

## MATERIALS MANAGEMENT MADE EASY



# THE TROUBLE WITH CONSTRUCTION: HOW TO MANAGE MATERIALS ON SITE PROPERLY

Material management is an essential and significant component of any construction activity on site. To improve the efficiency of any construction process requires the right materials in the right amount and right condition on the site at the right time and right location.

As the scale of projects increase, so does the complexity. Ensuring the millions of parts – whether elbows, steel beams, or pipes are in the right place at the right time presents a host of challenges such as receiving material, forecasting material needs, and transporting material between locations. This is compounded by the need to ensure the right labour and subcontractors are available at the right place at the right time, with the right materials needed to ensure the work is completed on time. So, project managers need up-to-date, accurate information about materials' quantity and location throughout the lifecycle of the project.

### COMMON PROBLEMS ON A CONSTRUCTION SITE

#### No established goods/material receipt process

- I. Warehouse personnel onsite receive materials by Purchase Order (PO) or by package, and are responsible for documenting material arrivals, checking actual vs. expected goods, and ensuring the right material is stored in the right place to facilitate efficient material management at the construction site. Not having a goods/material receipt process in place requires frequent manual stock checks to ensure that the inventory figures listed are correct and accurate.
- II. Manually counting and entering the shipment receiving data is very inefficient because it increases the cost of labor and lowers return. It also increases the risk of human error, thereby representing inaccurate stock. This is time-consuming, costly, and inefficient.
- III. Without clear insight into logistics of what is expected, onsite workers cannot prepare for unexpected shipments, leading to delays as shipments sit and wait while teams find an allocated space, and there is little visibility into whether all the materials ordered have arrived on site.





#### Unable to locate material on site

- I. Material, once received in a warehouse, can be moved to a different location within a warehouse or to a different warehouse. When this is not tracked, material is lost or misplaced. This leads to unplanned downtime as it can take a long time to locate this material. Adding to this is the risk of human error — since these deliveries and movements are handled manually. Movement of materials can lead to shortages and loss of materials, driving up cost and leading to project delays.
- II. When material is not accurately received — incorrect quantities arrive, which means you either don't have enough storage space or don't have everything you need to complete the necessary tasks. Delays and errors on this front can have a dramatic downstream impact on planning and construction and ultimately the cost and delay of projects.

#### Bad quality material issued for construction

- I. If a problem is discovered with a component, identifying other locations of it within the plant is difficult and cumbersome. Related heat numbers need to be identified and mapped to a particular batch of material received so that this material can be removed and replaced.

- II. Damage to material can happen anywhere along the supply chain — while material is in transit, while it is transported to storage, or while it is issued for construction — this is why you need to be vigilant to keep track of damaged material.

#### Improper material requirement planning

- I. On a construction site, determining and planning for the right amount of material at the right time for an activity is very crucial. To ensure this, it is required for the planning team to identify the Required On Site (ROS) date and ensure the material is made available. Knowing how long it takes for material to arrive from the moment you order, until the time it arrives on site is the key to effective material requirements planning. By not forecasting the material requirements we end up with material shortage, thereby delaying the construction activity and the entire project.
- II. It is also essential to reserve material ordered for specific activities. By not reserving the material we will have an inaccurate forecast and eventually end up in ordering excess material, which is also not desirable.



## INTERGRAPH SMART® MATERIALS

Intergraph Smart® Materials seamlessly manages the complexity of materials management on site, delivering total material visibility from shipment through issue of material into the construction phase. Smart Materials ensures all the stakeholders are up-to-date with the material handling. Employees at the site can prepare for the arrival of shipments by allocating space for the materials, sourcing the right equipment to unload the materials onsite, engaging the labor needed to track and unload the materials, increasing efficiency and preventing project delays.

Smart Materials offers “Constructability Simulation” by comparing all the data, along the value chain for a given project, such as packages, inventory, agreements and expected deliveries or shipments. Smart Materials gives a complete picture on what material is available in stock, what material is reserved in stock, what material will arrive on time, what material will be delayed in arrival, and what material is not yet ordered. Ultimately, this ability allows you to stay ahead by knowing what you need and when you need it. This reduces the risk of project delays due to shortages, while simultaneously minimizing surplus material and keeping the costs down.

## INTERGRAPH SMART MATERIALS MOBILE SCAN

Intergraph Smart Materials Mobile Scan is a mobile application that enables barcode and RFID tag scanning at the site. This app is fully embedded in Smart Materials – reading data from design and procurement and sharing data with planning and construction.

Mobile Scan allows you to generate Material Receiving Reports in Smart Materials. When a shipment arrives, the barcode or RFID is scanned, the system pulls data from Smart Materials and knows precisely what should be received as a part of the delivery, making it easy to receive, organize and track materials. Mobile Scan also allows you to register and associate heat numbers in real-time to accurately map instances of particular batches and report damaged material. Goods can be inspected, and actions taken on the spot can be recorded.

Whenever material needs to be moved across warehouses on site, all a user need do is scan an item in Mobile Scan and then request a transfer. Transfers can be initiated immediately, and these updates are automatically pushed to all stakeholders.



Materials will no longer go missing or turn up at an unexpected place. Everyone onsite will quickly and easily be able to find a given shipment and rely on the accuracy of the location data returned. Mobile Scan also utilizes the GPS in the device to map the precise location of materials to help aid navigation.

Mobile Scan allows you to keep better control of your inventory. It executes inventory checks and allows users to generate physical count sheets to speed up the stock check and ensure better accuracy. Once the count is complete, a detailed report of missing materials is generated without any manual input, reducing errors and maintaining quality.

When material needs to be issued to the construction site, Mobile Scan provides as an easy way to do this directly by using a handheld device on site or at the shop or in the yard. Material issue reports can be generated based on the items issued, or issue reports based on a drawing can also be created to issue material required for execution on site. Items are easily identified from a picking ticket and actual quantities issued are automatically indicated back to Smart Materials.

A robust material handling workflow provided by Smart Materials and Mobile Scan increases efficiency, reduces costs and helps protect the ultimate quality of your entire project.

## ABOUT HEXAGON

Hexagon is a global leader in digital solutions that create Autonomous Connected Ecosystems (ACE). Our industry-specific solutions create smart digital realities that improve productivity and quality across manufacturing, infrastructure, safety and mobility applications.

Hexagon's PPM division empowers its clients to transform unstructured information into a smart digital asset to visualize, build and manage structures and facilities of all complexities, ensuring safe and efficient operation throughout the entire lifecycle.

Hexagon (Nasdaq Stockholm: HEXA B) has approximately 20,000 employees in 50 countries and net sales of approximately 3.8bn EUR. Learn more at [hexagon.com](https://hexagon.com) and follow us @HexagonAB.