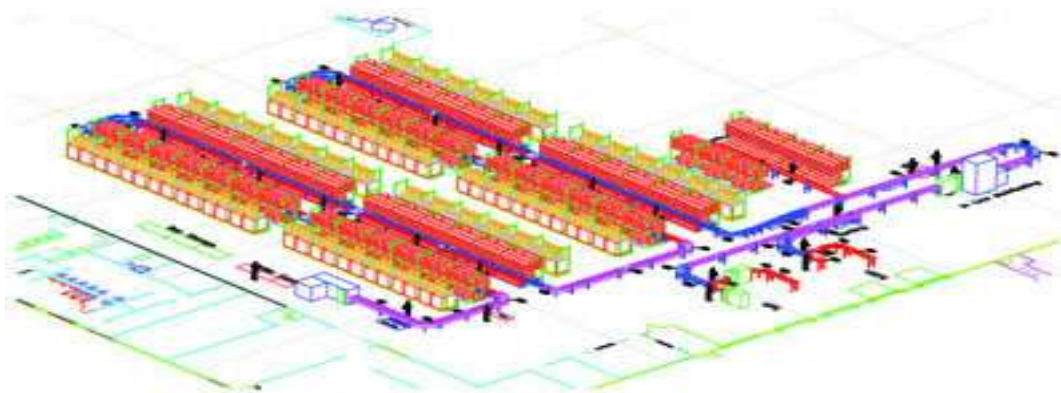


**JD GRAY ASSOCIATES  
CONTRACT INDUSTRIAL ENGINEERS**

**WAREHOUSE AUDIT**

**OF**

**MATERIALS HANDLING EQUIPMENT**



**AND**

**DIRECT LABOR CONTROLS  
OF  
STANDARDS, S-I-S, LABOR REPORTING, PICK/PACK, PACING & INCENTIVES  
FOR  
RECEIVING/PALLET REPAIR/PALLET WRAP/PICK FOR SHIPPING, ASSEMBLY  
and/or REPACK**

**-PROPOSAL-**

**JD GRAY ASSOCIATES**  
**CONTRACT INDUSTRIAL ENGINEERS**  
**WAREHOUSE AUDIT**

**PROPOSAL**

I. Purpose

The purpose of this proposal is to present to your management comprehensive assistance in the evaluation of your company's current status regarding materials handling equipment and direct labor controls for the profitable storage, retrieval and dissemination of your company products of the highest degree of reliability, with optimum lead times and unit cost, within the space confines the current facility for the volume levels and efficiency of operations projected.

II. Scope

A. Survey

1. General

- a) Review and understand company objectives and short and long-term goals, as they relate to program areas defined
- b) Review and understand company product line and sales forecast

2. Specific

- a) Existing warehouse facility building plan auto cad drawings including building walls, square footage, column location, utilities locations (will need local power and air pressure requirements) for the listed departments:
  - 1) Receiving
  - 2) Assembly and/or Repack
  - 3) Warehouse
  - 4) Shipping
- b) Analyze, review and evaluate, by application of sound engineering/management techniques, the warehouse requirements at various anticipated production levels for space, manpower, shift and machine utilization. Operational assessment including materials handling alternatives and productivity areas of direct labor control systems will be closely scrutinized within receiving, order picking, stock replenishment, pallet wrap, pallet repair, shipping and miscellaneous operations such as assembly or repack.
  - 1) Receiving, Warehouse and Shipping

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- (a) Handling, dispatch and stocking components in the most cost effective manner.



- (b) Live Storage and Retrieval Systems

- (1) Horizontal, Revolving Parts Carousel



- (2) Horizontal, Revolving Pallet Carousel



- (3) Vertical Revolving Parts Carousel

- (4) Order Picking Vehicle servicing stationary shelving



- (c) Electrical and/or Mechanical Aisle Savers

- (d) Live and Conventional Pallet Rack Application

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- (e) Component part picking methodology
- (f) Shelving and Flow Rack Application
- (g) Use of cubic capacity and space optimization
- (h) Programmed and computer controlled robot picking and replenishment of tote trays and pallets



- (i) Sortbars and Lighttrees



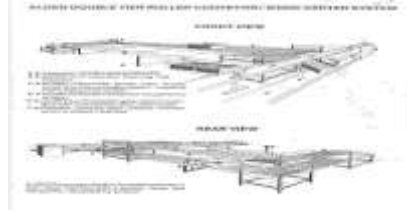
- (j) Automated (Pallet) Retrieval System



## 2) Assembly and/or Repack

- (a) Work Center

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(b) Rotary with or w/o pick & place robot



(c) Straight Line with or w/o pick & place robot



(d) Bench-Progressive Line Applications

(e) Supply, Storage and Interface with prior and subsequent Operations

(f) Transporter Conveyor System Applications



(g) Progressive Assembly Carousel Applications



## B. Report and Recommendations

1. From the accumulation and analysis of data obtained from the survey, a comprehensive report will be submitted and reviewed

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with the your management. It will contain:

- a) Productivity ROI's and Recommendations for receiving, order picking, stock replenishment, pallet wrap, pallet repair, shipping and miscellaneous operations such as assembly or repack
  - (1) Work Station
  - (2) Industrial Engineered Standards



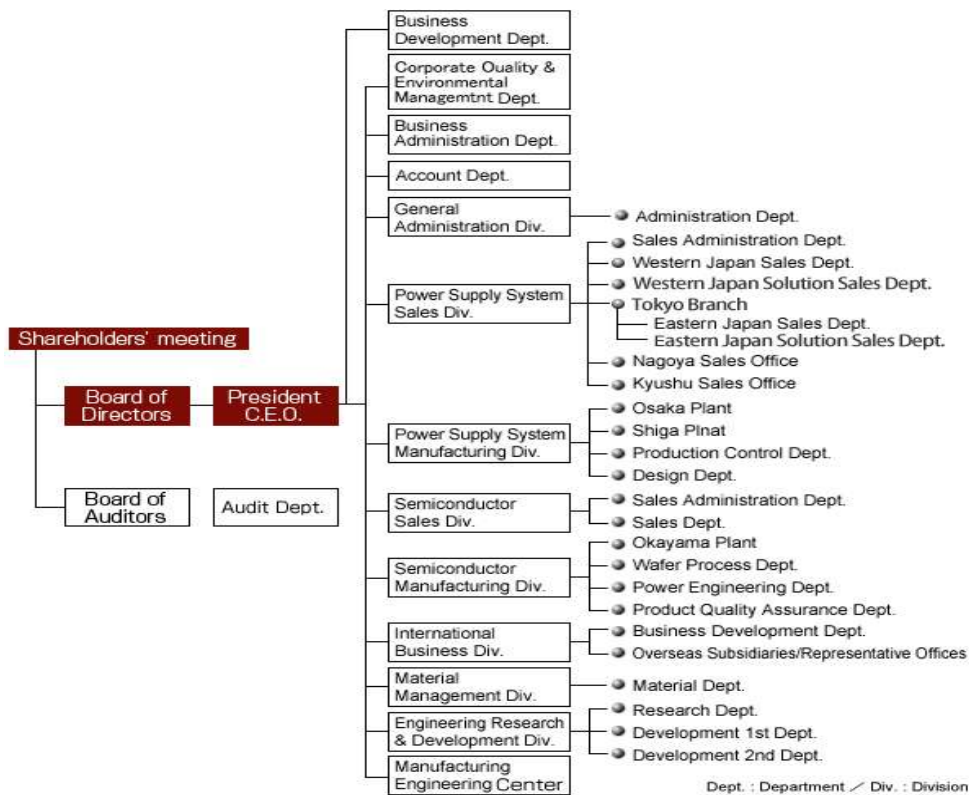
- (3) Short-Interval-Scheduling
  - (4) Labor Reporting
  - (5) Work Flow
  - (6) Industrial Incentives
  - (7) Pick and Pack Systems
- b) Materials Handling ROI's and Recommendations for receiving, order picking, stock replenishment, pallet wrap, pallet repair, shipping and miscellaneous operations such as assembly or repack.
- c) Order Management Recommendations for Material/Product Tracking, Planning and Scheduling.



- d) Inventory and WIP storage requirements.
- e) Modular Program Phases within selected alternative.

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- f) Implementation actions required with suggested personnel and responsibilities.
- g) Customized Layout of recommended alternative.
- h) Installation Pert Chart.
- i) Storage Rack and/or Conveyor System and Miscellaneous specifications and Quotations.
- j) Projected Staffing and Organization Chart Recommendations.



### III. Survey and Report

#### A. Consulting Activity, Fees and Expenses

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	<u>ASSEMBLY and/or REPACK</u>	<u>RECEIVING WHSE &amp; SHIP</u>	<u>TOTAL</u>
1. On-site Data Collection - Days	2	8	10
2. Direct Labor Controls and Departmental Sizing based On five year sales forecast – Days	2	13	15
3. Materials Handling Equipment Specifications/Quotations - Days	2	18	20
4. Building Plan Auto Cad Drawings – Days	1	9	10
5. Report Preparation, Alternative Development including Phased Implementation/Costing - Days	2	20	22
6. Report and Layout Presentation - Days	1	2	3
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Total Days	10	70	80
 <b>Consulting Fee</b>	 <b>\$10,000</b>	 <b>\$70,000</b>	 <b>\$80,000</b>

*(Actual On-Site Expenses to be billed separately)*

Quotation Number	Q1867	Q1868	Q1869
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**B. Payment Schedule**

1. 20% upon approval, Purchase Order And Irrevocable Letter of Credit	\$2,000	\$14,000	\$16,000
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**PO BOX 63 SUMMIT HILL, PENNSYLVANIA 18250**  
[jdgrayassociates@yahoo.com](mailto:jdgrayassociates@yahoo.com)      [www.jdgray-associates.com](http://www.jdgray-associates.com)

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2. 20% end of 1 <sup>st</sup> month	\$2,000	\$14,000	\$16,000
3. 20% end of 2 <sup>nd</sup> month	\$2,000	\$14,000	\$16,000
4. 20% end of 3 <sup>rd</sup> month	\$2,000	\$14,000	\$16,000
5. 20% upon report presentation	\$2,000	\$14,000	\$16,000

**IV. AGREEMENT:**

- A. JD Gray Associates shall submit detailed service fee invoices to company. Said invoices shall contain a detailed itemization of the date(s) on which services were provided and a description of tasks completed during the period with respect to which the invoice is submitted.
- B. Each compensation payment made by company to JD Gray Associates shall be within 10 days.
- C. Company Property – JD Gray Associates agrees that any confidential information furnished by company to JD Gray Associates or acquired by JD Gray Associates during the period in which JD Gray Associates is retained by company is and shall remain the sole and exclusive property of company and shall be placed in the hands of company by JD Gray Associates upon termination of this Agreement including any copies made thereof.
- D. Confidentiality – JD Gray Associates agrees that at no time, either during or after the period in which JD Gray Associates is retained by company shall JD Gray Associates utilize or disclose to any third party any of the confidential information of company.

Date: \_\_\_\_\_

Purchase Order Number: \_\_\_\_\_

**V. IMPLEMENTATION**

- A. Implementation is separate from the warehouse audit on a cost and activity basis.

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B. With company personnel, participate in planning, scheduling and method determination of approved alternative program.

C. Perform implementation elements as outlined and agreed upon in survey and report including: complete final equipment specifications, time study, work station balance, visual aids and task instructions, tote and shelf part patterns, routing sheets and picking lists, traffic and station leveling, training and installation to ensure attainment of maximum benefits and return-on-investment.

D. Perform follow-up

# JD GRAY ASSOCIATES CONTRACT INDUSTRIAL ENGINEERS

## THE SMART CHOICE IN AUTOMATED STORAGE

Buschman automatic storage and retrieval systems operate on a simple parts-to-person principle. They are built from standard component parts, including computer software that can be upgraded as your company grows and changes. That makes them economical, flexible and adaptable to many industries.

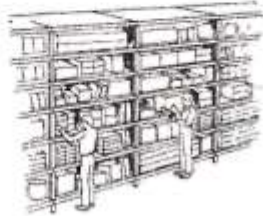
Buschman has designed and installed storage and retrieval systems for:

- Grocery, drugstore and chain retail distributors

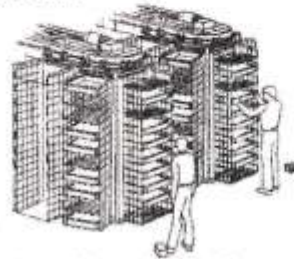
- Computer, shoe, video and stereo manufacturers
- Aerospace and electronics industries
- Defense contractors
- Banks, universities and hospitals
- Shipping and receiving operations
- Hardware and spare parts distribution

In fact, our systems are perfect for any operation that calls for a low-cube, high-activity inventory of products selected by pieces.

### GAIN 40 TO 60% IN STORAGE DENSITY

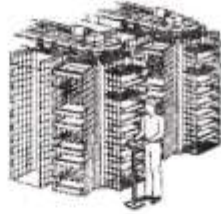


Conventional Storage Systems = 40 lines/hour

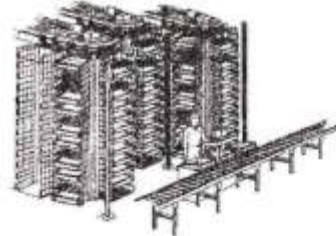


Manually-Operated Carousels = 120 lines/hour

### INCREASE EFFICIENCY UP TO 600%

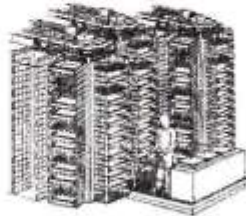


Controller-Operated Carousel = 180 lines/hour

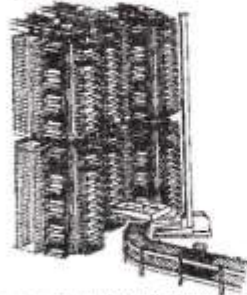


Computer-Operated Carousel with Light Trees and CLASS Software = 300 lines/hour\*

### INCREASE PRODUCTIVITY AND CUBE USE



Computer-Operated Carousel with Lift Platforms



Robotics Integrated with Multi-Carousel System

Whatever the storage and retrieval problem, Buschman has a solution with fast delivery and fast payback.

\*May increase or decrease, depending on operator activity.