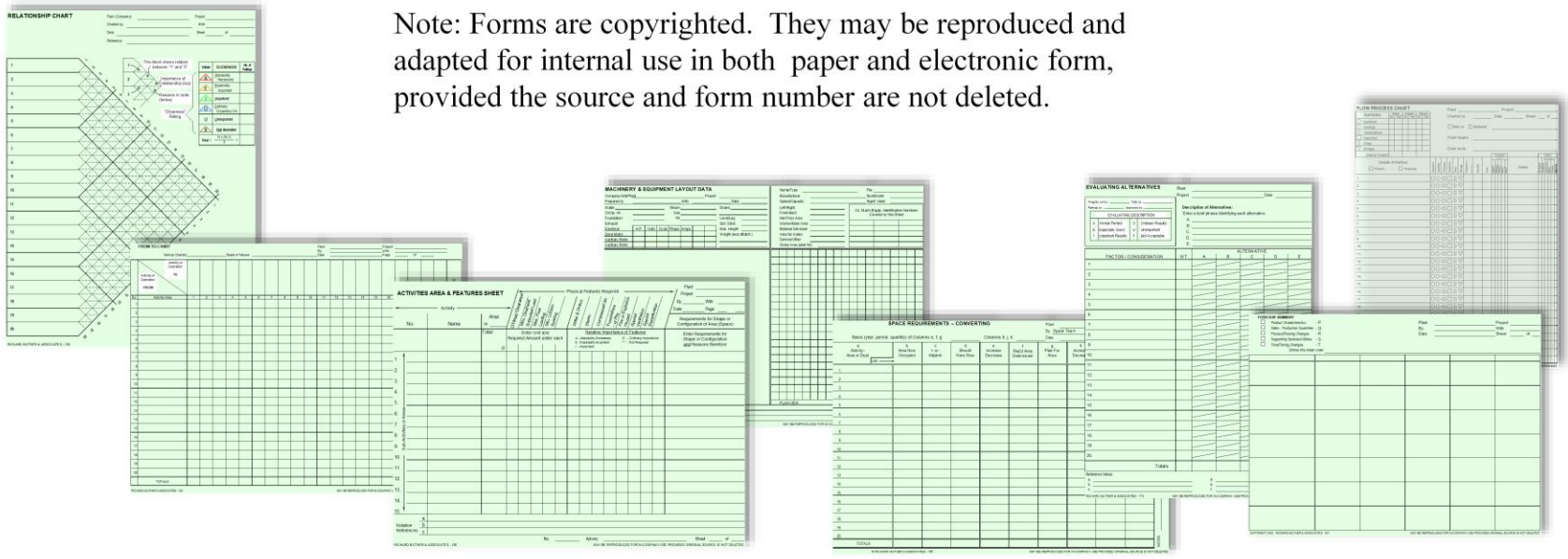
Systematic Layout Planning (SLP)

Working Forms

available in Excel from

www.RichardMuther.com



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PRODUCT-QUANTITY DATA SHEET

Plant _____ Project _____
Data gathered by _____ With _____
Date _____ Sheet _____ of _____

Fill-in as applicable **PRODUCT INFORMATION**
For ONE PRODUCT - Form and/or Treat only

Product Name & Description _____
Finished condition (fluid, delicate, hazardous, etc.) _____
Size-shape _____
Normal unit of measure _____ Weight/unit _____
Starting material condition _____
Size-shape _____ Weight/unit _____
Normal container: as received _____ as shipped: _____

For ONE PRODUCT - Assemble and/or Disassemble involved
Product Name & Description _____
Finished condition _____
Size-shape _____ Weight/unit _____

Major Components:	Material Condition	Size-shape	Weight/unit
a.			
b.			
c.			
d.			
e.			

☐ See Parts list(s) or Component Breakdown

PRODUCTION REQUIREMENTS

Quantity produced this year _____ Source _____
Quantity anticipated next year _____ Approved _____
Quantity anticipated in 5 yrs. _____ Est. by _____
Length of time present product or model will be produced _____
Seasonal variation _____
Expansion Plans _____

Trends in product:
Size _____ Diversification _____
Weight _____ Simplification _____
Materials _____
Rec'g. & Shipping amounts and frequencies _____
Refinements _____
Other _____

Operating hours _____ per shift _____ per day _____ per week

Plan Layout for (no. of units) _____ per hour, day, week

For SEVERAL PRODUCTS

Name of Product or Group	Condition	Size-shape	Weight/unit	Quantity: This Yr.	Last Yr.	Next Yr.	5 Yrs	Per Order or Lot	% of Production	Plan Layout for
A.										
B.										
C.										
D.										
E.										
F.										
G.										

Trends in Product: _____
Seasonal Variation _____
Expansion Plans _____
NOTES: _____

OFFICE SPACE RELATIONSHIP SURVEY Date: ____________ Period Covered ____________

Activity Area ____________ By: ____________ Location ____________

Sub-Area or Individual ____________ With: ____________ Space Assigned ____________ Sheet ______ of ______

Note the activity-area, sub-area or individual entered above. Use the vowel-letter ratings below to rate the degree of closeness desired between this activity-area and the others listed on the left below. Ratings should represent closeness desired in an ideal situation. For each rating other than "U" (Unimportant), give one or more reasons using the code numbers below on the right. If the proper reason is not already listed, please write it in next to your rating. Most ratings should be U's and O's. There should be very few E's and perhaps only one or even no A's. Make ratings for the planning period indicated above.

No.	**Activity Area**	Enter Vowel Code for Closeness Desired to: **(Letter)**	For each rating other than "U", please enter one or more Reason Code #s from the list, or write in. **(Number)**

Vowel Code Ratings	**Meaning**
A	Closeness Absolutely Necessary
E	Closeness Especially Important
I	Closeness Important
O	Ordinary Closeness OK
U	Closeness Unimportant
X	Closeness Not Desirable

Reason Code #	**Meaning**
1	
2	
3	
4	
5	
6	
7	
8	
Other	

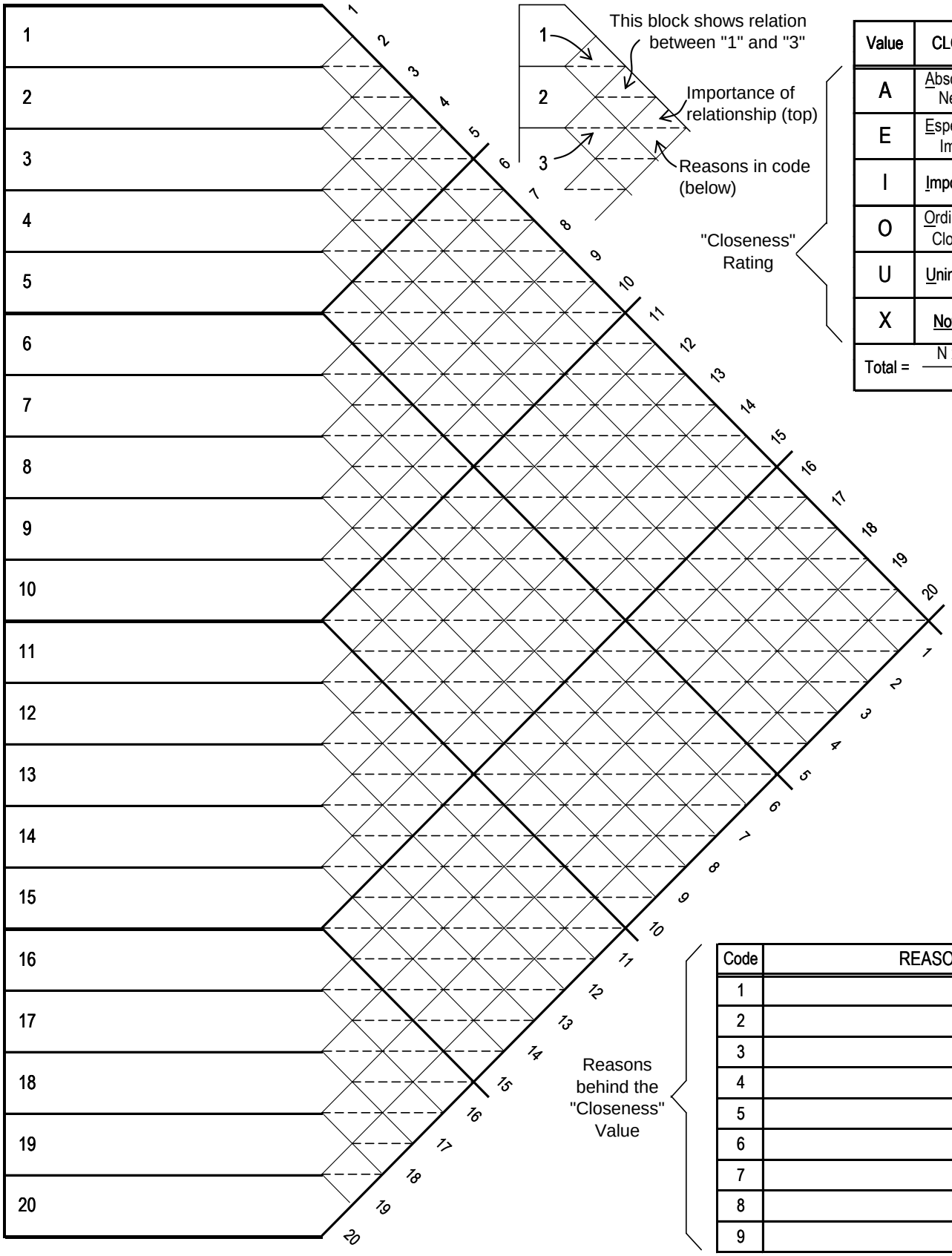
RELATIONSHIP CHART

Plant (Company) _____ Project _____

Charted by _____ With _____

Date _____ Sheet _____ of _____

Reference _____



Value	CLOSENESS	No. of Ratings
A	Absolutely Necessary	
E	Especially Important	
I	Important	
O	Ordinary Closeness OK	
U	Unimportant	
X	Not desirable	
Total = $\frac{N \times (N-1)}{2}$ =		

"Closeness" Rating

Reasons behind the "Closeness" Value

Code	REASON
1	
2	
3	
4	
5	
6	
7	
8	
9	

FROM-TO-CHART

Item(s) Charted: _____ Basis of Values: _____

Plant _____ Project _____
By _____ With _____
Date _____ Page _____ of _____

Activity or Operation **FROM** \ Activity or Operation **TO**	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	**TOTAL**
1																					
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					
TOTALS																					

NOTES:

FLOW-IN FLOW-OUT CHART

Plant _____ Project _____
By _____ With _____
Area: _____ Date _____ Sheet _____ of _____

FLOW IN →					OPERATION OR AREA	FLOW OUT →				
PRODUCT-MATERIAL DESCRIPTION (ITEM OR ITEM-GROUP)	*CLASS*	QUANTITY PER *day*			FROM		TO	QUANTITY PER *day*			*CLASS*	PRODUCT-MATERIAL DESCRIPTION (ITEM OR ITEM-GROUP)
		UNIT	AVG.	MAX.				UNIT	AVG.	MAX.		
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												

NOTES: _____

COMBINING FLOW & SERVICE RELATIONSHIPS

Plant (Company) _____ Project _____

Flow Source / Reference _____ Date _____

Other-Than-Flow Source _____ By _____

Sheet _____ of _____

Ratio of Flow to Other-Than-Flow:		
	to	

Line #	Activity-Pair		FLOW-OF-MATERIAL INTENSITY						OTHER-THAN-FLOW RELATIONSHIPS				RESULTANT COMBINED RELATIONSHIPS			Comments
			From-To	To-From	2-Way	Vowel Rating	Value	Wt.	Vowel Rating	Reasons	Value	Wt.	Combined Value	Combined Rating	Final Assigned Rating	

ACTIVITIES AREA & FEATURES SHEET

Plant _____
Project _____
By _____ With _____
Date _____ Page ____ of ____

Activity

Physical Features Required

No.	Name	Area in ____	O'Head Clearance	Max. Overhead Supported Load	Max. Floor Loading	Min. Column Spacing	Water & Drains	Steam	Compressed Air	Foundations - or Pits	Fire or Explosion Hazard	Special Ventilation	Special Electrification	Requirements for Shape or Configuration of Area (Space)
		Total:	Enter Unit and Required Amount under each				Relative Importance of Features A - Absolutely Necessary E - Especially Important I - Important O - Ordinary Importance — - Not Required							Enter Requirements for Shape or Configuration and Reasons therefore
1.														
2.														
3.														
4.														
5.														
6.														
7.														
8.														
9.														
10.														
11.														
12.														
13.														
14.														
15.														

Sub-Activities or Areas

Notation References
a
b
c

No. _____ Activity _____ Sheet ____ of ____

MACHINERY & EQUIPMENT AREA & FEATURES SHEET

Project ____________________

By ____________________ With ____________________

Company/Plant ____________________ Bldg/Dept/Area ____________________ Date ____________________ Sheet ________ of ________

Identification Data		Space									Physical Features Required															
Machine or Equipment Identification Number	Name and/or Description	Left -- Right *Inches*	Front -- Back *Inches*	Height *Inches*	Area for Machinery or Equip. in ____	Operator(s) Work & Maintenance Area	Material Set-down Area	Total Area each Machine or piece of Equip.	No. of Machines/Equip.	Total Net Area* (in ____)	110 - A.C.	120 - A.C.	Other Power	Ampere Rating		Water	Steam	Drains	Compressed Air	Other Piping *Gas*	Foundation/Pit	Exhaust/Hood	Dust Collector			Comments - - - - - Shape/Configuration Special Requirements

* Required space for main or delivery aisles and service areas not included.

Total Net Area Required* (in   )

Aisles ________

Services ________

Other ________

Total Area Req'd. ________

Reference Notes:

a. ____________________

b. ____________________

c. ____________________

d. ____________________

e. ____________________

MACHINERY & EQUIPMENT LAYOUT DATA

Company/Unit/Plant _____ Project _____

Prepared by _____ With _____ Date _____

Water _____ Steam _____ Drains _____

Comp. Air _____ Gas _____

Foundation _____ Pit _____ Level/Lag _____

Exhaust _____ Sp'l. Elect. _____

Electrical	H.P.	Volts	Cycle	Phase	Amps.		
Drive Motor							
Auxiliary Motor							
Auxiliary Motor							

Max. Height _____

Weight (less attatch.) _____

_____

Name/Type _____ File _____

Manufacturer _____ Size/Model _____

Speed/Capacity _____ Signif. Ident. _____

Left-Right _____

Front-Back _____

Net Floor Area _____

Worker/Main.Area _____

Material Set-down _____

Area for Aisles _____

Service/Other _____

Gross Area (plan for) _____

Co. Mach./Equip. Identification Numbers Covered by this Sheet		

ELEVATION SKETCH OR PHOTO SOURCE DATE

PLAN VIEW SCALE

Reference Notations/changes _____

SPACE REQUIREMENTS -- CONVERTING

Plant _____ Project _____

By _____ With _____

Basis (year, period, quantity) of Columns e, f, g _____ Columns h, j, k _____ Date _____ Sheet _____ of _____

a Activity-- Area or Dept. Unit →	b Area Now Occupied	c + or - Adjstmt.	d Should Have Now	e Increase Decrease	f Req'd Area Determined	g Plan-For Area	h Increase Decrease	j Req'd Area Determined	k Plan-For Area
1.									
2.									
3.									
4.									
5.									
6.									
7.									
8.									
9.									
10.									
11.									
12.									
13.									
14.									
15.									
16.									
17.									
18.									
19.									
20.									
TOTALS									

NOTES:

EVALUATING ALTERNATIVES

Plant _____

Project _____ Date _____

Weights set by _____ Tally by _____

Ratings by _____ Approved by _____

EVALUATING DESCRIPTION			
A	Almost Perfect	O	Ordinary Results
E	Especially Good	U	Unimportant
I	Important Results	X	Not Acceptable

Description of Alternatives:

Enter a brief phrase identifying each alternative.

A. _____

B. _____

C. _____

D. _____

E. _____

FACTOR / CONSIDERATION	WT.	RATINGS AND WEIGHTED RATINGS A	B	C	D	E
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
Totals						

Reference Notes:

a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

ROUTE CHART

From _____ To _____ Plant _____ Project _____

Distance _____ By _____ With _____

Date _____ Sheet _____ of _____

	PRODUCT-MATERIAL DESCRIPTION (ITEM OR ITEM-GROUP)	P-M CLASS	QUANTITY PER *week* UNIT	AVG.	MIN.	MAX.	NOTES
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

TOTAL MOVEMENT	PRODUCT-MATERIAL DESCRIPTION (ITEM OR ITEM-GROUP)	P-M CLASS	INTENSITY OF FLOW UNIT	AVG.	PLAN	INTENSITY X DISTANCE UNIT	AVG.	PLAN	COMMENTS OR SUGGESTIONS

INSTALLATION COST SUMMARY

Description _____

Plant _____ Project _____

Estimated by _____ With _____

Currency _____ Date _____ Sheet ____ of ____

	NATURE OF WORK	Estimated Material	Estimated Hours	Rate/ Hour	Labor Cost	Total Cost	Ouside Bid
1	Clear and prepare new area -- including marking aisles, columns, locations.						
2	Building repairs, alterations, or construction.						
3	Paint new areas, before and after move.						
4	Clean-up and repair machines and equipment now in storage.						
5							
6	Disconnect utilities -- electric, water, air, gas, etc.						
7	Disconnect auxiliaries -- vents, drains, ducts, conveyors, other handling equipment, etc.						
8	Move out operating machines and equipment.						
9	Move out all service and miscellaneous equipment.						
10	Move out materials, work-in-process, stores, tools, supplies.						
11	Remove operating machines and equipment not to be relocated.						
12	Remove service and miscellaneous equipment not to be relocated.						
13	Prepare non-movers for storage, sale, or other disposition.						
14	Fill-in pits, close holes, and clean-up old area.						
15							
16	Install pits, foundations, openings, special enclosures.						
17	Install conveyors, hoists, other handling equipment, racks, shelving, storage equipment.						
18	Install electric power equipment, leads, outlets, lighting fixtures, etc.						
19	Install utility lines and outlets -- water, air, gas -- drains and sewers,						
20	Install heating, ventilating, air conditioning, ducts, fans, filters, dust collectors, etc.						
21	Move operating machines -- spot, level, lag, mount						
22	Move in all service and miscellaneous equipment (not already installed).						
23	Move in all materials, work-in-process, stores, tools.						
24	Hook-up or connect, straighten-up, try out prior to operating.						
25							
	Total						

NOTES: _____

INSTALLATION COORDINATION WORKSHEET

Plant (Company) _____ Project _____
By _____ With _____
Date Originated _____ Sheet _____ of _____
Date of this review _____

		WHAT	WHO	WHEN	STATUS	As of (date)
MAKE READY	PLAN	1. Start planning the installation				
		2. Establish sequence and timing of moves				
		3. Inventory materials and equipment to move				
		4. Get disposition of non-moving material and equipment				
		5. Schedule moves in detail				
		6. Assign move numbers; check vs inventory & equipment (tag) number				
		7. Verify procedural changes and timing				
		8.				
	PROVIDE	1. Decide who will make moves				
		2. Secure bids as necessary				
		3. Determine and reserve moving equipment required				
		4. Set up communications for both ends of move				
		5. Appoint key person for each area				
		6. Get work order(s) for moves				
		7. Verify delivery for any new equipment				
		8.				
	PREPARE	1. Prepare new locations -- physical area, conditions, auxiliaries				
		2. Broadcast plans				
		3. Brief personnel specifically involved				
		4. Mark everything to move; identification, move no., destination				
		5. Disconnect or ready equipment				
		6. Check out equipment and release to movers				
		7. Complete required training				
		8.				
DO	INSTALL	1. Move equipment intact to reduce re-assembly time				
		2. Move close to spot to reduce line-up and hook-up time				
		3. Post move performance as accomplished				
		4. Keep moving crew informed, coordinated				
		5. Be on hand -- layout interpretation				
		6. Be on hand -- auxiliaries interpretation				
		7. Be on hand -- procedures interpretation				
		8				
PUT AWAY	HOOK-UP	1. Spot equipment; check location				
		2. Temporary hook-ups where needed				
		3. Check and release for permanent connections				
		4. Inspect the installation & release for tryout				
		5. Maintenance tryout				
		6. Release to operating group; secure acceptance				
		7.				
		8.				
	CLEAN-UP	1. Survey-inspect old and new areas				
		2. Schedule & assign clean-up -- old and new areas				
		3. Verify layout as installed				
		4. Verify auxiliary service as installed				
		5. Verify or adjust layout & service-specification records				
		6. Recap installation costs and performance				
		7. Final sign-off by operating group				
		8.				

Reference Notes:

a. _____ c _____
b. _____ d. _____

INSTALLATION INSTRUCTIONS SUMMARY

Description _____

Plant _____ Project _____

By _____ With _____

Date _____ Sheet _____ of _____

ITEM No.	DESCRIPTION / MACH./EQPT. No.	MOVE	UTILITIES						MILLWRIGHTS-MECHANICAL	ELECTRICAL						ELECTRICIANS	OTHER WORK -- (Code who and describe) C - Carpenters M - Methods S - Safety Engr. F - Fire Marshall P - Plant Engrg. * - Outside Contractor	
			Air	Water	Gas	Drain	Vent	*Steam*		Volts	Phase	KVA	Amps	H.P.			WHO	WHAT

To accompany Drwg. Nos. _____ Work Order _____

INSTALLATION RECORD

Plant _____ Project _____
Bldg. _____ Area _____ Dept. _____
Nearest Column Location _____
Sheet issued by* _____
Date issued _____ Date returned _____

Mach. or Eqpt. No. _____
Mach. /Eqpt. Type _____
Mfgr. _____
Size/Model _____
Signif. Identification _____

MECHANICAL, MAINTENANCE, MILLWRIGHTS

Level	Resp.		Due		Complete (sign)
Lag	Resp.		Due		Date
Mount	Resp.		Due		Comments
	Resp.		Due		

ELECTRICIANS

Power	Resp.		Due		Complete (sign)
Control	Resp.		Due		Date
Lights	Resp.		Due		Comments
	Resp.		Due		

PIPING & SHEET METAL

Water	Resp.		Due		Complete (sign)
Steam	Resp.		Due		Date
Drains	Resp.		Due		Comments
Comp. Air	Resp.		Due		
Gas	Resp.		Due		
Coolant, Lube	Resp.		Due		
Hoods, Ducts, Fans	Resp.		Due		
	Resp.		Due		

PAINT and CLEAN-UP

Paint	Resp.		Due		Complete (sign)
Clean-Up	Resp.		Due		Date
	Resp.		Due		Comments

SAFETY

Guards	Resp.		Due		Complete (sign)
Fire Regs.	Resp.		Due		Date
Fumes, Acids	Resp.		Due		Comments
	Resp.		Due		

OTHER INSTALLATION WORK SIGN-OFF

	Resp.		Due		Complete (sign)
	Resp.		Due		Date
	Resp.		Due		Comments
	Resp.		Due		

FINAL ACCEPTANCE (by installation coordinator or operating supervision)

Name _____ Title _____ Sign _____ Date _____
Comment _____
Name _____ Title _____ Sign _____ Date _____
Comment _____

(After final acceptance, return this sheet to person originally issuing it. See above.)

NOTES, Special Instructions, Reasons for Delay _____

* Return this sheet to person originally issuing it, after final acceptance

FLOW PROCESS CHART

Summary	Present No.	Present Time	Proposed No.	Proposed Time	Difference No.	Difference Time
○ Operations						
◇ Handlings						
⇨ Transportations						
□ Inspections						
D Delays						
▽ Storages						
Distance Traveled						

Plant _____ Project _____

Charted by _____ Date _____ Sheet ____ of ____

☐ Man or ☐ Material _____

Chart begins _____

Chart ends _____

Details of Method

☐ Present ☐ Proposed

	Operation	Handling	Transport	Inspection	Delay	Storage	Distance in ___	Quantity	Time	Analysis: What?	Analysis: Why? Where?	Analysis: Why? When?	Analysis: Why? Who?	Analysis: How?	Notes	Action: Eliminate	Action: Combine	Action: Change Sequence	Action: Change Place	Action: Change Person	Action: Improve
1.	○	◇	⇨	□	D	▽															
2.	○	◇	⇨	□	D	▽															
3.	○	◇	⇨	□	D	▽															
4.	○	◇	⇨	□	D	▽															
5.	○	◇	⇨	□	D	▽															
6.	○	◇	⇨	□	D	▽															
7.	○	◇	⇨	□	D	▽															
8.	○	◇	⇨	□	D	▽															
9.	○	◇	⇨	□	D	▽															
10.	○	◇	⇨	□	D	▽															
11.	○	◇	⇨	□	D	▽															
12.	○	◇	⇨	□	D	▽															
13.	○	◇	⇨	□	D	▽															
14.	○	◇	⇨	□	D	▽															
15.	○	◇	⇨	□	D	▽															
16.	○	◇	⇨	□	D	▽															
17.	○	◇	⇨	□	D	▽															
18.	○	◇	⇨	□	D	▽															
19.	○	◇	⇨	□	D	▽															
20.	○	◇	⇨	□	D	▽															
21.	○	◇	⇨	□	D	▽															
22.	○	◇	⇨	□	D	▽															
23.	○	◇	⇨	□	D	▽															
24.	○	◇	⇨	□	D	▽															
25.	○	◇	⇨	□	D	▽															

STANDARDIZED WORK

Manual Work ——————
Machine Time ·····
Walking /\/\/\/\/\/\/\/\

Company/Plant _____ Part/Product _____
Operation/Process _____ By _____ With _____ Issue Date _____
Production Rate _____ Takt Time _____ Sheet ___ of ___ Rev. Date _____

Ref. Symbol	Cyclical Work Element	Element Time (Sec.) Manual	Machine	Walking	5	10	15	20	25	30	35	40
	Sub-Total											
	Total Operator Cycle Time											

No.	Non-Cyclical Work Element	Time	Freq.	Total
	Total Operator Time			

LAYOUT SKETCH & WALK PATH

Notes

Notes _____

PROJECT SCHEDULE SHEET

Covering _____ Status as of _____ Originating Department _____

Distribution _____ Prepared by _____

Date _____ Sheet _____ of _____

Task/Proj. No. and/or Description / Work to do; Action to take	Resp. of																															Further Schedule
1																																
2																																
3																																
4																																
5																																
6																																
7																																
8																																
9																																
10																																
11																																
12																																
13																																
14																																
15																																
16																																
17																																
18																																

Gantt Chart Code: ⊏ Date work scheduled to start ⊐ Date work scheduled to finish ▭ Total time scheduled for work ▬ Amount of work done

(Each vertical period represents one unit of time. Use Gantt Chart Code or enter numbers and/or other indicators.)

COORDINATION AND PROGRESS SUMMARY

Covering _____ Status as of _____ Originating Department _____
Distribution _____ Reported by _____ Prepared by _____
Date _____ Sheet _____

Task/Project. No. and/or Description / Work to do; Action to be taken	Resp. Dept.	Status Code	Status & Remarks
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			

Status Code:

0, Not yet begun; 1, Preliminaries underway; 2, Prelim. Complete & work in process; 3, Well along; 4, Almost done; Compl., Complete

NOTES: _____