select this check box if you want to set up defaults for picking and default work.

▲ Picking workbench

Pick lists per batch:

Maximum lines per picking list:

Split by ship alone:

Split by delivery mode:

You're now ready to start the case study.

2 Case study – Inbound process

The following case study focuses on a large food distributor that services the end consumer in the retail industry. This case study only covers the warehouse management/distribution side of the supply chain, there is no focus on any retail capability.

- Customer – Bingos food supplies
- Address – 123 Anywhere Street, Bellevue WA 98022
- Multiple warehouses, but the focus will be on warehouse MAINDC, which is located in Bellevue, WA

2.1.1 Warehouse details

- Warehouse currently has three activity zones. In each zones, particular areas are defined in the warehouse. For Frozen and Fresh, cold/frozen storage is required.
 - Dry food
 - Fresh food
 - Frozen food
- In each activity zone (Dry, Fresh, Frozen) there are several location types.
 - For all incoming inventory, an inbound area location must be defined.
 - Each activity zone has a picking location.
 - Each activity zone has a bulk location (reserve).
 - Each activity zone has a staging location.
 - Each activity zone has an anomaly location, such as Bad, Returned, Broken, or Expired items.
- Each zone has Racks, Shelving, and Pallets for reserve stock.
- Default picking paths for each activity zone must be set (wave templates).

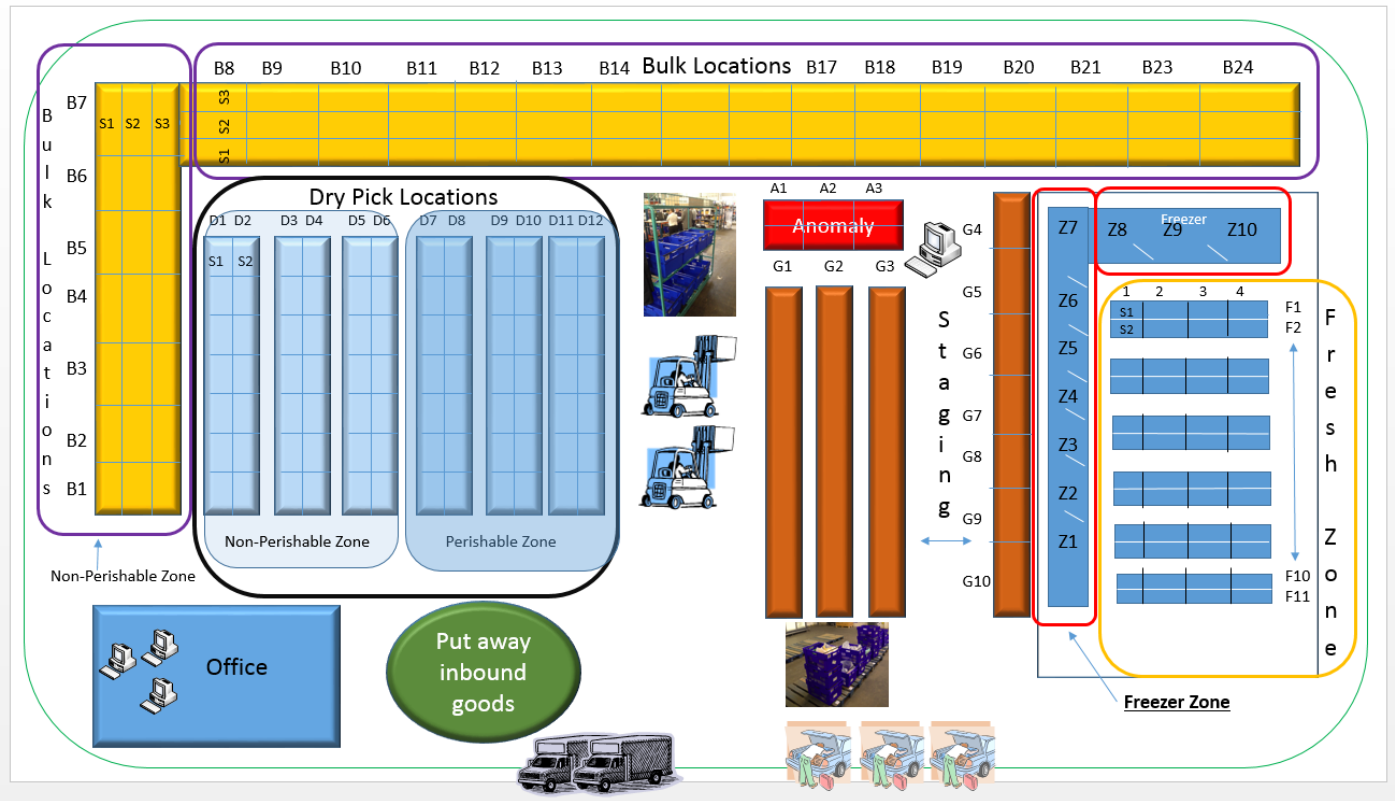
2.1.2 Product storage details

- Products are categorized into family groupings.
- Each family grouping can contain sub-family groups for picking frequency and optimization.
- Each product can have 1 to many production locations available.
- Each product can have 1 to many product EAN's.

2.1.3 Stock management details

- Replenishment from reserve to pick location can be automatic.
- Stock movements are available and created.
- Cycle counts are required.
- FEFO/Lot batch control is required.

2.1.4 Warehouse layout



- **Inbound area** – Represented in green, referred to as Inbound.
- **Office area** – Represented in blue in the lower-left corner.
- **Bulk area** – The bulk locations are shown in yellow and have Racks B1 – B24, which consists of 3 shelves represented as S1-S3. A typical location for bulk would read B2-S2, which is Rack Bulk 2 on shelf 2.
- **Dry zone** – Represented as Aisle D1 – D12, which consists of Racks 1-7 and Shelves S1- S2. A typical location code for the Dry zone area represents D4-1-S2, which is Aisle 4 rack 1 on shelf 2.
- **Anomaly** - Used for returned, damaged, or expired inventory. This is indicated in red and is Rack A – A3 shelf 1-2. A typical location code for Anomaly would be A2-S2, which represents Rack 2 on Shelf 2.
- **Staging** - Represented by the orange outline and there are areas on the floor represented by G1 – G11 without shelving.
- **Fresh locations** - Represented as F1 – F11. Racks are represented as 1-4 and shelves are represented as S1-S2. A typical Fresh location would resemble F6-3-S2, which is Aisle F5, Rack 3, and Shelf 2.
- **Freezer section** - Represented as Rack Z1 – Z10. There are two shelves in the freezer section represented as S1 – S2. A typical location would be Z3-S1, which represents Freezer door 3 on shelf 1.
- **Bay-door** – This represents the shipping of picked items, shown as the customer vehicles in the illustration.

2.1.5 Location types

Location types are used to describe or define the locations that your warehouse will be using. For example, the previous section shows the warehouse layout and the different areas that are mapped to Location types in Warehouse Management.

To create Location types, follow this navigation path:

Warehouse Management > Setup > Warehouse Setup > Location Types

Location type	Description
Anomol	MAINDC Anomaly
BAYDOOR	MAINDC Baydoor
BULK	Bulk
DryGoods	MAINDC Dry Goods Picking
FLOOR	Floor
FreshGoods	MAINDC Fresh Goods Picking
Frozen	MAINDC Frozen Goods
Inbound	MAINDC Inbound Doc
ORDER	Order picking locations
PACK	Pack
PRODUCTION	Production
QMS	Quality
RECV	Receiving
Reserve	Bulk Locations
STAGE	MAINDC Stage
Staging	Staging
USER	User
WEBSHOP	Webshop

2.1.6 Case study continued

In this case study, define the location types that you're going to need.

Create the following location types for Staging, inbound (Receiving), and outbound (Baydoor) for the shipping dock:

- Anomol locations
- Baydoor locations
- Drygoods location
- Freshgoods location
- Frozen location
- Inbound location
- Reserve (bulk) locations
- Staging – Unique

2.1.7 Location formats

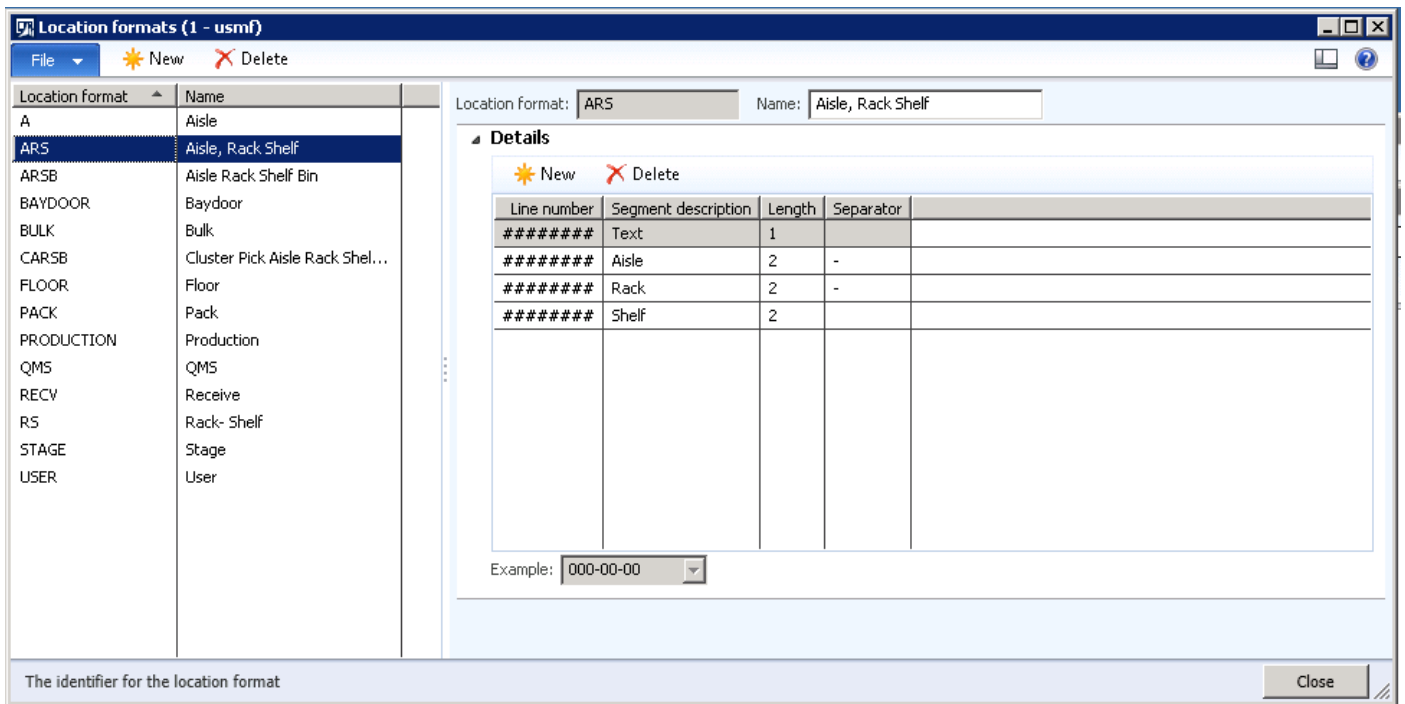
Location formats enable you to define what the numbering system for your warehouse will be. As shown in the previous warehouse layout diagram, you'll notice that there are several different locations which have been defined in the location types. These can have a unique format, depending on whether you use Aisles, Racks, Bins, Shelf, or whatever the structure resembles.

Using the previous example, ensure that you have a format available for the following types:

- **Anomol locations** – Uses Rack and Shelf – Setup Rack and Shelf (RS) in location formats
- **Baydoor locations** – Unique
- **Drygoods location** – Aisle Rack and Shelf – Setup ARS in location formats
- **Freshgoods location** – Aisle Rack and Shelf – Use ARS
- **Frozen location** – Rack and Shelf – Use RS
- **Inbound location** - Unique
- **Reserve (Bulk) locations** – Rack and Shelf – US RS
- **Staging** – Unique

To create location formats, follow this navigation path:

Warehouse Management > Setup > Warehouse > Location Formats



2.1.8 Case study continued

In this example, there is a Receiving, Staging, and Baydoor set, an Aisle Rack and Shelf format, and a Rack and Shelf format.

In the example in the preceding section, the ARS option is defined as 1-character length text, and a 2-character length Aisle, a 2-character length Rack, and a separate 2-character length shelf with appropriate separates. This information has been obtained by the warehouse design from the case study earlier in this document.

Next, you must create all the location formats that are associated with all of the location types.

2.1.9 Location profiles

Location profiles let you define things such as license plate control, which lets you select if mixed items, mixed inventory status, and mixed batches can be present, and trigger whether cycle counting is enabled. Location profiles can also be useful in other areas of Warehouse Management. For example, you can define location dimensions like height, length, width for a common unit of measure, such as pallets or boxes, or you can set the sizes by location volume.

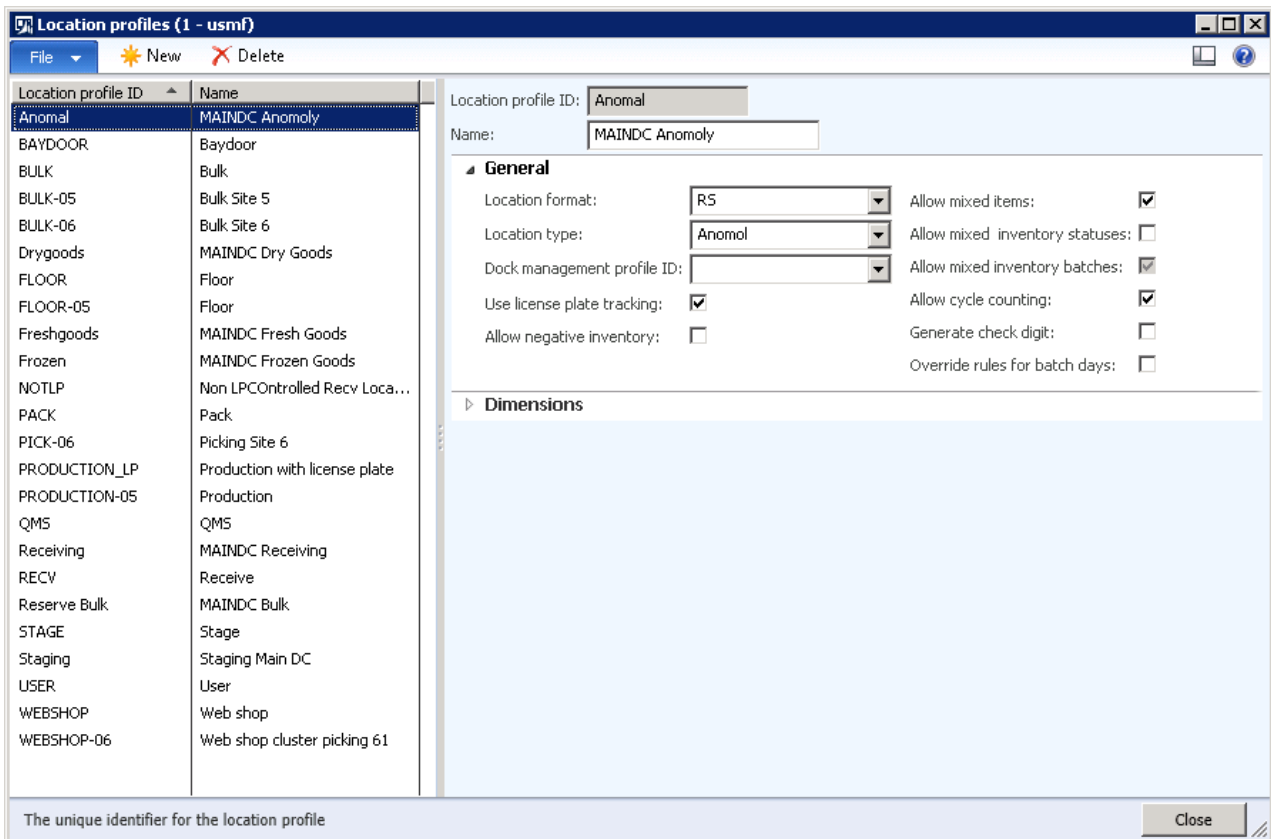
It's important that a special profile be created for user locations that is license plate controlled, allows for mixed items, and allows for mixed batches. This profile must be set in the **Warehouse Management Parameters** form for the user locations profile. When inventory is moved, the system puts the inventory in the user location. This ensures that the location of the inventory is always known throughout the movement.

2.1.10 Case study continued

In this case study, create profiles for the location types.

To create location profiles, follow this navigation path:

Warehouse Management > Setup > Warehouse Setup > Location Profiles



Ensure that all profiles have been created according to the following setup:

- Select **Use license plate tracking**.
- Select **Allow mixed items**.
- Select **Allow cycle counting**.

2.1.11 Zones and zone groups

Warehouse Management uses zones, which lets you categorize the warehouse locations into a "Zone". This can be useful for allocating product based off a zone area. In addition to zones, you can also group zones together for reporting. In this example, you can group the dry goods, perishable, and non-perishable items together for reporting, which allows you to logically group zones for analysis.

2.1.12 Case study continued

In this case study, define the following zones:

- DGP - Dry goods perishable
- DGNP - Dry goods non-perishable
- BGP - Bulk goods perishable
- BGNP - Bulk goods non-perishable
- Fresh
- Frozen

To create zone groups, follow this navigation path:

Warehouse Management > Setup > Warehouse Setup > Zone Groups and Zones

Zones and zone groups are required and are typically used for logical grouping. Zone groups logically group multiple zones and are used for reporting.

2.1.13 Case study continued

In this case study, create the following zone groups:

- Dry goods | Bulk goods
- Fresh | Frozen

The screenshot shows a window titled "Zone groups (1 - usmf)" with a menu bar containing "File", "New", and "Delete". The main area contains a table with the following data:

Zone group ID	Zone group name
ANOMOLY	MAINDC ANO...
BULK	Bulk
MDC Bulk	Main DC Bulk
MDC Dry	Main DC Dry
MDC Fresh	Main DC Fresh
MDC Frozen	Main DC Frozen
Staging	Staging
WEBSHOP	Webshop

At the bottom of the window, there is a status bar that says "The ID of the zone group" and a "Close" button.

The screenshot shows a window titled "Zones (1 - usmf)" with a menu bar containing "File", "New", and "Delete". The main area contains a table with the following data:

Zone ID	Zone name	Zone group ID
ANOM	MAINDC Anomol	ANOMOLY
BGNP	Bulk Goods Non Perishable	MDC Bulk
BGP	Bulk Goods Perishable	MDC Bulk
BULK06	Bulk 6 for CycleCounting in WH...	BULK
DGNP	Dry Goods Non Perishable	MDC Dry
DGP	Dry Goods Perishable	MDC Dry
Fresh	Fresh zone	MDC Fresh
Frozen	Frozen zone	MDC Frozen
STAGEC	MAINDC Staging Cold	Staging
STAGEG	MAINDC Staging General	Staging
WEBSHOP1	Webshop 1 for Cluster Picking	WEBSHOP

At the bottom of the window, there is a status bar that says "The ID for the zone" and a "Close" button.

This case study uses a rather simple structure for the zoning and grouping, but you can get very detailed with the layout and zoning of the warehouse, so that you can be as specific as you want.

2.1.14 Storage dimension groups

Storage dimension groups are required and are used to determine the inventory storage information that will be used, including whether the warehouse processes are active. You'll notice some additional options:

- Use warehouse management process
- Inventory status
- License plate

To create storage dimension groups, follow this navigation path:

Product Information Management > Setup > Dimension Groups – Storage Dimensions

Name	Active	Blank receipt allowed	Blank issue allowed	Physical inventory	Financial inventory	Coverage
Site	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
Warehouse	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Location	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
Inventory status	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
License plate	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	

The two options shown in this illustration are required when you use Warehouse Management. Notice on the model group that you can enable Warehouse Management.

By default, when **Use warehouse management processes** is selected, this turns on the following dimensions: Site, Warehouse, Location, and License plate. These dimensions are not optional and are set up and required by Warehouse Management.

New dimensions which are managed by Warehouse Management include:

- **License plate** - License plates can be turned on and off at the location level via the location profile (see location profile setup). License plates can be set up at **Warehouse Management > Setup > Warehouse > License Plates**.
- **Inventory status** - Statuses can be set up for reservations. Anything that is not available for reservation cannot be shipped. The effect of inventory status on reservations is explained later in this document. Inventory statuses can be set up at **Warehouse Management > Setup > Inventory > Inventory Status**.

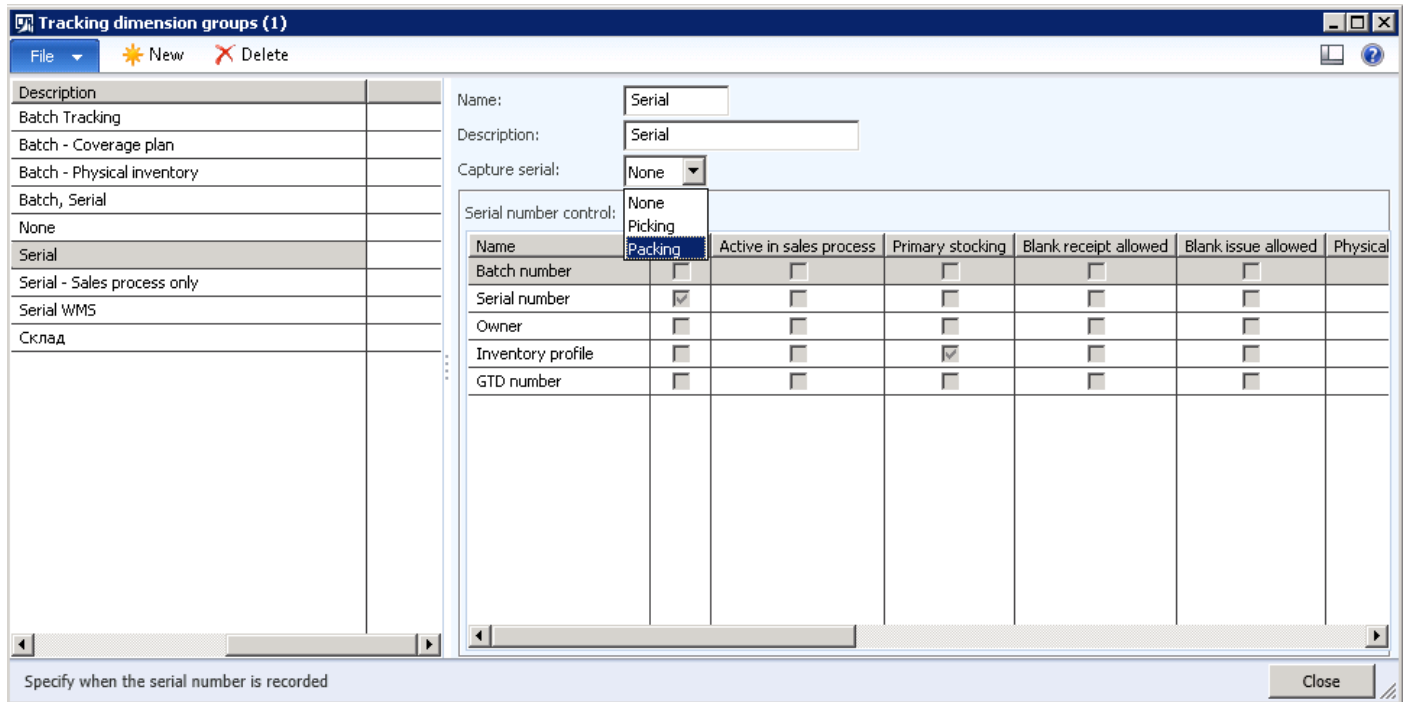
2.1.15 Case study continued

In this case study, create a new storage dimension for the products and call it MDCSD, which means main distribution center storage dimension. Refer to the previous screenshot to see the fields in this form.

2.1.16 Tracking dimension groups

Serial number and batch number are typical configuration options. However, there are new options on the dimension group that enable Warehouse Management to capture serial or batch numbers only at picking or packing.

To create tracking dimension groups, follow this navigation path:
Product Information Management > Setup > Dimension Groups – Tracking Dimensions



In this example, Warehouse Management will automatically configure the batch and serial dimensions. For serial dimensions, if you want to capture serial numbers for all inventory transactions you can enable the primary stocking flag for serial number. Otherwise, the option that was mentioned earlier determines whether the serial numbers are captured during picking or packing.

2.1.17 Case study continued

In this case study, create a new tracking dimension without serial number control and batch control. This is a standard tracking dimension. Later in the case study you'll learn about batch and serial number processing.

2.1.18 Unit of measure sequence groups

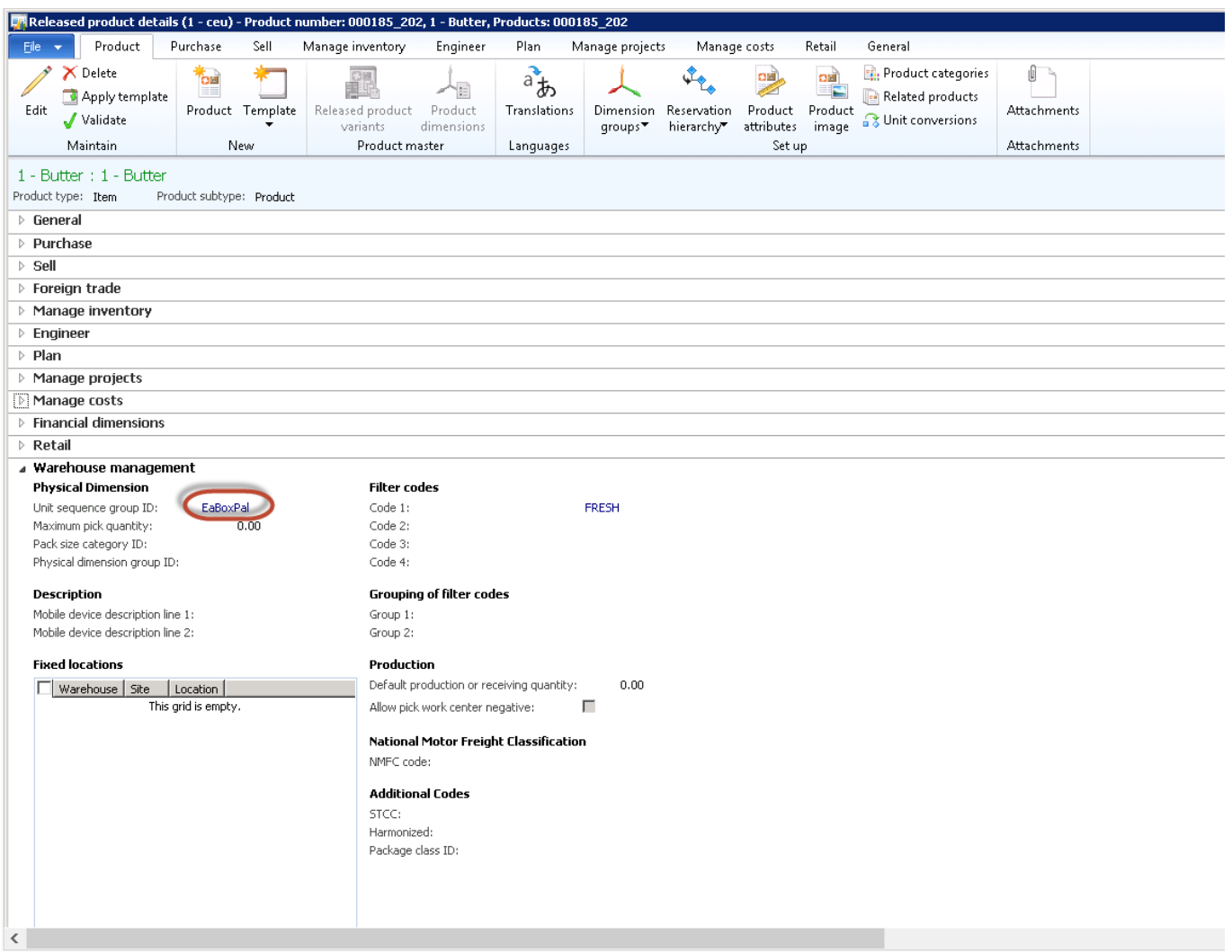
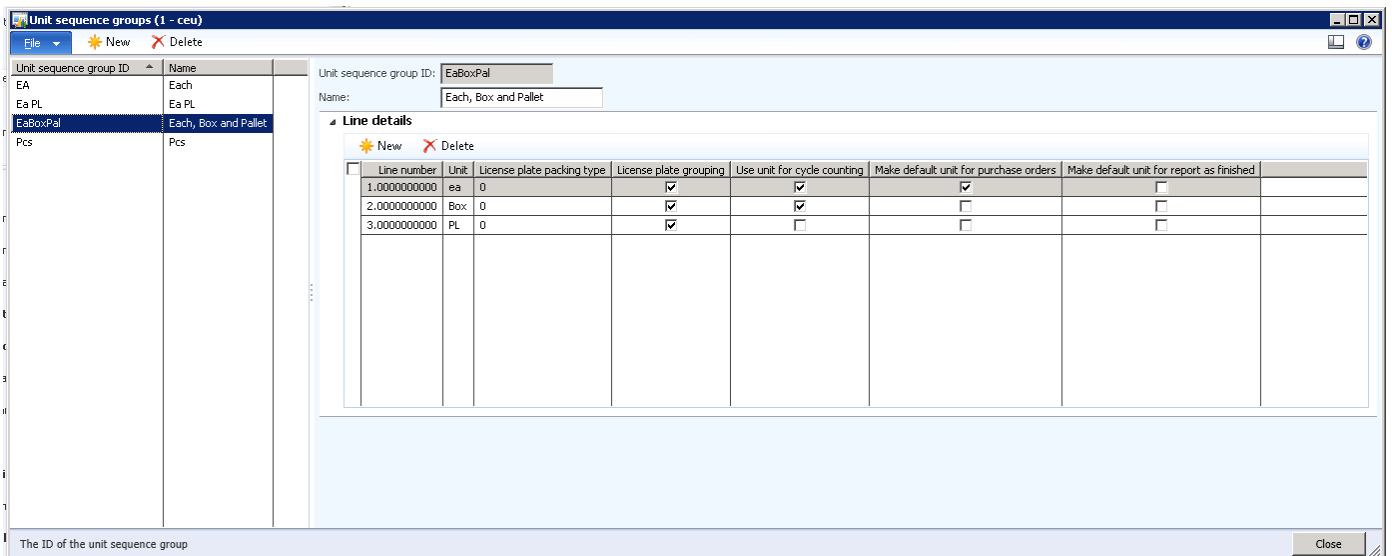
Unit of measure (UOM) sequence groups are critical to the setup of Warehouse Management. These groups determine how the inventory is stored in the warehouse. This setup drives how the system locates product in the warehouse or how locations are found to put inventory away.

A UOM sequence group defines which units of measure an item is stored in, from smallest to largest. In the following example, the item is stored in eaches (ea's), then boxes, and then pallets.

To create unit of measure sequence groups, follow this navigation path:
Warehouse Management > Setup > Warehouse Setup > Unit Sequence Groups

2.1.19 Case study continued

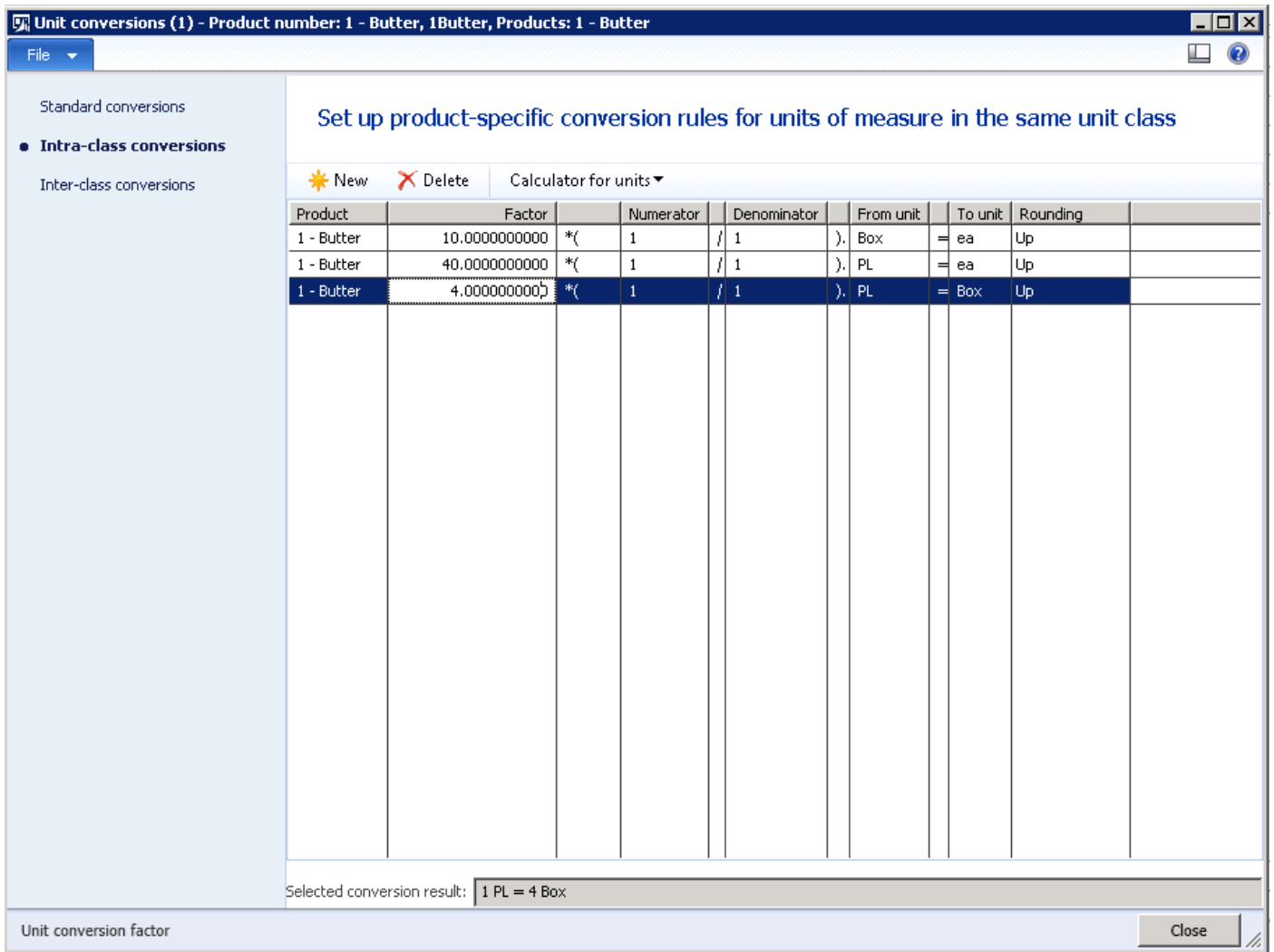
Create a new unit sequence group for each, box, and pallet, as defined in the following screenshot. Ensure that license plate grouping is selected, and that the default for purchase orders is set to ea's.



After you define unit sequence groups, set the **Unit Sequence Group ID** on the **Warehouse management** FastTab.

For pounds (lbs), you must define a unit sequence group for lbs, box, and pallet, and assign that group to the fresh items created when primary stocking is not eaches.

Unit conversions must be defined for each of these items.

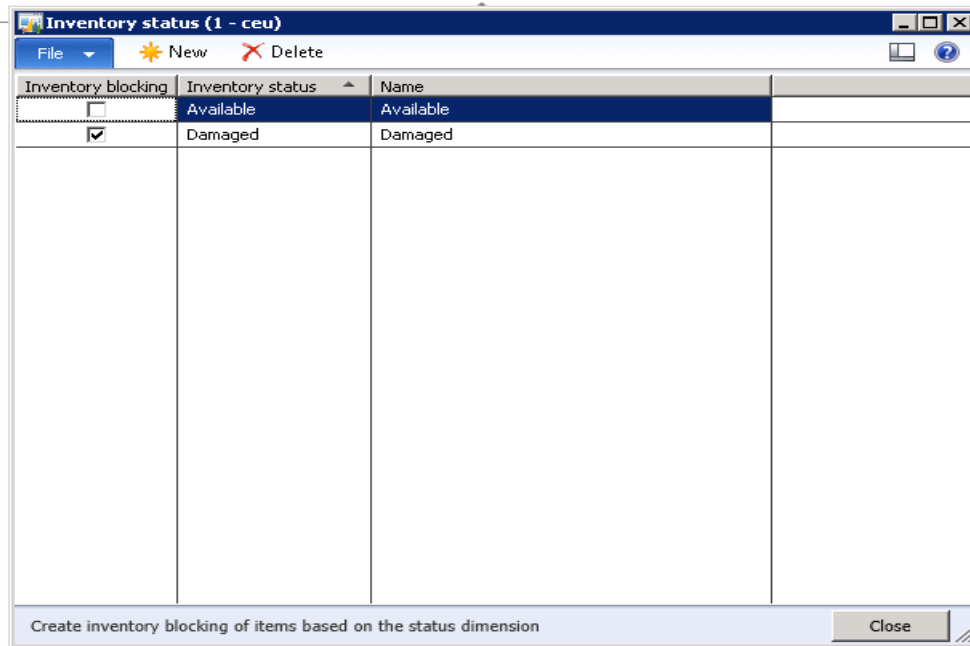


2.1.20 Inventory status

Inventory statuses are configurable, and can be designated as blocking or non-blocking. If **Inventory Blocking** is not selected, the status is considered "Good Status". If **Inventory Blocking** is selected, the item cannot be shipped or specified on a sales order, transfer order, or production BOM. In addition, the inventory is not considered available for reservation at the status, warehouse, site, and item levels in the hierarchy. It is still available in the location level, so that the inventory can be moved in the warehouse.

To configure inventory status, follow this navigation path:

Warehousing for AX menu under Setup > Inventory > Inventory Status



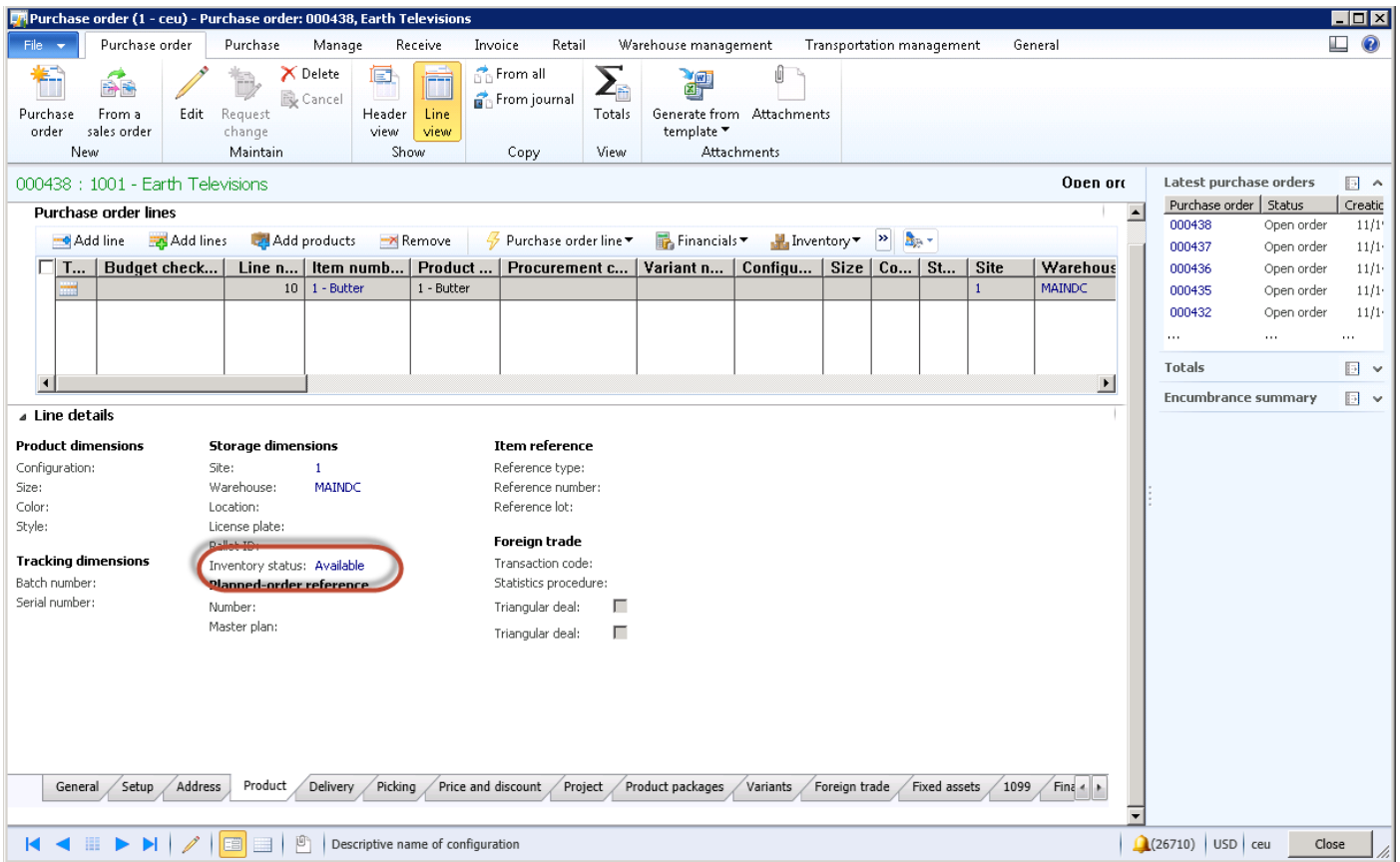
In this example, create an Available inventory status and a Damaged – Blocked inventory status. The blocking feature can be enabled in the following scenario:

- Generate a PO and wait for the PO to arrive. However, you're informed by the vendor that the shipment arriving will be "Non Useable". At the PO level, you can set the inventory status prior to receiving the goods.

To set the inventory status, follow this navigation path:

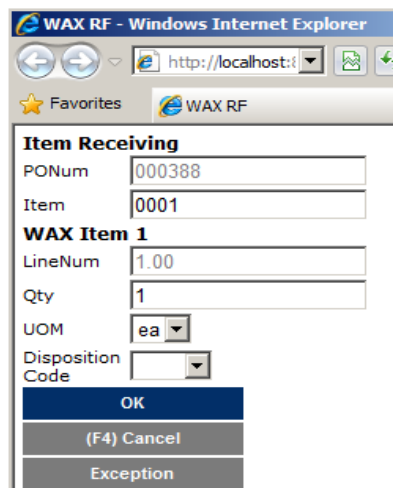
Procurement and Sourcing > Common > Purchase Order > All purchase Orders

1. Select the relevant PO.
1. On the **Action Pane**, select **Edit** to modify the PO. On the **Product** tab of the line detail you can change the status, which sets the default to **Unavailable** at the time of receipt.



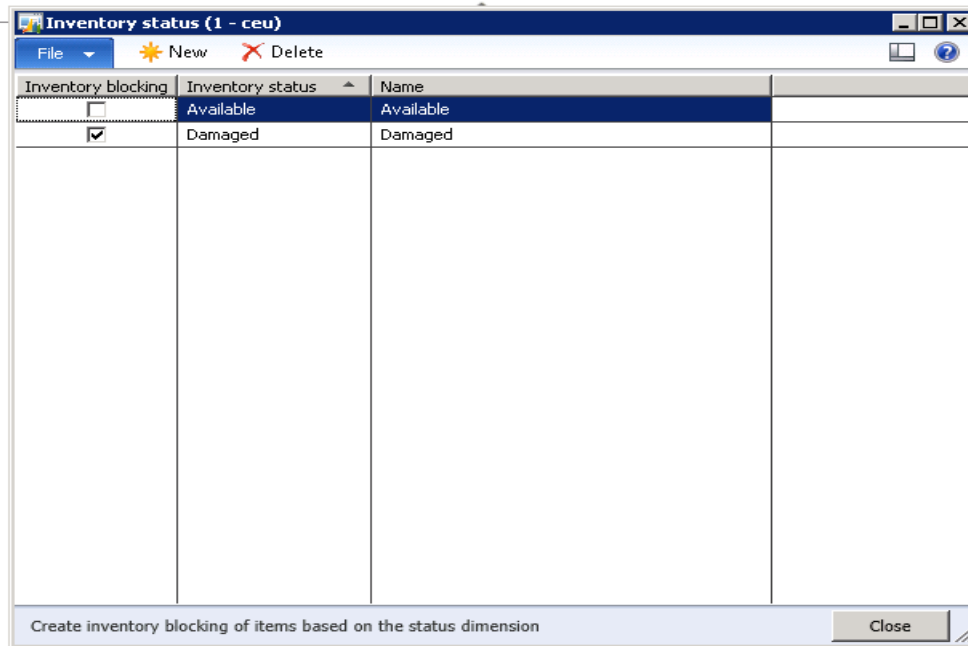
This will place the item into a blocking location until you can physically change the inventory status.

The other option is to allow the warehouse worker to inspect goods as they come in and decide on the status. If you want to let the warehouse worker to be able to view and change the Inventory status dimension on the mobile device when receiving, you must enable it. You can enable a mobile device at **Warehouse management > setup > Mobile Device > Mobile device** menu items. Select **Purchase Receive** and select **Display disposition code**, which will enable it on a mobile device. In this example, this is for processing Purchase receiving.



2.1.21 Case study continued

Ensure that these two inventory statuses exist – available and damaged.



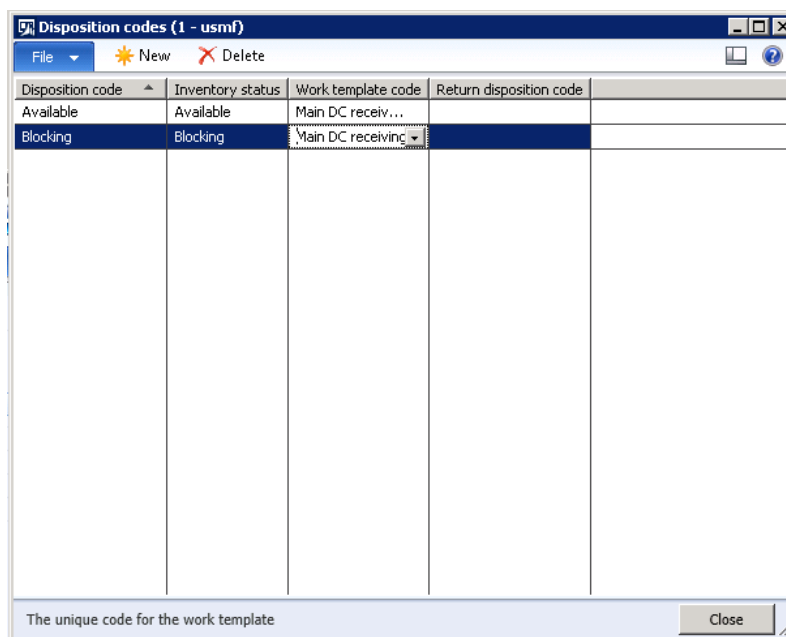
2.1.22 Disposition codes

In conjunction with the inventory status, Warehouse Management supports the identification of a disposition code. The code is user definable. The disposition points to a disposition configuration, which defines the inventory status that will be associated with this part of the receipt.

Disposition is often used to define that a product is in a non-usable state. The product might be damaged or require some attention or rework prior to being available for sales orders.

To create disposition codes, follow this navigation path:

Warehouse Management > Setup > Mobile Device > Disposition Code



2.1.23 Case study continued

In this example, there are two disposition codes for the MAINDC Receiving warehouse (see the previous screenshot). The disposition codes are directly related to the inventory status. In order for this to function, allocation of the disposition code to a work template is necessary. Work templates are covered later in this document.

If you want the disposition code to appear on the Mobile Device menu, you must enable that. Mobile Device menu items are covered later in this document.

2.1.24 Location setup wizard

The Location Setup wizard lets you create locations based on the formats that were previously defined. The process of creating the locations is simple.

To open the **Location setup wizard**, follow this navigation path:

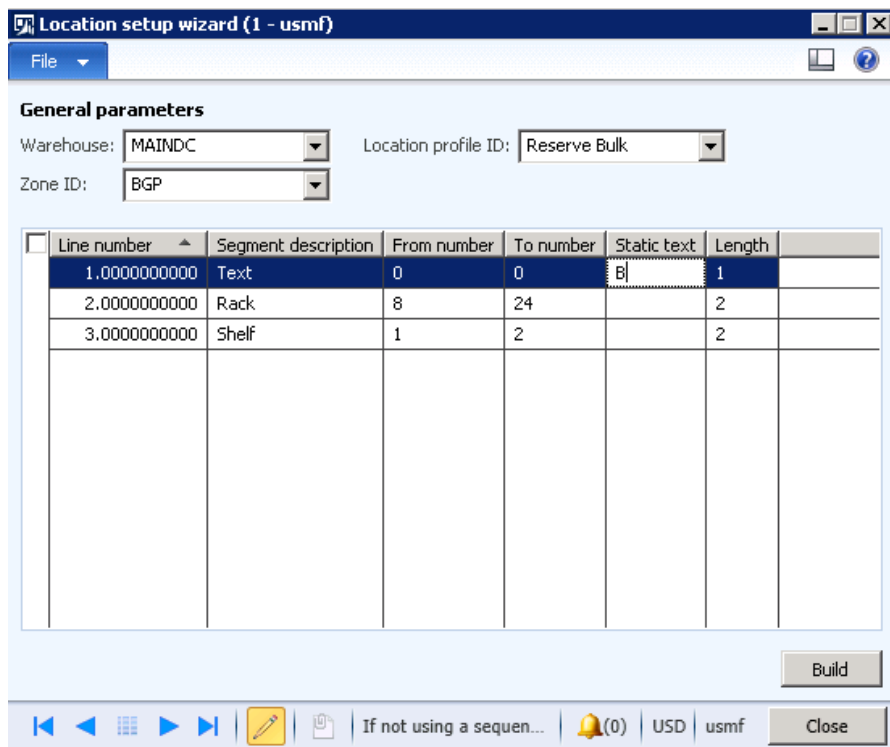
Warehouse Management > Setup > Warehouse Setup > Location setup wizard

Line number	Segment description	From number	To number	Static text	Length
1.0000000000	Text	0	0		1
2.0000000000	Rack	0	0		2
3.0000000000	Shelf	0	0		2

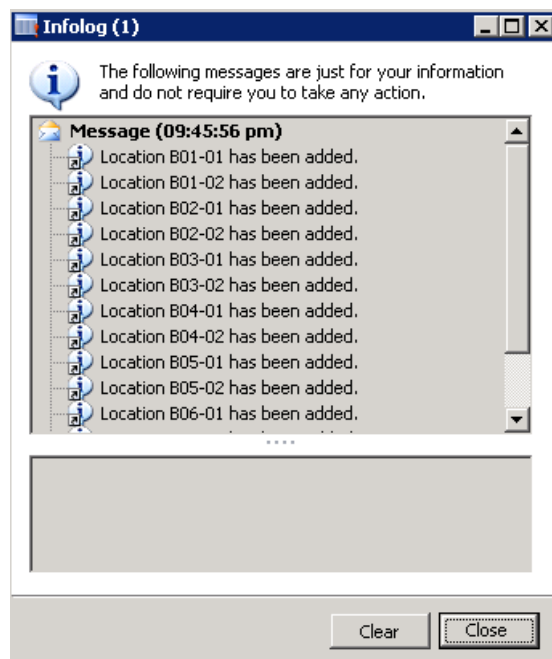
2.1.25 Case study continued

In the previous example, you created locations for the MAINDC warehouse, and locations for Bulk goods, Non-perishable items. If you refer to the warehouse layout, this is rack B1 through to B7.

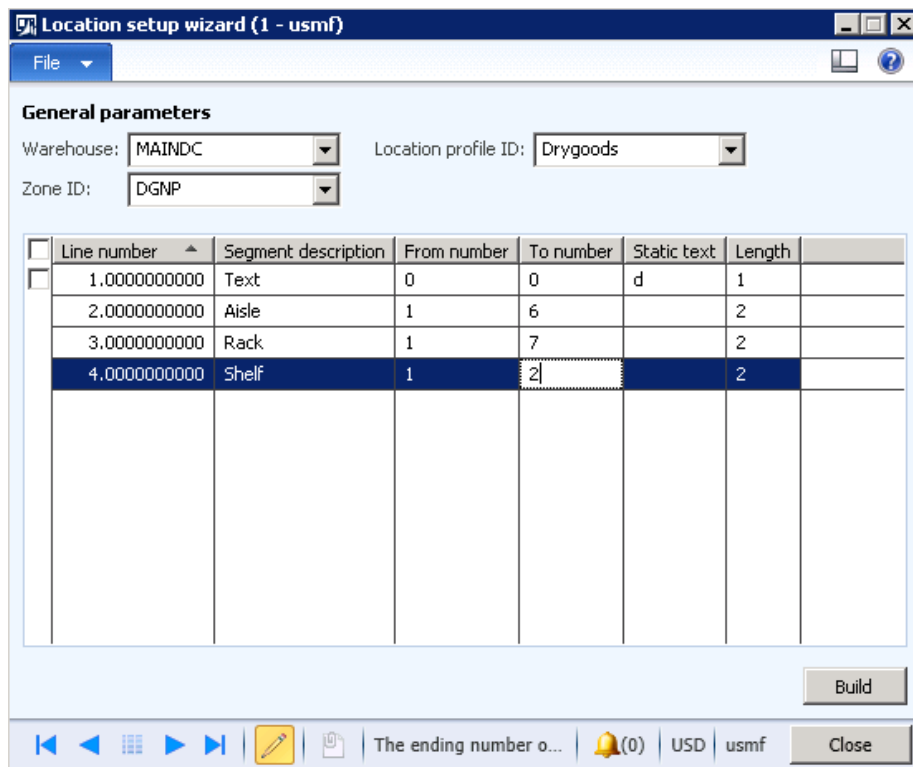
1. After the locations are defined, click **Build** in the lower right of the form.



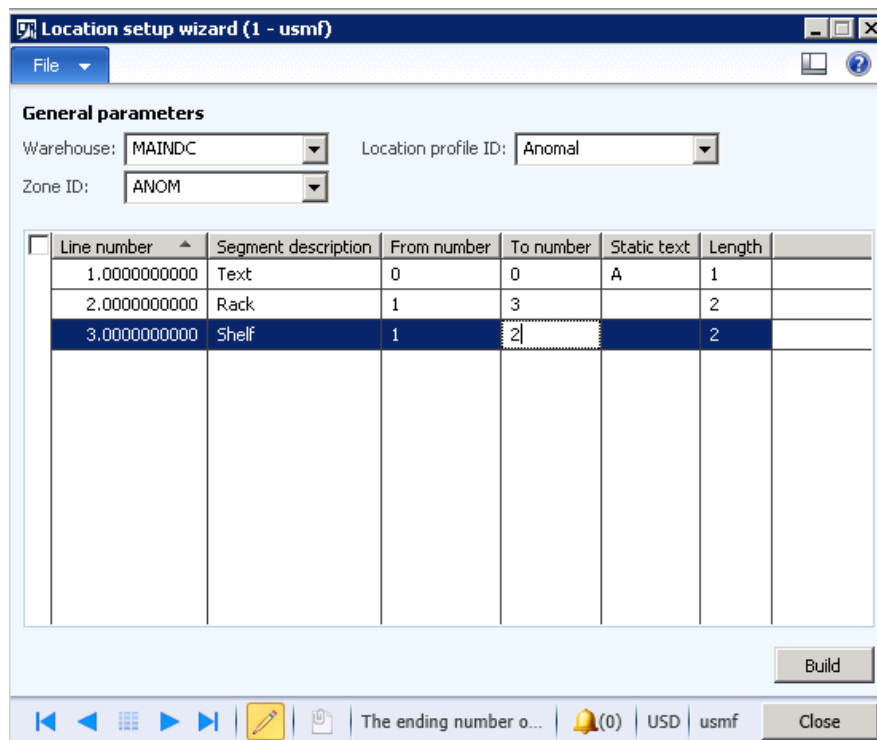
2. A message is displayed that the location codes have been created. Repeat this step for all zones.



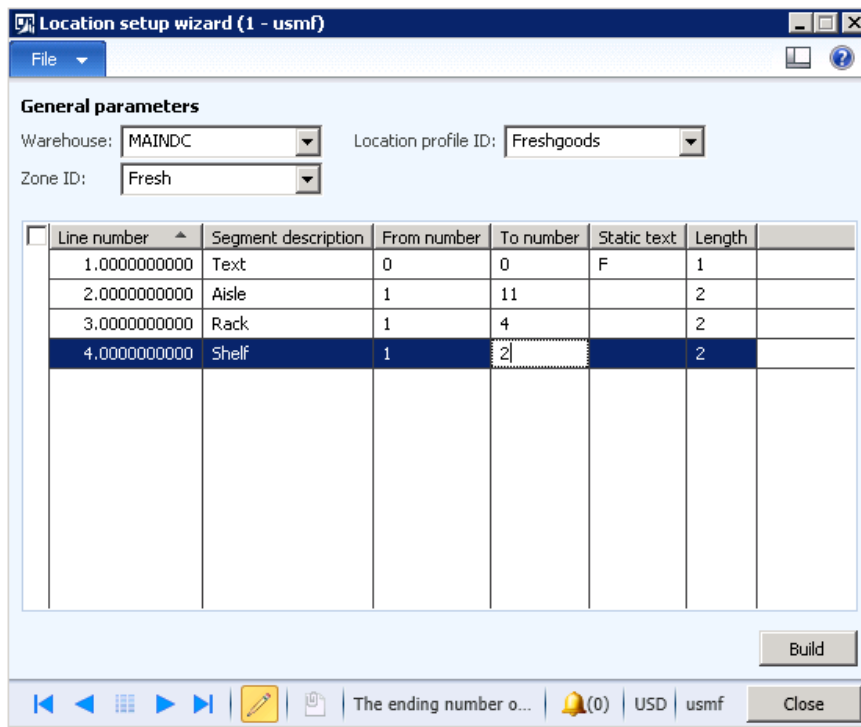
3. Create the perishable bulk section, rack 8 – 24.



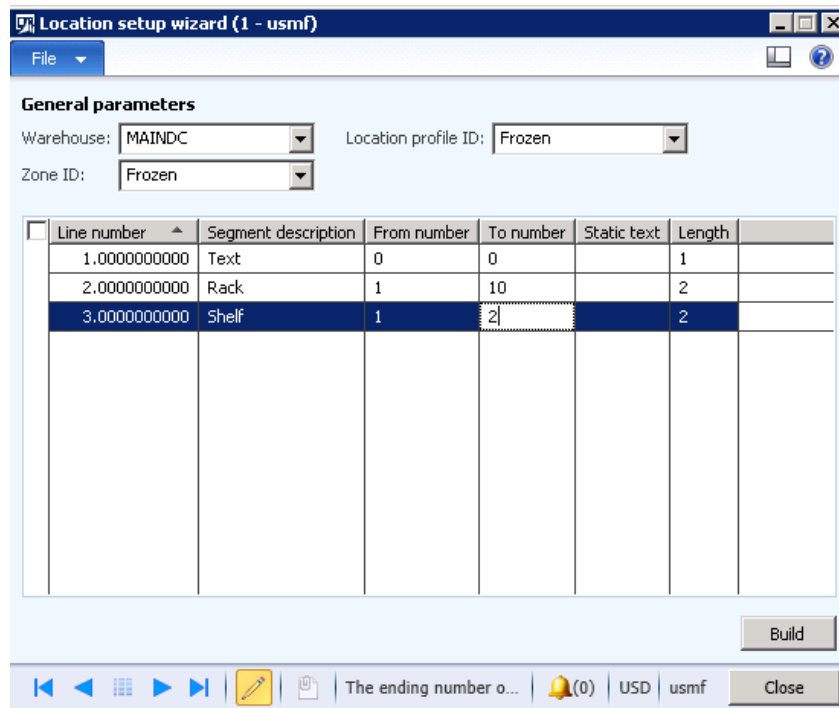
4. Create a location for Dry goods Non-perishable, which is Aisle 1-6, Rack 1-7, and Shelf 1-2.



5. Create locations for Anomaly locations – damaged expired goods.



6. Create locations for Fresh good storage (Cold room).



7. Create locations for Frozen.

2.1.26 Create inventory items – case study continued

Create the following inventory items for this case study.

Item	Name	Zone	UOM	Item Gp.	St Dim	Tk Dim	Model
1 – Butter	Packet of Butter	Fresh	Ea	Food	Ware	None	FIFO
1 – Cottage Cheese	Tub of Cottage Cheese	Fresh	Ea	Food	Ware	None	FIFO
1 – Cream	Pint of Cream	Fresh	Ea	Food	Ware	None	FIFO
1 – Milk	Qtr. of Milk	Fresh	Ea	Food	Ware	None	FIFO
1 – Frozen Chips	Pkt Frozen Chips	Frozen	Ea	Food	Ware	None	FIFO
1 – Frozen Pastry	Pkt Frozen Pastry	Frozen	Ea	Food	Ware	None	FIFO
1 – Frozen Peas	Pkt Frozen Peas	Frozen	Ea	Food	Ware	None	FIFO
1 – Ice Cream	Qtr. of Ice Cream	Frozen	Ea	Food	Ware	None	FIFO
1 – Pepper	Red Peeper	Dry Perish	Lbs.	Food	Ware	None	FIFO
1 – potato	White potato	Dry Perish	Lbs.	Food	Ware	None	FIFO
1 – Tomato	Tomato	Dry Perish	Lbs.	Food	Ware	None	FIFO
1 – Cheese Doritos	Pkt Cheese Doritos	Dry Non P	Ea	Food	Ware	None	FIFO
1 – Crackers	Pkt of Crackers	Dry Non P	Ea	Food	Ware	None	FIFO
1 – Pasta	Pkt of Pasta	Dry Non P	Ea	Food	Ware	None	FIFO
1 – Sugar	Pkt of Sugar	Dry Non P	Ea	Food	Ware	None	FIFO
1 – Flour	Pkt of Flour	Dry Non P	Ea	Food	Ware	None	FIFO

Warehouse management

Physical Dimension

Unit sequence group ID: EaBoxPal

Maximum pick quantity: 0.00

Pack size category ID:

Physical dimension group ID:

Description

Mobile device description line 1:

Mobile device description line 2:

Fixed locations

Wareh...	Site	Loc...
This grid is empty.		

Filter codes

Code 1: FRESH

Code 2:

Code 3:

Code 4:

Grouping of filter codes

Group 1:

Group 2:

Production

Default production or receiving quantity: 0.00

Allow pick work center negative:

National Motor Freight Classification

NMFC code:

Additional Codes

STCC:

Harmonized:

Package class ID:

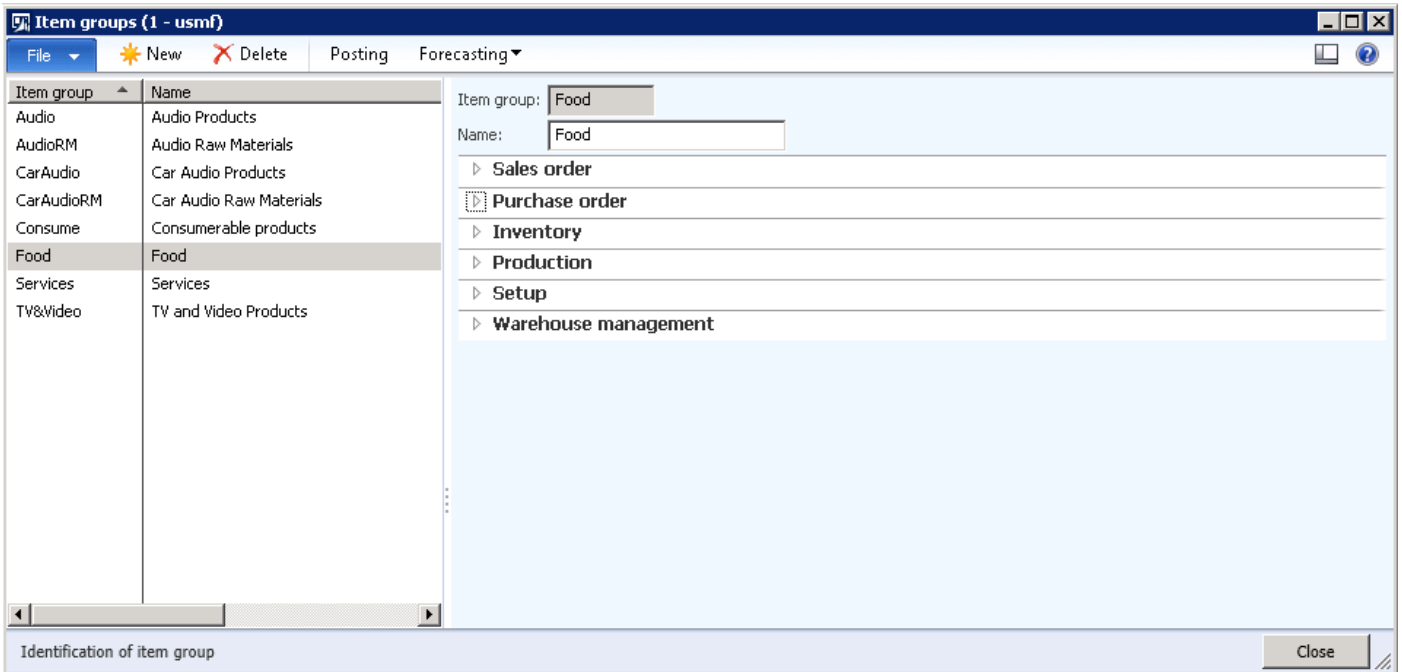
▸ Transportation management

2.1.27 Create a new item group – case study continued

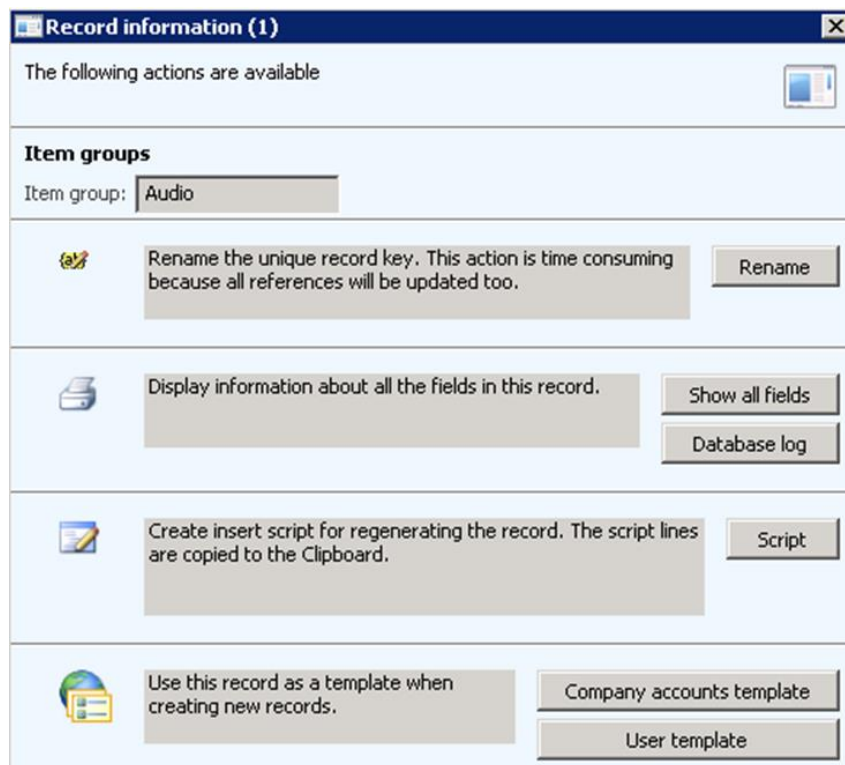
Next, create a new item group named “Food”. A quick way to do this is to create a template of the “Audio” Audio Product item group.

To create new item groups, follow this navigation path:

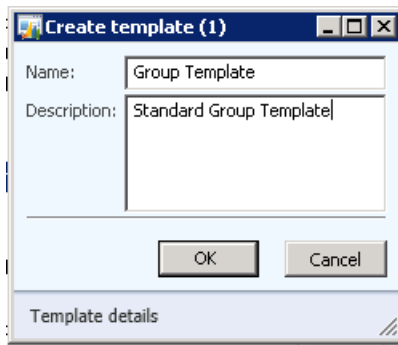
Inventory Management > Setup > Inventory – Item Groups



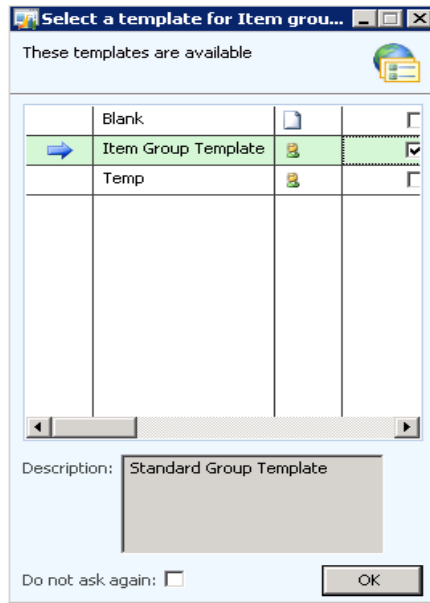
1. In the **Item Groups** window, select **HTS**, right-click, and then choose **Record Info**.



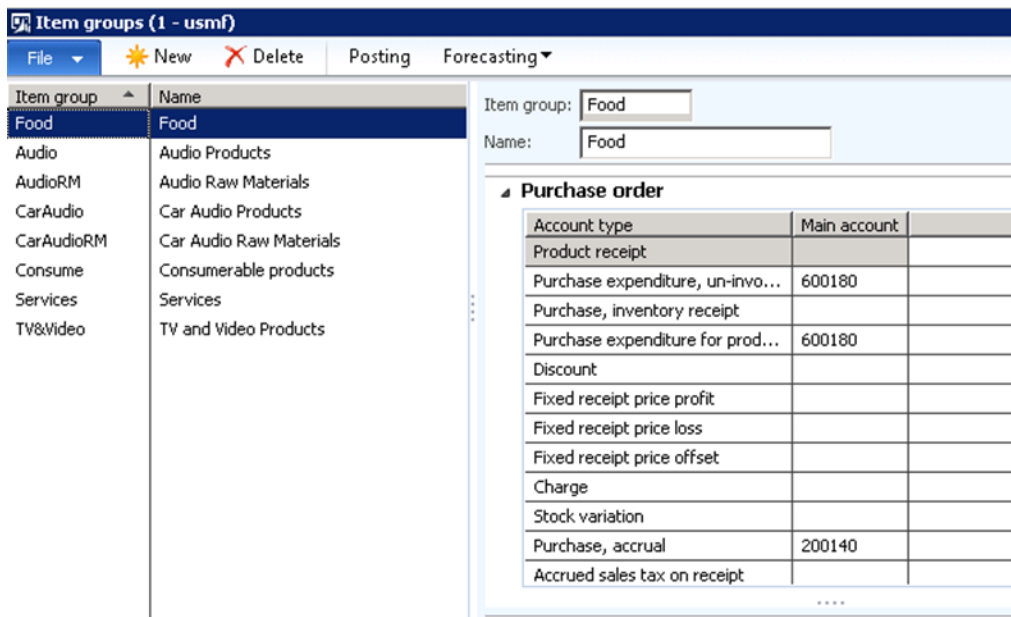
8. Select the **User Template** button. Create a name and a description.



9. Add a new Item group and select the template.



10. Select the template that you just created and create a new template called "Food".



All the posting profiles are copied to the new template for this case study.

2.1.28 Item groups and filters

Item filters are a new concept in Warehouse Management that let you:

- Categorize items. These categories can then be used throughout all of Microsoft Dynamics AX, not just in Warehouse Management.
- Limit which customers can order an item.
- Limit which items can be purchased from a vendor.

Filters are turned on and off via the item group. The **Use filter code** option lets you turn on the filter code that you'll use for the item group. You can then manually set that filter code on the item.

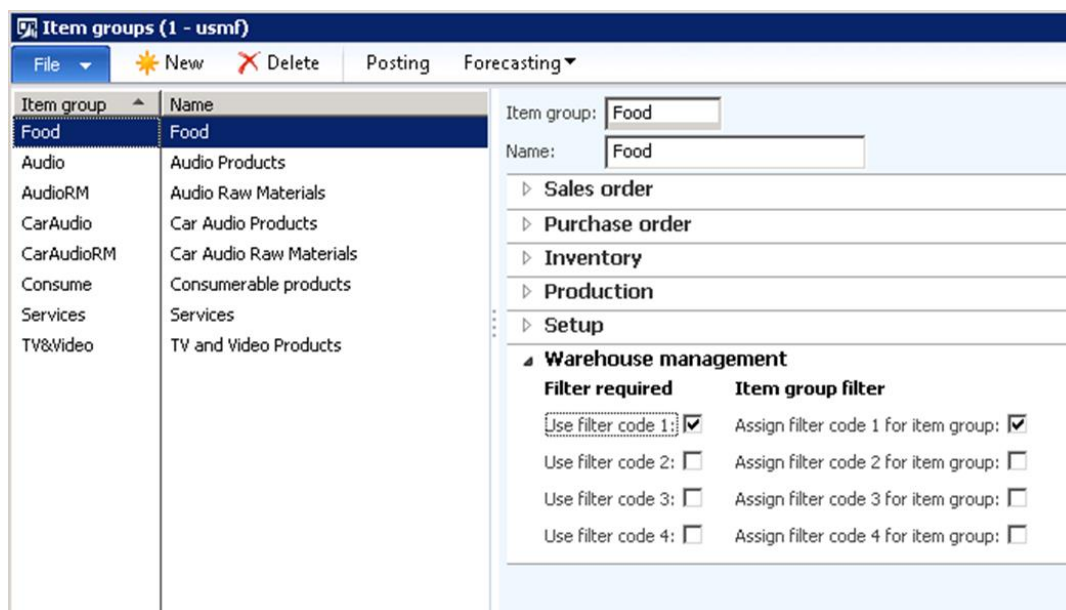
In addition, you can set up filter groups which will automatically default the filter codes based on the item group selection.

2.1.29 Case study continued

In this case study, create an item group named "Food" and use filter code 1 for items by defining an item as "Fresh, Dry perishable, Dry nonperishable & Frozen". This categorization or filtering can be useful for determining the location directive, which is where items are placed in the warehouse.

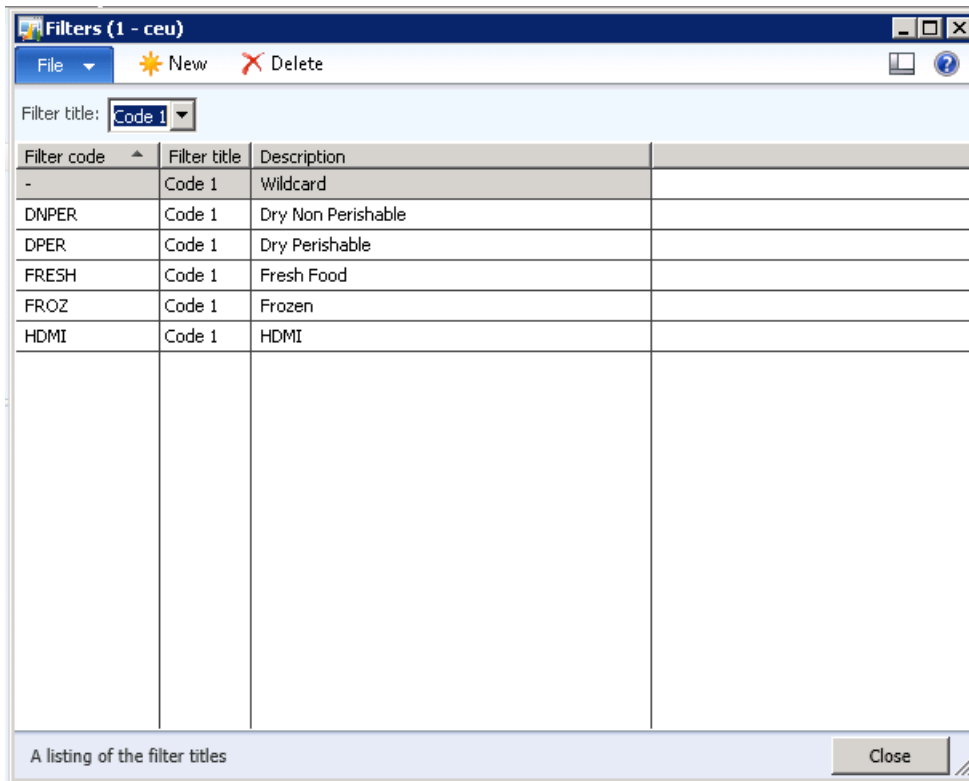
To create item groups, follow this navigation path:

Item Group – Navigation path > Inventory Management > Setup > Item Groups



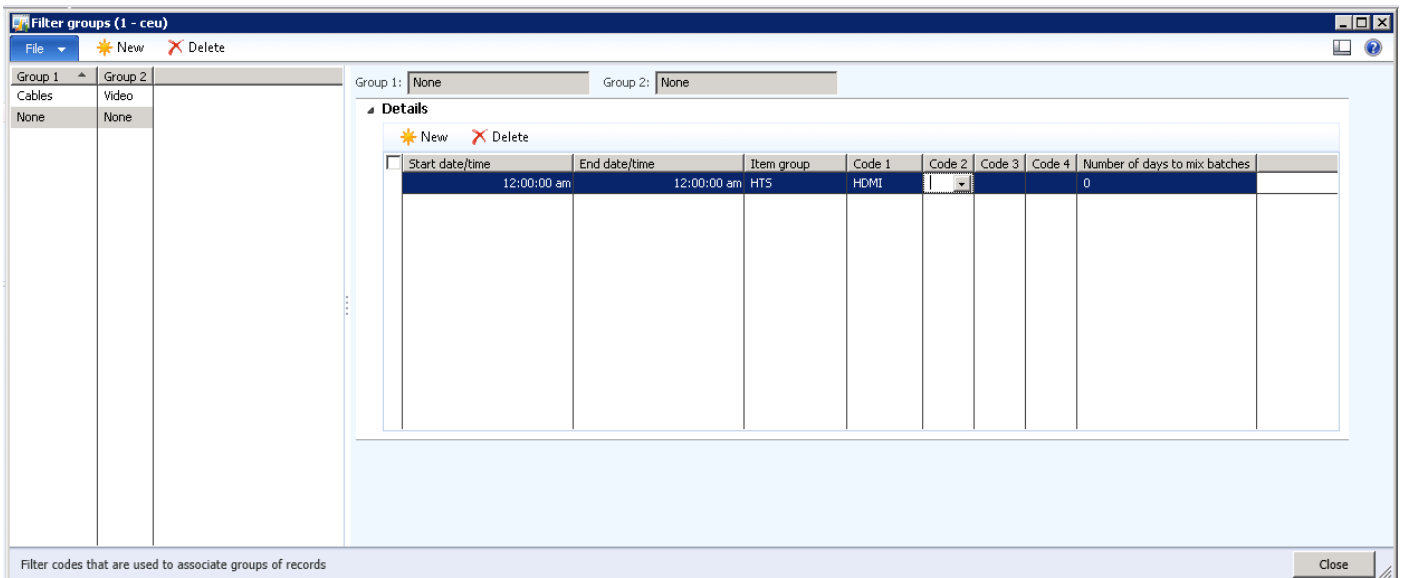
To create filters, follow this navigation path:

Filters and Filter Groups > Navigation path > Warehouse management > Setup > Filters



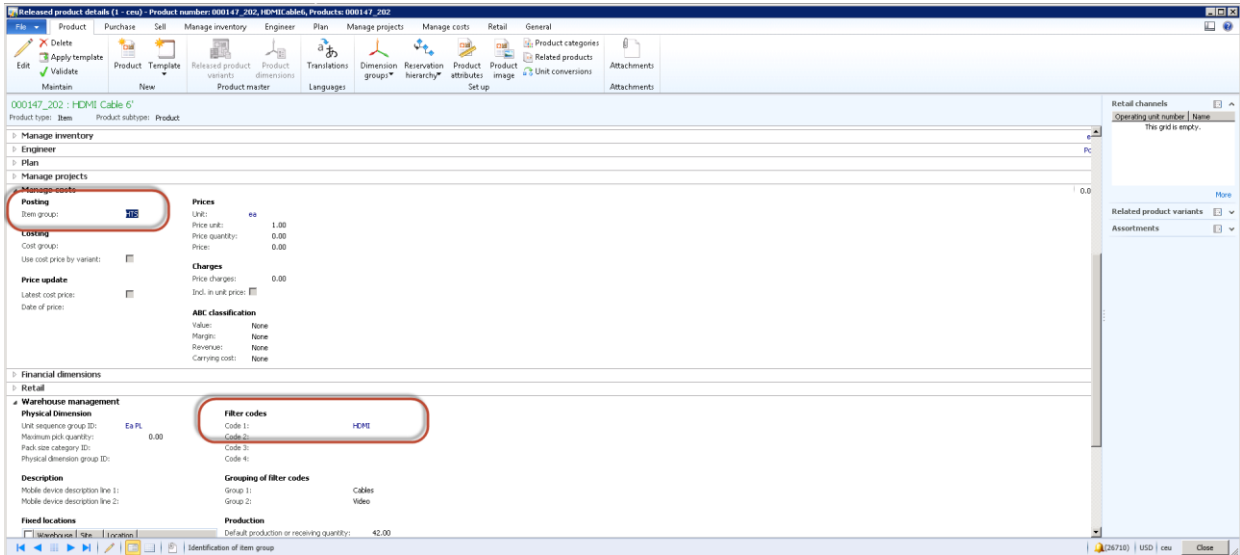
To create filter groups, follow this navigation path:

Filters and Filter Groups > Navigation path > Warehouse management > Setup > Filter Groups



This case study does not use filter groups, however the example shows how this might work. When you set up a new item and select the item group, HTS, the filter code 1 HDMI would automatically be set. This removes the need to manually set the filter code on the item.

The following screenshot is not relevant for this case study, but it shows how you can use default filter codes.

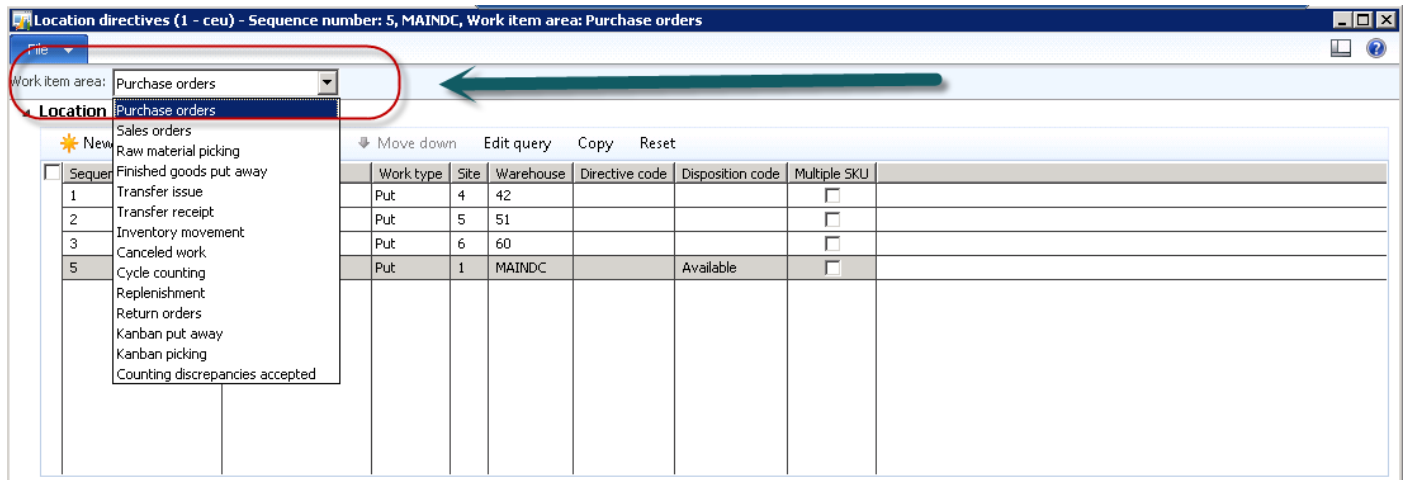


2.2 Location directives and work templates

The two most important areas in Warehouse Management are location directives and work templates. Both of these options are important in the configuration of how items will move around the warehouse.

2.2.1 Location directives

Location directives, as the name suggests, are used to direct work transactions to the appropriate locations in the warehouse. They can be accessed from **Warehouse Management > Setup > Location Directives**. There are many important elements in the **Location Directives** form.



Top grid

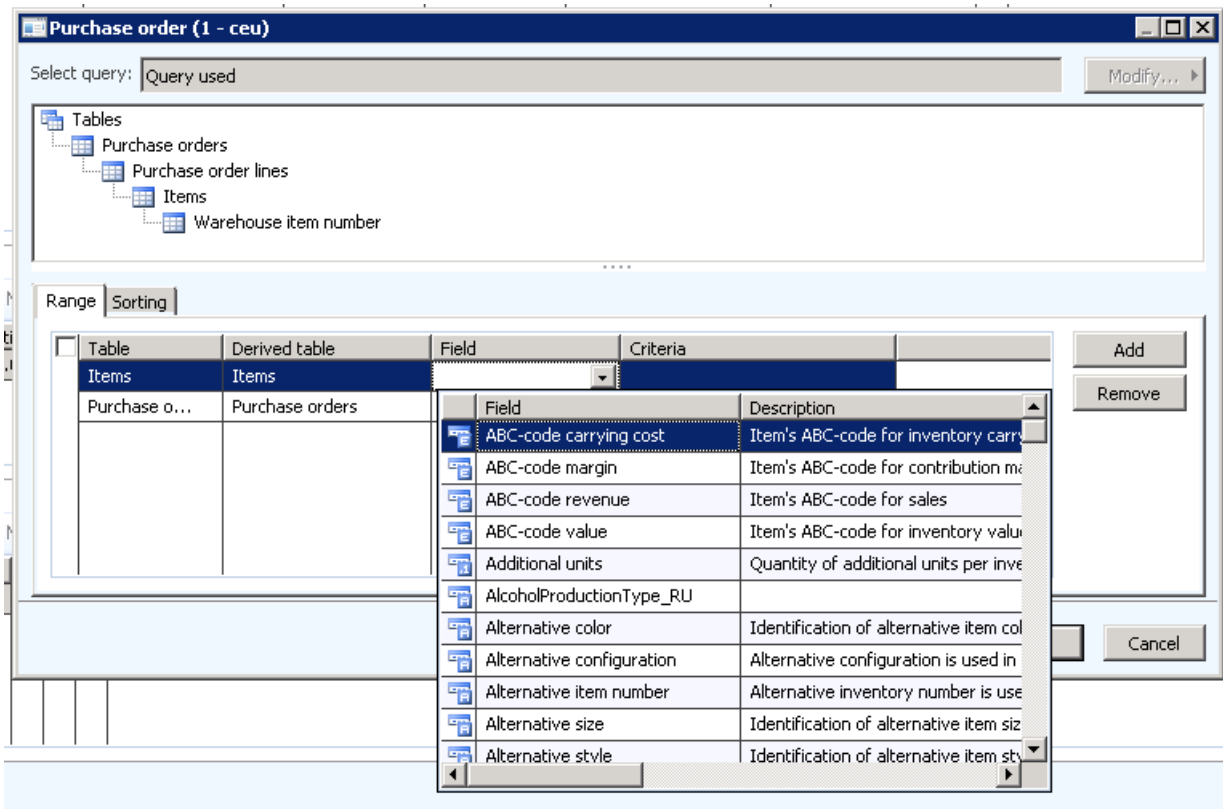
The **Work item area** identifies what Warehousing function the location directives are tied to. In this screenshot you can see the various work items that let you specify location directives.

In this case study, you're going to create a location directive that is associated with your purchase orders. This means that when you receive inventory on PO, Microsoft Dynamics AX will use the following setup for the location directives to place inventory in the appropriate area. In the **Location Directives** form, you'll notice that there is a Header section, a Lines section, and an Action section.

Header

First, create the header by clicking **New**. Enter a location directive for warehouse MAINDC. It's important to understand that the location directives can be sequenced and this sequencing works with the **Edit Query** function in the menu that is located above the form. For example, in all location directives, you can create multiple entries against the one warehouse that is differentiated via a

sequence number and a query. This means that you could filter the location directive by any field on the item table or by any cross referenced table that is available. See the following illustration for an example.



In this example, look at the range of inventory items or a specific inventory group or even one of the filter codes that was referenced earlier (Fresh, Frozen, Dry perishable, etc.). Warehouse Management will work through the sequences in numeric order, so if you create sequences with linked queries, you must make sure that you have a sequence at the end without a query, so that there is an "ALL" option. For example, if you set Sequence 1 to Frozen, Sequence 2 to Fresh, and Sequence 3 to Dry, it's important that you set sequence 4 to query blank so that it will pick up any items that do not fall into the fresh, frozen or dry category. This is like the concept of Table, Group, or All in the posting profiles of Microsoft Dynamics AX. First, search for table relationship, then search for group, and if not found, then use all.

To test location directives and make sure that the setup is accurate, you will set up queries later in the case study. For now, you'll create a new line for warehouse MAINDC on site 1 and define the work type. The two most prevalent values that are used in location directives are "pick" and "put". A work type equal to "pick" means that Warehouse Management will find the most ideal location to reserve inventory from. There is not an actual pick done until the work is completed, but the reservation is the first step in picking inventory. A work type equal to "put" means that the location directive will try to find the most ideal location to place or locate inventory coming into the system, either from receiving, production, or inventory adjustments, such as trying to find a location to "put" the inventory into.

For this purchase example, create a "put" work type because you want Microsoft Dynamics AX to put inventory away after the PO has been received.

Location directives (1 - ceu) - Sequence number: 5, MAINDC, Work item area: Purchase orders

Work item area: Purchase orders

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
1	42 Putaway	Put	4	42			<input type="checkbox"/>
2	51 Putaway	Put	5	51			<input type="checkbox"/>
3	60 Putaway	Put	6	60			<input type="checkbox"/>
5	MAINDC	Put	1	MAINDC		Available	<input checked="" type="checkbox"/>

The final piece in this example is the disposition code. In the parameters, you specified a default inventory status of Available, now the location directives can specify the default disposition code that the mobile device will display when activating this location directive.

Lines

After a location directive header has been created and selected, the process continues in an attempt to find an actual location to "pick from" or "put to". The middle grid on the form, called "lines", deals primarily with the quantity trying to be located or reserved. By having **From Qty** and **To Qty** fields and the **Restrict by UOM** check box, sequences can be configured so that only quantities or specific UOM's will select the sequence.

Field	Description
Sequence number	Similar to the sequence number from the header.
From Qty, To Qty, and Unit	You can specify a quantity range for when this middle-grid sequence should be selected. For example, if the From Qty is 5, the To Qty is 15, and the Unit is PL, Pallets, then if the quantity being "put" or "picked" is between 5 and 15 PL, this sequence would be selected. The bottom-grid values would most likely be a set of multiple pallet locations that can hold between 5 and 15 PL – typically bulk locations.
Locate Qty	Used only when trying to put/locate quantity into the warehouse.
License plate Qty	When evaluating whether a quantity is in the "From" and "To" quantity ranges, this is the quantity on the license plate being received.
Unitized Qty	When evaluating whether a quantity is in the "From" and "To" quantity ranges, this is the quantity being unitized during the specific transaction. Because Warehouse Management can receive a quantity of 1000 and break it into 10 license plates of 100 each, Warehouse Management would use 1000 instead of the license plate quantity of 100.
Remaining Qty	When evaluating whether a quantity is in the "From" and "To" quantity ranges, this is the quantity left to be received on the purchase order line currently being checked-in.
Expected Qty	When evaluating whether a quantity is in the "From" and "To" quantity ranges, this is the total quantity of the purchase order line, regardless of what has already been received.
Restrict by UOM	Allows the middle-grid sequence to be specific to a unit of measure or multiple units of measure. When reserving a quantity, if you only want to reserve pallets from a specific set of locations, then the middle-grid sequence would restrict that particular sequence to "PL" so that any quantity less than a pallet would not select the sequence.
Locate packing Qty	If you specified a packing quantity on a sales order or production order, this check box restricts the system to only select locations with at least that packing quantity in the location.

Field	Description
Allow split	This specifies if Warehouse Management splits the quantity being received or the quantity being reserved across multiple locations or if the quantity must be located to a single location or reserved from a single location.

2.2.2 Case study continued

In this case study, you're going to create a single sequence and one line entry from 0 – 200 each, to test the location directive.

Location directives (1 - ceu) - Sequence number: 5, MAINDC, Work item area: Purchase orders

Work item area: Purchase orders

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
1	42 Putaway	Put	4	42			<input type="checkbox"/>
2	51 Putaway	Put	5	51			<input type="checkbox"/>
3	60 Putaway	Put	6	60			<input type="checkbox"/>
5	MAINDC	Put	1	MAINDC		Available	<input type="checkbox"/>

Lines

New Delete Move up Move down Restrict by unit

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate packing quantity	Allow split
1	0.00	200.00	ea	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Location Directive Actions

New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Fresh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

The type of quantity to locate. Close

Location directive actions

The lower grid, **Location Directive Actions**, is where locations, or ranges of locations, are specified. After a location directive has been selected, and the header and lines are specified in the middle-grid sequence, the sequences that are configured in the lower grid are evaluated.

Field	Description
Sequence number	Similar to the header and lines.
Only use item fixed location	Any fixed location that is available to hold product or have product reserved from is eligible.
Allow negative inventory	If selected, then items that allow negative inventory will allocate to locations that allow negative inventory (based on the location profile) even if there is not enough inventory available. This will create negative inventory. This changes the query selection that is used to select locations by removing the criteria of physical inventory > 0 (greater than zero).
Batch enabled	If selected, then lower grid sequences must have the Batch enabled check box selected. This changes the query selection that is used to select locations to make it more efficient.

Field	Description
Strategy	<ul style="list-style-type: none"> • Consolidate - Used during the put function. If any locations specified by the Edit query button already contain the item trying to be put or located, inventory will be put into these locations first. • Match Packing Qty - Used during the pick function. Warehouse Management tries to find locations that either match or are closest to the Packing Qty that is specified on the Load line. • FEFO Batch Reservation – Inventory will be located by batch expiration date and will soft allocate the batch. • Round up to Full LP – Used to round up the quantity being allocated to match the LP to be picked. This soft allocates the LP. This can only be used for replenishment. • Round up to Full LP and FEFO Batch – Combines FEFO Batch Reservation and Round up to Full LP strategies. This can only be used for replenishment.
Edit query	<p>This button displays the Microsoft Dynamics AX query window. In this window, locations or ranges of locations can be included or excluded from selection by Warehouse Management. For example, one of the characteristics associated with each location is a zone, which is a collection of locations. In the query window, a zone can be specified to only use locations that have a specific zone specified in the query window. Warehouse Management will incorporate what is selected in the Batch Enabled check box and the Strategy field to find the most appropriate location to "pick from" or "put to".</p>

2.2.3 Case study continued

To test the location directive, you're going to use a simple specific location directive action and then as you move through the case study, you'll make changes and set up a more complex scenario.

The screenshot shows the 'Location directives' window. The 'Location Directive Actions' table is highlighted with a red rounded rectangle. The table has the following data:

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Fresh	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

- On the menu, select Edit query.

The 'Query used' dialog box shows the following criteria table:

Table	Derived table	Field	Criteria
Locat...	Locations	Warehouse	MAINDC
Locat...	Locations	Location profile ID	Freshgoods

In this example, you're basically defining that for all purchase orders in the MAINDC warehouse, if the quantity is between 0-200, find a location in the MAINDC warehouse, and then use the location profile ID of Fresh in the warehouse.

By querying on the locations and filtering on the profile of "Fresh", you'll get a list of possible locations in which the directive will place inventory.

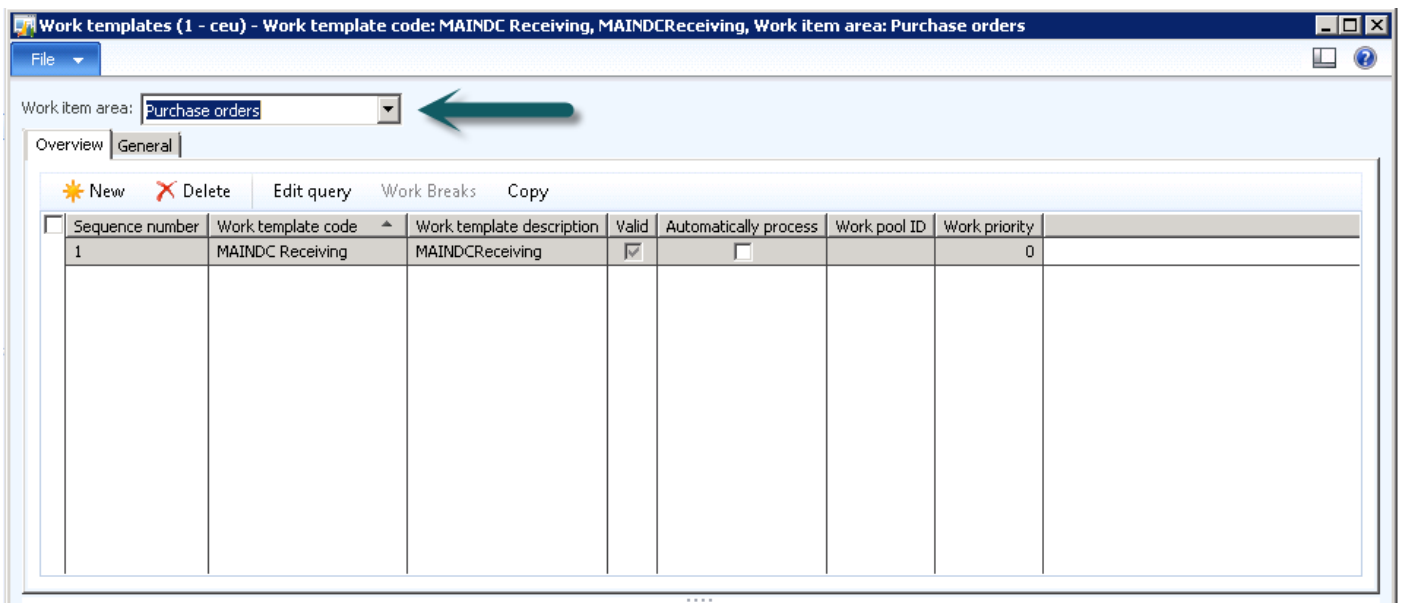
2.2.4 Work templates

Now that the location directives have been defined, you need to understand work templates. *Work templates* are a tool that Warehouse Management uses to create work at various points in the system. For example, a purchase order has been received, so a work item must be created for somebody to go and pick items from the defaulted receiving dock and follow the location directive action to put the item away in a particular location. The other areas where work is created are reservation/picking, production including lean kanban processes, inventory transfers, and adjustments.

In most instances, inbound and picking work is created in an Open status. These work instructions can be viewed by using the **Work Details** form at **Warehouse Management > Common > Waves > Work details**. In other instances, work is opened when a transaction is opened and then immediately closed when the transaction is completed. In these instances, the work can be used as transaction history because the item, location, and quantity are captured on the work instruction and can be viewed even though the work is closed.

To create work templates, follow this navigation path:

Warehouse Management > Setup > Work > Work Templates



Field	Description
Sequence number	Each work template is processed in ascending sequence number order.
Valid	If selected, there are even numbers of "pick-put pairs" configured for the work template in the bottom grid.
Automatically process	If selected, after a wave release any work created by this work template will automatically be executed. This is useful if there are inventory items that are not inventoried as carefully as most items, but still must be on the order for reporting, cost, or bill of lading purposes. For example, pallets or marketing items where they must be on a sales order and there is inventory, but it's not required for a user to actually "pick" these items.

Field	Description
Work priority	Work created by Warehouse Management uses a default value from the Warehouse Management Parameters form. However, by specifying a value in this field on the work template, a different priority can be set on the work for a specific template. Work priority is used during some mobile device flows, specifically system grouping.
Edit query	This opens the Microsoft Dynamics AX query window. In this window, values can be specified that help Warehouse Management determine which work template to select. For example, a work template can be configured that will be selected for any item that starts with "836*". Warehouse Management will continue to evaluate each work template configured until one is found that meets the current criteria. You must assign a lower sequence number to the most specific work templates and a higher sequence number to those templates that are more general.
Work breaks	This will group and break the work by the criteria specified in this window. When work templates are used, a record is created in the Temp Work Transactions table. A single temp work transaction record will be created for each item/location combination. However, depending on how the warehouse is configured, this record could be for multiple pallet picks. By using work breaks, you can break work by item and location, or break work on other attributes, such as batch ID or license plate.

Use the **Sorting** tab to sort work in a specific order. It's important to sort the work created to allow for work breaks to be configured appropriately.

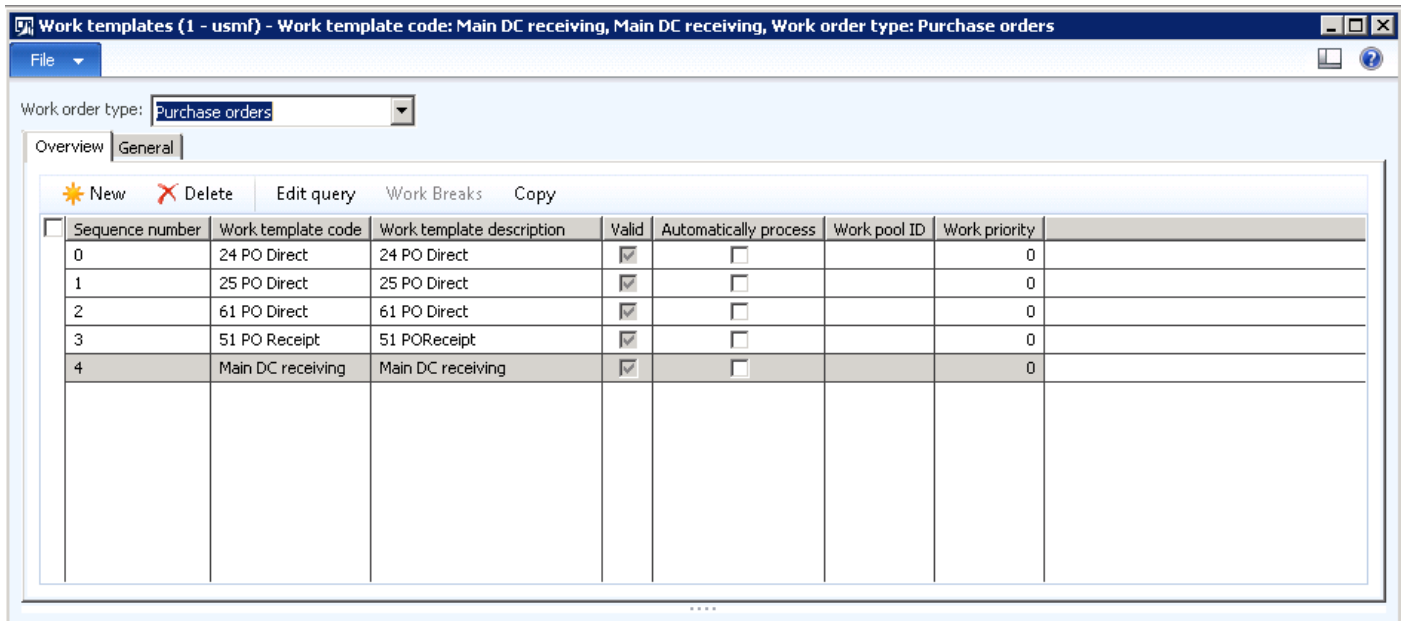
2.2.5 Case study continued

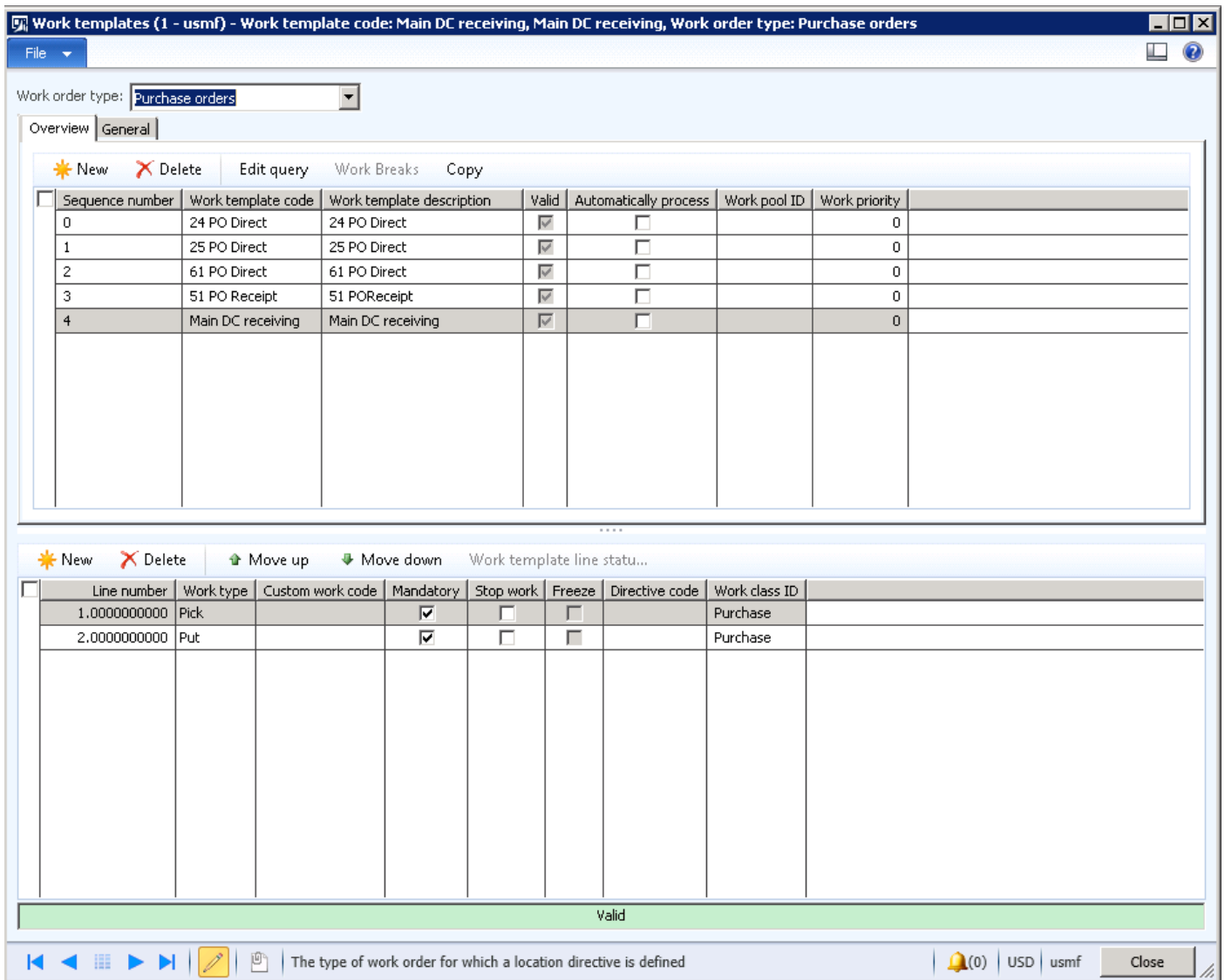
In this case study, the focus is on work templates for purchase orders, and creating a header for the MAINDC warehouse.

To create work templates, follow this navigation path:

Warehouse Management > Setup > Work > Work Templates

1. Click **New**.
2. In the **Sequence number** field, enter 1.
3. In the **Work template code** field, enter MAIN DC Receiving.
4. In the **Work template description** field, enter MAIN DC Receiving template.





After a work template has been selected, the lower grid determines the actual work steps that will be created. As stated earlier, work steps are configured in "pick-put pairs". For every pick up that is performed, the work must be put down somewhere. This can be a pick-up-and-drop-off location (P&D), a staging area, a warehouse location, or even a dock door, depending on what type of work is being performed.

Field	Description
Line number	The line number for each work type.
Work type	Specifies if the action is a pick-up or a put-down. Additionally, a value called Custom is allowed. By selecting this value, the Custom work code field becomes enabled and allows for custom mobile device screens to be inserted in the work flow process.
Custom work code	Entering a value allows for custom mobile device screens to be inserted into a mobile device work flow. Warehouse Management allows for a single data-capture screen with a configurable label to be displayed. Other windows that must be displayed would require custom mobile device code.
Mandatory	If selected, the work step must be performed or is optional. After a wave is run, there are options from both the Load place and the Wave place that allow a worker to "Skip Non Mandatory Work". If selected, any work step that does not have the Mandatory check box selected will be automatically executed by Warehouse Management so the worker is not required to perform the step.

Field	Description
Stop work	If selected, Warehouse Management displays the next mobile device screen to the worker or stops the transaction. In the example above, when the work instruction is first scanned, the worker will be presented with a pick transaction, and then a put transaction. At that point, the mobile device would exit the work and be ready to process the next piece of work. If the Stop work check box is cleared on the second pick step, the worker will be presented with a pick then a put, but then will be immediately presented with a second pick and put transaction.
Freeze	If selected, the work line will be blocked and you need to release the wave or unblock the actual work before you can complete the work on your mobile device.
Directive code	<p>This field is a link between the work templates and the location directives. If the directive code is blank, then Warehouse Management evaluates the work step to find a location directive with a blank directive code. If the directive code is not blank on the work template, then Warehouse Management accesses the location directives to find a directive with the specific directive code.</p> <p>In the previous illustration, the first work step is a pick, which is associated with a sales order work template. The first step is to use location directives to find a location to reserve the necessary inventory for picking. Since there is no directive code on this work step, Warehouse Management will find a sales order location directive that also has a blank directive code and use it to find the most appropriate location to reserve the inventory.</p> <p>The next work step is a request for a worker to put what was picked in the first work step into a shipping staging location. Again, for this work step Warehouse Management will access location directives to find the appropriate location to direct the worker to put down the picked inventory. However, in this case, Warehouse Management will only use a location directive that has a directive code equal to ShipStage, because this is the directive code configured on the work template work step.</p>
Work Class ID	This lets you control what mobile device menu item can process the work. On the Mobile Device Menu Item form, any menu item that is configured to use existing work can specify which work classes the mobile device menu item will process.

2.2.6 Case study continued

In this case study, you're going to create a simple work template line so that you can test the process. Later, you'll configure more complex examples.

Line number	Work type	Custom work code	M	S	F	Directive code	Work class ID
1.000000000	Pick		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Purchase
2.000000000	Put		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		Purchase

Valid

To create work templates, follow this navigation path:

Warehouse Management > Setup > Work > Work Templates

1. Click **New**.
2. On line 1, in the **Work type** field, select **Pick**.
 - Select **Mandatory**.
 - Clear **Stop work**.
3. In the **Work class ID** field, select **Purchase**.
4. On line 2, in the **Work type** field, select **Put**.
 - Select **Mandatory**.
 - Clear **Stop work**.
5. In the **Work class ID** field, select **Purchase**.

2.2.7 Mobile Device setup

The first step in using the mobile device is to set up a user ID for workers who will be using the mobile device. This can be accomplished by using the **Work users** form. Here you can define which menu the user will use. Different menus can be different screens for different users. You can also define groups, with different rules for different users.

To access the user form, follow this navigation path:

Warehouse Management > Setup > Work User > Worker

The screenshot shows the 'Work users (1 - usmf)' form. The left pane lists workers, with 'Julia Funderburk' selected. The right pane displays the 'Worker Profile' section, including fields for 'Packing profile ID' and 'Container closing profile ID'. Below this is the 'Users Work users' section, which contains a table with the following data:

User ID	User name	Default warehouse	Menu name	Inactive	Warehouses
MainDC	MainDC	MAINDC	Main	<input type="checkbox"/>	
24	WH 24	24	Main	<input type="checkbox"/>	
25	WH 25	25	Main	<input type="checkbox"/>	
34	WH34	34	Main	<input type="checkbox"/>	
51	WH51	51	Main	<input type="checkbox"/>	
61	WH61	61	Main	<input type="checkbox"/>	
RF Gen	RF Gen	24	Main	<input type="checkbox"/>	

At the bottom of the form, there is a status bar that says 'The user for processing work' and a 'Close' button.

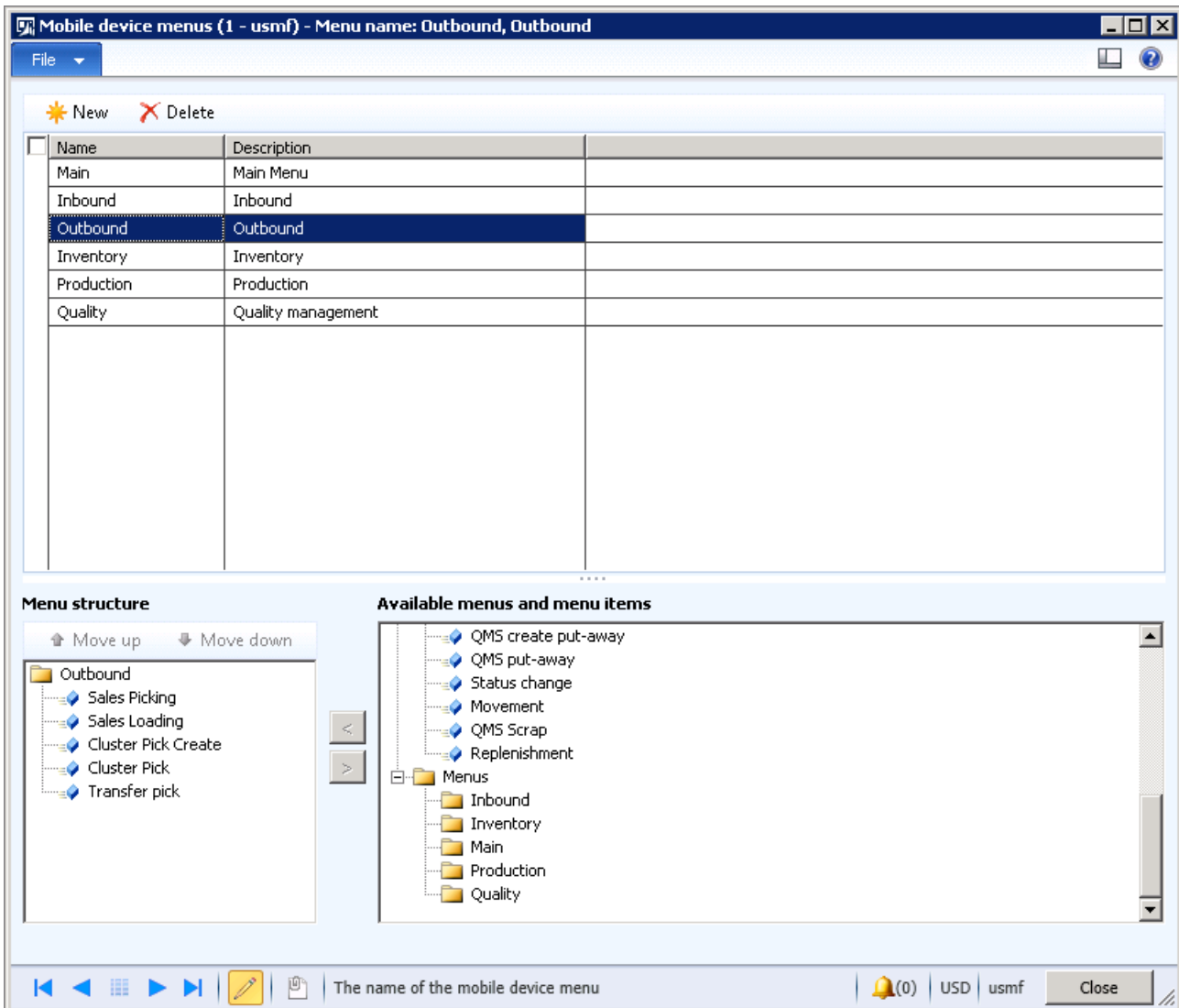
2.2.8 Case study continued

In this case study, the ADMIN user is linked to Julia Funderburk. If you select Julia in the leftmost part of the window, you can view the work user ID's listed in the rightmost part of the window. Note that the new worker user ID, "MainDC", has been linked to warehouse MAINDC and the default menu to be displayed is "Main". You can reset the password details for this user by selecting the **Reset Password** option. In this case study, the password is set to "Main".

2.2.9 Mobile device menu items

Warehouse Management provides a variety of mobile device menu items, and also lets you create customized mobile device menus without writing code. On the **Mobile Device Menu item** form, you can set up the different menus that will be displayed on the mobile device.

To create mobile device menus, follow this navigation path:
 Warehouse Management > Setup > Mobile Device > Mobile Device Menu



The screenshot highlights the standard menu options that are available:

- **Outbound** – The OOB menu for pick and pack.
- **Inbound** – The OOB menu for receiving.
- **Inventory** – The standard menu for inventory management using a mobile device.
- **Main** – A full set of menus which includes the above options.
- **Quality** – A standard list of quality functions.
- **Production** – A production menu for goods put away directly from manufacturing.

The top section of the form is for the menu, while the lower section of the form is for the menu items which belong to those menus. As mentioned previously, you can create your own customized menus without writing code.

2.3 Testing the case study – Purchase receive and put away

Based on the setup shown in the previous screenshot, you'll test the basic purchase receive and put way functions. After confirmation that the location directives are functioning as they should, and that work is created based on the work template, you'll move to a more complex setup to learn about the solution capabilities.

2.3.1 Create a purchase order

To create a purchase order, follow this navigation path:

Procurement & Sourcing > Common > Purchase Orders > All Purchase Orders

The screenshot displays the Microsoft Dynamics AX interface for 'All purchase orders'. The main window shows a list of purchase orders with columns for Purchase order, Vendor account, Name, Invoice account, Purchase type, Approval status, Status, and Direct delivery. The purchase order 000039 is selected and highlighted in blue. Below the list, the details for purchase order 000039 are shown, including the currency (USD) and the name (Acme Office Supplies). A table below the details shows the line items for the purchase order:

Line number	Item number	Product name	Procurement category	CW quantity	CW unit	Quantity	Unit	Unit price	Net amount
1	C0003	Microsoft A...	Computers			1.00	ea	34.95	34.95

The right-hand side of the interface shows a 'Totals' section with the following values:

- Currency: USD
- Line discount: 0.00
- Subtotal amount: 0.00
- Total discount: 0.00
- Charges: 0.00
- Sales tax: 0.00
- Round-off: 0.00
- Total amount: 0.00
- Cash discount: 0.00

Below the totals, there are sections for 'Latest purchase orders', 'Encumbrance summary', and 'Related information'.

1. To create a new purchase order, select **New Purchase Order**.

Create purchase order (1 - usmf)

Vendor

One-time supplier:

Vendor account: 1001

Name: Acme Office Supplies

Contact: [Dropdown]

Address

Name: Warehouse address

Address: 123 Anywhere Street
Redmond, WA 98052
USA

Delivery address: Warehouse address

General 000040

Purchase order	Currency	Dates
Purchase order: 000040	Currency: USD	Accounting date: 4/30/2014
Purchase type: Purchase order		Delivery date: 4/30/2014
Invoice account: 1001	Storage dimensions	Intercompany
Name: Acme Office Supplies	Site: 6	Intercompany: <input type="checkbox"/>
References	Warehouse: MAINDC	
Project ID: [Dropdown]		
Purchase agreement ID: [Dropdown]		

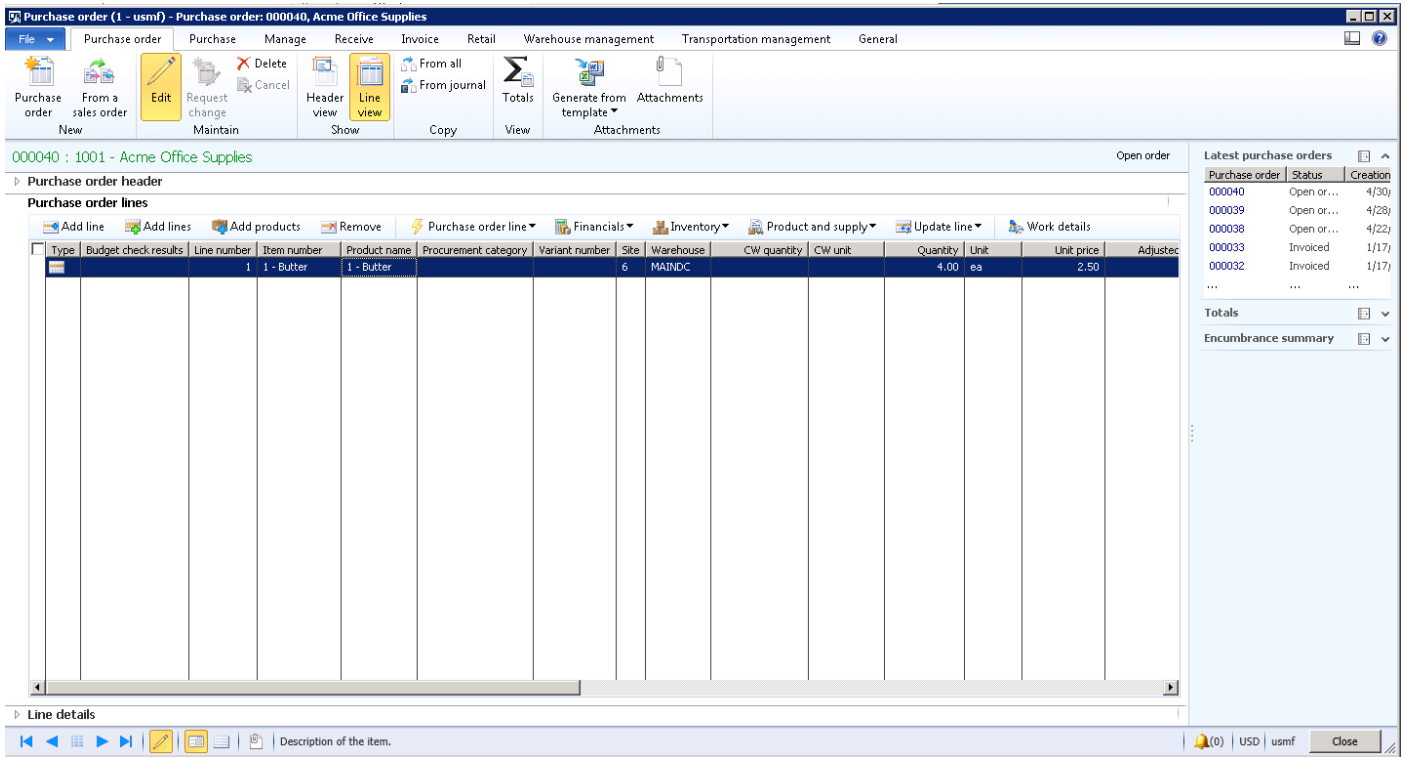
Administration

Unplanned purchases

OK Cancel

Identify the warehouse.

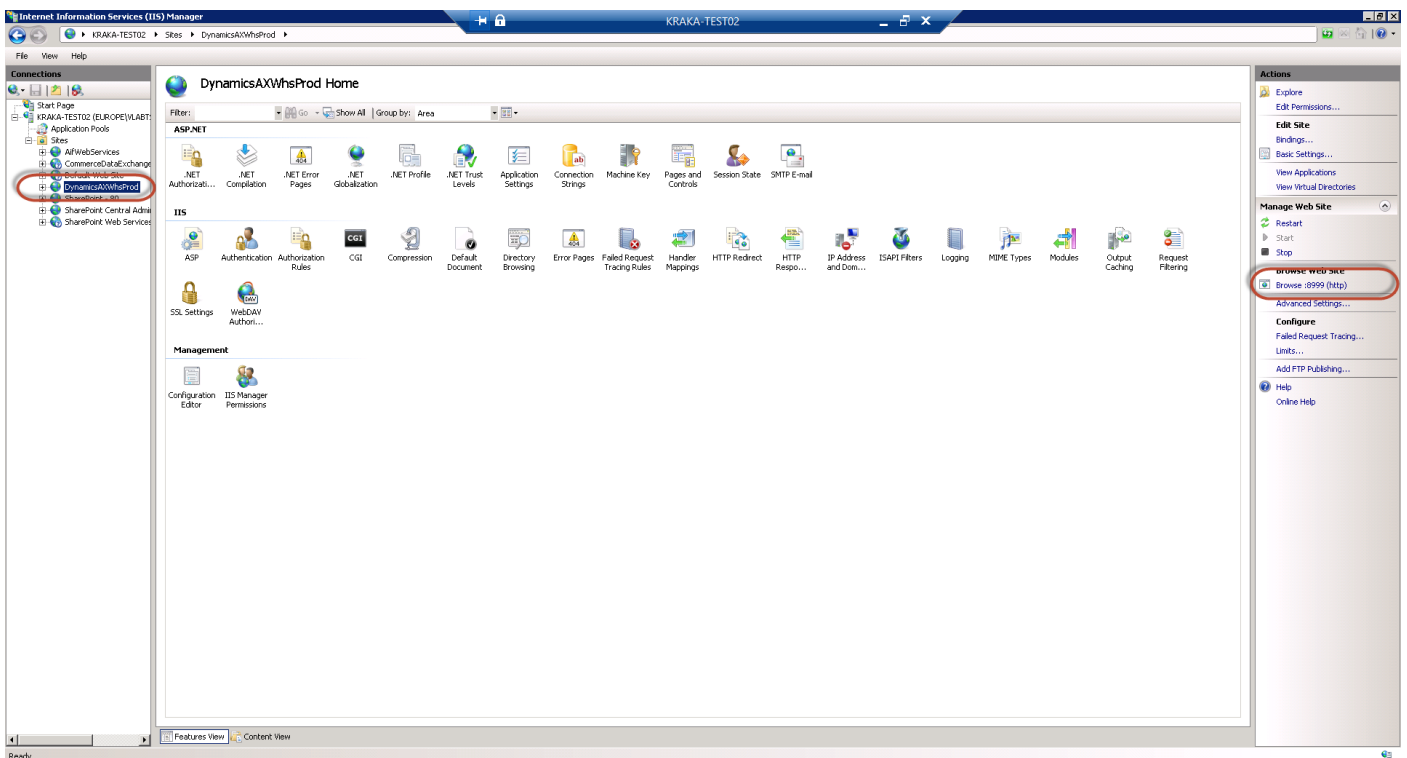
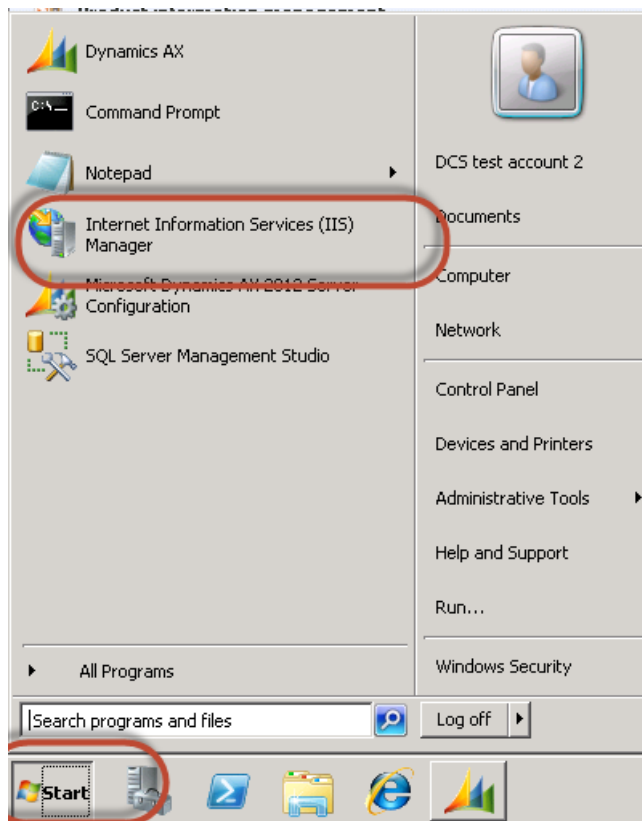
2. Select a vendor account. In this example, 1001 is selected.
3. Expand the **General** FastTab. Set the site to 6 and the warehouse to MAINDC.
4. Click **OK**.



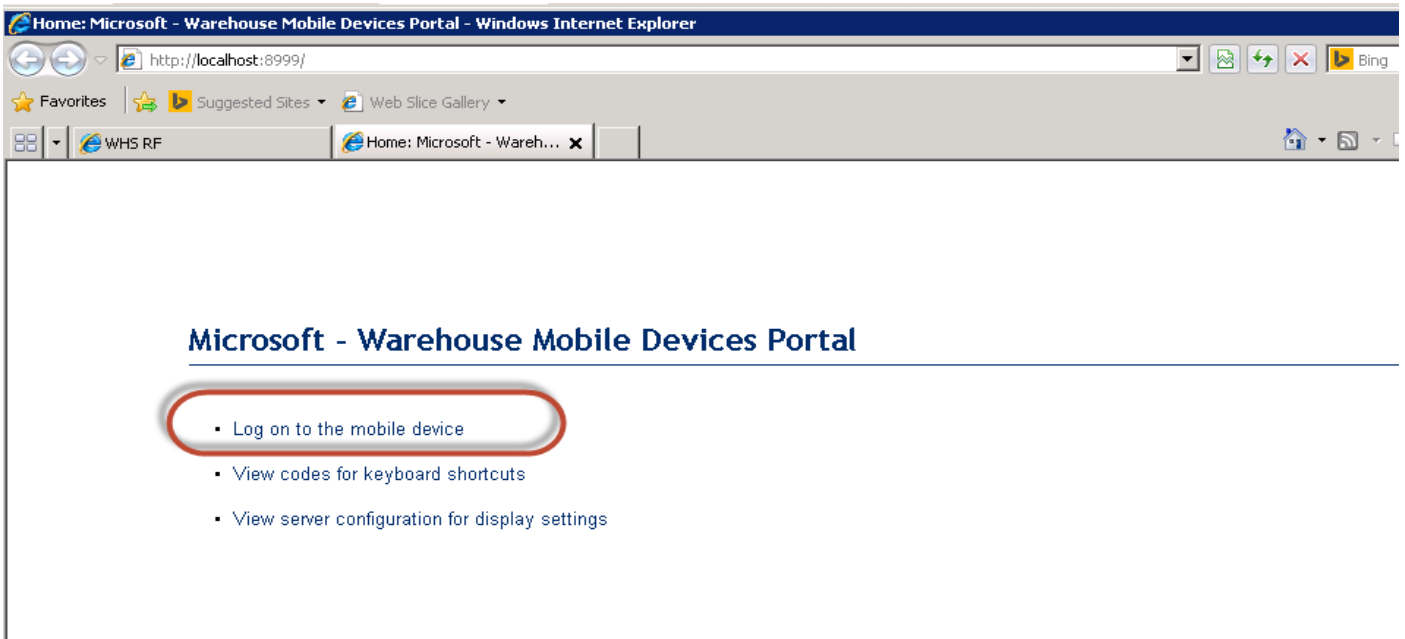
5. In the **Item number** field, enter Item, 1 - Butter.
6. In the **Quantity** field, enter 4.
7. Enter "ea" in the **Unit** field.
8. Enter a **Unit price** of \$2.50.
9. Close the PO.

2.3.2 Open the Mobile Device Emulator

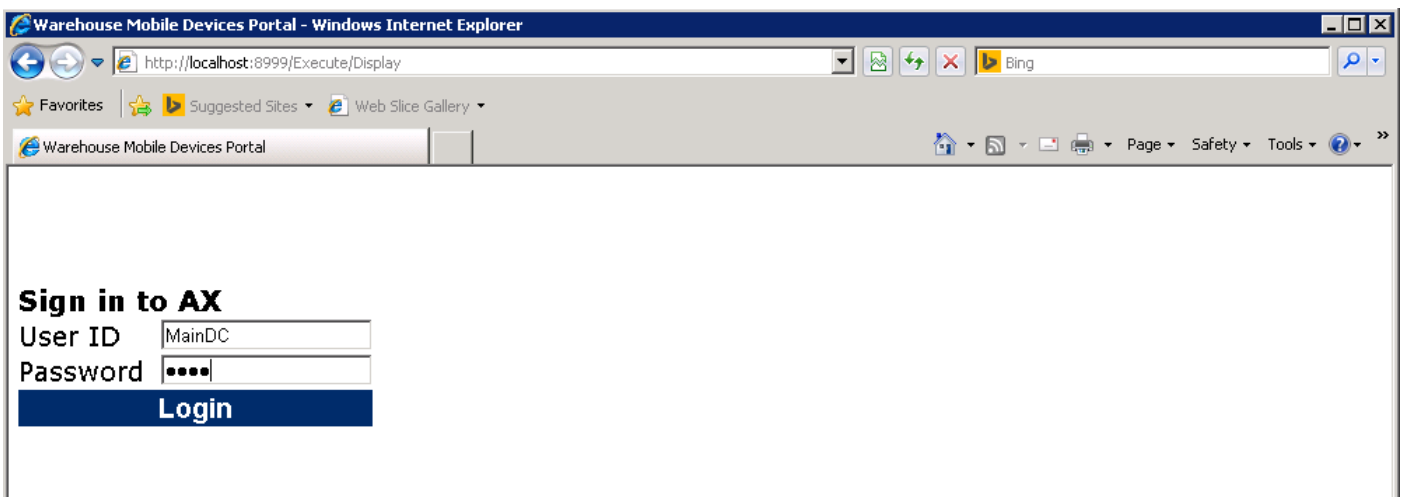
To open the Mobile Device Emulator, follow this navigation path:
 Start – Internet Information Service (IIS) Manager



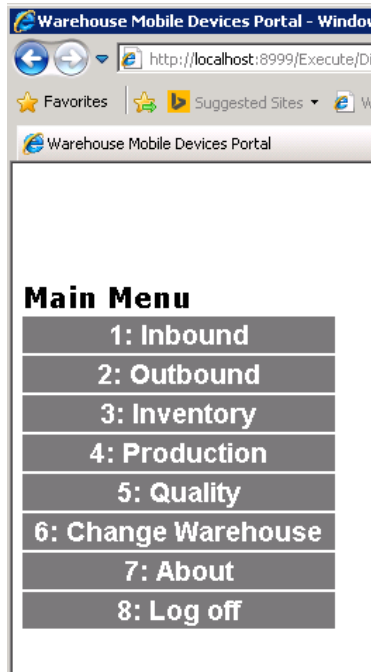
1. In the IIS Manager window, expand **Sites** to DynamicsAXWhseProd.
2. Select **Browse 8999 (HTTP)**.



3. Select Log on to the mobile device.



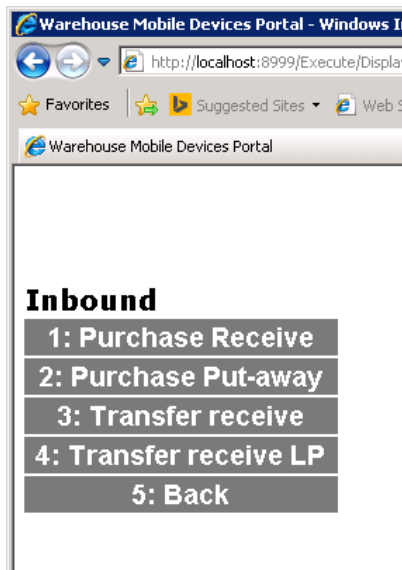
4. In the **User ID** field, enter MainDC.
5. In the **Password** field, enter Main.
6. Click **Login**.



The main menu is displayed according to the setup of the **Mobile Device** menu.

2.3.3 Create the purchase receipt

1. On the **Mobile Device Main** menu, select the **Inbound** menu.



2. On the **Inbound** menu, select option 1 – **Purchase Receive**.

Purchase Receive

PONum

Item

1 - Butter

LineNum

Qty

Unit

Disposition code

OK

Cancel

Exception

3. In the **PONum** field, enter a PO number.
4. In the **Item** field, enter item, 1 - Butter.
5. In the **Qty** field, enter the quantity of the receipt, in this case, enter 4.
6. Click **OK**.

LP 1 of 1

PONum

Item

1 - Butter

Qty

Unit

Loc

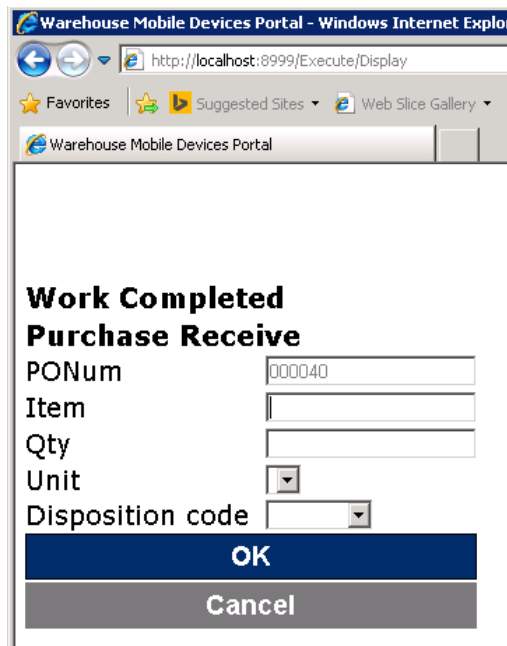
LP

OK

Cancel

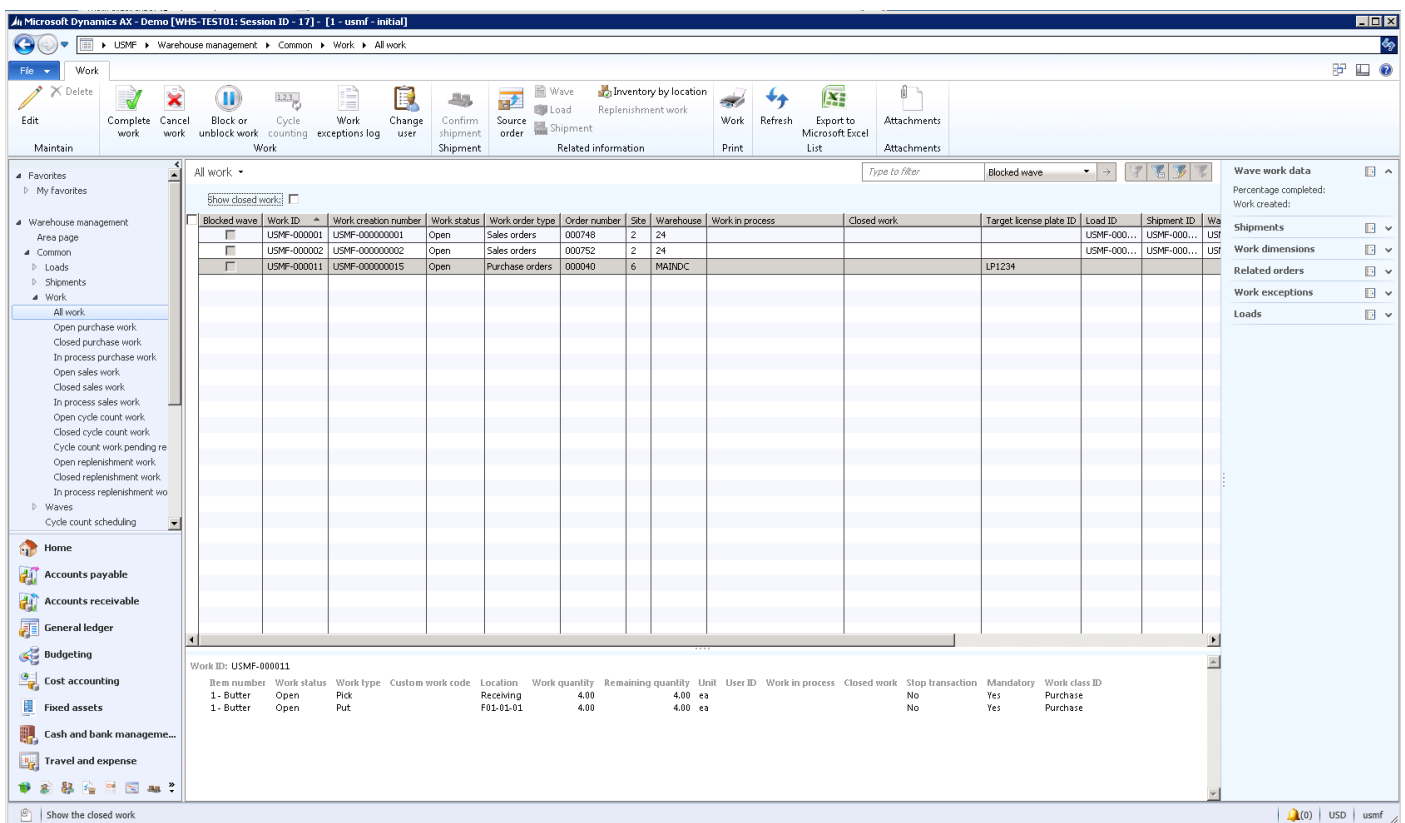
Because you specified that license plate tracking via the location profile is active, enter the license plate number. Scan or type the number.

7. Click **OK**.



A message is displayed that the work has been completed.

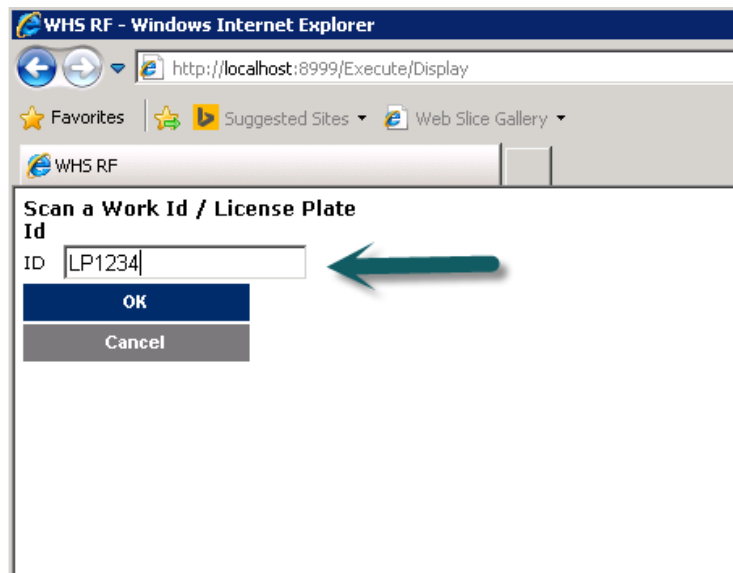
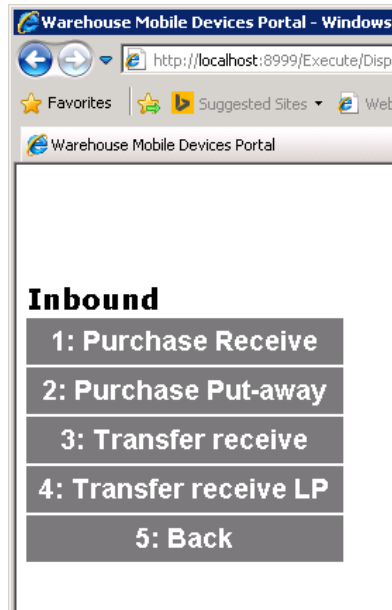
To review the work created in Warehouse Management, follow this navigation path:
Warehouse Management > Common > Work > All Work



The screenshot shows the work created in Warehouse Management. It also shows instructions for a pick from "Receiving" and a put into the location specified in the location directives.

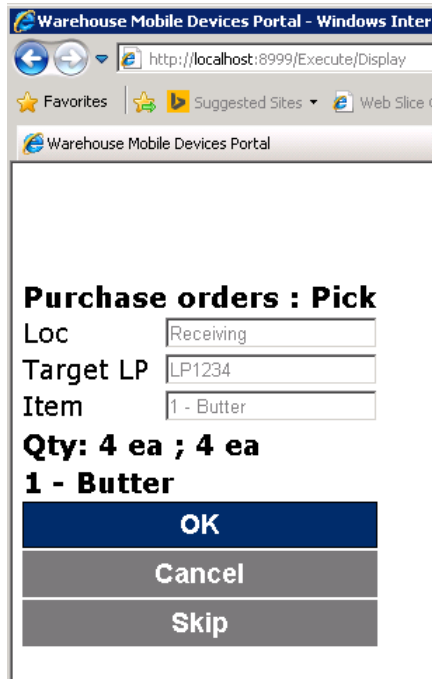
2.3.4 Create the put away

To create the put away, on the mobile device, select the **Purchase Put-away** menu.



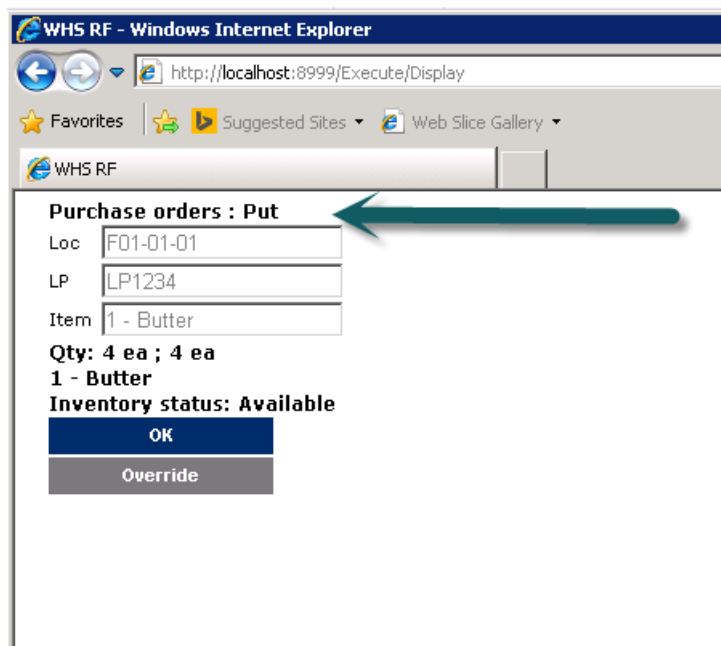
A scan of the license plate will enable the put away.

1. In the **ID** field, type the LP number.
2. Click **OK**.

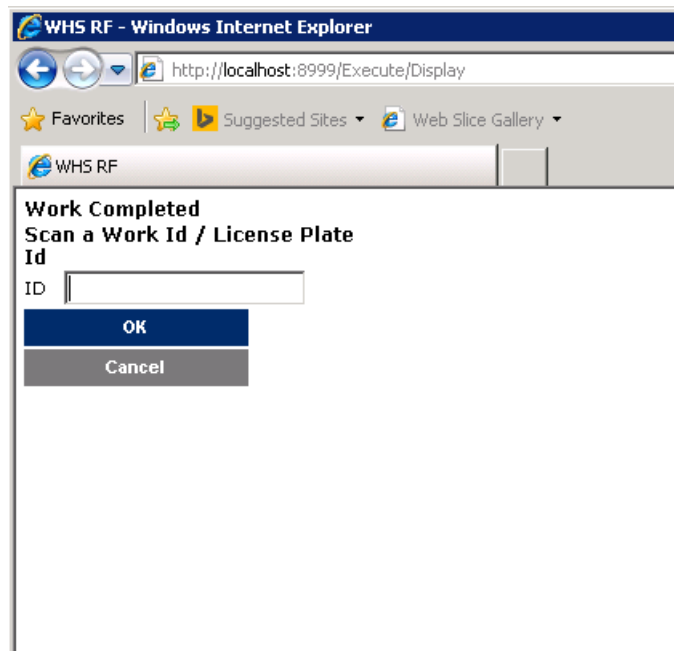


The previous screenshot shows the warehouse user to pick a quantity of 4 items from the Receiving location.

3. Click OK.



Put instructions have now been initiated and you're instructed to put the items in location F01-01-01. You have the security to override the location, if needed, however, for this scenario click OK.



Instructions show that put away work has completed.

You can now review the inventory on hand. Notice that the quantity via license plate and location is available and in stock.

Site	Warehouse	Location	License plate	Physical inventory	Physical reserved	Available physical	Ordered in total	On order	Ordered reserved	Total available
1	MAINDC	BAYDOOR	LP6r55							
1	MAINDC	BAYDOOR	LP7744							
1	MAINDC	F01-01-01	LP1234	4.00		4.00				4.00
1	MAINDC	F01-01-01	LP4443	2.00		2.00				2.00
1	MAINDC	F01-01-01	LP6555	4.00		4.00				4.00
1	MAINDC	F01-01-01	LP6r55							
1	MAINDC	F01-01-01	LP7744							
1	MAINDC	F01-01-01	LP7773	4.00		4.00				4.00
1	MAINDC	RECMAN	LP1234							
1	MAINDC	RECMAN	LP4443							
1	MAINDC	RECMAN	LP6555							
1	MAINDC	RECMAN	LP6r55							
1	MAINDC	RECMAN	LP7744							
1	MAINDC	RECMAN	LP7773							

2.3.5 Create a receipt for the purchase order in Procurement & Sourcing

Now that all work has been completed, create a purchase order receipt in Procurement & Sourcing.

To create a purchase order receipt, follow this navigation path:

Procurement & Sourcing > Common > Purchase Orders > All Purchase Orders

1. Select the purchase order, 000040.

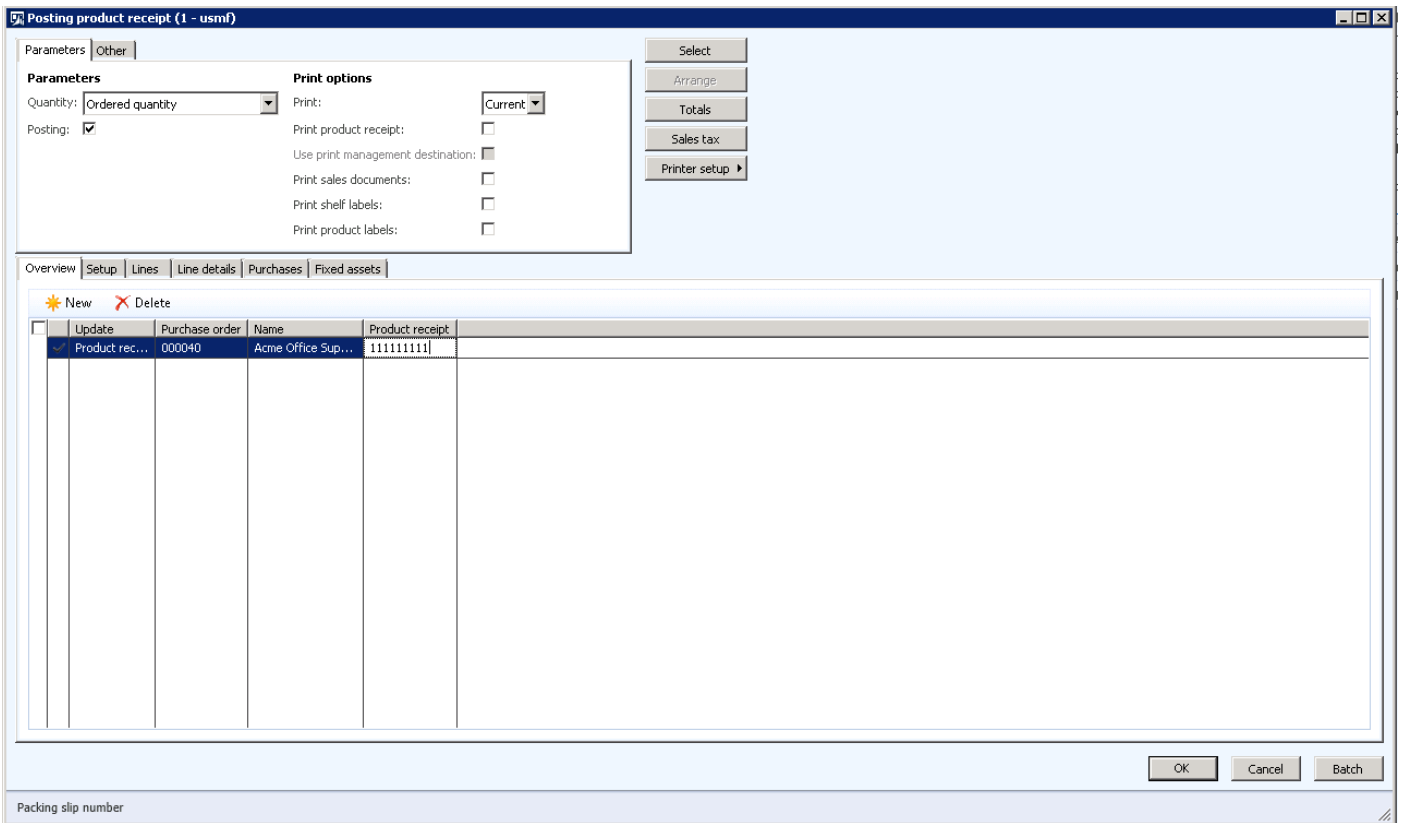
Purchase order	Vendor account	Name	Invoice account	Purchase type	Approval status	Status	Direct delivery
000010	US-101	Fabrikam Electronics	US-101	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000011	US-104	Fabrikam Supplier	US-104	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000012	US-105	Datum Receivers	US-105	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000013	JP-001	Contoso Chemicals Ja...	JP-001	Purchase order	Confirmed	Open order	<input type="checkbox"/>
000014	US-102	Talspin Parts	US-102	Purchase order	Confirmed	Open order	<input type="checkbox"/>
000015	CN-001	Contoso Asia	CN-001	Purchase order	Confirmed	Open order	<input type="checkbox"/>
000016	US-101	Fabrikam Electronics	US-101	Purchase order	Confirmed	Open order	<input type="checkbox"/>
000017	US-104	Fabrikam Supplier	US-104	Purchase order	Confirmed	Received	<input type="checkbox"/>
000018	US-105	Datum Receivers	US-105	Purchase order	Confirmed	Received	<input type="checkbox"/>
000019	US-103	Rain Projectors	US-103	Purchase order	Confirmed	Canceled	<input type="checkbox"/>
000020	CN-001	Contoso Asia	CN-001	Purchase order	Approved	Open order	<input type="checkbox"/>
000021	CN-001	Contoso Asia	CN-001	Purchase order	Approved	Open order	<input type="checkbox"/>
000023	US-104	Fabrikam Supplier	US-104	Purchase order	Confirmed	Open order	<input type="checkbox"/>
000026	US-104	Fabrikam Supplier	US-104	Purchase order	Confirmed	Received	<input type="checkbox"/>
000027	US-101	Fabrikam Electronics	US-101	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000028	US-101	Fabrikam Electronics	US-101	Returned order	Confirmed	Invoiced	<input type="checkbox"/>
000030	1001	Acme Office Supplies	1001	Purchase order	Approved	Canceled	<input type="checkbox"/>
000032	1001	Acme Office Supplies	1001	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000033	1001	Acme Office Supplies	1001	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000034	US-101	Fabrikam Electronics	US-101	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000035	US-111	Contoso office supply	US-111	Purchase order	Approved	Open order	<input type="checkbox"/>
000036	US-111	Contoso office supply	US-111	Purchase order	Approved	Open order	<input type="checkbox"/>
000038	1001	Acme Office Supplies	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000039	1001	Acme Office Supplies	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000040	1001	Acme Office Supplies	1001	Purchase order	Approved	Open order	<input type="checkbox"/>

Line number	Item number	Product name	Procurement category	CW quantity	CW unit	Quantity	Unit	Unit price	Net amount
1	1	Butter	1 - Butter			4.00	ea	2.50	10.00

2. On the Purchase tab, select Confirm to confirm the purchase order.

000036	US-111	Contoso office supply	US-111	Purchase order	Approved	Open order	<input type="checkbox"/>
000038	1001	Acme Office Supplies	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000039	1001	Acme Office Supplies	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000040	1001	Acme Office Supplies	1001	Purchase order	Confirmed	Open order	<input type="checkbox"/>

3. On the Receive tab, select Product Receipt.



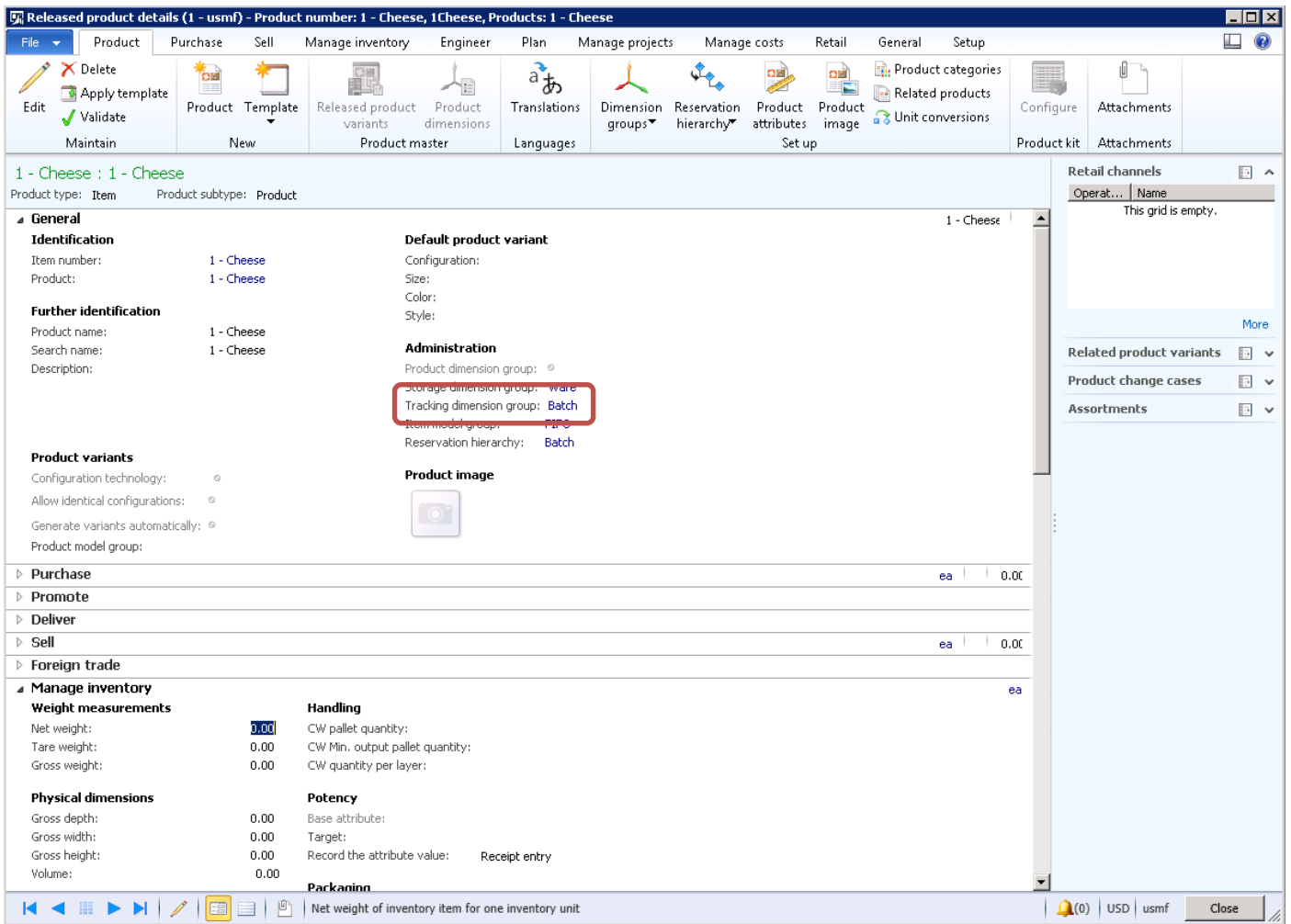
4. Enter the **Product receipt** delivery docket.
5. Click **OK**.

Update	Purchase order	Name	Product receipt				
<input checked="" type="checkbox"/>	000040	Acme Office Sup...	1111111111				

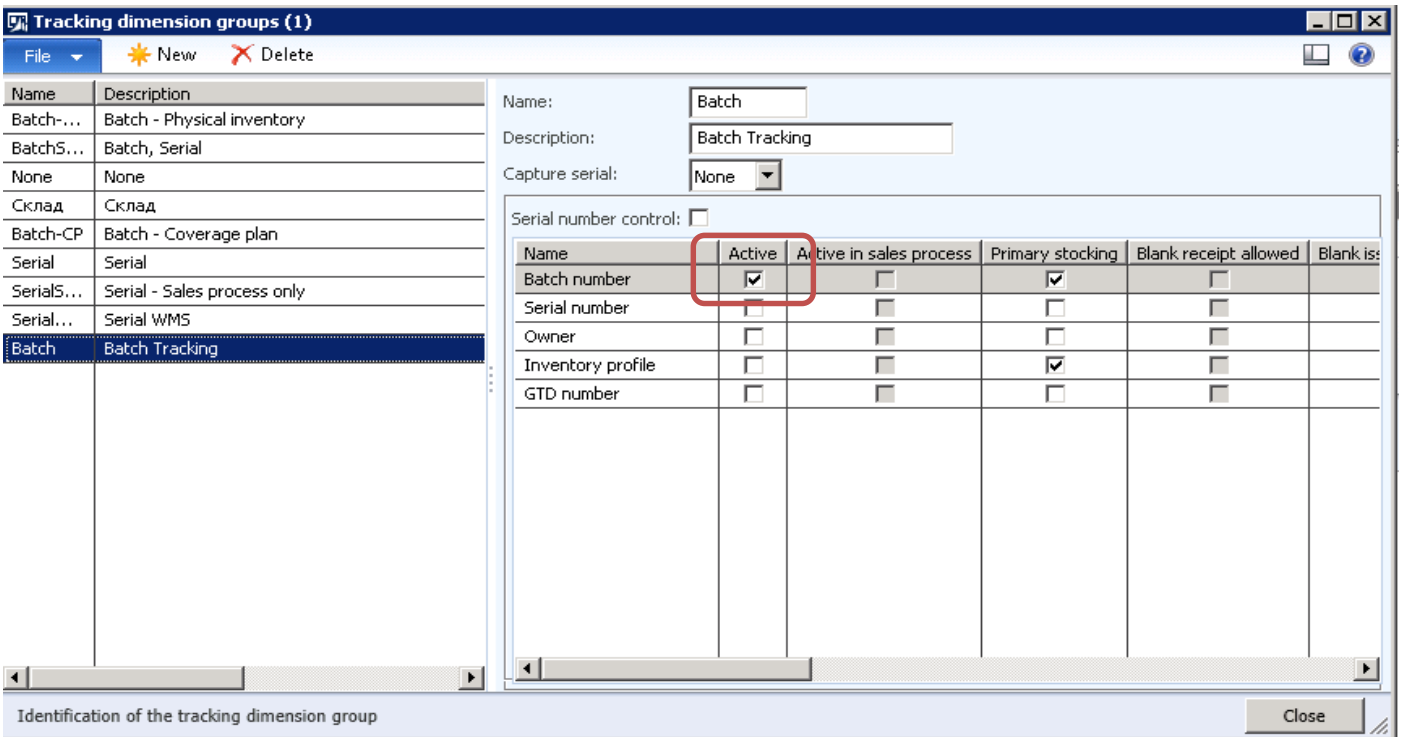
The purchase order is now received and completed.

2.3.6 Receipt using lot batch controlled items

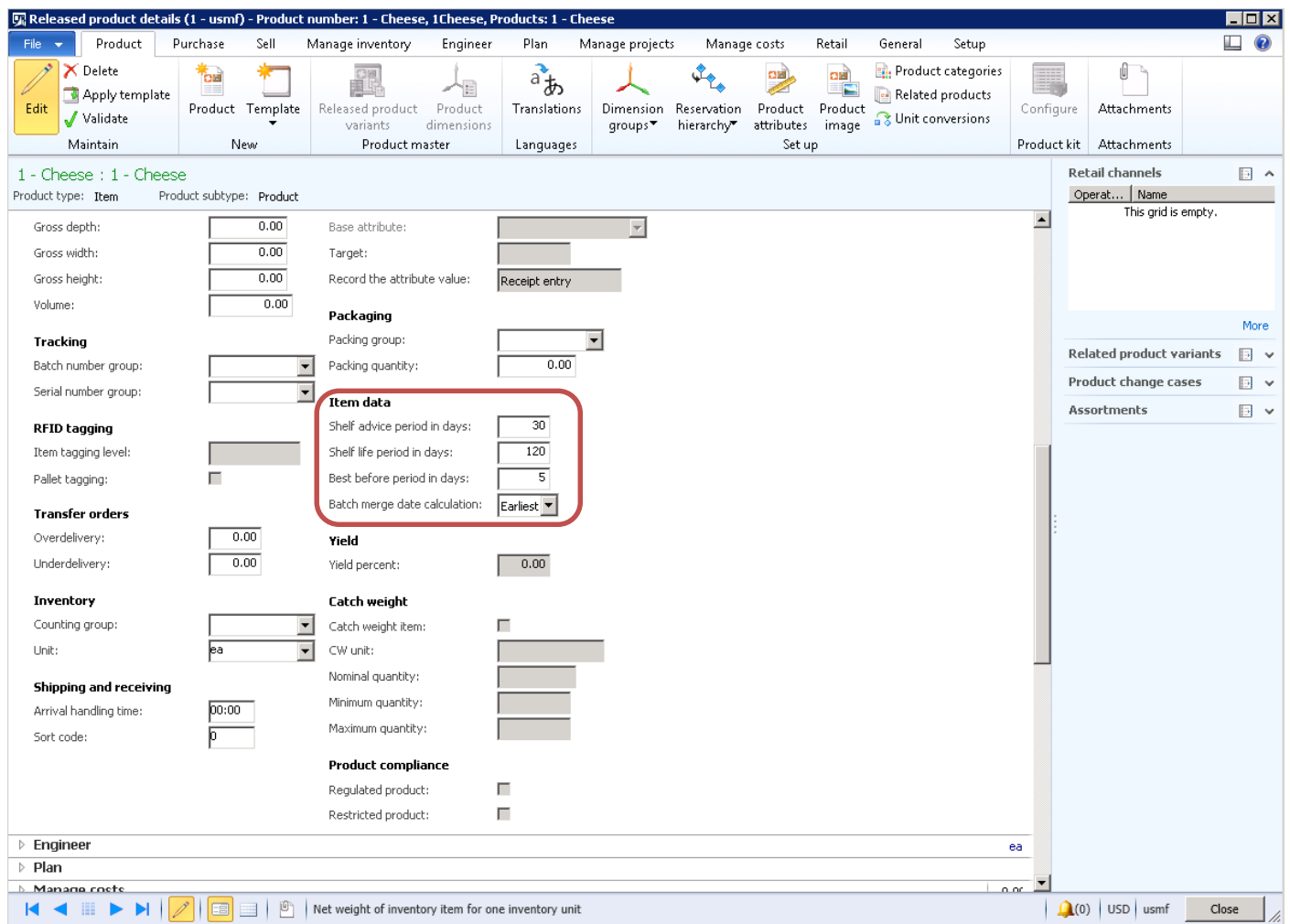
When using lot batch numbers, it's important that the setup of the inventory item reflects that batch control is being used. The first thing that must be defined is the appropriate tracking dimension group.



The tracking dimension group, "Batch", has lot batch tracking enabled.

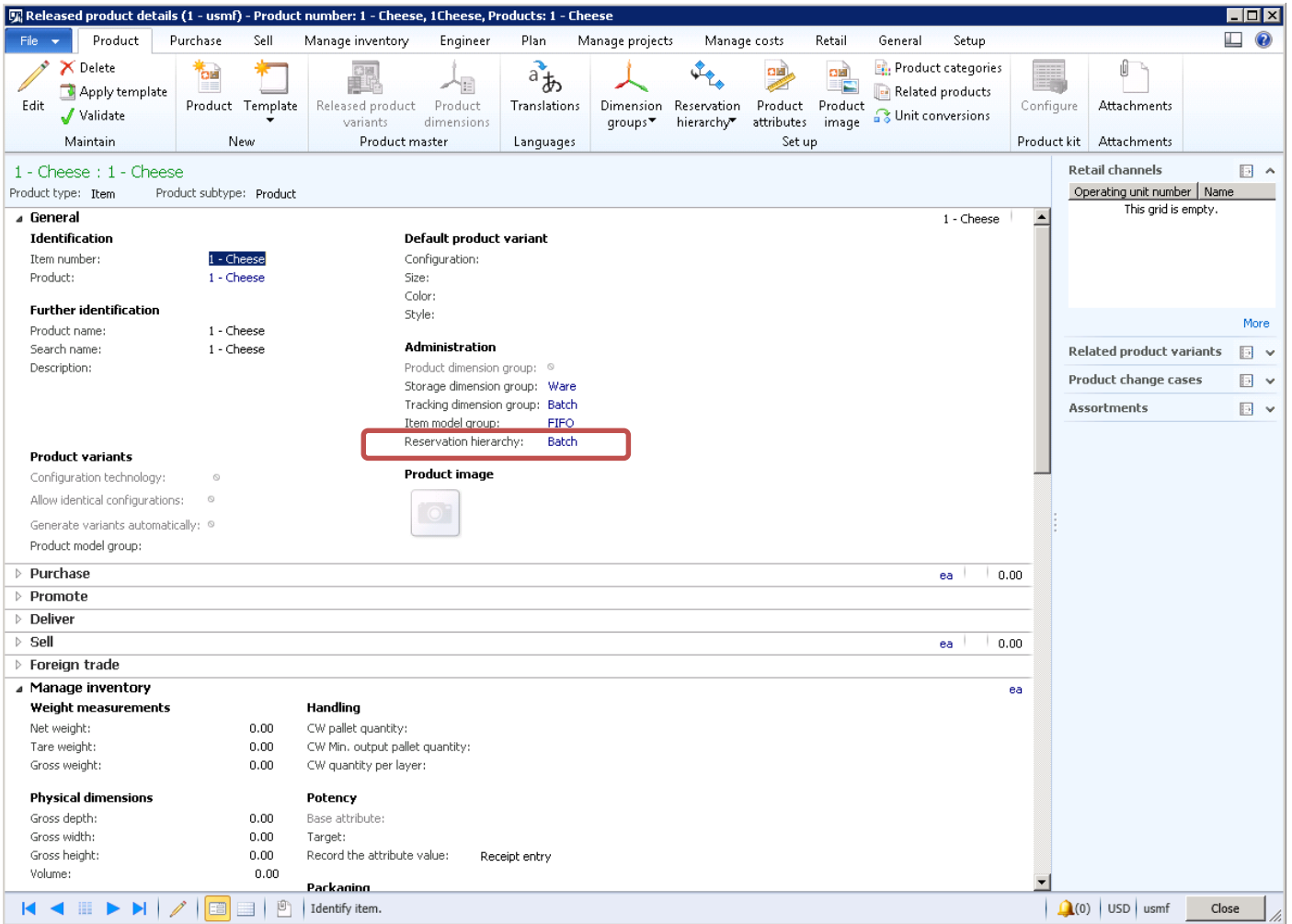


After the appropriate tracking dimensions have been defined, you have to set the appropriate batch shelf life, shelf advice period, and best before period parameters that exist on the item master record.



For item, 1 - Cheese, the necessary item data settings have been defined.

The last setup item that is required for batch tracked items is the reservation hierarchy. The reservation hierarchy lets you reserve the batch at order entry stage, or reserve the batch at picking. This is determined as either above the location (for reservation at order entry) or below the location for reservation at picking.



To test the scenario, create a purchase order on item, 1 – Cheese, for a quantity of 2 items.

Line number	Item number	Product name	Procurement category	CW quantity	CW unit	Quantity	Unit	Unit price	Net amount
1	1 - Cheese	1 - Cheese				2.00	ea	3.48	6.96

After the purchase order is created, log on to the mobile device to perform a goods receipt.

Purchase Receive

PONum

Item

1 - Cheese

LineNum

Qty

Unit

Disposition code

OK

Cancel

Exception

Enter the information shown above and then click OK.

LP 1 of 1

PONum

Item

1 - Cheese

Qty

Unit

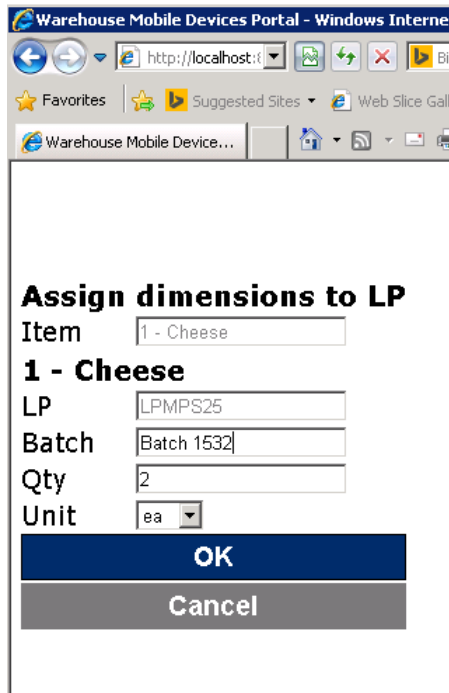
Loc

LP

OK

Cancel

Because license plate tracking is enabled through the location profile, enter the license plate. Click OK.



Note that the worker has been prompted to enter in the batch number. Click **OK**. Complete the put-away process and review on-hand by location.

On hand by location (1 - ceu)

File Work details Set as default

Site: 1 Warehouse: MAINDC

Show empty:

Overview Profile

Location	Zone ID	Location profile ID	Location type	Check text
D01-01-01	DGNP	DRYGOODS	DRYGOODS	
F01-01-01	Fresh	FRESH	FRESHGOODS	
F01-01-02	Fresh	FRESH	FRESHGOODS	
F01-02-01	Fresh	FRESH	FRESHGOODS	
F01-02-02	Fresh	FRESH	FRESHGOODS	
F01-03-01	Fresh	FRESH	FRESHGOODS	
F01-03-02	Fresh	FRESH	FRESHGOODS	
F01-04-01	Fresh	FRESH	FRESHGOODS	
F01-04-02	Fresh	FRESH	FRESHGOODS	
F03-01-01	Fresh	FRESH	FRESHGOODS	
INBOUND		RECV	RECV	

Item number: Multiple Quantity: 4.00

Overview

Transactions Quarantine Dimensions display

Item number	Product name	Parent license plate	Configuration	Size	Color	Style	Batch number	Serial number	Inventory status	License plate	Physical inventory	Availa
1 - Cheese	1 - Cheese						Batch 1532		Available	LPMP525	2.00	
1 - Cheese	1 - Cheese						MATTBATCH		Available	LPMP524	2.00	

Location in a warehouse. (26710) USD ceu

Two batches now show in one location. This is because you've allowed mixed batches as per the location profile setting.

2.3.7 Purchase returns

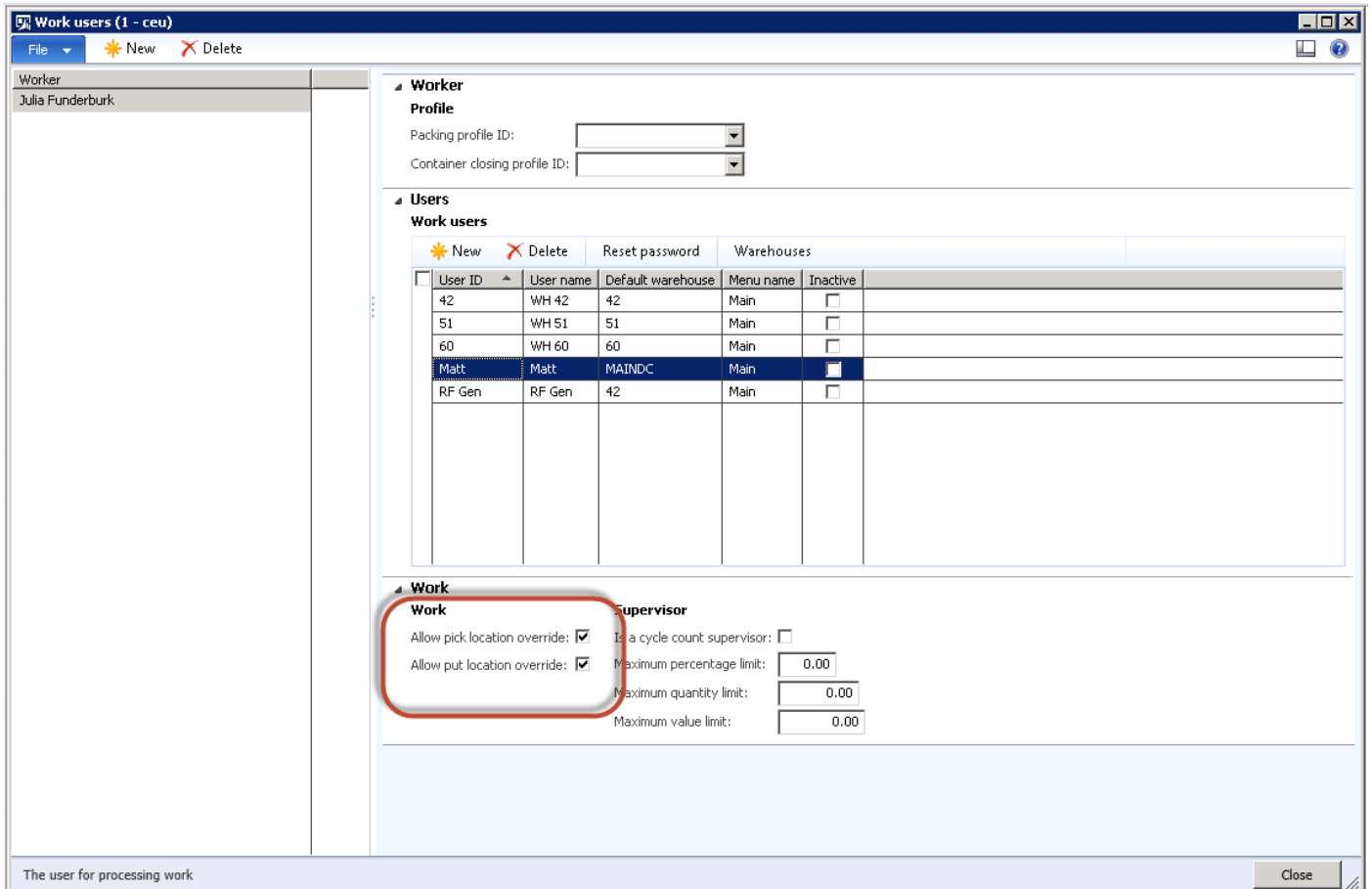
To process purchase returns, in this case study you'll set up an "Anomaly" location on the warehouse floor, which is to be used for all inventory that is awaiting returns, awaiting some kind of inspection, or needs an action associated to it. The next section shows several ways in which to handle inventory that is considered unsaleable and requires attention or return to the supplier.

Purchase return process 1

The first approach is to use the override location function on the mobile device and enable the worker to manually select a location in the Anomaly location. This requires security and enablement on the Mobile Device User account to enable override locations.

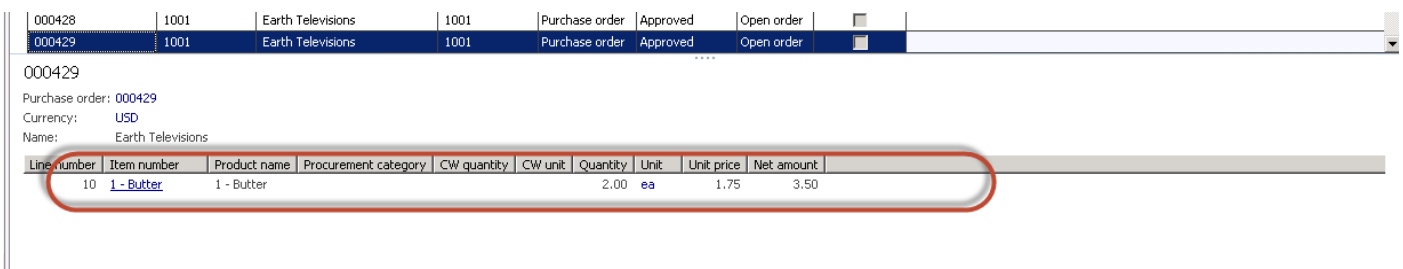
To enable a user to work manually, follow this navigation path:

Warehouse Management > Setup > Work User > Worker



By allowing the override, the user has the option to select the Anomaly location for the put away.

To test this scenario, create a PO on item, 1 - Butter, for a quantity, of 2 ea's.



After the PO has been created, log on to the mobile device, and perform the goods receipt

Warehouse Mobile Devices Portal - Windows Internet Explorer

http://localhost:8000

Warehouse Mobile Devices Portal

PO Receipt

PONum

Item

1 - Butter

LineNum

Qty

Unit

OK

Cancel

Exception

Click **OK** to enter the license plate.

Warehouse Mobile Devices Portal - Windows Internet Explorer

http://localhost:8000

Warehouse Mobile Devices Portal

LP 1 of 1

PONum

Item

1 - Butter

Qty

Unit

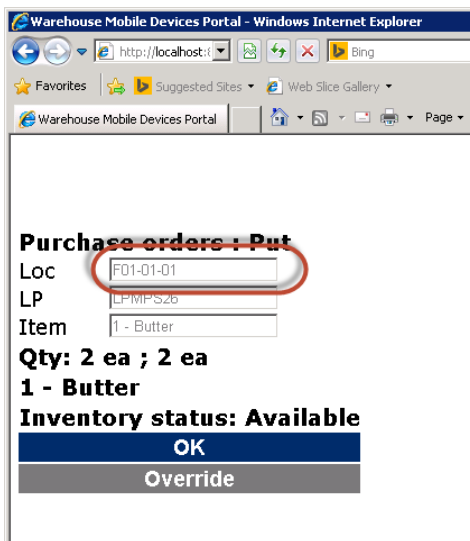
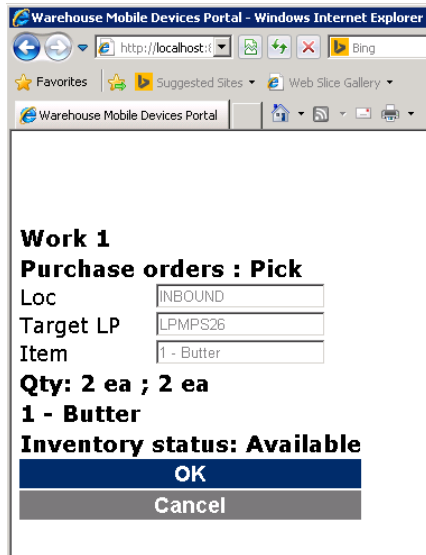
Loc

LP

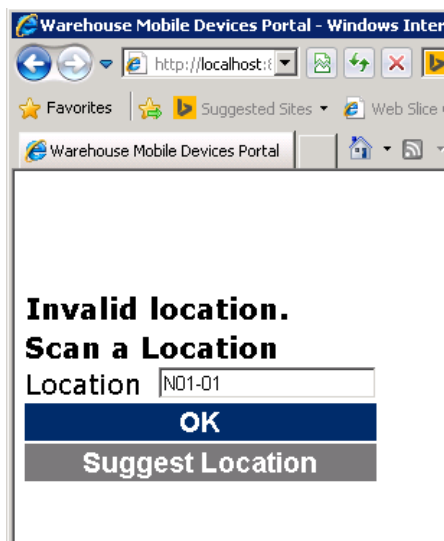
OK

Cancel

Go to process the put-away.



Because system directed put away is enabled, notice how the location has been suggested, due to the appropriate settings for the mobile device user. Also notice that an override option is available. Select the **Override** option. When you select **Override**, you must confirm that you're doing an override, after which you are prompted for the override location.



Notice that the anomaly location, N01-01, has been suggested. Complete the put away and now the inventory has been stored in the N01-01 location.

The screenshot shows the 'On hand by location (1 - ceu)' window. At the top, it displays 'Site: 1' and 'Warehouse: MAINDC'. Below this is a table of locations with columns: Location, Zone ID, Location profile ID, Location type, and Check text. The location N01-01 is highlighted in blue, indicating it is the selected location. Below the table, the 'Item number' is '1 - Butter' and the 'Quantity' is '2.00'. At the bottom, there is a 'Transactions' table with columns: Item number, Product name, Parent license plate, Configuration, Size, Color, Style, Batch number, Serial number, Inventory status, License plate, Physical inventory, and Available physical. The first row of the transactions table is circled in red, showing '1 - Butter' with an 'Available' status and a quantity of 2.00.

You're now ready to process the purchase return to the vendor.

Create a PO return for the item, 1 – Butter, with a quantity of -2.

The screenshot shows the 'Create purchase order (1 - ceu)' window. The 'Vendor' section is filled out with 'Vendor account: 1001', 'Name: Earth Televisions', and 'Address: 788 Jones Street, Bellevue, WA 98004, United States of America'. The 'General' section contains several fields: 'Purchase order: 000432', 'Purchase type: Returned order', 'Invoice account: 1001', 'Name: Earth Televisions', 'Currency: USD', 'RMA number: RMA123', 'Project ID', 'Purchase agreement ID', 'Site: 1', and 'Warehouse: MAINDC'. The 'Dates' section shows 'Accounting date: 1/27/2014' and 'Delivery date: 1/27/2014'. The 'Intercompany' section is empty. At the bottom, there are 'OK' and 'Cancel' buttons. A note at the bottom left states 'Unique number issued to authorize the return.'

Purchase order (1 - ceu) - Purchase order: 000432, Earth Televisions

File Purchase order Purchase Manage Receive Invoice Retail Warehouse management Transportation management General

Purchase order From a sales order Edit Request change Delete Cancel Header view Line view From all From journal Totals Generate from template Attachments

000432 : 1001 - Earth Televisions Open order

Purchase order header

Delivery
 Delivery date: 1/27/2014
 Earliest confirmed delivery:

Vendor
 Contact ID:

Retail
 Replenishment
 Service category:
 Location:
 Cross docking dates
 Delivery date: 1/27/2014
 Cross docking date:
 Local delivery date:
 Sales date:

Discounts
 Total discount %: 0.00

Contract concession
 Concession purchase:
 Product/order creation
 Auto created:

Latest purchase orders

Purchase order	Status	Created
000432	Open order	1/2
000431	Open order	1/2
000430	Invoiced	1/2
000429	Open order	1/2
000428	Open order	1/2
...

Totals
Encumbrance summary

Purchase order lines

Site	Warehouse	Location	License plate	CW quantity	CW unit	Quantity	Unit	Unit price	Adjusted unit price	Discoun
1	MAINDC					-2.00	ea	3.75	0.00000	

Line details
 The blended adjusted unit price for received potency items.

(26710) USD | ceu Close

Note the line with -2 quantity. Now you can reserve the return to the inventory that is in location N01-01. To do this, select the Inventory tab and choose Reservation.

Reservation (1 - ceu) - Purchase order: 000432, Line #10, 1 - Butter, Deleted: NoPurchase order: 000432

File Reserve lot

Reserved physical: 2.00 Reserved ordered: On order:

Detailed availability by dimension

Site:
 Warehouse:
 Inventory status:
 Location:
 License plate:
 Refresh dimensions

Item number	Maximum physical quantity	Total available	Site	Warehouse	Inventory st...	Location	License plate	Reservation
1 - Butter	0.00	0.00	1	MAINDC	Available	INBOUND	LPMP521	
1 - Butter	0.00	0.00	1	MAINDC	Available	INBOUND	LPMP526	
1 - Butter	0.00	0.00	1	MAINDC	Available	INBOUND	LPMP527	
1 - Butter	0.00	0.00	1	MAINDC	Available	Matt	LPMP51	
1 - Butter	0.00	0.00	1	MAINDC	Available	Matt	LPMP526	
1 - Butter	0.00	0.00	1	MAINDC	Available	Matt	LPMP527	
1 - Butter	0.00	0.00	1	MAINDC	Available	N01-01	LPMP526	
1 - Butter	0.00	0.00	1	MAINDC	Available	N01-01	LPMP527	2.00

Source line dimensions:
 Site=1, Warehouse=MAINDC, Inventory status=Available

Lock reservations

Quantity	Site	Warehouse	Inventory status	Location	License plate
2.00	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Quantity of the item in inventory unit

Close

Reserve 2 items against N01-01 on the license plate and confirm the purchase return. Update the purchase return so that inventory will be returned from the N01-01 location.

2.3.8 Cycle counting

Warehouse Management can create cycle counting work. Cycle count work is its own “type” of work which can be executed through the mobile device and verified through the client. Depending on the configuration, there are different ways to create and execute cycle counting work in order to verify a warehouse’s inventory.

Threshold cycle counting

One way to create cycle count work is by using thresholds. As warehouse workers execute picking work in the warehouse, if a threshold is met it will automatically create cycle count work for that location in the warehouse.

To set up thresholds, follow this navigation path:

Warehouse Management > Setup > Cycle Counting > Cycle Count Thresholds

Each threshold can be configured by using item and location queries, which are evaluated during the execution of picking work.

The threshold itself can be one of two types: either a straightforward check on a Quantity/UOM combination, or a volumetric percentage check. If the inventory falls below this threshold when doing picking work, and the last counted date on the location falls outside of the days between setup on the threshold, cycle count work will be created. There is also the option to have the warehouse worker execute the cycle count work immediately after the threshold is achieved.

2.3.9 Threshold quantity - case study continued

To test cycle counting thresholds, you’re going to continue to focus on item, 1 - Butter, for which there are currently 10 items on hand. (If you need to generate more purchase receipts, follow the steps in the previous case study to increase the number of items that you physically have on hand.)

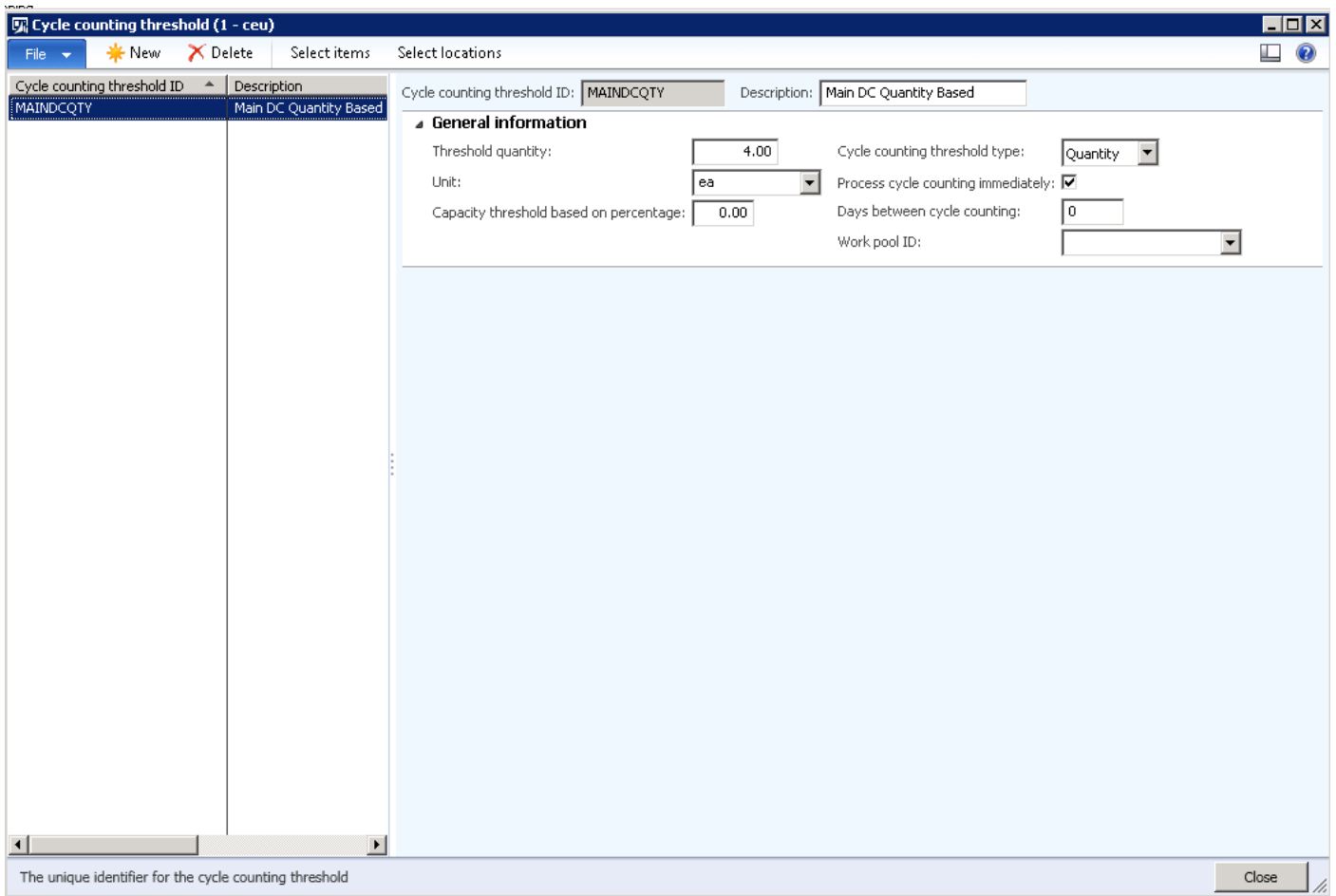
The following screenshot shows that there are 10 quantity on hand and 10 quantity total available.



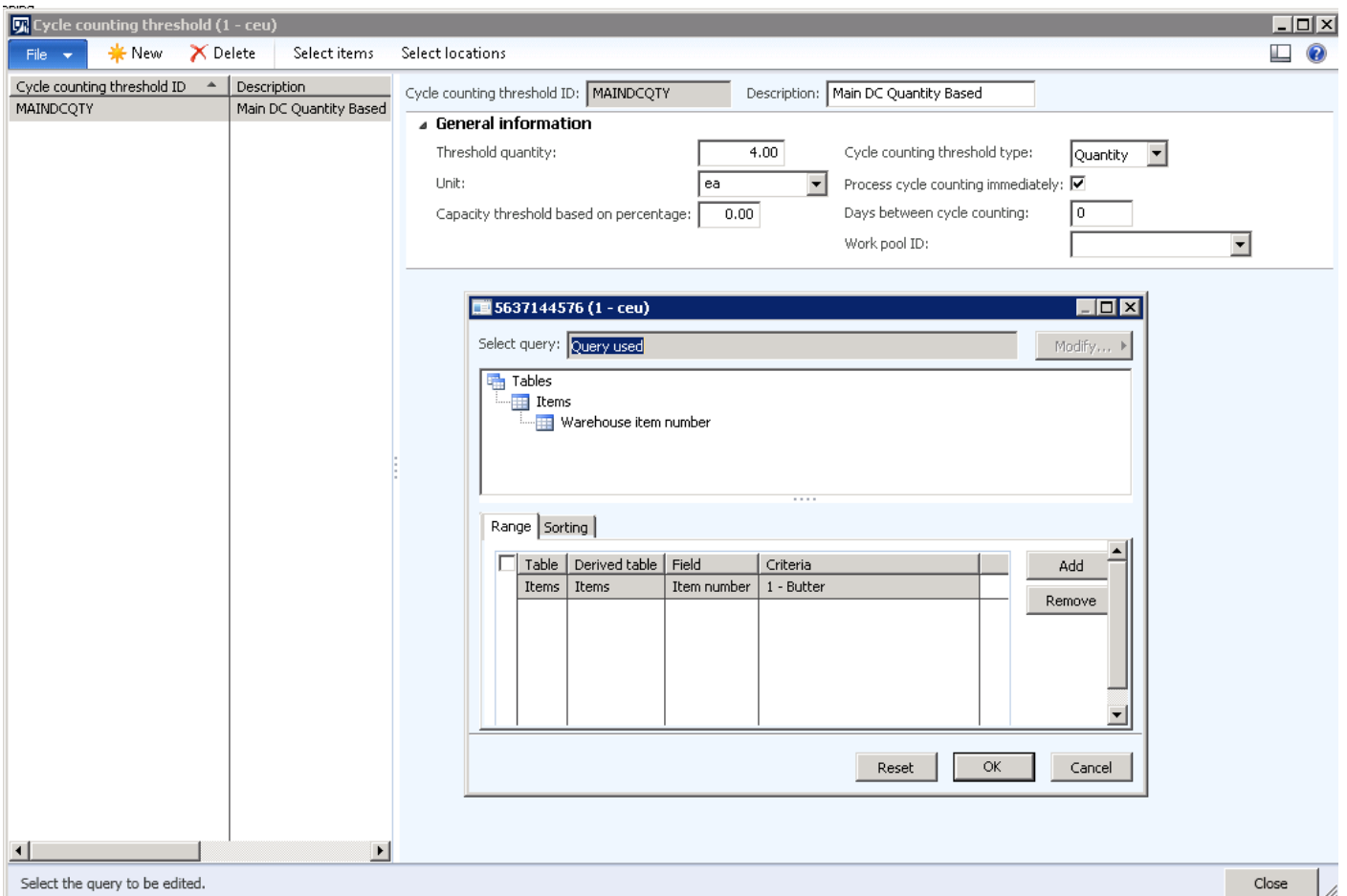
Physical inventory	Physical reserved	Available physical	Ordered in total	On order	Ordered reserved	Total available
10.00		10.00				10.00

To set up thresholds, follow this navigation path:

Warehouse Management > Setup > Cycle Counting > Cycle Count Thresholds



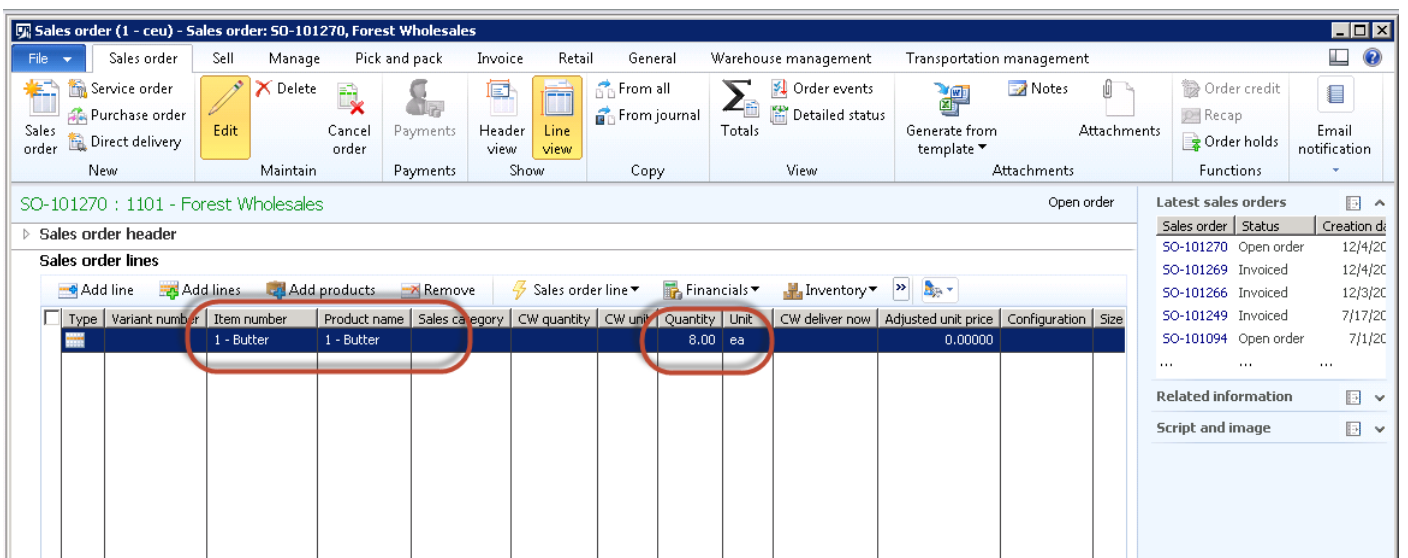
1. Enter the **Cycle counting threshold ID**.
2. Enter a description.
3. In the **Threshold quantity** field, enter 4.
4. In the **Unit** field, enter ea as an abbreviation for the unit of measure.
5. Do not include a capacity threshold percentage.
6. In the **Cycle counting threshold type** field, select Quantity.
7. Select **Process cycle counting immediately**.
8. Set **Days between cycle counting** to 0.
9. Select the items or the query which this cycle count code will apply to.
10. On the menu, select **Select items**.



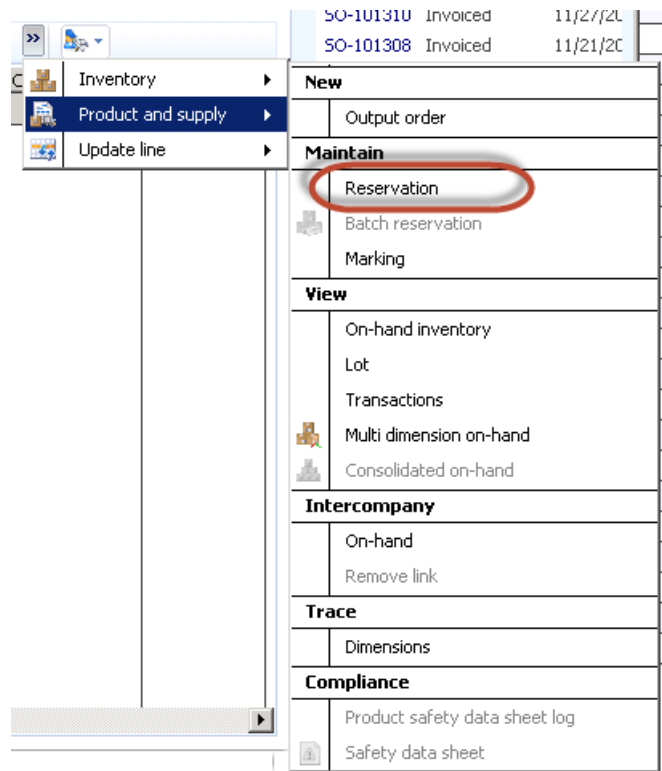
In this example, specify the item to test the capability. In a typical scenario, you would select the criteria needed for this cycle count method.

Test scenario

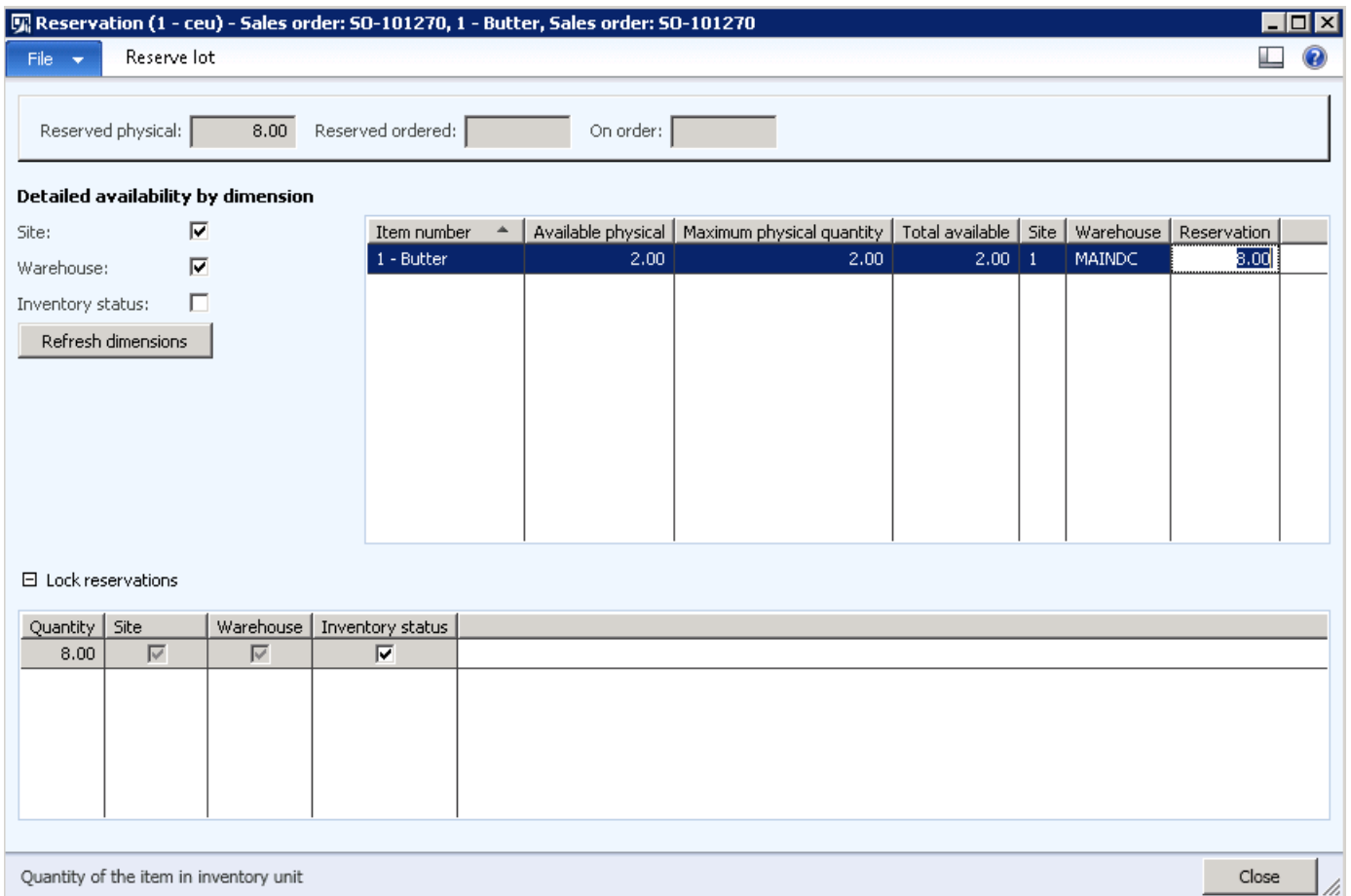
1. Create a sales order for item, 1 – Butter, for a quantity of 8 ea. This ensures that you’re below the threshold, so Warehouse Management automatically creates work for the cycle count.



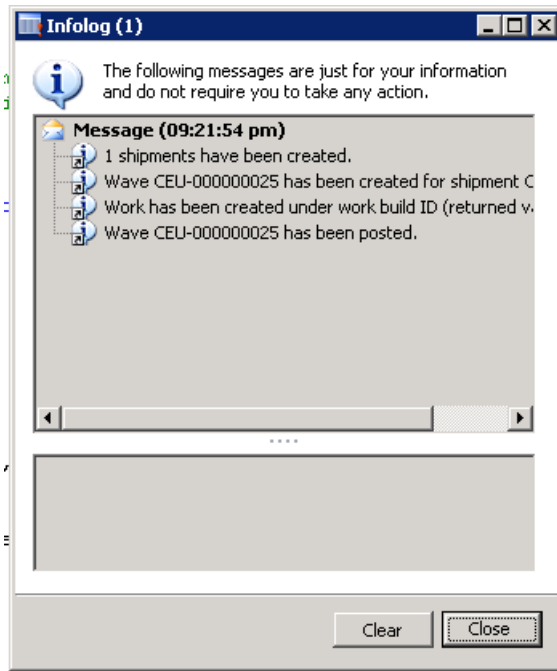
2. Reserve the stock by selecting the **Overflow** menu and choosing **Inventory > Reservation**.



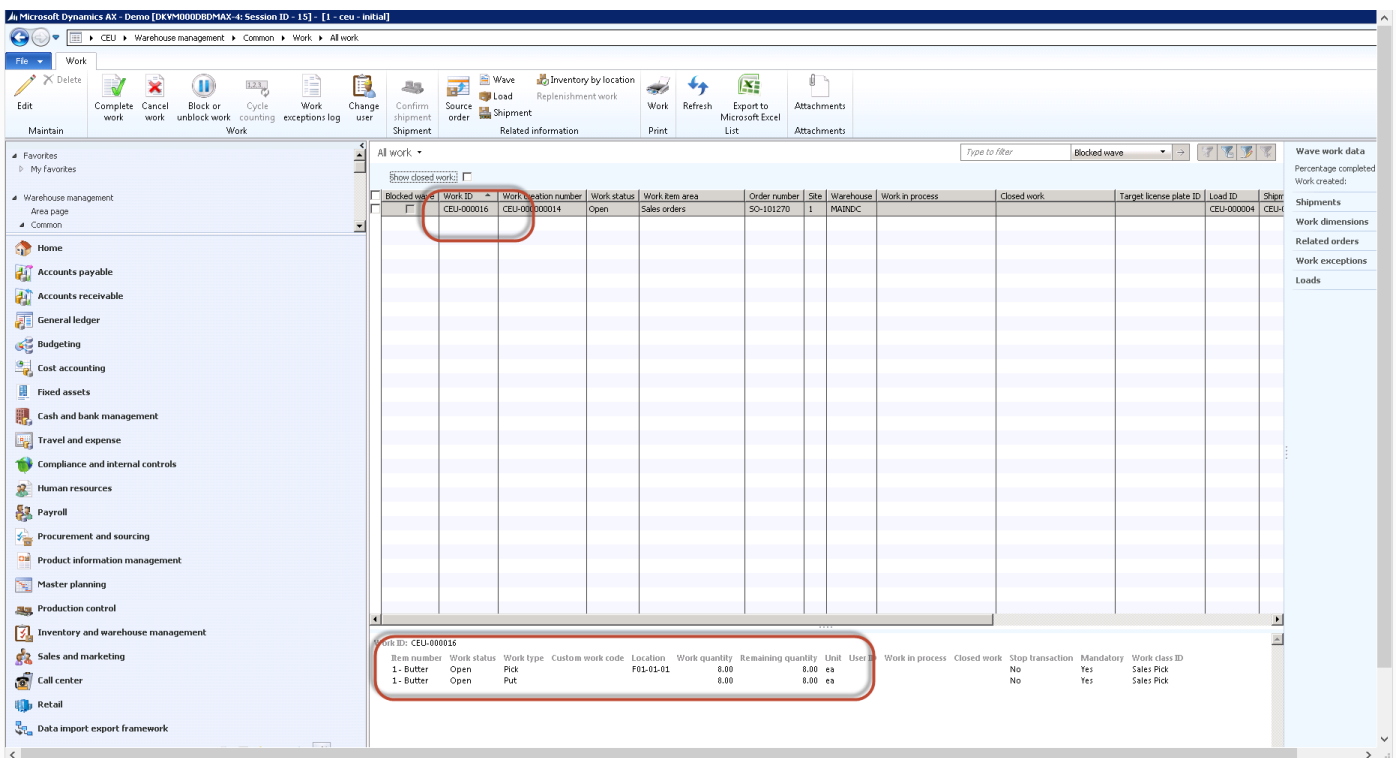
3. Set the order quantity to the Reservation quantity.



4. Click **Close**.
5. Release the order to the warehouse.



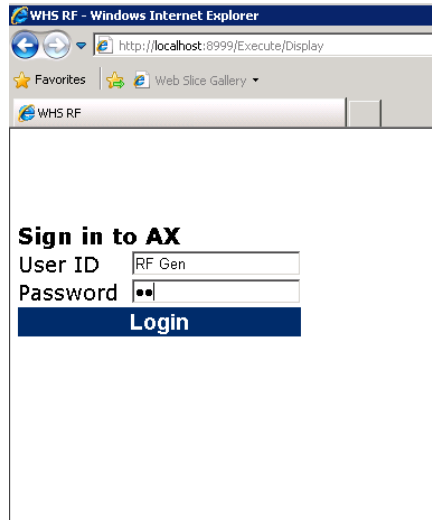
6. Click **Close** in the Infolog to confirm that the wave and the work has been completed.
7. Review the work that has been created by Warehouse Management.



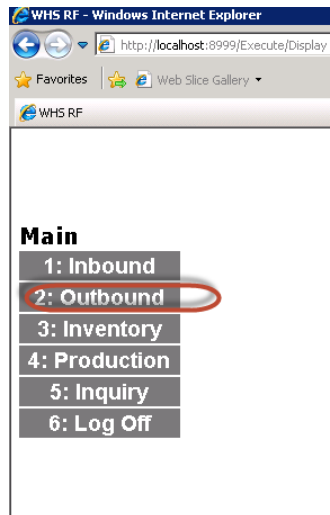
Warehouse Management has created the work for a pick and put based on the work template and is suggesting the location to pick the items from.

You're now ready to perform the picking function using the mobile device.

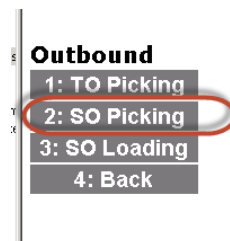
Log on to the mobile device



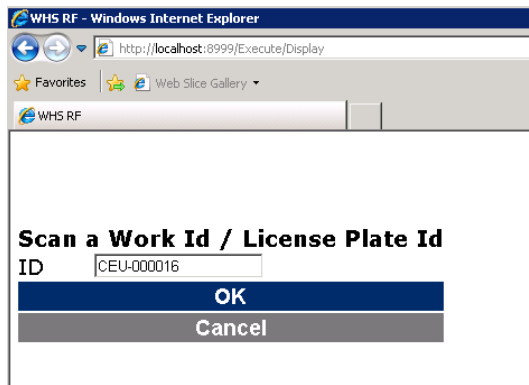
1. On the **Main** menu, select **Outbound**.



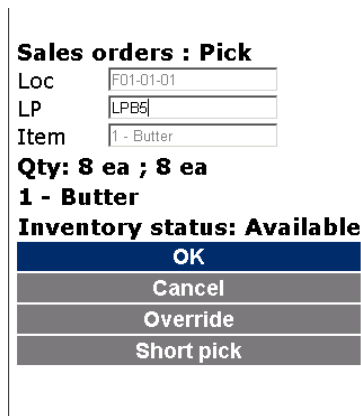
2. On the **Outbound** menu, select **SO Picking**.



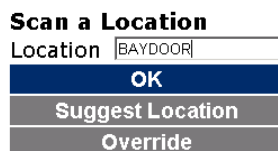
3. Scan a Work ID.



4. Click **OK**.

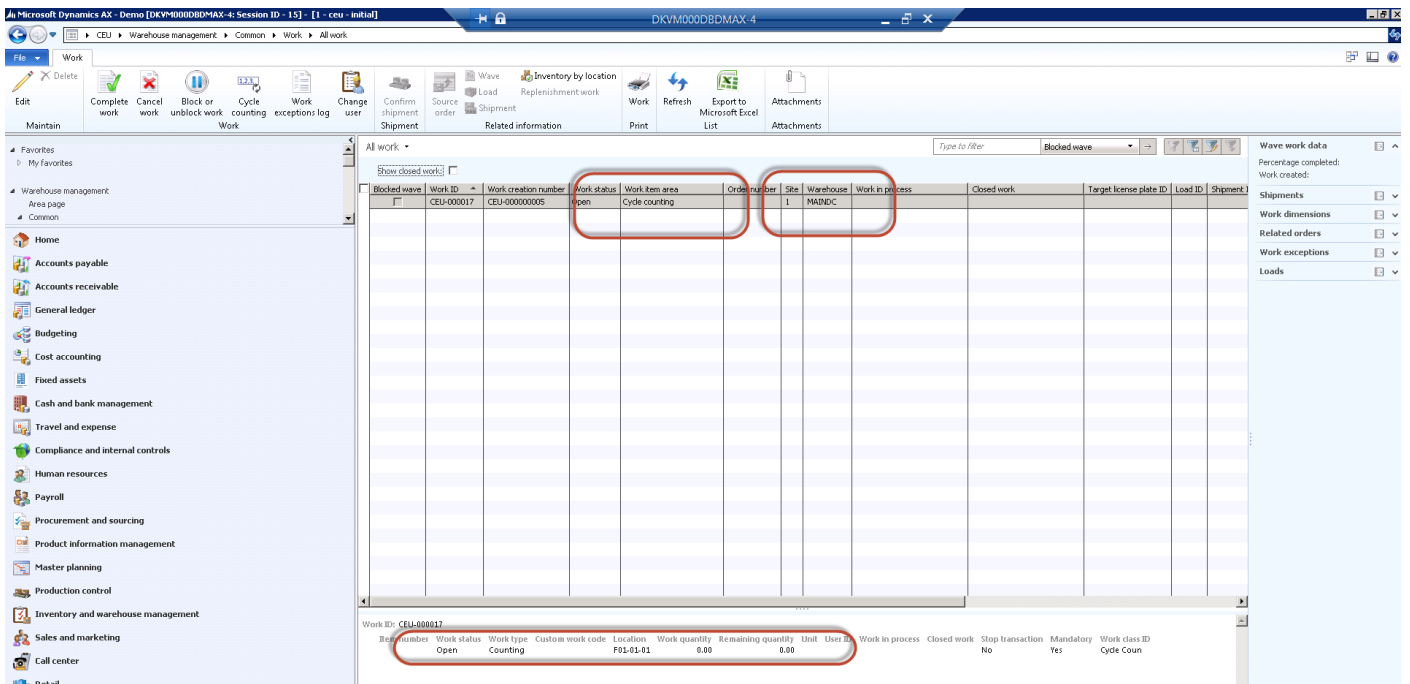


5. Scan or select a LP.
6. Click **OK**.

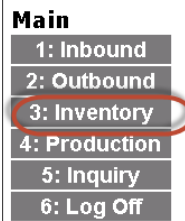


7. Because there is no staging, the item goes to the Baydoor.
8. Click **OK**.

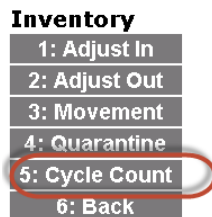
The sales order for a quantity of 8 has not been picked and shipped because it has fallen below the threshold of 4 for the quantity on hand. Next, you'll see an automatic generation of work created for the cycle count.



1. Confirm that the work was created.
2. Perform the cycle count on the mobile device.
3. Open the **Main** menu.
4. On the **Main** menu, select **Inventory**.



5. On the **Inventory** menu, select **Cycle Count**.



6. Scan or type the Work ID.
7. Click **OK**.

Cycle counting

Loc

Item

1 - Butter

LP

Qty

Unit

Inventory status

OK

Finished

Cancel

In this example, there were 10 Items. A pick for 8 items was processed from the sales order, and the quantity on hand is now 2. Assume there are actually 3 items on hand, so enter a quantity of 3 as being counted.

WHS RF - Windows Internet Explorer

http://localhost:11111

Bing

WHS RF

The counted quantity is not equal to the current on hand quantity. Please count again.

Cycle counting

Loc

Item

1 - Butter

LP

Qty

Unit

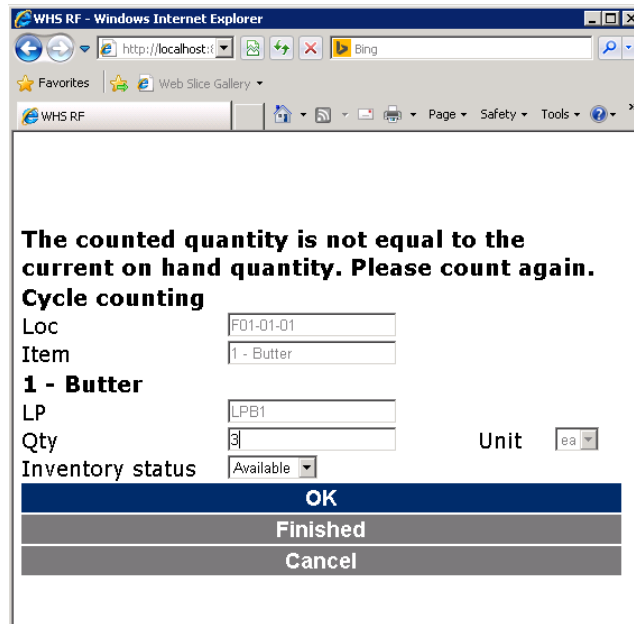
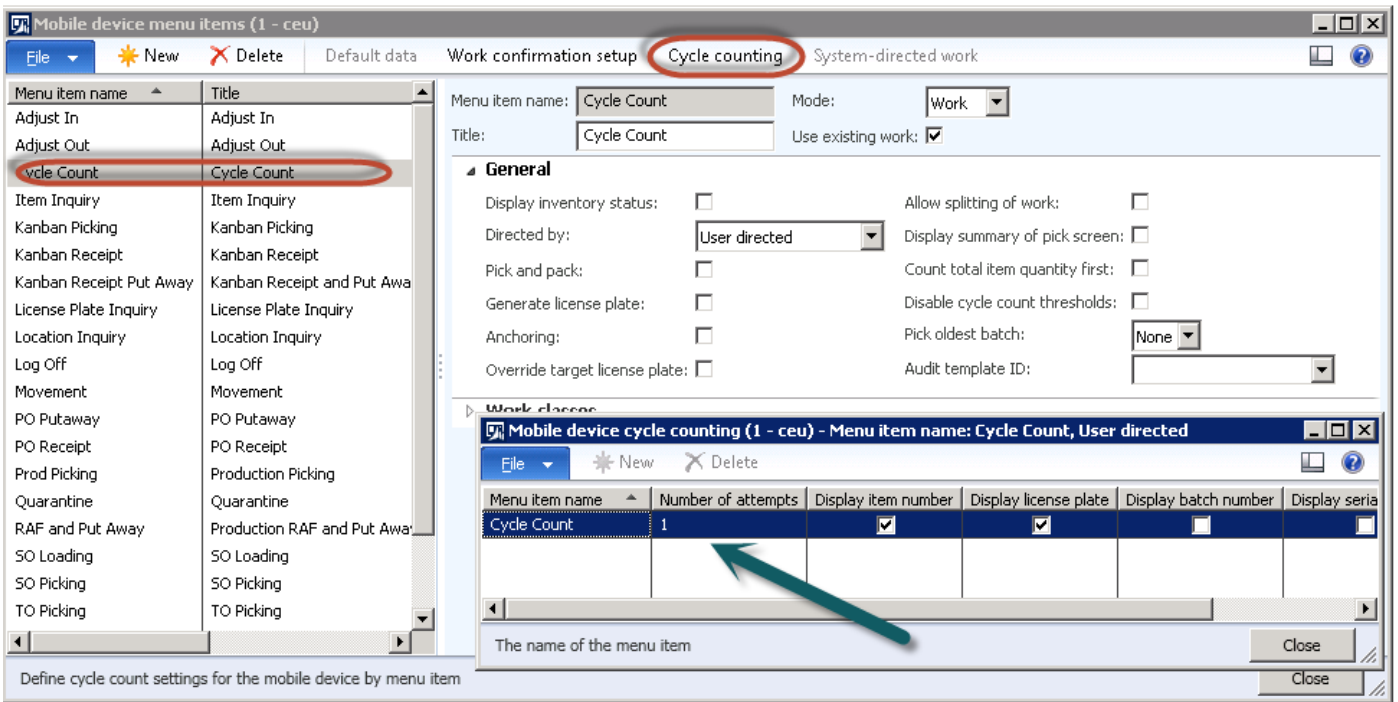
Inventory status

OK

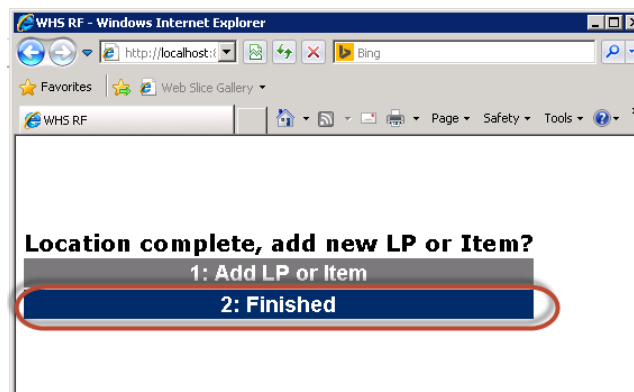
Finished

Cancel

A message displays on the mobile device stating that the current on hand quantity does not equal the counted quantity. This is a configuration setting that can be changed on the mobile device menu. To change this, go to **Warehouse Management > Setup > Mobile Device > Mobile Device Menu Items**. Select the **Menu item name** for cycle count, and then select **Cycle Counting**. Determine the number of times that you want the user to confirm the count.



1. On the mobile device menu, in the Qty field, enter 3.
2. Click OK.



3. Click **Finished**.

To review the transactions that were created for this cycle count, select the inventory item in released products and review the transactions.

Configuration	Size	Color	Style	Site	Warehouse	Batch number	Serial number	Physical date	Financial date	Reference	Number	Receipt	Issue	CW quantity	CW unit	Quantity	Cost amount
1				1	MAINDC			12/3/2013	12/3/2013	Work	CEU-000007		Sold			-3.00	-6.38
1				1	MAINDC			12/3/2013	12/3/2013	Work	CEU-000007		Sold			-1.00	-2.13
1				1	MAINDC			12/3/2013	12/3/2013	Work	CEU-000007	Purchased				2.00	4.25
1				1	MAINDC			12/3/2013	12/3/2013	Work	CEU-000007	Purchased				3.00	6.38
1				1	MAINDC			12/3/2013	12/3/2013	Work	CEU-000007	Purchased				1.00	2.13
1				1	MAINDC			12/4/2013	12/4/2013	Sales order	50-101266		Sold			-6.00	-6.38
1				1	MAINDC			12/4/2013	12/4/2013	Counting	000171_070	Purchased				3.00	
1				1	MAINDC			12/4/2013	12/4/2013	Counting	000172_070	Purchased				5.00	
1				1	MAINDC			12/4/2013	12/4/2013	Sales order	50-101269		Sold			-8.00	-8.50
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013		Sold			-3.00	-3.19
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013		Sold			-5.00	-5.31
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013	Purchased				3.00	3.19
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013	Purchased				5.00	5.31
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013		Sold			-5.00	-5.31
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013		Sold			-3.00	-3.19
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013	Purchased				5.00	5.31
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000013	Purchased				3.00	3.19
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000015		Sold			-8.00	-8.50
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000015	Purchased				8.00	8.50
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000015		Sold			-8.00	-8.50
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000015	Purchased				8.00	8.50
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000016		Sold			-8.00	-8.48
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000016	Purchased				8.00	8.48
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000016		Sold			-8.00	-8.48
1				1	MAINDC			12/4/2013	12/4/2013	Work	CEU-000016	Purchased				8.00	8.48
1				1	MAINDC			12/4/2013	12/4/2013	Counting	000173_070	Purchased				1.00	

- Note the adjustment of quantity 1.
- Select the **Ledger** tab.

Posting - physical	Accounts - physical
Physical posting: []	Ledger account: []
Physical offset: []	Offset account: []

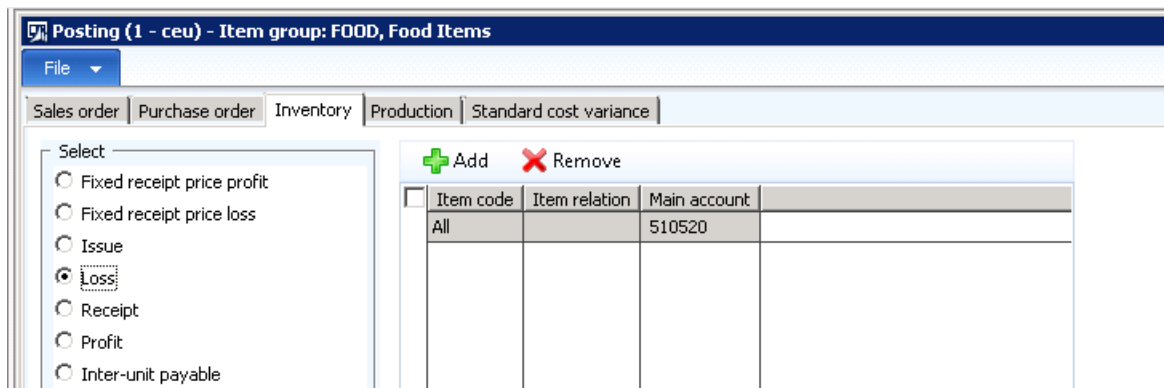
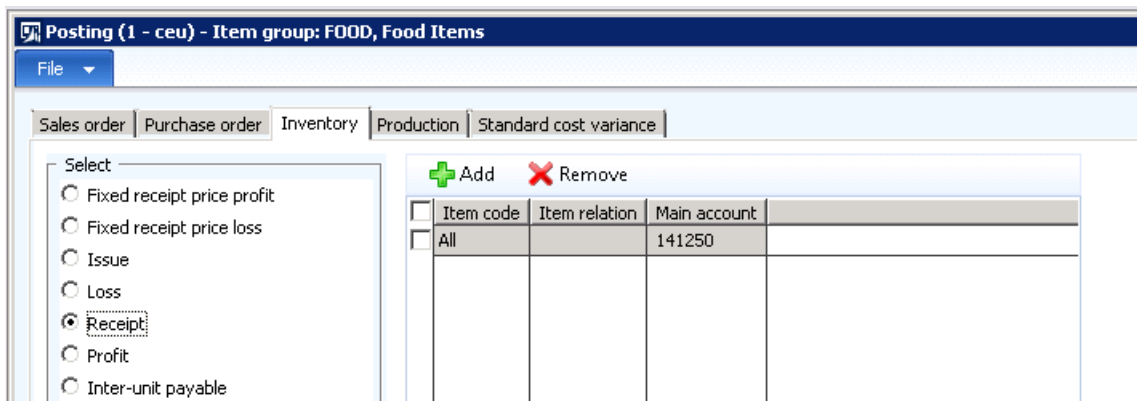
Posting - financial	Accounts - financial
Balance sheet posting: ry, inventory receipt	Ledger account: 141250 - - -
Profit and loss posting: ary, inventory profit	Offset account: 510520 - - -

Posting - physical revenue	Accounts - physical revenue
Turnover posting: []	Ledger account: []
Offset: []	Offset account: []

Posting - physical charge	Accounts - physical charge
Charge posting: []	Ledger account: []
Stock variation posting: []	Offset account: []

Posting - financial charge	Accounts - financial charge
Charge posting: []	Ledger account: []
Stock variation posting: []	Offset account: []

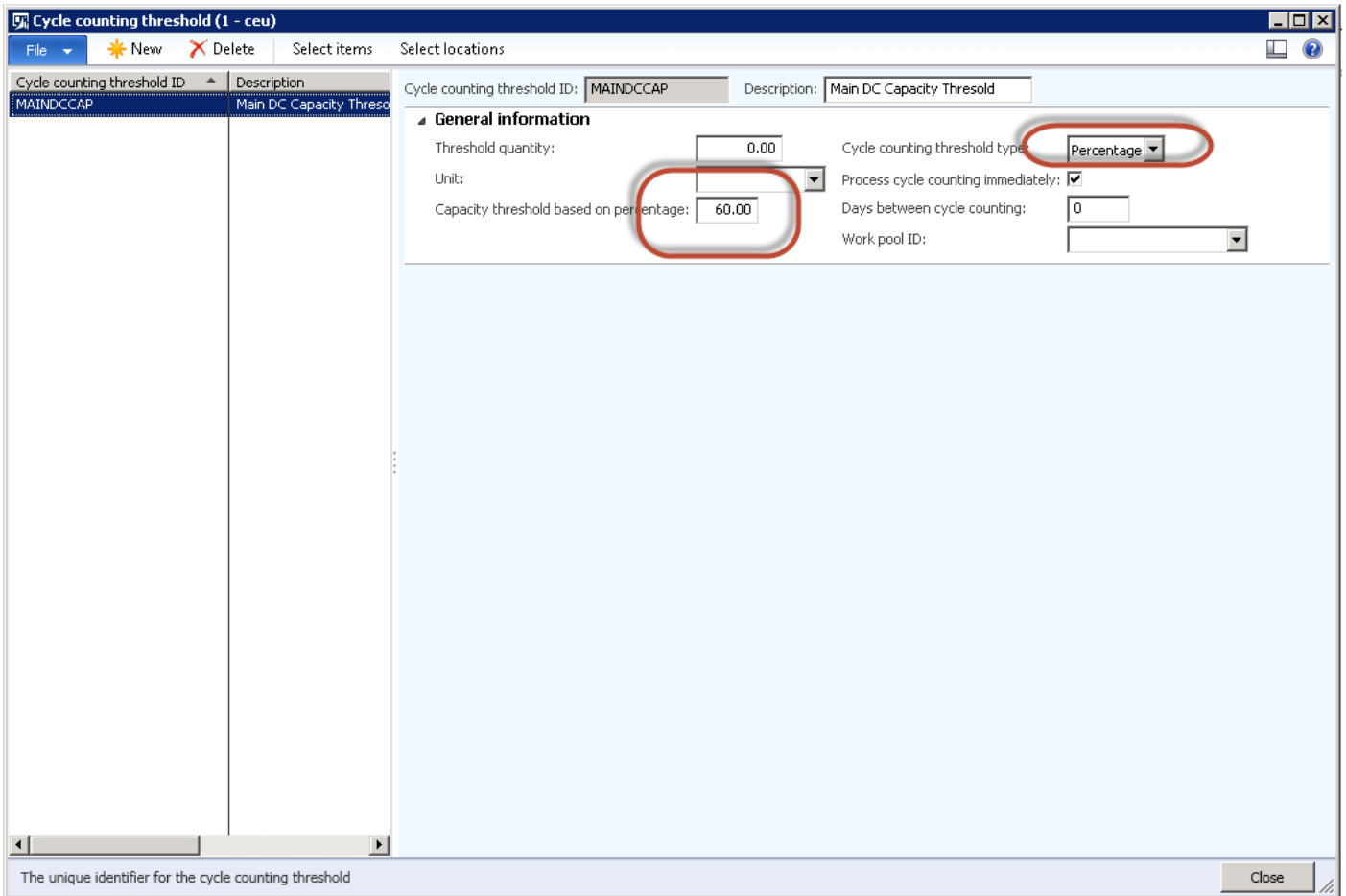
Notice the Balance Sheet account and the P&L account that were used. These are included because of the item group posting profiles for the Receipt account and the Loss account on the **Inventory** tab.



2.3.10 Capacity threshold cycle counting - case study continued

The second option available for cycle counting is the capacity threshold cycle count. The testing process is like the previous case study.

1. Create a new cycle count threshold. This time, enter 60 in the **Capacity threshold based on percentage** field.



1. Enter the **Cycle counting threshold ID**.
2. Enter a description
3. Enter the **Threshold quantity**.
4. In the **Unit** field, enter 'ea' as an abbreviation for the unit of measure.
5. Select the **Cycle counting threshold type**.
6. Select **Process Cycle counting immediately**
7. Enter 0 in the **Days between cycle counts** field.
8. On the menu, select **Select items**.
9. Add item, 1 - Butter. The quantity based counting threshold from the previous setup was removed, so you can test the new capacity function.

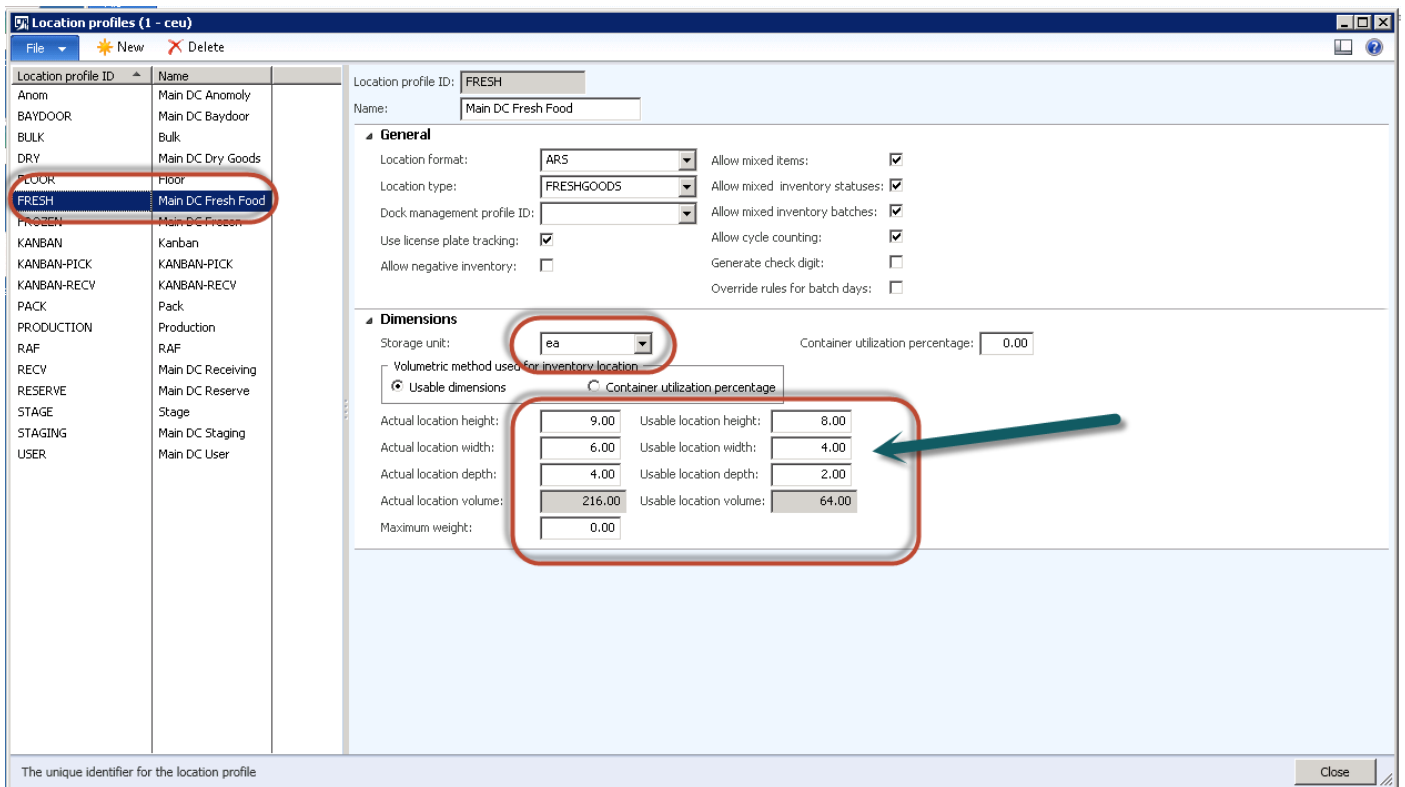
Using the capacity, Warehouse Management validates the capacity percentage against the volume of the location and the volume of the product via the unit of measure. To set the volume per location, you need to update the location profile and set the volume per item, which updates the physical dimension group.

Updating the location profile with volume data

To create location profiles, follow this navigation path:

Warehouse Management > Setup > Warehouse – Location profiles

Because you're using item, 1 - Butter, this item uses the "Fresh" location profile. Highlight that profile.



When you set up the location profile you have option to set the physical dimensions by unit of measure and you have actual location dimensions and usable location dimensions.

In this example, set the dimensions for both, as shown in the screenshot above.

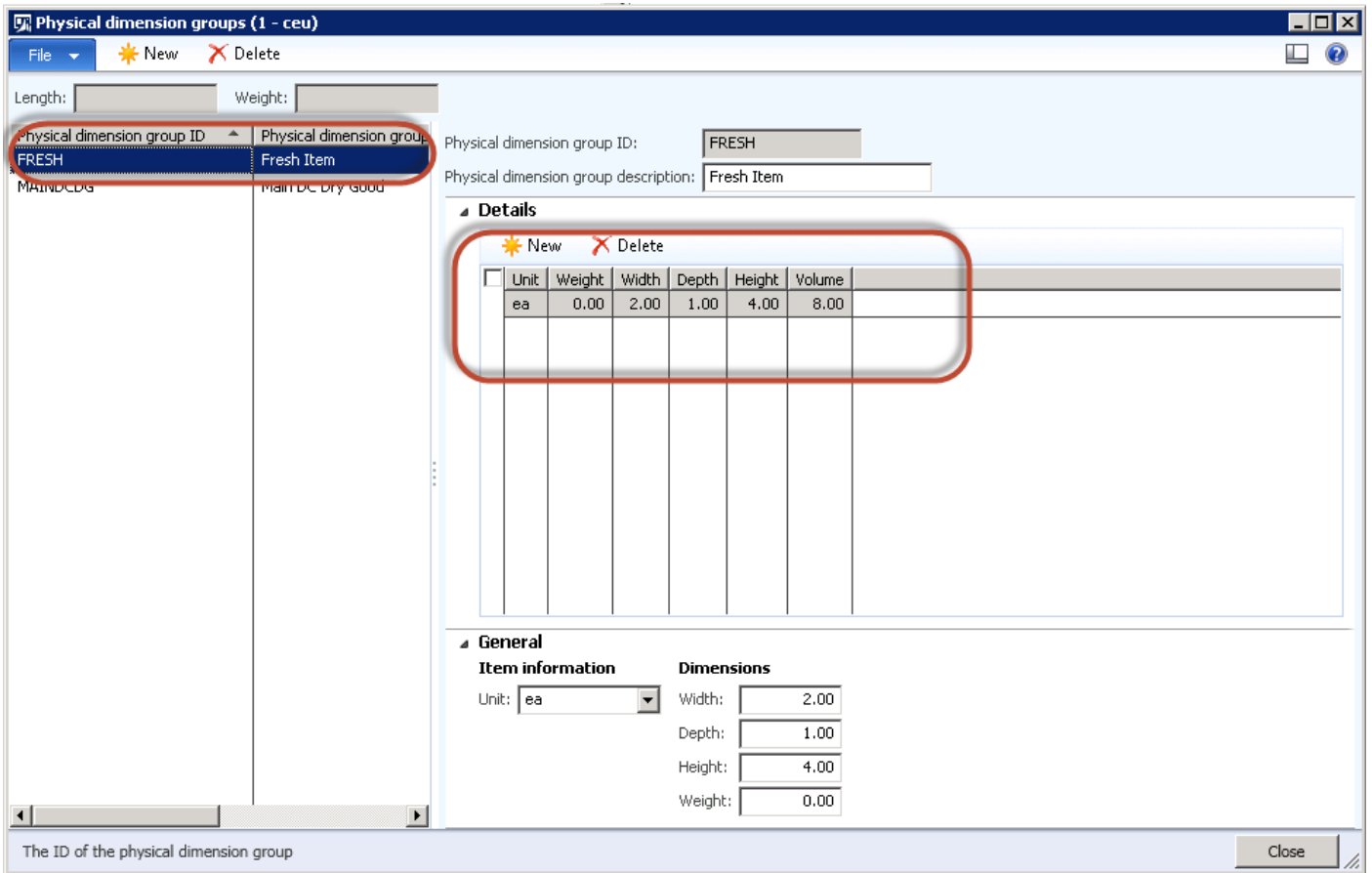
Note that the volume is calculated automatically.

After you've completed the location profile storage dimension and set the calculated volume, you can specify the physical dimension groups.

Updating the physical dimension groups

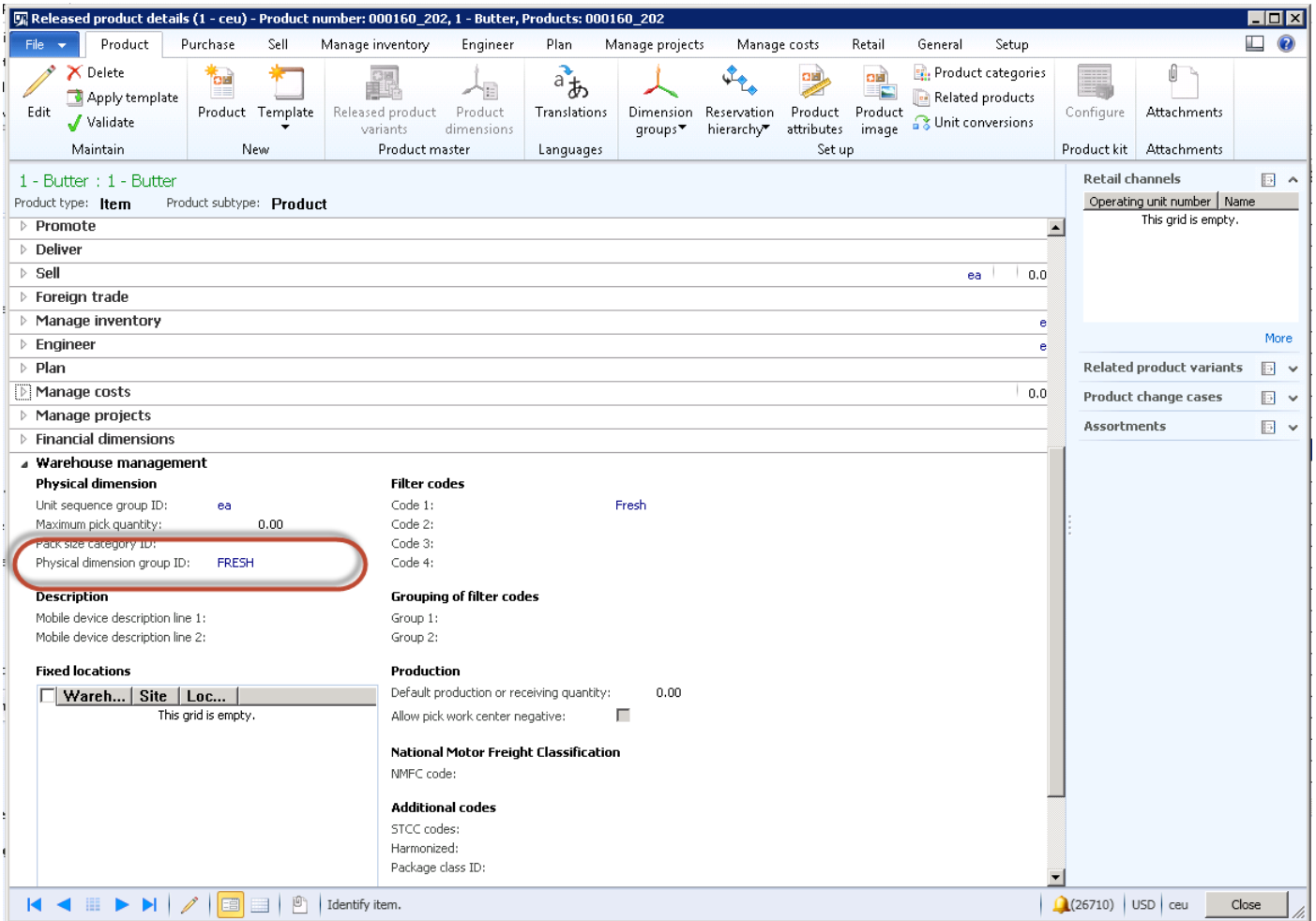
To create update physical dimension groups, follow this navigation path:

Warehouse Management > Setup > Inventory > Physical dimension groups



The screenshot shows the height, width, and depth of the inventory item. If you compare that to the location profile, this example shows that two items will display the location.

The final step of setup is to attach this Physical dimension group to the item, 1 - Butter.



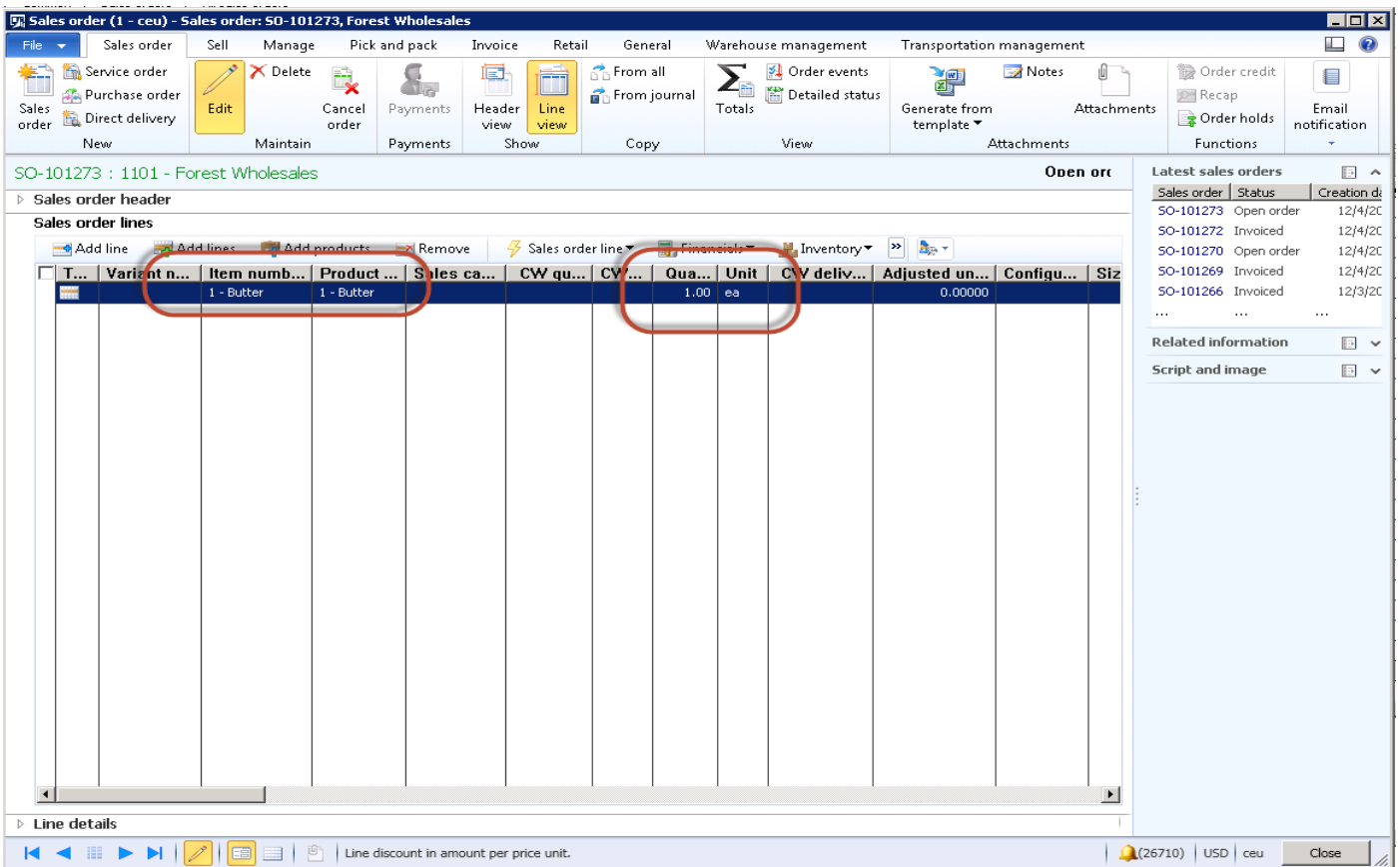
The Physical dimension group ID is now attached to the item, 1 - Butter.

Testing the setup

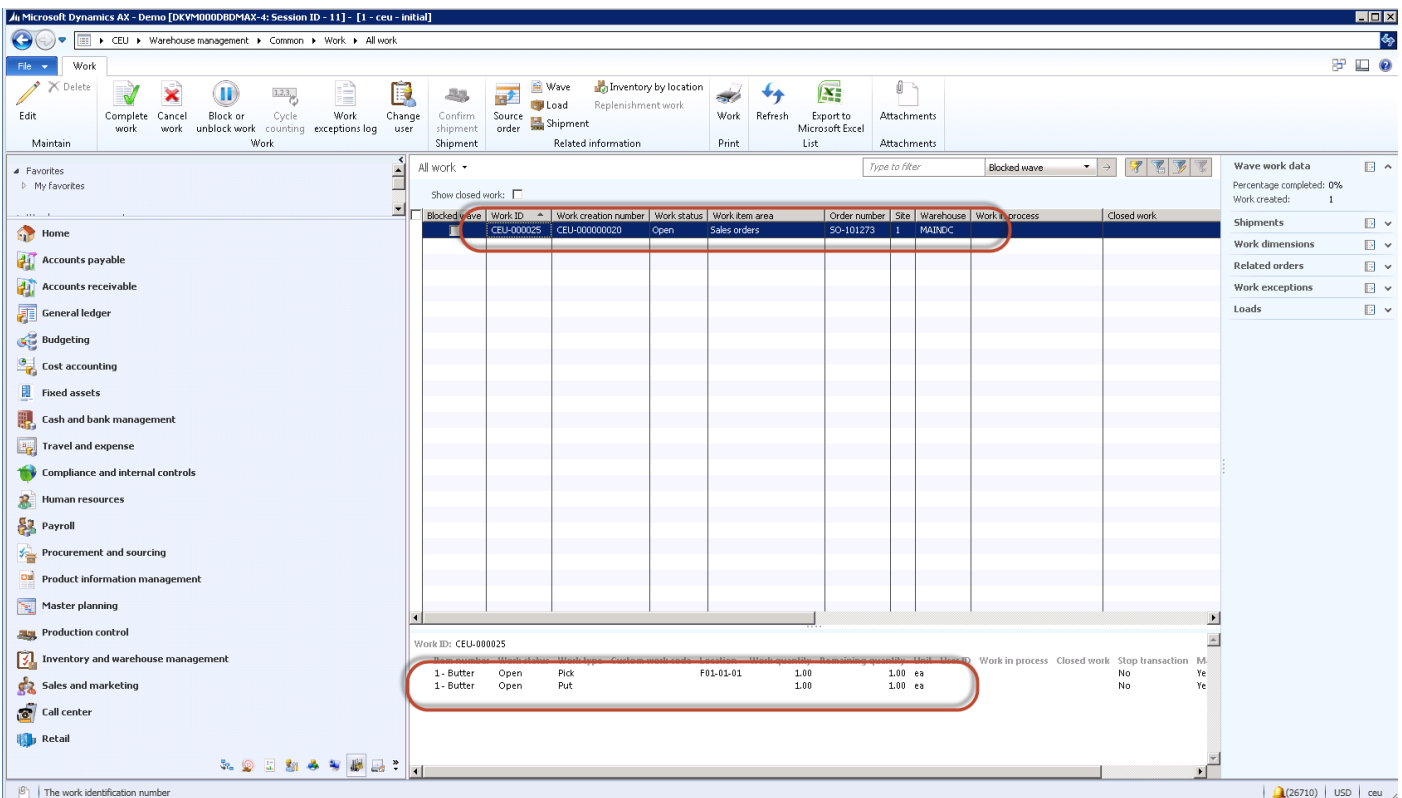
Search name	Site	Warehouse	Location	Physical inventory	Physical reserved	Available physical	Ordered in total	On order	Ordered reserved	Total available
1 - Butter	1	MAINDC	BAYDOOR							
1 - Butter	1	MAINDC	F01-01-01	11.00		11.00				11.00
1 - Butter	1	MAINDC	F01-01-02	2.00		2.00				2.00
1 - Butter	1	MAINDC	RECEIVING							

To test this setup make sure that you have a quantity of 2 items in a location. Based on the physical dimension setup and location profile dimension setup, you're at 100% capacity in that location.

1. Create a new sales order for a quantity of 1 for the item, 1 - Butter.



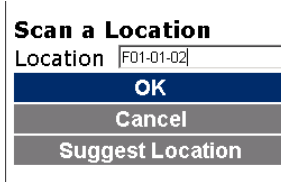
2. Follow the steps outlined above to reserve the quantity of 1.
3. Follow the steps in the previous example to release to warehouse.
4. Validate that pick work has been created.



5. Log on to the mobile device and select SO Picking from the menu.

6. Enter the **Work ID**.
7. In this example, make sure that you're picking from the F01-01-02 location. Microsoft Dynamics AX will use the F01-01-01 location for the FIFO pick. For this example, override the location and set it to F01-01-02.
8. Select the LP that you will be picking from.

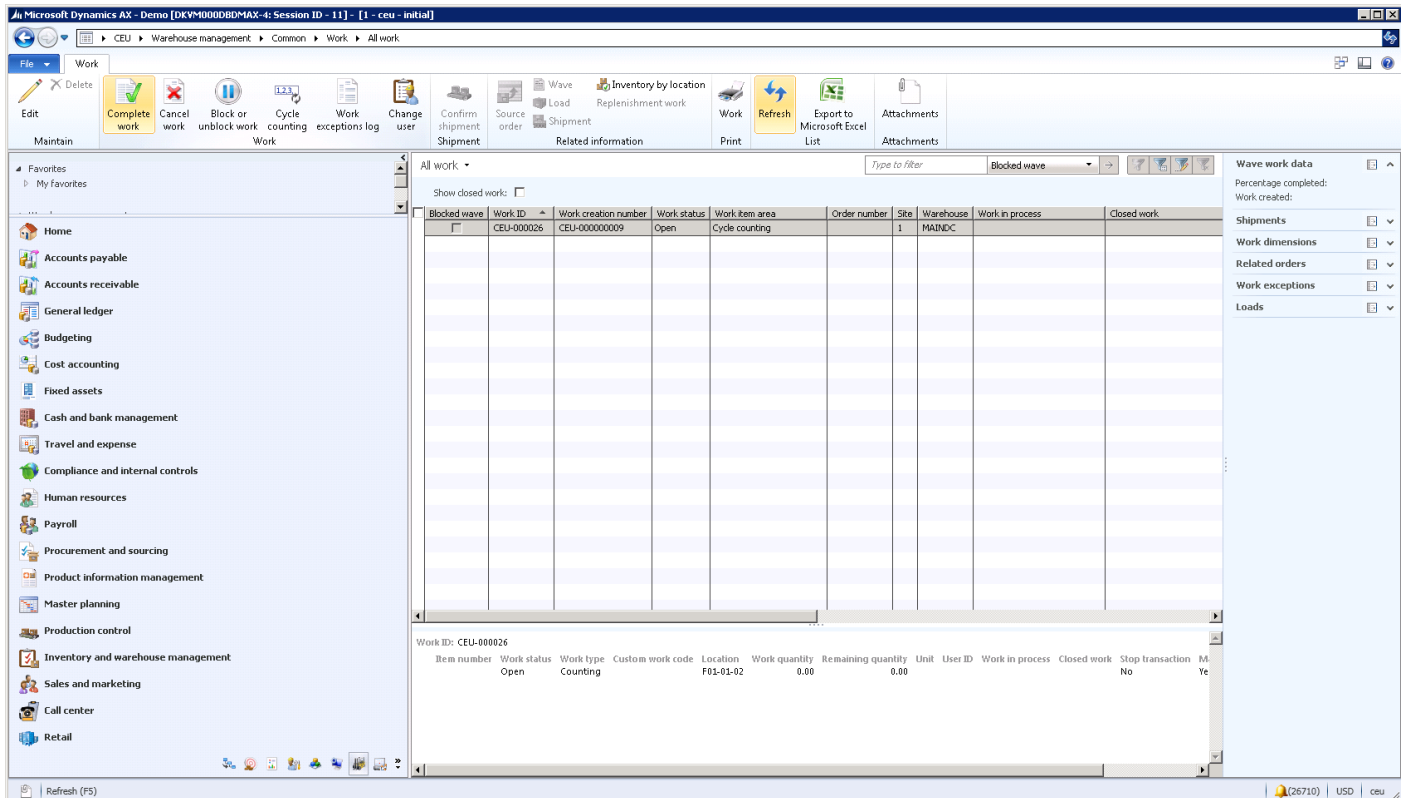
After you override the location, enter the new location to pick from.



9. Click **OK**. Follow the messages on the mobile device to complete the pick to the Baydoor.

Warehouse Management will automatically create work for a cycle count for the location because you've met a capacity threshold setting of less than 60%.

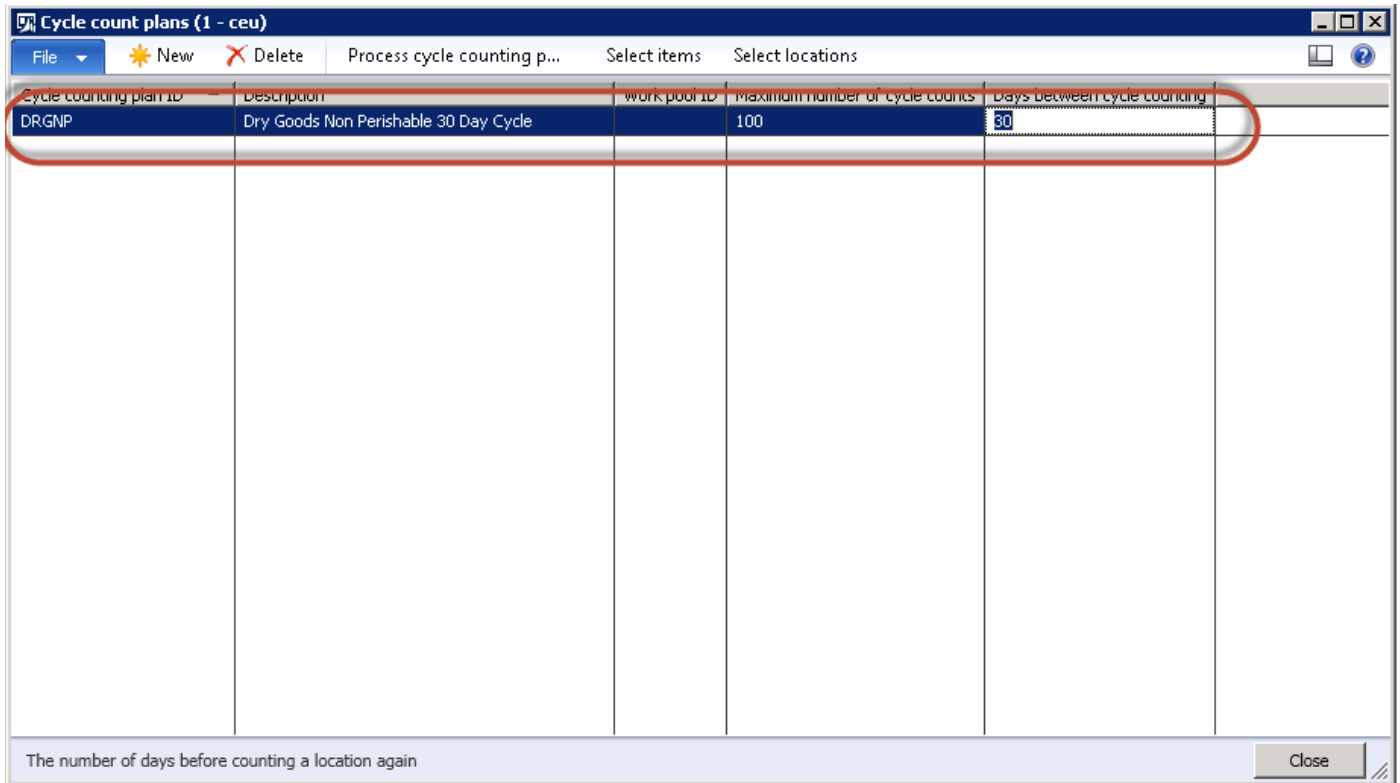
The following screenshot outlines work to cycle count the F01-01-02 location.



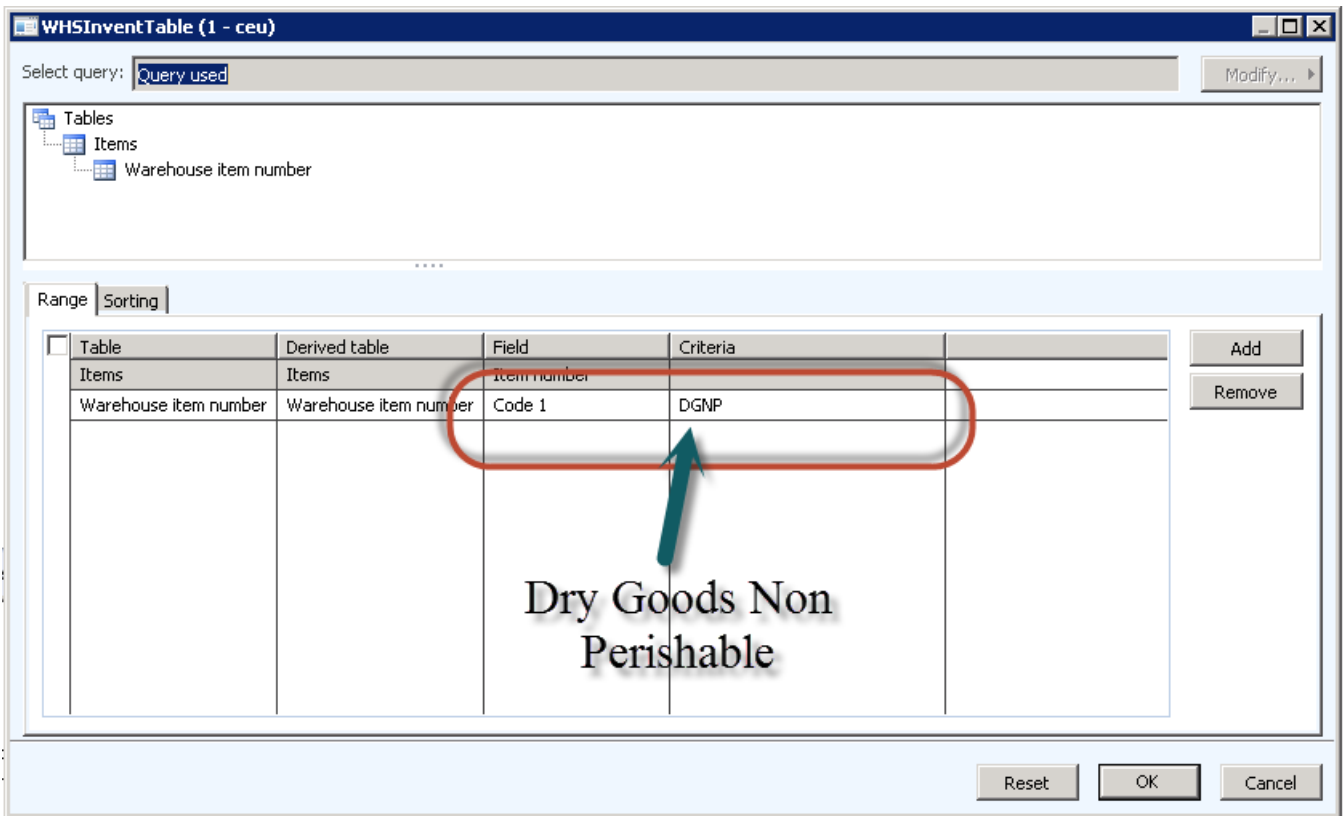
2.3.11 Cycle count plans - case study continued

Cycle count plans allow cycle count work to be automated. Each cycle count plan can be set up with specific item and location queries. When you're ready to execute a cycle count plan, click the **Execute Cycle Count Plan** button and set up a batch job for the plan. In most cases, the cycle count is based on the number of days from the last cycle, which you can set up monthly or quarterly. When the batch job runs, it will create cycle count work (up to the **Maximum number of cycle counts** specified on the plan) for all or custom intervals and the batch process will only create the work (cycle work) when the item or the items in the locations specified are due.

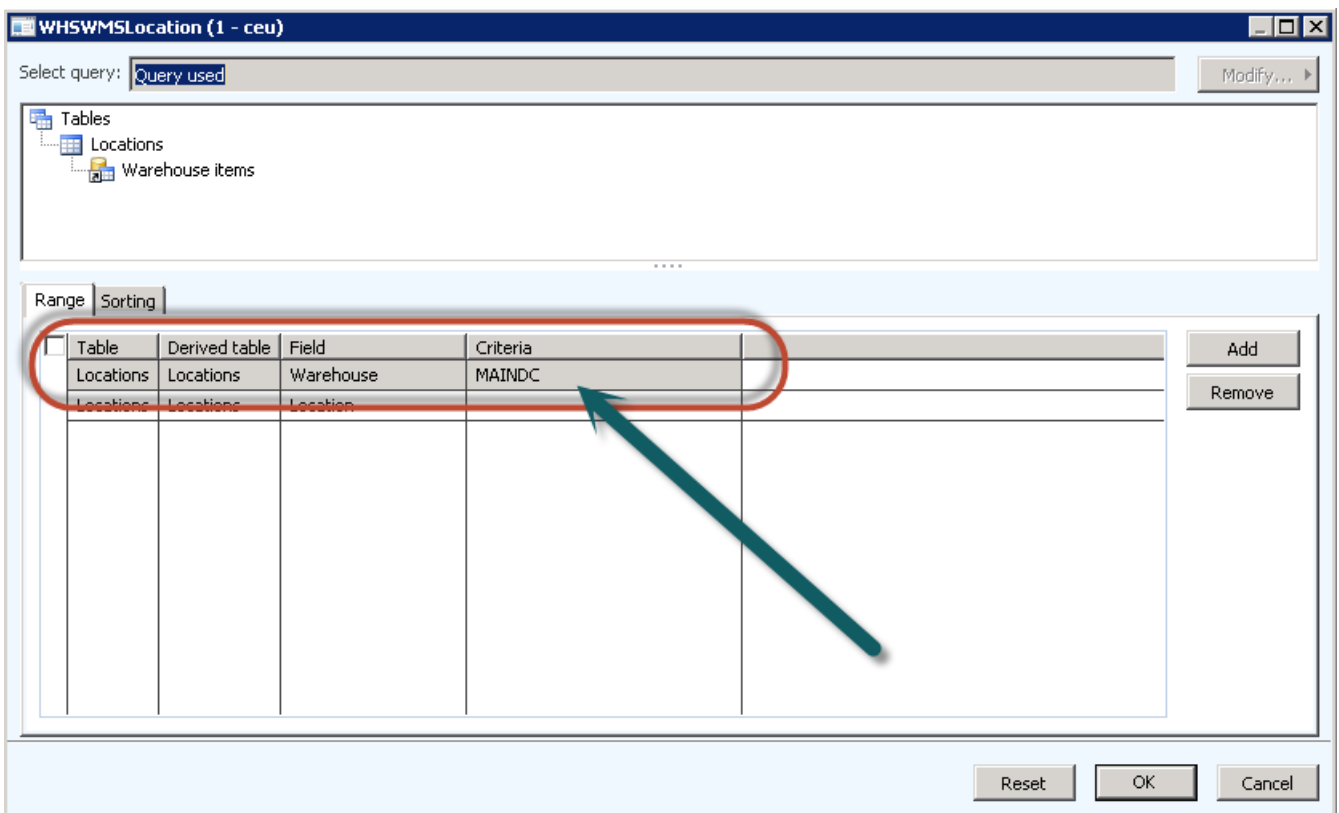
To create cycle count plans, follow this navigation path:



1. Click **New**.
2. Enter a **Cycle counting plan ID**, in this example use DRGNP.
3. Enter a description.
4. Select the maximum number of cycle counts that you want the system to generate each time it runs. This is used so that you can control workload.
5. Specify the number of days between cycle counts. This will stamp the cycle count date on the item. It will record this in the background so a second cycle count will not be created if the item falls within the time specified.
6. You must select either item filtering or location filtering to specify what you want to include in this 30-day cycle count.

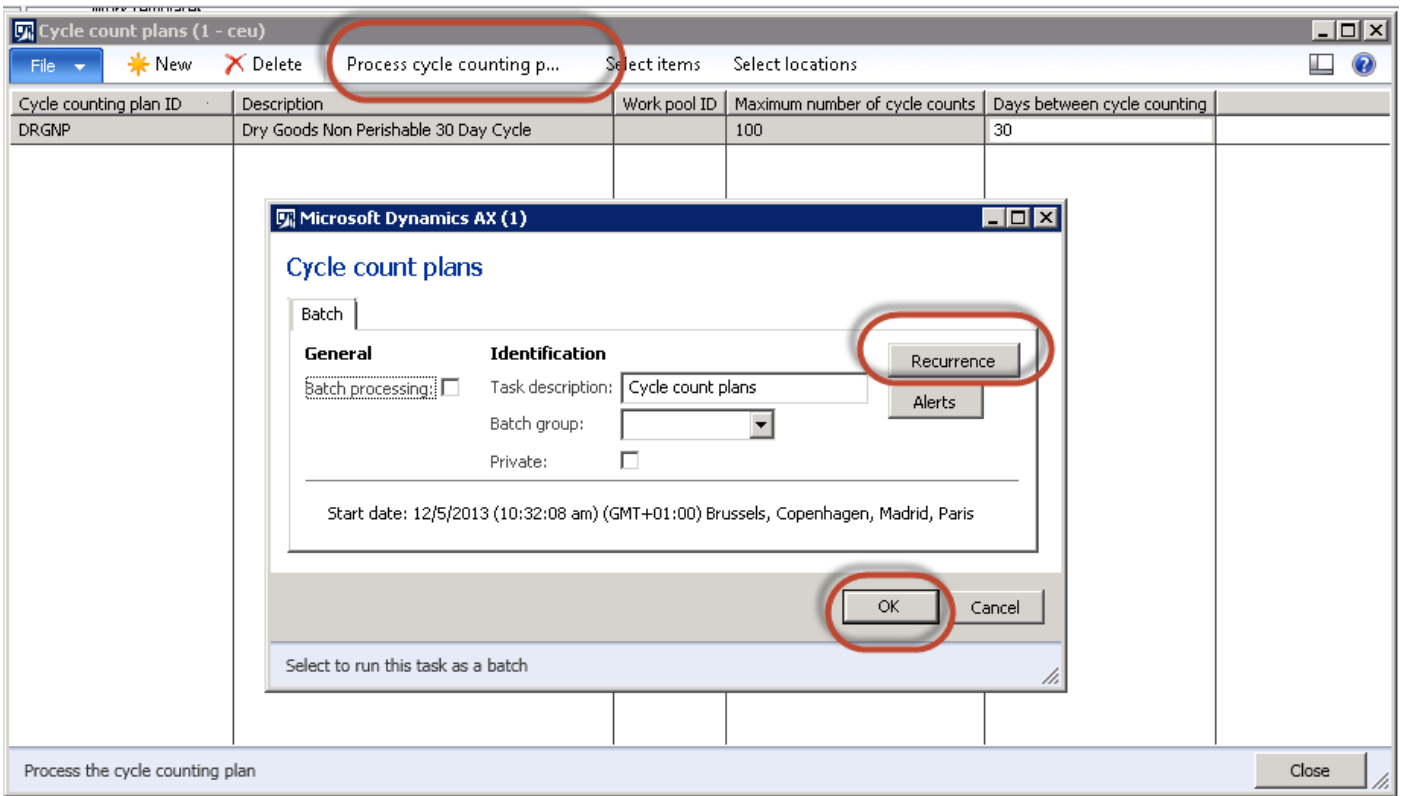


Dry goods have been defined as nonperishable, which was one of the filtering options that you specified in the inventory setup (Released Products).



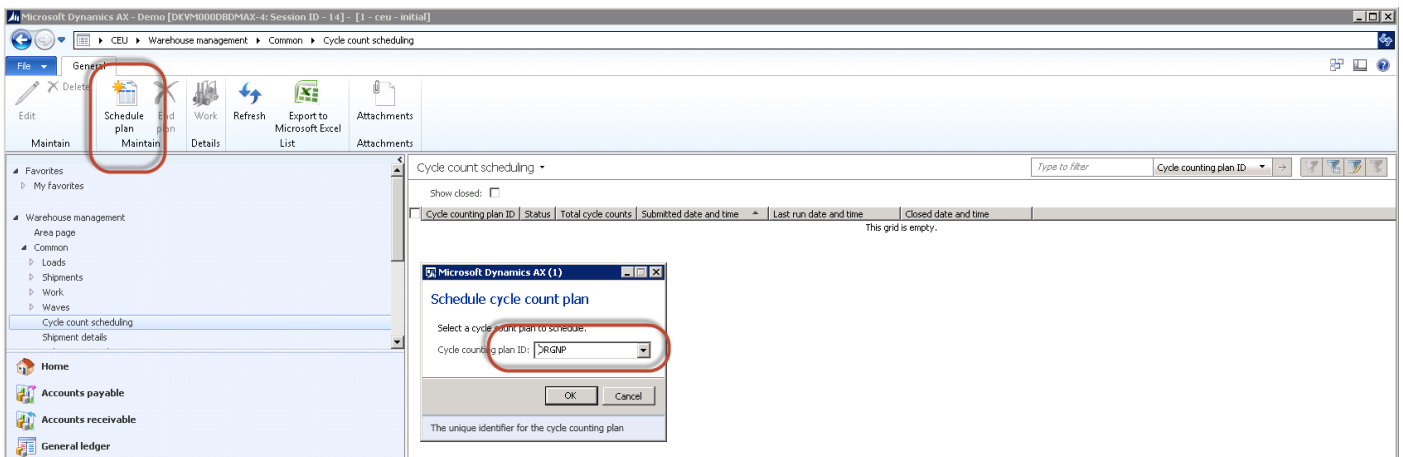
Note that the warehouse criteria is MAINDC.

To execute the cycle count plan, select **Process cycle counting** from the menu and submit this to a recurring batch.



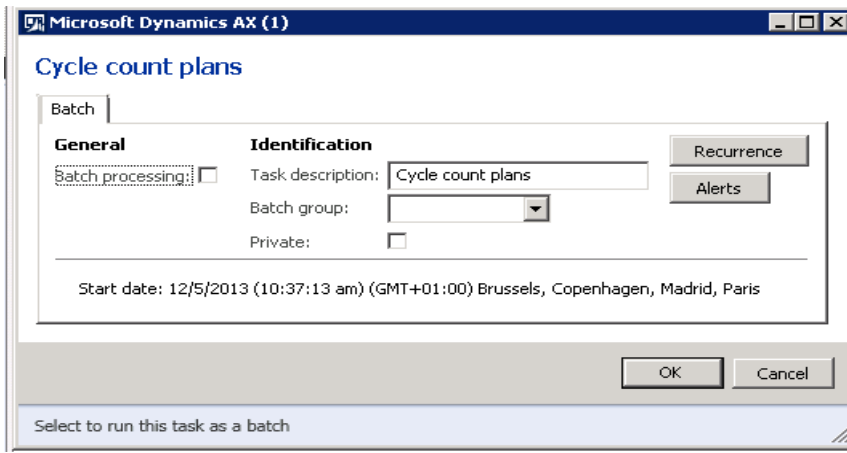
Alternatively, you can create a cycle count plan schedule.

To create a cycle count plan schedule, follow this navigation path:
 Warehouse Management > Common > Cycle Count Scheduling

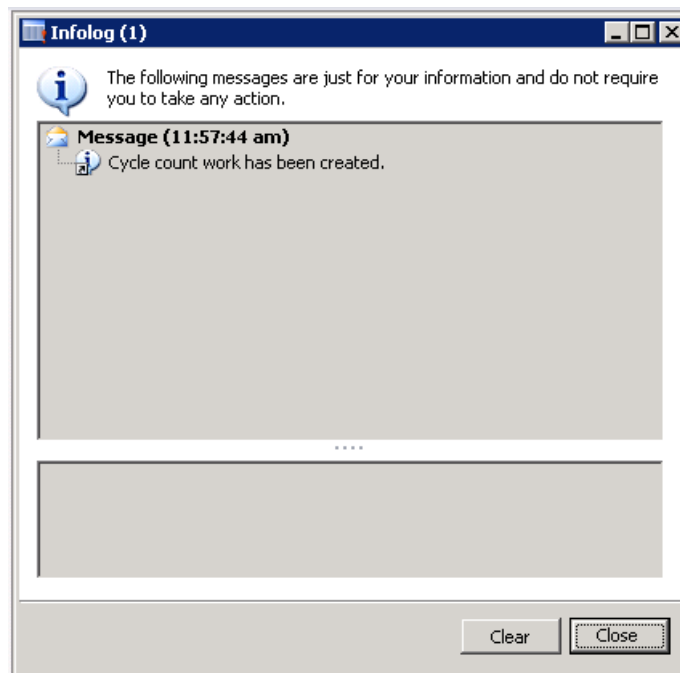


1. On the General tab, select Schedule plan.
2. Select the plan that you want to schedule. For this example, use DRGNP.
3. Click OK.

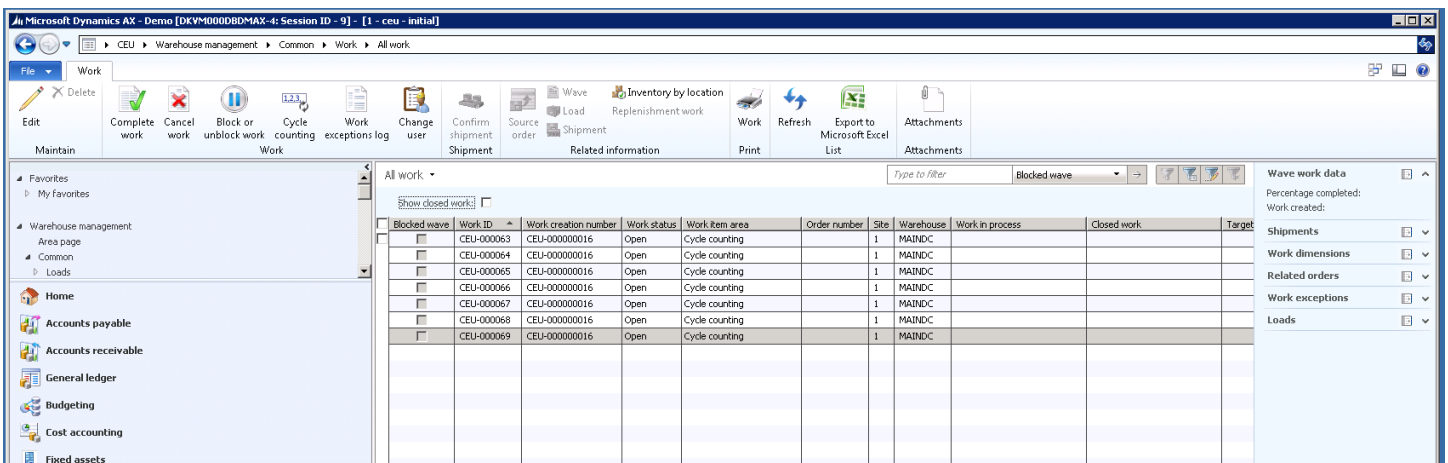
After you click OK, the batch job displays a window where you can set a recurrence on this cycle count plan.



After the cycle count is complete, a message appears outlining that work has been created.



Review the work that has been created.



2.3.12 Replenishment

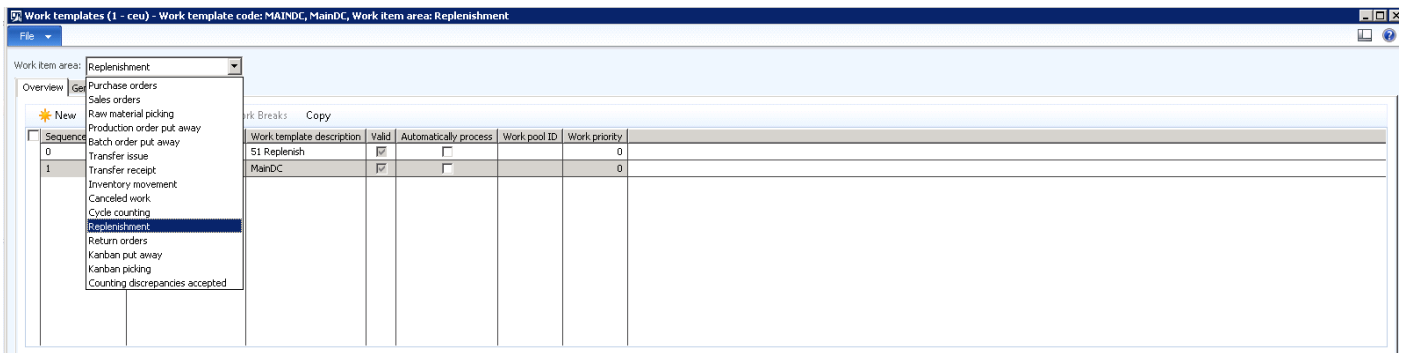
There are two types of replenishment:

- **Demand based replenishment** - Creates replenishment work for outbound orders that cannot locate inventory during work creation.
- **Min/Max replenishment** - Creates work units to restock inventory based on well-defined criteria. Minimum and maximum stocking limits are used to determine what must be restocked and by how much. After these settings have been determined, replenishment can be run manually or set up to run automatically in a batch job.

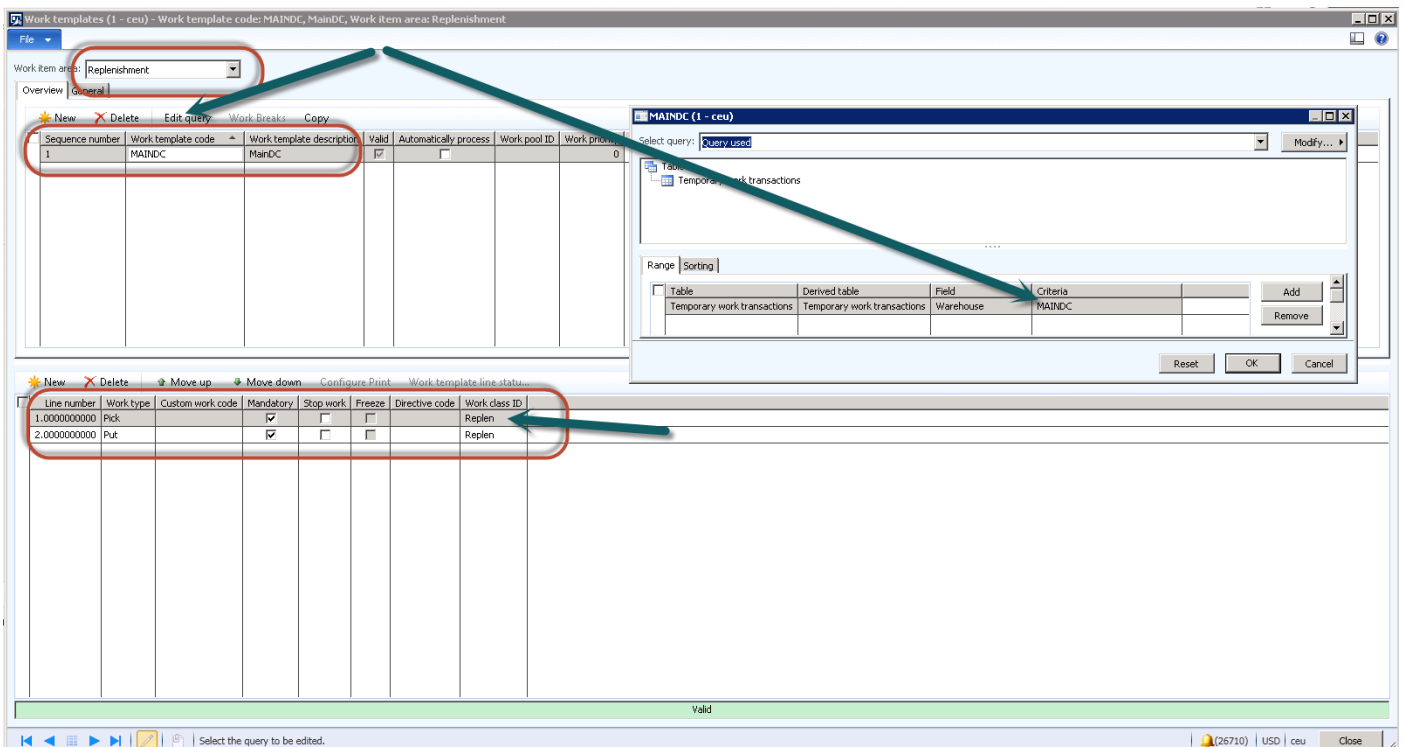
The first step in the replenishment process is to create a work template that defines the pick and put actions for potential bulk to picking location refill.

To create a work template, follow this navigation path:

Warehouse Management > Setup > Work > Work Templates



1. In the Work item area field, select Replenishment.



2. Create a new sequence number for the MAINDC warehouse.
3. On the menu, select **Edit query**, and then select the MAINDC warehouse.
4. In the lines, ensure that you have a pick with a **Work class ID** of **Replenish**.
5. Ensure that you have a put with a **Work class ID** of **Replenish**.

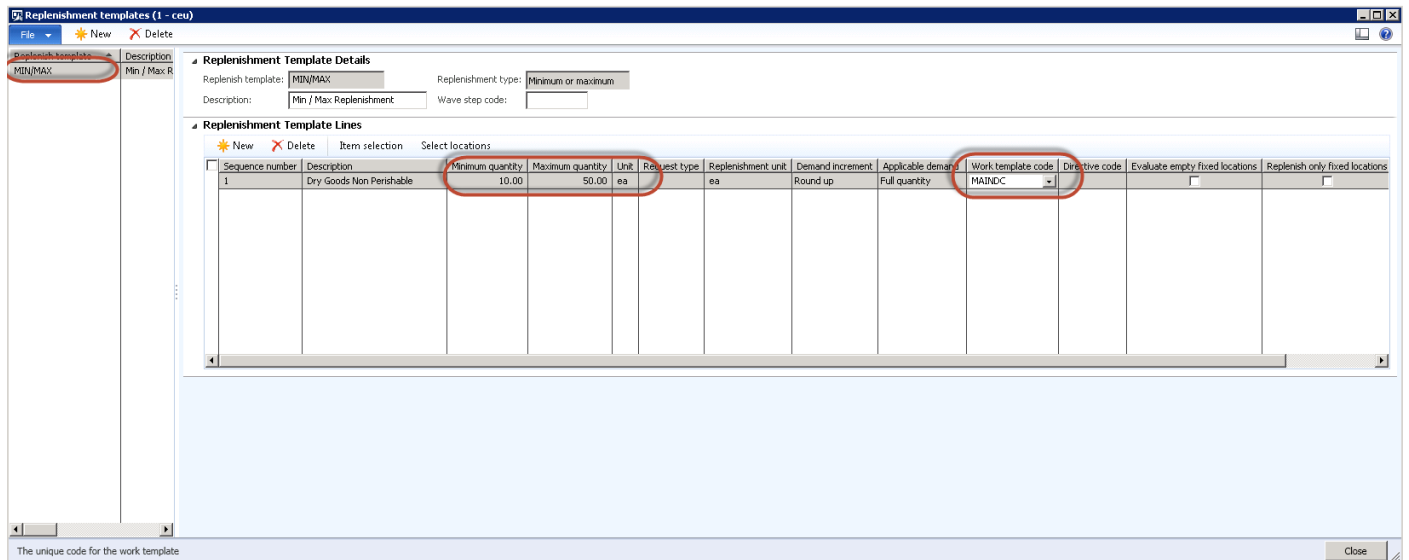
Similar to the put away work template, the work template instructs the user to pick items from a bulk location and place them in the picking location.

After the work template has been created, in order to use replenishment, you must create a replenishment template, which is a logical grouping of the sets of rules used to replenish inventory. By using multiple replenishment templates, you can choose when and how often groups of items and locations will be evaluated for replenishment.

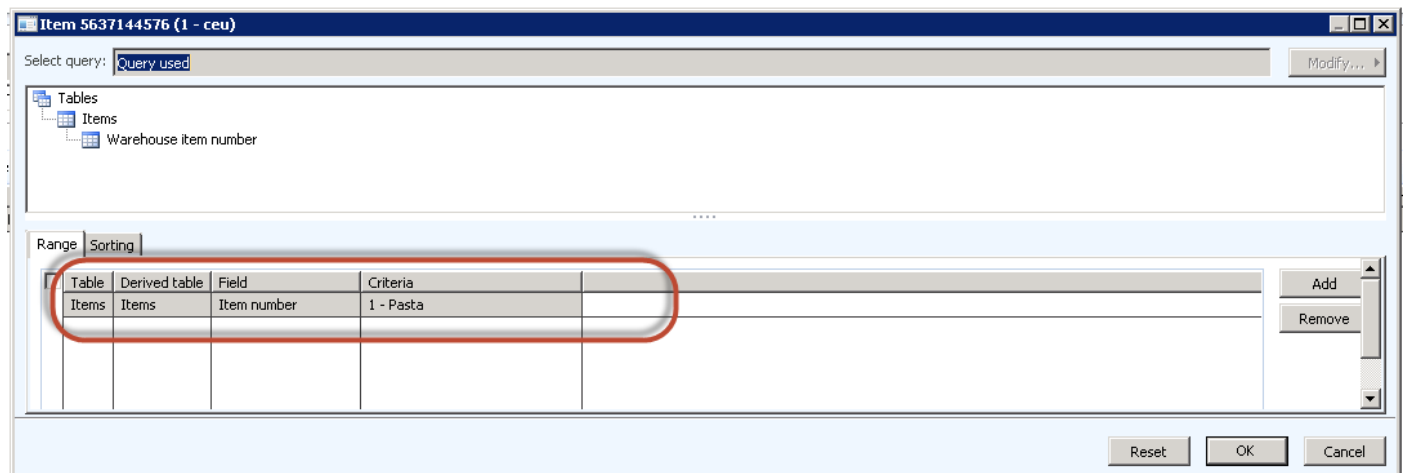
To create a replenishment template, follow this navigation path:

Warehouse Management > Setup > Replenishment > Replenishment Templates

In this example, you'll test the Min/Max Replenishment template. The minimum quantity is set to 10 and the maximum is set to 50.

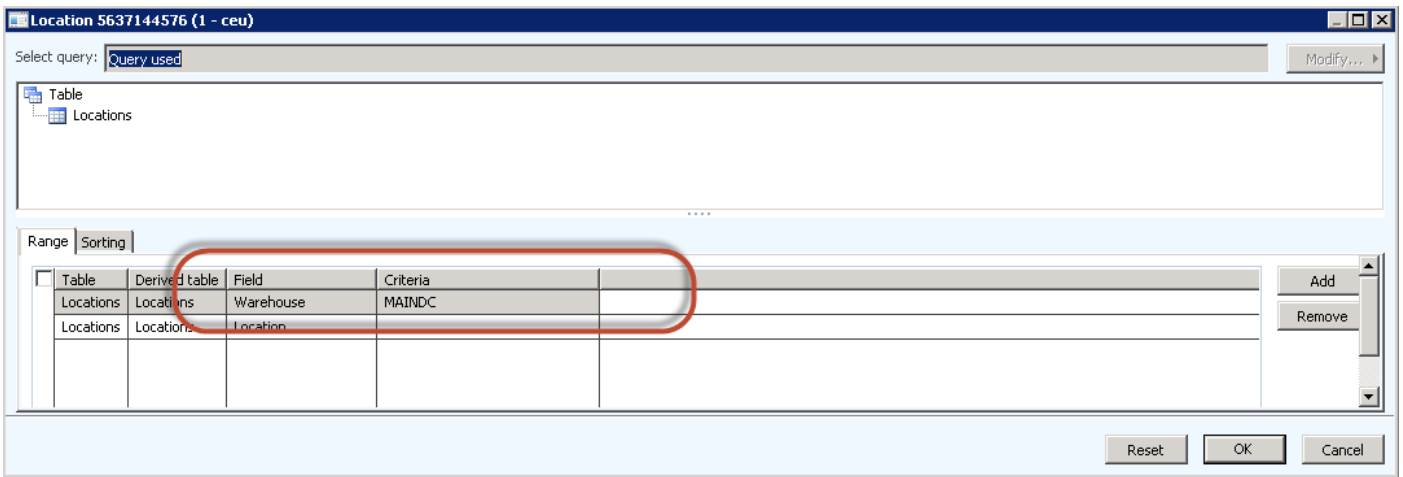


1. On the menu, select **Item selection**.



For this example, use item, 1 - Pasta, to show the process with a criteria restriction.

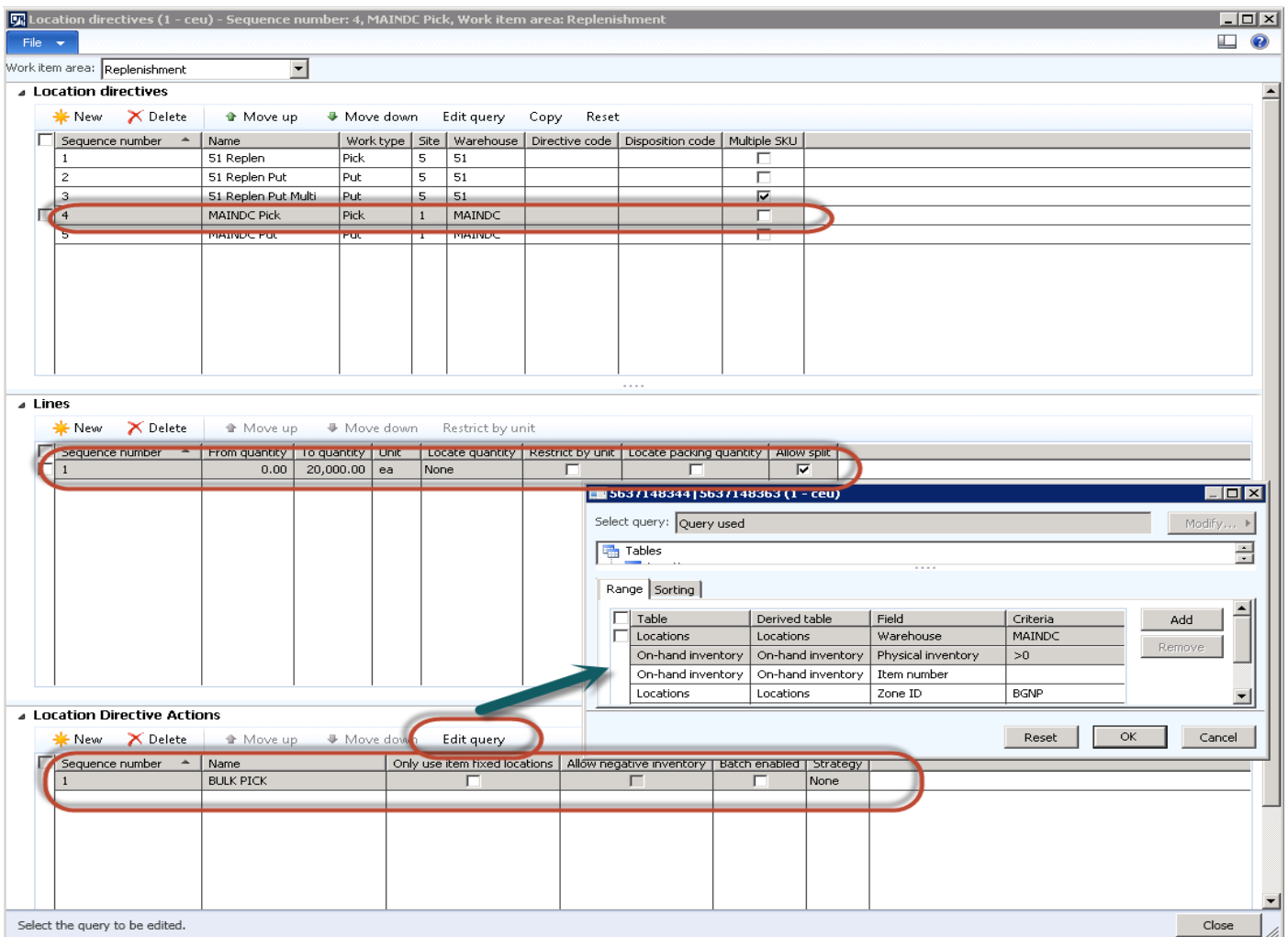
2. On the menu, select **Select Locations**.



If you do not have fixed locations specified on your items, the replenishment will only work on items with an on hand balance greater than 0.

Setting up location directives for replenishment

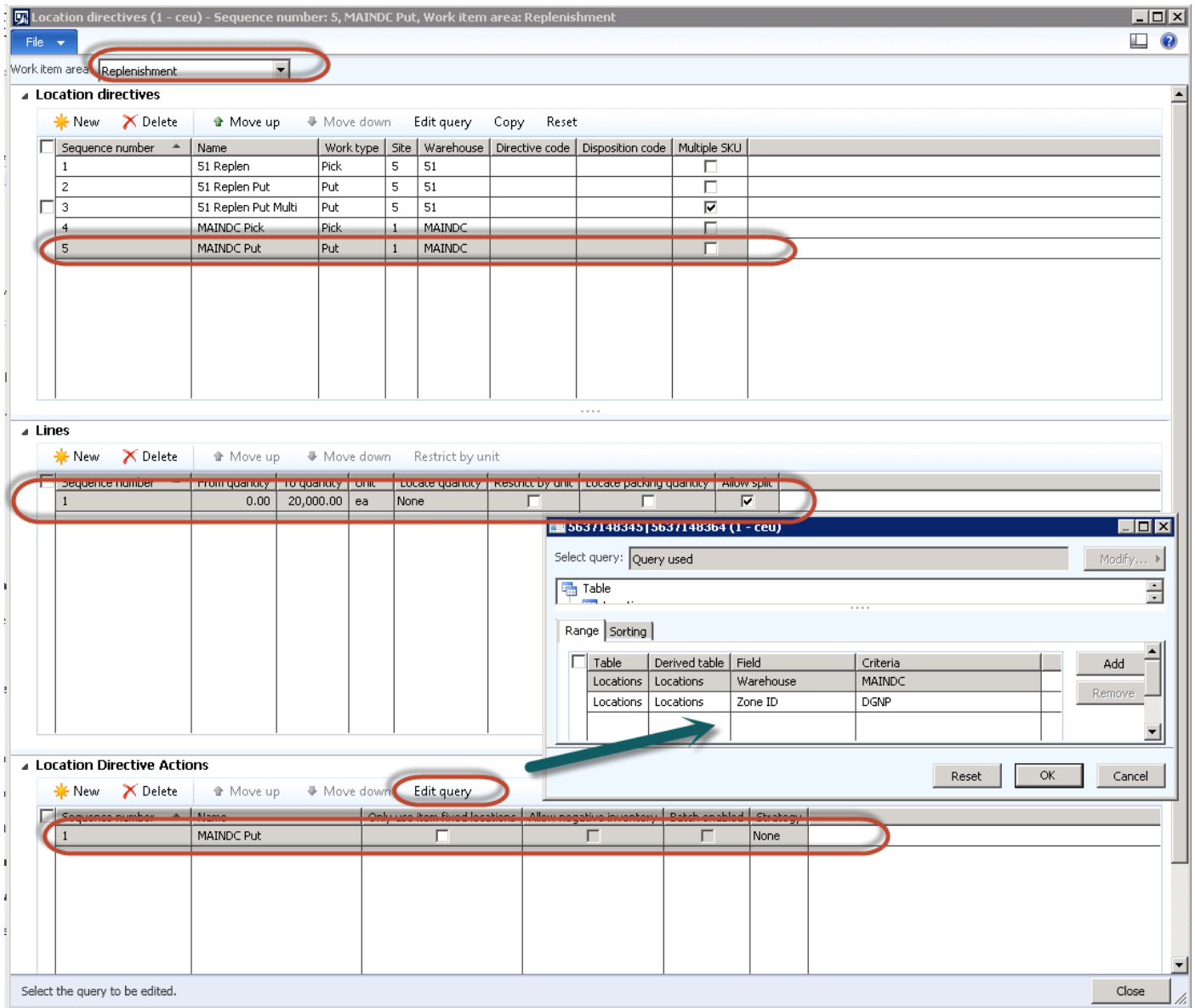
To set up location directives, follow this navigation path:
Warehouse Management > Setup > Location Directives



1. In the Work item area field, select Replenishments.
2. Create a "Pick" directive for the MAINDC warehouse.

3. In the lines, ensure that a sequence is set with a quantity on each's.
4. Ensure that the **Location Directive Actions** is set for Bulk.
5. Edit the query to specify the Bulk location zone for Nonperishable goods.

This location directive instructs the pick from the bulk. You also need a put directive to instruct the worker where to put the items.



The put directive has also been set, outlining that the replacement will take from the bulk and place it in Zone ID DGNP, specifically in the location which is below the minimum.

Review the on hand balance for item, 1 - Pasta.

The following screenshot shows location Bulk B01-02 with 100 each on hand and location D01-01-02 with a quantity of 5 on hand. Based on the setting, 5 is below the minimum of 10 so when you run replenishment, you would expect the system to create replenishment work. If you do not have any stock on hand, perform a stock adjustment and put stock in the bulk location. Replenishment will only work if the item has a quantity of more than zero.

On-hand (1 - ceu) - Closed: NoItem number: 1 - PastaItem number: 1 - Pasta, New Record

File Transactions Net requirements Intercountry on-hand Quantity adjustment Counting history Dimensions display

Overview Catch weight overview On-hand

Search name	Site	Warehouse	Location	Inventory status	Physical inventory	Physical reserved	Available physical	Ordered in total	On order	Ordered reserved	Total available
1 - Pasta	1	MAINDC		Available			105.00				105.00
1 - Pasta	1	MAINDC	B01-02	Available	100.00	45.00	55.00				55.00
1 - Pasta	1	MAINDC	D01-01-02	Available	5.00		5.00				5.00

Physical quantity available (26714) USD ceu Close

To generate replenishment, follow this navigation path:
Warehouse Management > Periodic > Replenishment

Microsoft Dynamics AX (1)

Replenishment

General Batch

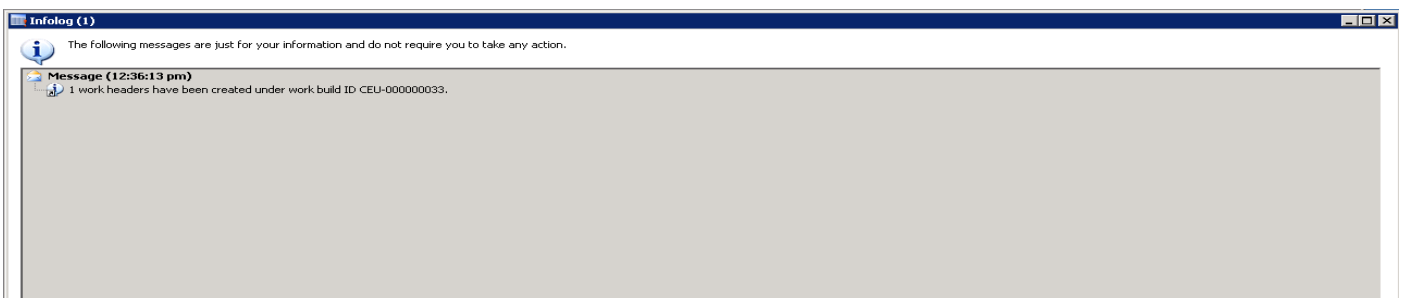
Replenishment templates Select

Replenish template: MIN/MAX

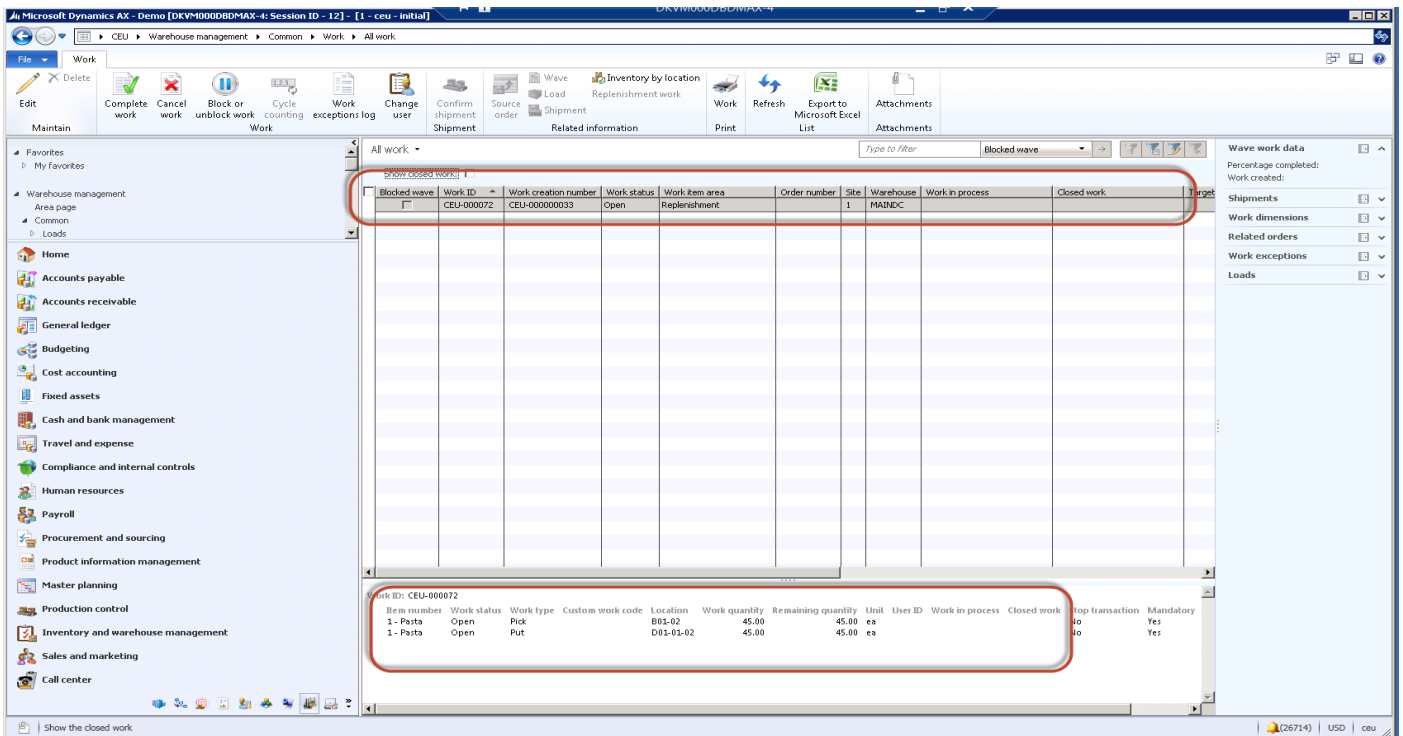
OK Cancel

Selection and setup of job search.

1. Click OK.



2. Review the work that is created.



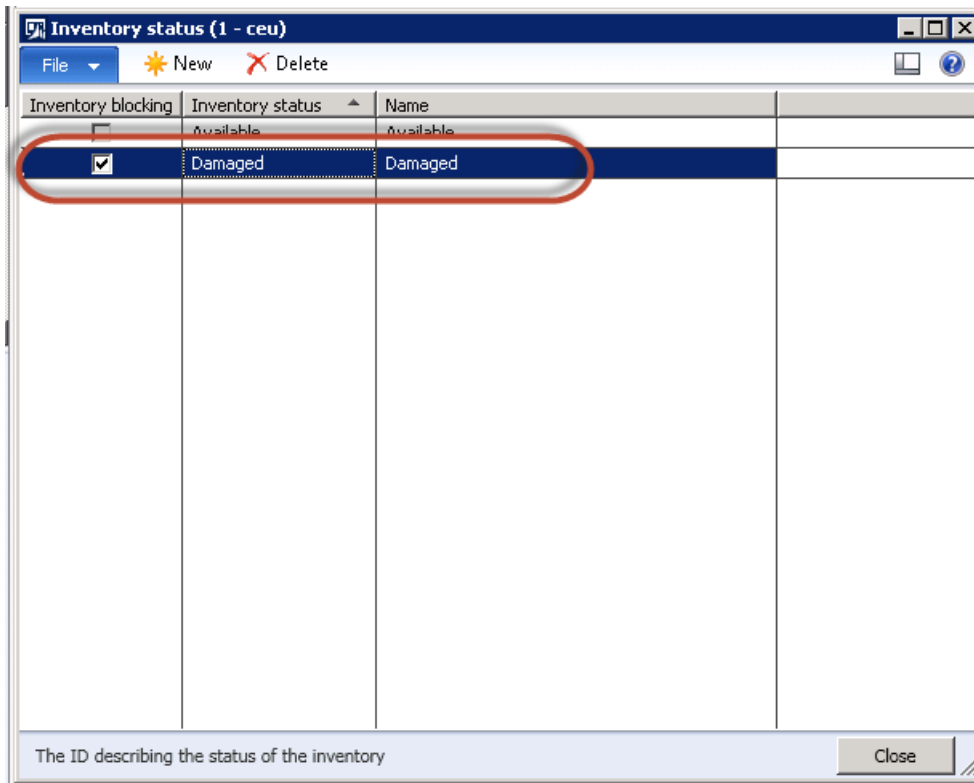
3. Complete the work on the mobile device.

2.3.13 Receive inventory with a non-good item status

In this scenario, you're going to test the process of selecting an inventory status at the time of receipt to something other than available. You can set the status on incoming goods which are considered damaged or unsaleable. The first step is to make sure that you have selected the **Inventory blocking** check box.

To change the inventory status, follow this navigation path:

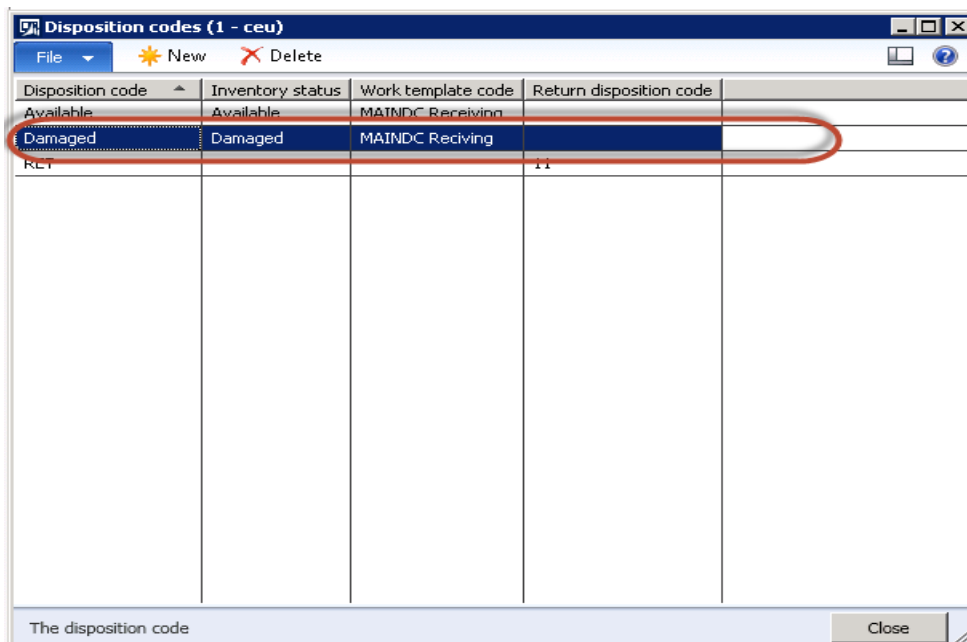
Warehouse Management > Setup > Inventory > Inventory Status



Next, make sure that the inventory status of “Damaged” has been linked to the disposition code that the mobile device will use at the time of receipt.

To change the disposition code, follow this navigation path:

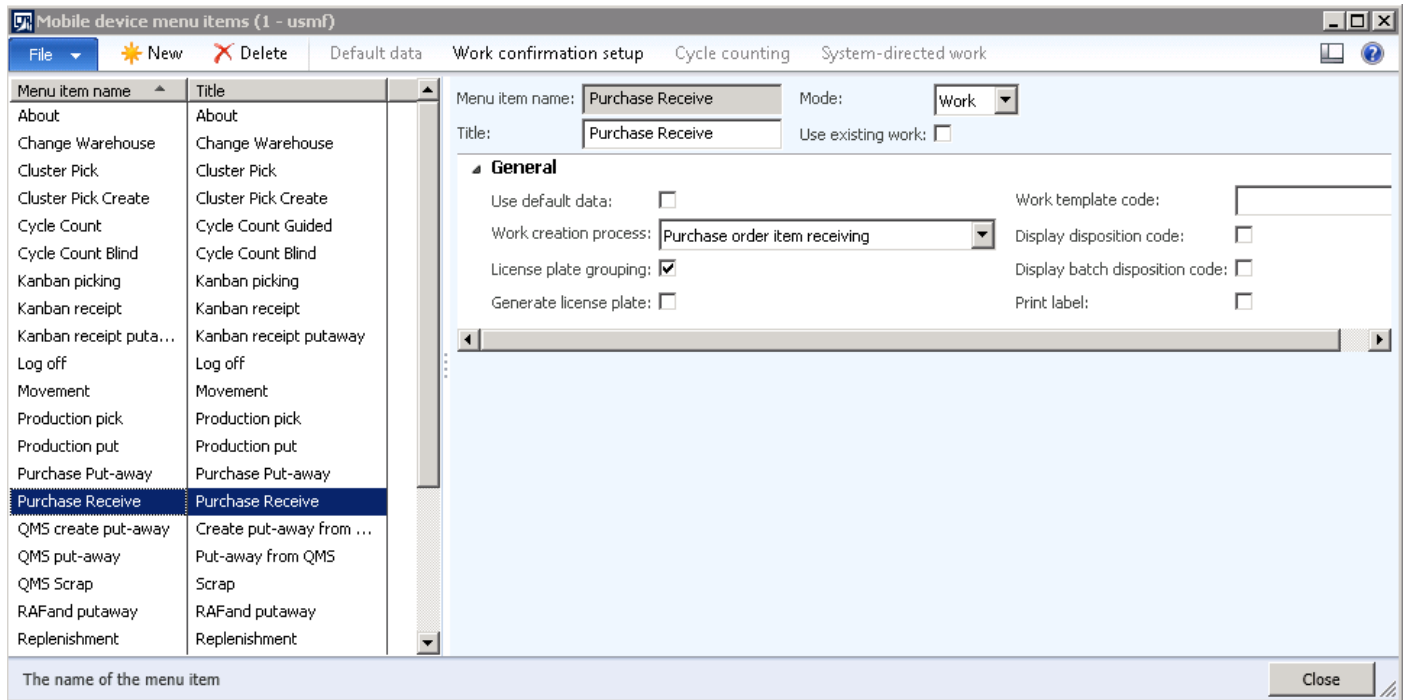
Warehouse Management > Setup > Mobile Device > Disposition Codes



Note that the disposition code and the inventory status are linked.

Ensure that the mobile device menu item has been enabled to display the “Disposition” code so that the user can select this at the time of receipt.

To change the mobile device menu items, follow this navigation path:



In the **Menu item name** field, select **Purchase receive**.

Next, test the scenario and receive a purchase order on the mobile device. This time, select the inventory status of Damaged.

In this scenario, there are two options:

- Select the disposition code of “Damaged” at the time of Purchase receive, and then override the put away location to a “Damaged” location in the warehouse. This is typically a manual override.
- Set the disposition code as “Damaged” and continue with the put away. In this scenario, Warehouse Management will set the inventory status to “Blocked” and place the item in its usual location as per the location directive, however reservation of this inventory is not possible. The item cannot be used for picking by any process. The only process that is available for a blocked status item is the ability to move it around the warehouse. In this scenario, what typically occurs is an automated process to move inventory from the default picking location is blocked, and placed in a damaged location. This work can be created by a batch.
 1. Ensure that you’ve created a purchase order, use item, 1 – Butter, as previously tested.
 2. Log on to the mobile device.
 3. Select the inbound process.
 4. Select **Purchase receive**.

PO Receipt

PONum

Item

1 - Butter

LineNum

Qty

Unit

Disposition code

Note that the disposition code is visible and enabled so that you can select the "Damaged" code.

This will place the item in the location as Blocked status.

2.3.13.1 Working with multiple units of measure on the put away

In all of the inbound processes you've seen the generation of purchase orders in the quantity of each and you've set up location directives not to restrict any processing by unit of measure. In the next example, you're going to work through a scenario where there is a location directive that will automatically put inventory away to a bulk location if order is by the pallet.

The following screenshot shows how you define the lines for both PL put away and EA put away. Notice on line, sequence 1, that there is a line to restructure by pallet. This means that only units of measure specified on the PO will use this line sequence to determine where to place goods in the warehouse.

Location directives (1 - ceu) - Sequence number: 4, MAINDC Fresh, Work order type: Purchase orders

File

Work order type: Purchase orders

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
1	42 Putaway	Put	4	42			<input type="checkbox"/>
2	51 Putaway	Put	5	51			<input type="checkbox"/>
3	60 Putaway	Put	6	60			<input type="checkbox"/>
4	MAINDC Fresh	Put	1	MAINDC			<input type="checkbox"/>

....

Lines

New Delete Move up Move down Restrict by unit

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate picking quantity	Allow split
1	0.00	100.00	PL	None	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	0.00	100.00	ea	None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

....

Location Directive Actions

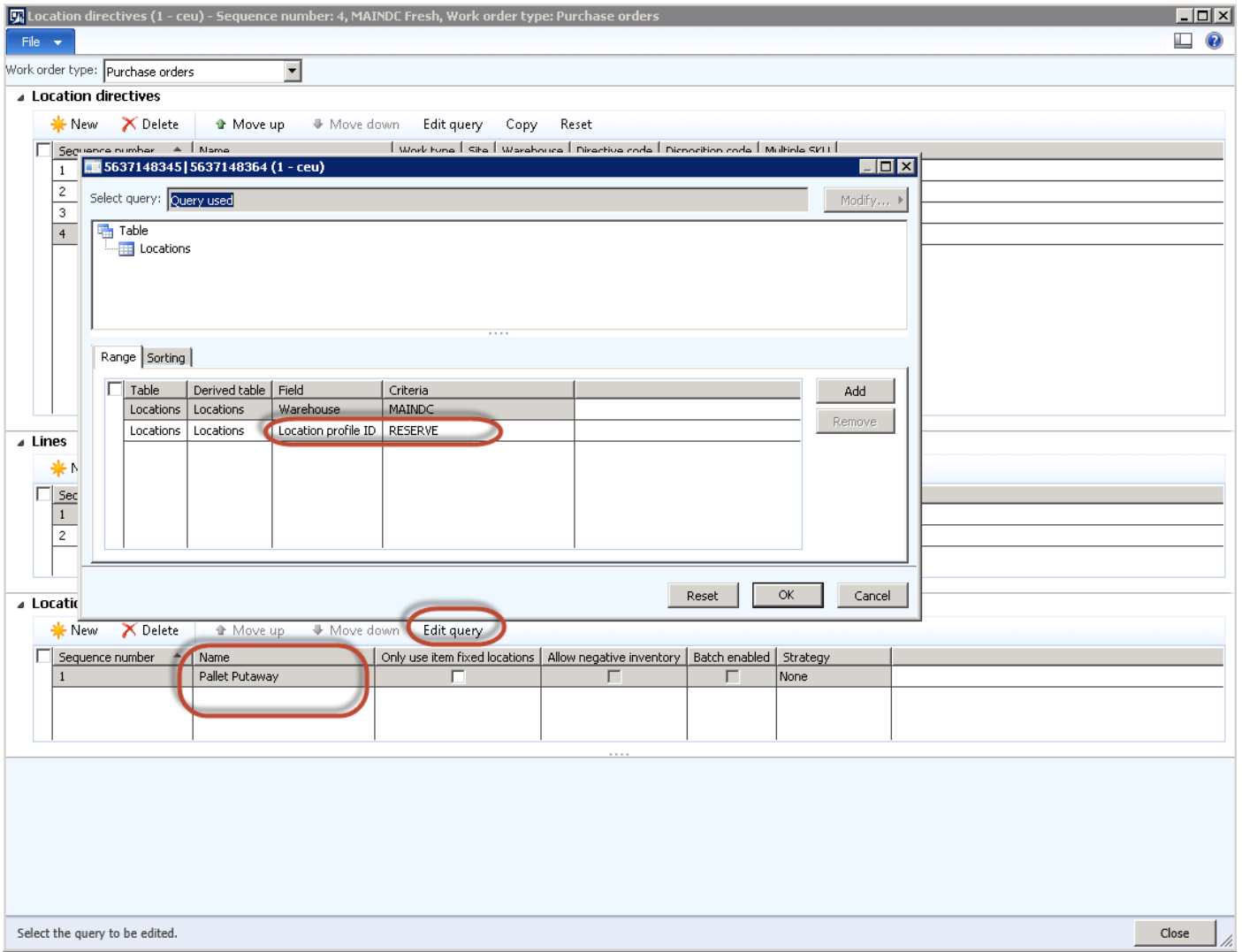
New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Pallet Putaway	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

....

The type of work order for which a location directive is defined

Close



The query on the location directive action has been specified to put away to a **Reserve** location.

To test the scenario, create a PO for item, 1 – Butter, for a 1 PL quantity.

All purchase orders ▾ Type to filter Purchase order ▾ →

Purchase order	Vendor account	Name	Invoice account	Purchase type	Approval status	Status	Direct delivery
000413	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000414	1001	Earth Televisions	1001	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000415	1001	Earth Televisions	1001	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000416	1001	Earth Televisions	1001	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000417	1001	Earth Televisions	1001	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000418	1001	Earth Televisions	1001	Purchase order	Confirmed	Invoiced	<input type="checkbox"/>
000421	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000424	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000425	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000426	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000427	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000428	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000429	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000430	1001	Earth Televisions	1001	Returned order	Confirmed	Invoiced	<input type="checkbox"/>
000431	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000432	1001	Earth Televisions	1001	Returned order	Confirmed	Invoiced	<input type="checkbox"/>
000433	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>
000434	1001	Earth Televisions	1001	Purchase order	Approved	Open order	<input type="checkbox"/>

000434

Purchase order: 000434
 Currency: USD
 Name: Earth Televisions

Line number	Item number	Product name	Procurement category	CW quantity	CW unit	Quantity	Unit	Unit price	Net amount
10	1 - Butter	1 - Butter				1.00	PL	50.00	50.00

Log on to the mobile device and create a PO receipt. After complete, review the work created.

All work ▾ Type to filter Blocked wave ▾ →

Show closed work:

Blocked wave	Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID	Shipment ID	Wave ID	Created
<input type="checkbox"/>	CEU-000001	CEU-000000001	Open	Purchase orders	000413	4	42			test1				1/24/201
<input type="checkbox"/>	CEU-000026	CEU-000000025	Open	Purchase orders	000421	1	MAINDC			LPMP516				1/24/201
<input type="checkbox"/>	CEU-000030	CEU-000000029	Open	Purchase orders	000424	1	MAINDC			LPMP518				1/24/201
<input type="checkbox"/>	CEU-000031	CEU-000000030	Open	Purchase orders	000425	1	MAINDC			LPMP519				1/24/201
<input type="checkbox"/>	CEU-000034	CEU-000000033	Open	Purchase orders	000426	1	MAINDC			LPMP521				1/24/201
<input type="checkbox"/>	CEU-000041	CEU-000000040	Open	Purchase orders	000433	1	MAINDC			LPCL1				1/27/201
<input type="checkbox"/>	CEU-000053	CEU-000000057	Open	Purchase orders	000434	1	MAINDC			LPBULK1				1/28/201

Work ID: CEU-000053

Item number	Work status	Work type	Custom work code	Location	Work quantity	Remaining quantity	Unit	User ID	Work in process	Closed work	Stop transaction	Mandatory	Work class ID
1 - Butter	Open	Pick		INBOUND	1.00	1.00	PL			No	No	Yes	PO Receipt
1 - Butter	Open	Put		B01-01	1.00	1.00	PL			No	No	Yes	PO Receipt

Note that work has been created to put the PL away to a bulk location.

3 Case study – Outbound/Picking process

Sales entry in Warehouse Management for Microsoft Dynamics AX 2012 R3 is basically the same as standard Microsoft Dynamics AX. The standard order entry screen is used, and most of the fields are the same. There are some additional tabs/buttons added to the form to give visibility into the various functions of Warehouse Management for sales order processing, which are described later in this section.

One of the key elements of Warehouse Management is the concept of deferred reservations. This section outlines what this represents.

3.1 Understanding the flows in outbound

3.1.1 *Outline of the outbound process*

There are several terms which must be defined in order to understand the outbound process in Warehouse Management for Microsoft Dynamics AX.

To ship sales order details, Warehouse Management for Microsoft Dynamics AX creates shipments and loads.

A *shipment* can be one or multiple sales orders going to the same destination. A shipment is a group of sales orders for the same customer or for the same destination.

A *load* is a group of sales orders grouped together and typically going out on a single truck, rail car, or other mode of delivery.

A load can have one or many shipments, and a shipment can have one or many sales orders.

Warehouse Management for Microsoft Dynamics AX replaces the pick list and packing slip processing of sales orders. If an order is run through standard Warehouse Management processing, the posting of pick lists and packing slips are handled by Warehouse Management.

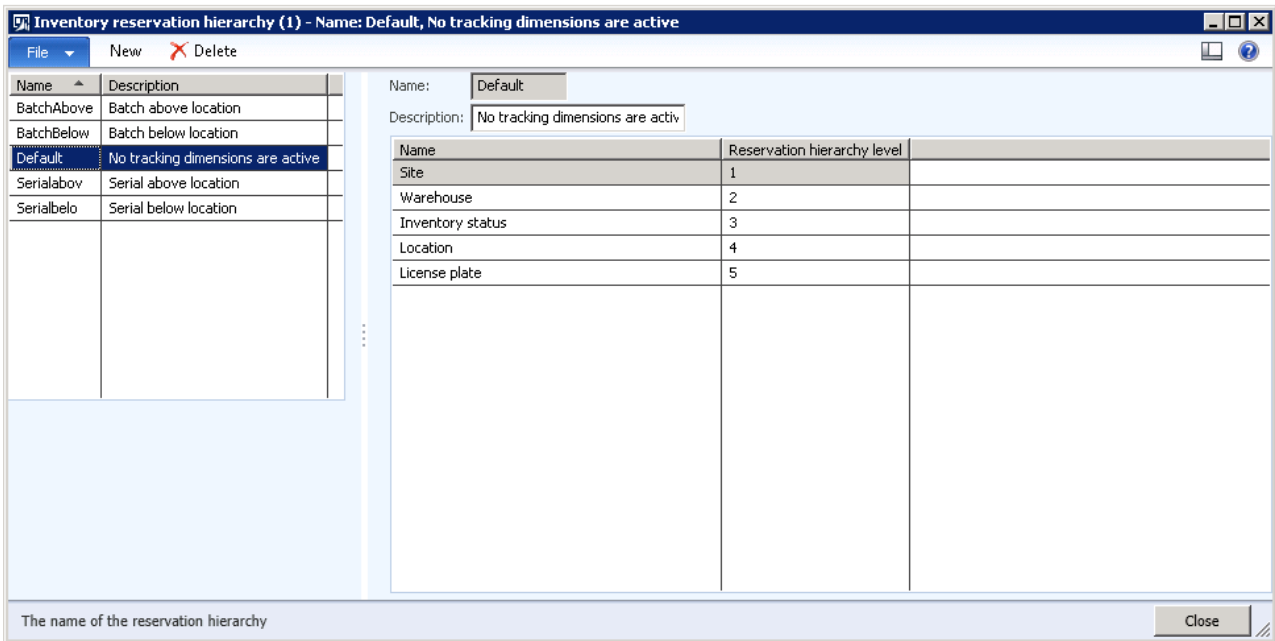
3.1.2 *Set up the reservation hierarchy*

You do not have to specify all inventory dimensions for an item in order to reserve against it. Instead, reservation totals are kept at many levels for items. This is accomplished through the reservation hierarchy.

Reservations and availability buckets are kept at each of these hierarchy levels, and totaled at each level. Serial numbers and batch numbers are optional based on the desired inventory dimension setup. Also, license plates are optional, because not all locations will have license plates.

To set up the reservation hierarchy, follow this navigation path:

Warehouse Management > Setup > Inventory > Reservation Hierarchy

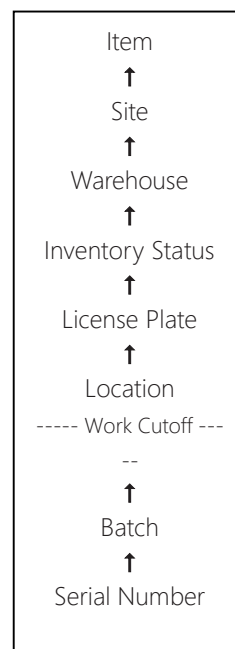
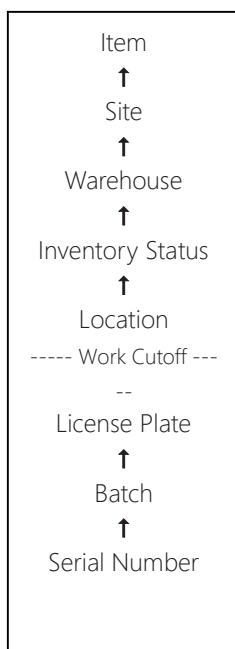


In the inbound process, it was required that you set a reservation hierarchy against the products that you're using for the inbound process flows. In the outbound/picking process, the hierarchy process becomes much more relevant. You'll notice in the screenshot some hierarchies are defined, which outline a default reservation process, and several options are defined, including both batch and serial number reservation.

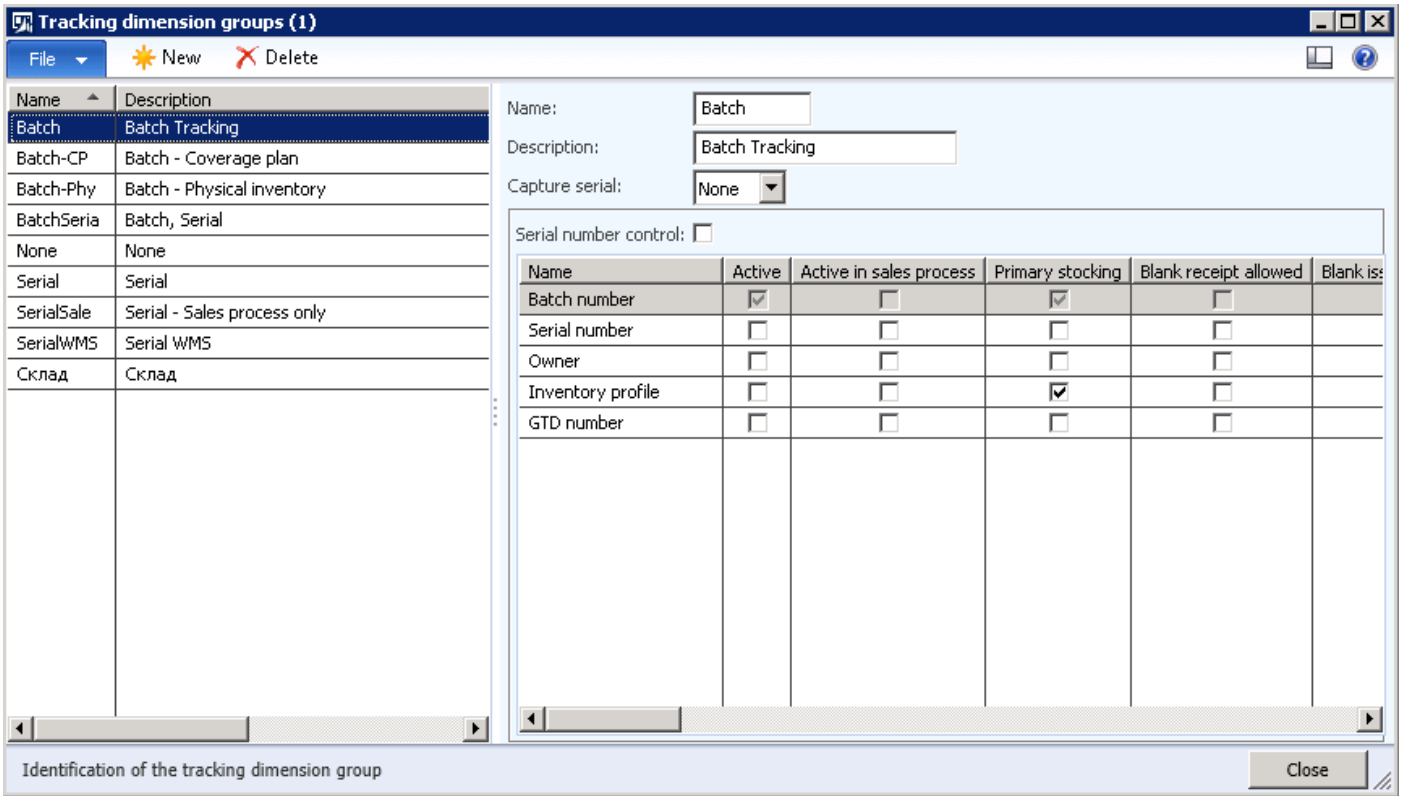
In the illustration on the left, the cutoff point for reservations is the location. This means that any items that are above the location cutoff are used in the automatic reservation. In this example, the reservation process uses the inventory item, at the nominated warehouse, and then checks the inventory status and reserves stock at that location. Everything that falls below the location line is not automatically reserved.

To extend this example, let's include license plate in the reservation hierarchy. To do that, move the license plate above the location cutoff line, as shown in the illustration on the right.

When using batch and serialized items, it's important that you use the tracking dimension group setting to nominate that your inventory is batch controlled or serial controlled.

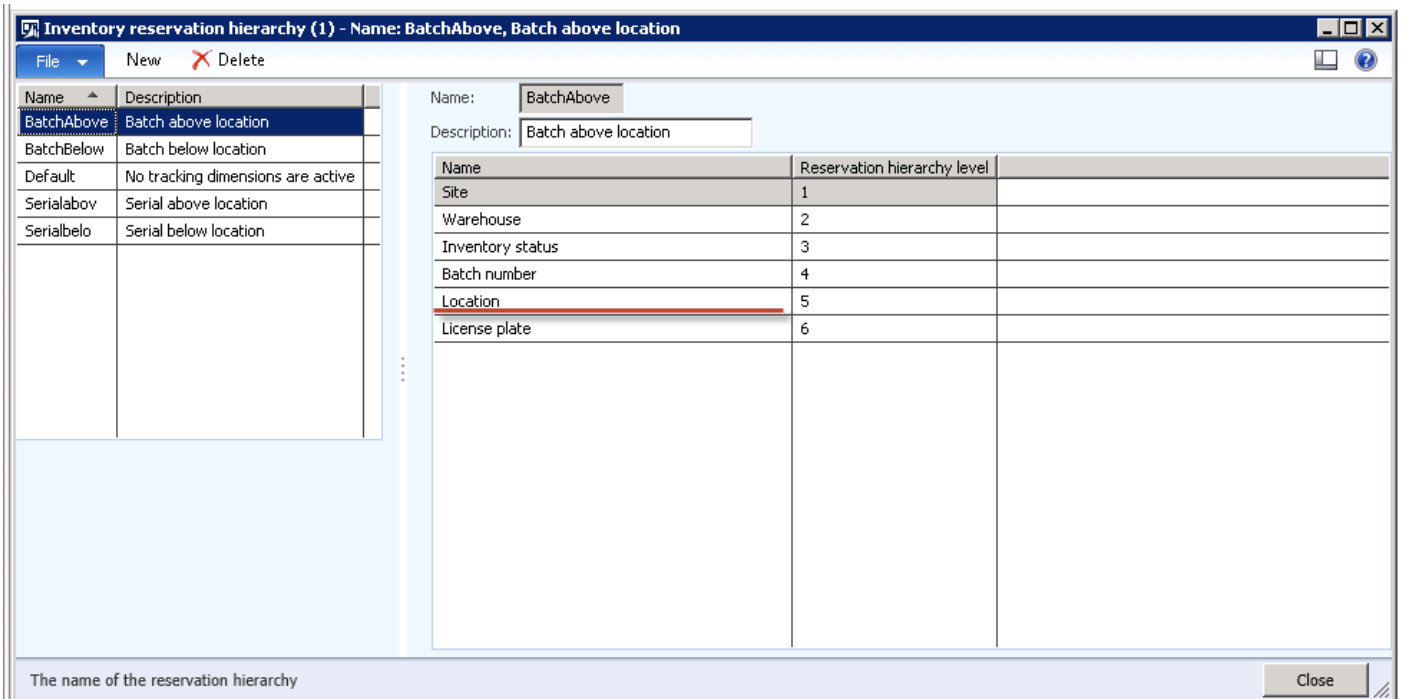


To set up the tracking dimension group, follow this navigation path:
 Product information management > Setup > Tracking dimension groups



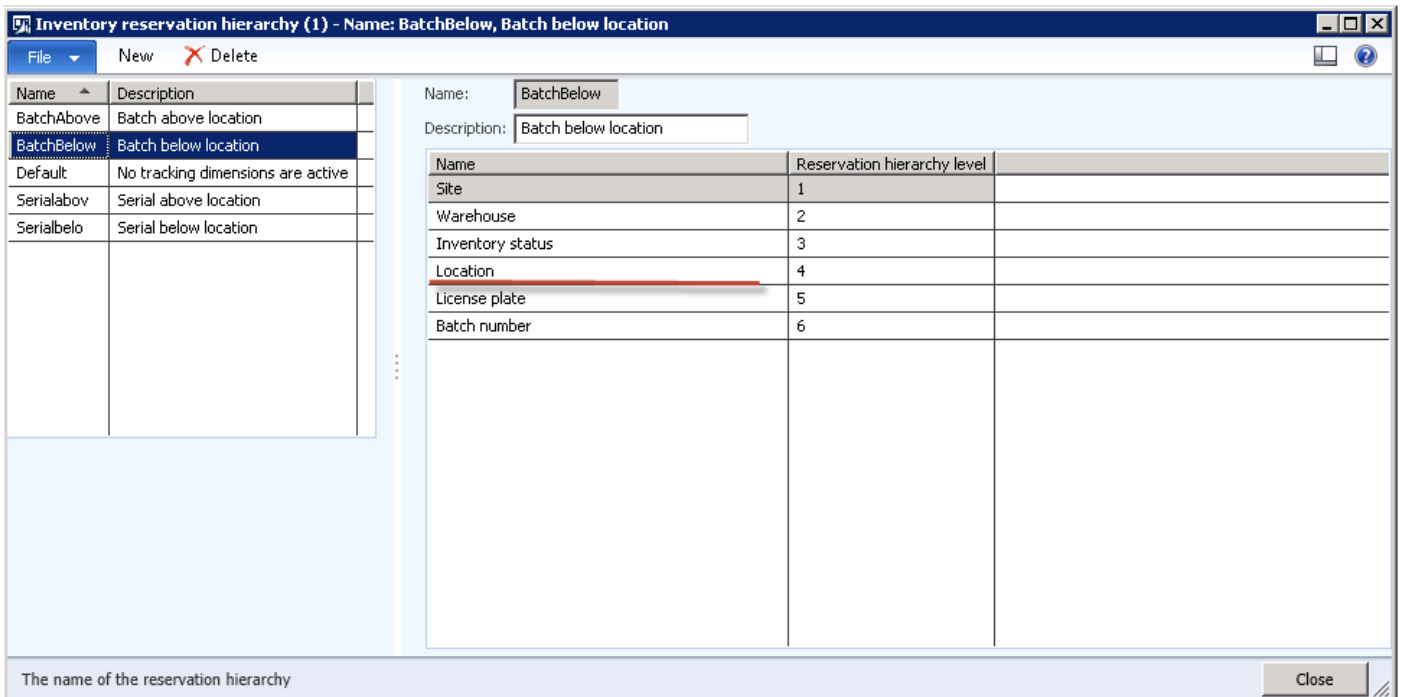
In this example, **Batch number** is active.

To reserve inventory at the time of the sales order entry, which means that the sales order entry person reserves the batch number on the order, set the reservation hierarchy to include the batch number above the location cutoff line.



In this example, select the batch number at order entry, which instructs the picker to make sure that this particular batch is picked.

To make this easy, you can enable the option to allow the picker to select the batch at picking time, which stops the user from having to search for a particular batch in stock. If you wanted to do this, you would move the batch number after the location cutoff.



The license plate and batch number will not be automatically reserved through the hierarchy. The same applies to serialization type products, either select the serial at order entry or reserve at picking.

3.1.3 Set up the location directives associated to the outbound process

As you've seen in the inbound process, creating location directives for the outbound process is important. This is where you specify where to pick items from, and where to put those items in preparation for either delivery to the customer, or collection from the customer.

To setup location directives for the outbound process, follow this navigation path:
Warehouse Management > Setup > Location Directives

Location directives (1 - usmf) - Sequence number: 18, 61 SO Put Stage Mult, Work order type: Sales orders

File

Work order type: Sales orders

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
6	25 SO Put	Put	2	25	Baydoor		<input type="checkbox"/>
7	25 SO Put Mixed	Put	2	25	Baydoor		<input checked="" type="checkbox"/>
8	51 Pick	Pick	5	51			<input type="checkbox"/>
9	51 Put	Put	5	51			<input checked="" type="checkbox"/>
10	61 Cluster pick	Pick	6	61			<input type="checkbox"/>
11	61 SO Pick order	Pick	6	61			<input type="checkbox"/>
12	61 SO Put stage	Put	6	61	Stage		<input type="checkbox"/>
13	61 SOPut Baydoor	Put	6	61	Baydoor		<input type="checkbox"/>
14	61 SPO Put Baydoor ...	Put	6	61	Baydoor		<input checked="" type="checkbox"/>
18	61 SO Put Stage Mult	Put	6	61	Stage		<input checked="" type="checkbox"/>

....

Lines

New Delete Move up Move down Restrict by unit

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate packing quantity	Allow split
1	1.00	99,999.00		None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

....

Location Directive Actions

New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Out to staging	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

Delete the selected record Close

Like the inbound process, the location directives are similar, however in this instance you will be doing the reverse - picking goods and placing them somewhere on the warehouse floor for dispatch.

Top grid

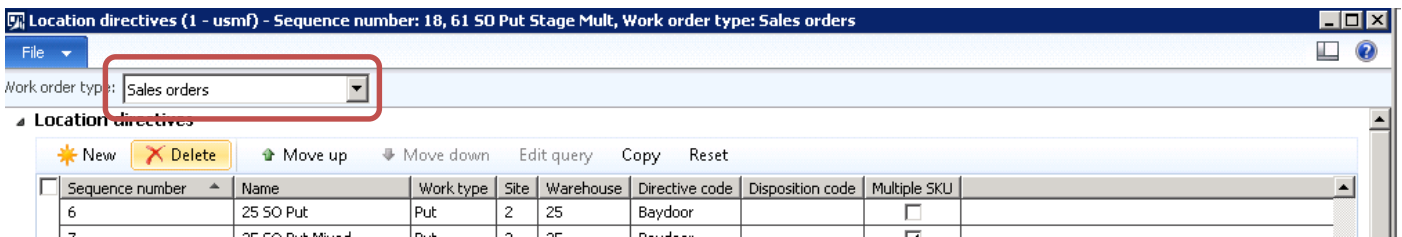
The **Work item** area identifies what warehousing function the location directives are tied to. In the preceding screenshot, notice that you can select various work items to specify location directives. In this example, you'll be moving to sales order location directives.

Header

The header is where you specify the sequence in which you want Warehouse Management to look for sales orders. For example, you can create location directives with unique filters and add them as a sequence in this form. By doing this you can create many location directive actions associated with a filter, which means that Microsoft Dynamics AX will search until a match is found in the sequence. That location directive action will be used to pick and put product.

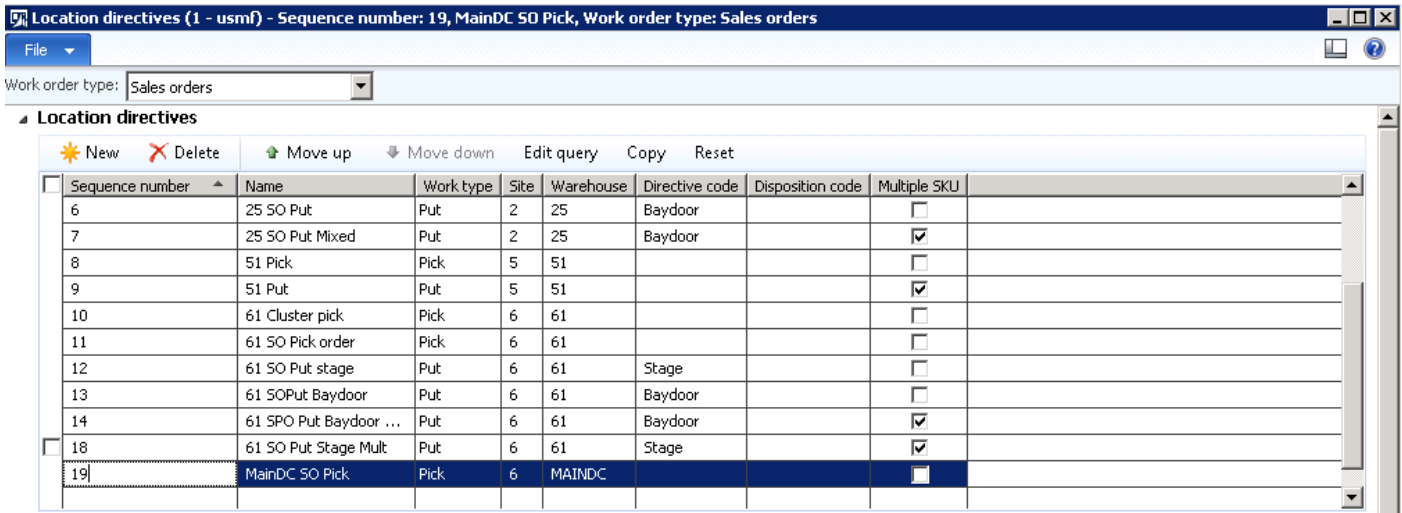
Next, you'll set up a basic location directive and process a sales order so that you can see how the directive works.

1. On the menu, in the **Work order type** field, select **Sales orders**.



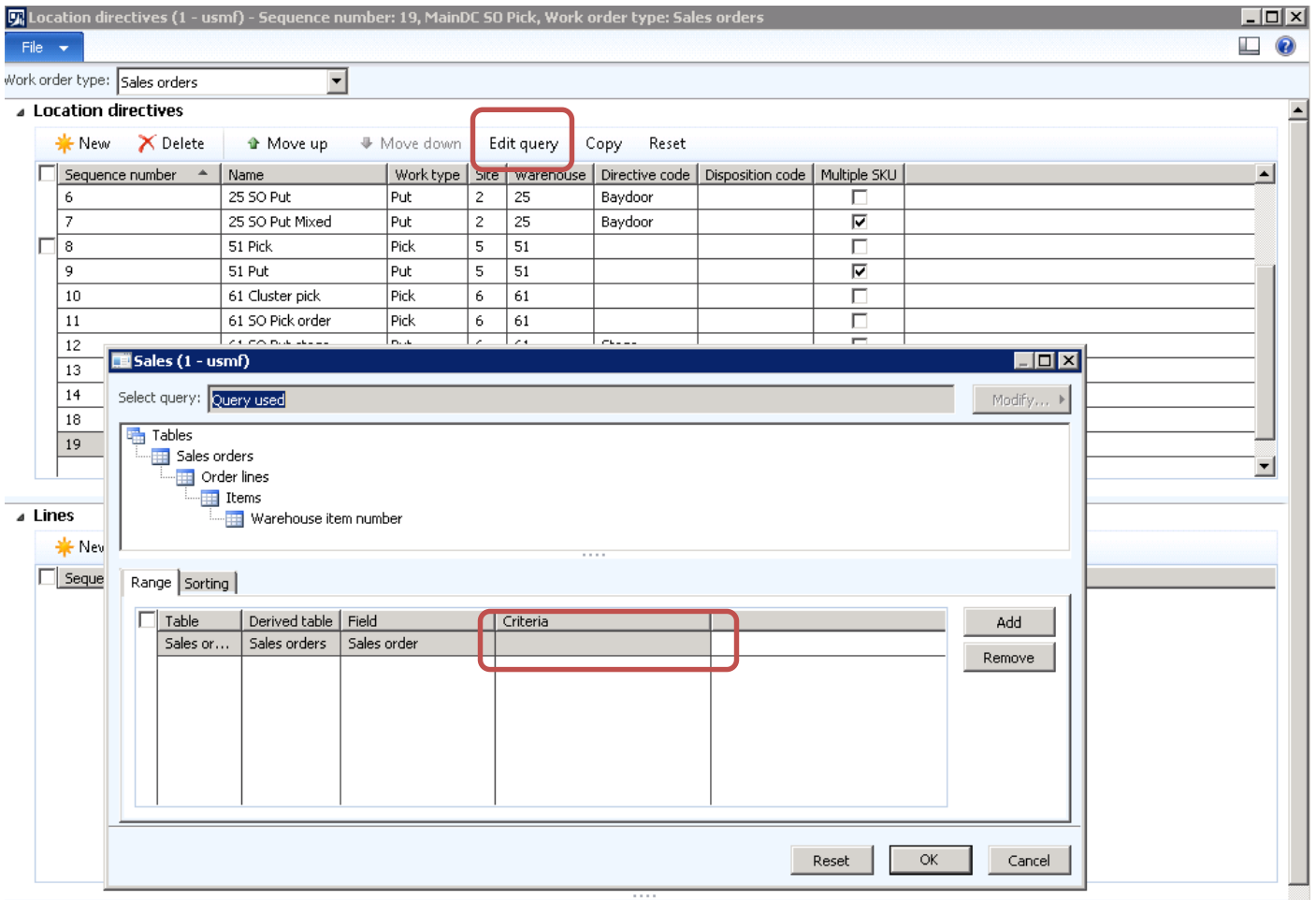
2. Create a new record and call it MAINDC sales order picking.

Note that this differs from the inbound location directive, you must create a location directive which is a Pick action and a second line which is a Put action.



Next, focus on sequence 19, the pick location directive. You've entered a line and specified a work type of Pick. You've also identified that you want this for site 1 for warehouse MAINDC.

The **Edit query** in the header section is blank, as shown in the following illustration.



Now let's review the lines section of the form.

Lines

After a location directive header has been created and selected by Warehouse Management, the process continues in an attempt to find an actual location to pick from or put to. The middle grid on the form, called *lines*, deals primarily with the quantity trying to be located or reserved. By using the **From Qty** and **To Qty** fields and the **Restrict by UOM** check box, sequences can be configured so that only quantities or specific UOM's will select the sequence.

Field	Description
Sequence number	Similar to the header.
From quantity, To quantity, and Unit	Specify a quantity range for when the middle-grid sequence should be selected. For example, if the From quantity is 5, the To quantity is 15, and the Unit is PL, Pallets, then if the quantity being put or picked is between 5 and 15 PL, this sequence would be selected. The bottom-grid values would most likely be a set of multiple pallet locations that can hold between 5 and 15 PL – typically bulk locations.

Field	Description
Locate Quantity	<p>Use this field if you want to put/locate quantity into the warehouse. The following options are available:</p> <ul style="list-style-type: none"> License Plate Qty - When evaluating whether a quantity is in the From quantity and To quantity ranges, use the quantity on the license plate being received. Unitized Qty - When evaluating whether a quantity is in the From quantity and To quantity ranges, use the quantity being unitized during the specific transaction. Since Warehouse Management can receive a quantity of 1000 and break it into 10 license plates of 100 each, 1000 would be used instead of the license plate quantity of 100. Remaining Qty - When evaluating whether a quantity is in the From quantity and To quantity ranges, this is the quantity left to be received on the Purchase order Line that is currently being checked-in. Expected Qty - When evaluating whether a quantity is in the From quantity and To quantity ranges, use the total quantity of the purchase order line, regardless of what has already been received.
Restrict by unit of measure	If selected, this allows the middle-grid sequence to be specific to a unit of measure or multiple units of measure. When reserving quantity, if you only want to reserve pallets from a specific set of locations, then the middle-grid sequence would restrict that particular sequence to PL so that any quantity less than a pallet would not select the sequence.
Locate packing quantity	If you specified a packing quantity on a sales order or production order, this check box restricts the system to only select locations with at least that packing quantity in the location.
Allow split	If selected, the quantity being received or the quantity being reserved across multiple locations is split, or the quantity must be located to a single location or reserved from a single location.

Next, let's use a simple scenario following the case study to show how to set up this action on a pick sequence.

The screenshot displays the 'Location directives (1 - usmf) - Sequence number: 19, MainDC SO Pick, Work order type: Sales orders' window. It features a 'Work order type' dropdown set to 'Sales orders' and a 'Location directives' section with a table of directives. Below this is a 'Lines' section with a table of lines.

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
6	25 SO Put	Put	2	25	Baydoor		<input type="checkbox"/>
7	25 SO Put Mixed	Put	2	25	Baydoor		<input checked="" type="checkbox"/>
8	51 Pick	Pick	5	51			<input type="checkbox"/>
9	51 Put	Put	5	51			<input checked="" type="checkbox"/>
10	61 Cluster pick	Pick	6	61			<input type="checkbox"/>
11	61 SO Pick order	Pick	6	61			<input type="checkbox"/>
12	61 SO Put stage	Put	6	61	Stage		<input type="checkbox"/>
13	61 SOPut Baydoor	Put	6	61	Baydoor		<input type="checkbox"/>
14	61 SPO Put Baydoor ...	Put	6	61	Baydoor		<input checked="" type="checkbox"/>
18	61 SO Put Stage Mult	Put	6	61	Stage		<input checked="" type="checkbox"/>
19	MainDC SO Pick	Pick	6	MAINDC			<input type="checkbox"/>

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate packing quantity	Allow split
1	0.00	10,000.00		None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

In the preceding screenshot, a new Line sequence is attached to the pick line in the header, which means that for any unit of measure up to a quantity of 10,000.00, you'll need to do the next action.

Next, focus on the location directive actions, which is the actions where locations or ranges of locations are actually specified. After a location directive has been selected, and the middle-grid sequence has been selected, the sequences that are configured in the bottom-grid are evaluated.

Field	Description
Sequence number	Similar to the top and middle grids.
Only use item fixed locations	If selected, any fixed location that is available to hold product or have product reserved from it is eligible.
Allow negative inventory	If selected, items that allow negative inventory will allocate to locations that allow negative inventory (based on location profile) even if there is not enough inventory available. This will drive the location negative. This changes the query selection that Warehouse Management uses to select locations by removing the criteria of physical inventory that is greater than zero (> 0).
Batch enabled	If batch controlled is turned on, then bottom-grid sequences must have this check box selected. This changes the query selection that is used to select locations, to make it more efficient.
Strategy	<p>The following strategies are available:</p> <ul style="list-style-type: none"> • Consolidate – This is used during the put function. If any locations specified by the Edit query button already contain the item trying to be put or located, put inventory into these locations first. • Match Packing Qty – This is used during the pick function. This means that Warehouse Management searches for locations that either match or are closest to the Packing Qty that is specified on the Load line. • FEFO Batch Reservation – Inventory will be located by batch expiration date and will soft allocate the batch. • Round up to Full LP – This is used to round up the quantity being allocated to match the LP to be picked. This soft allocates the LP. This can only be used for replenishment. • Round up to Full LP and FEFO Batch – Combines FEFO Batch Reservation and Round up to Full LP strategies. This can only be used for replenishment.
Edit query button	In this window, locations, or ranges of locations, can be included or excluded from selection. For example, one of the characteristics associated with each location is a zone, which is really nothing more than a collection of locations. A zone can be specified so that only locations that have the zone that is specified in the query window are used. Warehouse Management incorporates the selections in the Batch enabled check box and the Strategy field will be used to find the appropriate location to pick from or put to.

Location directives (1 - usmf) - Sequence number: 19, MainDC SO Pick, Work order type: Sales orders

Work order type: Sales orders

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
6	25 SO Put	Put	2	25	Baydoor		<input type="checkbox"/>
7	25 SO Put Mixed	Put	2	25	Baydoor		<input checked="" type="checkbox"/>
8	51 Pick	Pick	5	51			<input type="checkbox"/>
9	51 Put	Put	5	51			<input checked="" type="checkbox"/>
10	61 Cluster pick	Pick	6	61			<input type="checkbox"/>
11	61 SO Pick order	Pick	6	61			<input type="checkbox"/>
12	61 SO Put stage	Put	6	61	Stage		<input type="checkbox"/>
13	61 SOPut Baydoor	Put	6	61	Baydoor		<input type="checkbox"/>
14	61 SPO Put Baydoor ...	Put	6	61	Baydoor		<input checked="" type="checkbox"/>
18	61 SO Put Stage Mult	Put	6	61	Stage		<input checked="" type="checkbox"/>
19	MainDC SO Pick	Pick	6	MAINDC			<input type="checkbox"/>

....

Lines

New Delete Move up Move down Restrict by unit

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate packing quantity	Allow split
1	0.00	10,000.00		None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

....

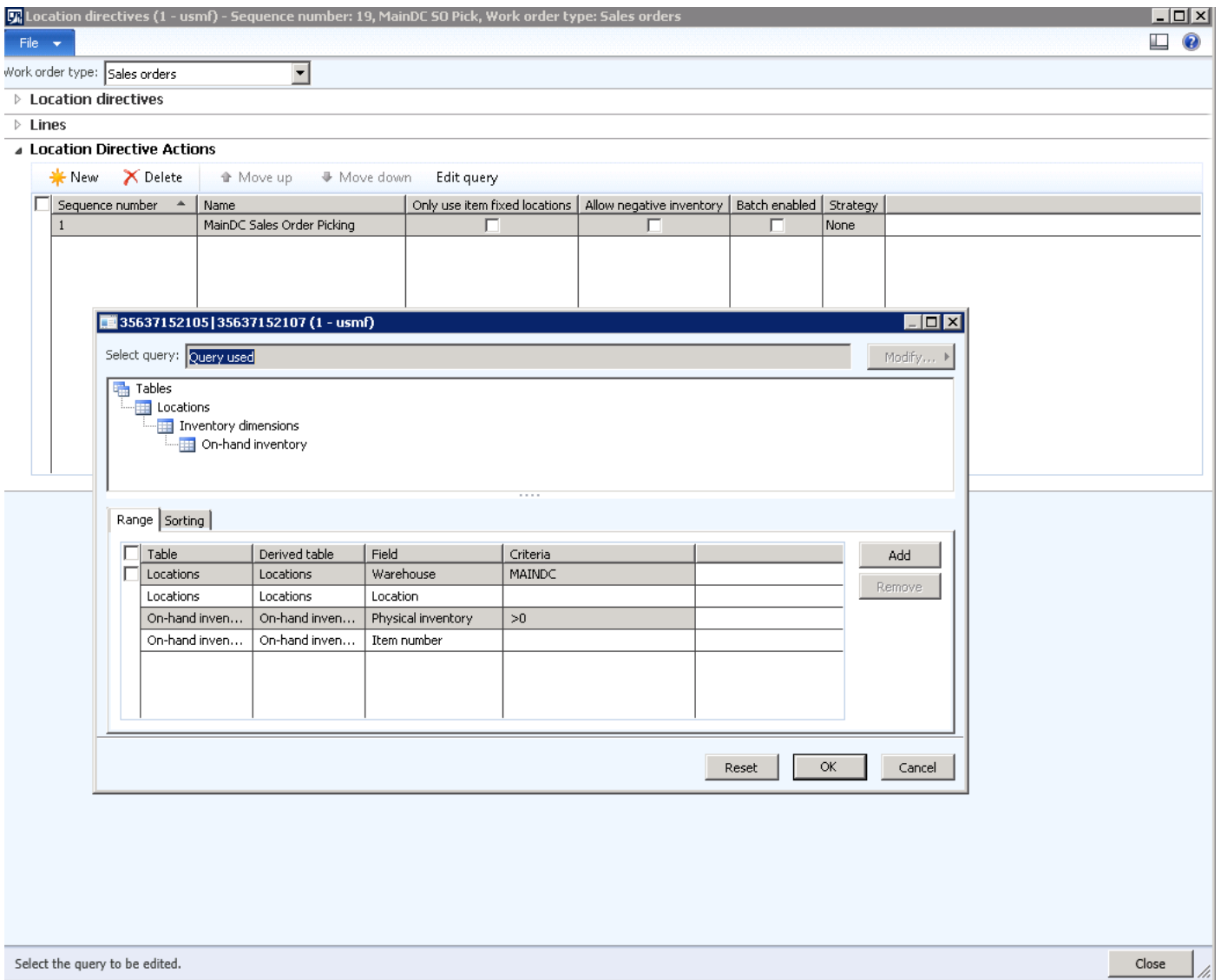
Location Directive Actions

New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	MainDC Sales Order Picking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

Name. Close

For the pick location directive action, you've created a new line and called it MAINDC Sales Order Picking. You're specifying on the pick action a specific location or area for the picking to take place. This means that you need to go to a specific area in the warehouse and pick these goods. This is handled through the query option.

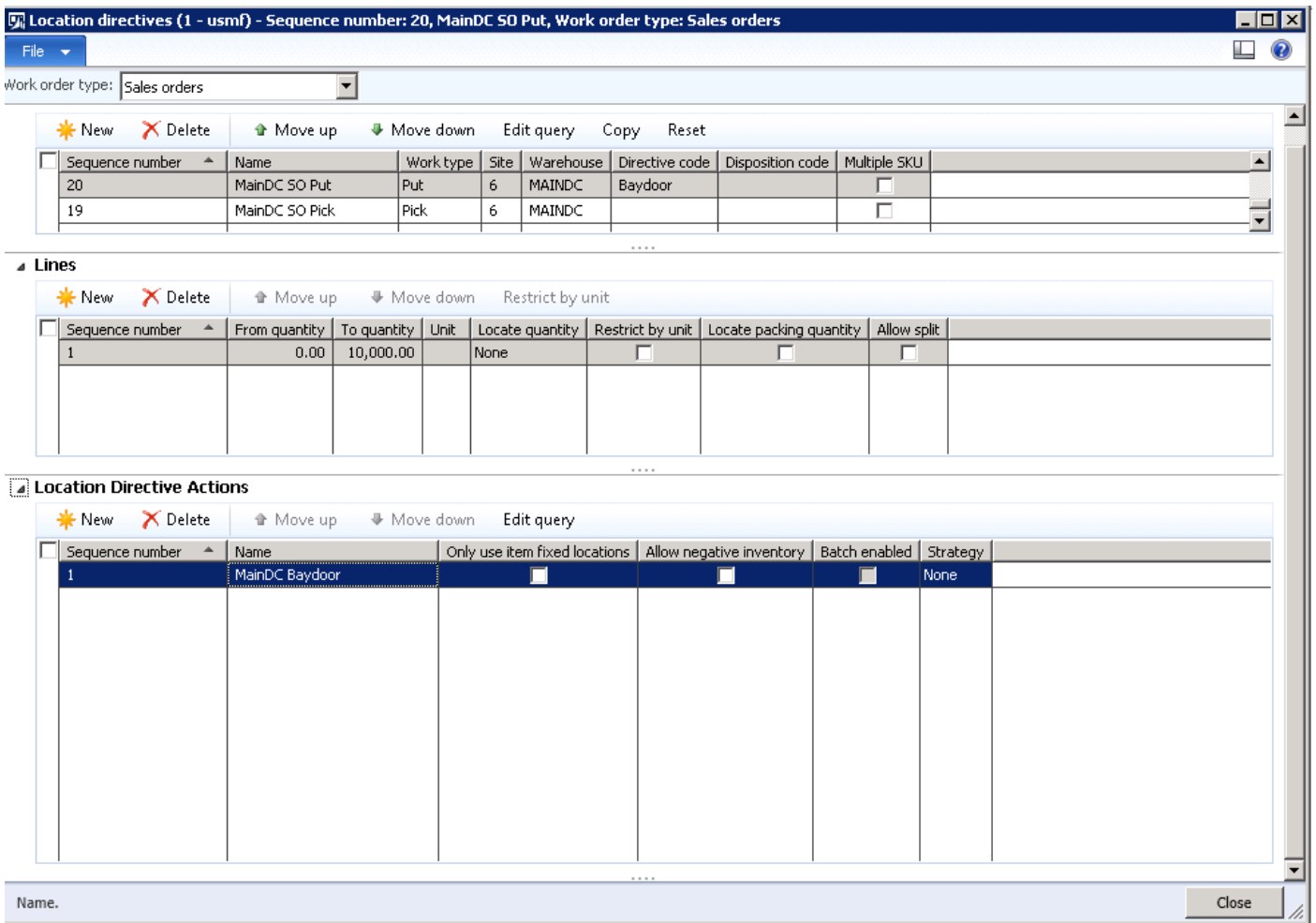


This process uses a simple pick sequence, by instructing the directive to find inventory in the MAINDC warehouse and pick based on FIFO picking. Because you have not specified where to pick from, Warehouse Management determines where to pick from, as long as the pick is from the MAINDC warehouse.

Now that you've created the Pick location directive, you have to create the put directive.

To open the **Location Directives** form, follow this navigation path:

Warehouse Management > Setup > Location Directives



Header

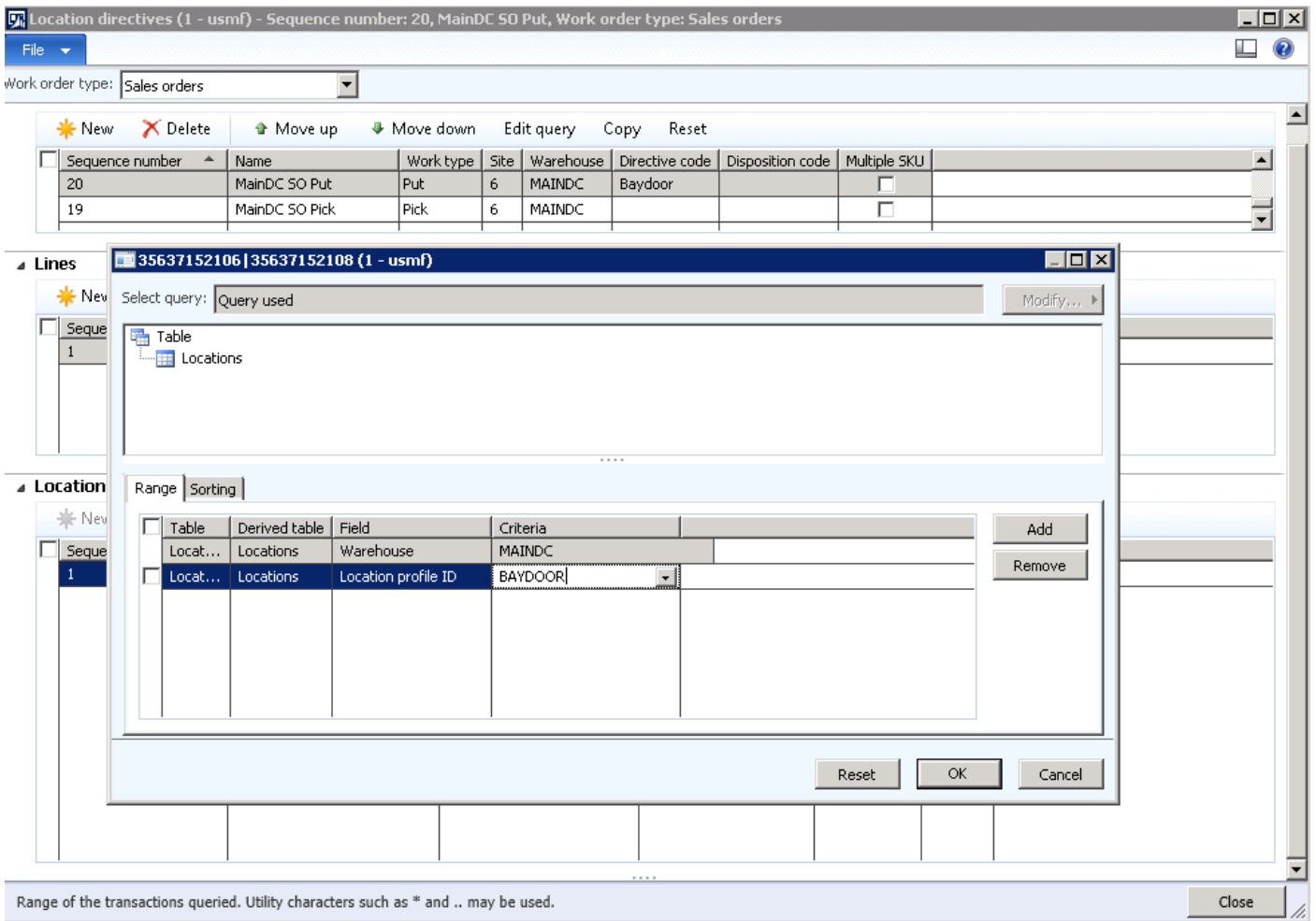
In the screenshot, you'll notice that line sequence 13 represents a put directive, and there is a small change in this instance as there is now see a directive code specified on the put line. A directive code enables you a step in the pick and put process, which can include things such as staging. Location directives using directive codes will be covered later in this document, for now, you're going to create a put directive which will instruct the worker to collect the product from the picking location and put it in this instance to the Baydoor. The Baydoor is considered the outbound dock or the last step in the picking process.

Lines

Notice that the line for the put directive resembles the pick directive. This example does not use any units of measure, instead it uses any quantity from 0 to 10,000.00.

Bottom – Location Directive Actions

Note the change in the setup in the location directive action. In the illustration, there is a location directive action for the put sequence, MAINDC Baydoor. This specifies that when the goods have been picked, you want to put them to the Baydoor (outbound dock), which is the last step in the process. There are no provisions for staging or packaging, you're picking and putting out of the warehouse.



Select **Edit query** so that the put instruction places the goods at the Baydoor, and then use the query to do that by selecting a profile ID of Baydoor as the filter.

You've now configured a basic location directive for the outbound process. As you continue with this case study you'll create more examples of when and how to use multiple options on location directives.

3.1.4 Set up the work template for sales order picking

As described in the inbound process, work is the core of warehouse management. It's where you can see the activity in the warehouse, consolidated into a single view and a set of tables.

Warehouse Management uses work templates to create work at various points in the system. You can find work areas in the **Work Trans Type** drop-down list. The areas where work is created is inbound/receiving, reservation/picking, production, and inventory transfers and adjustments.

Typically, for inbound/picking, work is created in an **Open** status. Work instructions can be viewed by using the **Work Details** form. In other instances, work is opened when a transaction is created and then closed when the transaction is completed. In these instances, the work can be used as transaction history because the item, location, and quantity are all captured on the work instruction and can be viewed even though the work is closed.

Work is divided into headers and details. How the work is created is based on location directives and work templates. Work headers are a group of pick/put pairs and describe the workflow to be performed against inventory. Work details describe the actual steps being performed against the inventory.

Work is what drives the steps executed on the mobile device and full-screen work execution. Every time a work step is executed,

one or more inventory transactions are performed in Microsoft Dynamics AX. Every work header has a unique work ID that is tracked throughout the system and often can be used on the mobile device.

Like the put away process, you need to define a work template for the outbound sales order process.

To open the **Work templates** form, follow this navigation path:

Warehouse Management > Setup > Work > Work Templates

Work order type: Sales orders

Overview | General

Sequence number	Work template code	Work template description	Valid	Automatically process	Work pool ID	Work priority
0	24 SO Stage		<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
1	25 Direct		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		0
2	24 SO Cluster Pick		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Webshop	0
3	61 SO Stage	Sales order picking with sta...	<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
4	61 SO Cluster pick	Cluster picking of sales orders	<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
5	51 Pick Ship		<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
6	MainDC	MainDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>		0

Line number	Work type	Custom work code	Mandatory	Stop work	Freeze	Directive code	Work class ID
1.0000000000	Pick		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	SO Pick	
2.0000000000	Put		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Baydoor	SO Pick

Valid

The type of work order for which a location directive is defined | USD | usmf | Close

This example shows a simple approach by creating a work template.

3.1.5 Top grid – Overview

Field	Description
Sequence number	Similar to the Location Directive form. Warehouse Management for Microsoft Dynamics AX processes each work template in ascending sequence number order.
Work template code	Unique identifier for the work template.
Work template description	The description of the work template code.
Valid	If selected, there is an even number of pick/put pairs configured for the work template in the bottom-grid.

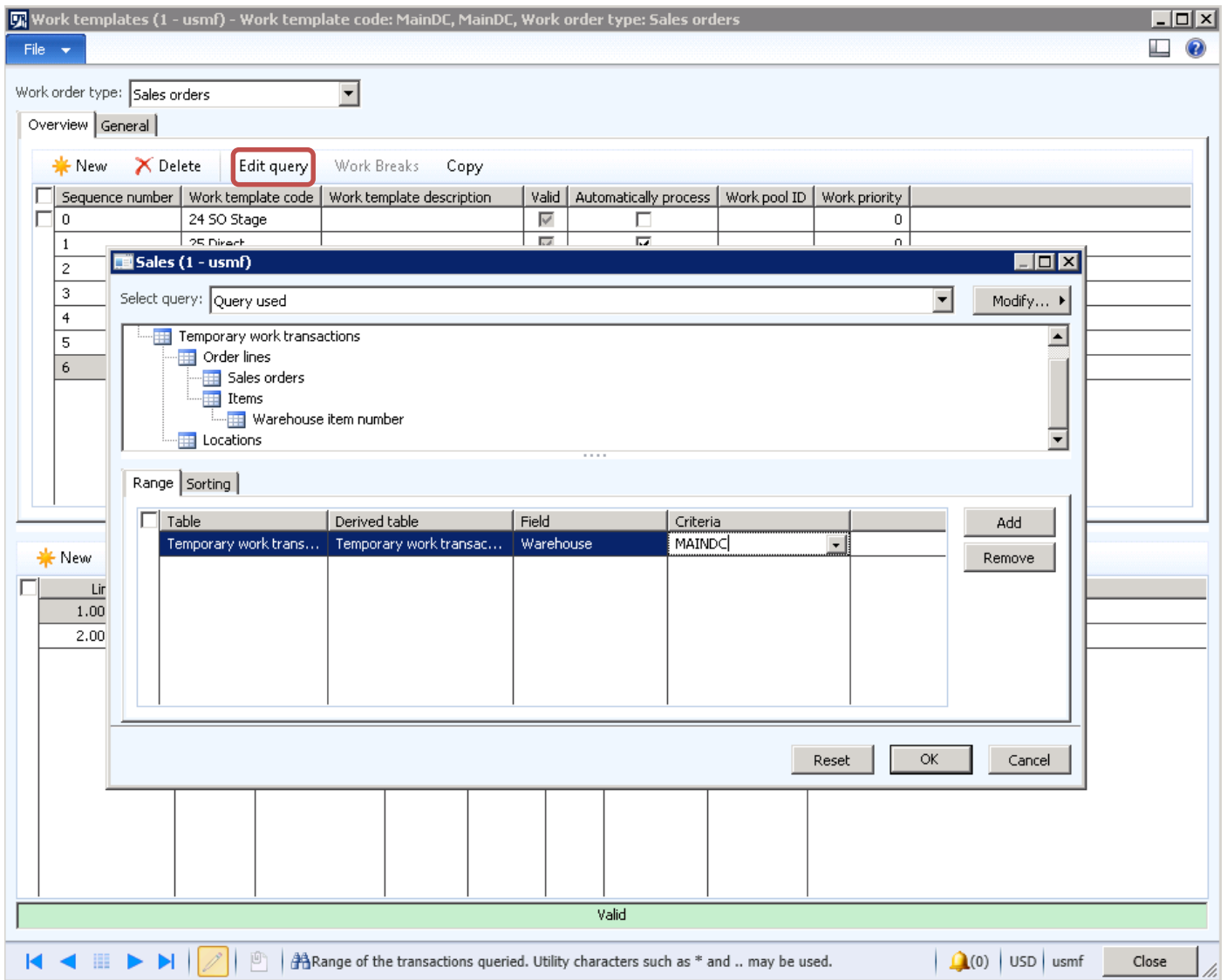
Field	Description
Automatically process	If selected, upon wave release any work created by this work template will automatically be executed. This is useful if there are inventory items that are not inventoried as carefully as most items, but still must be on the order for reporting, cost, or bill of lading purposes. For example, pallets or marketing items must be on a sales order and inventory must be in Microsoft Dynamics AX, but it is not required that the user actually pick these items.
Work priority	Work is created by using the default value found on the Warehouse Management Parameters form. However, by specifying a value in this field on the work template, a different priority can be set on the work that is created by a specific template. Work priority is used during some mobile flows, specifically system grouping.

3.1.6 Top grid – General tab

Field	Description
Max volume	Specify a value to create pallets up to the volume configured in this field.
Max weight	Specify a value to create pallets up to the weight configured in this field.
Max Qty / Max UOM	Specify a value to create pallets up to the configured quantity and unit of measure. For example, specifying 1 and PL will break work into single pallet increments.
Batch allocation strategy	Specify how batches are allocated during the work creation process. The options are FEFO and LEFO.
Packing Qty as maximum	If selected, individual pieces of work will be built up to the packing quantity that is specified on the load line. This is typically used during work creation for reservation/picking. For example, typically each pallet will be a single piece of picking work. By default, pallet work will be created based on what the pallet unit conversion is configured as. If you must build pallets either larger or smaller than a standard pallet, use this function.
Edit query button	Opens the query window where values can be specified to determine which work template to select. For example, a work template can be configured that will be selected for any item that starts with "836*". Warehouse Management will continue to evaluate each work template until one is found that meets the current criteria. It's important to assign a lower sequence number to the most specific work templates and a higher sequence number to the templates that are more general. By using the Sorting tab, the work that is created can be sorted in a specific order. It's important to sort the work created in a manner that allows for work breaks to be configured appropriately.
Work breaks	This field will group and break the work by the criteria specified. When work templates are run, records are created in the Temp Work Transactions table. A single temp work transaction record will be created for each item/location combination. However, depending on how the warehouse is configured, the single temp work transaction record could be for multiple pallet picks. By using work breaks, you can break work by item and location, and break work on other attributes, such as batch ID or license plate.

To complete the setup for this case study, follow these steps:

1. Ensure that the **Sales Order** work order type is selected.
2. Create a new header note, shown as **Sequence number** 6 in the example. The template code MAINDC is created, with a description.
3. On the header, select **Edit query**.



4. Ensure that the warehouse has been set in the **Criteria** field, as shown in the illustration.

You're now ready to move to the lines section of the work template.

Work templates (1 - usmf) - Work template code: MainDC, MainDC, Work order type: Sales orders

File

Work order type: Sales orders

Overview | General

New Delete Edit query Work Breaks Copy

Sequence number	Work template code	Work template description	Valid	Automatically process	Work pool ID	Work priority
0	24 SO Stage		<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
1	25 Direct		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		0
2	24 SO Cluster Pick		<input checked="" type="checkbox"/>	<input type="checkbox"/>	Webshop	0
3	61 SO Stage	Sales order picking with sta...	<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
4	61 SO Cluster pick	Cluster picking of sales orders	<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
5	51 Pick Ship		<input checked="" type="checkbox"/>	<input type="checkbox"/>		0
6	MainDC	MainDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>		0

....

New Delete Move up Move down Work template line statu...

Line number	Work type	Custom work code	Mandatory	Stop work	Freeze	Directive code	Work class ID
1.0000000000	Pick		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		SO Pick
2.0000000000	Put		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Baydoor	SO Pick

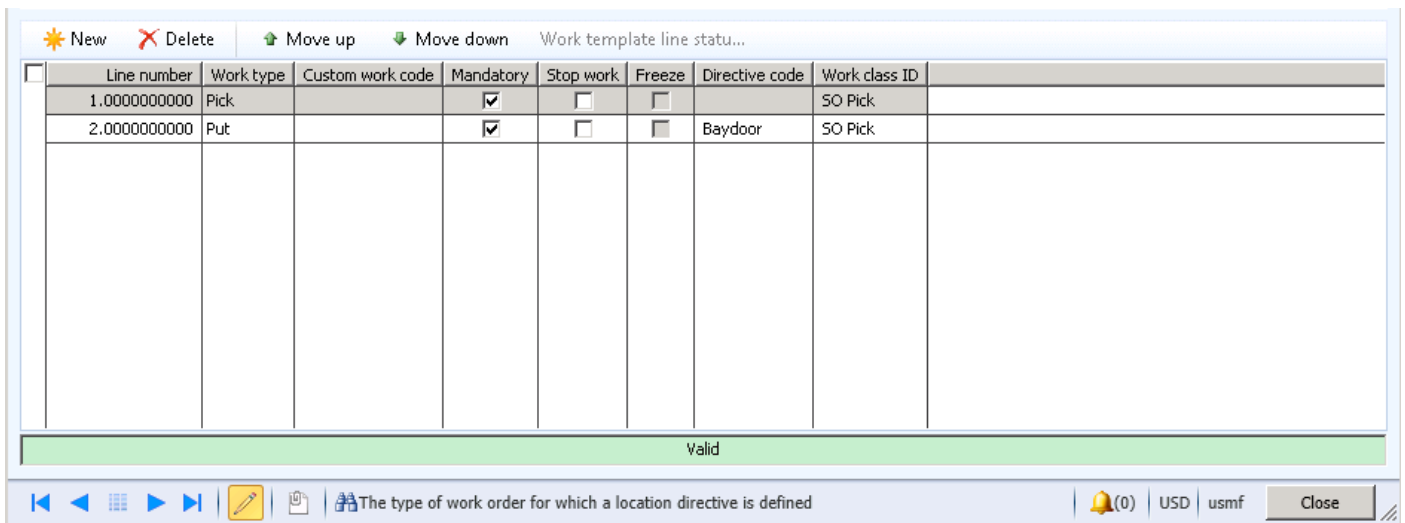
Valid

The type of work order for which a location directive is defined | (0) USD usmf Close

Field	Description
Line number	This will automatically default as line sequence 1, 2, 3. This is the order in which you want the actions to occur.
Work type	Specify whether the action is a pick-up or a put-down. Additionally, a value called "Custom" is allowed. By selecting this value, the Custom Code field becomes enabled and allows for custom screens to be inserted anywhere in the work flow process.
Custom code	Enter a value to allow for custom screens to be inserted into a work flow. This allows for a single data-capture screen with a configurable label to be displayed. Other screens that must be displayed require custom code.
Mandatory	Specify whether the work step must be performed or is optional. After a wave is run, there are options from both the load place and the wave place that allow a worker to skip non mandatory work. If selected, any work step that does not have the Mandatory check box selected is automatically executed so the worker is not required to perform it.
Stop	Specify if you want continue to display the next screen to the worker or if the transaction should be stopped. In the example above, when the work instruction is first scanned the worker will be presented with a pick transaction, and then a put transaction. At that point, the screen would be ready to process the next piece of work. If the Stop check box is not selected on the second pick step, the worker will be presented with a pick then a put, and then immediately presented with a second pick and put transaction.

Field	Description
Directive code	<p>This field is a link between the work templates and the location directives. If the directive code is blank, when Warehouse Management evaluates the work step it accesses the location directives for a directive with a blank directive code. If the directive code is not blank on the work template, then Warehouse Management accesses the location directives looking for a directive with the specific directive code. In the preceding screenshot, the first work step is a pick and it is associated with a sales order work template. Location directives are used to find a location to reserve the necessary inventory for picking. Since there is no directive code on this work step, Warehouse Management finds a sales order location directive that also has a blank directive code and uses it to find the appropriate place to reserve the inventory.</p> <p>The next work step is a request for a worker to put what was picked in the first work step, into a shipping staging location. Again, for this work step Warehouse Management will access location directives to find the most appropriate location to direct the worker to put down the picked inventory. In this case, specify that picked work will be sent to the outbound dock or the baydoor. This means that there is no loading or staging process in the pick. To reflect that, specify a directive code of Baydoor and only specify one set of pick and put. In this case study you'll learn how to add a staging process to the pick and put work.</p>
Work class ID	Controls what menu item can process which type of work. On the Mobile Device Menu Item form, any menu item that is configured to use existing work can be used to specify which work classes the menu item processes.

To continue the setup for this case study, move to the lines section and create two entries, as shown in the following illustration.



- Line Sequence 1 is a Pick work type that is Mandatory and the work class ID is SO Pick.
- Line Sequence 2 is a Put work type that is Mandatory and the work class ID is SO Pick.

3.1.7 Understanding wave templates

Now that you've learned about the following setup areas of the outbound process:

- **Location Directives** – Instruct where goods will be picked and put.
- **Work Templates** – Create the physical work for the users to perform the tasks.
- **Loads** – Enable you to set up either trucks, rail carts, or a load for delivery.
- **Wave Templates** – Enable you to create work based on a wave which lets you use filters to only create work for a certain carrier, a mode of delivery or any filtering so that you're only creating work on orders that must go out that day.

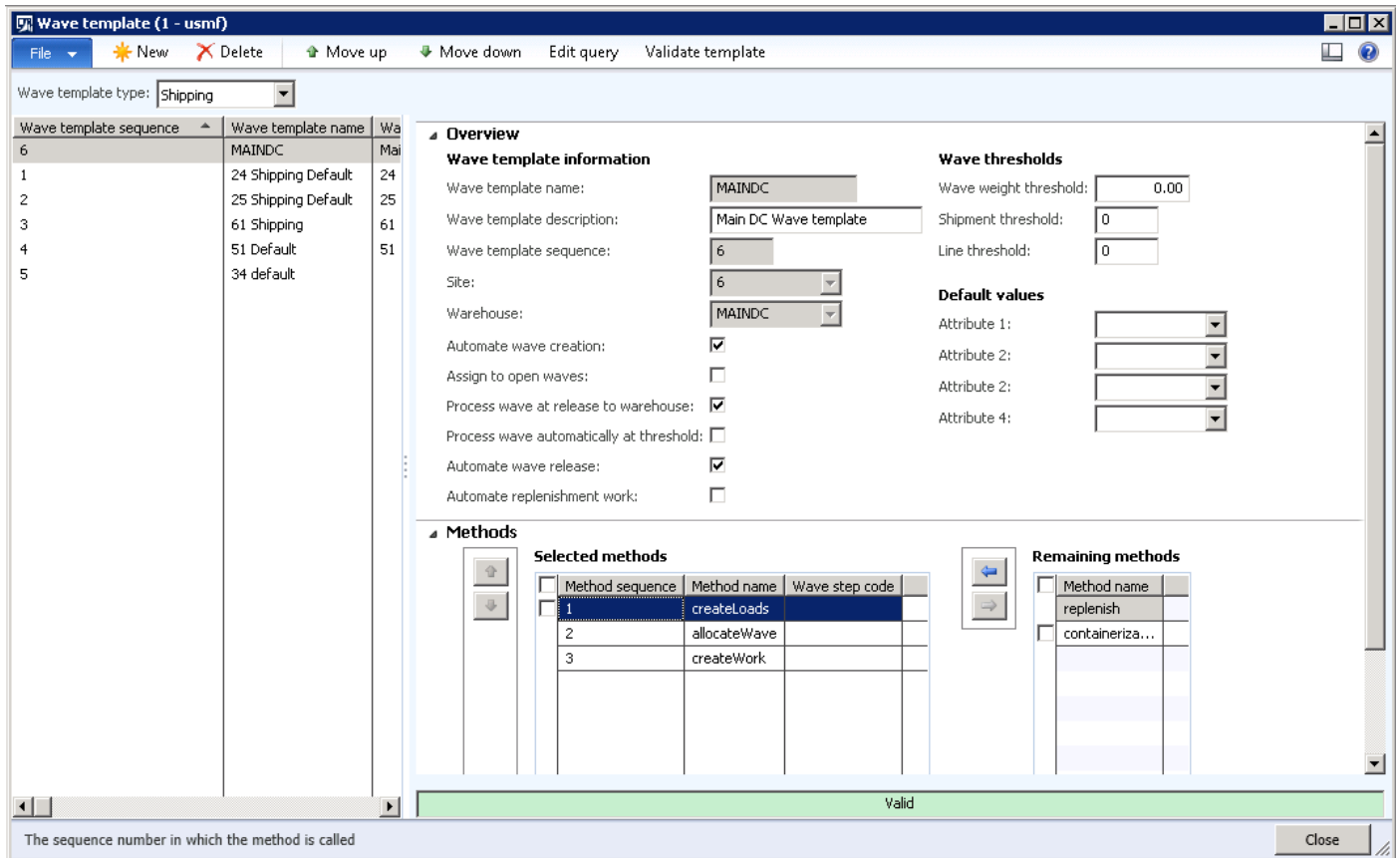
Let's review the process flow:

- A sales order is created, which will create a shipment. Typically, shipments refer to the same destination location. Multiple shipments can be created based on multiple sales orders.

- A wave template takes the shipments and creates the work which can create loads.

Wave templates are used to define the wave execution process and setup criteria for when waves are created, executed, and released.

To open the **Wave templates** window, follow this navigation path:
Warehousing Management > Setup > Waves > Wave Templates



Multiple wave templates can be created by using different properties for each template. When you first create a wave template, required base methods will be created as steps for that template and appear in the lower left grid. Additional wave execution methods will appear in the lower right grid and can be manually added to the wave template using the arrow buttons. Some base wave steps, such as containerization and replenishment, are optional and will have to be added manually to the wave template. The containerization wave steps can also be marked as repeatable in the wave execute method setup (**Warehousing for AX > Setup > Waves > Wave Execution Methods**). This allows the method to be called several times in a single wave template. New wave steps also have a **Wave step code** field, which is used to pass information to the method being called. A wave step is used by replenishment and containerization, as described later in this document.

Based on the wave template setup, the wave process can be automatic or manual. The following properties determine the setup:

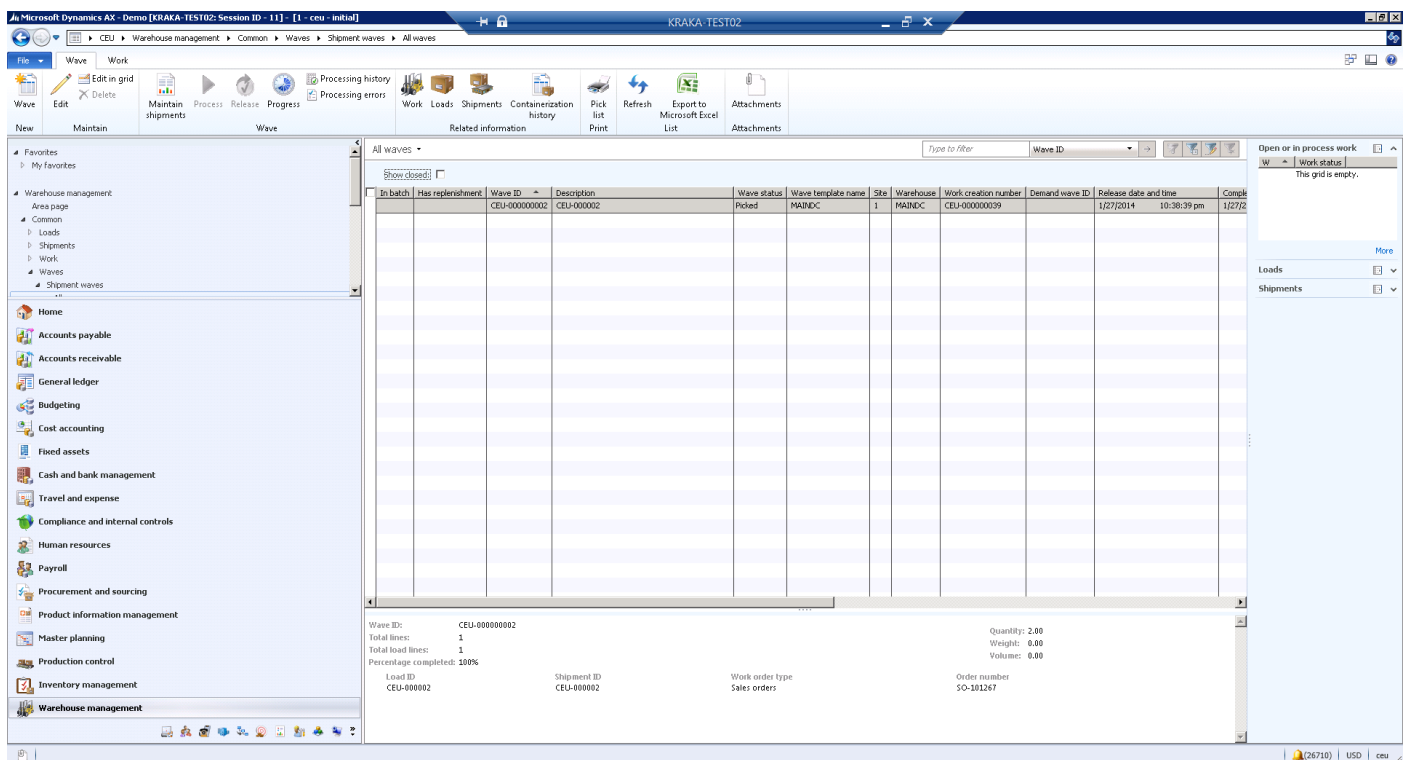
- **Automate wave creation** – If selected, waves will automatically be created for shipments at release to the warehouse. The query criteria can be used to limit what shipments will apply to this wave template.
- **Assign to open waves** – If selected, shipments will be assigned to open waves at release to the warehouse. The query criteria can be used to limit what shipments will be assigned to waves for this template.
- **Process wave at release to warehouse** – If selected, waves created during the release to the warehouse will automatically be executed to create work.
- **Process wave automatically at threshold** – If selected, waves will automatically execute when a defined threshold is reached.
- **Automate wave release** – If selected, waves will be automatically released after it is executed.
- **Automate replenishment work** – If selected, and demand based replenishment work is created, that work will be released automatically.
- **Wave template sequence** – This sequence number determines in what order the wave template will be used when you create

waves and assign shipments to existing waves. If a shipment does not fit the query criteria of a wave template, the next wave template in the sequence will be used.

3.1.8 Manual wave steps

Waves are required to create work for a load or shipment. Work is created through the wave that will run and execute steps defined in the wave template. The following steps show how to manually create and process a wave:

- First, go to the **Waves place** form. Click the **Create wave** button.
- Search for the load, sales order number, or shipment that needs to be executed. Select the **Add to wave** check box and the line will be added to the bottom grid.
- You can add several loads to one wave to make it a faster process. This is also how you consolidate shipments automatically.
- After the loads or shipments have been added to the new wave, click **Execute wave** on the form or in the **Waves place** form. This uses the wave template steps and uses work templates and location directives to determine how to create the work. These settings are configured on other forms.
- If the execution is successful, the new wave status will be Held. No work can be completed until this wave has been released. You can view the work to determine whether it's correct and determine if you want to continue or cancel the work and start over.
- If all work is created correctly, click the **Release** button at the top of the **Waves place** form.

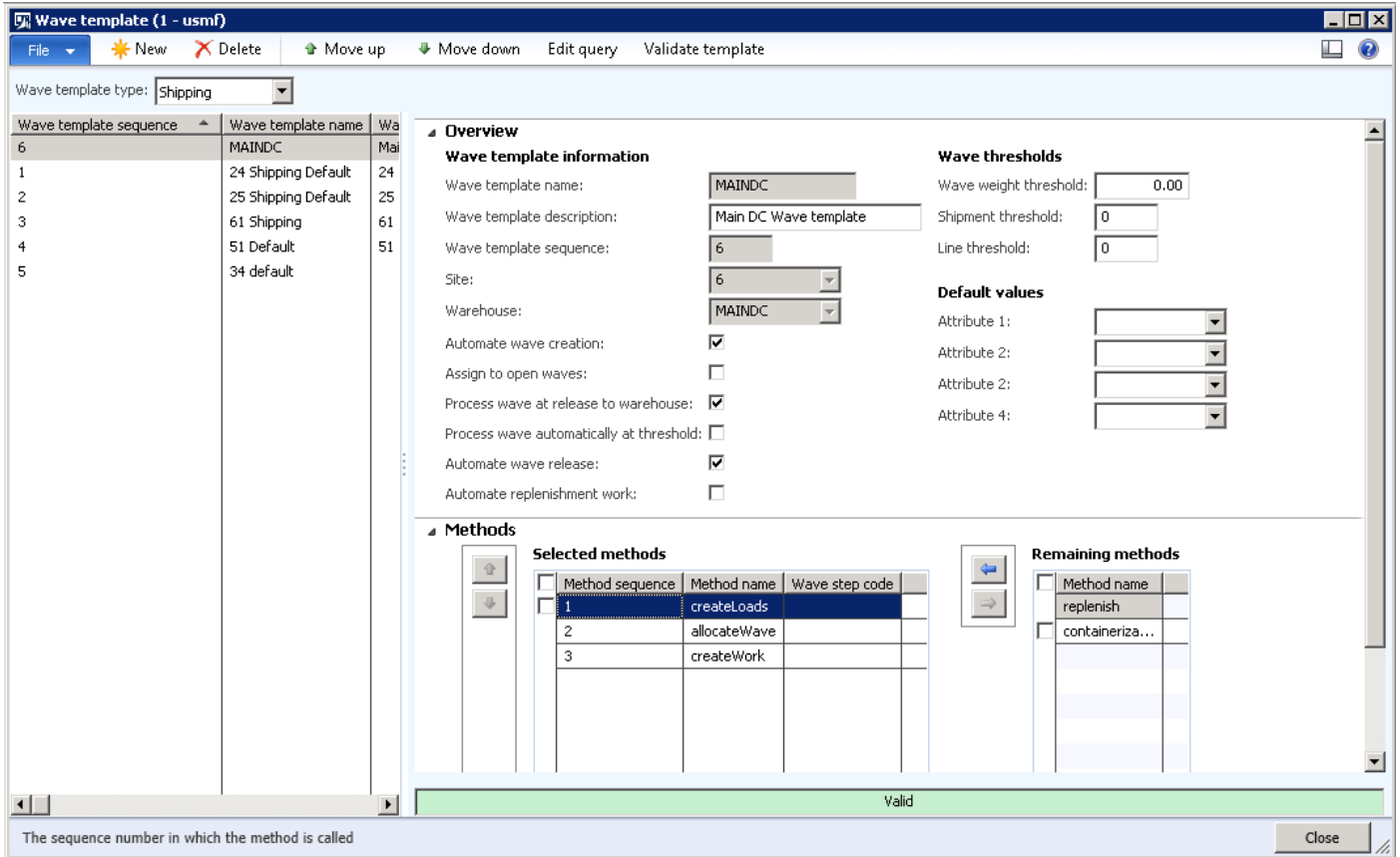


3.1.9 Wave release

After releasing the wave, more work can be created if all of the inventory was not available at the time the wave was originally run. You can create multiple waves for the same load/shipmen if any work has been canceled or not created for a load or shipment. To see the wave history, click the **Work creation history log**.

Use the filter on this form to see all the locations and steps that work uses to create steps. Also, when a wave is released, it cannot be executed again if any part of the work has been completed for it. If you want to do that, you'll have to create a new wave for the canceled portions.

3.1.10 Set up a new wave template sequence - case study continued



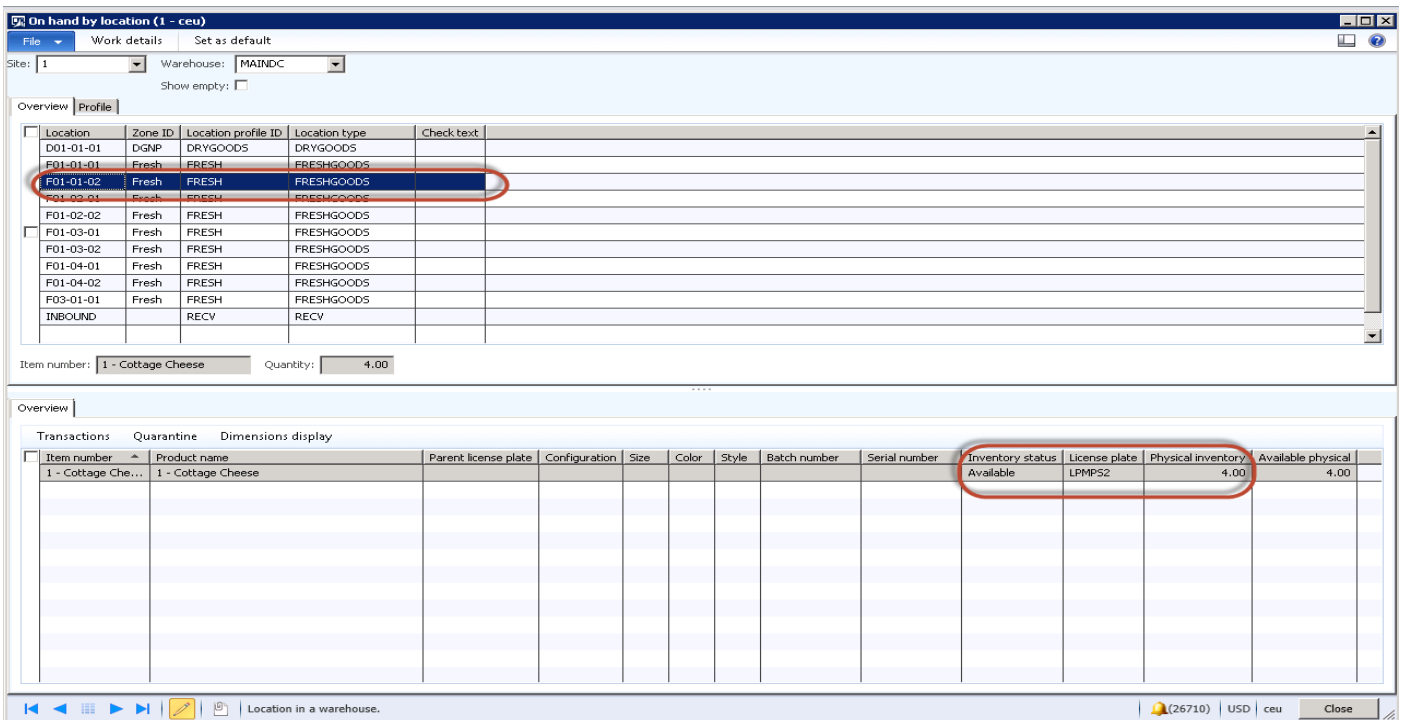
- Create a new wave template sequence and give it a template name. In this example, you're creating a wave template specifically for the MAINDC warehouse. Later in this document you'll see more advanced functions.
- Enter a wave template name and description.
- Select **Automate wave creation** to create the wave during release to the warehouse.
- Select **Process wave at release to warehouse** to automatically create work.
- Select **Automate wave release**, and when the wave is processed, it will automatically release.
- Select the standard methods at the bottom of the **Wave template** form.

Now that you've set up the required process, you can test the setup and process a sales order.

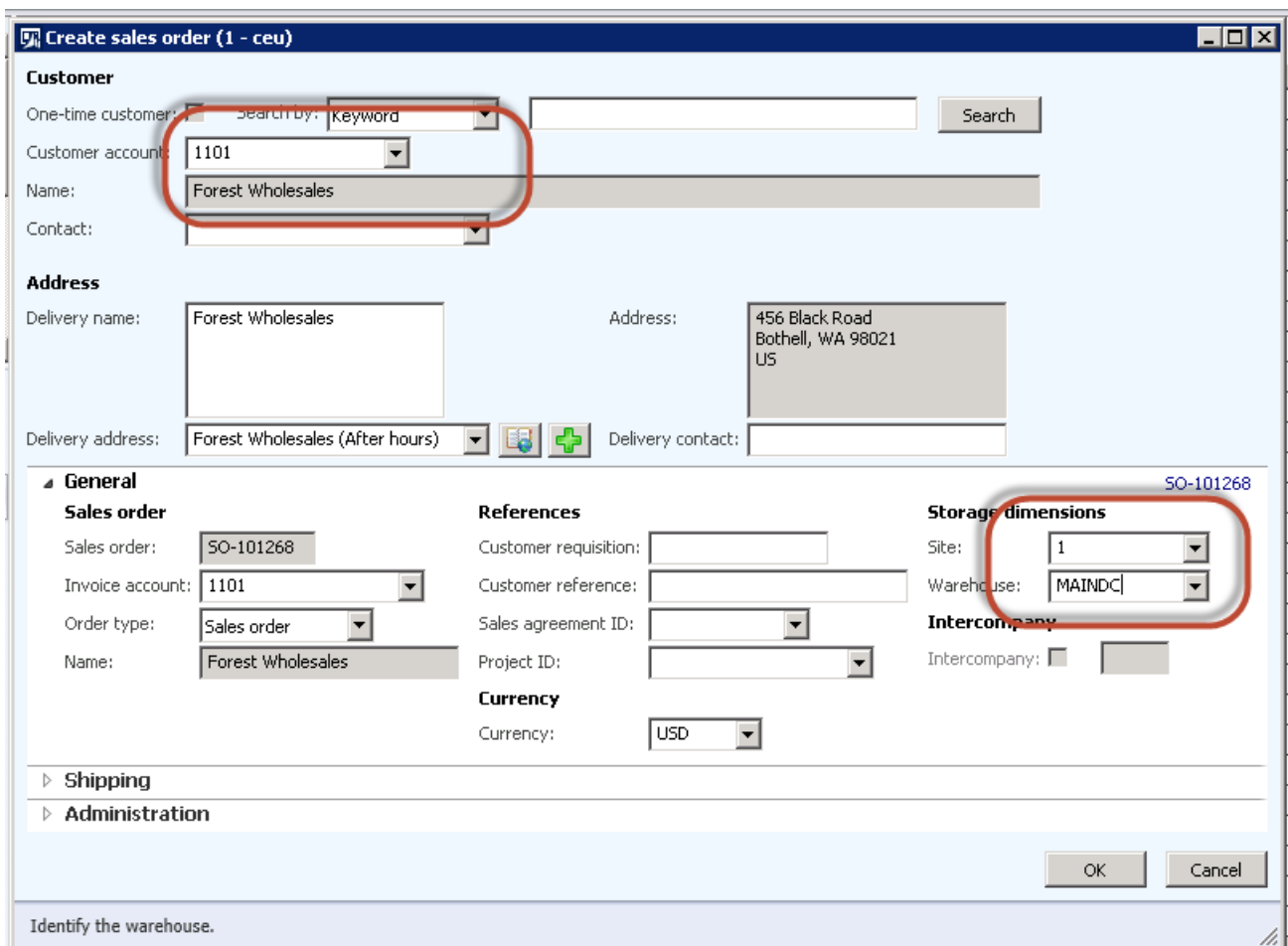
3.1.11 Test the case study setup and create a sales order

To test the setup, review the inventory on hand by location.

To open the **On hand by location** window, follow this navigation path:
Warehouse Management > Inquiries > On hand by location



In the **On hand by location** window there is available stock for the item, 1 - Cottage Cheese, so you need to create a sales order for a quantity of 4.

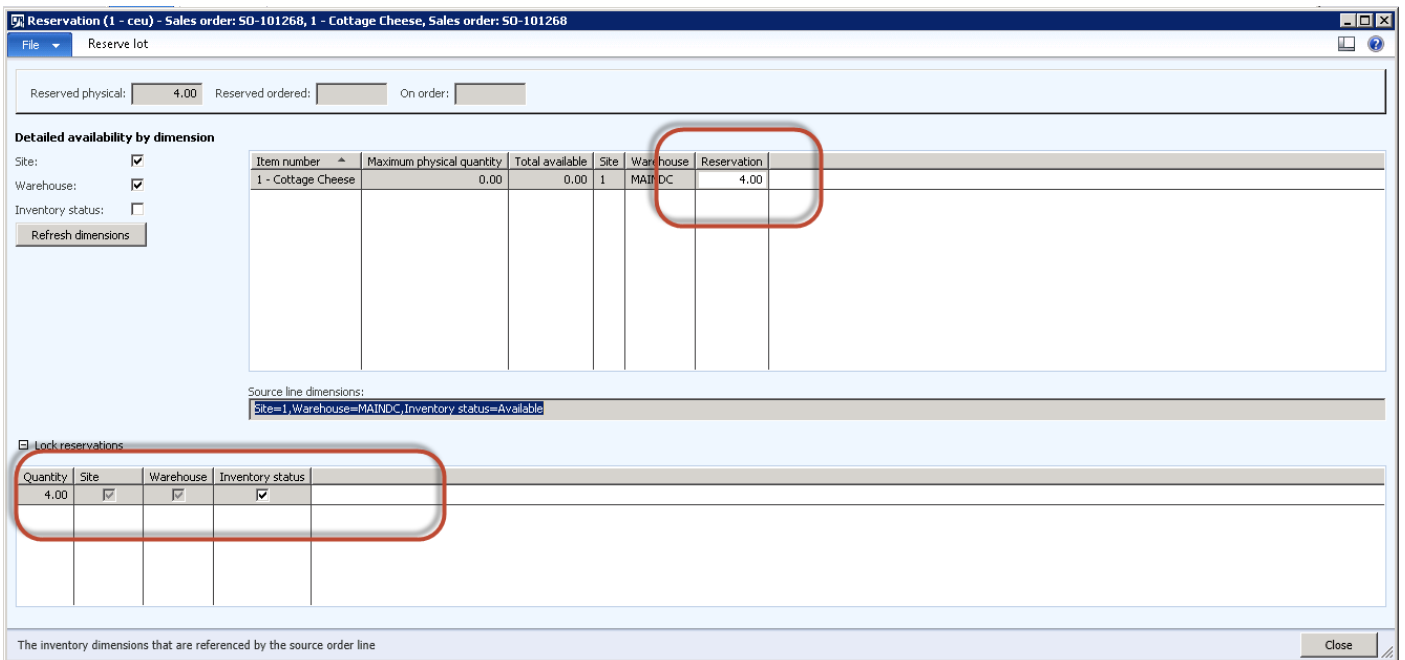


1. Use Account 1101.

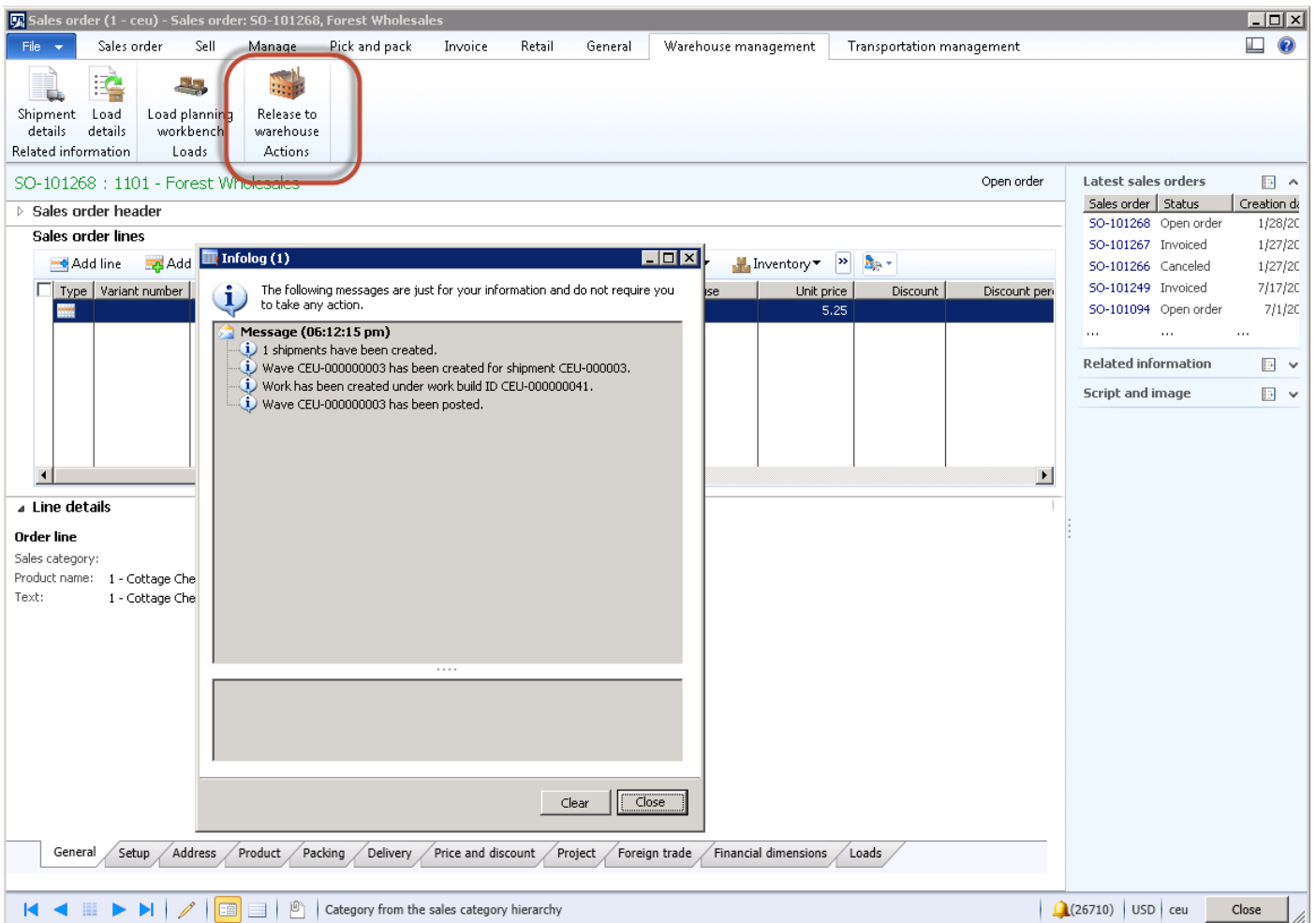
2. Ensure that site 1 and warehouse MAINDC have been selected.
3. Click OK.

The screenshot displays the Microsoft Dynamics CRM interface for a sales order. The main window title is "Sales order (1 - ceu) - Sales order: SO-101268, Forest Wholesales". The ribbon includes tabs for File, Sales order, Sell, Manage, Pick and pack, Invoice, Retail, General, Warehouse management, and Transportation management. The "Sales order lines" table is the central focus, with one line highlighted. The columns are: Type, Variant number, Item number, Product name, Sales category, Quantity, Unit, Site, Warehouse, Unit price, Discount, and Discount per. The first line has Item number "1 - Cottage C...", Product name "1 - Cottage C...", Quantity "4.00", and Unit "ea". The Site is "1" and the Warehouse is "MAINDC". Below the table, the "Line details" section is expanded, showing fields for Inventory (Lot ID, Reservation: Manual), Returned order (Scrap, Return cost price: 0.00, Return lot ID), Sales tax (Sales tax group: No-Tax), Commission (Sales group), and Date and time (Created date and time). The bottom status bar shows "Identification of the item lot." and "USD | ceu | Close".

- Look at item, 1 - Cottage Cheese, and note the quantity of 4.
- Because the default reservation parameter is manual, based on the accounts receivable parameters, you need to manually reserve inventory. Inventory must be reserved in order to release it to the warehouse.



- Manually trigger the reservation of inventory.



- By releasing the sales order to the warehouse, you've created a shipment and a wave has been created for the work.

Shipment details (1 - ceu) - Shipment ID: CEU-000003, CEU-000003, Order number: SO-101268 Work order type: Sales orders

File | Shipments | Transportation

Edit | Delete | Header view | Line view | Confirm shipment | Transfer shipment | Consolidate shipments | Quality orders | Change location Actions | Work details | Skip non-mandatory work | Print | Refresh | Export to Microsoft Excel List | Attachments

Shipment Details

Shipment

Load lines

Delete | Remove line | Reduce picked quantity

Load ID	Shipment ID	Item number	Quantity	Unit	Work created quantity	Packing quantity	Ready to ship	In process	Open	Closed
<input type="checkbox"/>	CEU-000003	1 - Cottage Cheese	4.00	ea	4.00	100.00				

Line details

- Note that the shipment details in the **Shipment details** form.

Load details (1 - ceu) - Load ID: CEU-000003, Load ID: CEU-000003

File Loads Ship and receive Transportation

Edit Header view Line view Change location Actions Reverse work Skip non-mandatory work Work Wave details Work Load planning workbench Posting errors Load seal Load history Containers Container structure Print Refresh Attachme...

Maintain Show Actions Work Related information Containers Container structure Print List

Load Details

Load

Load lines

Delete Reduce picked quantity Dimensions display

Invalid	Order number	Shipment ID	Item number	Code 1	Code 2	Code 3	Code 4	Overdelivery	Underdelivery	Quantity	Work created quantity
<input type="checkbox"/>	SO-101268	CEU-000003	1 - Cottage Cheese	Fresh				0.00	0.00	4.00	4.00

Pick up
Pick up
 Delivery name: Main Distribution Centre
 Address: 123 Coffee Street, Suite 300, Redmond, WA 98052, USA

Drop off
 Delivery name: Forest Wholesales
 Address: 456 Black Road, Bothell, WA 98021, USA

Open or in process work
 Appointments
 Related Orders
 Shipments

Line details

Set up the dimensions to be shown

(26710) USD ceu Close

- The load has been created.

All work

Type to filter Blocked wave

Show closed work

Blocked wave	Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID	Shipment ID	Wave ID
<input type="checkbox"/>	CEU-000001	CEU-000000001	Open	Purchase orders	000413	4	42			test1			
<input type="checkbox"/>	CEU-000026	CEU-000000025	Open	Purchase orders	000421	1	MAINDC			LPMP516			
<input type="checkbox"/>	CEU-000030	CEU-000000029	Open	Purchase orders	000424	1	MAINDC			LPMP518			
<input type="checkbox"/>	CEU-000031	CEU-000000030	Open	Purchase orders	000425	1	MAINDC			LPMP519			
<input type="checkbox"/>	CEU-000034	CEU-000000033	Open	Purchase orders	000426	1	MAINDC			LPMP521			
<input type="checkbox"/>	CEU-000041	CEU-000000040	Open	Purchase orders	000423	1	MAINDC			LPCD1			
<input type="checkbox"/>	CEU-000042	CEU-000000041	Open	Sales orders	SO-101268	1	MAINDC				CEU-000003	CEU-000003	CEU-00000000

Work ID: CEU-000042

Item number	Work status	Work type	Custom work code	Location	Work quantity	Remaining quantity	Unit	User ID	Work in process	Closed work	Stop transaction	Mandatory	Work class ID
1 - Cottage Cheese	Open	Pick		F01-01-02	4.00	4.00	ea			No	Yes		Sales Pick
1 - Cottage Cheese	Open	Put		BAYDOOR	4.00	4.00	ea			No	Yes		Sales Pick

Work work...
 Percentage completed: 0
 Work created: 1

Shipments
 Work dime...
 Related or...
 Work exce...
 Loads

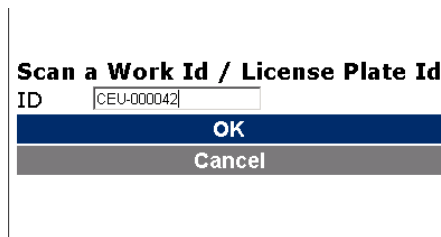
- You can also see the work that has been created, which instructs the picker to pick 4 quantity from Location F01-01-02 and put it at the outbound dock Baydoor. In this scenario, there is no staging or loading process, it is straight pick and then out the door.

Now that you've created work, you're ready to use a mobile device to pick the sales order. To access the mobile device through the AOT, open a developer workspace, open classes, and then find the **WHSWorkExecuteform** class, which will be the mobile device forms. Alternatively, you can open the mobile device menu through Internet Information Services (IIS).

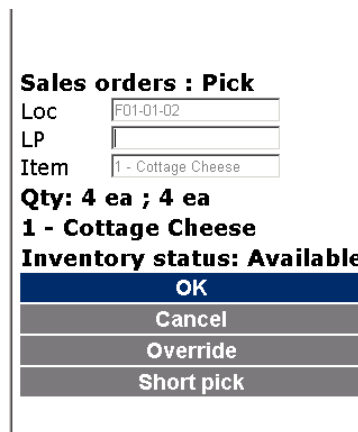
- Log on to the mobile device.
- Enter the password.
- Select the outbound process from the menu item.



- Select SO Picking.



- Copy the Work ID from the work form and paste it into the mobile emulator. Click **OK**.



- Enter the license plate in which the inventory is available in that location. Typically, you will scan the LP bar code.

Sales orders : Put

Loc
 LP
 Item

Qty: 4 ea ; 4 ea
1 - Cottage Cheese
Inventory status: Available

- Note that the LP number has been entered (scanned) and OK has been selected. You are now seeing the Put instructions which have been set up in the location directive.

Work Completed
Scan a Work Id / License Plate Id

ID

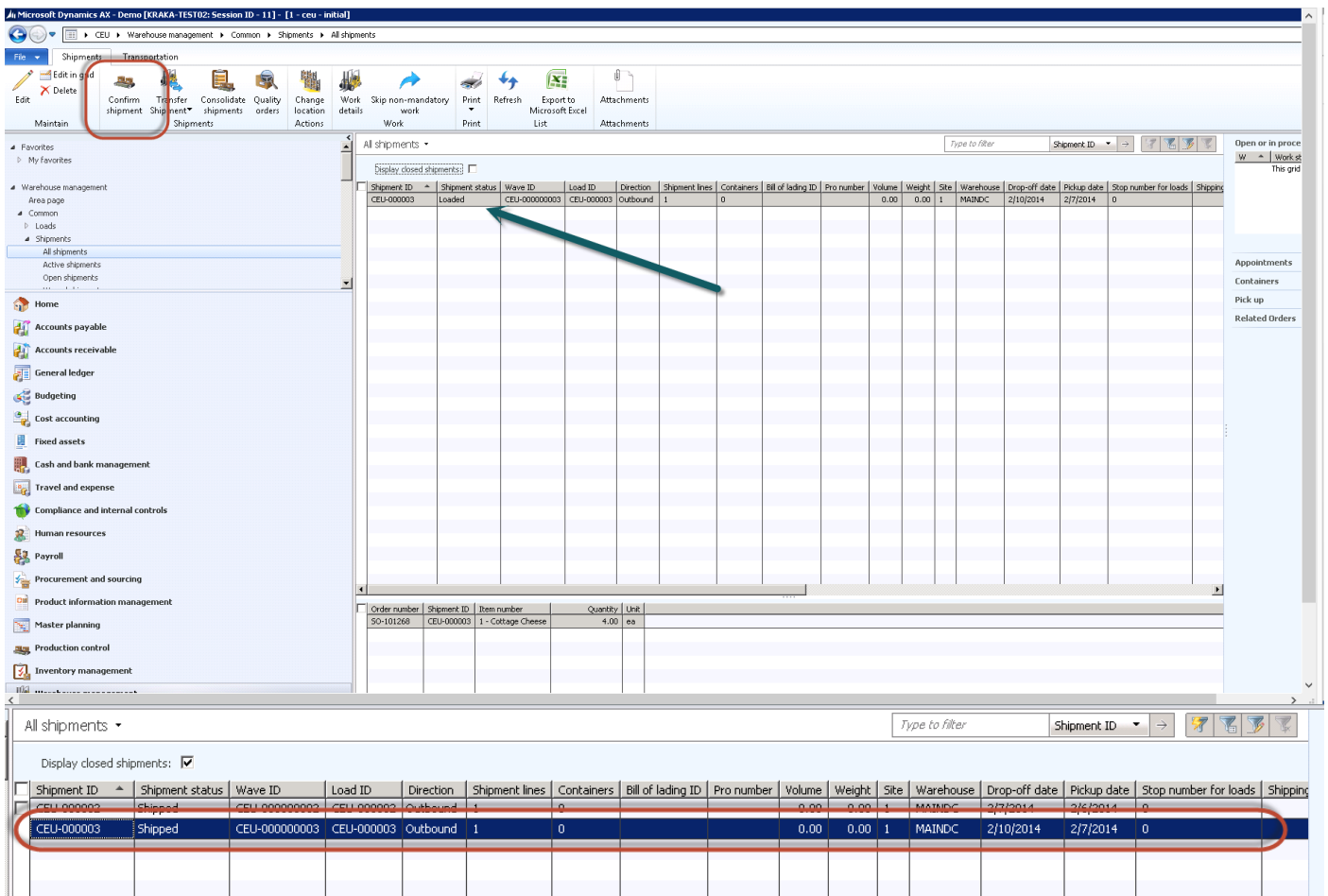
- Click OK to complete the work. This means that this inventory has been picked from the location and has been delivered to the baydoor, the customer has taken the goods, and the sales order can now be updated.

The Closed work in the Work form shows that the order has been picked and the work has been closed.

Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID	Shipment ID	Wave ID	Created
CEU-000019	CEU-000000018	Canceled	Purchase orders	000417	1	MAINDC			LPMP18				1/24/2014
CEU-000020	CEU-000000019	Canceled	Purchase orders	000417	1	MAINDC			LPMP19				1/24/2014
CEU-000021	CEU-000000020	Canceled	Purchase orders	000417	1	MAINDC			MPSLP20				1/24/2014
CEU-000022	CEU-000000021	Canceled	Purchase orders	000417	1	MAINDC			LPMP21				1/24/2014
CEU-000023	CEU-000000022	Closed	Purchase orders	000418	1	MAINDC	1/24/2014 06:57:31 pm	1/24/2014 06:59:17 pm	LPMP10				1/24/2014
CEU-000024	CEU-000000023	Canceled	Purchase orders	000419	1	MAINDC			LPMP12				1/24/2014
CEU-000025	CEU-000000024	Canceled	Purchase orders	000420	1	MAINDC			MPSLP7				1/24/2014
CEU-000026	CEU-000000025	Open	Purchase orders	000421	1	MAINDC			LPMP16				1/24/2014
CEU-000027	CEU-000000026	Canceled	Purchase orders	000422	1	MAINDC			LPMP17				1/24/2014
CEU-000028	CEU-000000027	Canceled	Purchase orders	000422	1	MAINDC			LPMP18				1/24/2014
CEU-000029	CEU-000000028	Canceled	Purchase orders	000423	1	MAINDC			LPMP17				1/24/2014
CEU-000030	CEU-000000029	Open	Purchase orders	000424	1	MAINDC			LPMP18				1/24/2014
CEU-000031	CEU-000000030	Open	Purchase orders	000425	1	MAINDC			LPMP19				1/24/2014
CEU-000032	CEU-000000031	Canceled	Purchase orders	000426	1	MAINDC			LPMP20				1/24/2014
CEU-000033	CEU-000000032	Canceled	Purchase orders	000426	1	MAINDC			LPMP21				1/24/2014
CEU-000034	CEU-000000033	Open	Purchase orders	000426	1	MAINDC			LPMP21				1/24/2014
CEU-000035	CEU-000000034	Closed	Purchase orders	000427	1	MAINDC	1/24/2014 10:17:34 pm	1/24/2014 10:22:26 pm	LPMP24				1/24/2014
CEU-000036	CEU-000000035	Closed	Purchase orders	000428	1	MAINDC	1/24/2014 10:40:51 pm	1/24/2014 10:40:51 pm	LPMP25				1/24/2014
CEU-000037	CEU-000000036	Closed	Purchase orders	000429	1	MAINDC	1/24/2014 11:02:40 pm	1/24/2014 11:07:31 pm	LPMP26				1/24/2014
CEU-000038	CEU-000000037	Closed	Purchase orders	000431	1	MAINDC	1/27/2014 07:08:13 pm	1/27/2014 07:08:35 pm	LPMP27				1/27/2014
CEU-000039	CEU-000000039	Closed	Inventory mov...		1	MAINDC	1/27/2014 07:11:05 pm	1/27/2014 07:11:05 pm	LPMP27				1/27/2014
CEU-000040	CEU-000000039	Closed	Sales orders	SO-101267	1	MAINDC	1/27/2014 10:39:54 pm	1/27/2014 10:41:20 pm	LPMP1	CEU-...	CEU-000...	CEU-0...	1/27/2014
CEU-000041	CEU-000000041	Open	Purchase orders	000435	1	MAINDC			LPMP2				1/27/2014
CEU-000042	CEU-000000041	Closed	Sales orders	SO-101268	1	MAINDC	1/28/2014 06:29:04 pm	1/28/2014 06:33:43 pm	LPMP2	CEU-...	CEU-000...	CEU-0...	1/28/2014

Item number	Work status	Work type	Custom work code	Location	Work quantity	Remaining quantity	Unit	User ID	Work in process	Closed work	Stop transaction	Mandatory	Work class ID
1 - Cottage Cheese	Closed	Pick		F01-01-02	4.00	0.00	ea	Matt	1/28/2014 06:29:04 pm	1/28/2014 06:33:43 pm	No	Yes	Sales Pick
1 - Cottage Cheese	Closed	Put		BAYDOOR	4.00	0.00	ea	Matt	1/28/2014 06:29:04 pm	1/28/2014 06:33:43 pm	No	Yes	Sales Pick

Because you've completed the work and you're not physically shipping the goods or loading them onto a delivery truck, you can confirm the shipment as complete and assume that the customer has collected the goods.



The shipment is now closed and the shipment status is **Closed**.

3.1.12 Understanding how to introduce staging into the picking process

In the previous section you followed a simple location directive where you set a pick and a put work type for sales orders where pick was from the location and put was to the outbound dock, Baydoor.

In the next example, you're going to learn about staging. You'll pick your items and then place them in a staging location where all lines of the order will be held. This means the items can be packed, relabeled, or loaded onto a delivery truck, and then sent out the door.

To do this, you need to adjust two things:

- The location directives.
- The work template.

3.1.13 Adjusting the location directives

In the previous section, you had a pick and a put to the baydoor, however now you'll learn use a directive code of Stage. You need to make sure that the staging process is between the pick and the end put to the baydoor.

- Notice in the illustration that there's sequence number 13 and a work type of Put with a directive code of Stage.
- The lines section on the form are basically the same. Specify a **To quantity** of 10,000.00.
- The location directive actions are created, however, make sure that you select the **Edit query** option for the Put stage work type.

Location directives (1 - ceu) - Sequence number: 12, MAINDC Sales Order Picking

Work order type: Sales orders

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
12	MAINDC Sales Order Picking	Pick	1	MAINDC			<input type="checkbox"/>
13	MAINDC Sales Order Picking	Put	1	MAINDC	Stage		<input type="checkbox"/>
14	MAINDC Sales Order Picking	Put	1	MAINDC	Baydoor		<input type="checkbox"/>

Lines

New Delete Move up Move down Restrict by unit

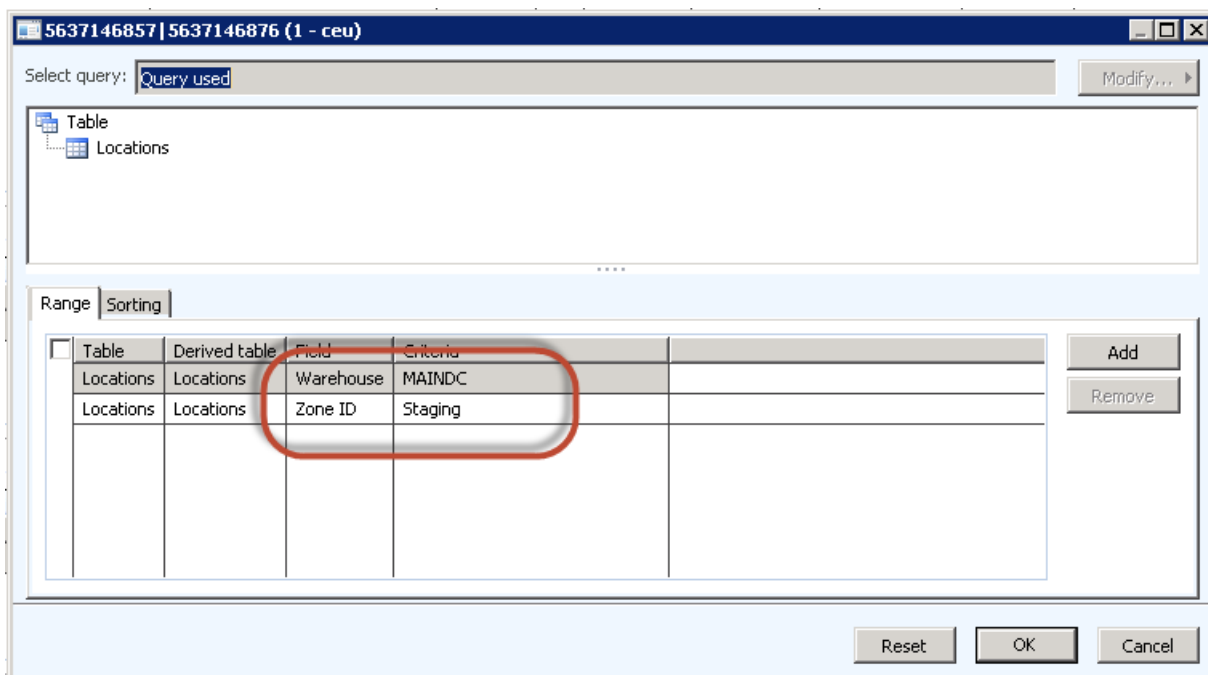
Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate packing quantity	Allow split
1	0.00	10,000.00		None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Location Directive Actions

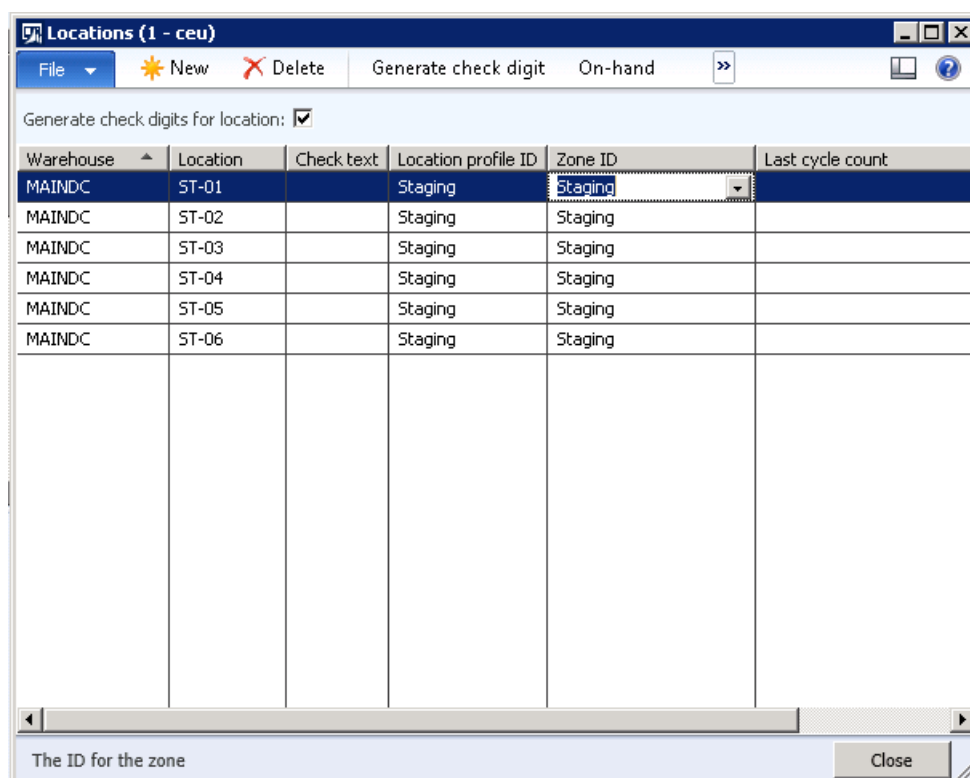
New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	MAINDC Sales Order Picking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

The type of work Close



- In the query, specify that for this put sequence, you want goods to be put in any location in Zone ID Staging. A quick query of the locations shows where that is.

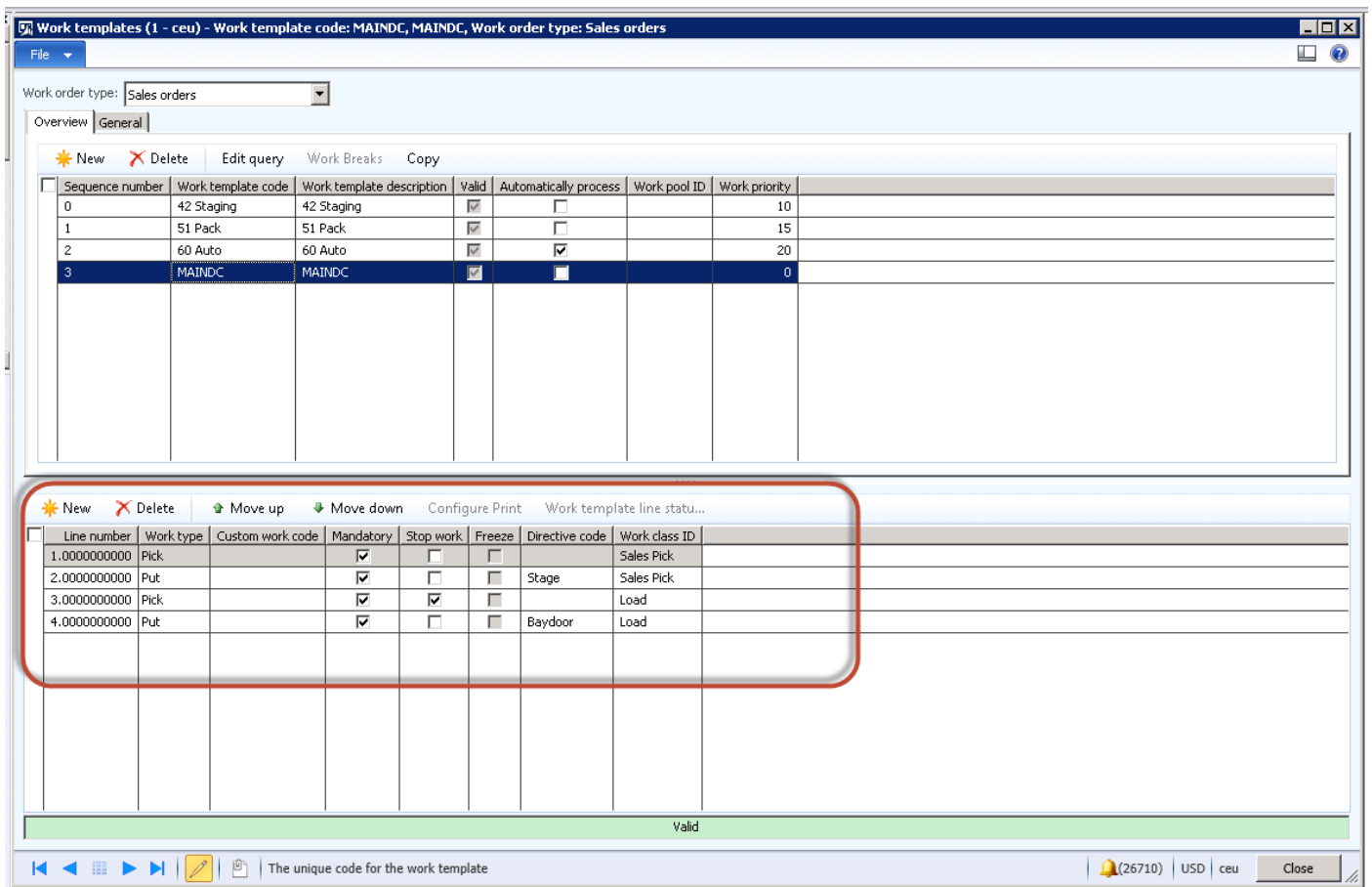


Note that ST-01 through to ST-06 are available staging locations on the warehouse floor.

After you've inserted the additional put process, you're ready to review the work template.

3.1.14 Understanding the work template for staging

In the work template you need to show that you'll have multiple pick and put work types.



In the illustration, notice the lines of the work template, there are 4 line numbers.

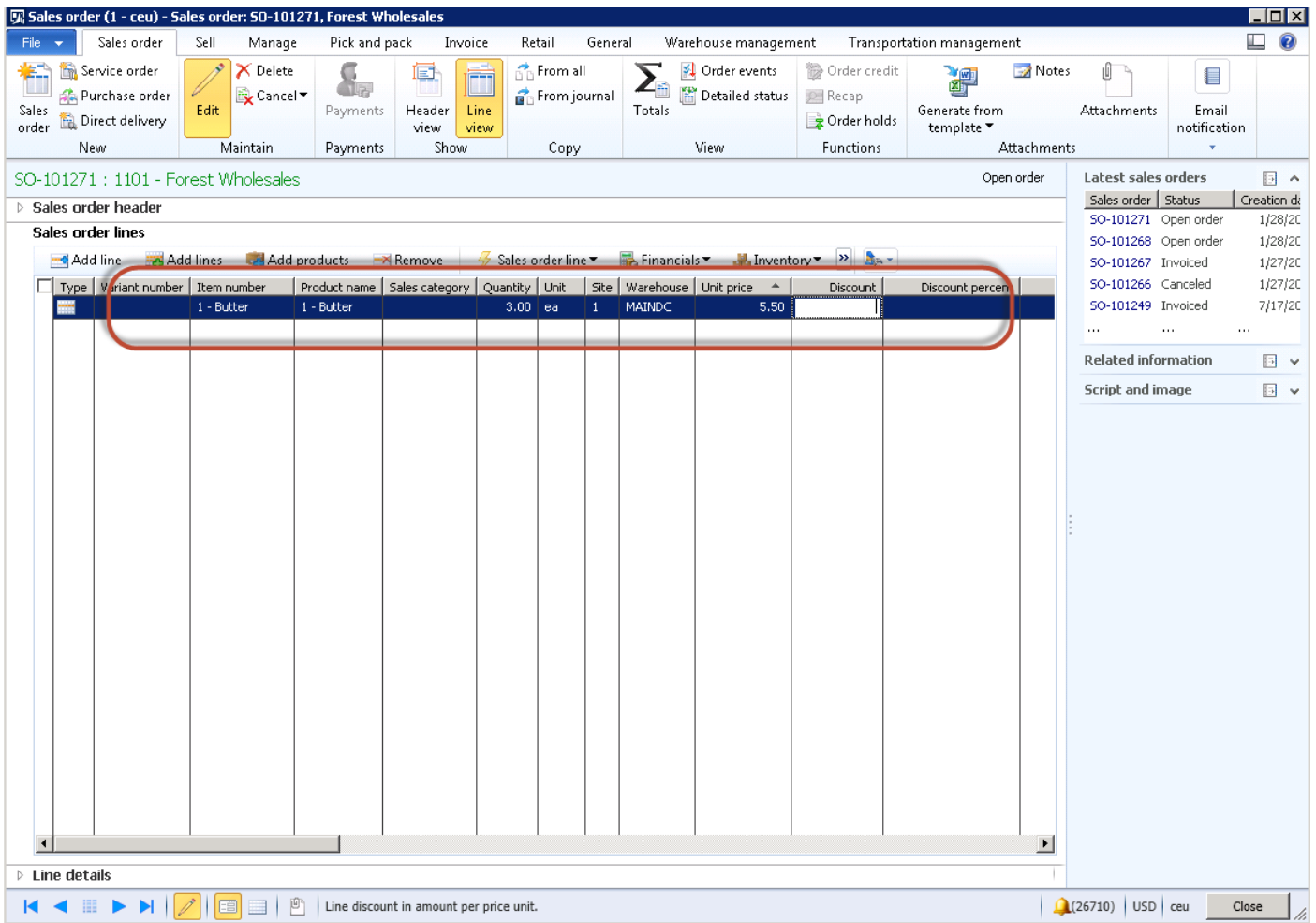
- An instruction to pick the goods using the work class ID sales pick from the nominated locations in the location directive.
- An instruction to put the goods via work class ID sales pick to the directive code stage. The directive code is matched against the location directive.
- The **Stop work** check box is selected on line 3 which means that after you've completed the put to the staging location, do not automatically continue with the load. Assume that the work stops and a warehouse load person will load this onto a truck or rail for delivery.
- The third line number specifies the pick from staging, however in this case you're using the work class ID Load, which is a different menu on the mobile device.
- The fourth line is the put instruction to the Baydoor, which represents that the order has been dispatched.

Using this setup, you're now ready to test the process.

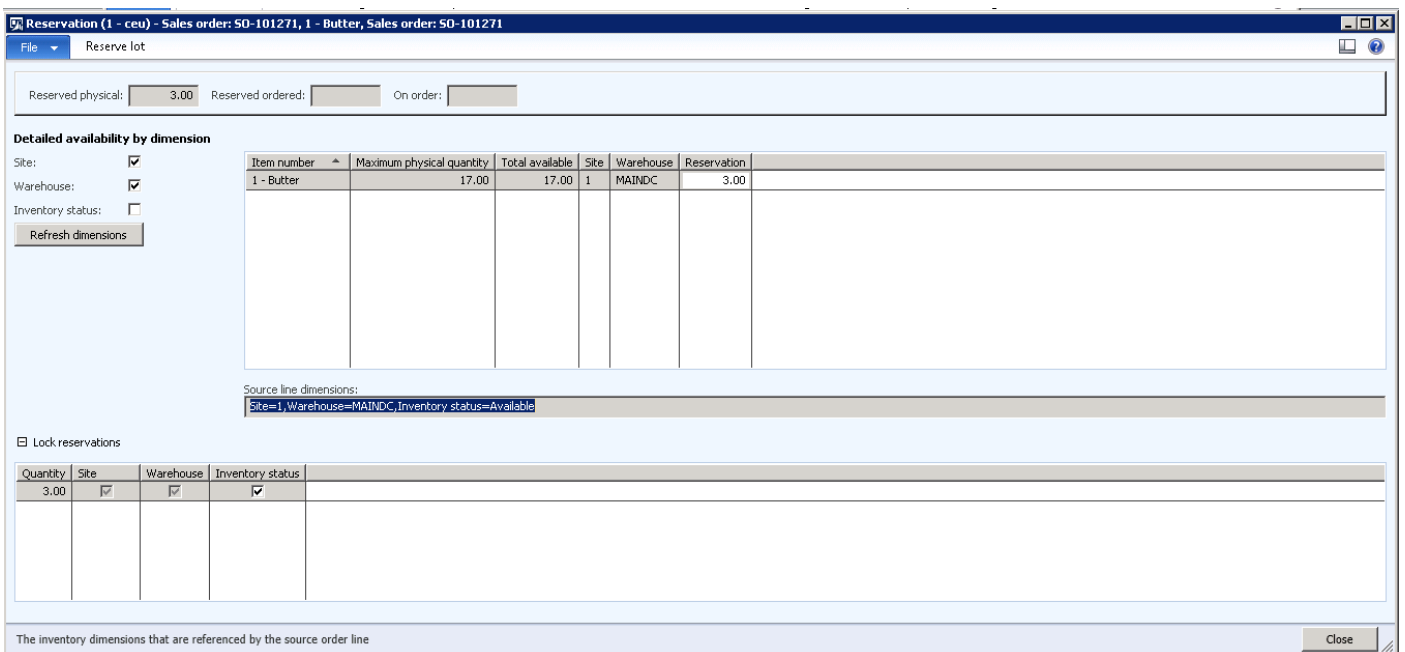
3.1.15 Test the use of staging in the outbound process

1. Create a sales order.

2. Ensure that the **Site** and **Warehouse** fields are set correctly.
3. Click **OK**.



4. Add item, 1 – Butter, to the sales order line for a quantity of 3.0.
5. Reserve the stock.



6. Release to the warehouse and review the work that is created.

Blocked wave	Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID	Shipment ID	Wave ID
<input type="checkbox"/>	CEU-000001	CEU-000000001	Open	Purchase orders	000413	4	42			test1			
<input type="checkbox"/>	CEU-000026	CEU-000000025	Open	Purchase orders	000421	1	MAINDC			LPMP516			
<input type="checkbox"/>	CEU-000030	CEU-000000029	Open	Purchase orders	000424	1	MAINDC			LPMP518			
<input type="checkbox"/>	CEU-000031	CEU-000000030	Open	Purchase orders	000425	1	MAINDC			LPMP519			
<input type="checkbox"/>	CEU-000034	CEU-000000033	Open	Purchase orders	000426	1	MAINDC			LPMP521			
<input type="checkbox"/>	CEU-000041	CEU-000000040	Open	Purchase orders	000433	1	MAINDC			LPMP521			
<input type="checkbox"/>	CEU-000049	CEU-000000053	Open	Sales orders	SO-101274	1	MAINDC				CEU-000015	CEU-000015	CEU-00000001

Item number	Work status	Work type	Custom work code	Location	Work quantity	Remaining quantity	Unit	User ID	Work in process	Closed work	Stop transaction	Mandatory	Work class ID
1 - Butter	Open	Pick		F01-01-01	3.00	3.00	ea				No	Yes	Sales Pick
1 - Butter	Open	Put		ST-01	3.00	3.00	ea				No	Yes	Sales Pick
1 - Butter	Open	Pick		ST-01	3.00	3.00	ea				Yes	Yes	Load
1 - Butter	Open	Put		BAIDOOR	3.00	3.00	ea				No	Yes	Load

The four line numbers reflect the pick and put to staging, and the pick and put to the Baydoor.

Complete the staging pick process using the mobile device.

Scan a Work Id / License Plate Id

ID

OK

Cancel

1. Scan the work ID for the sales order.
2. Select OK.

Sales orders : Put

Loc

LP

Item

Qty: 3 ea ; 3 ea

1 - Butter

Inventory status: Available

OK

Override

3. Scan the License Plate that the inventory is on. Select OK.

Work Completed
Scan a Work Id / License Plate Id

ID

OK

Cancel

The work has completed, and now inventory has moved to the staging location. To confirm this, perform an inventory inquiry by location and review.

The screenshot shows the 'On hand by location' window in Dynamics NAV. The window title is 'On hand by location (1 - ceu)'. The 'Site' is set to '1' and the 'Warehouse' is 'MAINDC'. The 'Overview' tab is selected, showing a table of locations. The row for 'ST-01' (Staging) is highlighted with a red oval. Below the table, the 'Item number' is '1 - Butter' and the 'Quantity' is '3.00'. The bottom section of the window shows a detailed table of transactions for '1 - Butter', with the first row highlighted by a red oval. The status is 'Available', and the physical inventory is 3.00.

Location	Zone ID	Location profile ID	Location type	Check text
D01-01-01	DGNP	DRYGOODS	DRYGOODS	
F01-02-01	Fresh	FRESH	FRESHGOODS	
F01-02-02	Fresh	FRESH	FRESHGOODS	
F01-03-01	Fresh	FRESH	FRESHGOODS	
F01-03-02	Fresh	FRESH	FRESHGOODS	
F01-04-01	Fresh	FRESH	FRESHGOODS	
F01-04-02	Fresh	FRESH	FRESHGOODS	
F03-01-01	Fresh	FRESH	FRESHGOODS	
INBOUND	DECU	DECU		
ST-01	Staging	Staging	STAGE	

Item number	Product name	Parent license plate	Configuration	Size	Color	Style	Batch number	Serial number	Inventory status	License plate	Physical inventory	Available physical
1 - Butter	1 - Butter								Available	LPMP51	3.00	3.00

Inventory is shown in the staging location.
 Review the work and the status.

All work ▾ Type to filter Blocked wave ▾ →

Show closed work:

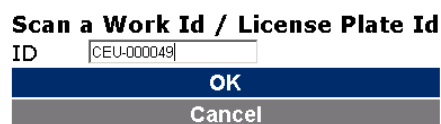
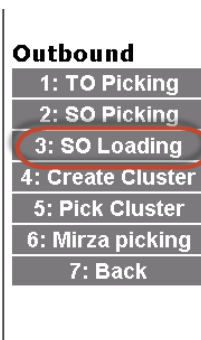
Blocked wave	Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID	Shipment ID	Wave ID
<input type="checkbox"/>	CEU-000001	CEU-000000001	Open	Purchase orders	000413	4	42			test1			
<input type="checkbox"/>	CEU-000026	CEU-000000025	Open	Purchase orders	000421	1	MAINDC			LPMP516			
<input type="checkbox"/>	CEU-000030	CEU-000000029	Open	Purchase orders	000424	1	MAINDC			LPMP518			
<input type="checkbox"/>	CEU-000031	CEU-000000030	Open	Purchase orders	000425	1	MAINDC			LPMP519			
<input type="checkbox"/>	CEU-000034	CEU-000000033	Open	Purchase orders	000426	1	MAINDC			LPMP521			
<input type="checkbox"/>	CEU-000041	CEU-000000040	Open	Purchase orders	000433	1	MAINDC			LPCD1			
<input checked="" type="checkbox"/>	CEU-000049	CEU-000000053	In process	Sales orders	SO-101274	1	MAINDC	1/28/2014 09:49:45 pm		LPMP51	CEU-000015	CEU-000015	CEU-000000

Work ID: CEU-000049

Item number	Work status	Work type	Custom work code	Location	Work quantity	Remaining quantity	Unit	User ID	Work in process	Closed work	Stop transaction	Mandatory	Work class ID
1 - Butter	Closed	Pick		F01-01-01	3.00	0.00	ea	Matt	1/28/2014 09:49:45 pm	No	Yes		Sales Pick
1 - Butter	Closed	Put		ST-01	3.00	0.00	ea	Matt	1/28/2014 09:49:45 pm	No	Yes		Sales Pick
1 - Butter	Open	Pick		ST-01	3.00	3.00	ea		1/28/2014 09:49:45 pm	Yes	Yes		Load
1 - Butter	Open	Put		BAYDOOR	3.00	3.00	ea		1/28/2014 09:49:45 pm	No	Yes		Load

The picking process has been marked as Closed and the load process is marked as Open. To complete the process, perform a sales load using the mobile device.

1. Log on to the mobile device and select SO Loading.



2. Scan the Work ID and select OK.

Work 1
Sales orders : Pick
 Loc
 Target LP
 Item
Qty: 3 ea ; 3 ea
1 - Butter
Inventory status: Available

- Note the message to pick up from the staging location. Select **OK**. A message is displayed for the license plate, but you can skip this by clicking **Done**.

Sales orders : Put
 Loc
 LP
 Item
Qty: 3 ea ; 3 ea
1 - Butter
Inventory status: Available

- Note the message to put the stock at the Baydoor, which is considered Complete. Select **OK**.

Work Completed
Scan a Work Id / License Plate Id
 ID

- Work is complete.
- Review the On hand by location form.

On hand by location (1 - ceu)

File Work details Set as default

Site: 1 Warehouse: MAINDC

Show empty:

Overview Profile

Location	Zone ID	Location profile ID	Location type	Check text
D01-01-01	DGMP	DRYGOODS	DRYGOODS	
F01-02-01	Fresh	FRESH	FRESHGOODS	
F01-02-02	Fresh	FRESH	FRESHGOODS	
F01-03-01	Fresh	FRESH	FRESHGOODS	
F01-03-02	Fresh	FRESH	FRESHGOODS	
F01-04-01	Fresh	FRESH	FRESHGOODS	
F01-04-02	Fresh	FRESH	FRESHGOODS	
F03-01-01	Fresh	FRESH	FRESHGOODS	
INBOUND		RECV	RECV	

Item number: 4 - Cheese Doritos Quantity: 11.00

Overview

Transactions Quarantine Dimensions display

Item number	Product name	Parent license plate	Configuration	Size	Color	Style	Batch number	Serial number	Inventory status	License plate	Physical inventory	Available physical
4 - Cheese Doritos	4 - Cheese Doritos								Available	LPMP510	11.00	11.00

Identify the warehouse. (26710) USD | ceu Close

All staging locations have now been depleted, the process is complete.

3.1.16 Understanding how to use anchoring in the staging process

Anchoring lets you override the staging or loading location so that all open puts will be directed to the new staging or loading location. The **Mobile Device Menu** configuration is found on the Mobile Device Menu Item configuration. If the **Anchor** field is selected, then you can anchor by shipment or by load. If anchoring is by shipment, then the subsequent open puts will be changed to the new location for that shipment. If anchoring is by load, then the subsequent open puts will be changed to the new location for that load.

3.1.17 Understanding cluster picking

Cluster picking offers significant levels of optimization. You can pick multiple orders at a time by incorporating the pick tasks for various orders and sequencing them accordingly.

Work will be created in clusters, and the picking functionality ensures that the warehouse worker visits every location in the cluster only one time. The worker will be instructed to pick the whole quantity needed and place the items into positions, for all cartons.

The following illustration shows an example of where cluster picking would be useful. Each blue box on the cart represents a position and an order. This allows the picker to pick the item many times, but place it in the designated position.



To set this up, there are several steps required to identify what orders would be considered cluster picked orders and what orders would not. The next case study example will identify orders that have a sales origin of INET, which will be picked in a cluster picking environment.

Step 1

Create a new location directive for the sales order work type that specifies setup for cluster picking.

To open the **Location directives** window, follow this navigation path:

Warehouse Management > Setup > Location Directives

Location directives (1 - ceu) - Sequence number: 15, MAINDC Cluster Picking

Work order type: Sales orders

Location directives

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
15	MAINDC Cluster Picking	Pick	1	MAINDC			<input type="checkbox"/>
16	MAINDC Cluster Put	Put	1	MAINDC	Baydoor		<input type="checkbox"/>

Lines

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit
1	0.00	10,000.00		None	<input type="checkbox"/>

Location Directive Actions

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Clustering Picking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

Select the query to be edited.

1. For the location directive, create two additional sequence numbers to support the cluster picking directive – a pick instruction and a put instruction. Focus on line sequence 15 – the Pick instruction.
2. Create a new line and set it against MAINDC warehouse and site 1.
3. Select the **Edit query** option and specify that you only want sales orders that have a sales origin of INET to be routed through the cluster picking location directive.
4. For the lines of the location directive for Pick, do not restrict by unit of measure and use a default of 0 to 10,000.00.

Lines

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate packing quantity	Allow split
1	0.00	10,000.00		None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Location Directive Actions

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Clustering Picking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

- For the location directive actions, at the bottom of the form, create a simple line action for the pick work type, which has no assigned query.

Location Directive Actions

New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Clustering Picking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

Name. Close

- For the put work type of the location directive, create a cluster pick without staging. To do this, follow a setup that is like the original location directive that you created earlier.

Location directives (1 - ceu) - Sequence number: 16, MAINDC Cluster Put, Work order type: Sales orders

File Work order type: Sales orders

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
6	42 Put Door Multi	Put	4	42	Baydoor		<input checked="" type="checkbox"/>
7	51 Put Pack	Put	5	51	Pack		<input type="checkbox"/>
8	51 Put Pack Multi	Put	5	51	Pack		<input checked="" type="checkbox"/>
9	60 Sales Order Pick	Pick	6	60			<input type="checkbox"/>
10	60 Put	Put	6	60	Baydoor		<input type="checkbox"/>
11	60 Put Multi	Put	6	60	Baydoor		<input checked="" type="checkbox"/>
12	MAINDC Sales Order Picking	Pick	1	MAINDC			<input type="checkbox"/>
13	MAINDC Sales Order Picking	Put	1	MAINDC	Stage		<input type="checkbox"/>
14	MAINDC Sales Order Picking	Put	1	MAINDC	Baydoor		<input type="checkbox"/>
15	MAINDC Cluster Picking	Pick	1	MAINDC			<input type="checkbox"/>
16	MAINDC Cluster Put	Put	1	MAINDC	Baydoor		<input type="checkbox"/>

Lines

New Delete Move up Move down

Sequence number	From quantity	To quantity	Unit
1	0.00	10,000.00	

Location Directive Actions

New Delete Move up Move down

Sequence number	Name	Only
1	Cluster Picking	

Select the query to be edited.

Sales (1 - ceu)

Select query: Query used Modify...

Tables: Sales orders, Order lines, Items, Warehouse item number

Range Sorting

Table	Derived table	Field	Criteria
Sales orders	Sales orders	Sales origin	INET

Add Remove

Reset OK Cancel

Close

- Create a put line against warehouse MAINDC. Make sure that you do the same using **Edit query** and specify the sales order of INET. This specifies that you only want orders that have the sales origin of INET to follow this path.

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate picking quantity	Allow split
1	0.00	10,000.00		None	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Location Directive Actions

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
16	MAINDC Cluster Put	Put	1	MAINDC	Baydoor		<input type="checkbox"/>

8. The line sequence should have a 0 to 10,000.00 quantity.

Location directives (1 - ceu) - Sequence number: 16, MAINDC Cluster Put, Work order type: Sales orders

Work order type: Sales orders

Location directives

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
6	42 Put Door Multi	Put	4	42	Baydoor		<input checked="" type="checkbox"/>
7	51 Put Pack	Put	5	51	Pack		<input type="checkbox"/>
8	51 Put Pack Multi	Put	5				<input type="checkbox"/>
9	60 Sales Order Pick	Pick	6				<input type="checkbox"/>
10	60 Put	Put	6				<input type="checkbox"/>
11	60 Put Multi	Put	6				<input type="checkbox"/>
12	MAINDC Sales Order Picking	Pick	1				<input type="checkbox"/>
13	MAINDC Sales Order Picking	Put	1				<input type="checkbox"/>
14	MAINDC Sales Order Picking	Put	1				<input type="checkbox"/>
15	MAINDC Cluster Picking	Pick	1				<input type="checkbox"/>
16	MAINDC Cluster Put	Put	1				<input type="checkbox"/>

Lines

Sequence number	From quantity	To quantity	Unit	Locate quantity
1	0.00	10,000.00		None

Location Directive Actions

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	Cluster Picking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

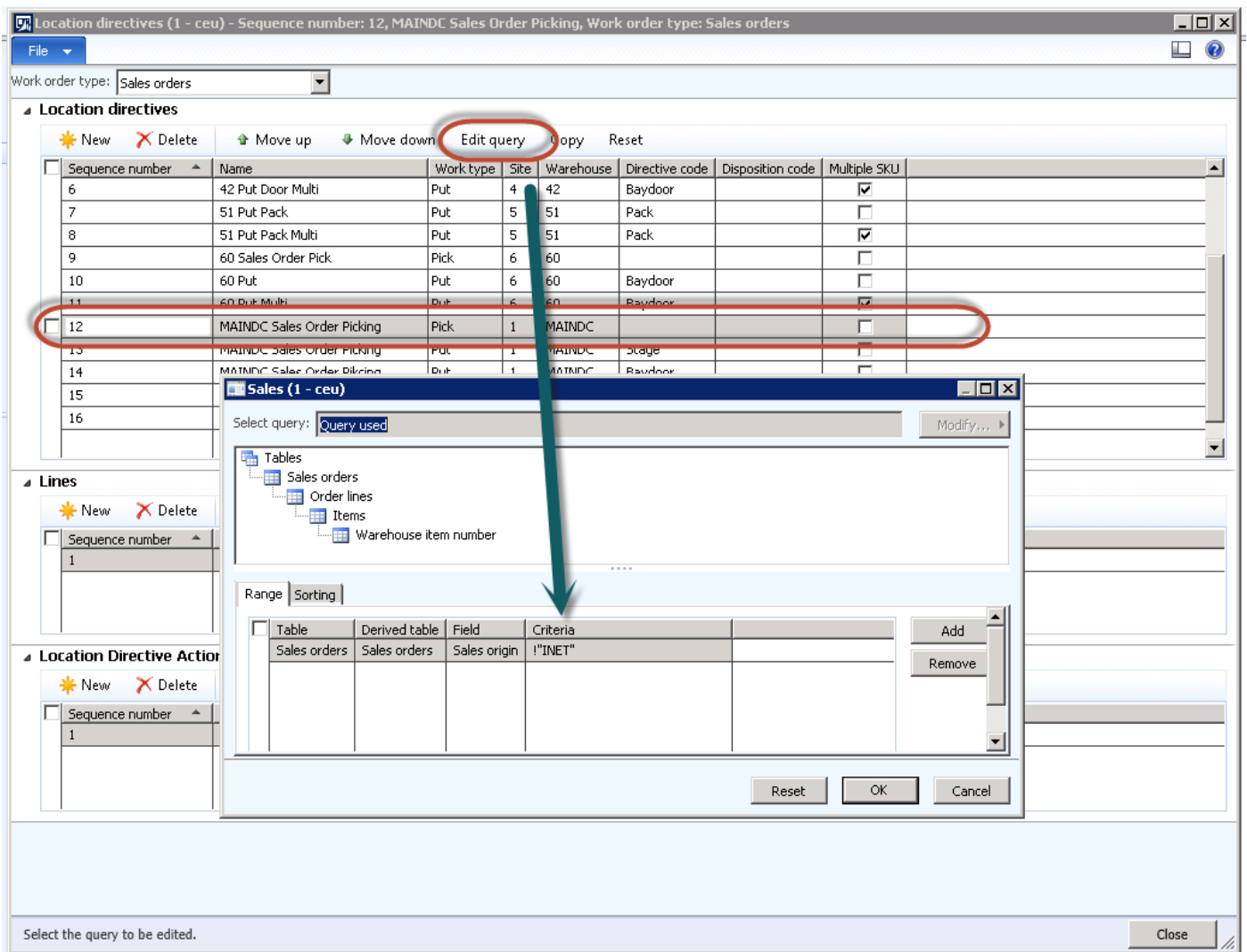
Query Editor

Select query: Query used

Table	Derived table	Field	Criteria
Locations	Locations	Warehouse	MAINDC
Locations	Locations	Location profile ID	BAYDOOR

9. On the **Location Directive Actions** FastTab, enter one sequence and enter the put instruction to place the items in the location profile, Baydoor.

10. Specify !"NET" criteria on the standard location directive, which in this case study is Sequence number line 12.

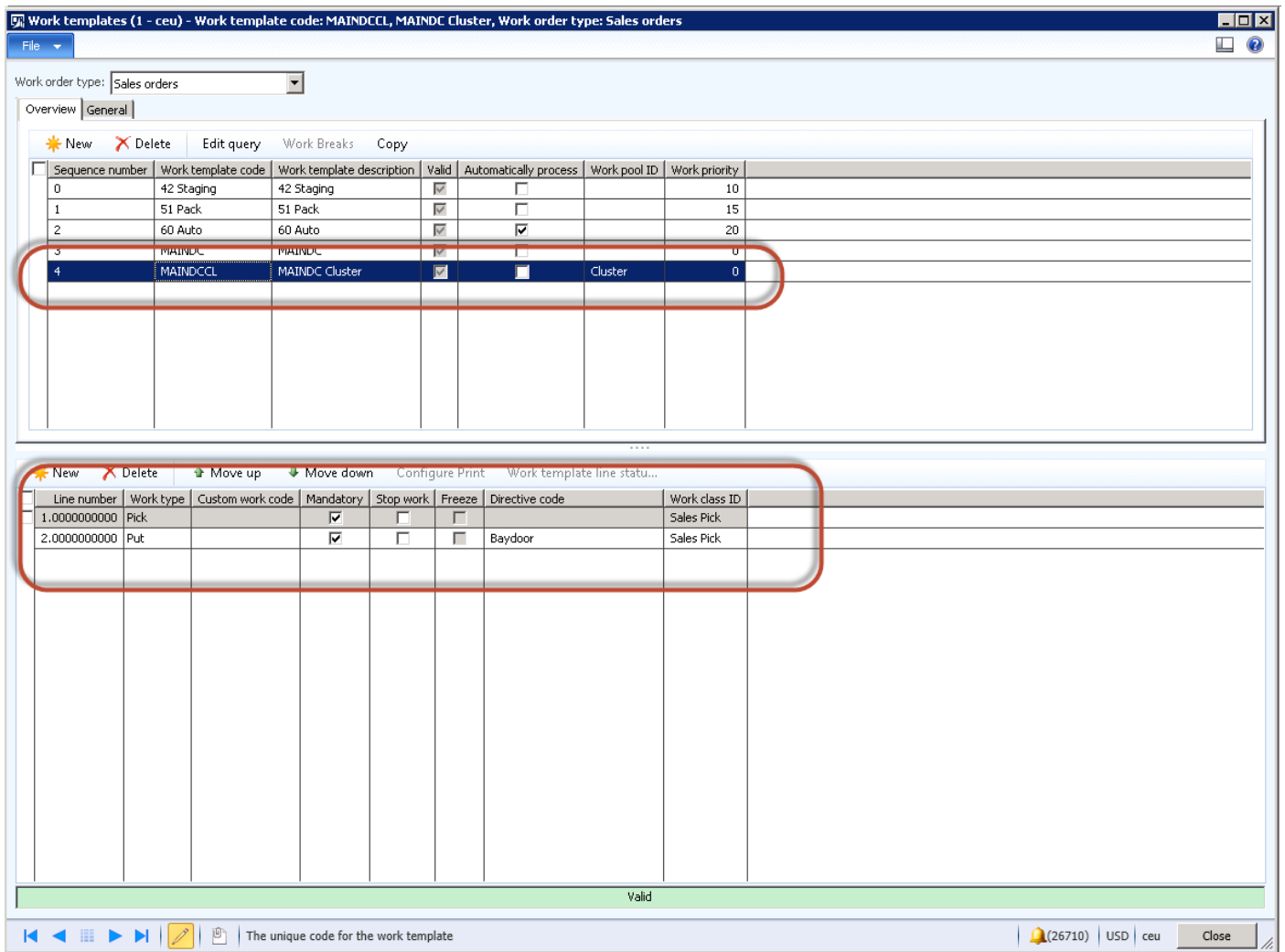


Step 2

For step two, must make sure that you have a work template created to handle the work that is associated with a cluster pick.

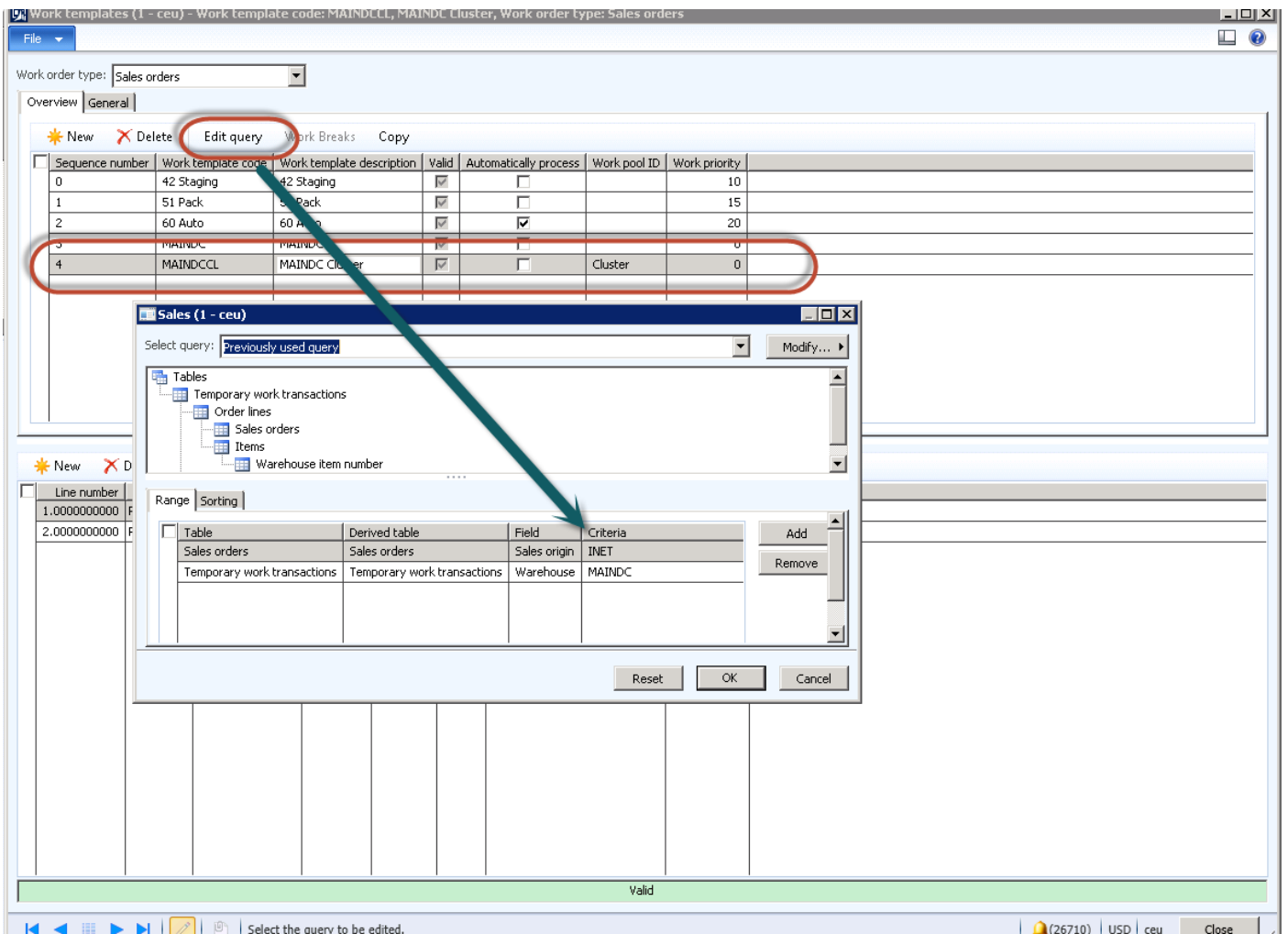
To open the **Work template** window, follow this navigation path:

Warehouse Management > Setup > Work > Work Template

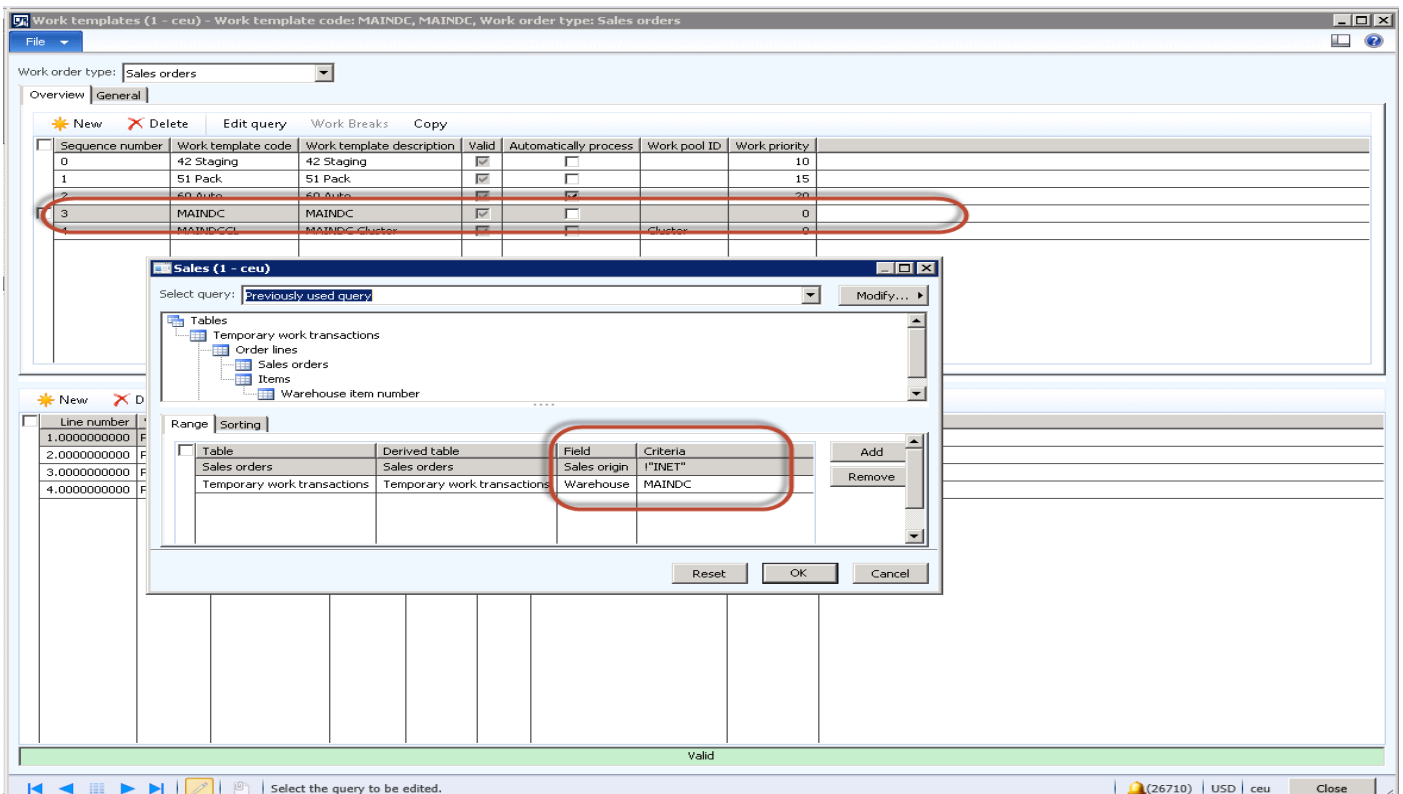


Notice the work template that was created for cluster picking against the sales order work type.

1. You're using a straight pick and put to Baydoor without staging, however you can include staging, as mentioned in the location directive earlier in this document.
2. On the header, create a work pool ID and set this to cluster. Make sure that you create a work pool ID of cluster and attach it to the work template. When you want work reports, it's easier to filter out work only for cluster picking. This is not required but it makes it easy to filter and identify work.
3. On the header of the work template, make sure that you select **Edit query** and follow the same procedure outlined for the directive, in order to filter only sales orders that have a sales pool of INET.



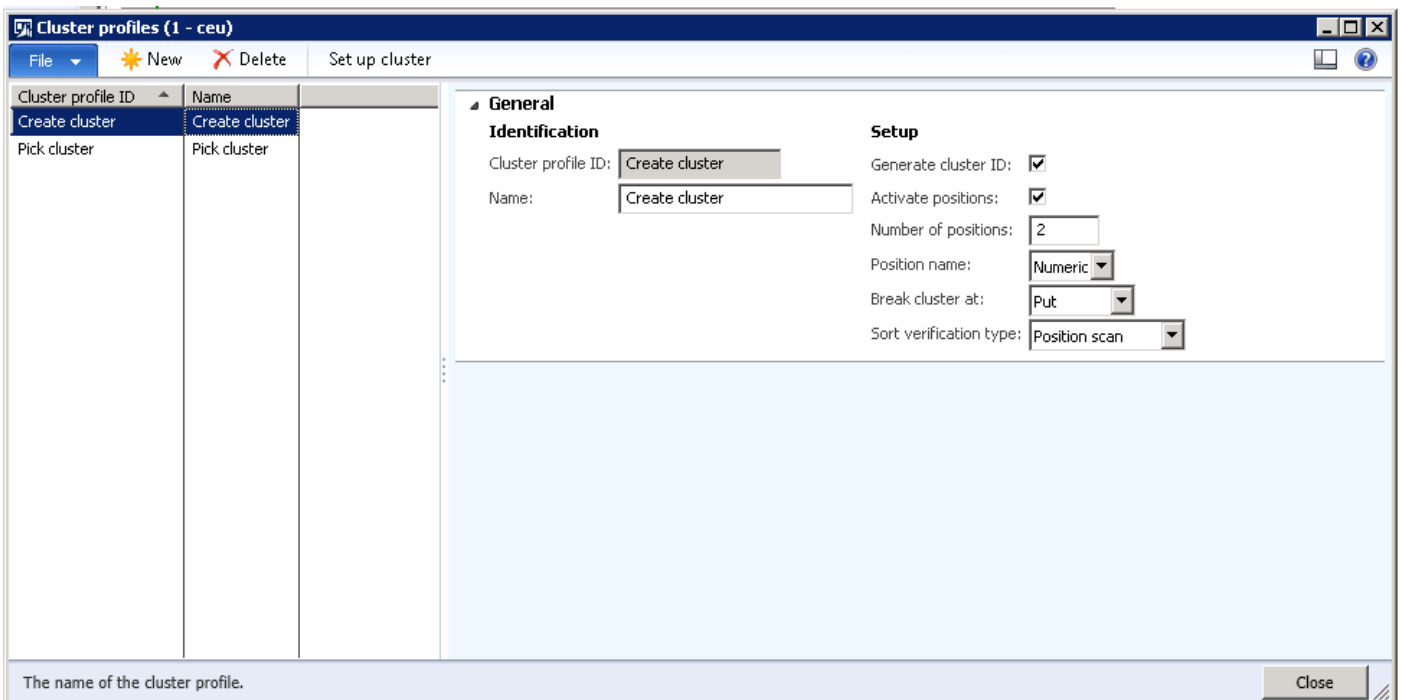
You must also specify !"NET" criteria on the query of the standard work template. In this example, this is sequence number 3. This specifies that you only want orders that do not have an origin of INET, which means anything other than INET.



Step 3 - Set up Cluster Profiles

Cluster profiles enable you to start a cluster and assign work to the positions and start the pick of the cluster. It's important that you create both a cluster and a pick cluster profile.

To open the Cluster profiles window, follow this navigation path:
 Warehousing for AX > Setup > Mobile Device > Cluster Profiles

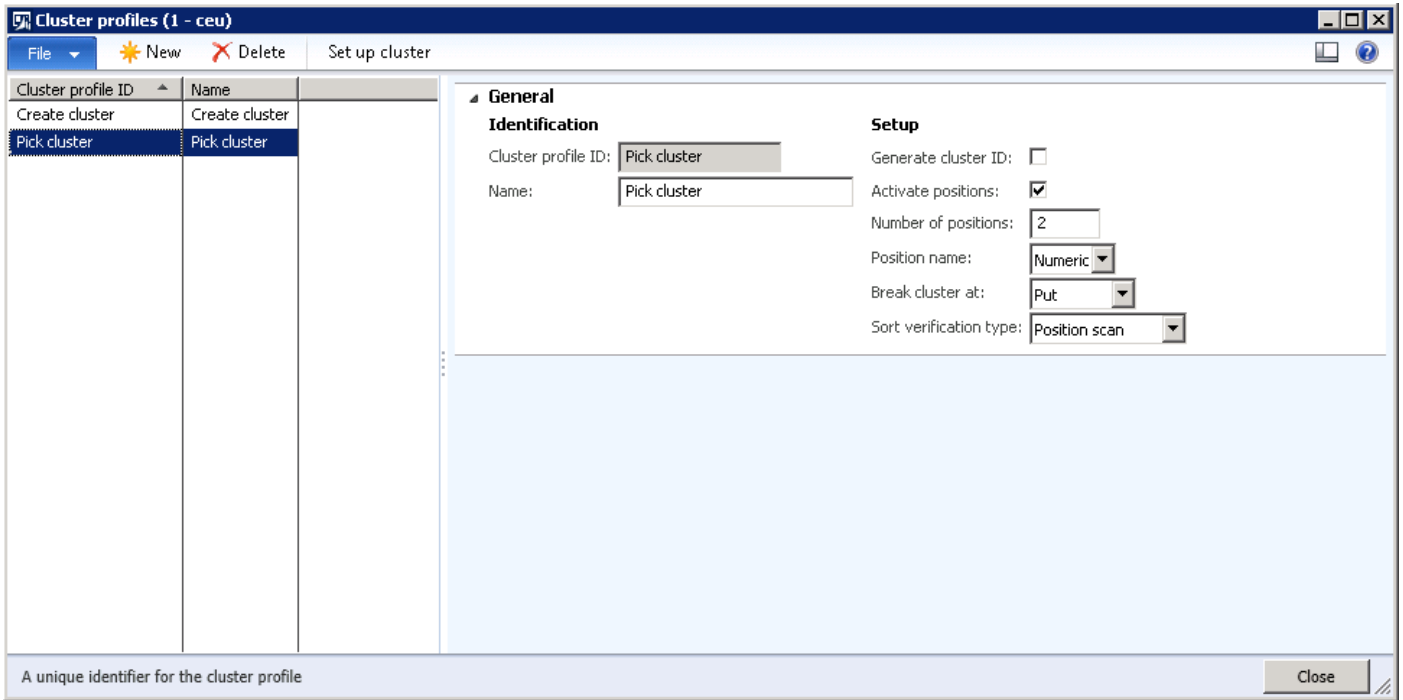


Set up a cluster profile ID called **Create Cluster**, with the following options:

1. Select **Generate cluster ID**.

4. Select **Activate positions**.
5. Specify the **Number of positions** on the cart. The example shows only 2, but you can create as many as you need.
6. The **Position name** is **Numeric**.
7. The **Break cluster** is set to **Put**.
8. The **Sort verification type** is based on the **Position scan**.

After you've created the create cluster profile, create the pick cluster profile.

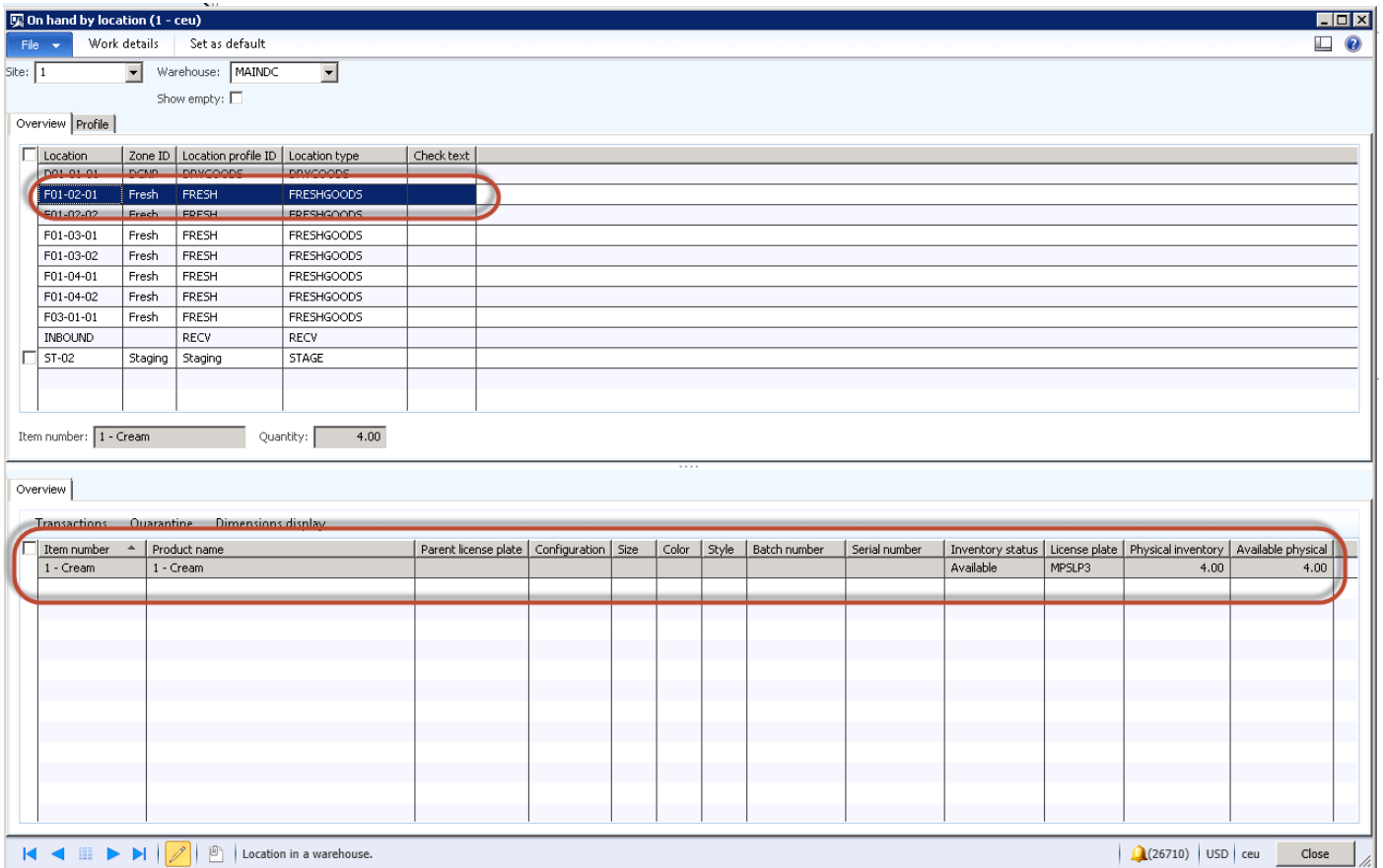


Note the settings for the **Pick cluster** setup.

Step 4 - Test the process

To test the process, make sure that you have a location with inventory on hand, so perform an on hand by location inquiry.

Based on the following illustration, there are 4 items in stock in location F01-02-01.



1. Create two sales orders against two different customers, as shown in the following illustration.

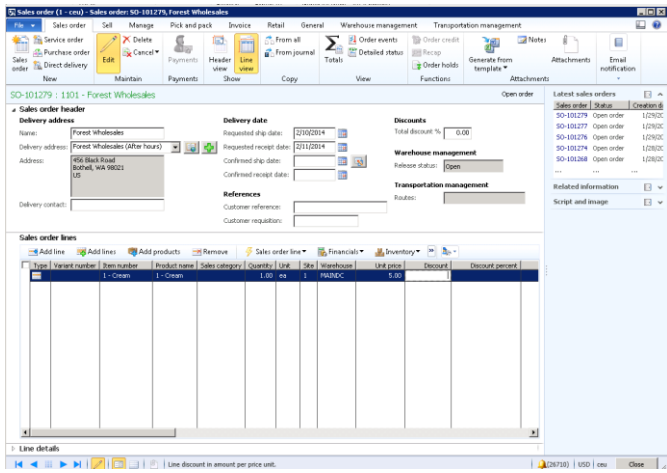
Header

- Created for account 1101.
- Marked on site 1, warehouse MAINDC.
- Ensure sales origin is set to INET.

Header

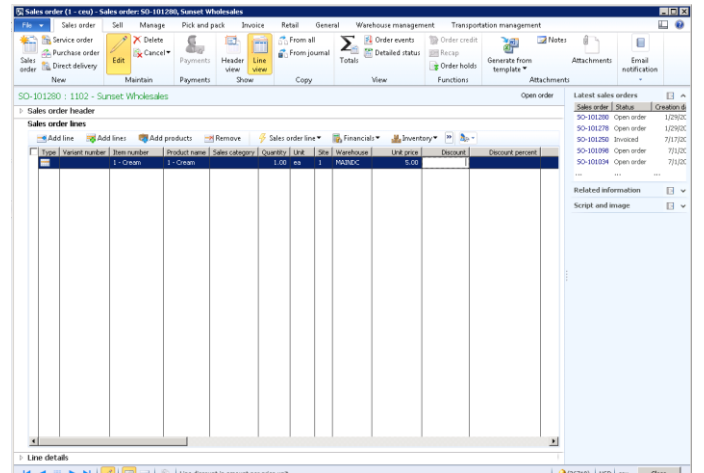
- Created for account 1102.
- Marked on site 1, warehouse MAINDC.
- Ensure sales origin is set to INET.

Lines



- Ensure item, 1 – Cream, is selected.
- Enter a quantity of 1.
- Enter a price of 5.00.

Lines



- Ensure item, 1 – Cream, is selected.
- Enter a quantity of 1.
- Enter a price of 5.00.

- Ensure that reservations on both orders have occurred.
- Release both orders to the warehouse.
- Review the work that has been created.

All work Type to filter Blocked wave

Show closed work:

Blocked wave	Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID	S
	CEU-000001	CEU-000000001	Open	Purchase orders	000413	4	42			test1		
	CEU-000026	CEU-000000025	Open	Purchase orders	000421	1	MAINDC			LPMP516		
	CEU-000030	CEU-000000029	Open	Purchase orders	000424	1	MAINDC			LPMP518		
	CEU-000031	CEU-000000030	Open	Purchase orders	000425	1	MAINDC			LPMP519		
	CEU-000034	CEU-000000033	Open	Purchase orders	000426	1	MAINDC			LPMP521		
	CEU-000041	CEU-000000040	Open	Purchase orders	000433	1	MAINDC			LPD1		
	CEU-000062	CEU-000000066	Open	Sales orders	SO-101279	1	MAINDC				CEU-000022	C
	CEU-000063	CEU-000000067	Open	Sales orders	SO-101280	1	MAINDC				CEU-000023	C

Work ID: CEU-000062

Item number	Work status	Work type	Custom work code	Location	Work quantity	Remaining quantity	Unit	User ID	Work in process	Closed work	Stop transaction	Mandatory	Work class ID
1 - Cream	Open	Pick		F01-02-01	1.00		1.00 ea				No	Yes	Sales Pick
1 - Cream	Open	Put		BAYDOOR	1.00		1.00 ea				No	Yes	Sales Pick

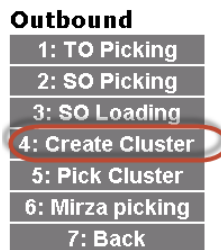
Two lines of work have been created based on the work template. There are pick and put instructions from the location F01-02-01 to the Baydoor.

Next, create the cluster, join both work ID's, and then engage a trolley to pick the items.

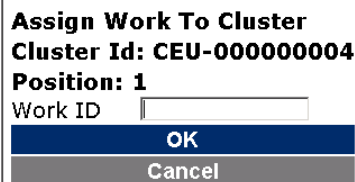
1. Create the cluster.
2. Log on to the mobile device.



3. Select Create Cluster.



4. Note the message about assigning the Work ID to Position 1.



All work ▾ Type to filter Blocked wave ▾

Show closed work:

Blocked wave	Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID
<input type="checkbox"/>	CEU-000001	CEU-000000001	Open	Purchase orders	000413	4	42			test1	
<input type="checkbox"/>	CEU-000026	CEU-000000025	Open	Purchase orders	000421	1	MAINDC			LPMP516	
<input type="checkbox"/>	CEU-000030	CEU-000000029	Open	Purchase orders	000424	1	MAINDC			LPMP518	
<input type="checkbox"/>	CEU-000031	CEU-000000030	Open	Purchase orders	000425	1	MAINDC			LPMP519	
<input type="checkbox"/>	CEU-000034	CEU-000000033	Open	Purchase orders	000426	1	MAINDC			LPMP521	
<input type="checkbox"/>	CEU-000041	CEU-000000040	Open	Purchase orders	000433	1	MAINDC			LPD1	
<input checked="" type="checkbox"/>	CEU-000062	CEU-000000066	Open	Sales orders	SO-101279	1	MAINDC				CEU-000022
<input type="checkbox"/>	CEU-000063	CEU-000000067	Open	Sales orders	SO-101280	1	MAINDC				CEU-000023

Assign to position 1

Assign Work To Cluster
Cluster Id: CEU-00000004
Position: 1
 Work ID

OK
Cancel

5. Select **OK**.

Assign Work To Cluster
Cluster Id: CEU-00000004
Position: 2
 Work ID

OK
Cancel
Done

6. Select the second **Work ID** and assign to **Position 2**.

Create Cluster : Pick
Cluster Id: CEU-00000004
 Loc
 Item
1 - Cream
Qty: 2.00 ea
 LP

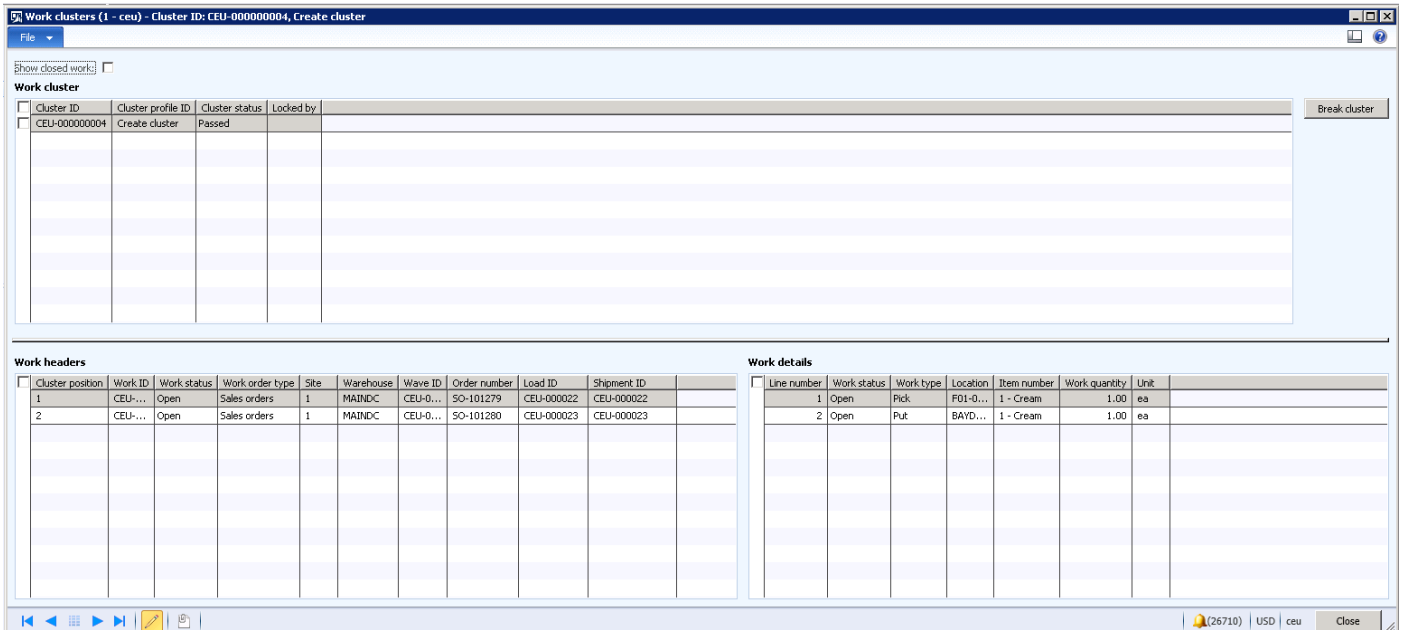
OK
Pass
Skip
Short pick

7. You've created Cluster ID, CEU-000000004, for a quantity of 2 items, 1 per each sales order. In this case study, you do not need to move on to picking, so select **Pass**.

Let's review the cluster pick.

To open the **Work clusters** window, follow this navigation path:

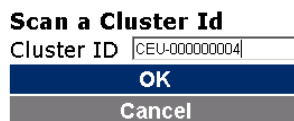
Warehouse Management > Inquiries > Work Clusters



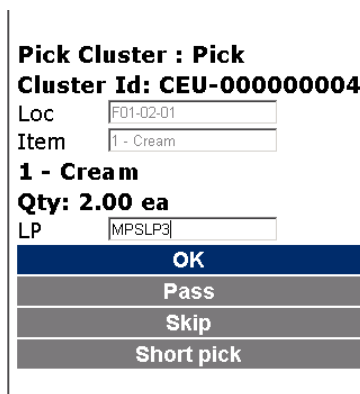
Notice that there are two sales orders on this cluster ID.

Next, you're going to continue with the picking of the cluster.

1. Log on to the mobile device. This time select Pick Cluster from the outbound menu.
2. Select the cluster ID that is shown in the following illustration. Select OK.



3. Note the message to scan the license plate from where you will pick the item, 1 - Cream.



4. Select OK.

Sort: Pick Cluster
Cluster Id: CEU-000000004
ItemId: 1 - Cream
1 - Cream
Position: 1 Qty: 1.00 ea
 Position name

5. Note the message to place item, 1 – Cream, in Position 1.
6. Enter a **Position name** and select **OK**.

Sort: Pick Cluster
Cluster Id: CEU-000000004
ItemId: 1 - Cream
1 - Cream
Position: 2 Qty: 1.00 ea
 Position name

7. Note the message to place item, 1 – bCream, in Position 2.
8. Enter a **Position name**.
9. Select **OK**.

Pick Cluster : Put
Cluster Id: CEU-000000004
 Loc
 Item
1 - Cream
Total Qty: 2.00
Position: 1
Position: 2

10. Note the message to put the items at the outbound dock, or the baydoor for dispatch or collection from the customer.
11. Select **OK**.

Cluster Completed
Scan a Cluster Id
 Cluster ID

The cluster pick has completed.

Let's review the work and see what it looks like.

All work ▾ Type to filter Blocked wave ▾ →

Show closed work

Blocked wave	Work ID	Work creation number	Work status	Work order type	Order number	Site	Warehouse	Work in process	Closed work	Target license plate ID	Load ID	Shipment ID	Wave ID	Created
<input type="checkbox"/>	CEU-000040	CEU-000000039	Closed	Sales orders	SO-101267	1	MAINDC	1/27/2014 10:39:54 pm	1/27/2014 10:41:20 pm	LPMW1	CEU-...	CEU-000...	CEU-0...	1/27/2014
<input type="checkbox"/>	CEU-000041	CEU-000000040	Open	Purchase orders	000433	1	MAINDC			LPD1				1/27/2014
<input type="checkbox"/>	CEU-000042	CEU-000000041	Closed	Sales orders	SO-101268	1	MAINDC	1/28/2014 06:29:04 pm	1/28/2014 06:33:43 pm	LPMP52	CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000043	CEU-000000042	Canceled	Sales orders	SO-101269	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000044	CEU-000000043	Canceled	Sales orders	SO-101269	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000045	CEU-000000044	Canceled	Sales orders	SO-101269	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000046	CEU-000000045	Canceled	Sales orders	SO-101269	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000047	CEU-000000046	Canceled	Sales orders	SO-101269	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000048	CEU-000000052	Canceled	Sales orders	SO-101274	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000049	CEU-000000053	Closed	Sales orders	SO-101274	1	MAINDC	1/28/2014 09:49:45 pm	1/28/2014 09:57:46 pm	LPMP51	CEU-...	CEU-000...	CEU-0...	1/28/2014
<input type="checkbox"/>	CEU-000050	CEU-000000054	Canceled	Purchase orders	000434	1	MAINDC			LPBULK1				1/28/2014
<input type="checkbox"/>	CEU-000051	CEU-000000055	Canceled	Purchase orders	000434	1	MAINDC			LPBULK2				1/28/2014
<input type="checkbox"/>	CEU-000052	CEU-000000056	Canceled	Purchase orders	000434	1	MAINDC			LPBULK1				1/28/2014
<input type="checkbox"/>	CEU-000053	CEU-000000057	Canceled	Purchase orders	000434	1	MAINDC			LPBULK1				1/28/2014
<input type="checkbox"/>	CEU-000054	CEU-000000058	Canceled	Sales orders	SO-101275	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/29/2014
<input type="checkbox"/>	CEU-000055	CEU-000000059	Canceled	Sales orders	SO-101276	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/29/2014
<input type="checkbox"/>	CEU-000056	CEU-000000060	Canceled	Sales orders	SO-101276	1	MAINDC				CEU-...	CEU-000...	CEU-0...	1/29/2014
<input type="checkbox"/>	CEU-000057	CEU-000000061	Canceled	Sales orders	SO-101276	1	MAINDC	1/29/2014 05:41:03 pm	1/29/2014 05:45:07 pm	STG1	CEU-...	CEU-000...	CEU-0...	1/29/2014
<input type="checkbox"/>	CEU-000058	CEU-000000062	Canceled	Inventory mov...		1	MAINDC			STG1				1/29/2014
<input type="checkbox"/>	CEU-000059	CEU-000000063	Canceled	Inventory mov...		1	MAINDC			STG1				1/29/2014
<input type="checkbox"/>	CEU-000060	CEU-000000064	Closed	Sales orders	SO-101277	1	MAINDC	1/29/2014 07:41:10 pm	1/29/2014 07:42:13 pm	000CEU-000000010	CEU-...	CEU-000...	CEU-0...	1/29/2014
<input type="checkbox"/>	CEU-000061	CEU-000000065	Closed	Sales orders	SO-101278	1	MAINDC	1/29/2014 07:41:10 pm	1/29/2014 07:42:13 pm	000CEU-000000020	CEU-...	CEU-000...	CEU-0...	1/29/2014
<input checked="" type="checkbox"/>	CEU-000062	CEU-000000066	Closed	Sales orders	SO-101279	1	MAINDC	1/29/2014 09:56:20 pm	1/29/2014 09:59:02 pm	000CEU-000000030	CEU-...	CEU-000...	CEU-0...	1/29/2014
<input checked="" type="checkbox"/>	CEU-000063	CEU-000000067	Closed	Sales orders	SO-101280	1	MAINDC	1/29/2014 09:56:20 pm	1/29/2014 09:59:02 pm	000CEU-000000040	CEU-...	CEU-000...	CEU-0...	1/29/2014

Work ID: CEU-000063

Item number	Work status	Work type	Custom work code	Location	Work quantity	Remaining quantity	Unit	User ID	Work in process	Closed work	Stop transaction	Mandatory	Work class ID
1 - Cream	Closed	Pick		F01-02-01	1.00	0.00	ea	Matt	1/29/2014 09:56:20 pm	1/29/2014 09:59:02 pm	No	Yes	Sales Pick
1 - Cream	Closed	Put		BAYDOOR	1.00	0.00	ea	Matt	1/29/2014 09:56:20 pm	1/29/2014 09:59:02 pm	No	Yes	Sales Pick

Both work orders for the two sales orders are marked as Closed, so the customer pick was successful and completed.

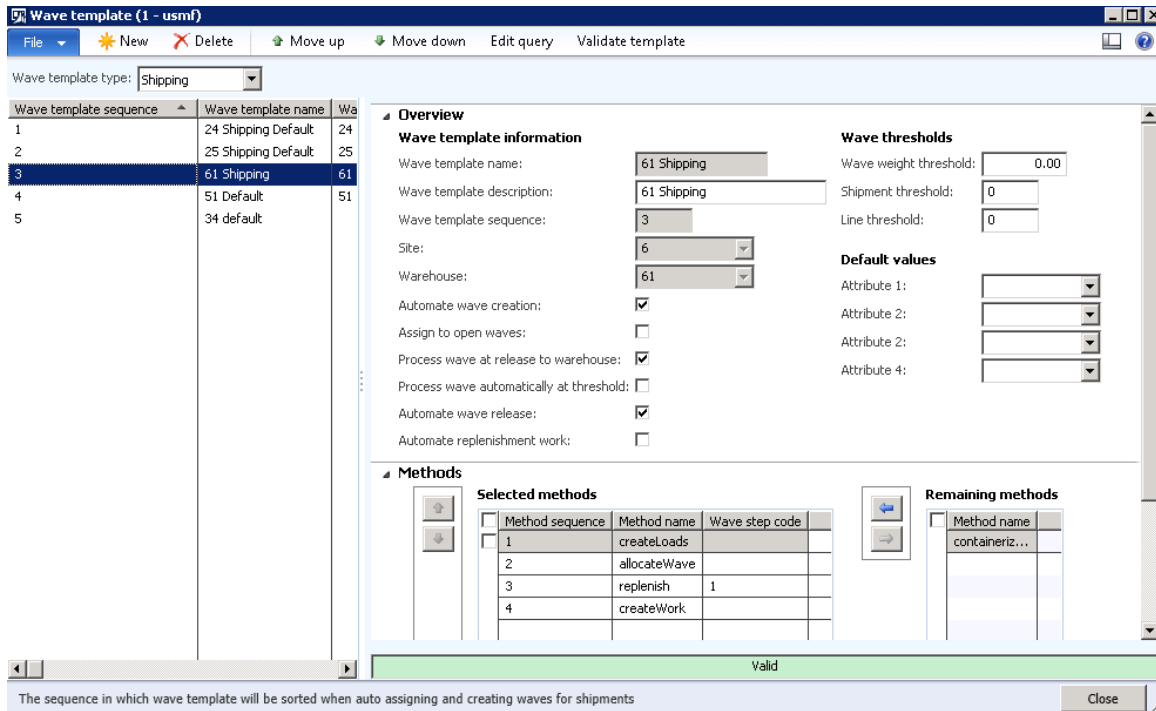
4 Transfer Order Process

This section shows how to transfer items between warehouses using the warehouse management processes.

4.1 Outbound – Setup requirements

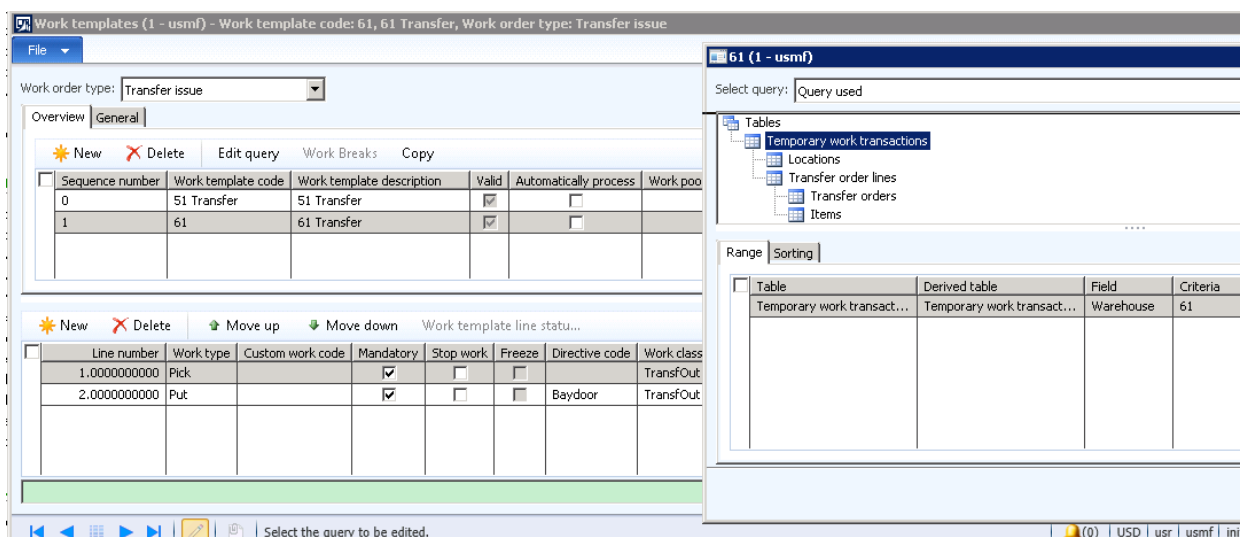
4.1.1 Enable the wave template

To enable the outbound transfer order process, the same logic that is used for sales orders processing must be defined as a Wave template (Shipping).



4.1.2 Enable the work template

To enable the outbound transfer order process, the same logic that is used for sales orders processing must be defined as a Work template (Transfer issue).



4.1.3 Enable the location directives

To enable the outbound transfer order process, the same logic that is used for sales orders processing must be defined as a Location directive (Transfer issue).

For pick

Location directives (1 - usmf) - Sequence number: 6, 61 TO Pick, Work order type: Transfer issue

File

Work order type: Transfer issue

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
1	51 TO Pick	Pick	5	51			<input type="checkbox"/>
2	51 TO Put	Put	5	51	Baydoor		<input type="checkbox"/>
3	51 TO Multiput	Put	5	51	Baydoor		<input checked="" type="checkbox"/>
4	34 Pick	Pick	3	34			<input type="checkbox"/>
5	34 Put	Put	3	34			<input type="checkbox"/>
6	61 TO Pick	Pick	6	61			<input type="checkbox"/>
7	61 TO Put	Put	6	61	Baydoor		<input type="checkbox"/>

....

Lines

New Delete Move up Move down Restrict by unit

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit	Locate packing quantity	Allow split
1	0.00	20,000.00		None	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

....

Location Directive Actions

New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory	Batch enabled	Strategy
1	TO Pick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None

For put

Location directives (1 - usmf) - Sequence number: 7, 61 TO Put, Work order type: Transfer issue

File

Work order type: Transfer issue

Location directives

New Delete Move up Move down Edit query Copy Reset

Sequence number	Name	Work type	Site	Warehouse	Directive code	Disposition code	Multiple SKU
1	51 TO Pick	Pick	5	51			<input type="checkbox"/>
2	51 TO Put	Put	5	51	Be		<input type="checkbox"/>
3	51 TO Multiput	Put	5	51	Be		<input type="checkbox"/>
4	34 Pick	Pick	3	34			<input type="checkbox"/>
5	34 Put	Put	3	34			<input type="checkbox"/>
6	61 TO Pick	Pick	6	61			<input type="checkbox"/>
7	61 TO Put	Put	6	61	Be		<input type="checkbox"/>

....

Lines

New Delete Move up Move down Restrict by unit

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit
1	0.00	20,000.00		None	<input type="checkbox"/>

....

Location Directive Actions

New Delete Move up Move down Edit query

Sequence number	Name	Only use item fixed locations	Allow negative inventory
1	TO Put	<input type="checkbox"/>	<input type="checkbox"/>

35637151356 | 35637151358 (1 - usmf)

Select query: Query used

Table

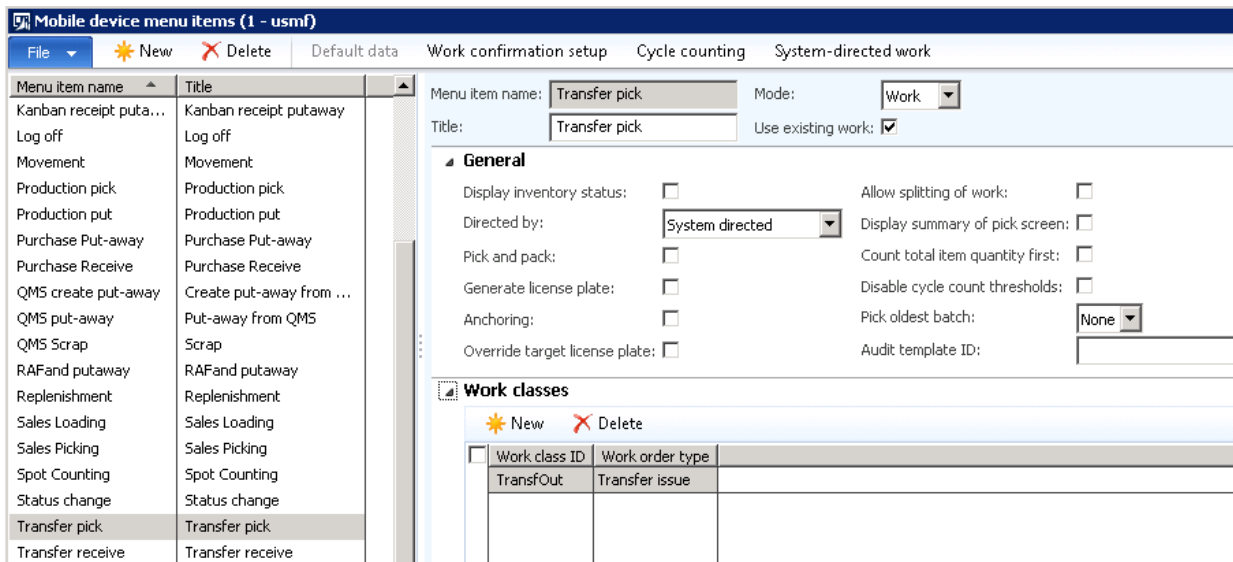
- Locations

Range Sorting

Table	Derived table	Field	Criteria
Locat...	Locations	Warehouse	61
Locat...	Locations	Location pr...	BAYDOOR

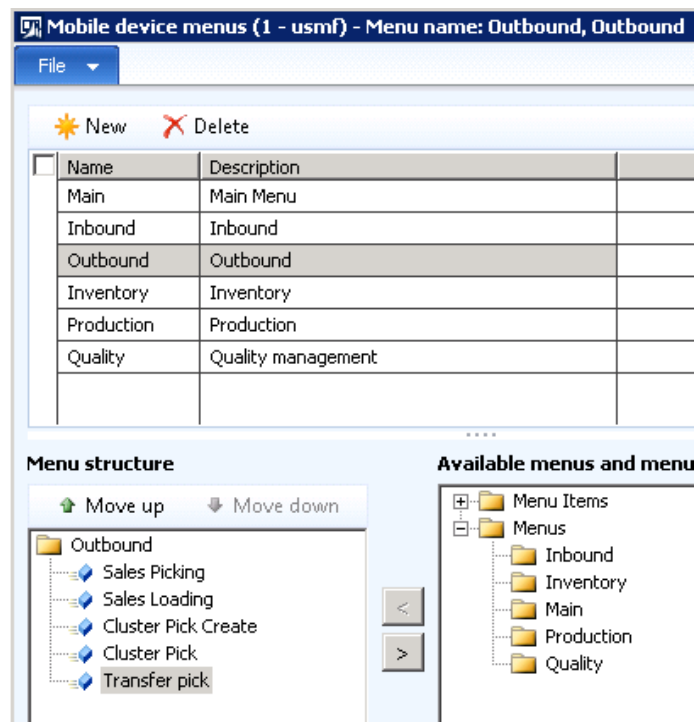
4.1.4 Enable the mobile menu item

To enable the outbound transfer order process, the same logic that is used for sales orders processing must be defined as a mobile device menu item (using the work order type Transfer issue).



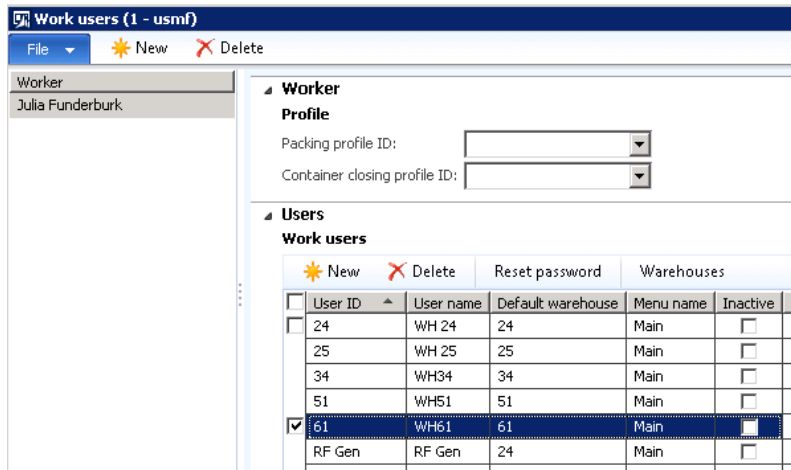
4.1.5 Enable the mobile device menu

To enable to outbound transfer order process, the same logic that is used for sales orders processing must be defined as a mobile device menu.



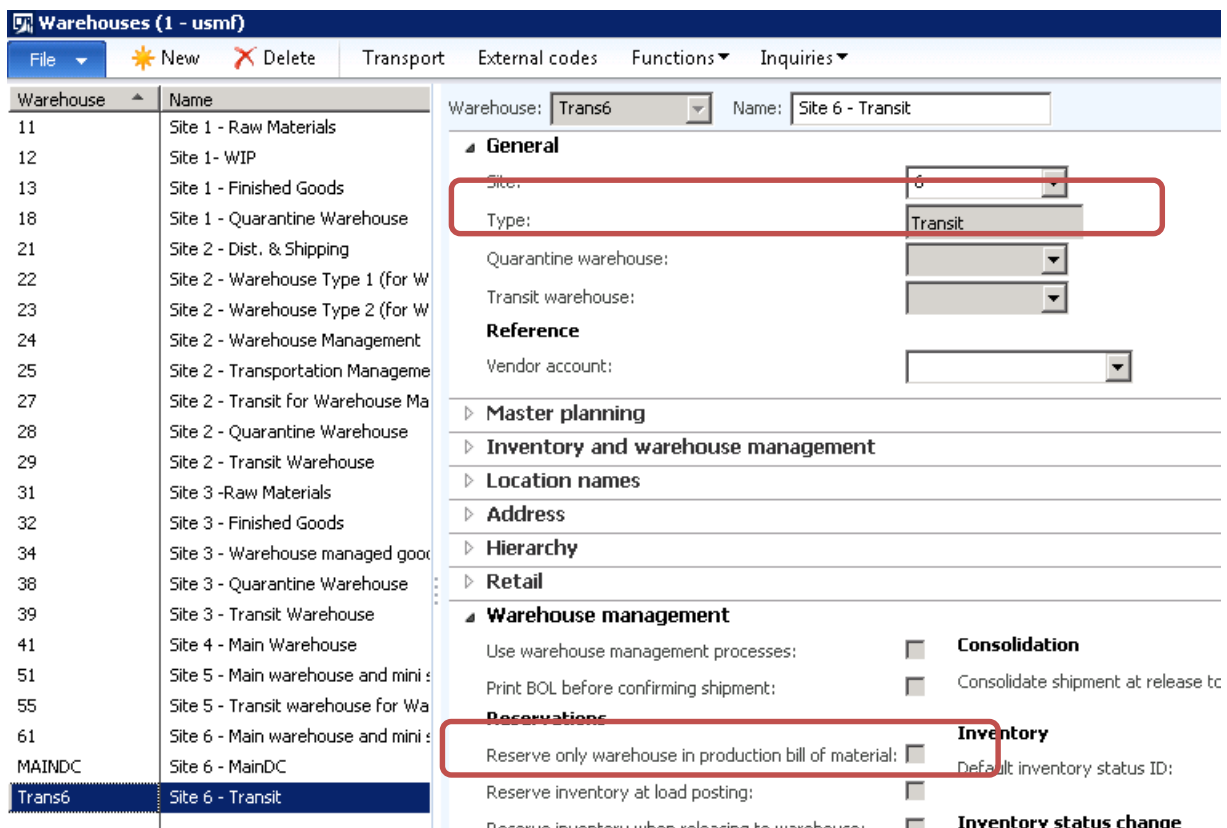
4.1.6 Enable a work user

Enable a work user for warehouse 61.

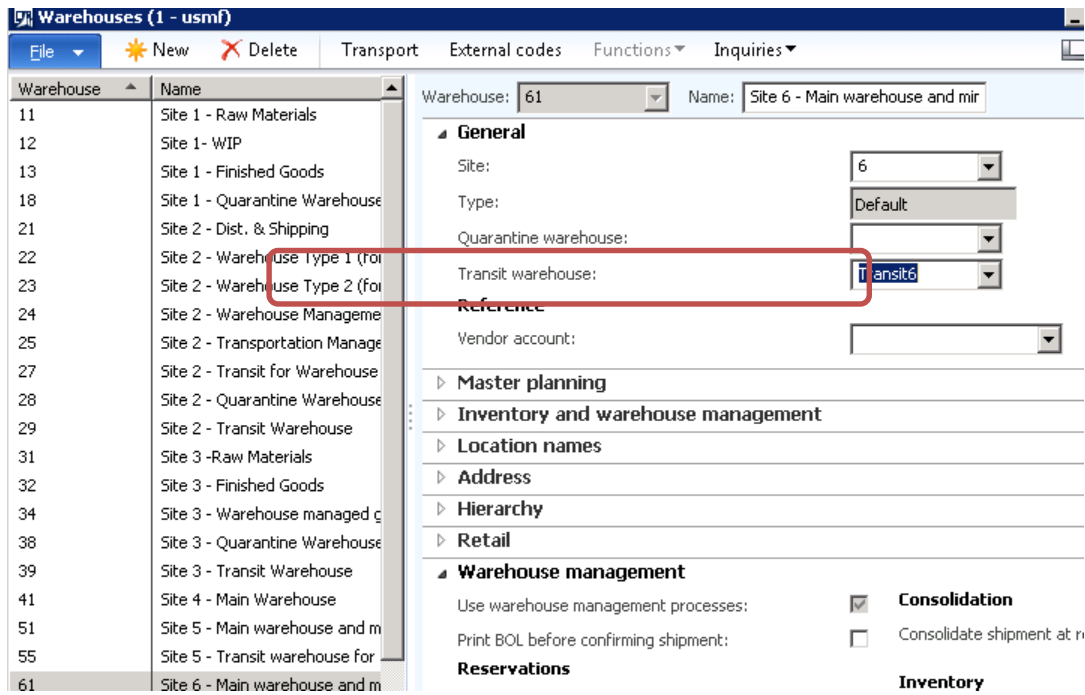


4.1.7 Enable an additional transit warehouse

To enable the outbound transfer order process, a transit warehouse must be created and associated with the shipping warehouse. In this example, this is 61. The **Type** must be **Transit**.



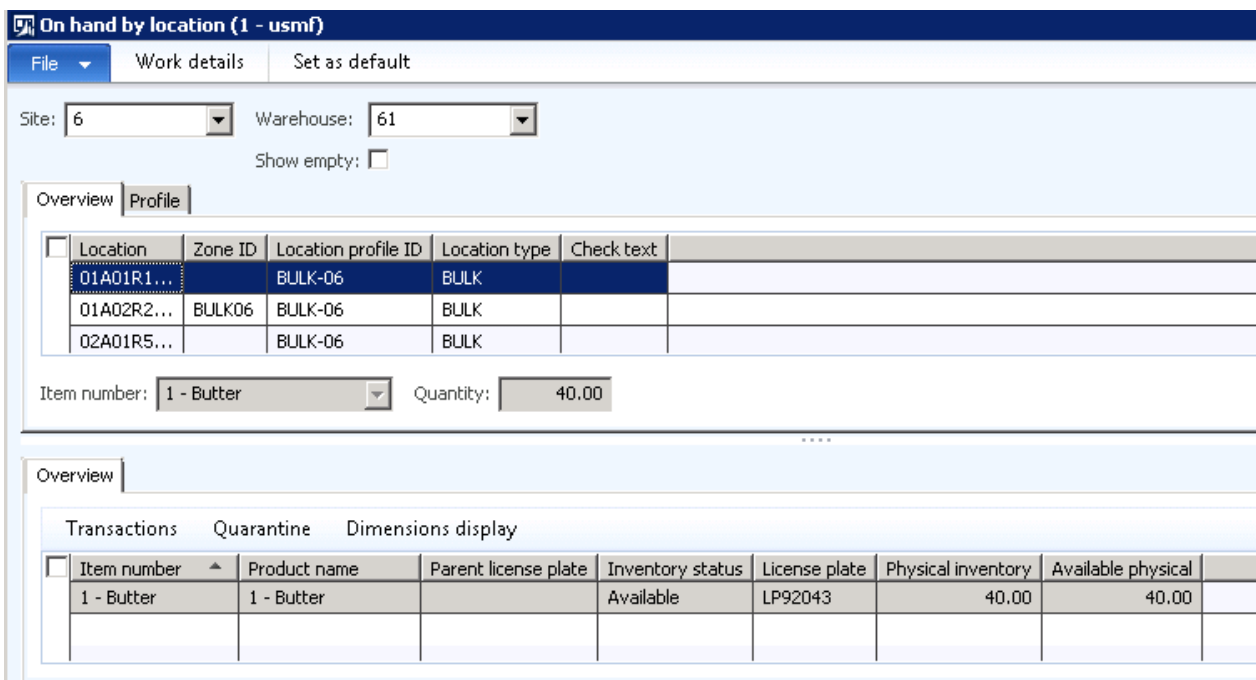
The 61 warehouse must be updated with the new transit warehouse.



4.1.8 Add on-hand to ship from warehouse

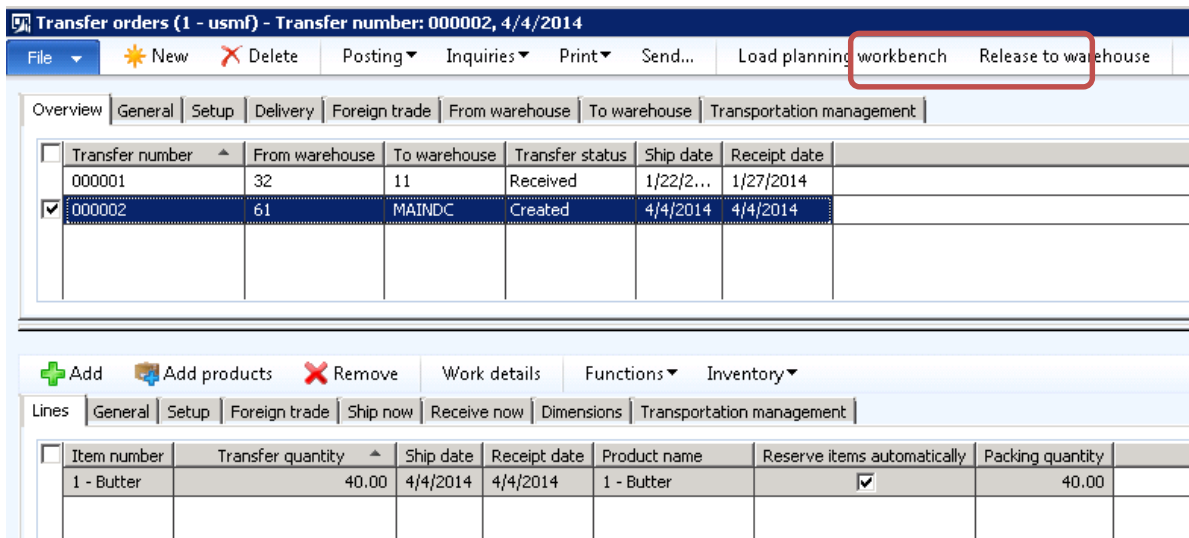
In the previous example, you created item, 1 - Butter, and added on-hand inventory at MAINDC based on a purchase order receipt. Now you need to have inventory on-hand at MAINDC and transfer items from another warehouse (61) to the MAINDC warehouse.

Add on-hand inventory to warehouse 61.

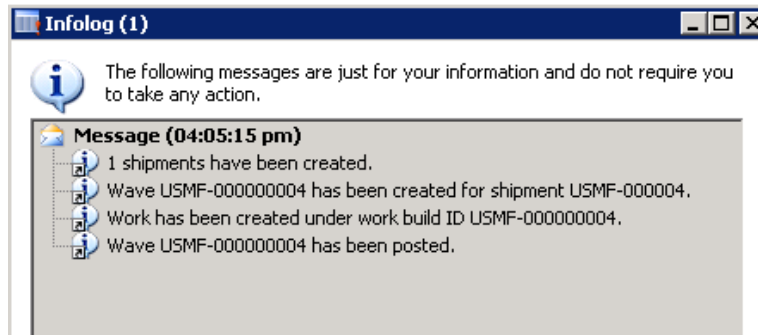


4.1.9 Create a transfer order

A transfer order is created, requesting to transfer 40 each from warehouse 61 to warehouse MAINDC. The **Release to warehouse** method is used and will automatically be created.



The Release to warehouse method is used and will automatically be created.



4.1.10 Mobile device transfer order outbound execution

1. Log on to the mobile device, in this case, user 61.

Sign in to AX

User ID

Password

Login

2. Select Outbound.

Main Menu

1: Inbound

2: Outbound

3: Inventory

4: Production

5: Quality

6: Change Warehouse

7: About

8: Log off

3. Select Transfer pick.

Outbound

- 1: Sales Picking
- 2: Sales Loading
- 3: Cluster Pick Create
- 4: Cluster Pick
- 5: Transfer pick
- 0: BACK

The warehouse worker goes to the location and scans the license plate ID. The mobile device prompts the worker to deliver the picked inventory at the Baydoor, based on the setup shown in the following illustration.

Transfer issue : Pick

Loc

LP

Item

Qty: 1 PL ; 40 ea
1 - Butter

- OK
- Cancel
- Override
- Short pick
- Skip

Transfer issue : Put

Loc

LP

Item

Qty: 1 PL ; 40 ea
1 - Butter

- OK
- Override

4.1.11 Shipment confirmation

When the work has been completed, the related transfer order line transactions is picked. Because there are no more lines that must be transferred for this shipment, the shipment can be confirmed.

The screenshot shows the Dynamics NAV interface for shipment confirmation. The 'Confirm shipment' button is highlighted with a red box. The main window displays a table of 'Shipments ready to ship' with one entry for 'USMF-00004' in 'Loaded' status. Below it, a table shows 'Order number', 'Shipment ID', 'Item number', 'Quantity', and 'Unit' for '1 - Butter' with a quantity of 40.00 ea. The right-hand pane shows 'Pick up and Drop off' details for a location in Redmond, WA.

4.2 Inbound - Setup requirements

4.2.1 Enable the work template

MAINDC has already been enabled for inbound purchase order processes, but it must also be enabled to transfer orders.

A work template must be enabled. In this case, pick and put warehouse operations are defined for put-away.

Sequence number	Work template code	Work template description	Valid
0	61 TR	Transfer receipt	<input checked="" type="checkbox"/>
1	MAINDC TO	Transfer order	<input checked="" type="checkbox"/>

Line number	Work type	Custom work code	Mandatory	Stop work	Freeze	Directive code	Work class ID
1.000000000	Pick		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		TransfIn
2.000000000	Put		<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		TransfIn

4.2.2 Enable the location directives

The inventory for all the Fresh goods will be directed to the locations that are related to the Freshgoods location profile.

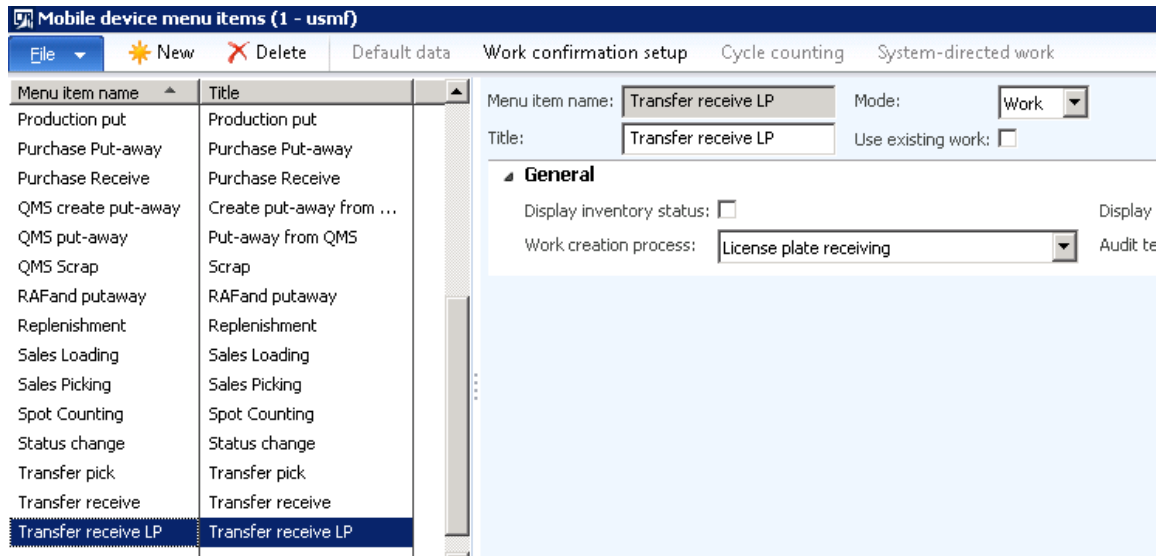
Sequence number	Name	Work type	Site	Warehouse	Direct
1	TO Receipt	Put	5	S1	
3	TO MAINDC	Put	6	MAINDC	
2	61 TO Receipt	Put	6	61	

Sequence number	From quantity	To quantity	Unit	Locate quantity	Restrict by unit
1	0.00	200,000.00		None	

Sequence number	Name	Only use item fixed locations	Allow negative inventory
1	Put	<input type="checkbox"/>	<input type="checkbox"/>

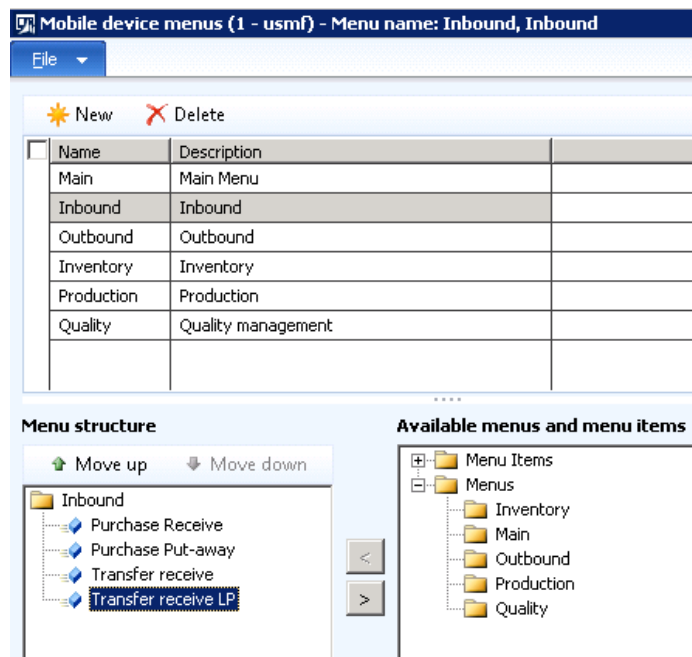
4.2.3 Enable the mobile device menu item

The mobile device menu item must be enabled. In this case, License plate receiving will be used.



4.2.4 Enable the mobile device menu

Add the menu item to the mobile menu.



4.2.5 Execute inbound transfer order process

When the transfer order has a status of **Shipped**, you can receive.

Transfer orders (1 - usmf) - Transfer number: 000002, 4/4/2014						
File New Delete Posting Inquiries Print Send... Load planning workbench Release to warehouse						
Overview General Setup Delivery Foreign trade From warehouse To warehouse Transportation management						
Transfer number	From warehouse	To warehouse	Transfer status	Ship date	Receipt date	
000001	32	11	Received	1/22/2...	1/27/2014	
000002	61	MAINDC	Shipped	4/4/2014	4/4/2014	
+ Add Add products Remove Work details Functions Inventory						
Lines General Setup Foreign trade Ship now Receive now Dimensions Transportation management						
Item number	Transfer quantity	Ship date	Receipt date	Product name	Reserve items automatically	Packing quantity
1 - Butter	40.00	4/4/2014	4/4/2014	1 - Butter	<input checked="" type="checkbox"/>	40.00

4.2.6 Mobile device transfer order inbound execution

1. At the receiving warehouse, log on to the mobile device with user, RF Gen.

Sign in to AX

User ID

Password

Login

2. Select Change warehouse, and then select MAINDC.

Main Menu

- 1: Inbound
- 2: Outbound
- 3: Inventory
- 4: Production
- 5: Quality
- 6: Change Warehouse**
- 7: About
- 8: Log off

Select Warehouse

OK

Cancel

3. Select Inbound.

Main Menu

1: Inbound
2: Outbound
3: Inventory
4: Production
5: Quality
6: Change Warehouse
7: About
8: Log off

4. Select Transfer receive LP.

Inbound

1: Purchase Receive
2: Purchase Put-away
3: Transfer receive
4: Transfer receive LP
5: Back

5. Scan the license plate ID that is shipped from the 61 warehouse.

Scan a License Plate

License plate	<input type="text"/>
OK	
Cancel	

6. Click OK to pick up license plate.

License Plate: LP92044
Order: 000005
Item Id: 1 - Butter Qty: 40.00 ea
Inventory status: Available
OK
Cancel
Exception

7. Accept the license plate information.

Transfer receipt : Pick	
Loc	<input type="text" value="Receiving"/>
Target LP	<input type="text" value="LP92044"/>
Item	<input type="text" value="1 - Butter"/>
Qty: 1 PL ; 40 ea	
1 - Butter	
OK	
Cancel	

8. Transfer the inventory to the dedicated location. Click OK to put the license plate.

Transfer receipt : Put

Loc

LP

Item

Qty: 1 PL ; 40 ea

1 - Butter

OK

Cancel

The on-hand item, 1 - Butter, with 40 each, is updated at the put location on the same license plate that was shipped out of warehouse 61.

5 Manufacturing and Warehouse management

In this section, you'll learn how manufacturing scenarios are executed in conjunction with the Warehouse Management processes.

5.1 Using warehouse management in production

5.1.1 *Aligning the concepts: Release production, release to warehouse and reservation*

The new Warehouse Management functionality in Microsoft Dynamics AX 2012 R3 uses a slightly different conceptual approach for triggering warehouse work. In addition, the mechanics of work creation for production picking do not match the concepts used in picking for sales or transport. This is why it's important to familiarize yourself with these new concepts.

The trigger for the release to warehouse is the production order release, combined with the reservation. In Microsoft Dynamics AX 2012 R3, to create picking work for production, the picked material must already be reserved. The quantities associated with the wave lines are the reserved quantities that are used when the release to the warehouse is run.

To make it easier to automatically control reservations, two changes have been implemented in the production order reservation for Microsoft Dynamics AX 2012 R3:

- **Reservation principle release policy** – With the reservation principle release policy, the reservation of components for production or batch orders can be configured more granularly. Because the initial release to warehouse always happens at the release of the production order, it's recommended that you use the reservation at release in all quick turning inventory scenarios.
- **Release to warehouse policy** - The release to warehouse policy in production can be either set to Allow partial reservation or Require full reservation. When full reservation is required, the release to warehouse is postponed unless all material can be fully reserved. The reservation on order is enough to fulfill the condition, so the release to warehouse will be possible as soon as a pegged production or purchase order can be reserved.

Both of these policies can be configured in either the production parameters or in the site-specific production parameters so that the policy is the default for the initial production order creation.

When you manually create an order, the policies can be overwritten before creating the production order. When firming planned orders, the default settings are used - in both cases, manual and automatic firming.

After you create the production order, both policies can be manually overwritten:

- The reservation principle can be overwritten on the production BOM lines.
- The release to warehouse condition can be changed on the **Production order details** form on the **Warehouse Management** FastTab.

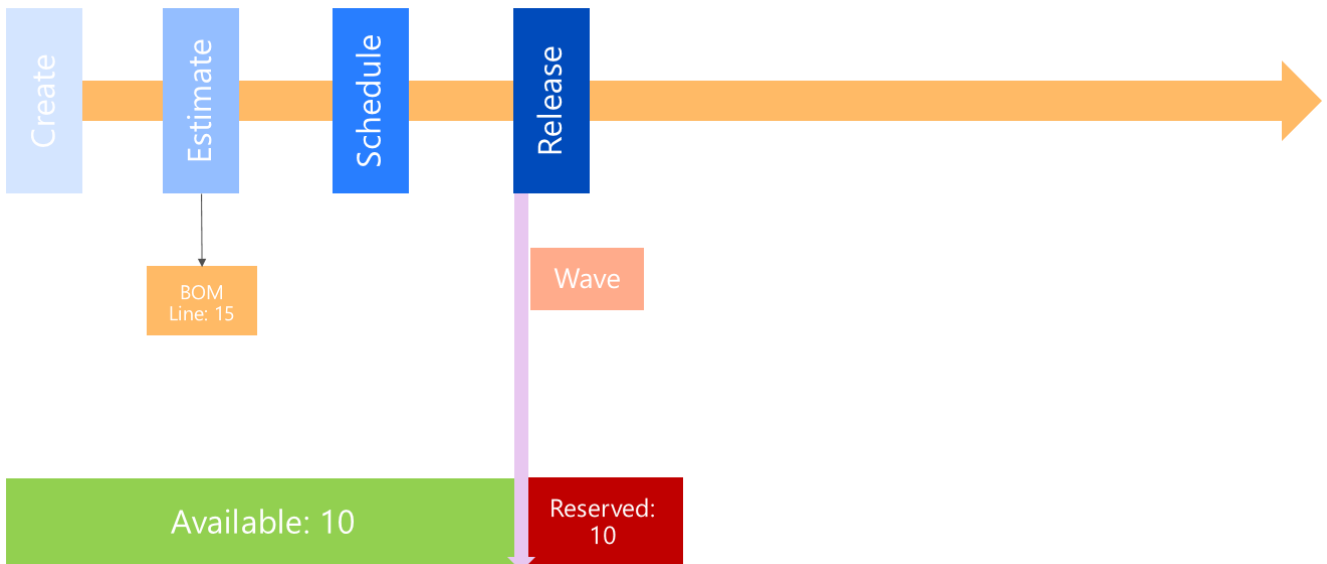
5.1.2 *Multiple release to warehouse*

If a partial release to warehouse is allowed during a production order release, a second release to warehouse might be needed.

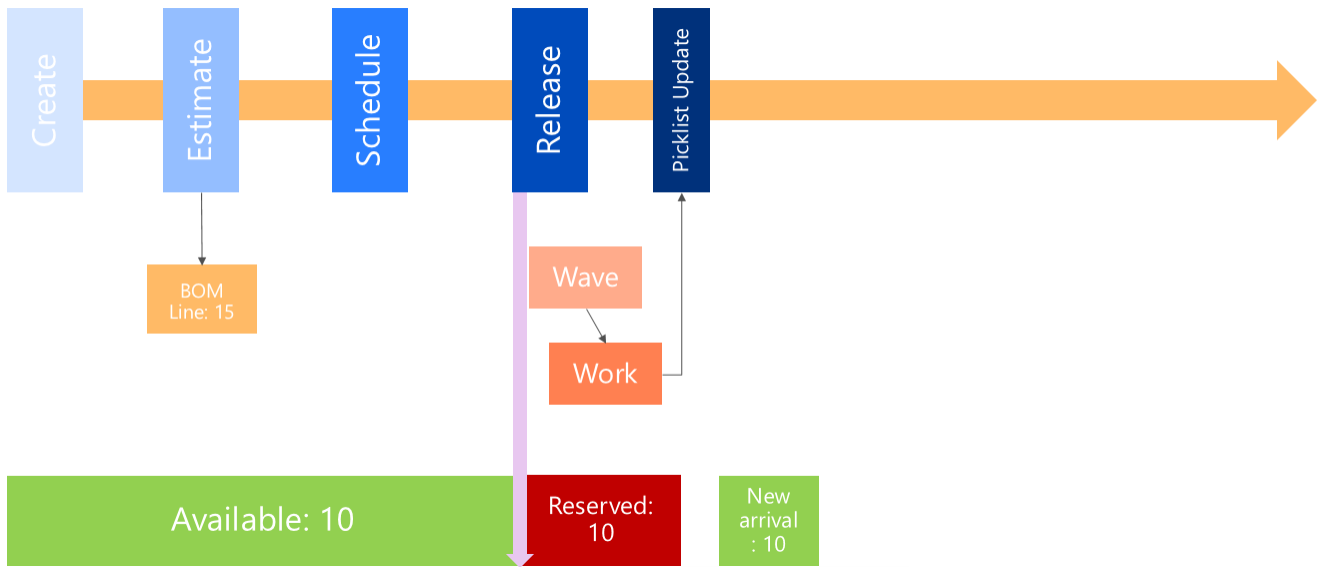
The following scenario describes this process.



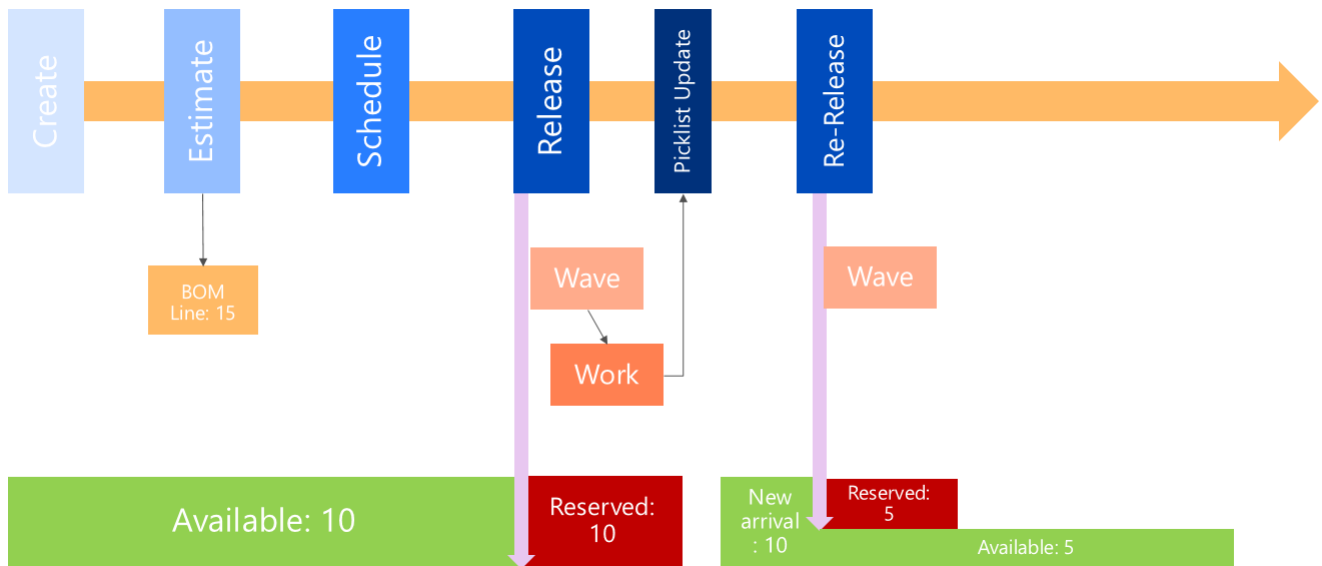
A production order is created that has a BOM line for a component with a quantity of 15 pieces. However, only 10 pieces are available. Assume that no planned orders exist to replenish or procure the component.



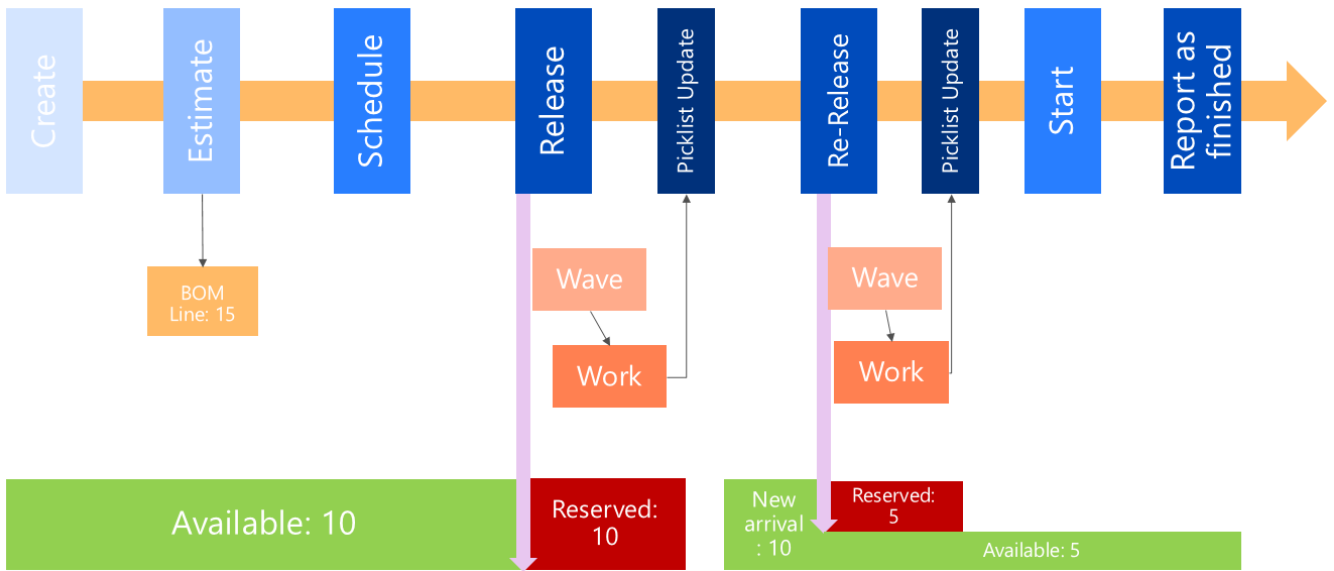
If the production order is released, a wave can only be created if the release to warehouse policy is set to **Allow partial release**. In this case, the available 10 pieces will be reserved and a wave with a quantity of 10 will be created.



After the work has been created and completed, 10 new pieces arrive at the warehouse. A second release to warehouse can be done using the Release to warehouse function on the **Production order** list page or the **Production order details** page.

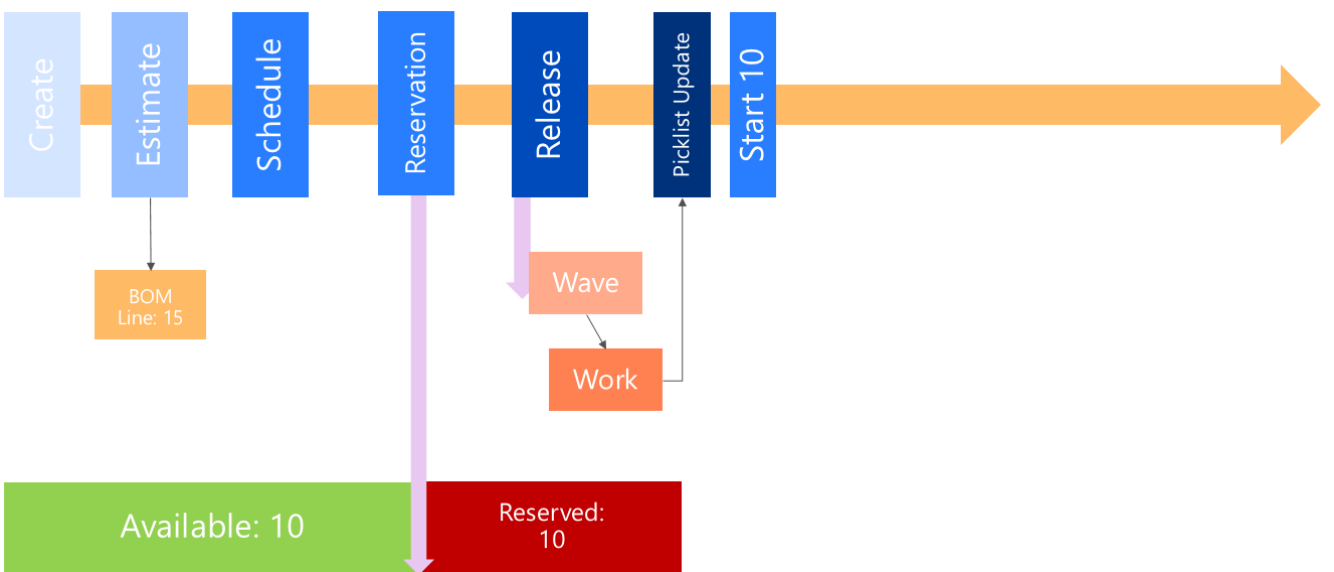


This second release to warehouse reserves the remaining 5 pieces and creates a wave with a wave line of 5 pieces. After processing the wave and completing the work, the production order can now be started and completed with the full quantity.

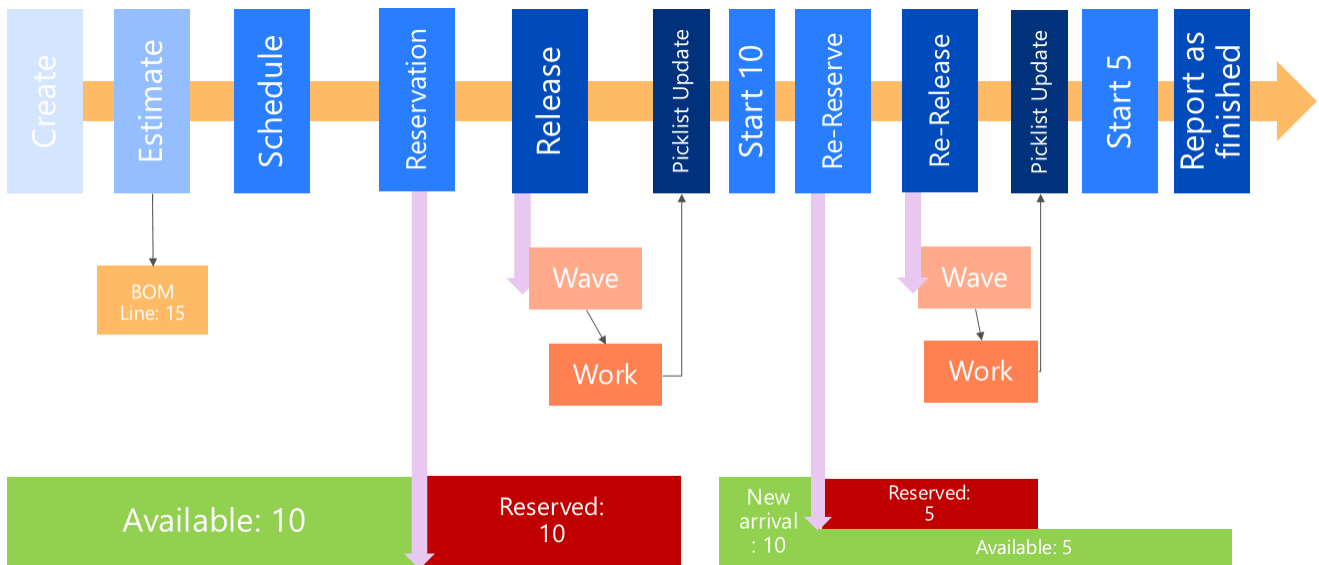


This scenario is not ideal because the first 10 pieces of the component are moved to the production shop floor before the production order can be started, and these pieces might end up staying there for a long time.

The scenario makes more sense if the partial picked quantity can be used to do a partial start of the production order, as shown in the following diagram.



After completing the pick work for 10 pieces, the production order is started with a partial quantity.



After the new arrival and the second release to warehouse, the remaining 5 pieces can be started.

5.1.3 Release to warehouse requires full reservation

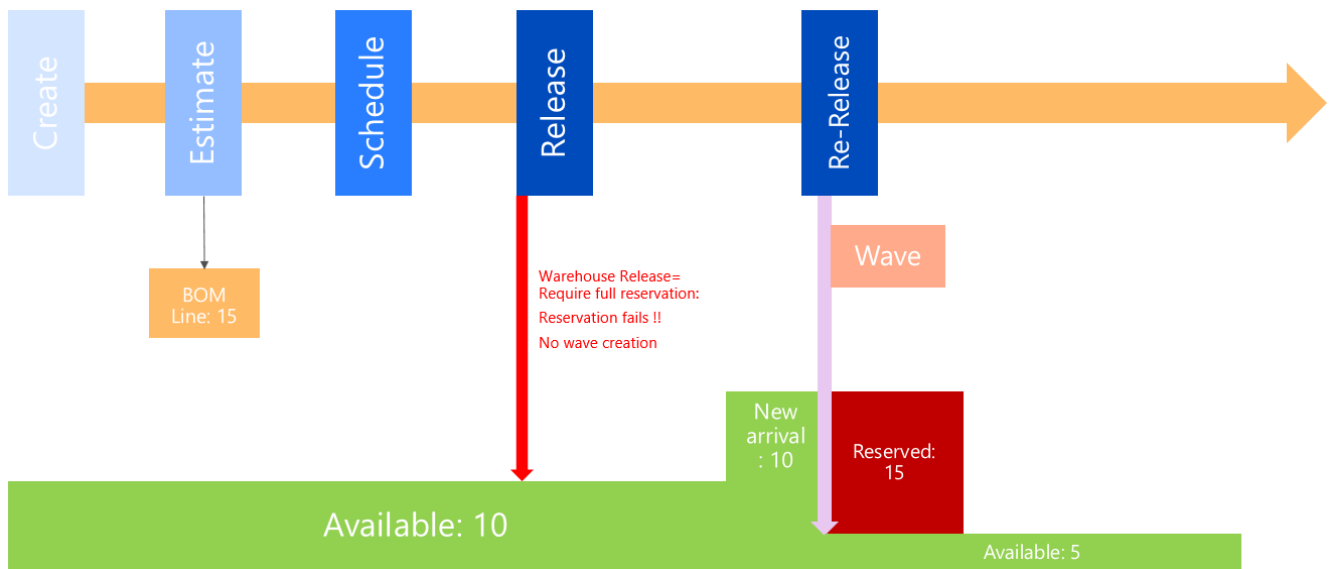
As the previous scenario has shown, it might not be a good idea to start picking partial quantities from the warehouse if it's not possible to start partial quantities. The risk of moving material that cannot be processed to the shop floor is high. Therefore, for all scenarios where production start is impossible if the full required material cannot be picked, the release to warehouse policy should be set to Require full reservation.

To illustrate this functionality, consider the scenario again, this time, the production order is released with the policy Require full reservation.

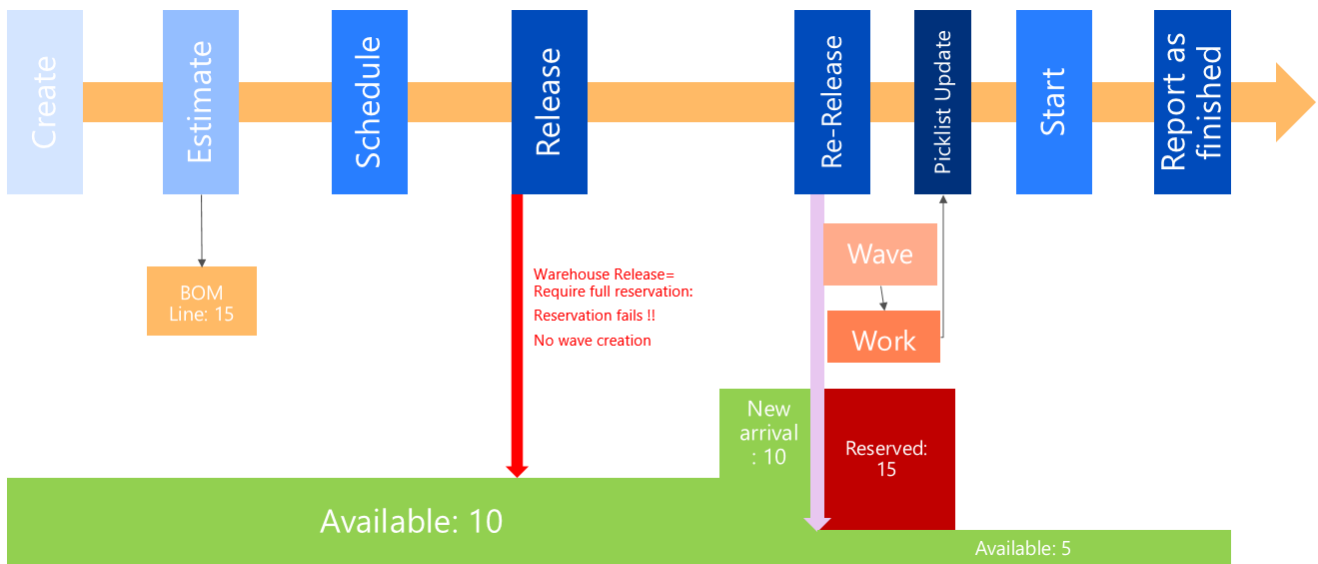


After the release of the production order, the reservation fails and a wave is not created. The status of the production order is still set to Released. The release to warehouse should be made available through a material availability status.

After the missing material is received, a second attempt to release to warehouse will succeed.



The full quantity to be picked will be reserved and the wave will be created. After processing the wave, completion of the work production order can be started and finished.

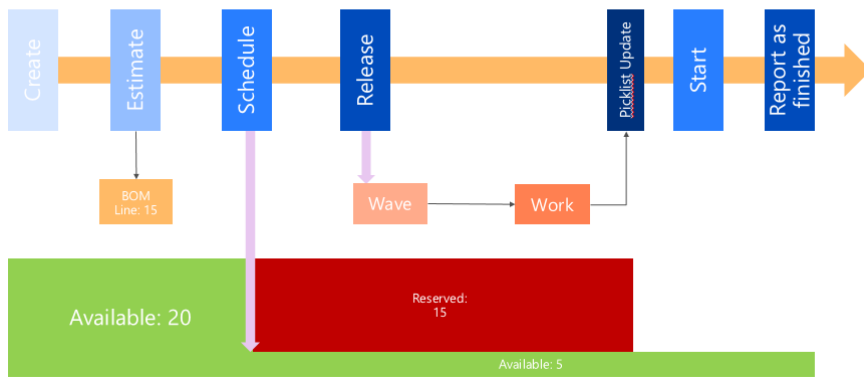


5.1.4 Reservation before release to warehouse

The implementation of picking for production orders - or for batch orders in process industries - requires reservation of the components before the waves and related wave lines are created, before the picking requirements are released to the warehouse. In the previous scenarios, this is why the automatic reservation was set to reserve at release of the production order. This is similar to Just in time processing.

However, in other scenarios, the reservation of the material might occur in an earlier step, either as automatic reservation at estimation or scheduling, or by manual reservation.

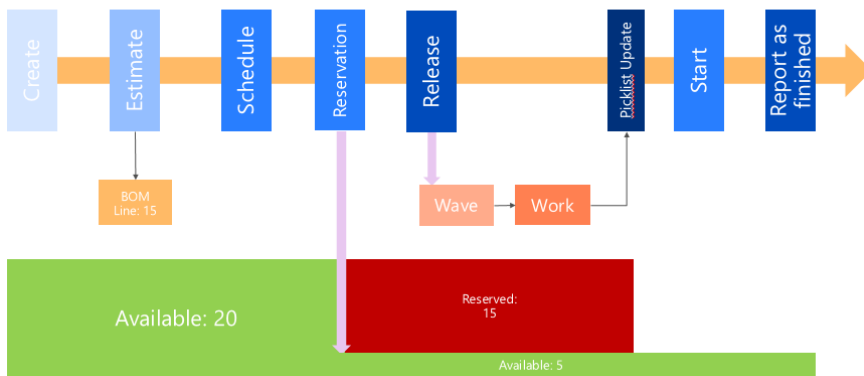
Automatic reservation at Scheduling



This example shows the scenario with automatic reservation at the scheduling of the production order. The later release creates the wave. This scenario should be used for critical, high priority production orders where critical material is impossible to replenish before the planned production starts, to ensure that the critical material will not be allocated to other production orders.

Instead of automatic reservation, manual reservation can be used as well.

Manual reservation



The manual reservation can be used to control how much material is allocated to specific production orders. Manual reservation can also be combined with partial picking and partial start of production orders.

Note - In an actual implementation, it's not possible to reserve and release to warehouse at the start of the production order. The option to start on the reservation of materials in the production BOM cannot be combined with wave and work creation and processing. Scenarios where partial start of dedicated quantities is needed in production orders is not well supported. For example, a production order runs over multiple days and every day partial quantities are planned to be started. Instead, the maximum order quantity should be limited to a quantity that corresponds to the start quantity that will result in multiple production orders to be created that can be prepared and started separately. This aligns with the lean production principle, where you reduce order sizes to the smallest possible processing unit.

5.1.5 Material staging for production or batch orders

The new Warehouse Management functionality in Microsoft Dynamics AX 2012 R3, the concept of license plates has been introduced. A license plate identifies a handling unit such as a pallet, container or box. A handling unit that can either contain various quantities of a single product or various quantities of different products, such as a mixed load pallet.

Depending on topology and process definition of a warehouse, a single location can be loaded and unloaded with full handling units referenced by license plates. In Microsoft Dynamics AX 2012 R3, a location can be set up to be managed by its content by license plate. This is done by assigning a location profile to the location, which indicates that locations should be license plate

controlled.

If a location is set up as license plate controlled, warehouse work for raw material picking will move the full content of the license plate to the production input location. Moving the content of a license plate, instead of moving the actual requested quantity of the production material line, is called *staging*. This is different than order picking where you pick the actual demand.

In scenarios where there is a known variation in consumption of an ingredient, it's useful to stage materials by the license plate handling unit to the place of consumption. For example, a license plate, such as a pallet of the ingredient, is staged to the location. When the production starts, the consumption from the pallet will begin. When the order is completed there might be some leftovers of the staged materials on the pallet. This material can either be consumed by new orders that consume the same material or moved back to the inventory by the warehouse worker. Generally, when raw material work is created, the system will first look at on-hand material in the production input location. If materials are available in that location, no work will be created to move this quantity of material, instead the material will be deducted from the location by the work. Work will only be created for quantities that cannot be covered by the quantity on the production input location.

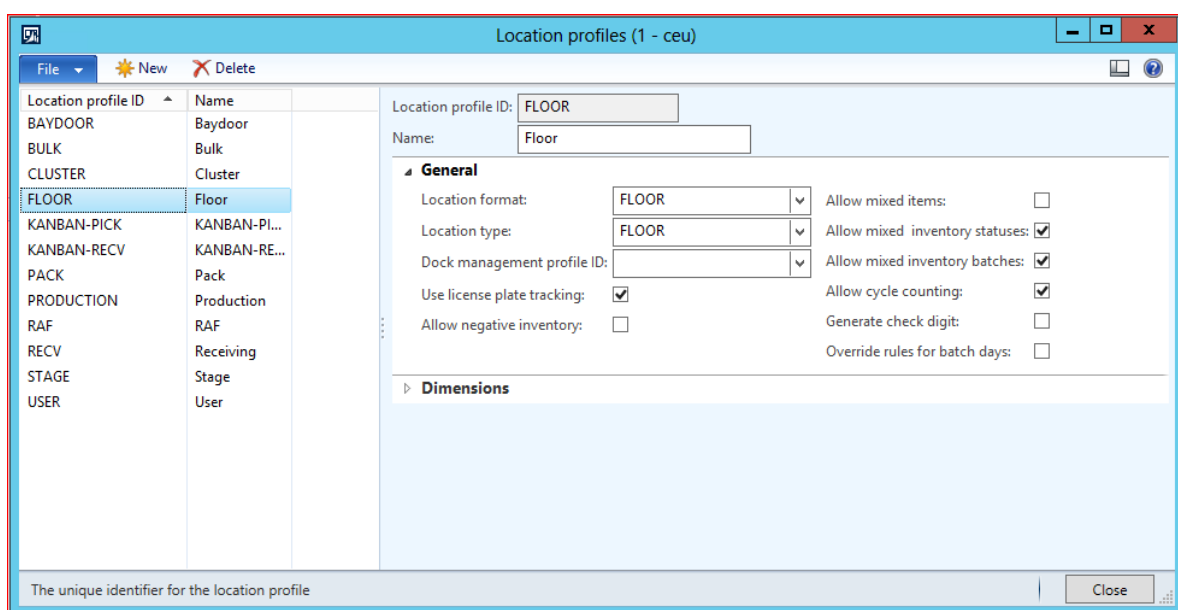
When raw material work is executed, the requested quantity from the production material lines deducts the on-hand material from the production input location. The status of the inventory transactions for the material lines will change from On order to Picked.

After the warehouse work is completed for the production or batch order, consumption of the material from the production input location to the order can start. Consumption of material is registered in the production picking list journal. Consumption can start when the production or batch order has a status of Started. This is done by completing the Start step. There are some system parameters associated with the Start step, for example, if the requested material should be consumed when the Start step is complete. This process is known as *forward flushing*. The requested quantity of the material will automatically be posted in the picking list journal. It's also possible to set up the parameters in the Start step, so the materials are not consumed, and postponed when the finished goods are reported. This process is known as *back flushing*.

You can complete the Start step from a menu item on the mobile device. This option does not leverage the parameters in the Start function. When using the Start option, the requested materials are automatically consumed and there is no option to deviate from that. Any corrections in the raw material consumption must be done by manually adjusting the production picking list journal.

The following prerequisites are needed to enable the staging process for the production warehouse processes:

- Materials can only be staged from dedicated locations that have been enabled for license plate tracking. This criteria is set up in the **Location profiles** window.

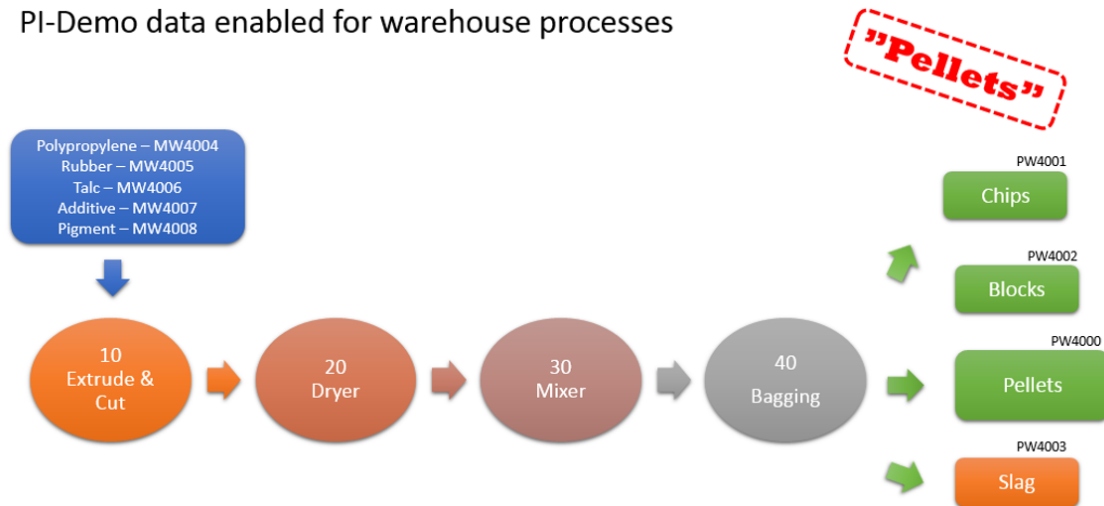


- The location directive for raw material picking in production must be set up to point to picking for locations enabled for license plate tracking.
- We recommend that the production input location be set up so that it is not license plate controlled.

Here’s a simple scenario to show where material staging is used. This example is based on the demo data for Microsoft Dynamics AX 2012 R3.

A company produces plastic pellets. In this process some of the ingredients are staged to the production input location. The following flowchart shows that polypropylene is an ingredient in the pellet production.

PI-Demo data enabled for warehouse processes



In this example, polypropylene is a purchased commodity that, when received, is stored in the warehouse in 220 pound bags. When polypropylene is picked to production, only whole bags are moved from the warehouse locations to the production input location. When the production process starts, the bags are opened and emptied into the extruding and cutting machine, which represents the first operations on the line.

The following list shows information about the on-hand inventory of polypropylene bags, which can be extracted from the table below:

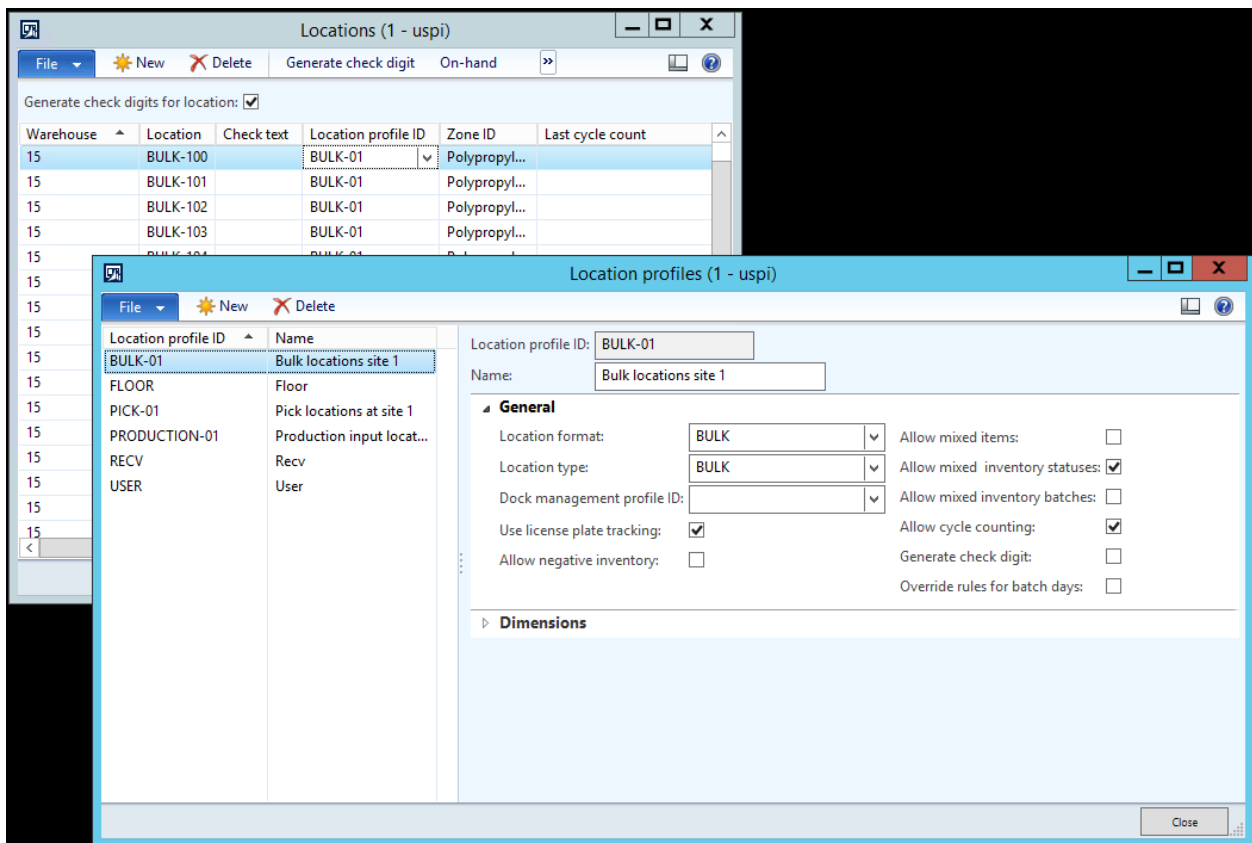
- Each bag is identified by one unique license plate.
- One location can only contain one license plate.
- Each bag is referenced by a batch number with an expiration date. Multiple bags can be referenced by the same batch number.

MW4004 - Polypropylene (FEFO)

License plate	Location	Batch number	Expiration date	On-hand (lbs)
1000	BULK-100	B00001	24-03-2017	220
1001	BULK-101	B00001	24-03-2017	220
1002	BULK-102	B00002	10-12-2016	220
1003	BULK-103	B00003	01-02-2017	220
1004	BULK-104	B00003	01-02-2017	220

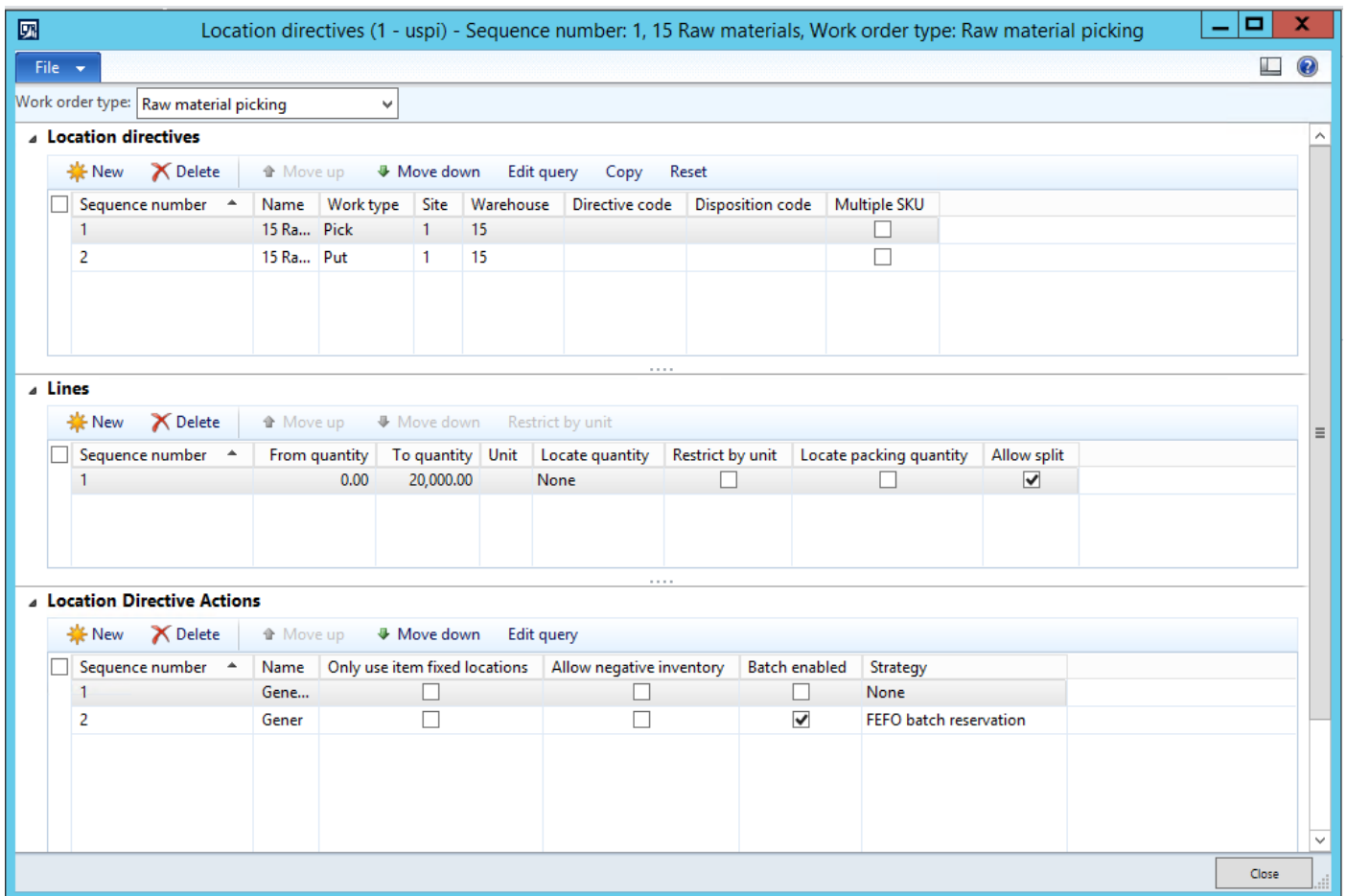
When picking polypropylene, it’s required that you use first expiration, first out (FEFO) order.

To fulfill this process, some setup is required. First, ensure that the setup of the Location profile is associated with the locations.



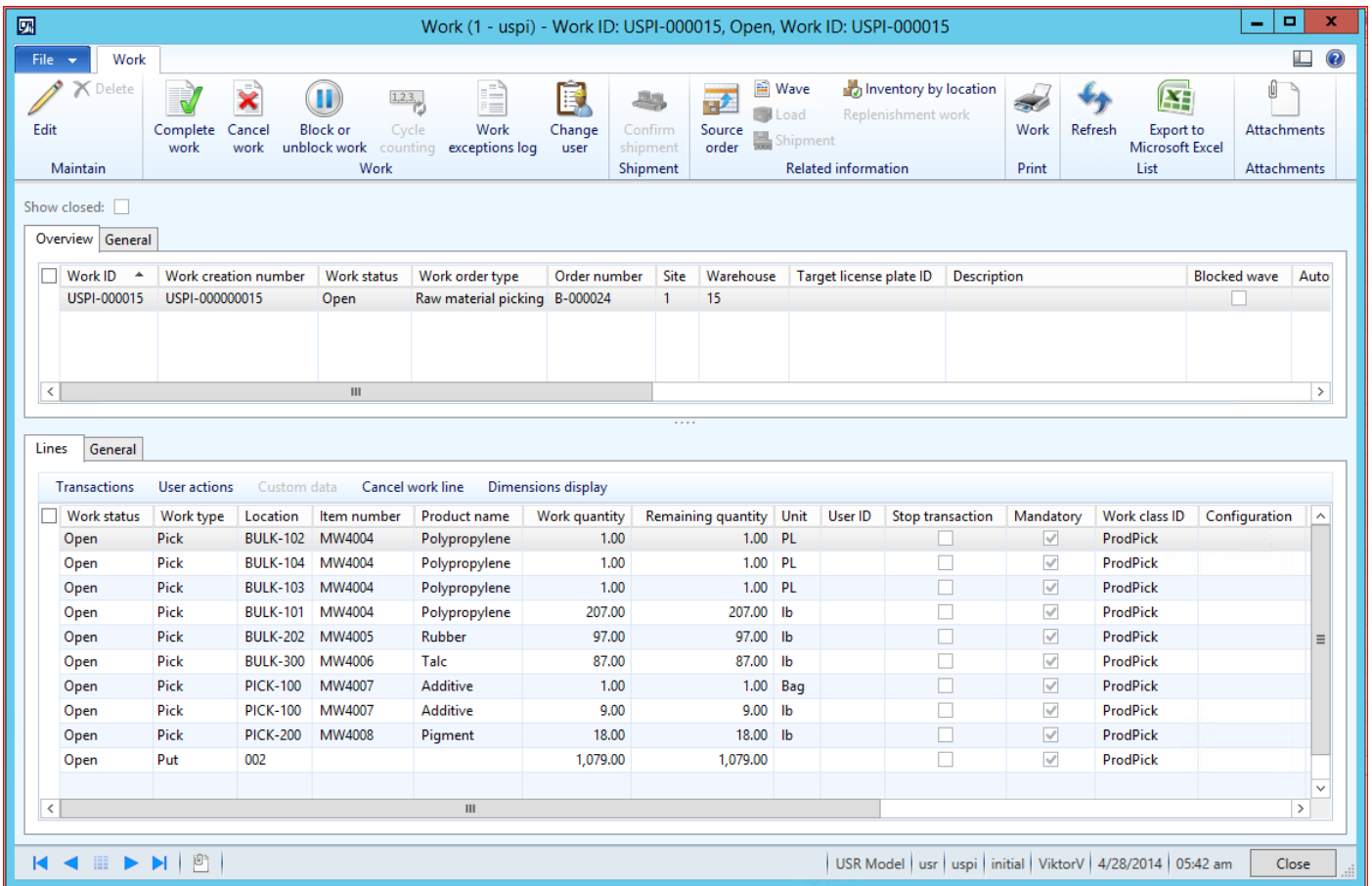
All the locations where polypropylene is stored are associated with the same **Location profile ID** and **Use license plate tracking** is selected.

Next, ensure the location directive for Raw Material picking. Because polypropylene is picked in FEFO order, a line that represents the FEFO strategy must be created in the **Location Directive Actions** section. This line must have the FEFO batch reservation strategy. The second line in the section is for picking items that are not batch controlled, so the strategy must be None.



Picking in FEFO order requires that the picked products be batch enabled. An item number is batch enabled when it's associated with a tracking dimension group that has the dimension batch set to Active. The item must also be associated with an inventory model group that has the FEFO date-controlled property enabled.

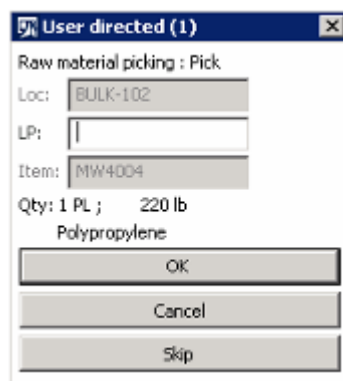
Next, let's look at the warehouse work that is generated when releasing a batch order for 1000 pounds to the warehouse.



In the **Lines** section of the **Work details** form, there are four lines for polypropylene. The first three lines are in unit PL and the last lines are in lb, for pounds. The sum of the work quantity represents the required quantity for the batch order. However, because the locations for polypropylene are set up to be license plate controlled, only full license plates can be moved from the locations. The result of this work will be that 4 pallets will be moved.

The lines are listed in FEFO order, so the first line represents work for moving a pallet from location BULK-102 where the batch that expires first is located.

Because the bulk locations are set up to be license plate controlled, the warehouse worker will be prompted to enter a license plate to pick in those locations.



For locations that are not setup to be license plate controlled, the warehouse worker will not be prompted for a license plate and the exact ordered quantity will be moved.

General constraints

The ability to stage materials by moving whole license plates from the warehouse location to the production input location is only

applicable for the raw material picking process. This capability is not applicable in other picking scenarios.

When a location is marked as license plate controlled, only the full content of license plates in that location can and will be moved to the production input location.

In the **Work details** form, a work quantity is specified. This quantity represents the quantity ordered by production. In the example above, for the work details there are 4 work lines for polypropylene. Three of the lines suggest to move a pallet and one work line suggests to move 207 pounds of polypropylene. Even though the last work line shows a work quantity of 207 pounds, a whole pallet will be moved to the production input location. When executing the work on a mobile device, the quantity of 207 will also be shown, but one pallet (220 pounds) will be moved, because the location is license plate controlled.

You can only define one input location for a production order. This input location comes from the input location that is specified on the resource group that is used for the first operation on the production or batch order.

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