

I.T.U.
FACULTY OF ARCHITECTURE

**CONSTRUCTION MANAGEMENT &
ECONOMICS**

**COMPUTER-AIDED
PROJECT PLANNING & PROGRAMMING**

Practical Study

by
Assoc.Prof.Dr. **Alaattin KANOĞLU**
İ.T.Ü. Faculty of Architecture

2001-2002

SCENARIO

SUBJECT Planning and programming of construction process of basic structure of a project containing 20 workshops that belong to ABC Cooperative of Artisans.

DATA The cooperative that plans to provide 80 workshops for its members has the construction working drawings prepared and made the invitation for the tender of structural system for the first part of 20 units of the project.

The contractor firms are demanded to submit a work schedule and progress payment plan for the construction of 20 workshops. Please find the required information related to the project in pages 2-6.

OUTPUT Assuming that your company has an invitation to the tender and as the responsible person of planning department you are supposed to prepare the required reports.

The reports needed for the submission of bid are:

- Bar chart that show the activities and relationships among them.
- Progress payment graph (histogram and S curve)

I.T.U. FACULTY OF ARCHITECTURE
CONSTRUCTION MANAGEMENT & ECONOMICS
PROJECT PLANNING & PROGRAMMING
PRACTICAL STUDY

QUANTITY TAKEOFF

Group	Code	Work Item	Un. Ms.	Amount	Unit Price (TL)
SUB	14.018	Soil Backfilling	m3	248.00	320.000
STRUC	15.0012	Excavation by machine	m3	730.00	228.000
TURE	15.1402	Sand-Aggregate filling (Slab)	m3	62.00	1.130.000
	15.1402	Sand-Aggregate filling (Sewer)	m3	120.00	1.130.000
	16.0441	B225 Class Reinf.Concrete (Foundat)	m3	200.00	9.600.000
	16.0441	B225 Class Reinf.Concrete (Slab)	m3	71.00	9.600.000
	18.409	ø 20 Sewerage	mt	74.00	1.000.000
	30.200	60x60 Precast manhole	ad	5	50.000.000
	21.011	Wooden formwork (Foundation)	m2	388.00	1.600.000
	23.0011	(ø 08-12) Reinforcement (Foundation)	ton	0.12	108.000.000
	23.0011	(ø 08-12) Reinforcement (Slab)	ton	3.20	108.000.000
	23.002	(ø 14-50) Reinforcement (Slab)	ton	16.74	97.000.000
	23.010	Meshreinforcement (Slab)	ton	3.20	135.000.000
INFRA	16.0441	B225 Reinforced Concrete (Wall)	m3	87.00	9.600.000
STRUC	16.0441	B225 Reinforced Concrete (Slab)	m3	71.00	9.600.000
TURE	21.0355	Assembly of Steel Formwork (Wall)	m2	870.00	2.000.000
	21.0355	Assembly of Steel Formwork (Slab)	m2	473.00	2.000.000
	23.010	Meshreinforcement (Wall)	ton	3.90	135.000.000
	23.010	Meshreinforcement (Slab)	ton	3.20	135.000.000
	23.0011	(ø 08-12) Reinforcement (Wall)	ton	3.90	108.000.000
	23.0011	(ø 08-12) Reinforcement (Slab)	ton	3.20	108.000.000
	30.110	Precast Wall Component	ad	20	120.000.000
	30.111	Precast Parapet Component	ad	18	20.000.000

I.T.U. FACULTY OF ARCHITECTURE
CONSTRUCTION MANAGEMENT & ECONOMICS
PROJECT PLANNING & PROGRAMMING
PRACTICAL STUDY

ANALYSIS OF PRODUCTION ITEMS

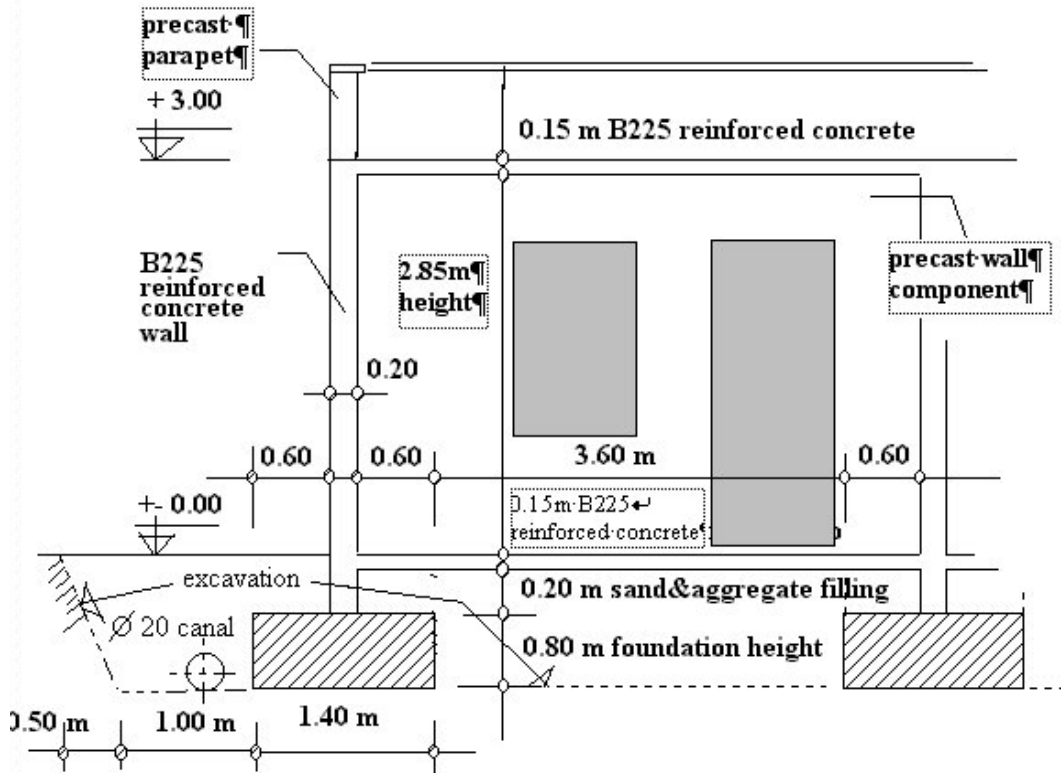
14.018	Soil Backfill		320.000 TL / m3
	MT-----	%0.00	----
	TM-Filling Works	%100.00	320.000 TL / m3
	EQ-----	%0.00	----
15.0012	Excavation by machine		228.000 TL / m3
	MT--Gas	%30.00	68.400 TL / m3
	TM-Excavation	%44.00	100.320 TL / m3
	EQ-Excavator	%26.00	59.280 TL / m3
15.1402	Sand & aggregate filling		1.130.000 TL / m3
	MT—Sand and Aggregate	%72.00	813.600 TL / m3
	TM-Filling Works	%28.00	316.400 TL / m3
	EQ-----	%0.00	----
16.0441	Reinforced B225 Class Concrete		9.600.000 TL / m3
	MT-B225 Class Concrete	%74.00	7.104.000 TL / m3
	TM-Concrete	%25.00	2.400.000 TL / m3
	EQ-Mixing plant	%1.00	96.000 TL / m3
18.409	ø 20 Concrete sewer canalet		1.000.000 TL / mt
	MT-ø 20 Concrete sewer	%24.00	240.000 TL / mt
	TM-Sewer	%76.00	760.000 TL / mt
	EQ-----	%0.00	-----
30.200	60x60 precast manhole		50.000.000 TL / ea
	MT-Precast Manhole	80.00	40.000.000 TL / ea
	TM-Sewer	20.00	10.000.000 TL / ea
	EQ-----	%0.00	----

I.T.U. FACULTY OF ARCHITECTURE
CONSTRUCTION MANAGEMENT & ECONOMICS
PROJECT PLANNING & PROGRAMMING
PRACTICAL STUDY

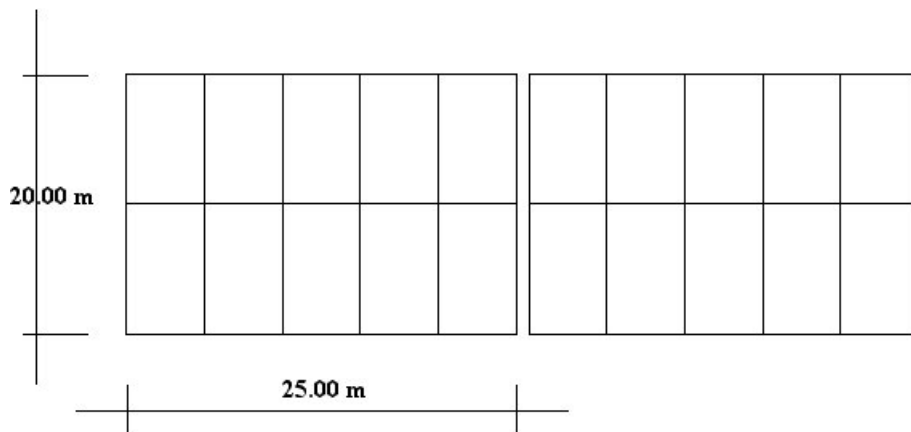
INPUT ITEMS & ASSOCIATED UNIT PRICES FOR THE PRODUCTION ITEMS

21.011	Wooden mould works		1.600.000 TL / m2
	MT-Wooden mould	%68.00	1.088.000 TL / m2
	TM-Wooden Mould	%32.00	512.000 TL / m2
	EQ-----	%0.00	----
23.0011	(ø 08-12) Reinforcement works		108.000.000 TL / ton
	MT- (ø 08-12) Reinforcement	%64.00	69.120.000 TL / ton
	TM-Reinforcement	%36.00	38.880.000 TL / ton
	EQ-----	%0.00	----
23.002	(ø 14-50) Reinforcement works		97.000.000 TL / ton
	MT-(ø 14-50) Reinforcement	%73.00	70.810.000 TL / ton
	TM-Reinforcement	%27.00	26.190.000 TL / ton
	EQ-----	%0.00	----
23.010	Meshreinforcement works		135.000.000 TL / ton
	MT-Mesh reinforcement	%81.00	109.350.000 TL / ton
	TM-Reinforcement	%19.00	25.650.000 TL / ton
	EQ-----	%0.00	----
21.0355	Steel mould and scaffolding works		2.000.000 TL / m2
	MT-Steel Formwork	%50.00	1.000.000 TL / m2
	EKP-Steel Formwork	%20.00	400.000 TL / m2
	EQ-Crane	30.00	600.000 TL / m2
30.110	Precast wall component works		120.000.000 TL / ea
	MT-Precast Wall	%70.00	84.000.000 TL / ea
	TM-Precast Assembly	%10.00.	12.000.000 TL / ea
	EQ-Crane	%20.00	24.000.000 TL / ea
30.111	Precast parapet component works		20.000.000 TL / ea
	MT-Precast Parapet	%60.00	12.000.000 TL / ea
	TM-Precast Assembly	%15.00.	3.000.000 TL / ea
	EQ-Crane	%25.00	5.000.000 TL / ea

PROJECT DATA



PARTIAL SECTION



BLOCK-A

BLOCK-B

LOCATION PLAN

I.T.U. FACULTY OF ARCHITECTURE
CONSTRUCTION MANAGEMENT & ECONOMICS
PROJECT PLANNING & PROGRAMMING
PRACTICAL STUDY

TEAMS & PRODUCTIVITY VALUES

TEAM	Capacity /Hr	Unit of measr	Work pattern (Normal)	Work pattern (Max)	Max. Team Numbr	Production Item
Excavation	20	m3	8 hr	10 hr	2	Excavation
Filling	20	m3	8 hr	10 hr	2	Filling
Sewerage	1	ad	8 hr	10 hr	1	Manhole
	5	mt	8 hr	10 hr	1	Concrete sewer
Wooden Formwork	10	m2	8 hr	10 hr	2	Foundation
Steel Formwork	20	m2	8 hr	10 hr	2	Wall
	25	m2	8 hr	10 hr	2	Slab
Reinforcement	1.0	ton	8 ht	10 hr	2	Meshreinforc.
	0.25	ton	8 hr	10 hr	2	Reinforcement
Precast Assembly	2	ad	8 hr	10 hr	1	Wall component
	4	ad	8 hr	10 hr	1	Parapet
Concrete	5.0	m3	8 hr	10 hr	1	Concrete