CASE STUDY: HIGH-RISE BUILDING

The planned construction project is the "Okayama Tower", a 50-story skyscraper in the heart of Tokyo, Japan with an estimated cost of 200,000,000 USD, estimated direct field construction labor of 1,400,000 USGC manhours, and an estimated construction schedule of 210 weeks.

NB: The Case Study is representative of these types of projects and does not represent any actual planned or constructed facility.

For this case study we will assume that the planned construction project has the following additional characteristics:

- **The contractor has a current backlog of 4 months and has successfully completed several previous construction projects for the owner**
- **The building has 32 floors with identical floor plans. However it is estimated that only 20% of the workforce will be doing identical tasks on each floor. The effect of the learning curve Fcb is then 8.4 (42 x 0.2).**
- **The laydown area is adjacent to the construction area**
- **The current construction activity where the workforce will be recruited from is average for the area (moderate activity)**
- **It is estimated that the worker/supervisor ratio will be 8**
- **It is estimated that the average height above ground for the workforce will be 50 feet**
- **The area per worker is 300 square feet**
- **The workforce will be unionized, working a 5 day 8-hour day, and will be using public transportation to the construction site**

The Estimated Direct Construction Field Labor Productivity Form is shown on the following page.

Estimated Direct Construction Field Labor Productivity

Date: *Monday, 22 January 2018*

Project: ***Okayama Tower***

No.	Project Information				Page
1	Country of Construction		*Japan*		
2	Origin of Workforce		*Tokyo*		
3	Project Type		*High-Rise Building*		
4	Base Productivity (percent)			BP = 100.3	32
	Adjustment Factors				
5	Category	Item	Symbol	Value	F Value	
6	Project	Project Size	Fps	*1,400,000 USGC mh*	-15.1	43
7		Construction Schedule	Fsh	*210 weeks*	-2	44
8		Additional Safety Requirements	Fsr	*na*	0	45
9		Work in Operating Areas	Fop	*na*	0	46
10		Working Height	Fhe	*50 feet*	-6	47
11		Excessive Security	Fes	*na*	0	48
12	Construction Site	Climate - Temperature/Humidity	Fth	*na*	0	49
13		Climate - Precipitation	Fra	*na*	0	53
14		Climate - Wind Chill	Fwc	*na*	0	55
15		Climate - Wind	Fwn	*na*	0	56
16		Travel Time to Site	Ftv	*Public Transportation*	0	57
17		Level of Construction Activity	Fec	*Moderate*	-4	58
18	Contractor	Contractor Backlog	Fbk	*4 months*	0	59
19		Workforce Supervision	Fws	*8 Workers/Supervisor*	-2	60
20	Construction Management	Work Week	Fwk	*5 8-Hour days*	0	62
21		Shifts per Day	Fsd	*1*	0	63
22		Workforce Pay Basis	Fpb	*Hourly Rate*	0	64
23		Laydown Area Access	Far	*50 Feet*	0	65
24		Workforce Catering	Fca	*none*	0	66
25		Workforce Accommodation	Fac	*none*	0	67
26		Workforce Congestion	Faw	*300 sq ft/worker*	0	68
27		Crew Loading	Fcv	*100%*	0	69
28		Subcontract Labor	Fsu	*na*	0	70
29	Workforce	Workforce Organization	Fun	*Union*	-12	71
30		Workforce Experience	Fwx	*10 to 15 years*	-8	72
31		Learning Curve - Process Trains	Fcp	*na*	0	73
32		Learning Curve - Buildings/Units	Fcb	*32 Identical Floors*	8.4	74
33		Workforce Morale	Fwm	*na*	0	75
34		Workforce Turnover	Fwt	*na*	0	76
35	Other					
36						
37	Post Construction Start	Change Orders	Fsc			77
38		Stretched Schedule	Fss			78
39						
40	Sum of Adjustment Factors (SumFactors) - F Values No. 6 through 39 inclusive				-40.7	
41	Productivity = Estimated Direct Construction Field Labor Productivity (percent) Productivity = BP + (BP x SumFactors / 100) US Gulf Coast Productivity = 100%				59.5	

Figure 10 - Completed Productivity Form – Case Study: High-Rise Building