

**MATERIAL HANDLING INDUSTRY PRACTICES AND GUIDELINES -  
FUNCTIONAL REQUIREMENTS**

**JOINT EFFORT OF THE**

**CONVEYOR PRODUCT SECTION OF MHI**

**AND**

**THE ASSOCIATION OF PROFESSIONAL MATERIAL HANDLING  
CONSULTANTS**

**WORKING DOCUMENT**

**A Recommended Common Industry Practice and Guidelines  
For A Conveyor System Request for Proposal**

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***This recommended standard was developed by the Conveyor Product Section of Material Handling Industry, an association of the United States' leading manufacturers of Conveyor Systems and The Association of Professional Material Handling Consultants (APMHC), an association of the North American leading independent material handling consultants; for the purpose of promoting and clarifying standardized specifications. It is a recommendation only and its use is strictly voluntary. As such, neither the Conveyor Product Section, the APMHC, nor Material Handling Industry warrants, either expressly or implicitly, its use or assumes any responsibility of any kind.***

## Preface

This document is intended to guide an end user/owner project team, including a consulting partner when appropriate, in the creation of a procurement specification to accompany a Conveyor System request for proposal.

All of the necessary sections to a complete bid specification are identified. In most Sections there is a description of what is required in that Section. ***In other Sections there are alternatives from which a selection should be made and specifically addressed. These alternatives are shown in bold italics***, indicating with blanks or [brackets] where someone compiling the specification may have options from which to choose. Wherever [TBP] appears it means "To Be Provided" by owner.

In addition to the goal of educating persons who have minimal experience with a Conveyor System, or at writing a Conveyor System bid specification, the objective of this document is to promote and support the writing of bid specifications which are complete and that reflect the current state of the art regarding the design of Integrated Conveyor Systems, and which do not contain unnecessary or redundant requirements.

The Conveyor industry's intent is to provide the best performance to cost ratio available by pre-engineering the equipment and portions of the system. As such, specifying or requesting the substitution of certain specific components not normally provided by the vendor may actually reduce the reliability and performance or significantly increase the system cost with no added value. We recommend that when specifying components that the requestor describe the intended performance desired.

The Conveyor Industry also wants to encourage the writing of a procurement specification which allows vendors who elect to respond to apply their experience and ingenuity to proposing solutions beyond a base line system which can be demonstrated to meet the performance and safety requirements specified. Notwithstanding the merits of a baseline system, the practice of required bidding to the specifications of a base line system and then proposing other alternatives takes tremendous resources and additional cost, which in the end can inflate the cost of the final purchased price.

Appendix A to this document contains a glossary of terms in common use within the Conveyor industry. It should be referred to any time there is uncertainty as to the meaning of a word or phrase. Should there be any remaining uncertainties about any aspect of this document the reader is invited to contact Material Handling Industry offices in Charlotte, North Carolina.

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## 1.0 INTRODUCTION

### 1.1 Purpose of This Specification

The intent of this specification is to provide guidelines for designing and defining a material handling conveyor system.

### 1.2 System Scope

A conveyor system must be defined by the scope of work that the supplier and customer expects to achieve with the desired system functionality.

#### 1.2.1 Definitions

### 1.3 Contact by Function

There generally are many people that individually and collectively contribute to the success of a system. There must be contact information available for these project people to address issues that arise during the duration of the program. Their contact information must include phone, fax, and email for the direct staff and back-up individuals when the primary individuals are not available.

#### 1.3.1 Administrative Questions

#### 1.3.2 Technical Questions

#### 1.3.3 Confirmation of Conversations

#### 1.3.4 Owner

#### 1.3.5 Site Location

### 1.4 Time Table

A significant amount of coordination is required to achieve the schedules established by the parties involved. To insure the schedules are met, a specific time table must be established to meet the deadlines of the project.

#### 1.4.1 Request for Quotation and Selection Process

#### 1.4.2 Contract Award

#### 1.4.3 Installation Schedule

#### 1.4.4 System Acceptance and Beneficial Use

## 2.0 REFERENCES (Drawing)

There are many documents and references that define the project. Additionally, as the project evolves, a well documented and orderly registration of the project insure that misunderstandings and questions are kept to a minimum or eliminated. The references also provide an historical basis of the project for service and support activities.

### 2.1 Drawings

Drawings must be developed using standard CAD formats that are accepted by all parties. Each revision must also be signed and referenced with the person(s) affecting the change.

#### 2.1.1 Drawings of Existing Buildings

#### 2.1.2 Drawings of Existing Equipment to Remain

#### 2.1.3 Drawings of New Equipment to be Provided For / Desired Work Flow

#### 2.1.4 System Path and Equipment Location

#### 2.1.5 Alternative Solutions Drawings

### 2.2 Specifications

Specifications of the conveyor structure, design, and components identify information that clearly details the products and project. This also is a key element for system definition.

#### 2.2.1 Conveyor Structure

#### 2.2.2. Conveyor Support

##### 2.2.2.1 Floor

##### 2.2.2.2 Mezzanine

##### 2.2.2.3 Load Drawings

##### 2.2.2.4 Super structure utility building

### 2.3 Other Documents

Various documents are also included in the project that can contribute significantly to the definition of the system. All must be kept in an orderly and structure form.

#### 2.3.1 Other Specifications

#### 2.3.2 In-house Specifications

#### 2.3.3 Layout Drawing Approval Process

#### 2.3.4 Prototype Drawings

#### 2.3.5 Customer Recommended Items

### 2.4 Applicable Codes and Standards

To insure that codes and standard are followed in the project, they should be identified and categorized for easy referencing. The adherence and compatibility may be challenged at some point during the project or after ownership transfer to the buyer. If this were to occur, clear compliance or non-compliance must be accessible for all parties.

#### 2.4.1 Safety Codes

#### 2.4.2 Local and National Building Codes

#### 2.4.3 Industry Standards - OSHA, BOCA, communication, etc.

#### 2.4.4 Other Applicable Standards for bar codes, etc.

#### 2.4.5 American Disabilities Act

## 3.0 OVERVIEW OF THE PLANNED PROJECT/SYSTEM

An overview and summary of the project must be clear and specifically defined to allow all parties to understand the objectives and goals. This will keep the parties of the project focused on the project direction and goals.

### 3.1 Broad Project/System Objectives

A broad or "big picture" explanation or definition of the project and objectives must be stated to make sure all parties of the project are focused on the foundation of the program.

### 3.2 Process(es) to be Supported

Often a conveyor system will support or interface with a process or multiple processes. This must be clearly defined to insure proper support and interface for these activities.

### 3.3 Owner / Consultants Envisioned Conveyor Network

## 4.0 BASIC REQUIREMENTS

Before system definition can be developed, it is essential that several basic elements are understood and defined. They include the loads to be handled, performance profiles, cycle times, operator interface requirements, and environmental and ergonomic issues.

### 4.1 Loads to be Handled

The essential element of the project is the definition of the loads or products to be handled. Once they are defined and categorized, the delivery system and conveyor components can be engineered for the project. It is also important to group the loads and products into categories that identify size, weight, packaging, and frequency of use in the system.

4.1.1 For items to be conveyed, Table 6 in the sample Project Information Form in the Appendix

4.1.2 For pallets and tubs, use a table similar to Table 6 in the sample Project Information Form in the Appendix

4.1.3 To describe the dimensions of the items to be conveyed, the Table 8 in the sample Project Information Form

### 4.2 Total System Performance

It is essential that the performance expectations are identified early in the project. This definition drives many of the design and layout elements of the project.

4.2.1 From / To Chart of Information (Flow Charts)

4.2.2 Use table like Table 7 in the Project Information Form

### 4.3 Methods of Cycle Time Verification

Defining cycle times and how they are verified must be identified to insure consistent measurement of system activity rates.

4.3.1 Calculation

4.3.2 Spread Sheet Time Matrix

4.3.3 Simulation

### 4.4 Operator Interface WMS, Home Grown, PLC

Many companies have standardized or will be standardizing the screen layout and operator interface requirements for control and software systems. This is especially important because of the variety of operator skills that will be available for system control management and monitoring.

### 4.5 Noise Requirements

Industry and government standards for noise levels must be identified for compliance or non-compliance. Once established, where testing is required, the methodology for measurement and documentation must be stated.

4.5.1 OSHA Standards - Statement by conveyor company

4.5.2 Method of Testing - Statement by end user

#### 4.6 Ergonomic Issues

Many types of material handling systems are designed with ergonomic considerations for operators interfacing with the equipment. Industry standards or supplier designs that enhance the workers ability to perform their tasks while working with the machinery must be identified.

### 5.0 SYSTEM REQUIREMENTS

The purpose of this section is to define the overall system requirements from an operational and performance point of view.

#### 5.1 Operational Requirements-

Many factors will affect the operational requirements. Each operation affects the other, and different shifts and schedules will affect the overall operation.

5.1.1 Shifts per Day

5.1.2 Days per Week

5.1.3 Receiving Schedule

5.1.4 Shipping Schedule

#### 5.2 Characteristics of Owners Business -

A significant amount of coordination is required by the consultant and end user to define the owner's characteristics

5.2.1 Number of SKUs - Active, Total

5.2.2 Estimated Inventory of Each

5.2.3 Etc.

#### 5.3 Material Flow -

Material Flow is the key to designing a conveyor system. All aspects of the system design are influenced by this element of the system. This is especially critical when there are integrated subsystems that can be affected by the material flow upstream or parallel to the next operation. .

5.3.1 Description of Operation

5.3.2 Process Flow Chart

#### 5.4 Downtime Effect -

Downtime Effect should be measured to help keep track of operation/maintenance reliability of the system.

5.4.1 Redundancy Requirement

5.4.2 Cost per Minute / Hour

#### 5.5 Computer/Operating System Requirements -



The correct computer/operating system is one of the single most important elements of a reliable conveyor system. Because of the integration of information and flow of materials inherent in every system, computer operating systems must be defined and engineered for all material flow requirements.

5.5.1 Connection with MIS

5.5.2 Stand Alone Requirements

5.5.3 External Control Systems interface (ups, etc.)

5.5.4 Type of Controller to be used (PLC, PC)

5.6 Agencies / Codes / Regulations to be Adhered to (See 9.0) -

This is a very critical area to review and document because of the legal codes or regulation changes that may or have occurred in various areas of the USA

## 6.0 CONVEYOR EQUIPMENT GENERAL REQUIREMENTS -

There are several elements of the conveyor system that require definition and detailed information to insure compatibility of need and use in the system. This can be used as a benchmark to compare quality and type of equipment each vendor is planning to use.

**6.1 Design and application objectives for the Use of Gravity Conveyor - Wheel or Roller**

**6.2 Design and application objectives for the Restriction of Use of Incline Conveyor**

**6.3 Design and application objectives for the Restriction of Use of Vertical Conveyor**

**6.4 Design and application objectives for the Use of Lineshaft Conveyor**

**6.5 Design and application objectives for the use and application of Belt Driven Conveyor**

**6.6 Design and application objectives for Chain Driven Conveyor vs. Belt Driven**

**6.7 Design and application objectives for the Special Applications/Designed Conveyor**

**6.8 Design and application objectives for the Conveyor Supports**

**6.9 Design and application objectives for the requirement for interface to other material handling systems**

## 7.0 CUSTOMER PREFERENCES OF USE AND GENERAL REQUIREMENTS OF SORTING SYSTEMS -

The Sorting System is another key element to the success of a system. The correct type of sorter and capacity is critical to the design of the system for the end user. This can be critical when planning for long term growth. Each sorter has its own application capacity and layout requirements.

**7.1 Function and Constraints of Use of Pushers**

**7.2 Function and Constraints of Use of Pop-up - Wheel or Roller**

**7.3 Function and Constraints of Use of Sliding Shoe**

**7.4 Function and Constraints of Use of Tilt Tray**

**7.5 Function and Constraints of Use of Cross Belt**

**7.6 Function and Constraints of Special Application/Design Sortation**

**7.7 Function and Constraints of Accumulation zones and their interfaces**

**8.0 MAINTENANCE ACCESS REQUIREMENTS -**

This section should cover all aspects of maintenance, from hardware to software. There are currently several software packages available to aid maintenance personnel in the proper time intervals for ordering spare parts, ordering procedures, tool requirements, and access guidelines.

8.1 Maintenance Platforms and walkways

8.2 Lifting Support Equipment

8.3 System access requirements - start/stop, panel accessories, etc.

**9.0 BUILDING REQUIREMENTS (IF INCLUDED) -**

This section should be identified in every RFQ, if possible. Many times critical load/location mistakes are made without this information.

9.1 Owners Esthetics Requirements

9.2 Bidders Provided Information Relative to Building Floors, Siding, etc.

9.3 Load Requirements (Roof Load/Power Conception/AMPS Draw

9.4 Code Requirements and/or Variances (Local, state)

9.5 Industry Standards

**10.0 CUSTOMER SPECIFIED COMPONENT SUPPLIERS -**

This section should be very clear, as many conveyor vendors also have their own standard components. It must be understood that it may cost the end user additional dollars to change the suppliers components to the users component standards..

#### 10.1 Components -

Component listings are very helpful during bid evaluations. They can be used as a comparison of various suppliers product offerings.

- 10.1.1 Reducers
- 10.1.2 Belting
- 10.1.3 Rollers
- 10.1.4 Bearings
- 10.1.5 Etc.

#### 10.2 Treatments -

Specific customers will only accept a certain type of metal treatments (i.e. Food Industry) Where this is required, it must be clearly stated. Cost implications can be significant. Therefore, the need for strict compliance must be identified.

- 10.2.1 Paint
- 10.2.2 International (specifications)
- 10.2.3 Etc.

### 11.0 GENERAL CUSTOMER CONTROLS REQUIREMENTS -

This section should be general because each conveyor vendor may have their own special control designs and philosophy.

#### 11.1 Class of Controls and System Architecture -

Specify the type of control architecture to be used. This may be a general requirement at the system level or may vary at the component and functionality level. It be significant when interface requirements are specified. It also may be a company standard that has been established when multiple sites are involved.

- 11.1.1 Relationship of Conveyor Controls to the Shop Floor, Warehouse and Enterprise Level Systems
- 11.1.2 Class of Controls Equipment to be Provided; PCs, PLCs
- 11.1.3 Desired Instrumentation Interconnect Structure

#### 11.2 Customer Specified Suppliers of Components for Standardization -

Items specified by the customer are typically designed into the product because of the customer's experience and purchasing power. Deviations may create cost and performance variances..

- 11.2.1 Motors
- 11.2.2 PLCs
- 11.2.3 PCs
- 11.2.4 Barcode Scanners
- 11.2.5 Starters
- 11.2.6 Weighing Scales
- 11.2.7 Volume Measuring

### 11.2.8 Other Items i.e. Photos, Limit Switches etc.

### 11.3 Controls Logic Considerations -

This area is very sensitive to some customers, due to existing systems or the familiarity of their maintenance staff with certain types of control logic. Ramifications of change should be clearly understood when considering modifications to control logic design.

#### 11.3.1 Device Location Recognition

#### 11.3.2 Load Location Recognition

#### 11.3.3 Tracking Parameters

### 11.4 Minimizing Field Wiring Methods -

This area affects the overall cost of the project due to power drops and number of electrical devices. System design must be evaluated to minimize field wiring installation costs.

## 12.0 INSTALLATION CONDITIONS AND REQUIREMENTS -

This section should be described in detail due to the building design and condition and type of labor to be used.

### 12.1 Installation Conditions -

Installation Conditions play a key role in the implementation of the conveyor system, new building or existing. On site surveys should be planned for existing structures. New buildings designs must state the plans because of the potential cost impact when unknown.

#### 12.1.1 Security

#### 12.1.2 Access, Staging, Storage

#### 12.1.3 Electric Power (Refer to Section 19.0)

##### 12.1.3.1 Power Required for System

##### 12.1.3.2 Distribution Panel Layout

##### 12.1.3.3 Isolation for Control System

##### 12.1.3.4 Electrical Power to be supplied for installation.

### 12.2 Site Conditions -

Play a very important factor. (e.g. - lights in a new construction/no lights). The conveyor vendor has to determine pricing based on the site conditions. Site surveys for existing buildings must be made by potential vendors.

#### 12.2.1 Existing or New Building

#### 12.2.2 Seismic

#### 12.2.3 Wind

#### 12.2.4 Local Codes

### 12.3 Installation Labor -

There can be a large difference between the types of labor used, and the actual labor pool available. Location plays an important part in pricing.

#### 12.3.1 Union / Non Union / No Requirement

12.3.2 State Status - Right-To-Work

12.3.4 1st, 2nd, or 3rd shift.

12.4 Project Management -

Project Management is one of the single most important elements of a successful project. He/she is the single point of contact. Project management methodology should clearly be stated.

12.4.1 Owner/consultant/vendor

12.4.2 Type of schedule to be used

12.5 Construction Interface -

This area is critical for communication prior to and during the conveyor system implementation. Clear and accurate description of these interface needs will minimize or eliminate schedule delays and cost overruns.

12.5.1 New Construction

12.5.2 Interface with Existing

13.0 GENERAL CONDITIONS -

This area should be described in detail. Some bids could be received without some of the items below and could result in back charges.

13.1 System Warranty -

A detailed written warranty is a requirement.. The end user will require this information for post implementation follow-up.

13.1.1 Provisions

13.1.2 Duration

13.2 Quotation Duration -

A defined quotation duration should be included because of potential price increases/escalations.

13.3 Proposal Quantity and Format -

This section should specify the number of copies of proposals required and specific price page formats for ease of comparison.

13.3.1 Formality of Bid Document

13.3.2 Acceptance or Not of Facsimile Changes

13.3.3 Degree of Documentation Required

13.4 Contract Terms and Conditions (If Not Separate Document) -

Each vendor should supply their Terms & Conditions. The customer may have specific requests that each vendor should review. Changes to supplier standard Terms and Conditions may have cost impact.

13.5 Service Requirements -

A brief description of service contracts and locations of field offices should be included.

### 13.6 After Sales Support Requirements -

This section should detail who to contact, where and how long it will take to get support.

### 13.7 Spare Provisions -

A complete mechanical/electrical spare parts listing should be given to the customer after mechanical/electrical engineering is complete. Parts should be onsite prior to start-up.

### 13.8 As Build Drawings -

As Built Drawings should be provided in manual; form due no later than 30 days after acceptance.

13.9 Status of Equipment Rentals - This is the contractors responsibility.

## 14.0 FUNCTIONAL AND OPERATIONAL TESTS

Tests must be defined to measure success or failure of system performance. The tests can also be used to define system acceptance for ownership transfer to the buyer.

### 14.1 Functional Demonstration-

System functionality must be demonstrated to insure all defined functions of operation perform to the design standards.

#### 14.1.1 To - From Flow

#### 14.1.2 Induct and Delivery of Handled Materials

#### 14.1.3 Unit Functional Performance

### 14.2 System Throughput Demonstration.

The material flow expectations of the customer must be demonstrated by operating the system at the levels of performance and throughput defined in the specification.

#### 14.2.1 Nominal Throughput

#### 14.2.2 Maximum Capacity Under Full Load

### 14.3 Acceptance/Performance Test Plan and Documentation

To protect the buyer and seller, a well-defined Acceptance/Performance test plan must be developed and defined. Key elements are timing, number of tests, and management of the operations during testing. This must be performed prior to any attempt to move product through the system for customer deliveries.

#### 14.3.1 Detailed Test Plan Date Due

#### 14.3.2 Sample Loads Required for Testing

#### 14.3.3 Completeness of Test Plan

#### 14.3.4 Approval of Plan

#### 14.3.5 Recovery during Test

## 15.0 RELIABILITY AND AVAILABILITY REQUIREMENTS

Clearly defined reliability expectations and availability of the system will assist management in the understanding of overall performance. This is especially important when planning and scheduling normal operations.

15.1 Reliability Desired/Required

15.2 Reliability Measurement Method

15.3 Availability Level Objective/Required

15.4 Availability Measurement Method

## 16.0 SAFETY REQUIREMENTS

As is the case with all machinery, safety standards, established as industry standards and customer standards, must be identified and clearly documented. The documentation may be a reference for legal issues and must be clear and concise.

16.1 Meet or Exceed

16.1.1 Lockout & Tag-out Procedures

16.1.2 Space Constraints / Provisions (Access / Egress)

16.1.3 Safety Labeling

## 17.0 TRAINING / DOCUMENTATION & CERTIFICATION

Training and documentation will insure clear ownership transfer. When the customer participates in these activities and is provided proper documentation, performance can be optimized when proper staff participate in the programs.

17.1 Operations - Supervision Only or Including Operators

17.2 Maintenance - Supervision Only or Including Personnel

## 18.0 SYSTEM MAINTENANCE (OPTIONS AVAILABLE)

Occasionally the owner of the system may elect to subcontract maintenance responsibility. The clarity of the program will enhance third party maintenance success and provide increased potential for system uptime and performance.

18.1 Who to Perform

18.2 Include in Bid or Not

18.3 Work during Warrantee

18.2.1 Who is responsible for diagnosis

18.2.3 How are warrantee parts repaired

18.3.3 What spare parts are required on site

18.3.4 Duration of warrantee period

## 19.0 OWNER PROVIDED ITEMS AND SERVICES

The definition of services and items to be provided by the owner during the contract period will provide a foundation of responsibility by both parties. Costs associated with the services and items will then be assigned to the proper parties.

### 19.1 Power Source and Location

To insure that the supplier provides the most accurate and cost affective installation and power systems, clear definition of the type and location of power must be identified.

#### 19.1.1 During Installation

#### 19.1.2 Permanent Power

### 19.2 Other Items

Various types of equipment and services may be provided by the owner because of availability or previous contracts. This may be in the form of equipment and resources that may aid installation and operation. Their availability may also provide a cost benefit to the supplier and owner.

## 20.0 SUPERVISORY COMPUTER SYSTEM

With an ever expanding need to provide real-time information on system activities, status and conditions, a clear definition of the types of computer systems, responsibilities, and interfaces must be documented. Communication with all parties that are supplying supervisory computer systems must be made by both the customer and suppliers.

### 20.1 MES (Manufacturing Execution System)

### 20.2 WMS (Warehouse Management System)

### 20.3 Suppliers Provided Facility Director Computer System

### 20.4 Information Management and Communication System

#### 20.4.1 Existing Hardware

#### 20.4.2 Existing Systems

#### 20.4.3 Interface Requirements

### 20.5 System Support Requirements

## 21.0 APPENDICES

Appendix 1 is a sample document that contains most of the elements described in the material above. It is not to be considered as complete or a restriction to providing additional relevant information about the project



## **Appendix 1**

### **Sample Format**

#### **1.0 INTRODUCTION**

##### **1.1 Purpose of This Specification**

In this section the writer describes why the specification was written and what is expected of those who read it and respond. The writer should also briefly state the events taking place within his/her company, plant, or facility, its location, and relate the specification to those events. For example, is the system to be a retrofit, an expansion or a "green field installation?" In general this section is intended to be a quick orientation to the circumstances leading up to the writing of the specification and what the outcome is expected to be.

##### **1.2 System Scope**

In this section the writer will define the total project in terms of what is to be supplied by the successful bidder, including all subsystems, controls and auxiliary equipment; where the system is to be installed (city, state and other defining characteristics); and the type of contract being sought (for example "firm fixed price," or "design and build.")

##### **1.3 Contact by Function**

###### 1.3.1 Administrative Questions

Administrative questions relative to specification, dates, terms and conditions should be referred to:

*Mr./Mrs./Ms. (Name)*  
*Purchasing Department*  
*Mailing Address*  
*Phone and Fax Numbers*

###### 1.3.2 Technical Questions

Technical questions relative to specification and system requirements should be referred to:

*Mr./Mrs./Ms. (Name)*  
*Department Name*  
*Mailing Address*  
*Phone and Fax Numbers*

###### 1.3.3 Confirmation of Conversations

Following all phone conversations the supplier is obligated in a timely manner to document a summary of the conversation to the Owner's person contacted with a copy to the Project Manager.

*Mr./Mrs./Ms. (Name)*  
*Department Name*  
*Mailing Address*  
*Phone and Fax Numbers*

## Project Data Form

### 1. Customer Information

Prepared By: Company:	Project Number: Date:
-----------------------------	-----------------------------

### 2. Proposal and Project Milestones

Bid Due Date:	Project Start Date:
Site Visit Date:	Begin Acceptance
Estimated Award Date:	Beneficial Use Date:

### 3. Facility Information

Site:	<input type="checkbox"/> New	<input type="checkbox"/> Existing
Building:	<input type="checkbox"/> New	<input type="checkbox"/> Existing
Equipment:	<input type="checkbox"/> New	<input type="checkbox"/> Retrofit
Customer Drawings:	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Customer Specifications:	<input type="checkbox"/> Yes	<input type="checkbox"/> No

### 4. Seismic Considerations

Seismic Requirement:	<input type="checkbox"/> No	<input type="checkbox"/> Yes	Zone
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### 5. Electrical Requirements

Power Supply:	Volts	Phase	Hertz
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### 6. Description of Items to be Conveyed

Load Characteristics:	<input type="checkbox"/> Smooth/firm conveyable surface	<input type="checkbox"/> Non-flat surface	<input type="checkbox"/> Mix	<input type="checkbox"/> Other
Type of Product:	<input type="checkbox"/> Letter <input type="checkbox"/> Pallet	<input type="checkbox"/> Small/Flats <input type="checkbox"/> Other	<input type="checkbox"/> Parcel	<input type="checkbox"/> Case

### 7. System Capacity Requirements

Hours of Operation (hrs)	Average Rate (items/hr)
Duration of Peak (hrs.)	Peak Rate (items/hr)

**8. Size of Items to be Conveyed**

	Length (inches)	Width (inches)	Height (inches)	Weight (lbs.)
Minimum				
Maximum				
Average				

**9. General Conveyor Description**

Conveying Technology:	<input type="checkbox"/> Gravity Roller	<input type="checkbox"/> Skate Wheel	<input type="checkbox"/> Belt Driven Live Roller	<input type="checkbox"/> Chain Driven Live Roller
	<input type="checkbox"/> Ball Table	<input type="checkbox"/> Belt on Roller	<input type="checkbox"/> Belt on Slider Bed	<input type="checkbox"/> Lineshaft
	<input type="checkbox"/> Chain Driven Conveyor	<input type="checkbox"/> Other		

**10. General Sorting System Description**

Sorting Technology:	<input type="checkbox"/> Not Applicable	<input type="checkbox"/> Cross Belt	<input type="checkbox"/> Sliding Shoe	<input type="checkbox"/> Other
Mechanization:	<input type="checkbox"/> Tilt Tray <input type="checkbox"/> Automatic	<input type="checkbox"/> Pop-up <input type="checkbox"/> Manual	<input type="checkbox"/> Flat Belt <input type="checkbox"/> Semi-Auto	<input type="checkbox"/> Flat Belt

**11. Proposal Needs**

<input type="checkbox"/> Letter Proposal <b>OR</b>			
<input type="checkbox"/> Complete Formal Proposal			
with ...	<input type="checkbox"/> Flow Chart/Diagram	<input type="checkbox"/> Layout Drawing	<input type="checkbox"/> Specifications
<input type="checkbox"/> Price is...	<input type="checkbox"/> Budget	<input type="checkbox"/> Cost Plus Fee	<input type="checkbox"/> Firm Fixed Price

**12. Component Specifications**

Item	Supplier Choice	Customer Specified
Motors	<input type="checkbox"/>	
Reducers	<input type="checkbox"/>	
Belting	<input type="checkbox"/>	
Paint	<input type="checkbox"/>	
PLC	<input type="checkbox"/>	
Barcode Scanners	<input type="checkbox"/>	
Starters	<input type="checkbox"/>	
Weighing Scales	<input type="checkbox"/>	

**13. Description of Customer's Conveying/Sorting System Process**

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**14. Field Conditions**

<input type="checkbox"/> No Requirements	<input type="checkbox"/> Right-To-Work State
<input type="checkbox"/> Non-Union	<input type="checkbox"/> Walsh Healy Act
<input type="checkbox"/> Union	<input type="checkbox"/> Davis Bacon Act
<input type="checkbox"/> WBE Goal =	<input type="checkbox"/> MBE Goal =

**15. Contract Conditions**

Bid Bond	<input type="checkbox"/> No	<input type="checkbox"/> Yes	Amount
Performance Bond	<input type="checkbox"/> No	<input type="checkbox"/> Yes	Amount
Liquidated Damages	<input type="checkbox"/> No	<input type="checkbox"/> Yes	Amount
Taxes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	Tax Number

**16. Warranty**

Months	
Parts	<input type="checkbox"/> Yes <input type="checkbox"/> No
Labor	<input type="checkbox"/> Yes <input type="checkbox"/> No

**17. Project Financial Information**

Approx. Project Value	\$
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**18. Other Considerations**

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