

**JD GRAY ASSOCIATES
DISTRIBUTION CENTER PRODUCTIVITY CONSULTANTS**



DC WAREHOUSE PROPOSAL

**LABOR STANDARD DEVELOPMENT WITH
MATERIALS HANDLING**

**ALL WAREHOUSE PALLET RACK LOCATIONS
ALL INBOUND AND OUTBOUND OPERATIONS**

AND/OR

A NEW UNIQUE OPERATION

**JD GRAY ASSOCIATES
DISTRIBUTION CENTER PRODUCTIVITY CONSULTANTS**

**IE STANDARD DEVELOPMENT WITH MATERIALS
HANDLING**

A. SCOPE

There are two basic methods regarding industrial engineered labor standards within a DC warehouse materials handling environment.

The first method is an LMS or a Labor Management Software system. This involves an industrial engineered standard of the job code/operation as well as materials handling standard time development for an unloaded/loaded fork truck and hand truck & pallet rack locate time by slot height...this is what we call our *DC Labor Standards Kit*. Then an electronic excel warehouse map must be calculated and prepared. Finally a computer program must be developed that factors a materials handling minutes per foot standard by the actual distance traveled while calculating in the pallet rack height level and adding the job code industrial engineered standard. As a result of this methodology shift labor performance and utilization will be calculated automatically when your existing software program directs the fork truck driver to his/her next materials handling assignment.

A much less expensive second method likewise involves our *DC Labor Standards Kit* but instead of an electronic excel warehouse map and subsequent computer programming, distances are calculated manually...this is our proposal. A labor reporting form should then be designed and filled out by operating personnel. Client personnel would either calculate labor performance and utilization manually or modify an in-house program to perform.

In other words the second method can either stand on its own or be the prelude to an LMS system. Both systems require our *DC Labor Standards Kit*, which is a viable cost alternative to time-consuming work measurement studies.




JD GRAY ASSOCIATES DISTRIBUTION CENTER PRODUCTIVITY CONSULTANTS


B. INBOUND AND OUTBOUND OPERATIONS

SIX INBOUND JOB CODES OF TRUCK PALLET UNLOADING, PALLET PUT-A-WAY, CASE SKU BREAKDOWN, CASE PUT-A-WAY, REPLENISH CASE & REPLENISH PALLET. THREE OUTBOUND JOB CODES OF PICK CASE, PICK PALLET & TRUCK PALLET LOADING.

C. CONSULTING ACTIVITY

 **JD GRAY ASSOCIATES TO PERFORM VARIABLE TRAVEL FOOTAGE CALCULATION FROM A** CENTRALIZED STAGING LOCATION TO EACH OF THE DISTRIBUTION CENTER'S BULK & PALLET RACK LOCATIONS FOR EACH INBOUND AND OUTBOUND OPERATION - USING A *LOADED* FORK TRUCK (OR HAND TRUCK) CALCULATE THE TIME ALLOCATION FOR EACH FOOTAGE CALCULATION

+

 **JD GRAY ASSOCIATES TO PERFORM VARIABLE TRAVEL FOOTAGE CALCULATION TO A** CENTRALIZED STAGING LOCATION FROM EACH OF THE DISTRIBUTION CENTER'S BULK & PALLET RACK LOCATIONS FOR EACH INBOUND AND OUTBOUND OPERATION - USING AN *EMPTY* FORK TRUCK (OR HAND TRUCK) CALCULATE THE VARIABLE TRAVEL TIME ALLOCATION FOR EACH FOOTAGE CALCULATION


+

 **JD GRAY ASSOCIATES TO DEVELOP THE TIME VALUE OF EACH VARIABLE BULK & PALLET RACK SLOT LOCATION** FOR EACH INBOUND AND OUTBOUND OPERATION.


+

 **JD GRAY ASSOCIATES TO DEVELOP THE FIXED JOB CODE STANDARD TIME** WITHOUT VARIABLE TRAVEL AND SLOT LOCATION TIME.

=

 **JD GRAY ASSOCIATES TO DEVELOP THE VARIABLE AND FIXED TIME OF EACH** OF THE DISTRIBUTION CENTER'S BULK & PALLET RACK LOCATIONS FOR EACH INBOUND AND OUTBOUND OPERATION.

/

 **JD GRAY ASSOCIATES TO DIVIDE THE SUM INTO THE SHIFT NET MINUTES** TO DETERMINE THE **SHIFT OUTPUT OF EACH** OF THE DISTRIBUTION CENTER'S BULK & PALLET RACK LOCATIONS FOR EACH INBOUND AND OUTBOUND OPERATION.

JD GRAY ASSOCIATES
DISTRIBUTION CENTER PRODUCTIVITY CONSULTANTS
D. IE STANDARD FORMULA PER FOOTAGE PATH FOR (1) PALLET LOCATION –
PUTAWAY PALLET - EXAMPLE

FROM	ROOM	AI-SLE	RACK ID	TRAVEL DISTANCE IN FEET TO RACK AND RETURN (TO & FROM + RACK WIDTH = TOTAL DISTANCE)	TRAVEL TIME ADD-ON	LOCATE TIME FOR (1) PALLET TO RACK	SUB TOTAL TRAVEL AND LOCATE SUB TOTAL TIME	JOB CODE STD W/O TRAVEL AND LOCATE TIME	JOB CODE WITH TRAVEL AND LOCATE 8 HOUR SHIFT STD 450	
						+	=	+	=	=
STAGE LN	1	1	1	450 + 0 = 450	1.8000	.3830	2.1830	.5500	2.7330	165
			2	454 + 4 = 458	1.8320	.3830	2.2150	.5500	2.7650	163
			3 / 28	458 + 8 = 466	1.8640	.3830	2.2470	.5500	2.7970	161
			4 / 29	462 + 12 = 474	1.8960	.3830	2.2790	.5500	2.8290	162
			5 / 30	466 + 16 = 482	1.9280	.3830	2.3110	.5500	2.8610	157
			6 / 31	470 + 20 = 490	1.9600	.3830	2.2430	.5500	2.8930	156
			7 / 32	474 + 24 = 498	1.9920	.3830	2.3750	.5500	2.9250	154
			8 / 33	478 + 28 = 506	2.0240	.3830	2.4070	.5500	2.9570	152
			9 / 34	482 + 32 = 514	2.0560	.3830	2.4390	.5500	2.9890	151
			10 / 35	486 + 36 = 522	2.0880	.3830	2.4710	.5500	3.0210	149
			11 / 36	490 + 40 = 530	2.1200	.3830	2.5030	.5500	3.0530	147
			12 / 37	494 + 44 = 538	2.1520	.3830	2.5350	.5500	3.0850	146

IE STANDARD FORMULA PER FOOTAGE PATH FOR MULTIPLE PALLET LOCATION
PUTAWAY 3 PARTIAL PALLETS AFTER BRINGING ALL 3 INTO ROOM 1 AT ONCE – EXAMPLE

NUMBER PALLET RACK LOC (S) FROM ORDER	PALLET RACK LOC (room-aisle-pallet rack loc)	STD TRAVEL TIME	NET TRAVEL TIME (less initial standard travel time X 2 [for return to pickup point])	STD LOCATE TIME FOR (1) PALLET TO RACK	STACK(1)PALLET ONANOTHER STD (X 2 for unstacking in storage lane)	JOB CODE STD W/O TRAVEL AND LOCATE SUB TOTAL TIME	TOTAL TRAVEL AND PALLET LOCATE AND JOB CODE TIME	JOB CODE WITH TRAVEL AND LOCATE 8 HOUR SHIFT STD 450	
				+	+	+	=	=	=
1	1-1-29	1.8960	1.8960	.3830	.31850 X 2 or .6370	.5500	3.4660		
2	1-1-41	2.2800	2.2800	.3840	.31850 X 2 or .6370		1.4040		
3	1-2-10	2.9520	2.9520	.6720	.31850 X 2 or .6370		1.6920		
							6.5620 Total Min		
							2.1873 Ave / Pallet	2.1873	206

NOTE: FOR THE ABOVE MULTIPLE PALLET LOCATION EXAMPLES - IF PALLET RACK LOCATION IS DIFFERENT AISLE AND RACK NUMBERS RESET - CALCULATION SHOULD BE TO LAST RACK IN EXISTING AISLE THEN PLOT TIME OF 1ST PALLET RACK IN NEW AISLE TO DESTINATION RACK FOR ADDED CALCULATION TIME.

**JD GRAY ASSOCIATES
DISTRIBUTION CENTER PRODUCTIVITY CONSULTANTS**

E. CONSULTING FEE AND EXPENSES

IE STD DEVELOPMENT WITH MATERIALS HANDLING –
CONSULTING FEE SELECTION

<u>FACILITY SQUARE FOOTAGE</u>	<u>WEEKS</u>	<u>CONSULTING FEE</u>
<input type="checkbox"/> UNDER 50,000 SQ FT	2	\$8,000
<input type="checkbox"/> BETWEEN 50,000 TO 75,000	3	\$12,000
<input type="checkbox"/> BETWEEN 75,000 TO 100,000	4	\$16,000
<input type="checkbox"/> OTHER _____ (SPECIFY)		TO BE DETERMINED

1. \$ _____ SELECTED

+

2. THE WAREHOUSE LABOR STANDARD GUIDE IN ITS ENTIRETY AT A COST OF \$1050

+

3. SHOULD NO SCALED FLOOR PLAN EXIST, WE WILL PROVIDE SCALED SKETCH FOR ADDITIONAL \$2000

=

4 A. TOTAL COST WITH EXISTING SCALED FLOOR PLAN SUPPLIED BY CLIENT ...\$ _____

-or-

4 B. TOTAL COST WITHOUT EXISTING SCALED FLOOR PLAN SUPPLIED BY CLIENT ...\$ _____

EXPENSES:

CAR RENTAL, AIR FARE AND HOTEL TO BE PREPAID BY CLIENT. PER DIEM EXPENSES WITH RECEIPTS
TO BE SUBMITTED UPON CONCLUSION OF PROJECT FOR REIMBURSEMENT.

CONSULTING FEE TERMS:

50% UPON FRONT. 50% UPON CONCLUSION OF PROJECT. PAYABLE TO
JD GRAY ASSOCIATES AT PO BOX 63 SUMMIT HILL, PA 18250.

**JD GRAY ASSOCIATES
DISTRIBUTION CENTER PRODUCTIVITY CONSULTANTS**

2.0 A NEW UNIQUE OPERATION

A. ALL OFF-SITE INDUSTRIAL ENGINEERING SERVICES

[*Standard and Method* - Time study observations, elemental sequencing, workstation instructions, tool identification, workstation layout, workstation visual aids, workstation part listing and container, workstation fixtures, training manual]. Client to supply taped video of each existing operation or a skype live video using a webcam or an approved YouTube for each family for the purpose of offsite time study. \$1,800 per operation per family.

B. PARTIAL ON-SITE – USA

Off-site industrial engineering consulting services [*Method* - elemental sequencing, workstation instructions, tool identification, workstation layout, workstation visual aids, workstation part listing and container, work station fixtures, training manual]. *Standard* - Time study observation, training and follow-up assistance will be performed on-site. \$2,300 per operation per family. Client to prepay all on-site travel expenses.

**C. PARTIAL ON-SITE INDUSTRIAL ENGINEERING SERVICES
-OUTSIDE USA**

Off-site industrial engineering consulting services [*Method* - elemental sequencing, workstation instructions, tool identification, workstation layout, workstation visual aids, workstation part listing and container, work station fixtures, training manual]. *Standard* - Time study observation, training and follow-up assistance will be performed on-site. \$3,200 per operation per family. Client to prepay all on-site travel expenses.

CONSULTING FEE SELECTION

- ALL OFF-SITE INDUSTRIAL ENGINEERING SERVICES
- PARTIAL ON-SITE – USA
- PARTIAL ON-SITE INDUSTRIAL ENGINEERING SERVICES -OUTSIDE USA

SELECTED \$ _____ PER OPERATON PER FAMILY X
_____ NUMBER OF OPERATONS (LIST ON SEPARATE PAGE) X
NUMBER OF FAMILIES (LIST ON SEPARATE PAGE) =
_____ NEW UNIQUE OPERATION COST

EXPENSES:

CAR RENTAL, AIR FARE AND HOTEL TO BE PREPAID BY CLIENT. PER DIEM EXPENSES WITH RECEIPTS TO BE SUBMITTED UPON CONCLUSION OF PROJECT FOR REIMBURSEMENT.

CONSULTING FEE TERMS:

50% UPON FRONT. 50% UPON CONCLUSION OF PROJECT. PAYABLE TO
JD GRAY ASSOCIATES AT PO BOX 63 SUMMIT HILL, PA 18250.

**JD GRAY ASSOCIATES
DISTRIBUTION CENTER PRODUCTIVITY CONSULTANTS**

3.0 AGREEMENT

CLIENT TO PROVIDE SCALED FLOOR PLAN OF FACILITY DEPICTING PALLET RACKLOCATIONS. JD GRAY ASSOCIATES' IE LABOR STANDARDS AND ASSOCIATED FOOTAGE PATH CALCULATIONS ARE DEVELOPED MANUALLY AND CAN SUPPLEMENT IN-HOUSE OR FUTURE LMS SYSTEMS. SHOULD NO SCALED FLOOR PLAN EXIST, WE WILL PROVIDE SCALED SKETCH FOR ADDITIONAL \$2000. NOTE: THIS DOES NOT INCLUDE AN ELECTRONIC EXCEL WAREHOUSE MAP OR LMS PROGRAMMING.

CLIENT TO PURCHASE THE WAREHOUSE STANDARD GUIDE IN ITS ENTIRETY AT A COST OF \$1050.

CLIENT TO ACCEPT AND PURCHASE THIS PROPOSAL FOR JD GRAY ASSOCIATES TO PERFORM IE STANDARD DEVELOPMENT FOR ALL WAREHOUSE PALLET RACK LOCATIONS FOR ALL INBOUND AND OUTBOUND OPERATIONS AND/OR A NEW UNIQUE OPERATION.

FINAL COMPENSATION PAYMENT MADE BY CLIENT TO JD GRAY ASSOCIATES SHALL BE WITHIN 10 DAYS OF IE STANDARDS SUBMISSION FOR ALL WAREHOUSE PALLET RACK LOCATIONS FOR ALL INBOUND AND OUTBOUND OPERATIONS AND/OR A NEW UNIQUE OPERATION.

JD GRAY ASSOCIATES AGREES THAT ANY CONFIDENTIAL INFORMATION FURNISHED BY CLIENT TO JD GRAY ASSOCIATES OR ACQUIRED BY JD GRAY ASSOCIATES DURING THE PERIOD IN WHICH JD GRAY ASSOCIATES IS RETAINED SHALL REMAIN THE SOLE AND EXCLUSIVE PROPERTY OF CLIENT AND SHALL BE PLACED IN THE HANDS OF CLIENT BY JD GRAY ASSOCIATES UPON TERMINATION OF THIS AGREEMENT INCLUDING ANY COPIES MADE THEREOF.