DESCRIPTION	UNIT	Q'TY
1 PRE-FEASIBILITY STUDY		
2 FEASIBILITY STUDY		
3 FINANCING		
4 DETAILED DESIGN		
5 TENDERING		
6 MAIN CIVIL WORKS		
(1) Mobilization		
(2) Preparatory works		
(3) Diversion tunnel		
a) Excavation		
Portal	m3	105,000
Tunnel	m3	230,000
b) Concrete		
Portal	m3	4,700
Tunnel	m3	68,000
Plug	m3	11,680
c) Grout	m	14,000
d) Gate	set	1
(4) Cofferdam		
a) Excavation	m3	88,000
b) Embankment	m3	687,000
(5) Main dam		
a) Excavation		
Common	m3	163,000
Weathered rock	m3	255,000
Hard rock	m3	109,000
b) Foundation grouting	m	43,000
c) Gallery concrete	m3	16,000
d) Embankment		
Core	m3	437,000
Filter	m3	92,000
Rock	m3	2,171,000
(6) Spillway		
a) Excavation	m3	1,760,000
b) Concrete	m3	103,000
(7) River outlet works		
a) Concrete	m3	200
b) Metal works	set	1
(8) Cofferdam for Saddle dams		
a) Excavation	m3	18,000
b) Embankment	m3	73,000
(9) Saddle dams		
a) Excavation	m3	801,000
b) Foundation grouting	m	47,000
c) Embankment		
Core	m3	305,000
Filter	m3	66,000
Rock	m3	1,143,000

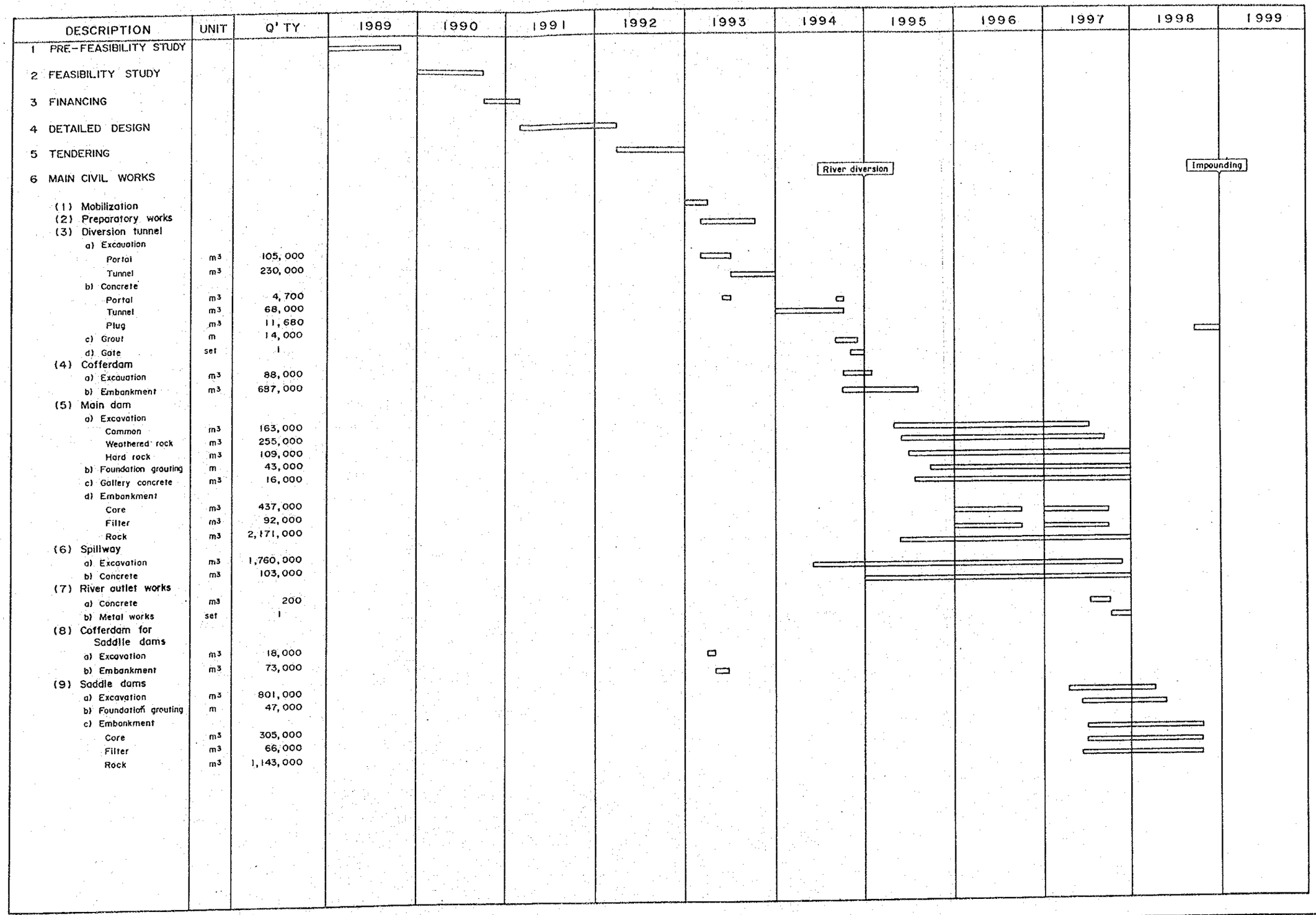


Fig.7.1 Construction Time Schedule for Lebir Dam Project

GOVERNMENT OF MALAYSIA
STUDY
ON
KELANTAN RIVER BASIN - WIDE FLOOD MITIGATION
JAPAN INTERNATIONAL COOPERATION AGENCY

DESCRIPTION	UNIT	Q'TY
Urban area		
1 PRE - FEASIBILITY STUDY		
2 FEASIBILITY STUDY		
3 FINANCING		
4 DETAILED DESIGN		
5 TENDERING		
6 CIVIL WORKS		
(1) Mobilization		
(2) Preparatory works	L.S	
(3) Clearing stripping	m²	197,000
(4) Embankment		
from borrow area	m³	1,018,000
from excavation	m³	2,605,000
(5) Revetment		
low water channel	m²	12,500
high water channel	m²	94,400
(6) Sluice	P.C	10
(7) Toe drain & ditch	m	29,100
(8) Maintenance road	m	29,100
(9) Sod facing	m²	829,000
Rural area		
1 TENDERING		
2 CIVIL WORKS		
(1) Mobilization		
(2) Preparatory works	L.S	
(3) Clearing & stripping	m²	1,378,000
(4) Dredging	m³	2,100,000
(5) Embankment		
from borrow area		1,132,000
from excavation		9,503,000
(6) Revetment		
low water channel	m²	88,600
high water channel	m²	72,500
(7) Toe drain & ditch	m	89,500
(8) Maintenance road	m²	134,900
(9) Sod facing	m	4,217,000

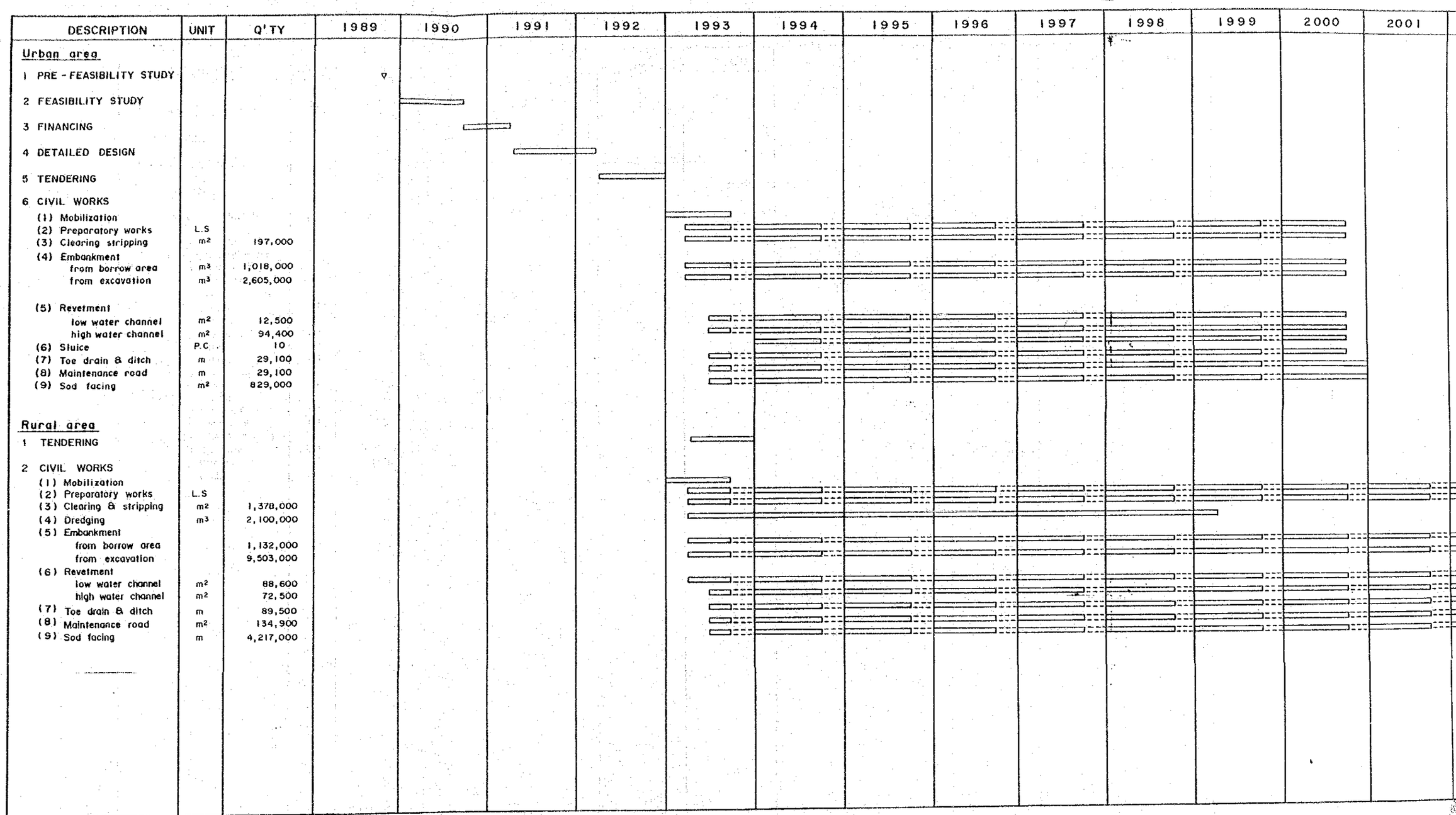
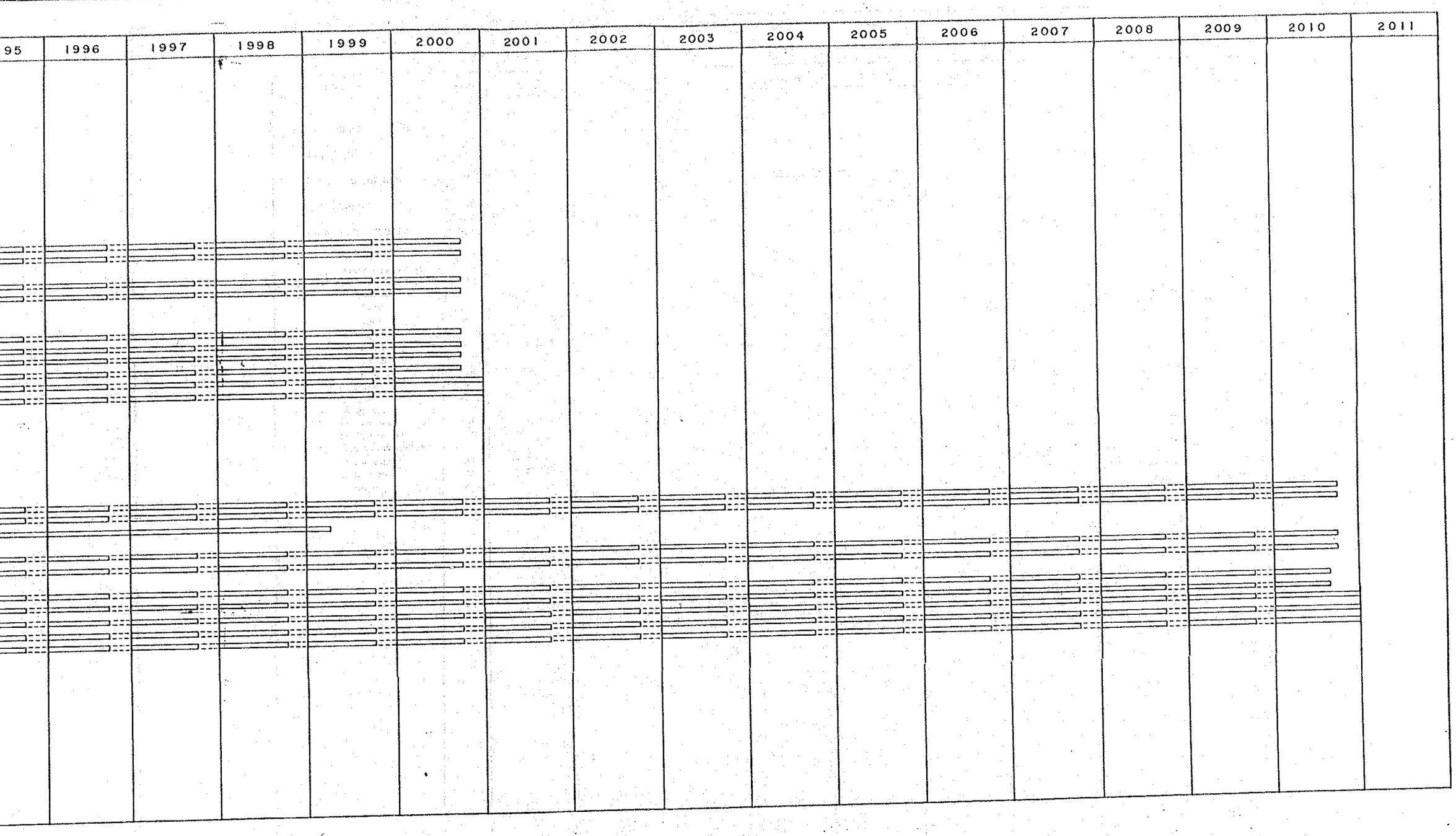


Fig.7.2 Construction Time Schedule for Kelantan River Improvement Works



uction Time Schedule for Kelantan River Improvement Works

GOVERNMENT OF MALAYSIA
STUDY
ON
KELANTAN RIVER BASIN - WIDE FLOOD MITIGATION
JAPAN INTERNATIONAL COOPERATION AGENCY

DESCRIPTION	UNIT	Q'TY
1 FEASIBILITY STUDY		
2 FINANCING		
3 DETAILED DESIGN		
4 TENDERING		
5 MAIN CIVIL WORKS		
(1) Mobilization		
(2) Preparatory works		
(3) Diversion tunnel		
a) Excavation		
Portal	m3	106,600
Tunnel	m3	70,000
b) Concrete		
Portal	m3	2,500
Tunnel	m3	17,700
Plug	m3	5,800
c) Grout	m	4,000
d) Gate	set	1
(4) Cofferdam		
a) Excavation	m3	21,000
b) Embankment	m3	188,000
(5) Main dam & spillway		
a) Excavation	m3	413,500
b) Concrete	m3	148,000
c) Grout	m	12,000

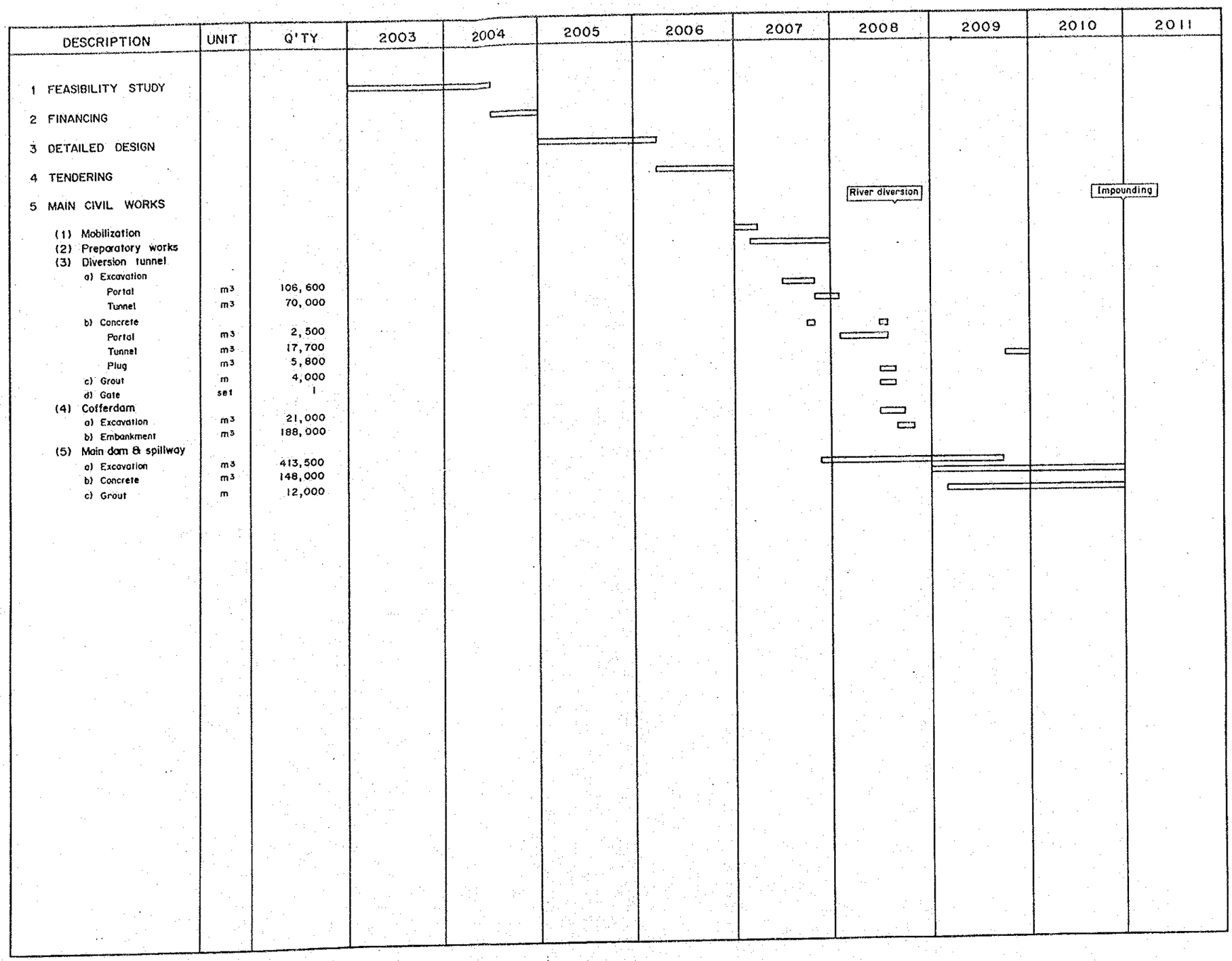


Fig.7.3 Construction Time Schedule for Kemubu Dam Project

GOVERNMENT OF MALAYSIA
STUDY
ON
KELANTAN RIVER BASIN - WIDE FLOOD MITIGATION
JAPAN INTERNATIONAL COOPERATION AGENCY