

# Assembly Line Conveyor and Controls System: Appliance Manufacturing



## PROJECT SCOPE

System Integration,  
Engineering, Structural,  
Mechanical-Electrical  
Installation, Controls  
Design & Programming

## INDUSTRY

Manufacturing

## LOCATION

Midwestern United  
States

Pictured: Overhead structural steel installation in progress to support elevated conveyance for assembly line system.

**SilMan provided a custom assembly line conveyor solution to integrate new equipment and controls with an existing manufacturing material handling system, including structural steel installation for elevated conveyance and maintenance catwalk.**

## Assembly Line Conveyor System Integration and Execution

SilMan Industries was contracted by a leading home appliance maker to design an assembly line material handling solution to provide added speed and efficiency in the transfer of finished goods from production to inventory. The project was executed by SilMan's Material Handling team, drawing from their in-house design, engineering, and installation resources.

This turnkey project was designed by SilMan to be executed simultaneously with daily operations. Thanks to detailed planning between SilMan and the project owner, shutdown periods and weekend work were strategically undertaken to minimize interruptions.

The solution calls for the creation of a new line and modification of an existing line to divide the main flow of crates into two lanes through the final segment of assembly.

Additionally, the expanded overhead conveyance system included the removal of an existing escalator-style vertical lift to be replaced with an inclined belt conveyor to accommodate the speed of the new configuration.

Notably, the onsite work was completed in the summer of 2020. This plant was one of the few home appliance manufacturers that continued operations throughout the global pandemic.

The SilMan team performed all onsite work, including structural steel, mechanical, electrical, and controls.

## Improved Throughput and Efficiency

Since the design creates two parallel conveyance lines where there was previously one, the new arrangement effectively doubles the rate of products transferred from the factory to the warehouse. Moreover, newer equipment will decrease downtime for repair and maintenance in this section of the line.

The creation of a new ceiling conveyance system is a key aspect of the design. In addition to expanding the volume of crates transferred to the warehouse, the overhead assembly provides a catwalk for maintenance personnel.

To accomplish these results, a temporary line was created to support ongoing operations during installation.

## Results provided

- Increased overall throughput rates
- Improved efficiency of operations and upkeep
- No unscheduled downtime occurred during installation!

## Self-Performance is Key to Success

SilMan Industries has deep ties to the manufacturing sector through the work of their Construction and Site Services divisions. These highly specialized teams support all aspects of industrial operations, including facility improvements, piping, rigging, electrical, machinery maintenance, and installation.

These in-house capabilities allow SilMan's Material Handling Team to offer expansive, cost-effective service to clients from a single resource.

## Scope of Work

### Assembly Line Conveyor and Controls

The scope of the package includes new structural steel for supporting ceiling conveyance, new incline belt conveyors, roller conveyors, controls, and modifications required for the integration of new and existing finished-boxed conveyance.

## Three Project Phases

**Phase one** involves structural engineering by [LECGI](#) for overhead structures to support the new overhead conveyance and maintenance lane.

The structural work, performed by SilMan's installation team, includes hangars, catwalks, platforms, and incline supports.

**Phase 2** consists of building a parallel conveyance system for finished boxes from the assembly line to a newly created incline system to the modified ceiling conveyance system and routed to the warehouse.

The new lane includes an existing 90-degree Chain Driven Live Rolling Conveyor (CDLR), controls/hardware to accumulate trains of multiple units before advancing the products to the warehouse, via incline and ceiling conveyors.

**Phase 3** provides for the reconfiguration of the existing lane.

The main feature of this aspect of the project is the removal of an esconveyor to be replaced by an inclined belt conveyor, supported by floor footings and newly installed reinforced ceiling hangars.

The new overhead line is identical to the existing ceiling conveyance, with the exception of new catwalks which allow crossover and maintenance on both lanes.

The new ceiling construction includes the installation of new conduit and wire runs.

A new diverter for damaged or incorrectly processed products was also provided. The operation is manually inspected and triggered by a team member, which directs the package to QC for remedial work and reinduction.



## Mechanical and Equipment

The mechanical equipment required for this project includes over 150+ linear feet of conveyor and 16 motors.

- Tapered Roller Curves,
- Horizontal Brake Meter Belt Conveyors,
- Belt over roller Incline Conveyor
- Conveyor Crossover
- CDLR Conveyor
- Roller Bed Belt over roller Incline Conveyor
- Photo eyes (40)

All conveyor equipment was provided by [Roach Conveyors](#) and Scanners from [Cognex](#).

## Electrical and Controls

The SilMan Controls Group designed and programmed the system per the project owner's specs, installing Rockwell-Allen Bradley controls.

Specific control applications include photo eyes, merge, and accumulation zones.

## Specialized skills deployed

Mechanical and Electrical Engineering

- Design
- Procurement
- Project Management

Structural Construction

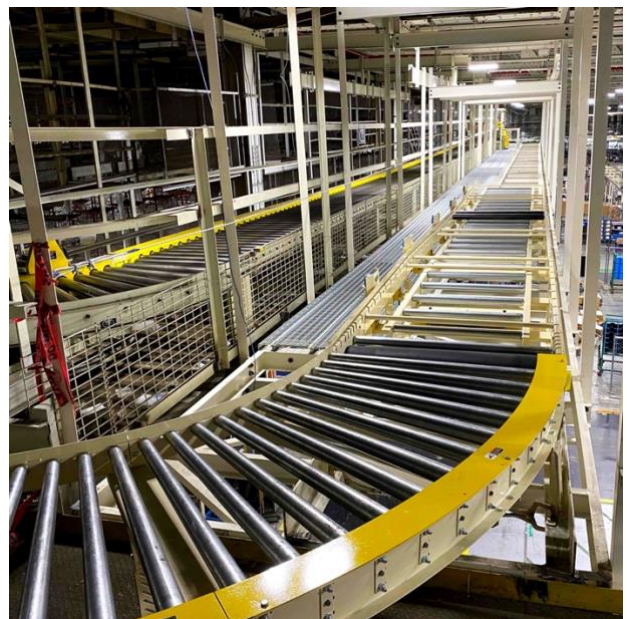
- Structural steel (bolted)
- Ceiling hangars
- Floor supports
- Fabrication of platforms, decking, and guards
- Modification to existing structures

Mechanical Installation

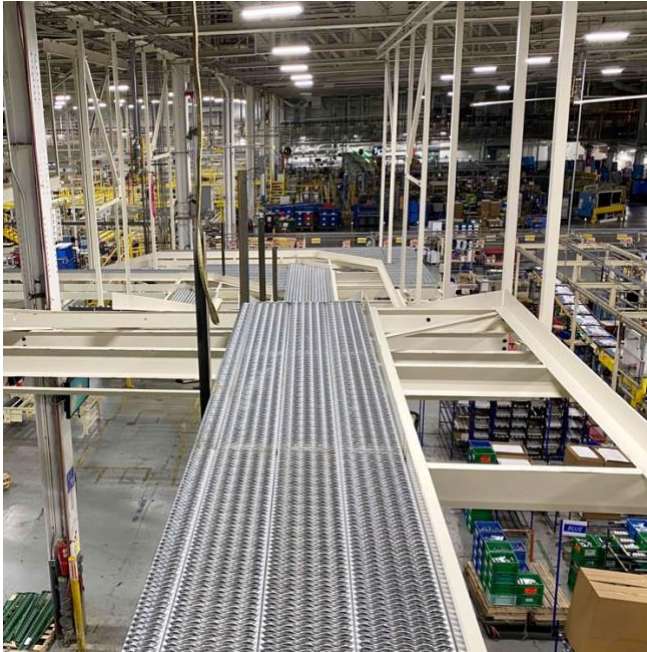
- Millwright
- Pipefitters
- Conveyors
- Commission equipment

Electrical Installation

- Panel



- Power
- Devices
- Controls
- Commission equipment



## Midsouth and Midwest Industrial Sectors

### **SilMan continues to expand geographic service areas**

SilMan Industries is no stranger to serving Midwest and Mid-South industrial concerns.

They established their first regional office in Tupelo, Mississippi in 2010 when the company was contracted to de-commission the [NUMMI auto production line](#) in Fremont, California, and relocate the assembly and conveyance equipment to Toyota's Blue Springs, Mississippi facility.

Other projects completed in the region include [automotive forge-press installation](#) for Kobe Aluminum (Bowling Green, Ky.), [multi-site line modifications](#) for FedEx Ground, and [cooperage manufacturing material handling systems](#) for distillers Brown-Forman and Speyside, and McGinnis Wood Products.

### **About SilMan**

SilMan Industries (previously SilMan Construction) is based in San Leandro, Calif. Founded in 2008, the firm operates nationwide in three divisions – Construction, Material Handling and Site Services – and partners with “best in class” companies nationwide providing integrated solutions in the Industrial, Manufacturing, Distribution, and Public Works sectors. For more information, please visit [www.silmanindustries.com/about](http://www.silmanindustries.com/about).