Warehouse

Bar Code or Voice Pick

Label and Sign Installation:

6 Steps to Successful Installation

An ID Label Inc. White Paper

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Successful Warehouse Label and Sign Installation
Starts with Planning

In a typical new Distribution Center (DC) construction project we see many details going in to planning a state of the art facility. A DC covering 500,000 square feet, having 25 aisles and allocating 10% as a bulk storage area may cost upwards of 9 Million dollars. The interior fitted with the latest rack and conveyor equipment may add 1.2 Million dollars or more. The leading edge technology wireless infrastructure, mobile computers with scanners and printers may be purchased for about $400,000. A tier two Warehouse Management System software use license is another $600,000. The cost of consultants may be $175,000 dollars. All this is planned and budgeted to get maximum productivity and throughput in warehouse operations.

What about Bar Code Labels and Signs?

How much did you budget for?

> • **Bar code labels for racks?**
> • **Multi-level vertical labels?**
> • **Bulk Storage Signs?**
> • **Staging, Aisle or Door Signs?**
> • **What about Installation Costs?**
> • **Have you thought about who will do the installation?**

Sometimes bar code or voice pick labels and signs are usually an afterthought and not included in the scope of the project.

In Planning a bar code or voice pick label and sign project you will need to look at the entire scope of the warehouse label and sign requirements.
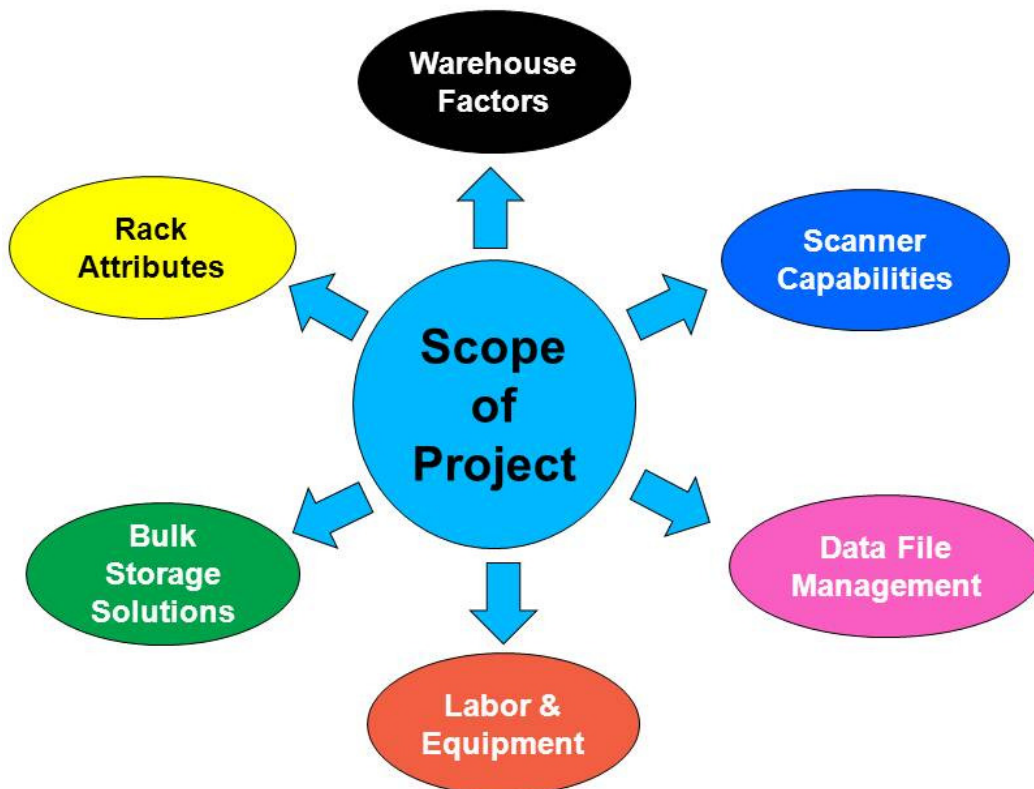
Essentially there are six factors or steps in the analysis of this type of project.

Step #1: Analyzing the Warehouse Factors affecting the Project
Step #2: Assessing Mobile Computer Scan Capabilities
Step #3: Evaluating Rack Attributes
Step #4: Determining Bulk Storage Solutions
Step #5: Creating the Data file
Step #6: Planning your Labor and Equipment

Step #1:
Analyzing the Warehouse Factors affecting the Project

Many warehouse factors will influence the project from a working environment perspective. If it is a new DC, timing will be critical as to when you begin labeling. New racks must be completely clean. Sometimes racks are delivered and kept outside until installation. Dirt and debris may be on them or cement dust may have accumulated on them during anchor bolt hole drilling. You need a clean surface for labels to adhere.

An active existing warehouse will require more time to label if you install during put away and pick operations. Possibly you can work evenings if the facility is accessible 24 hours or maybe weekends are better. Also in active environments, product may need to be moved during installation activities. Will extra manpower be available for the moves?

If you will be using battery powered scissor lifts or booms, will active electrical receptacles be available to charge equipment? This is always critical in a new facility.

What are the temperature ranges in the facility? Label adhesives have different application and service temperature ranges. It is important to know and plan for what the temperature within a given area is when applying the labels such as room a cooler or freezer.

Analysis of the Computer Aided Design or CAD drawing of the DC floor layout is imperative for evaluating what equipment can be used in the aisles or how best to address an infrastructure for hanging signs. You should also look at the rack elevation layout. It will be important to see if the rack levels will match to your vertical or horizontal label, placard or magnet layouts. Are all the levels the same or do the lower levels have bins or flow racks with different horizontal beam faces? These different beams may require different size labels than pallet storage locations. Are you accounting for all labels? For example flow racks have pick and replenishment sides so a duplicate label is needed for each side.

Step #2:
Assessing Mobile Computer Scan Capabilities

Your final label or sign design will be determined by 4 major factors:

1. **Whether your pick or put away activities a man up or man down operation.**
2. **The capabilities of the mobile device used to scan.**
3. **The data string length**
4. **The symbology used for the bar code.**

You should consider all parts of your organization's processes when evaluating. For example your operations may be a person down operation for everyday activity but an up operation for cycle counts. This may require a different label or an additional design element to accommodate for that activity.

When you evaluate your mobile computer capabilities relative to scanning there are 5 critical items to consider:
1. **What is the device's depth of field range?**
2. **What is the minimum scan distance the unit can scan from?**
3. **What is the maximum distance?**
4. **What is the aperture of the laser scan beam at the distance range the bar code will be scanned?**
5. **What is the symbology being scanned?**

Evaluating all these parameters will ensure a solution that scans every time.

Symbology selection can greatly impact the size and corresponding cost of the label. For example Code 128C can accommodate encoded characters in much smaller amount of space than code 39. Hence you can design a smaller less expensive label.

Using retro reflective label material will help in lower lighting conditions and will maximize scan distance.

Is your mobile computer 2 dimensional symbology capable? Using a 2D code may save space on the label while having a long scan distance capability. Just keep in mind the size of human readable data on this label may be part of the design that determines the ultimate size of the label or sign.

Step #3:
Evaluating Rack Attributes

Is this a new warehouse? Are beam surfaces flat or channeled? Bevel and indents will require solution designs to position bar codes for maximum scan efficiency and the best readability for text. An experienced warehouse label manufacturing and installation company can provide multiple solution options for beam face design challenges.

New racks may also be dusty from construction activities. They may need cleaning before applying labels. Labels will not adhere well to a dusty surface.

Looking at existing racks is critical in determining label design and placement. Wire deck hangover and foam bumper placement limit the space for human readable data and bar code height. A short bar code may take a little extra time targeting impacting productivity. Human readable under the wire deck hangover might be miss read. If you are sliding the label partly under the deck you may need to move product sometimes. This will definitely impact installation time.

Are the existing racks clean? Are there damaged labels? Will you try to scrape them off or maybe paint over them? Scraping, painting and/or pressure washing racks in an active warehouse is time consuming. It can be disruptive to normal warehouse operations. You may want to consider cover up labels or possibly covering the whole beam.

Do you also have other racks such as flow or cantilever? They will require a different label solution.

Step #4:
Determining Bulk Storage Solutions

Using Long range scanners and overhead hanging signs is the best bulk storage solution. You have many options for signs both in style and type material. Typically you will get optimum scanning with an angle sign. A double sided sign can enhance productivity with the capability to scan from either side.

The material can be fluted coroplast or PVC Plastic. Coroplast is lighter and does not install at an angle without special hardware. Any airflow from open dock doors or interior fans will affect coroplast signs. PVC signs are sturdier and work much better in an environment with moving air flow.

There are 3 main infrastructure options to install signs: chain, conduit, and cable. There are many pros and cons of using one method over another. Most projects require a combination of these options. An experienced sign installation company can offer a total combination solution that will be best for your DC.

If the existing mobile computer has a short range scanner many people look at floor plate solutions. Floor plates are not a good solution for a bulk storage area as the constant impact of forklifts going over them severely impacts their life. Some designs may promise optimum life but no company offering the product guarantees how long they may last. You will spend more time installing floor plates initially and over the long run the continual replacement of damaged floor plates cost will outweigh the cost of upgrading to mobile computers with long range scanning capability.

Step #5:
Creating the Data file

Printer software programs all work with Excel or comma delimited files for a print database. Setting up a print file is much like setting up a mailing database. The simplest method is to set up columns for the fields you want to print in an Excel workbook. There should be column for what is encoded in the bar code. The human readable data should be a separate column as it prints in a different location on the label and it may even be different than the encoding in the bar code. It may have dashes or spaces for easy reading. If you have Check Digit Verification you will need a column for that also. Vertical labels, colors and arrows all play in the data file layout.

Step #6:
Planning your Labor and Equipment

What type of equipment to install labels and signs should you use? Will you use Scissor lifts or booms? How many do you need? Do you have these in house? If so will using them for this activity keep them from being used for what you normally have them for? Should you rent them? From your elevation drawing you can determine how high you need to go. You may consider using a single wide lift for narrow aisles and a double wide lift for wider aisles. You can choose from electric or propane gas powered lifts.

After determining the length of time you are targeting to complete the installation you can calculate how many people you will need and the quantity of lifts or booms you need to complete installation in that time period. Will you use temporary or your own warehouse personnel? Are these people scissor lift certified? Who will train them?

Depending on the sign installation you chose whether it was chain, conduit or cable you will need to figure out how much material such as pipe, couplers, chain, cable, clamps, S hooks etc. you will need. Do you have the right tools?

You may want to consider outsourcing the installation to an experienced installation company as they would address all the labor and equipment details for you.

Planning Costs

Since bar code or voice pick labeling usually does not re-occur often, planning is an area where most people do not understand how much time to allocate for the process. There is little past experience to draw upon.

On a new warehouse you should start thinking about bar code or voice pick labels and signs when you are evaluating your systems and software you will deploy. It is never too early. Not evaluating the labels and signs during the software and systems planning stage could be the difference of tens of thousands of dollars.

As you progress in the planning process you should understand the lead times for label and sign production. Don't forget the materials you may need for installation and their lead times.

You should develop a team for planning the label and sign installation and meet from time to time to assess progress and how you look in meeting any milestone dates. Who should be on the planning team? You may want to consider an upper management member, operations, IT, a project engineer, and your WMS provider consultant. If you outsource label production and installation someone from that company should be part of the team. Typically there will be less planning time when using an experienced label & sign manufacturing and installation company.

You may want to start assessing the cost of planning relative to time spent at this time.
- How many hours will each team member spend on this project?
- Do they have previous experience on this type of project? If not will the learning curve take more time? What type of risks are there since there is no previous experience?
- Do you have resident expertise on materials, bar codes, and label/sign format layout?

Other Costs

While you are looking at costs you should probably look at all the costs of the project and quantify them.

What are Software Costs? You will need a Bar Code label Design program if you do not already have one. How much time will be needed for design and testing? Do you have the graphic fonts like arrows that you may need? How much wasted material will there be during testing.
While you may have a bar code printer and you do not need buy one there will be print head wear and maintenance to consider. In house printing does not accommodate colors. Use of color on labels for levels may offer long term productivity gains in picking and put away operations. What is that productivity savings worth? Do you have the right equipment for applying labels to magnets if that is one of your solutions? Note printing in house is a less durable label than a laminated label. A laminated label is more durable and has a longer life. How much time will it take to create, test and approve the label and sign designs as well as creating the data files?

Who will do the printing? Since this is a one off type of project, will inexperienced people take longer to do it than you calculated? You need to assess set up and print time, as well as considering any errors and waste. How much time will it take to train the people printing the labels and the installers? Who will do the training?

Lastly, you can look at procurement activities costs. You or your purchasing department will be spending time analyzing the best place to buy the supplies and materials you need. Once ordered there will probably be tracking time involved with the vendors you are working with to make sure everything is on schedule.

Do It Yourself or Outsource?

Now is the time you may want to look closely at whether you want to do it yourself in house or use experienced professionals. Typically a project like this done in house takes twice as much time than an experienced installation company. Keep this in mind when planning your barcode label and sign projects.
Should you do it in house or outsource? An experienced label and sign manufacturing and installation company offers many advantages:
1. **They have a high level of experience in multiple label and sign solution options.**
2. **Since they do this often there will be a reduction in overall planning time.**
3. **Training time is eliminated as they provide it all.**
4. **Manufacturer of labels provide high quality durable materials including lamination.**
5. **They have extensive color and graphic printing capability to accommodate easy reading and discernment between locations and levels.**
6. **They have resident bar code symbology expertise.**
7. **They have become label and sign design proficient as they do it day in and day out.**
8. **They offer an additional level of quality checking on your data files.**
9. **They provide a fixed Cost for material, printing, and labor and equipment & tools to install**
10. **If there are requirements to reschedule they are usually flexible.**

11. **They typically provide a guarantee of 5 or ten years if they do installation.**
12. **Many of the risks are eliminated or assumed by installing company**

The example below is a summarized comparison of a warehouse with 1400 bulk storage locations in a 500,000 square foot facility. The first four lines are for materials and supplies. The second four lines are for printing and applying labels to signs. The last three lines are for supplies and equipment and labor to hang signs.

When you compare the in house cost to the outsource cost you see a nearly 40% savings. It will behoove you to include all the costs of do it yourself to compare against an out source proposal. Even if the cost differential you think you have is not as great or maybe even lower because you did consider the "Double your Time Project Rule" for Do It Yourselfers, you should think about the soft costs that may be involved on the Do It Yourself (DIY) production and installation. The soft costs are part of the risk.

Warehouse Label Sign Costs	Internal Maintenance Dept			Outsource
Item	QTY	Cost	Total	Total
4" X 13" Blank Retro Labels	1,400	$0.86	$1,204	Included
4" X 13" Blank Poly Labels	1,400	$0.30	$420	Included
Resin Ribbons	4	$50.00	$200	Included
11" X 16" PVC Signs	1400	$4.95	$6,930	Included
Printing/Set Up/Loading/Printhead	8.5	$28.00	$238	Included
Labor To Print	15	$20.00	$300	Included
Management Time	40.5	$58.00	$2,349	Included
Apply labels To Signs & Racks***	24	$28.00	$672	Included
Chain (Feet) .342 ft & S hooks	31,500	$0.38	$11,949	Included
Hang Chain and Sign*	210	$28.00	$5,880	Included
Equipment Rental (Weekly)	4	$800	$3,200	Included
		Totals	$33,342	$20,433
Savings	$12,909	39%		

Know Your Exposure

There are seven areas of exposure to additional or unforeseen surprise Costs
1. **What if the data file was set up improperly and you need to reprint?**
2. **What if the labels are put on wrong location? Can you remove and reset without damaging them. How much will it cost to reprint? How much to re-install?**
3. **If the data file omitted some locations, it will be a new project with set up time to print and install those labels. Did the missed locations cause other labels to be placed in the wrong place?**
4. **Overtime cost**
5. **If you are not done in time what will be the delay costs. In one case where a company was moving to a new warehouse and was one day late exiting the old warehouse it cost them an entire month's lease payment and a penalty. It was not a small amount of money.**
6. **What other costs will be incurred from missed Go Live Dates? Each day you don't make your Go Live date typically accrues additional costs.**

Summary

If you allocate sufficient planning time to the six steps of successful bar code and label installation, you will have a productive and efficient warehouse operation. Remember to include the six steps here in your planning process from the beginning of your new DC or relabeling project.

1. **Analyze Your Warehouse Factors**
2. **Evaluate your Mobile Computer Scanner Capabilities**
3. **Review Your Rack Attributes**
4. **Determine the Best Bulk Storage Solution**
5. **Create your Data Files**
6. **Plan your Labor, Equipment and Tool requirements carefully or determine if you should outsource.**

Good luck with your warehouse sign and label project!

About ID Label Inc.

ID Label, Inc. designs, manufactures and installs a broad range of high-quality, technically-innovative barcode products for a variety of warehouse and distribution center applications. Products range from asset tracking labels to warehouse retro reflective and poly barcode labels and signs. ID Label specializes in paper, synthetic, laminated paper and laminated synthetic variable information, sequential barcodes and consecutive numbers labels. ID Label not only manufactures the highest quality warehouse rack labels and signs, they also install them. Since 1994, ID Label's Mission is to provide the finest products available with zero defects. This is accomplished through the use of state-of-the-art multicolor digital presses, a knowledgeable sales team and outstanding customer service.

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