

### 10.3 Construction Cost Estimates

The quantities for all work items were based on the prepared preliminary engineering drawings. The construction costs of the Project Roads, on the other hand, were estimated using the unit costs by work items which were analyzed on the basis of the material cost, labor cost, equipment cost, etc., taking into consideration the local conditions in the Project area. The right-of-way acquisition cost was estimated on the collected data from the assessors' offices in the DIZ.

The prices in October 1981 were applied. The cost was split into foreign currency, local currency and taxes. The rates of exchange used to convert the Philippine Peso to Japanese Yen and US Dollar are:

$$₱7.95 = \text{Jp.Yen } 225.00 = \text{US\$1.00}$$

The foreign currency portion was estimated at approximately 50% of the Project cost excluding the right-of-way acquisition cost. The total cost, by plan and stage is summarized in Subsection 12.2.

## 11. Environmental Impact of the Project Roads

The environmental study for the Project Roads was conducted in a separate volume: "Environmental Impact Statement" to analyze the environmental and social impacts of the Project Roads in accordance with the guidelines of the National Environmental Protection Council (NEPC) to obtain the approval and issuance of Environmental Clearance certificate for the implementation of this Project.

The study has revealed that the forecast traffic pollution (air quality, noise and vibration) arising from the implementation of the Project Roads would not significantly affect the adjacent areas of the Roads.

From the socio-economic aspects, the Project Roads will greatly strengthen the function of the road network system south of Metro Manila, enhancing the land use potential along the roads, and contributing to the beautification of the areas by providing an open space in the form of a roadway. On the other hand, the implementation of the new road will affect neighbourhood cohesiveness of some communities, but it is expected to promote economic activities in the surrounding areas, as well as provide better access to Metro Manila.

## 12. Benefits and Economic Evaluation

### 12.1 Benefits

The total traffic cost on the major road network in the DIZ was estimated for both cases of with and without the project and associated roads in the different development stages. The difference in the traffic cost with and without the project and associated roads is the savings in traffic cost accruing from the improved road network. The traffic cost consists of distance-related running cost, time-related fixed cost, and passenger time cost. The quantification was based on the traffic volume assigned on the road network and the dl method together with the basic vehicle operating cost.

The savings in traffic cost accruing from A- and B-Routes are mostly from the improved flow of the normal traffic using the road, while the benefits from C-Route include savings resulting from diverted traffic and the decongestion effect on other existing major roads. Beside these benefits, C-Route will produce development benefits, although the amount is relatively small.

### 12.2 Cost

Investment and maintenance costs are adjusted to economic cost by excluding taxes and duties. The costs of the associated roads were roughly approximated and tabulated in the cost stream together with that of the Project. In summary, the total economic cost and financial cost of the Roads including the associated roads for the period 1983-1994 are shown in Table 2. The figures in ( ) are the costs discounted to the year 1981 with  $i = 15\%$  p.a.

TABLE 2 COSTS OF THE PROJECT ROADS AND ASSOCIATED ROADS

	(In million Pesos, 1981 Prices)					
	Plan 1		Plan 2		Plan 3	
	Economic	Financial	Economic	Financial	Economic	Financial
The Project Roads						
1. (1983-1987)	555.3	600.5	493.9	528.4	623.2	677.9
2. (1989-1990)	170.1	196.5	—	—	—	—
3. (1993-1994)	91.8	106.2	238.9	276.3	109.7	126.7
Total	817.2	903.1	732.9	804.6	732.9	804.6
(Disc. Total)	(367.6)	(402.6)	(309.0)	(334.2)	(354.6)	(386.9)
The Associated Roads						
1. (1983-1987)	—	—	—	—	—	—
2. (1989-1990)	713.9	793.2	—	—	—	—
3. (1993-1994)	50.5	56.1	294.0	326.7	294.0	326.7
Total	764.4	849.3	294.0	326.7	294.0	326.7
(Disc. Total)	(254.3)	(272.6)	(55.7)	(61.9)	(55.7)	(61.9)
Grand Total	1,581.6	1,752.4	1,026.9	1,131.3	1,026.9	1,131.3
(Disc. Total)	(612.9)	(675.2)	(364.7)	(396.1)	(410.3)	(448.8)

### 12.3 Economic Evaluation

The main assumptions of the benefit-cost analysis are: 1) discount rate of 15% p.a., and 2) 20 years of the benefit stream after the completion of the first stage, i.e., 1987-2006. The result is shown below:

	<u>Plan 1</u>	<u>Plan 2</u>	<u>Plan 3</u>
Present Worth in million pesos $i = 15\%$	2,154.5	1,057.5	1,111.8
Benefit/Cost $i = 15\%$	3.7	3.3	3.1
Internal Rate of Return (%)	39	40	37

The economic evaluation shows that all the alternatives are economically feasible and have a high rate of return. A sensitivity test was conducted to find the relative changes in the above figures. However, there was no change in the order of the alternatives. Since Plan 2 indicates the least cost investment at the first stage and also the least cost solution in terms of the discounted total investment cost during the period 1983-1994, it is found that Plan 2 is the most economical solution among the alternatives.

## 13. Conclusion and Recommendations

### 13.1 Conclusion

Alternative Plan 2 is recommended for the Project after evaluation of the three alternatives. The point should be taken into account in implementing the project that the plan, which requires the lowest investment cost for the first stage and produces the highest IRR, will serve the traffic demand on B-Route for a while, giving rise to certain traffic congestion probably in the early 1990's.

The construction of the related trunk roads is limited to the minimum under this plan, which proposes for the implementation of Imelda Avenue Extension and Metro Manila Expressway before 1994 and the southern part of C-5 and other related roads beyond 1995. In the absence of C-5, the traffic confluence at the Bicutan Interchange would result in a traffic congestion at the intersection. Under this plan the Alabang intersection with B-Route will remain unimproved until 1994.

### 13.2 Recommendations

- The Project should be implemented at the earliest possible time.

- The land for the road right-of-way should be acquired after the alignment has been fixed during the detailed engineering.
- The loan preparation should commence at the earliest appropriate date.
- Feasibility studies for C-5, Imelda Avenue Extension and other related trunk roads should be carried out as soon as possible.
- Close coordination of the project implementation with the development policy of the Metro Manila Commission should be maintained.
- For a smooth flow of through traffic, service lanes with designated loading and unloading zones for operation of buses and jeepneys should be provided, and strict regulations should be laid down in connection therewith.
- Periodic traffic volume survey should be conducted to monitor the behavior of vehicular traffic.

#### 14. Implementation Program

The Southern Road Package Project under Plan 2 was recommended for the implementation as shown in Fig. 8 in which the preliminary time schedule from the detailed engineering and right-of-way acquisition to the construction of roadways and structures are indicated for all stages. The detailed engineering design for all stages of the Project will be conducted within 24 months, and the land for the ultimate right-of-way width should be acquired during the beginning four years. The earlier acquisition is recommended because it is found in other cases that the staged acquisition has encountered difficult problems caused by the development on the designated right-of-way.

Considering the urgency of the Project, it is recommended that the Government consider implementation of the first stage as soon as possible. The implementation cost of the Project and schedule of the cost disbursement under Plan 2 are summarized in Tables 3 and 4, respectively.

FIG. 8 RECOMMENDED IMPLEMENTATION SCHEDULE FOR THE PROJECT

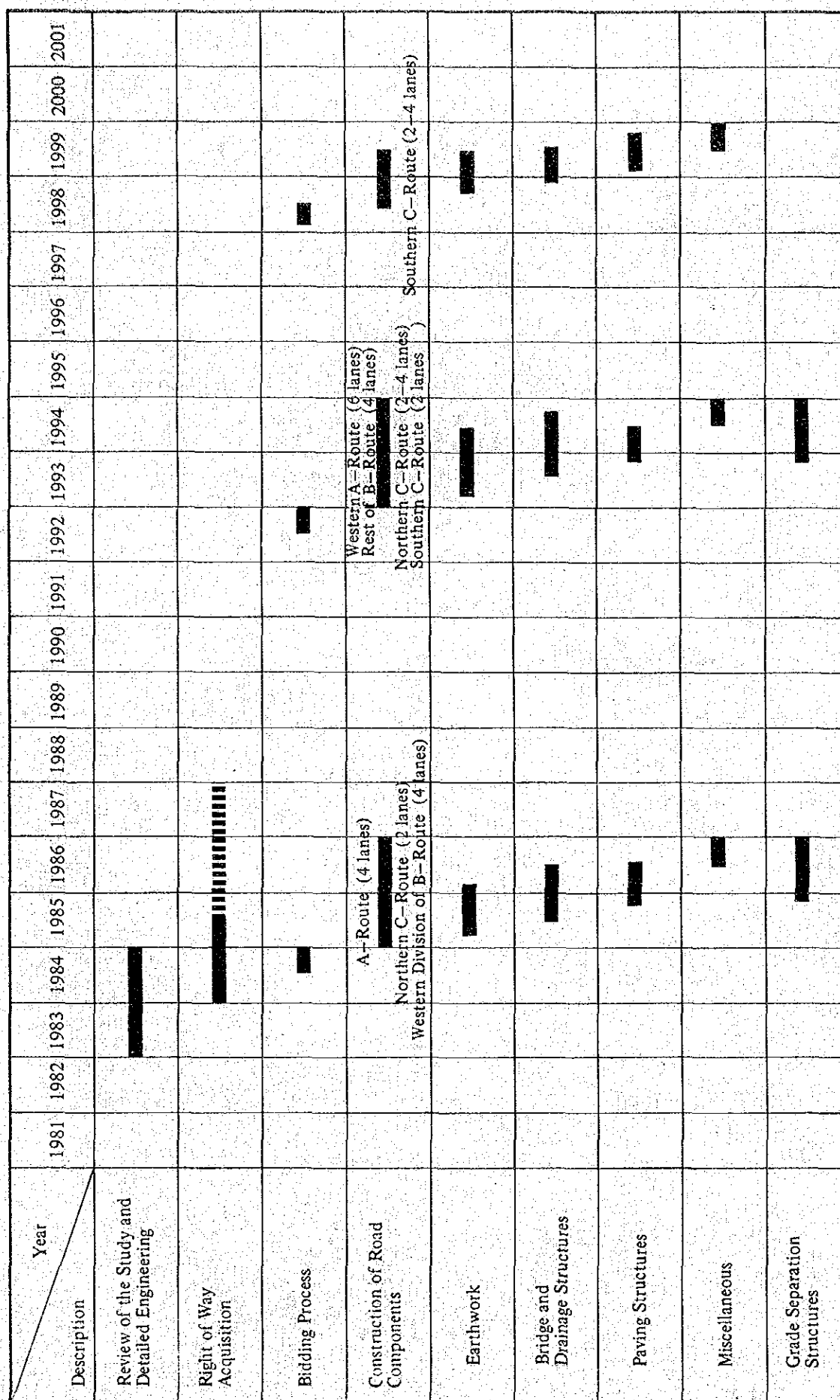


TABLE 3 IMPLEMENTATION COST OF THE PROJECT UNDER PLAN 2

(Pesos in Thousand, 1981 Prices)

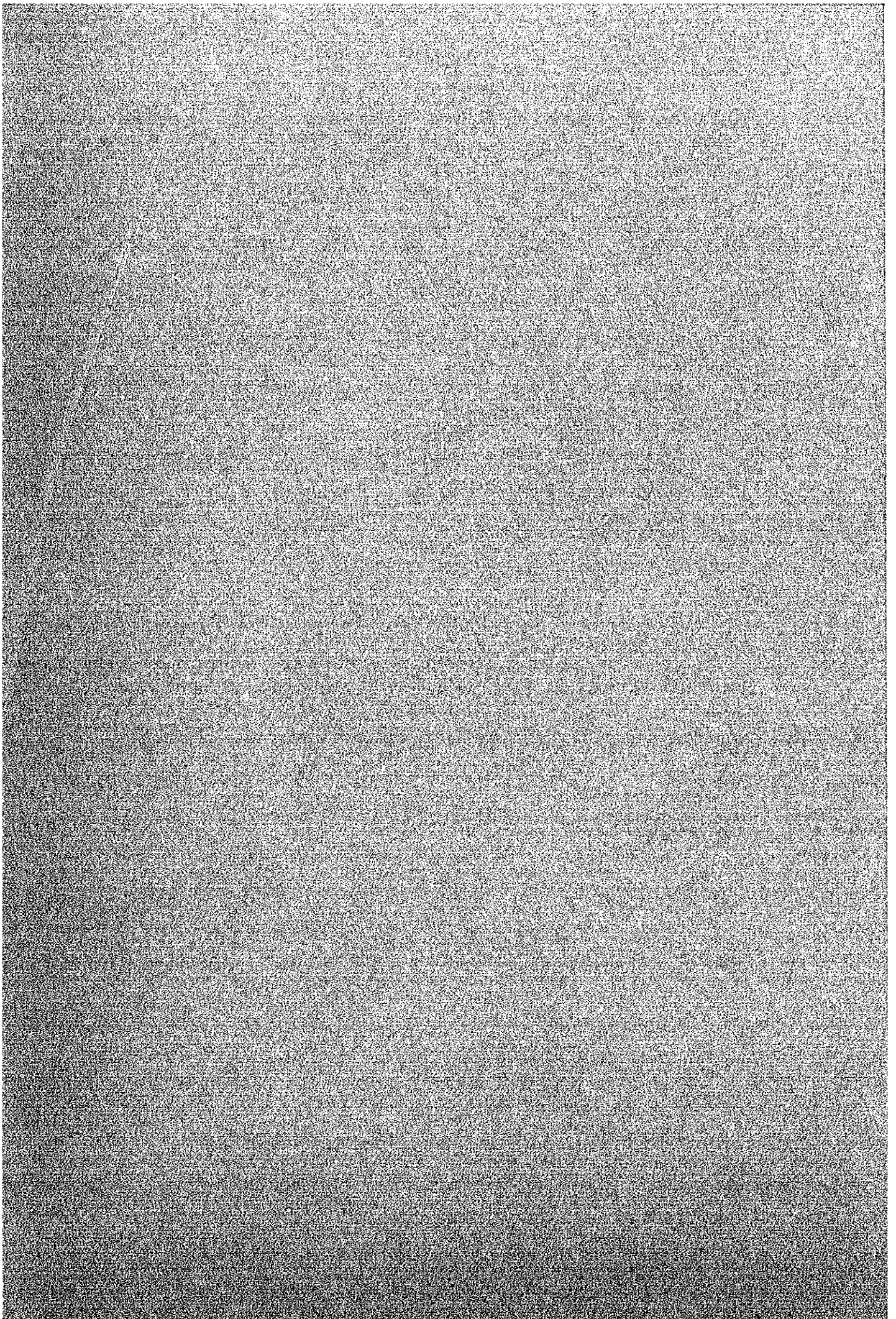
STAGE	ITEM	FOREIGN CURRENCY	LOCAL CURRENCY	TOTAL	TAXES	GRAND TOTAL
1 (1983-86)	Construction	101,397	69,071	170,468	26,643	197,111
	Detailed Design	10,661	7,143	17,804	2,779	20,583
	Supervision	7,098	4,835	11,933	1,865	13,798
	Physical Contingencies	11,916	8,105	20,021	3,128	23,149
	Total	131,072	89,154	220,226	34,415	254,641
	Land Acquisition	—	273,709	273,709	—	273,709
	TOTAL	131,072	362,863	493,935	34,415	528,350
2 (1991-94)	Construction	120,946	82,043	202,989	31,731	234,720
	Detailed Design	—	—	—	—	—
	Supervision	8,466	5,743	14,209	2,221	16,430
	Physical Contingencies	12,941	8,779	21,720	3,395	25,115
	Total	142,353	96,565	238,918	37,347	276,265
	Land Acquisition	—	—	—	—	—
	TOTAL	142,358	96,565	238,918	37,347	276,265
Total	Construction	222,343	151,114	373,457	58,374	431,831
	Detailed Design	10,661	7,143	17,804	2,779	20,583
	Supervision	15,564	10,578	26,142	4,086	30,228
	Physical Contingencies	24,857	16,884	41,741	6,523	48,264
	Total	273,425	185,719	459,144	71,762	530,906
	Land Acquisition	—	273,709	273,709	—	273,709
	GRAND TOTAL	273,425 (34)	459,428 (57)	732,853 (91)	71,762 (9)	804,615 (100)

TABLE 4 DISBURSEMENT SCHEDULE OF THE PROJECT COST UNDER PLAN 2

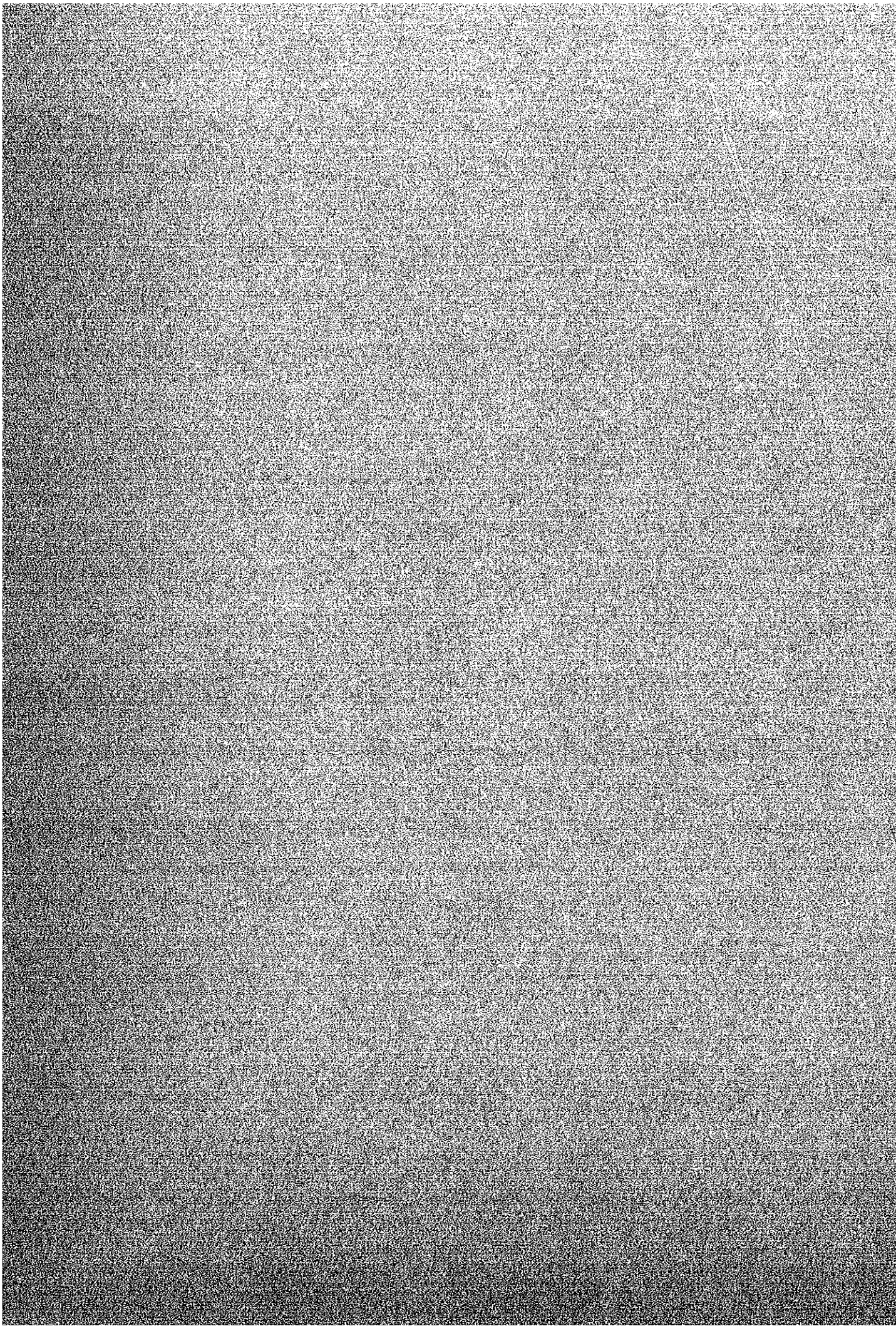
(Pesos in Thousand, 1981 Prices)

Item	1983	1984	1985	1986	1987	Total ..... 1993	1994	Total	G. TOTAL
Detailed Design	11,321	11,320				22,641	—	—	22,641
ROW Acquisition		68,427	68,427	68,427	68,427	273,709	—	—	273,709
Supervision and Construction			92,800	139,200		232,000	138,132	138,132	276,265
Total	11,321	79,747	161,227	207,627	68,428	528,350	138,132	138,132	804,615

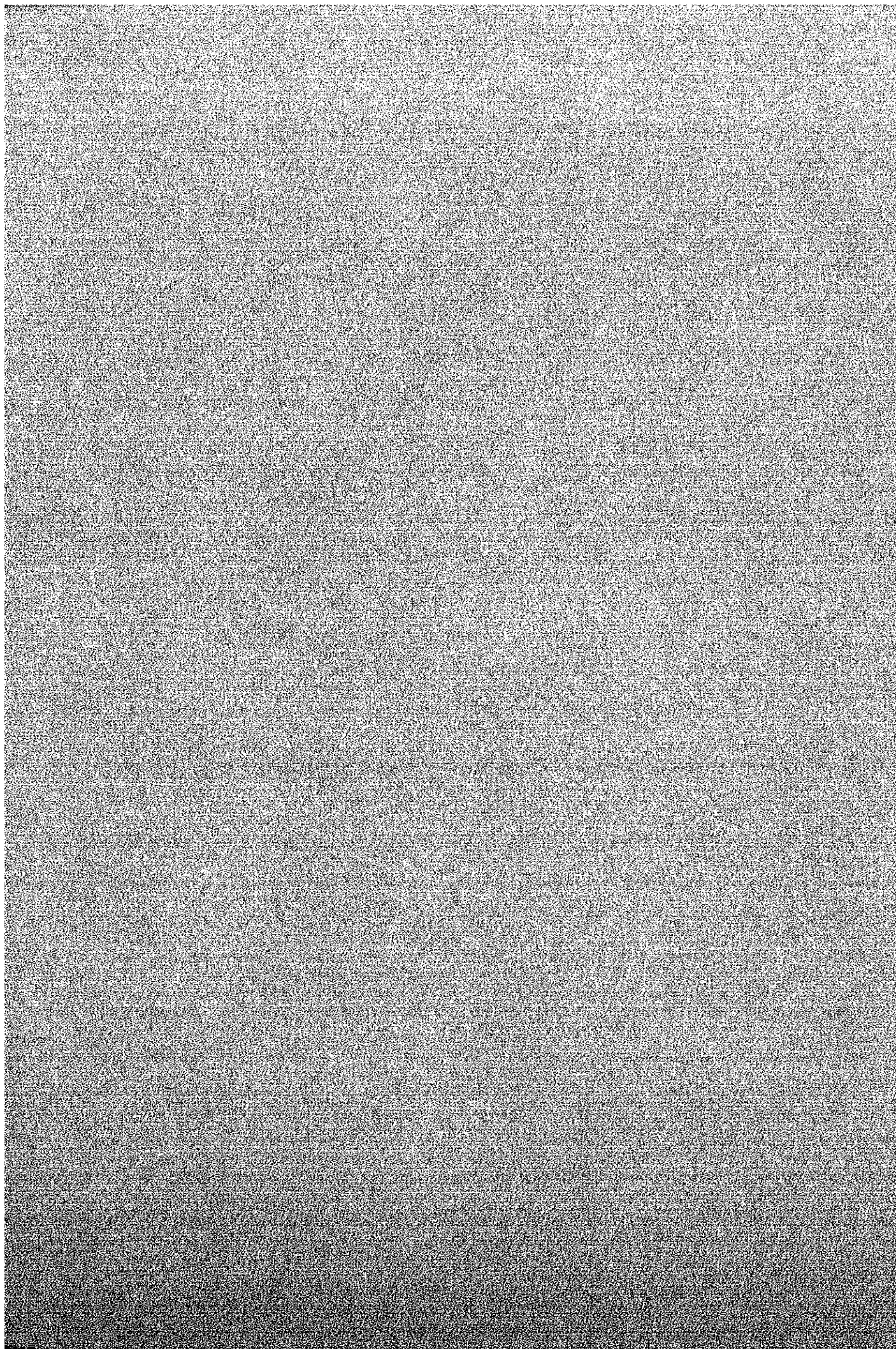












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