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Austin's Top Ten Equipment Installation Tips

Teamwork and Planning ensure Equipment Installation goes smoothly

The Austin Company has the experience and knowledge to realize a successful equipment installation project. At Austin, we understand that for equipment to meet manufacturing's expectations, the installation must be well thought out and properly implemented.

Here are Austin's Top 10 Tips for a Successful Equipment Installation:

1. Equipment Drawings

It is imperative that accurate drawings be provided early in the design process for the planned equipment installation. These drawings should show the size, shape, configuration and dimensions of the equipment, as well as any utility point of connections and anchorage requirements. Critical operating and required maintenance clearances should also be indicated. These drawings should be available in electronic CAD format either 2 dimensional drawings or 3 dimensional models for integration into building and infrastructure drawings and design work.

2. Equipment Supports

The weight of the equipment, its footprint, anchorage requirements and loading characteristics (static and dynamic) must all be considered to develop the structural support of the equipment. These elements will be used by the structural engineers to determine if foundations are required or if the structural floor can adequately support the equipment. Special considerations for vibration or dynamic loads may require isolation or vibration absorption. If the equipment is elevated on a mezzanine or upper floor additional special requirements may apply. Seismic requirements are a code consideration throughout most of the United States.

3. Understanding / Defining

Utility requirements are critical to ensuring a successful equipment installation. The type of utilities, their size/quantity and their quality all must be determined and provided. Typical utilities include electrical power, compressed air, special gases, potable water, drain systems, ventilation/exhaust and data communication. Equipment requirements should be carefully analyzed and the demand load estimated to avoid over sizing the overall utility systems.

4. Material Handling Integration

Often, major pieces of production equipment require integration with material handling equipment. This can be an input or output conveyor, an overhead bridge crane or a localized jib crane or lift assist device. Integration may require coordination of layouts, alignments or even heights. Use of overhead cranes may prevent utilities from being located overhead.

Many times materials required or produced by the production equipment will need a forklift or pallet jack access. These “mobile material handling devices” require adequate space for turning and accessing materials. In addition these devices can accidently impact or damage production equipment, so additional protection measures must be considered.

5. Protection

Equipment is normally provided with minimum required personnel guarding or protection by the manufacturer. This should be carefully reviewed for compliance with state and local requirements and interpretations. Your company may have additional safety requirements based on the type of equipment or use. Locating equipment near personnel circulation aisles or material handling aisles may require additional protection for employees and the production equipment. Automated equipment such as robotic arms may require guarding to prevent accidental impacts. Equipment which utilizes lasers or welding may require visual protection. Loud noise generating equipment may require sound absorption or hearing protection to protect operators and others in the area.

6. Layout Matters

Whether your equipment installation is replacing a single existing piece of equipment, part of an integrated production line or an in independent work cell, it’s layout matters. Care needs to be taken to ensure that all required clearances and requirements for the equipment layout are adequately addressed. Electrical panels, control panels and disconnect switches all have specific code required clearances and requirements. Human machine interfaces (HMI) and touch screens must be readily accessible. Adequate space needs to be planned for work in progress, raw materials and finished goods.

7. Plan for Maintenance

All production equipment requires maintenance at some point. Planning for the required and periodic maintenance should be part of the early stages of a project. Planning adequate space and access for maintenance makes maintenance easier and more likely to occur, better protecting the overall equipment investment. Allowing space to readily replace motors, maintain moving parts, perform periodic lubrication and replace expendable parts such as filters, helps support production availability and efficiency.

8. Some Assembly Required

Large production equipment is often shipped in pieces for assembly at the final destination. The number of shipping containers, their size and weight should be identified prior to shipment. The receiving of the shipment, uncrating and movement of the components to their final location must be carefully planned. Uncrating large components requires considerable space. Moving large components will require adequate clearances for the component and the equipment required to move it such as forklifts or cranes. Protection of doorways, walls and floors may be required. Staging space will be required for the various

components and the equipment, tools, materials and labor necessary to assemble the components to create the production equipment.

9. Imported Equipment Issues

Equipment manufactured overseas and imported often has specific issues when installed in the United States. Electrical differences include motor efficiencies, voltage, hertz and control panel wiring or components. European equipment may use 200-220 volt motors instead of 480 volt motors used in the United States. This results in higher amperage requirements. Imported equipment may not be "listed" by an approving agency such as Underwriters Laboratories (UL). This can cause delays from local code authorities in determining if the equipment is safe to be energized. Approval may require third party inspection and documentation or at worst replacement of key electrical components, controls or wiring.

Another consideration is scheduling of delivery. Overseas shipping requires customs review upon arrival and reshipping within the US. Make sure to allow adequate time for these activities. In addition, multiple handling in shipment can risk damage to sensitive components.

10. Start up Assistance

Start up assistance is often a key part of an equipment installation. Most of the time, initial startup and testing is provided by the equipment manufacturer as an additional service. This service can be critical to ensure the installation was competed in an appropriate manner and quality. It also can be a valuable introduction or training opportunity to the new equipment for operators and maintenance personnel. The actual level of "hands-on" service provided should be carefully reviewed. If the start up assistance includes making wiring or plumbing connections or modifications, these services should be reviewed for potential conflicts with tradesman, unions or maintenance personnel requirements. If the start up is strictly "hands off", then personnel will need to be available to make necessary adjustments or modifications.

Start up activities may require actual materials for testing. Allow for materials to be available to verify the equipment works as intended on the materials required.

If the equipment is particularly sensitive or accurate, calibration testing may also be required. Calibration testing is often validated by an independent third party service not the equipment manufacturer or installer.

Austin Capabilities

The Austin Company provides guidance, expertise and experience in Facilities design and construction which extends beyond the brief information provided in this Top Ten List. Should your future plans include upgrading an existing facility or planning for a new facility, please contact us at one of the offices below to find out how Austin can help your equipment installation or facility plans go smoothly.

About Dan Wiegandt, AIA, LEED AP:

As Manager of Engineering for The Austin Company, Mr. Wiegandt is responsible for overseeing all design and engineering work performed. His activities include providing overall management, quality assurance, and an ongoing "independent" critical appraisal of the total engineering efforts. His responsibility places a strong emphasis on the quality assurance, and cost-effective design. Mr. Wiegandt has 31 years of professional experience and 20 years with The Austin Company.

Mr. Wiegandt's experience has provided him with a thorough working knowledge of design and construction procedures from inception through engineering, estimating, scheduling, purchasing, and construction. He has demonstrated the ability to accomplish successful results for building programs, based on a unique combination of technical knowledge, practical judgment, and overall management skills. His experience provides a solid base for meaningful understanding of management, technical, and cost and schedule considerations that must be optimally addressed in order to achieve a successful project.

The Austin Company:

The Austin Company is a consulting, planning, architecture, engineering, and construction services company offering a comprehensive portfolio of services to a broad spectrum of industries nationwide. Austin offers its clients significant flexibility in the way its services are offered, delivering services under a single source design-build agreement or on an individual service basis designed around specific project requirements. The Austin Company is credited by the Design-Build Institute of America (DBIA) as being the originator of design-build in the United States over 100 years ago. Using The Austin Method®, the company's design-build approach, Austin provides its clients a single source for all facility planning, design and construction services, and assumes undivided responsibility for meeting project budget, schedule and quality. In addition to complete services for the built environment, Austin offers a host of value-added strategic planning services including site location, transportation/ distribution consulting, facility/process audits and related services. The Austin Company works as an extension of its clients' organizations, offering unparalleled experience in each of the markets and industries it serves.