Lean Warehouse Aisle-Bay-Level-Position Bin Location Coding

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Abstract
As we implement Lean Warehouses at numerous Clients, we are finding a multitude of bin-location coding schemes; the code that locates parts in aisles / bays / levels / shelf positions. As we've been to many warehouses, have seen different ways of coding, and came up with some of our own. This white-paper will discuss what is important when setting up location codes and some options based on the nature of your warehouse and distribution business.

Floor-Stock, Shelving, Racking
Before we explain these options… most bin location coding schemes are based on racking and shelving, assuming a relatively uniform warehouse layout (uniform racks going across the entire warehouse). This is not the case for many of our Clients, who use a combination of floor-stock, shelving and racking.

Floor-stock, in particular, is ideal for items that are uniform and stack well. This type of storage has no "levels" and "positions." It is the densest way of stocking if you have a good way to grab items from high up and if first-in-first-out (FIFO) is not important. Make sure your bin location coding scheme works as well for floor stock as for racking and shelving.

Aisle Numbering
Aisles are usually, or we recommend, using numbers. We prefer to start with only even numbers (2, 4, 6…). If a future small modification adds an aisle, it is easy to fit into the existing aisle numbering scheme. Our number is therefore coded as 02, 04, 06, etcetera. Note, if you will have 50 or more aisles, you will need to add a digit; 002, 004, 006 as you will reach 100 or higher in your aisle numbering.

Additionally, you can "sectionalize" aisle numbering, using a section of numbers for different types of storage.
01 – 20: Small parts shelving
30 – 50: Floor Stock
60 – 80: Racking

This type of sequence will create zones, which most warehouse management systems (WMS) do, but without having to look at the scanners. Note that we leave open numbers between the different sections to allow for growth.

Bay Codes
There are three considerations for bay coding; alternating sides, letters or numbers, single or bi-directional aisle picking paths.

Alternating Sides
We recommend alternating sides (A on one side – B directly across or 01 on one side – 02 directly across) so the Picker will be naturally routed to pick from their right and left as they travel down the aisle.

Lettering or Numbering

You need to choose if you want to use lettering or numbering. Letters create a natural "hyphen" or break when you are looking at positions. "02/A" is more intuitive than "02/01". However, if your aisle will have more than 13 bays and you are alternating sides then with letters you will need to go to AA, AB, AC, etcetera. It is much more intuitive to have 01 – 99 as your bay numbering than changing using two-digit letters.

Single or Bi-Direction Aisles

If the nature of your pick operation is you are gathering many items or many orders on one pick path then you probably will use single-direction aisles. These warehouses do not have a steep velocity curve (V1 = items with the most "picks", V4 are items with least "picks). It is likely the Picker will have to route through much of the warehouse or zone to pick the items for their orders.

Shelf Level

There are two choices for coding shelf height, numbering or the shelf-height in inches, or centimeters.

Numbers are what is most widely seen in warehouses. There is a logic to the bottom shelf being "1" and the top shelf being a larger number. Note, you should always make the lowest level "1" not zero. We have always found it more logical for the first level to be number 1. In addition, this makes floor stock "level" codes the same as an item on the floor level of a rack or shelf. In addition, always number from the bottom up so you can add shelves without having to reset your shelf level numbering scheme.

The other option is using the shelf height in inches or centimeters. There are two advantages to this design. First, you can easily add shelf levels without having to reset shelf levels for the bays that get the additional shelving. Second, the Picker can easily look at the location of the item and know if he/she will need equipment to reach an item higher up on the shelf or rack.

Shelf Position

Some organization prefer to add positions to their shelving. We don't recommend doing this as this can change if items need more shelf space and it is easy for one item to cross over a specific position and be in two positions. These codes are usually letters, A, B, C and D.

Examples

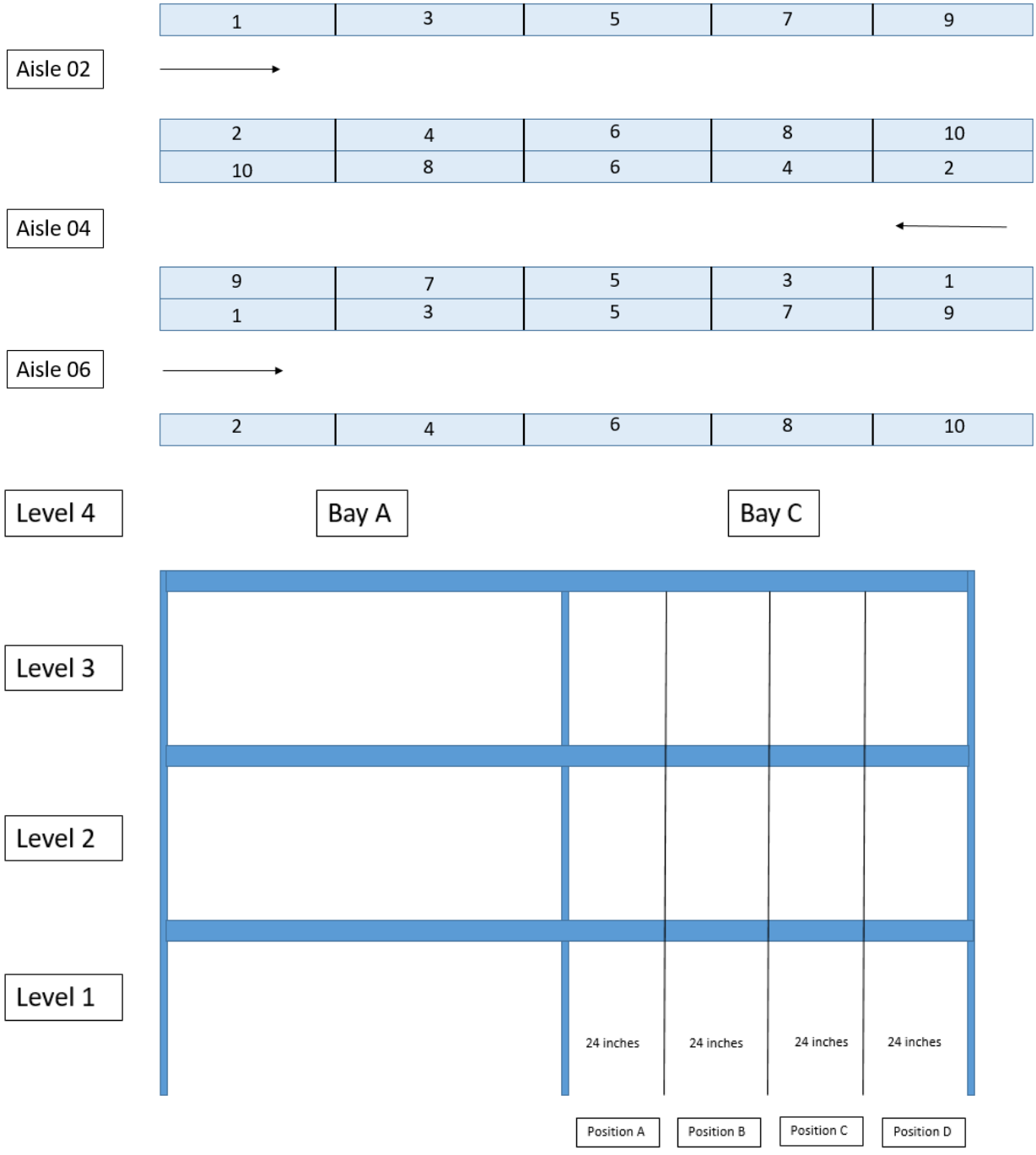
Below are some visuals to help you see different schemes. Of course, as we are implementing Lean Warehouses, every facility has some level of uniqueness due to the nature of the product, the size and shape of the building or the function of the building (sharing the space with manufacturing).

We can support you as you implementing your Lean Warehouse. Email info@supplyvelocity.com to connect with a Lean Warehouse Specialist.

Single-Direction (Snaking) Aisles – Number for Bay / Number for Shelf Height

Figure 1 below shows the top-view and elevation-view of a warehouse that uses single direction aisles. This layout supports when a Picker will route through most aisles, picking orders with many items. This design can be ideal for companies without a warehouse management system (WMS) that creates pick-sequence other than smallest to largest. It also can support picking from paper versus being guided by a scanner

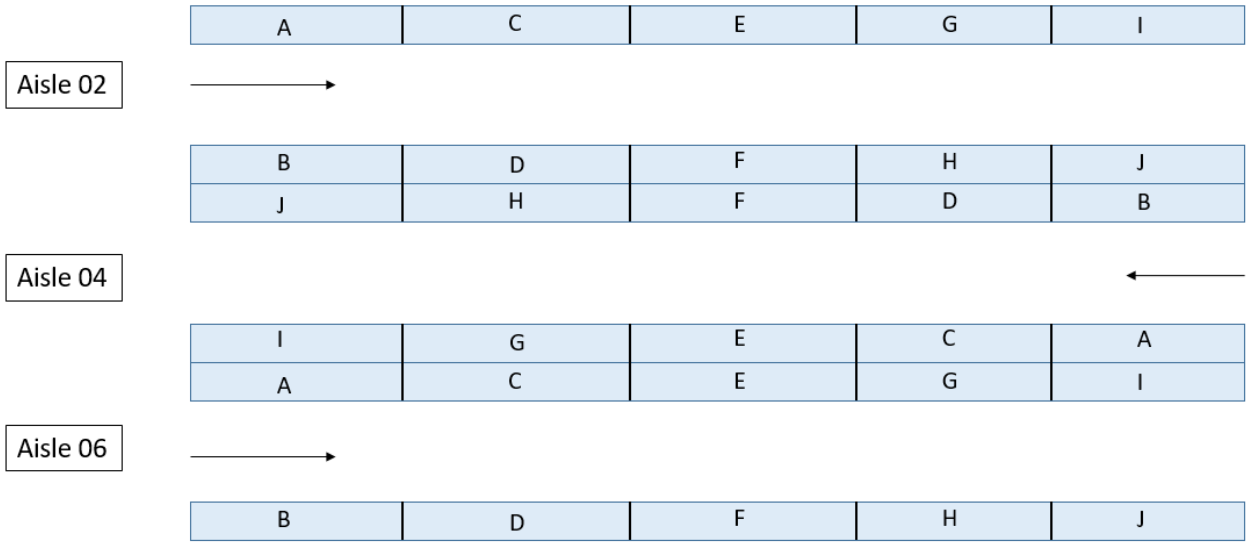
Bin Location Example: 02 (aisle) / 01 (bay) / 3 (level) / C (shelf position)



Single-Direction (Snaking) Aisles – Letter for Bay

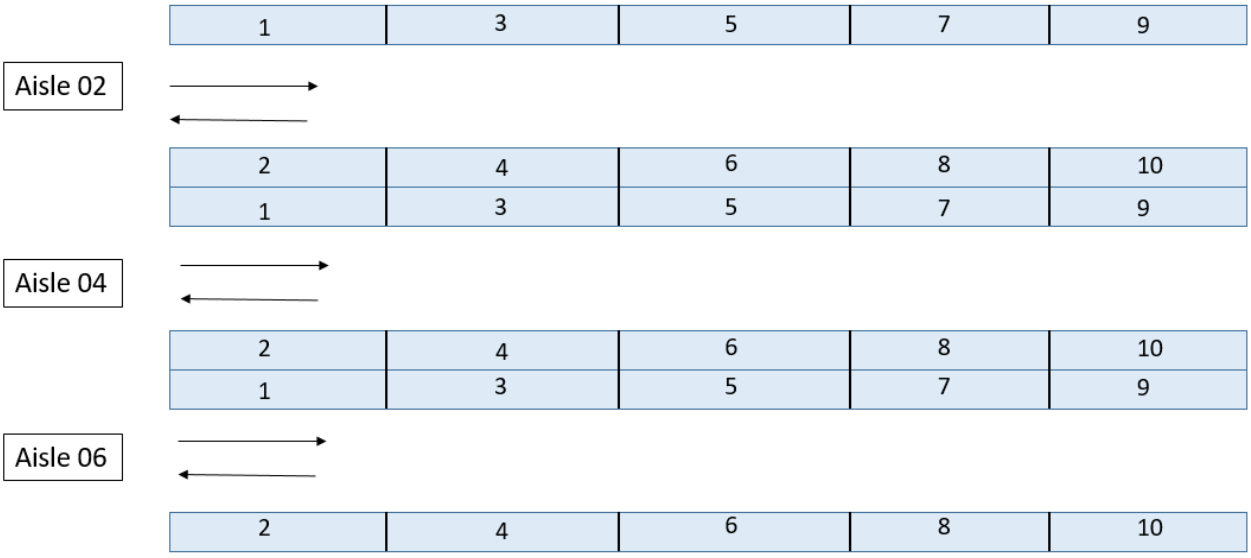
Figure 2 below is identical to Figure 1 above but uses letters for the Bay code. This can be beneficial by creating a natural break in locating codes between aisles (number) and shelf level (number)

Bin Location Example: 02 (aisle) / A (bay) / 3 (level) / C (shelf position)



Bi-Direction Aisles – Number as Bay

If your picking is unlikly to require snaking and aisles can support two-way travel, then coding all bays from left-to-right or right-to-left has a significant advantage. When all bay codes go in the same direction it is easy to know where a bay is located across the entire warehouse. This can be advantageous for identifying where cut-throughs are located. This is shown in Figure 3 below.



Shelf Level in inches or centimeters

As mentioned above, setting your shelf or rack levels based on their actual height has many advantages. Below in Figure 4 we show how levels can be coded based on height.

Bin Location Example: 02 (aisle) / A (bay) / 048 (level) / C (shelf position)