

Facility Management Feat. RFID

Facility Management Challenges Today

In the dynamic world of construction, coordination is top priority. Inclusive in a construction site manager's daily tasks are the ordering, receiving, handling and distribution of raw material. Currently, these tasks are handled using manual tracking with paper manifests, manual data entry in facility and material logs, and perhaps through "mental notes" taken by the construction foreman. Certification documents and general documentation to ensure proper material quality control are the main source of reference for today's construction sites. Likewise, when inspections are carried out, these same documents are often the only form of reference for materials from a quality and certification standpoint. If that documentation were to become misplaced, lost, or damaged beyond readability, there could be serious and costly delays, and the construction company could potentially face steep fines.

As with any complex project, materials management needs to be as exact as possible. In the case of construction projects that suffer from low productivity, delays, and cost overruns, the blame can often be placed on poor materials management. Construction firms lack accurate, real-time information generated through site use monitoring, material planning and inventory control. However, it is not an easy task to keep track of this staggering amount of data in real time.

Imagine a real time status check of inspection reports and progress reports on your handheld computer while you walk the site. Envision the confidence of project managers when they can electronically verify documents received and even see a picture of the documents on the shelf. The solution presented here, utilizes RFID to link the actual physical work to the information flow.

Safety and Workforce Compliance

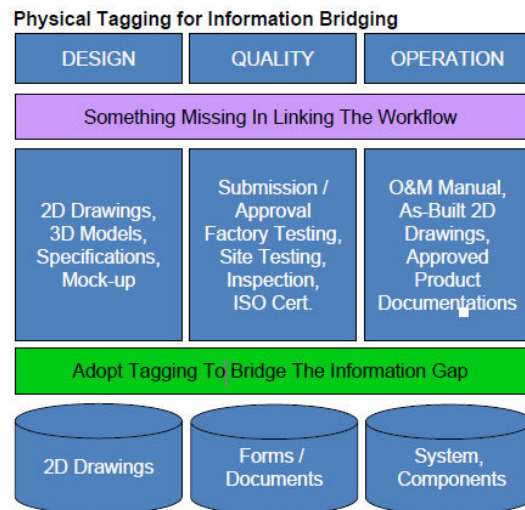
From a safety and compliance perspective, companies not only need to have the correct material on hand, but also the correct size, rated, inspected material—this distinction can sometimes mean the difference between life and death. For instance, if a batch of general framing material is mistaken or confused with support beam material, the resulting structure will not pass a safety inspection and ultimately will not be safe to inhabit. Fixing such a mistake is extremely costly in terms of materials, labor, and lost productivity, not to mention the risk of missing crucial deadlines or delaying further construction.

Compliance inspectors from the US Occupational Safety and Health Administration (OSHA) make frequent visits to a construction site to ensure safety regulations are closely followed. The construction work environment and tools are thoroughly inspected to ensure they are safe and will not cause any work related injuries. While OSHA plays a role in helping ensure the safety of the location, the construction site manager is ultimately responsible for overall workplace safety.

Rather than rely solely on compliance inspections to keep a worksite safe, the site manager needs to keep up-to-date information and maintenance on all equipment used by employees.

Testing, field inspection, procurement and document control are all part of this process. Today such a process is conducted mainly with pen and paper. Inevitably, this leads to human error, which could not only cause production delays but also potential (and unnecessary) injury to workers.

With the addition of an automated real-time tracking system utilizing radio frequency identification (RFID), construction material management could become a more accurate and accountable method to facilitate the management and flow of information. Order and material planning and management could then become a dynamically streamlined process.



Work-In-Progress (WIP) Tracking Limitations

As with the management of construction materials, work-in-progress (WIP) tracking is currently carried out using a traditional paper rider system. For each major component (normally a physical foundation which is built upon), a paper rider in the form of a plastic folder or perhaps a binder contains documentation, including a component bill of materials (BOM).

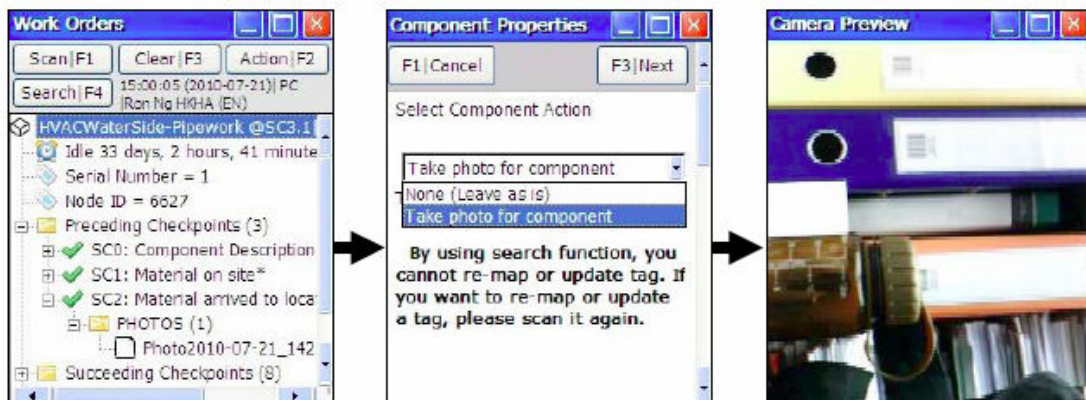
Knowing precisely where a product is during the process of manufacture is a critical piece of information, allow manufacturers to know in real-time what goods have been finished and are ready to ship; how many are still in production; and when they will be finished for delivery. WIP tracking also prevents the loss of items during the manufacturing process, which can waste time and resources when the staff has to search for these items.

In the case of construction, knowing where an asset is located is only part of the puzzle.

Other important pieces of information include when an item was received, batch numbers (in case of a material recall), and the name of the last person to handle the asset.

WIP Tracking Optimized:

With the help of RFID, every time a component is moved, its location is scanned with a wireless connected hand-held RFID scanner connected to a GPS location device. The asset ID and its GPS location are reconciled and uploaded to a facility management database where the construction foreman or any relevant manager can access the information in real time. In addition, when major construction milestones have been met on a specific piece, these milestones are also available from the same facility management database.



General Maintenance Tracking

Equipment maintenance—from the heating, ventilation and air conditioning (HVAC) systems up to and including data servers—is a crucial element of maintaining the operation of a commercial building.

A malfunctioning HVAC system creates uncomfortable (and unproductive) working conditions for employees. Likewise, a server room containing hundreds of data servers requires daily monitoring. Servers are often moved to different locations within a server room (or to a different room), and are removed and subsequently replaced due to routine maintenance. Keeping accurate and timely inventory of each server is a critical component of ensuring that the correct server is in place and has been properly serviced.

In either case, a maintenance technician must manually track each maintenance item by hand. The item model, serial number, and sometimes the assigned asset ID (in the form of a label or bar code) must be read or scanned during every service event. Handwritten records must be kept for each maintenance cycle and procedure to ensure the correct maintenance has been performed, and to determine when the next round of maintenance will occur and what services will be performed.



Telecom Server Rack 1

Maintenance Cycles Streamlined

Having maintenance information on-demand is a critical component for timely and accurate maintenance of everything from HVAC systems to data servers. Having 100% positive identification of each component and knowing right away which requires service saves time and money by eliminating or reducing un-scheduled downtime. In addition, subsequent maintenance scheduling can take place immediately after the current maintenance cycle is completed.

Physical Asset Accountability

At the end of each fiscal quarter, companies such as financial institutions, large scale manufacturers and content delivery network providers need to account for every server that is currently in service, has been moved, replaced, is in need of replacement, and at a base level, any servers or assets that have entered and exited the server room.

Current methods of inventory control include manually entering equipment numbers or asset ID numbers into an inventory system, or scanning a bar code label on the equipment.

As one can imagine, this is a laborious task that is not only time consuming, but also costly. The amount of manpower required to perform the audit/inventory, combined with potential fees and costs associated with rented equipment either not being returned on time or lost, can quickly add up. In addition, it is only at the end of the lengthy and costly audit that companies can determine if any equipment is missing.



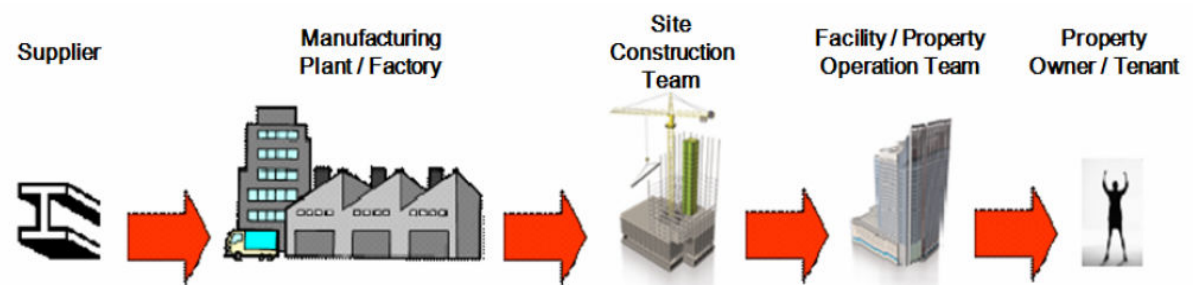
Real-Time Asset Accountability

RFID can improve asset management in a number of construction and facilities management scenarios.

- With passive RFID technology, real-time asset location can be accomplished with doorway and/or location systems that note the “last seen” location of a specific asset. In the case of a tagged laptop computer, server or other capital asset, this is a cost-effective and accurate alternative to a fully active RFID solution (not to mention these systems utilize smaller, more practical and aesthetically pleasing passive RFID transponders).
- Especially relevant in the financial industry, but becoming more commonplace in the everyday office, is a security checkpoint that can scan personnel and visitors as they pass through entryways and exits. For the banking industry, making sure a laptop computer or other data storage device containing sensitive information does not leave a facility is not only a good practice to safeguard sensitive data—it is also the law.
- An asset may be checked in or checked out as part of an automated process ensuring accountability and responsibility for crucial assets. For example, an employee uses their employee badge (also containing a RFID tag) to check out a laptop computer. At the time of checkout, the tagged laptop’s ID is scanned into the checkout database along with the employee’s ID, the time and date. At any point afterward the asset manager may retrieve who is in possession of specific assets in real time.

Construction Materials Tracking Improved

One supplier of Construction Process Control Management systems has begun to use RFID tags to track during pre and post fabrication. Tectron has implemented building pieces containing XERAFY RFID tags for Gammon Steel. The RFID tag identifies each pre-fab piece as belonging to a particular part of the building and prevents those items from being used in the wrong part of the construction process. In addition, the “freshness” and lot identification of each piece of building material is easily identifiable and instantly accountable. This helps identify material lots that potentially need to be recalled for quality and/or other concerns, as well as materials that might not have the same build integrity if they have been stored for lengthy periods of time.



The Xerafy Embedded Solution

Xerafy's unique ability to function on and in metal objects provides the ultimate flexibility when it comes to integration into today's construction and facilities management applications.

In the tough and demanding construction environment, the Xerafy Micro, for example, could be leveraged on the large steel beams used for building frames. To ensure that the proper frames are used, and that the sequence of construction takes place in the proper order, each beam may be scanned with a wireless, hand-held RFID reader for real-time accountability and verification, ensuring the job is performed correctly the first time, on time.

When used with pre-fabricated building blocks, the Xerafy Brik™ is an ideal tag for embedding into concrete. Up to 2.5 feet (.75 meters) of read range with a hand-held reader can be obtained with a Brik embedded under a full 5 cm of concrete. With an embedded Brik, pre-fabricated construction becomes a painless operation with real-time verification providing on-demand WIP traceability. Imagine not having to go back and check if the proper wall was put into place AFTER it was already installed. The correct wall is installed correctly the FIRST time.



Servers and IT capital equipment would benefit from streamlined tracking and maintenance cycles using RFID tags that are either affixed upon receipt by the customer or (ideally) embedded by the manufacturer. The Xerafy Nano fits very nicely on the side of a laptop computer or horizontally on the face of a blade server, providing discrete and rugged performance for the sometimes rough handling of these devices.

Conclusion



RFID can have a significant impact quality assurance and asset management via automation and improved accountability. By introducing intelligence to assets instead of relying on traditional paper travelers or other manual methods, companies can take the guesswork out of these processes and significantly reduce the potential for human error.

Real-time location and accountability function across a broad range of applications, including the harsh conditions found in construction and facilities management environments. Xerafy's range of RFID tags have been designed explicitly to operate in and survive these demanding applications.

Customers are already beginning to see the ROI of using RFID in facility management. By eliminating or significantly reducing the occurrence of human error, RFID can reduce the occurrence of un-scheduled machine downtime and lost productivity due to missing or expired construction materials.

Contact Us

For more information on this application, product overview or any other questions, please contact Xerafy at www.Xerafy.com.