

The effects of sand compaction piles on soft cohesive soil are that the shearing resistance of the ground is increased by forming a composite ground of cohesive soil and sand piles. This results in a reduction in the amount of consolidation settlement and also in the time necessary for settlement as well.

#### G.4.4 Dynamic Consolidation

This system employs heavy tamping and was originally used on ballast fills or natural gravelly soils. Its range of applicability has now been extended to alluvial soils and clays. This method is now called Dynamic Consolidation. It involves impacting 5 to 4 ton weights, called pounders, from heights of 20 to 100 ft. (6 to 30 m), according to a predetermined pattern specially evaluated for the particular site. Weights as large as 200 tons are now contemplated for use. Fig. G-14 illustrates execution of Dynamic Consolidation Method. Fig. G-15 shows a typical soil behaviour during dynamic consolidation.

The theory of Dynamic Consolidation followed its application. In granular soils, the high energy impact is believed to cause partial liquefaction of the deposit, thereby allowing the mass to settle into a denser state. However, Dynamic Consolidation of fine-grained soils is not so well understood. Menard and Broise (1975) hypothesized that in clays, the shock waves and high stresses compress the air microbubbles in nearly saturated soils. After repeated impacts, gradual liquefaction occurs accompanied by changes in soil mass permeability due to fissures around the impact points. Finally, the deposit undergoes thixotropic strength recovery, presumably at a higher density.

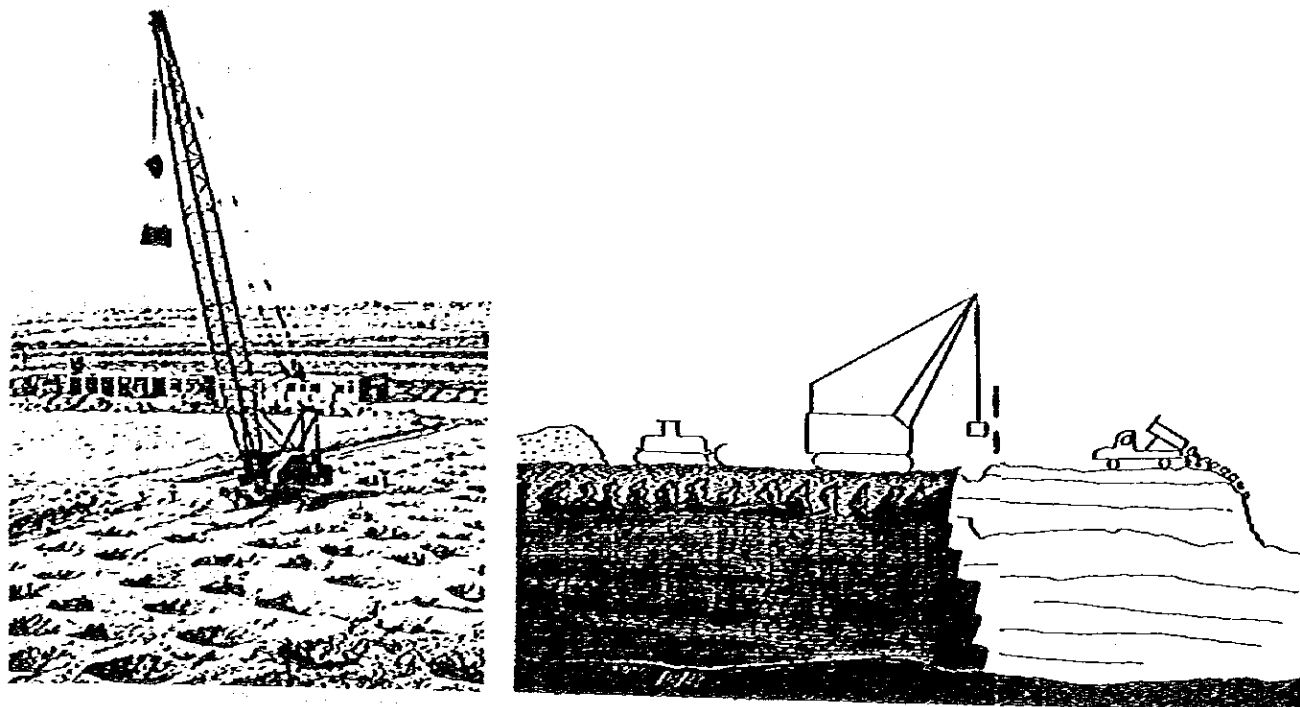
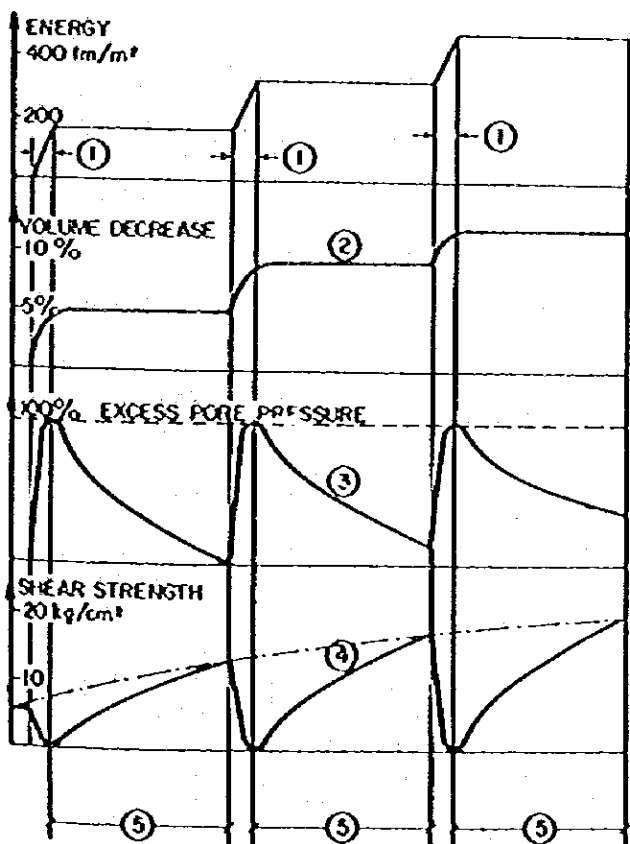


Fig. 6-14 Illustration of Dynamic Consolidation Execution



- 1) High energy applied at ground surface by impact of falling weight. Energy is applied in three phases in this example.
- 2) Induced settlement of ground surface typically corresponds to a volume reduction of 5 to 15% in the weak soil being treated.
- 3) Excess pore pressures increase to the overburden stress during energy application, then dissipate rapidly.
- 4) Strength of soil first decreases then increases to a higher value.
- 5) Waiting period of several days to several weeks between phases.

Fig. 4-15 Typical Soil Behaviour During Dynamic Consolidation

To determine the energy requirements for liquefaction, a patented dynamic oedometer has been developed. Dynamic loads are applied to an 11.8 inches (30 cm) diameter specimen while allowing static consolidation to occur. The device simultaneously measures pore pressures and horizontal pressures. Although this test does not entirely duplicate field conditions, it has been used successfully to estimate the effect of dynamic consolidation, as well as to optimize the field compaction operation. Other soil investigation methods should also be employed to determine operation methods and parameters, number of phases, and instantaneous settlements. Menard and Broise (1975) recommend boreholes for stratigraphy and in-situ testing with pressuremeter, vane, and penetrometer for soil properties. This would be coupled with laboratory testing for moisture contents, grain-size distributions, etc.

The lifting and release of these huge pounders may be from a standard crane of 50 to 120 ton capacity, a tall tri-pod mast or larger specially built cranes. The pounders are dropped numerous times at one location before moving to the next impact position. After the initial pass over the entire site, subsequent passes are accomplished at time intervals based on dissipation rates of the induced pore water pressures. These intervals may be up to three weeks depending upon the particular soil at the site.

Dynamic consolidation is most suitable for projects in rural areas or at construction sites surrounded by a large open area. The very high impact produces vibrations with frequencies on the order of 2 to 12 Hz. Field measurements

have shown that at a distance of 98 ft (30 m) away from the point of impact, the wave velocities remain below 5 cm/sec. which can be tolerated by most structures. Surface settlement of 5% to 15% of the total deposit thickness can be achieved.

Environmentally, this method poses very few problems. However, the noise may be objectionable in urban areas. Run-off from induced drainage may carry some fines into surrounding areas. However, this can easily be remedied by proper precautions.

#### G. 4. 5 Roller Compaction

If the soft layer to be improved is at relatively shallow depth, such as less than 8 ft (2.4 m), roller compaction method is useful and economical.

Compaction of ordinary controlled fills constructed using light surface rollers extends about a foot below the roller. When low density granular soils extend to depths of five to eight feet, heavy rollers are available which can successfully achieve compaction from the surface.

Pneumatic Tire Rollers; Much research and development since the 1950's has resulted in greatly improved rollers today. Development of this equipment was greatly accelerated by the U.S. Army Corps of Engineers because of the rapid escalation of aircraft wheel loads and tire pressures. Fifty and 100 ton pneumatic tire rollers have been developed and used extensively on air-fields, dams and highways.

Vibratory Rollers; Research and experimentation with vibratory compactors, initiated in the late fifties led to the development of effective steel wheel vibratory rollers and various types of vibratory sleds in the sixties. Vibratory frequency was found to be critical. The most effective compaction may be obtained using the least energy if resonance can be achieved.

For a short time steel wheel vibratory rollers as large as about 7,000 pounds (3 tons) were considered as "heavies". They proved so effective in granular soils and reached depths previously believed unreachable, that the size and weight of these rollers accelerated rapidly soon reaching weights as high as 15 tons and delivering a dynamic force of 30 tons or more. Effective compaction to depths as deep as 8 ft (2.4 m) have been reported. However, with the greatly increased vibrational forces the upper one to two feet (0.5 m) of soil became loosened rather than densified.

## G. 5 Chemical Stabilization

Because of the high cost and the absence of precise methods to predict and evaluate the results, the use of a chemical stabilization method is limited to corrective measures for post-construction problems and small, isolated soft or loose deposits. This method is performed by injecting fine soils and/or chemical grouting materials, such as cement, lime, and other chemicals or mixtures of these into the problem deposit.

Mixtures of fine soil, portland cement, and water; lime and water; sodium silicate; calcium chloride; polymers, and resins are the most universally used grouting materials. Various surfactants and catalysts, such as calcium ligno-sulfonate, hydroxylated carboxylic acid, and carbon dioxide gas, are also used to facilitate the dispersion and solidification of grouts in soils and to promote in-situ reaction.

Compaction grouting and hydraulic fracturing (Ruppel, 1970) can be used to compensate for differential settlement of structures or stabilize soft foundations. A commonly-used mixture for compaction grouting is portland cement and fine sand or silt. Mixtures of well-graded sand and silt are also used. Twelve to fifteen percent by weight of portland cement is mixed with the soil and water into a highly viscous grout that is pumped into bored holes at pressures up to 500 psi (352 ton/m<sup>2</sup>).

Penetration grouting (penetration of the grout into soil pores) cannot be used to stabilize soils finer than sands with permeabilities of  $5 \times 10^{-6}$  m/sec or higher (Mitchell, 1970).

A groutability ratio of 25 or higher is necessary for consistent penetration. The groutability ratio "R" is defined as the ratio of the 15% size of the formation to be grouted to the 85% size of the grout, or  $D_{15} \text{ formation} / D_{85} \text{ grout}$ .

Soil-cement grouts can be used for the strengthening of loose, coarse sands or the prevention of their liquification under cyclic loading. Fine sand containing 15 to 35 percent by weight of portland cement, mixed with a minimum amount of water to allow the mixture to be pumped, has been used for this purpose (Peignaud, 1971).

Soil tests should be performed to determine the presence of any substances that will counteract the hardening of the grout. This problem may occur particularly near the banks of polluted streams and at industrial plant sites with polluted ground water.

The strength developed by the cement-grouted foundation varies with the grouting techniques as well as with variations in the water-cement ratios. Strengths as high as 70 tons/ft<sup>2</sup> (683 ton/cm<sup>2</sup>) can be obtained. Bentonite used with portland cement (Caron, 1972) has produced strengths up to 75 tons/ft<sup>2</sup> (734 ton/cm<sup>2</sup>) in sands.

Lime-water slurry has been used to stabilize soft clays as well as stratified alluvial deposits (Karol, 1960). The lime may react with clays, in-situ, after injection. Lime and a wetting agent are mixed with water and injected under high

pressure (about 100 psi, or 70 t/m<sup>2</sup>). This method has been used for slope stabilization and the treatment of expansive soft soils. The strength developed by the in-situ reaction varies widely. Fig. G-16 illustrates an advanced technique of chemical stabilization of soft clay which is called "CMC Method". Examples of application of chemical stabilization are shown in Fig. G-17.

A large variety of chemical grouts, many of which are proprietary, are used to stabilize fine granular soils. These grouts are expensive; however, they are easier to inject because they do not contain particulate matter. Thus they can penetrate smaller voids than the cement or soil grouts.

Upon hardening, some chemical grouts produce high strengths. Most of them are either monomers that are polymerized in place or phenoplasts. Polymerized chemicals form a gel with a strong-bonded, cross-linked molecular structure. The strength and gel time can be controlled by the amount of catalysts and the temperature. Phenoplasts, upon gelling, form polycondensed non-linear structures of high strength.

The permanence of chemical grouts, as well as their extent of penetration, remains somewhat indeterminate. Even though some formulae have been developed to estimate the radial penetration distance, final design decisions are often based on empirical data and field pumping tests.



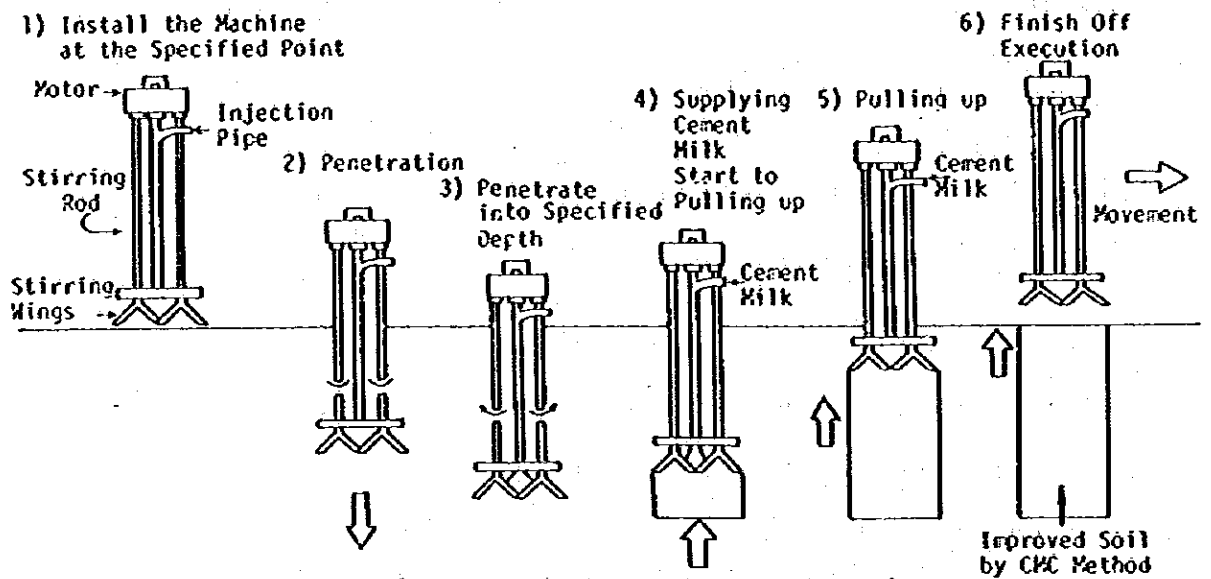
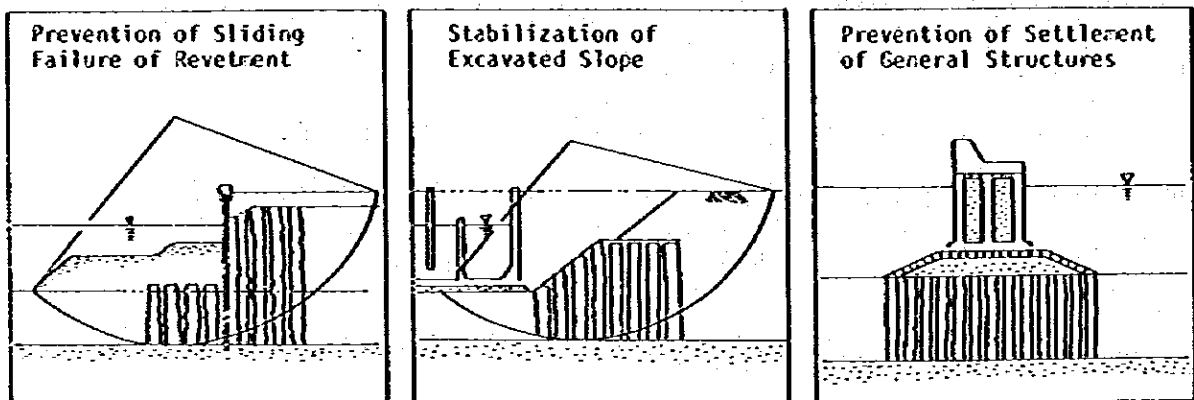


Fig. G-16 Execution Steps of CMC Method



- (1) Improvement of soft soils at depth
  - Prevention of sliding failure of Revetment
  - Improvement of Foundation Soils for Embankment
- (2) Prevention of Settlement of General Structures
- (3) Stabilization for Excavation
- (4) Improvement of Soft Ground at the Foot of Bridges
- (5) Intensifying Lateral Resistance of Piles

Fig. G-17 Application of Chemical Stabilization Methods

## G. 6 Excavation and Replacement

Where materials such as soft clays are underlain by soil deposits of suitable stability at shallow depths (less than 20 ft or 6m), it is often economical to remove the unsuitable material by excavation and replace it either with special borrow material or, after drying or treatment, replace the original material. The type of borrow material used and the methods of its placement depend largely on the position of the water table.

If the water table is below the excavation line, either fine or coarse grained soils can be used as replacement material, with densification by mechanical means and admixture stabilization with lime, portland cement or other chemical agents, if necessary. The mixing of stabilizing agents may be accomplished either on or off the site. If the excavation site is confined, the mixing of the soil and stabilizer can be done either at a central mixing plant or at a location adjacent to the excavation. The mixture is then placed into the excavation and compacted in layers.

If the water table is above the bottom of the excavation line, and is not lowered by a dewatering system, the excavated material can only be replaced with granular material such as sand, slag, gravel, etc. Additional mechanical compaction or stabilization can be accomplished with vibratory or dynamic

methods (Vibroflotation, Vibro-Rod, Dynamic Consolidation, etc.).

Many soft soil deposits are located under water and excavation under such conditions present serious problems to both the designer and the builder. Both the excavation and the placement of the fill material require special consideration of the material properties and careful inspection during excavation operations (Johnson et al., 1971).

Underwater excavation is performed with draglines and dredges. The foreslopes of the trench should be flat designed to be stable to prevent refilling of the excavation trench by slope failures occurring after the excavation of a section. If such failures occur and remain undetected, soft materials may be trapped under the select fill.

In some cases the water level in the excavated trench should be maintained at the phreatic surface, because lowering of the water table would otherwise cause subsidence of the surrounding area (Transportation Research Board, 1975).

Environmental aspects are of utmost importance in the planning and execution of underwater excavation and placement and should be considered in the early planning stages. Disposal of the excavated material without affecting the sheet water flow becomes particularly important in marshlands and flat lowlands subject to tidal inundation. The fate of pollutants dredged from river and harbor bottoms must be considered. In some cases treating the dredged spoil with quick or hydrated lime prior to wasting is an effective means for preventing

contamination of adjacent waters with silt and clay fines. Use of the excavated material to create water basins and wildlife refuge islands may, in many cases, be an acceptable alternative.

Granular materials suitable for placement and densification under water are pumped sand, clam shell, gravel, or slag. For large fill projects, sand has been pumped as far as fifteen miles under 120 psi (84.4 ton/m<sup>2</sup>) pressure (Starring, 1971).

When the removal of soft cohesive soils by excavation is not feasible or economical, the displacement method can be used to remove the unsuitable material.

Removal by displacement is accomplished by placing sufficient embankment material to cause failures in the underlying soft layers in the direction of least resistance, which normally is ahead of the advancing embankment. These failures create a mudwave that can then be excavated. The rate of any required excavation of the mudwave ahead of the embankment should be about the same as the rate of placement of the embankment material. If this rule is not followed, there is the danger of trapping pockets of soft soils under the embankment.

Lateral movement of the soft soil beyond the limits of construction may sometimes occur resulting in the formation of lateral mudwaves with consequential damage to adjacent structures. However, if the lateral mudwaves present no problems, they act as berms and greatly increase the stability of the embankment. Displacement methods have been successfully

used for soft soil deposits up to 65 feet (20m) thick (Weber, 1962).

Soft clays and highly organic soils respond well to displacement. However, if the organic material is composed of large fibers, the soft material tends to become reinforced and will resist the required forward movement. This, in turn, results in the encapsulation of soft materials under the fill, which may cause differential settlements.

資料H

基礎工費積算資料

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## 資 料 H

### 基礎工費積算資料

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## H. DETAILED DATA FOR COST STUDY

Details of the costs for the following items are presented in this section:

- 1) Preloading and Surface Compaction
- 2) Ground Improvement other than Preloading
- 3) Pile Foundation

Subsection H.1 gives details for Items 1) and 2), and Subsection H.2 provides details of 1), 2) and 3).

Summary of Item 1) is shown on Table H-1 (page H-3) and that of Items 2) and 3) is shown on Table H-7 (page H-31).

The contents of Tables H-1 and H-7 are used to prepare Tables 6-3 and 8-3 in Main Text.



## H.1 Unit Cost of Ground Improvement for Soft Material

(Reference to Table 6-3 in Main Text)

Unit: M\$

### H.1.1 Basis for Cost Estimation

- 1) Machine and equipment are assumed to be available in Kuala Lumpur.
- 2) Construction Area : 40,000 m<sup>2</sup>
- 3) Thickness of Improvement: 5 m (for type B, C ground)  
10 m (for type D ground)
- 4) Total Installation : 100,000 m
- 5) Each method will be used for the suitable ground condition and purpose.

### H.1.2 Cost Estimation

#### (1) Preloading

##### a. (H = 3 m, for 3 x A (bldg))

Type B ground: M\$27.6/m<sup>2</sup>

Type C ground: M\$43.5/m<sup>2</sup>

Type D ground: M\$46.5/m<sup>2</sup>

##### b. (H = 1.5 m, for 3 x A (bldg))

Type B ground: M\$17.4/m<sup>2</sup>

Type C ground: M\$31.8/m<sup>2</sup>

Type D ground: M\$33.3/m<sup>2</sup>

Details of the cost of preloading are summarized in Table H-1 (Detail explanation are given in Sub-section H.2 below).

Table H-1 Unit Cost of Preloading and Surface Compaction

Ground Condition	Structure	① Thickness of Sand Blanket (m)	② Thickness of Preload/Fill (m)	③ Amount of Settlement (m)	④ Grubbing, Clearing, Spreading & Surface Compaction (MS/m <sup>2</sup> )	Cost for Loss of Material (MS/m <sup>2</sup> )				Cost for Transferring Preload Earth to Next Site		⑪ Total (MS/m <sup>2</sup> )	⑫ Cost for 3 x A (bidg) ⑩ x 3
						⑤ Sand Blanket ① x MS9.0 (MS/m <sup>2</sup> )	⑥ Due to Settlement ③ x MS6.0 (MS/m <sup>2</sup> )	⑦ Other Loss		⑨ Thickness (m)	⑩ x MS2.0 (MS/m <sup>2</sup> )		
								⑦ Thickness (m)	⑧ x MS6.0 (MS/m <sup>2</sup> )				
Type A	Low- & Medium- & High-Rise	0	0	0	1.0	-	-	-	-	-	1.0	3.0	
Type B	Low-Rise	0	1.5	0.15	1.0	0	0.9	0.2	1.2	1.35	2.7	5.8	17.4
	Medium- & High-Rise	0	3.0	0.25	1.0	0	1.5	0.2	1.2	2.75	5.5	9.2	27.6
Type C	Low-Rise	0.5	1.5	0.70	1.0	4.5	1.2	0.2	1.2	1.35	2.7	10.6	31.8
	Medium- & High-Rise	0.5	3.0	0.95	1.0	4.5	2.7	0.2	1.2	2.55	5.1	14.5	43.5
Type D	Low-Rise	0.5	1.5	0.85	1.0	4.5	2.1	0.2	1.2	1.15	2.3	11.1	33.3
	Medium- & High-Rise	0.5	3.0	1.20	1.0	4.5	4.2	0.2	1.2	2.3	4.6	15.5	46.5
Type E	Low-Rise	1.0	5.5	0.80	1.0	9.0	4.8	0.2 + 4.0	25.2	0.5	1.0	41.0	123.0
	Medium- & High-Rise	1.0	6.0	0.85	1.0	9.0	5.1	0.2 + 4.0	25.2	0.95	1.9	42.2	126.6

(2) Wellpoint and Deep Well

a. Wellpoint

◦ Interval of header pipe = 30 m

◦ Interval of wellpoint = 2 m

Therefore, total length of header pipe is  $7 \times 200 \text{ m}$   
= 1,400 m (700 points)

$\text{M\$}388.98/\text{m}\cdot\text{month} \times 1,400 \text{ m} \div 40,000\text{m}^2 = \text{M\$}13.61/\text{m}^2/\text{month}$

Period of operation

U%	50	80
T	0.196	0.567
	170 days	492 days
t	5.7 months	16 months

for  $t_{50}$

$$13.61 \times 5.7 = 77.58 \approx \underline{\text{M\$ } 78/\text{m}^2}$$

for  $t_{80}$

$$13.61 \times 16 = 217.76 \approx \underline{\text{M\$ } 218/\text{m}^2}$$

b. Deep Well

i) Assumed ground condition

- 1) Clayey layer (5 m) is sandwiched by 5 m thick sand layers.

2) Coefficient of permeability of sand layer

$$k = 2 \times 10^{-2} \text{ cm/sec.}$$

3) Ground water will be lowered at least 10 m at any location.

4) Installed at grid points of 30 m x 30 m

$$(36 \text{ wells})/40,000 \text{ m}^2$$

5) Diameter of well: 1 m = 2r

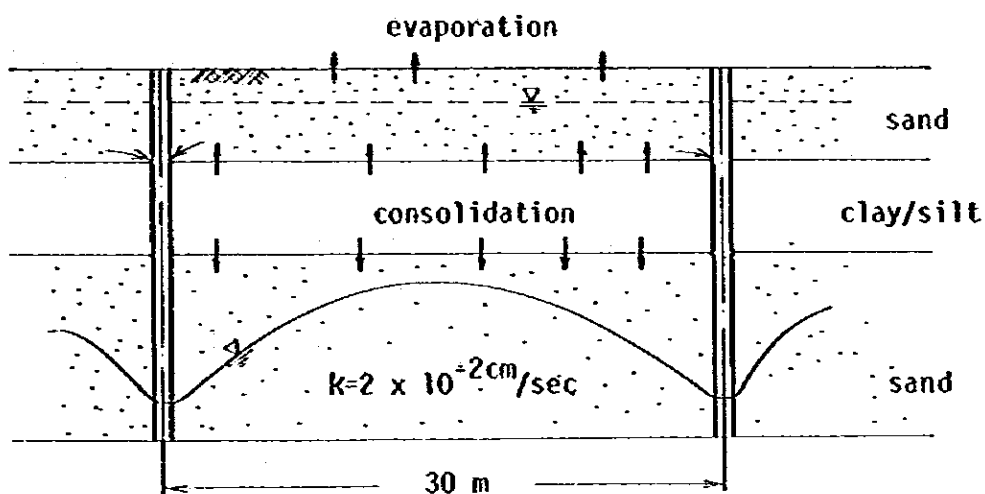
6) Depth of well : 20 m

7) Affective diameter of area: 500 m = R

8) Remaining height of water in wells: 2 m = h

9) Period of operation:  $t_{50} = 5.7$  months

$$t_{80} = 16 \text{ months}$$



ii) Quantity of pumping (Q)

$$k(H^2 - h_j^2) = \sum_{i=1}^n \frac{Q_i}{\pi} \ln \frac{R}{r_i} - \sum_{i=1}^n \frac{Q_i}{\pi} \ln \frac{r_{ij}}{r_i}$$

$$Q = 0.3 \text{ m}^3/\text{min}$$

where;  $r_1 = r_2 = \dots = r_n$ ,  $h_1 = h_2 = \dots = h_n$ ,

$Q_1 = Q_2 = \dots = Q_n$ , and

$$r_{ij} = \frac{\sqrt{2} + 2}{2} \times 30 = 51.21 \text{ m}$$

iii) Capacity of Pump and Diesel Generator

$$P_o = \frac{Q \times (2.0 \times 1.3)}{4.5 \times (1.5 \sqrt{2})} = 3.57 \text{ HP (max.)}$$

\* Submerged pump TS-6C 65 mm 3.7 kW

0.36 ~ 0.225 m<sup>3</sup>/min. 49.5 m ~ 28 m

\* Diesel Generator

$$2.7 \times 36 = 133.2 \text{ kW}$$

SDG150S 125/150 kW 200/400 V

361/180 A

iv) Timing of Operation

The operation is assumed to be continuous.

v) In Case of 50% Consolidation of Clay Layer

1) Excavation and Installation

$$\text{M\$1,220/m} \times 720 \text{ m} = 878,400$$

2) Pump

$$\text{M\$663/pump} \times 36 \times 5.7 \text{ months} = \text{M\$136,048}$$

3) Generator

$$\text{M\$6,000/month} \times 1 \times 5.7 = 34,200$$

4) Miscellaneous expenses	M\$6,000/month	} M\$11,000
Operation	M\$2,000/month	
Fuel, oil, etc.	M\$3,000/month	

$$11,000 \times 5.7 = 62,700$$

For 40,000 m<sup>2</sup> ... Total M\$1,111,348

$$\underline{\text{M\$28/m}^2}$$

vi) In Case of 80% Consolidation of Clay Layer

1) Same to t<sub>50</sub> = M\$878,400

2) 663 x 36 x 16 = M\$381,888

3) 6,000 x 1 x 16 = M\$96,000

4) 11,000 x 16 = M\$176,000

Total M\$1,532,288 for 40,000 m<sup>2</sup>

$$\underline{\text{M\$39/m}^2}$$

Table K-2 Cost of Ground Improvement of Soft Material (Unit Cost per 1 m)

(Refer Table 6-3)

Description Method	Lease of Machine	Operation	Transportation	Installation	Miscellaneous Expenses	Material	Total	Notes
Preloading	-	-	-	-	-	-	-	
Sand Drain (MS/m)	6.58	3.57	0.86	4.25	2.00	1.35	MS18.71/m	
Paper Drain (MS/m)	1.28	0.85	0.80	2.50	0.77	0.50	MS 6.70/m	
Fabric Drain (MS/m)	1.28	0.85	0.80	2.50	0.77	1.00	MS 7.70/m	
Wellpoint (MS/m/month)	228.97	28.70	86.56		44.75	-	MS388.98/m/month	Per unit length of header pipe, well point: 10 m deep
Deep Well (MS/m)	252.00	15.28	(76.25)		16.67	-	( - )	
Vibro-Red (MS/m)	10.49	5.85	1.17	4.50	2.86	1.80	MS26.67/m	
Vibro-floatation (MS/m)	10.28	8.03	1.08	4.50	3.11	1.80	MS28.80/m	
Sand Compaction Pile (MS/m)	16.45	9.18	1.73	4.72	4.00	4.50	MS40.58/m	
Dynamic Consolidation (MS/m <sup>2</sup> )	30.85	10.84	3.75	9.17	8.34	3.75	-	
Roller Compaction (MS/m <sup>2</sup> )	-	-	-	-	-	-	MS 1.0/m <sup>2</sup>	
Chemical CMC (Cement) (MS/m)	65.80	27.54	4.15	14.16	14.51	38.50	MS164.66/m	
Chemical DMX (Line)	65.80	27.54	4.15	14.16	14.51	23.10	MS149.26/m	
Full Excavation	-	-	-	-	-	-	MS 9/m <sup>3</sup>	

Table H-3 Cost of Ground Improvement for Soft Material (Type B ground, Medium and High Rise)

(Refer Table 6-3)

Description	Cost per 1m (MS/m)	Cost per 5m (MS)	Unit Cost per 1m <sup>2</sup> (MS/m <sup>2</sup> )	*2 1.5 x A (bldg) (MS/m <sup>2</sup> )	*2 Pre-loading 3xA (bldg) (MS/m <sup>2</sup> )	*1 + *2 (MS/m <sup>2</sup> )	Notes
Method							
Preloading	-	-	-	-	27.6	28	3m preloading
Sand Drain	18.71	93.55	23.39	35.09	27.6	63	Space of Drain 2m x 2m Square
Paper Drain	6.70	33.50	21.44	32.16	27.6	60	Space of Drain 1.25m x 1.25m Square
Fabric Drain	7.70	38.50	19.64	29.46	27.6	57	Space of Drain 1.4m x 1.4m Square
Wellpoint	-	-	-	-	-	78 (218)	( ) : t <sub>90</sub> = 16 months
Deep Well	-	-	-	-	-	28 (39)	
Vibro-Rod	26.67	133.35	33.34	50.01	-	50	Space of Pile 2m x 2m Square
Vibrofloatation	28.80	144.00	36.00	54.00	-	54	- ditto -
Sand Compaction Pile	40.58	202.90	50.73	76.10	-	76	- ditto -
Dynamic Consolidation	-	-	33.35	50.03	-	50	-
Roller Compaction	-	-	-	-	-	1	Shallow Depth only
Chemical CMC (Coment)	164.66	823.30	205.83	308.75	-	309	Space of Installation 2m x 2m Square
Chemical DLM (Lime)	149.26	746.30	186.58	279.87	-	280	
Full Excavation	-	-	-	-	-	-	

\*1 Thickness of Improvement = 5 m

\*2 See conditions in Notes.



Table H-4 Cost of Ground Improvement for Soft Material (Type C ground, Medium and High Rise)

(Refer Table 6-3)

Description	Cost per 1m (MS/M)	Cost per 5m (MS)	Unit Cost #1 per 1m <sup>2</sup> (MS/m <sup>2</sup> )	1.5 x A (bldg) (MS/M <sup>2</sup> )	Pre-loading 3 x A (bldg) (MS/m <sup>2</sup> )	① + ② (MS/m <sup>2</sup> )	Notes
Preloading	-	-	-	-	43.5	44	3m preloading
Sand Drain	18.71	93.55	23.39	35.09	43.5	79	Space of Drain 2m x 2m Square
Paper Drain	6.70	33.50	21.44	32.16	43.5	76	Space of Drain 1.25m x 1.25m Square
Fabric Drain	7.70	38.50	19.64	29.46	43.5	73	Space of Drain 1.4m x 1.4m Square
Wellpoint	-	-	-	-	-	-	-
Deep Well	-	-	-	-	-	-	-
Vibro-Rod	-	-	-	-	-	-	Space of Pile 2m x 2m Square
Vibrofloatation	-	-	-	-	-	-	- ditto -
Sand Compaction Pile	40.58	202.90	50.73	76.10	-	76	- ditto -
Dynamic Consolidation	-	-	-	-	-	-	-
Roller Compaction	-	-	-	-	-	-	Shallow Depth only
Chemical CXC (Cement)	164.66	823.30	205.83	308.75	-	309	Space of Installation 2m x 2m Square
Chemical DIX (Lime)	149.26	746.30	186.58	279.87	-	380	
Full Excavation	-	-	45	-	-	90	Area of Replacement = 2 x A (bldg)

#1 Thickness of Improvement = 5m

#2 See conditions in Notes.

Table H-5 Cost of Ground Improvement for Soft Material (Type D ground, Medium and High Rise)

(Refer Table 6-3)

Description	Cost per 1m (MS/m)	Cost per 10m (MS)	Unit Cost *1 per 1m <sup>2</sup> (MS/m <sup>2</sup> )	1.5 X A (bldg) (MS/m <sup>2</sup> )	Pre-loading 3xA (bldg) (MS/m <sup>2</sup> )	① + ② (MS/m <sup>2</sup> )	Notes
Preloading	-	-	-	-	46.5	47	3m preloading
Sand Drain	18.71	187.10	46.78	70.17	46.5	117	Space of Drain 2m x 2m Square
Paper Drain	6.70	67.00	42.88	64.32	46.5	111	Space of Drain 1.25m x 1.25m Square
Fabric Drain	7.70	77.00	39.29	58.94	46.5	105	Space of Drain 1.4m x 1.4m Square
Wellpoint	-	-	-	-	-	-	-
Deep Well	-	-	-	-	-	-	-
Vibro-Rod	-	-	-	-	-	-	-
Vibrofloatation	-	-	-	-	-	-	-
Sand Compaction Pile	40.58	405.80	101.45	152.18	-	152	-
Dynamic Consolidation	-	-	-	-	-	-	-
Roller Compaction	-	-	-	-	-	-	Shallow Depth only
Chemical CMC (Cement)	164.66	1646.60	411.65	617.48	-	617	Space of Installation 2m x 2m Square
Chemical DLM (Lime)	149.26	1492.60	373.15	559.73	-	560	- ditto -
Full Excavation	-	-	-	-	-	-	-

\*1 Depth of Improvement = 10m.

\*2 See conditions in Notes.

**H.2 Unit Cost of Foundations + Soft Ground Improvement**  
(Reference to Table 8-3 in Main Text)

Unit: M\$

**H.2.1 Ground Condition A**

**(1) Unit cost of Surface Compaction by Mechanical Compactor for Low-Rise Housing**

**a. Conditions**

- 1) Mechanical Compactor: 10 ton-class
- 2) Rental fee with a driver and fuel : M\$16,000/month  
(one month = 26 days)
- 3) One day is required to compact an area of 2,500 m<sup>2</sup> (50 m x 50 m) with 10 passes.
- 4) Surface cleaning, grubbing, etc. will also be performed.

**b. Cost per Unit Area**

- 1) Unit rate for surface compaction with mechanical compactor:  $(M\$16,000/26 \text{ days}) \times 1 \text{ day} / 2,500 \text{ m}^2 = M\$0.25/\text{m}^2$
- 2) Cost for surface cleaning, grubbing, etc. = M\$0.75/m<sup>2</sup>
- 3) Thus, cost for area preparation is:-  
 $M\$0.25 + M\$0.75 = M\$1.0/\text{m}^2$

**(2) Unit Cost of Direct Foundation + Compaction of Sand Layer for Medium-Rise Housing**

Unit cost of direct foundation + compaction of sand layer is summarized in Table H-6.

Table H-6 Unit Cost of Direct Foundation + Compaction of Sand Layer  
for Medium-Rise Housing

Soil Improvement Method	*1	Unit Costs of Lease of Machines, Operation, Transport, Installation and Miscellaneous Expenses	Material Unit Cost	Total Unit Cost	Required Unit Cost *2
1.3.1 Vibro Rod		MS24.9/m	MS1.8/m	MS26.7/m	{ (MS26.7 x 5m) ÷ 4m <sup>2</sup> } x 1.5 ÷ MS50/m <sup>2</sup>
1.3.2 Dynamic Consolidation		MS30.3/m <sup>2</sup>	MS3.0/m <sup>2</sup>	MS33.3/m <sup>2</sup>	MS33.3 x 1.5 ÷ MS50/m <sup>2</sup>
1.3.3 Vibro Floatation		MS27.0/m	MS1.8/m	MS28.8/m	{ (MS28.8 x 5m) ÷ 4m <sup>2</sup> } x 1.5 ÷ MS54/m <sup>2</sup>
1.3.4 Composer Pile		MS36.1/m	MS4.5/m	MS40.6/m	{ (MS40.6 x 5m) ÷ 4m <sup>2</sup> } x 1.5 ÷ MS76/m <sup>2</sup>
<p>(Notes) *1 Basis for Cost Estimation</p> <ul style="list-style-type: none"> <li>◦ Machine and equipment are assumed to be available in Kuala Lumpur.</li> <li>◦ Construction Area: 40,000 m<sup>2</sup>, Depth of Improvement: 5 m</li> <li>◦ Installation Pitch of 1.3.1, 1.3.3 and 1.3.4 is 2 m x 2 m square.</li> </ul> <p>*2 For above methods, it is necessary to improve the ground area equal to 1.5 times the floor area of building.</p>					

(3) Unit Cost of Pile + Surface Compaction for Medium-Rise Housing

a. Treated Timber Pile (6" sq.) + Surface Compaction

i) Condition and Assumption

1) Size of Treated Timber Pile

L = 10.5 m, 6" square

2) Unit Cost per Design Load and Length:

M\$0.8/ton·m

3) Structural Design Load:  $3.9 \text{ t/m}^2$

4) Unit cost of pile is calculated assuming 30% of additional piles are required that the number of piles calculated from the structural design load.

ii) Calculation of Unit Cost

1) Piling

\*Unit Cost of Pile

$$(3.9 \text{ t/m}^2 \times 1.3) \times 10.5 \text{ m} \times \text{M\$}0.8/\text{ton}\cdot\text{m} \\ = 5.07 \times 8.4 = \text{M\$}42.6/\text{m}^2$$

\*Unit Cost for Joint of Pile (one joint per pile)

$$(5.07 \text{ tons} \div 20 \text{ tons/pile}) \times \text{M\$}15/\text{joint} \\ = \text{M\$}3.8/\text{m}^2$$

2) Unit Cost of Surface Compaction:  $\text{M\$}1.0/\text{m}^2$

3) Total:  $\text{M\$}42.6/\text{m}^2 + \text{M\$}3.8/\text{m}^2 + 1.0/\text{m}^2 = \underline{\text{M\$}47.4/\text{m}^2}$

b. Steel Pile (30m Long: See Table 10-3b) + Surface Compaction

i) Condition and Assumption

- 1) Length of Steel Pile:  $L = 30 \text{ m}$
- 2) Unit Cost per Design Load and Length :  $\text{M}\$1.0/\text{ton}\cdot\text{m}$
- 3) Structural Design Load:  $3.9 \text{ t/m}^2$
- 4) Unit cost of pile is calculated assuming 30% of additional piles are required than the number of piles calculated from the structural design load.

ii) Calculation of Unit Cost

- 1) Unit Cost of Steel Pile  
 $(3.9 \text{ t/m}^2 \times 1.3) \times 30 \text{ m} \times \text{M}\$1.0/\text{ton}\cdot\text{m}$   
 $= 5.07 \times 30 = \text{M}\$152.1/\text{m}^2$
- 2) Unit Cost of Surface Compaction:  $\text{M}\$1.0/\text{m}^2$
- 3) Total:  $\text{M}\$152.1/\text{m}^2 + 1.0/\text{m}^2 = \underline{\text{M}\$153.1/\text{m}^2}$

(4) Unit Cost of Pile + Surface Compaction for High-Rise Housing

a. RC Pile + Surface Compaction

i) Condition and Assumption

- 1) Size of RC Pile:  $15'' \text{ sq.}, L = 11.5\text{m}$
- 2) Structural Design Load:  $16.75 \text{ tons/m}^2$
- 3) Unit Cost per Design Load and Length:  
 $\text{M}\$0.7/\text{ton}\cdot\text{m}$

- 4) Unit cost of pile is calculated assuming 30% of additional piles are required than the number of piles calculated from the structural design load.

ii) Calculation of Unit Cost

- 1) Unit Cost of RC (15" sq.) Pile  
 $(16.75 \text{ t/m}^2 \times 1.3) \times 11.5 \text{ m} \times \text{M\$}0.7/\text{ton}\cdot\text{m}$   
 $= \text{M\$}175.3/\text{m}^2$
- 2) Unit Cost of Surface Compaction:  $\text{M\$}1.0/\text{m}^2$
- 3) Total:  $\text{M\$}175.3 + \text{M\$}1.0 = \underline{\text{M\$}176.3/\text{m}^2}$

b. Steel Pile (30 m Long: see Table 10-3b) + Surface Compaction

i) Condition and Assumption

- 1) Length of Steel Pile:  $L = 30 \text{ m}$
- 2) Structural Design Load:  $16.75 \text{ tons/m}^2$
- 3) Unit Cost per Design Load and Length :  $\text{M\$}1.0/\text{ton}\cdot\text{m}$
- 4) Unit cost of pile is calculated assuming 30% of additional piles are required than the number of piles calculated from the structural design load.

ii) Calculation of Unit Cost

1) Unit Cost of Steel Pile

$$(16.75 \text{ t/m}^2 \times 1.3) \times 30 \text{ m} \times \text{M\$}1.0/\text{ton}\cdot\text{m} \\ = \text{M\$}653.3/\text{m}^2$$

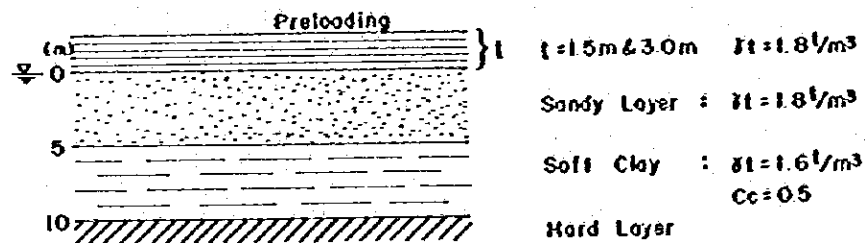
2) Unit Cost of Surface Compaction:  $\text{M\$}1.0/\text{m}^2$

3) Total:  $653.3 + 1.0 = \underline{\text{M\$}653.3/\text{m}^2}$



H.2.2 Ground Condition B(1) Unit Cost of Preloading + Surface Compactiona. Conditions

## 1) Soil Conditions



$e \sim \log p$  curve of SBH-2, UD-4 is used for the calculation of consolidation settlement.

## 2) Calculation of Settlement

In case of  $t = 1.5 \text{ m}$

$$P_0 = (1.8 - 1.0) \times 5 + (1.6 - 1.0) \times 2.5 \\ = 5.5 \text{ t/m}^2 \rightarrow e_0 = 1.40$$

$$P_1 = 5.5 + (1.8 \times 1.5) = 8.2 \text{ t/m}^2 \rightarrow e_1 = 1.34$$

$$\therefore S = \frac{1.40 - 1.34}{1 + 1.40} \times 500 = 12.5 \text{ cm} \rightarrow 15 \text{ cm}$$

In case of  $t = 3.0 \text{ m}$

$$P_0 = 5.5 \text{ t/m}^2 \rightarrow e_0 = 1.40$$

$$P_1 = 5.5 + (1.8 \times 3.0) = 10.9 \text{ t/m}^2 \rightarrow e_1 = 1.30$$

$$\therefore S = \frac{1.40 - 1.30}{1 + 1.40} \times 500 = 21 \text{ cm} \rightarrow 25 \text{ cm}$$

b. Unit Cost of Preloading (t = 1.5 m) + SurfaceCompaction for Low-Rise Housing

- 1) Grubbing, Clearing, Spreading Earth and  
Surface Compaction:  $M\$1.0/m^2$
- 2) Loss of Material (Normal earth) due to Settlement:  
 $0.15 \text{ m} \times M\$6/m^3 = M\$0.9/m^2$
- 3) Other Loss of Material:  $0.20 \text{ m} \times M\$6/m^3 = M\$1.2/m^2$
- 4) Transportation for Transferring Preloading Material  
to Next Site:  $1.35 \text{ m}^3/m^2 \times M\$2/m^3 = M\$2.7/m^2$
- 
- Total : 1) + ... + 4)  $= M\$5.8/m^2$

- 5) Unit Cost for 3 times the Floor Area of Low Rise [1F]  
House:  $M\$5.8/m^2 \times 3 = M\$17.4/m^2$

c. Unit Cost of Treated Timber Pile (6" Sq.) + Preloading  
(t=3.0m) + Surface Compaction for Medium Rise Housing

## 1) Unit Cost of Treated Timber Pile (6" Sq.)

Same to the unit cost of treated timber pile (6" Sq.)  
calculated at ii) in a. on page H-14:

$$M\$42.6/m^2 + M\$3.8/m^2 = M\$46.4/m^2$$

## 2) Earth Work

- i) For Grubbing, Clearing, Spreading Earth and Surface Compaction:

$$\text{M\$1.0/m}^2$$

- ii) Loss of Material (Normal earth) due to Settlement:

$$0.25 \text{ m} \times \text{M\$6/m}^3 = \text{M\$1.5/m}^2$$

- iii) Other Loss of Material:

$$0.20 \text{ m} \times \text{M\$6/m}^3 = \text{M\$1.2/m}^2$$

- iv) Transportation for Transferring Preloading Material to Next Site:

$$2.75 \text{ m}^3/\text{m}^2 \times \text{M\$2/m}^2 = \text{M\$5.5/m}^2$$

---


$$\text{Total} = \text{M\$9.2/m}^2$$

- v) Unit Cost for 3 times of the Floor Area of Medium Size [5F] Building:

$$\text{M\$9.2} \times 3 = \text{M\$27.6/m}^2$$

- 3) Total: 1) + 2) =  $\text{M\$46.4/m}^2 + \text{M\$27.6/m}^2 = \underline{\text{M\$74.0/m}^2}$

d. Unit Cost of RC Pile (15" Sq.) + Preloading (t=3.0m) + Surface Compaction

- 1) Unit Cost of RC Pile (15" Sq.)

Same to the unit cost of RC (15" Sq.) Pile calculated at ii) on page H-16:  $\text{M\$175.3/m}^2$

- 2) Unit Cost of Preloading + Surface Compaction

Same to the unit cost of earth work calculated at 2) in c. on this page :  $\text{M\$27.6/m}^2$

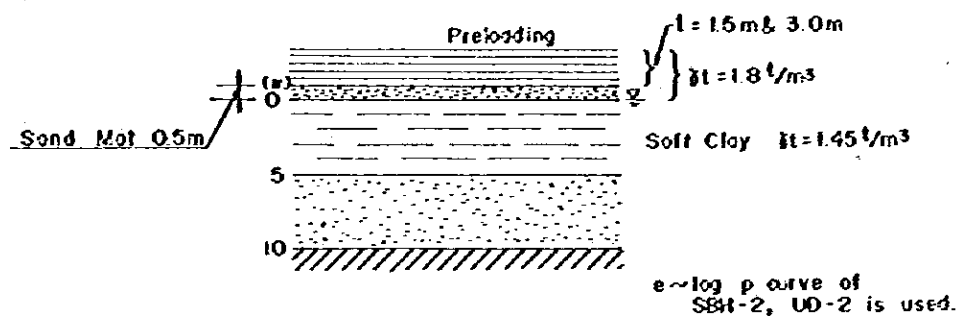
- 3) Total: 1) + 2) =  $\text{M\$175.3/m}^2 + \text{M\$27.6/m}^2 = \underline{\text{M\$202.9/m}^2}$

### H.2.3 Ground Condition C

#### (1) Unit Cost of Sand Mat (t = 0.5 m) + Surface Soil (with Surface Compaction) + Preloading

##### a. Conditions

##### 1) Soil Conditions



##### 2) Calculation of Settlement

In case of  $t = 0.5 \text{ m} + 1.5 \text{ m} = 2 \text{ m}$

$$P_0 = (1.45 - 1.0) \times 2.5 = 1.125 \text{ t/m}^2 \rightarrow e_0 = 2.23$$

$$P_1 = 1.125 + 1.8 \times 2.0 = 4.73 \text{ t/m}^2 \rightarrow e_1 = 1.79$$

$$\therefore S = \frac{2.23 - 1.79}{1 + 2.23} \times 500 \approx 70 \text{ cm}$$

In case of  $t = 0.5 + 3.0 \text{ m} = 3.5 \text{ m}$

$$P_0 = 1.125 \text{ t/m}^2 \rightarrow e_0 = 2.23$$

$$P_1 = 1.125 + 1.8 \times 3.5 = 7.43 \text{ t/m}^2 \rightarrow e_1 = 1.64$$

$$\therefore S = \frac{2.23 - 1.64}{1 + 2.23} \times 500 = 91 \text{ cm} \rightarrow 95 \text{ cm}$$

b. Unit Cost for Low-Rise Housing

1) Grubbing, Clearing, Spreading Earth and Surface

Compaction:  $M\$1.0/m^2$

2) Loss of Materials due to Settlement:

$\{ 0.5m \text{ (Sand)} \times \$9/m^3 \} + \{ 0.2m \text{ (Normal earth)} \times M\$6/m^2 \}$   
 $= M\$5.7/m^2$

3) Other Loss of Material:  $0.2 m \times M\$6/m^3 = M\$1.2/m^2$

4) Transportation for Transferring Preloading Material

to Next Site:  $1.35 m^3/m^2 \times M\$2/m^3 = M\$2.7m^2$

---

Total of 1) + ... + 4)  $= M\$10.6/m^2$

5) Unit Cost for 3 times the Floor Area of Low Rise [1F]

House:  $M\$10.6/m^2 \times 3 = M\$31.8/m^2$

c. Unit Cost of Sand Mat + Surface Soil (with Surface Compaction) + Preloading for Medium Rise Housing

1) Unit Cost of Timber Pile [6" Sq.]

Same to the unit cost of timber pile [6" Sq.] shown at

ii) in a. on page H-14:  $42.6 + 3.8 = M\$46.4/m^2$

## 2) Earth Work

- i) Grubbing, Clearing, Spreading Earth and Surface Compaction:

$$\text{M\$1.0/m}^2$$

- ii) Loss of Materials due to Settlement:

$$\begin{aligned} & \{0.5 \text{ m (Sand)} \times \text{M\$9/m}^3\} \\ & + \{0.45 \text{ m (Normal earth)} \times \text{M\$6/m}^3\} = \text{M\$7.2/m}^2 \end{aligned}$$

- iii) Other Loss of Material:  $0.2 \text{ m} \times \text{M\$6/m}^3 = \text{M\$1.2/m}^2$

- iv) Transportation for Transferring Preloading Material to Next Site:

$$2.55 \text{ m}^3/\text{m}^2 \times \text{M\$2/m}^3 = \text{M\$5.1/m}^2$$

---

Total

$$\text{M\$14.5/m}^2$$

- v) Unit Cost for 3 times the Floor Area of Medium Rise Housing

$$\text{M\$14.5/m}^2 \times 3 = \text{M\$43.5/m}^2$$

- 3) Total: 1) + 2)

$$\text{M\$46.4/m}^2 + \text{M\$43.5/m}^2 = \underline{\text{M\$89.9/m}^2}$$

d. Unit Cost of Replacement for Medium Rise Housing

- 1) Excavation of Soft Clay:

$$\text{M\$0.8/m}^3 \times 5 \text{ m}^3/\text{m}^2 = \text{M\$4/m}^2$$

- 2) Transportation for Removal of Soft Clay:

$$\text{M\$2.0/m}^3 \times 5 \text{ m}^3/\text{m}^2 = \text{M\$10/m}^2$$

- 3) Filling Material:  $\text{M\$6/m}^3 \times 5 \text{ m}^3/\text{m}^2 = \text{M\$30/m}^2$

- 4) Compaction:  $\text{M\$1/m}^2$

---


$$\text{Total of 1) + ... + 4) } \quad \text{M\$45/m}^2$$

5) Unit Cost of Replacement for 2 times the Floor Area  
of Building: M\$90/m<sup>2</sup>

e. Unit Cost of Pile + Sand Mat (t = 0.5 m) + Surface Soil  
(with Surface Compaction) + Preloading (t = 3.0 m) for  
High Rise Housing

1) Unit Cost of RC (15" Sq.) Pile

Same to the unit cost of RC (15" Sq.) pile shown at  
ii) in a. on page H-16: M\$175.3/m<sup>2</sup>

2) Unit Cost of Sand Mat + Surface Soil (with Surface  
Compaction) + Preloading

Same to the unit cost for earth work shown at v)  
in 2) on page H-23: M\$43.5/m<sup>2</sup>

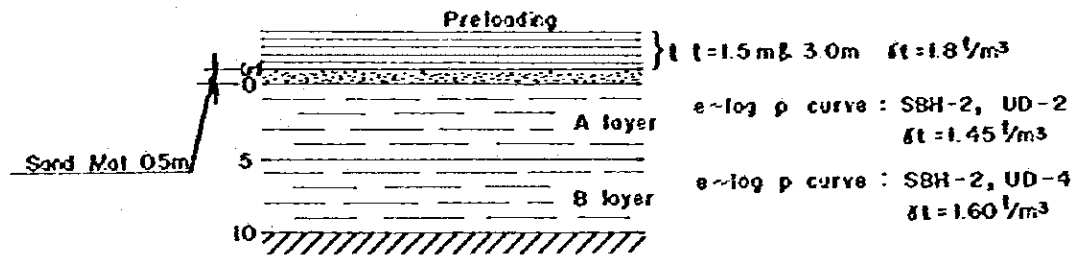
3) Total: 1) + 2) = M\$218.8/m<sup>2</sup>

H.2.4 Ground Condition D

(1) Unit Cost of Sand Mat (t = 0.5 m) + Surface Soil (with Surface Compaction) + Preloading

a. Conditions

1) Soil Conditions



2) Calculation of Settlement

In case of  $t = 0.5 + 1.5 = 2.0$  m

For A layer

$$P_0 = (1.45 - 1.0) \times 2.5 = 1.125 \text{ t/m}^2 \rightarrow e_0 = 2.23$$

$$P_1 = 1.125 + 1.8 \times 2.0 = 4.73 \text{ t/m}^2 \rightarrow e_1 = 1.79$$

$$S_A = \frac{2.23 - 1.79}{1 + 2.23} \times 500 = 70 \text{ cm}$$

For B layer

$$P_0 = (1.45 - 1.0) \times 5.0 + (1.6 - 1.0) \times 2.5 = 3.75 \text{ t/m}^2 \rightarrow e_0 = 1.44$$

$$P_1 = 3.75 + (1.8 \times 2.0) = 7.35 \text{ t/m}^2 \rightarrow e_1 = 1.36$$

$$S_B = \frac{1.44 - 1.36}{1 + 1.44} \times 500 = 16 \text{ cm}$$

$$S = S_A + S_B = 85 \text{ cm}$$



In case of  $t = 0.5 + 3.0 = 3.5$  m

For A layer

$$P_0 = 1.125 \text{ t/m}^2 \rightarrow e_0 = 2.23$$

$$P_1 = 1.125 + 1.8 \times 3.5 = 7.43 \text{ t/m}^2 \rightarrow e_1 = 1.64$$

$$S_A = \frac{2.23 - 1.64}{1 + 2.23} \times 500 = 91 \text{ cm}$$

For B layer

$$P_0 = 3.75 \text{ t/m}^2 \rightarrow e_0 = 1.44$$

$$P_1 = 3.75 + (1.8 \times 3.5) = 10.05 \rightarrow e_1 = 1.31$$

$$S_B = \frac{1.44 - 1.31}{1 + 1.44} \times 500 = 27 \text{ cm}$$

$$S = S_A + S_B \div 120 \text{ cm}$$

b) Unit Cost for Low Rise Housing

1) Grubbing, Clearing, Spreading Earth and Surface

Compaction: M\$1.0/m<sup>2</sup>

2) Loss of Material due to Settlement:

$$(0.5 \text{ m} \times \text{M}\$9/\text{m}^3) + (0.35 \text{ m} \times \text{M}\$6/\text{m}^3) = \text{M}\$6.6/\text{m}^2$$

3) Other Loss of Material:  $0.2 \text{ m} \times \text{M}\$6/\text{m}^3 = \text{M}\$1.2/\text{m}^2$

4) Transportation for Transferring Preloading Material

to Next Site:  $1.15 \text{ m} \times \text{M}\$2/\text{m}^3 = \text{M}\$2.3/\text{m}^2$

---

Total M\$11.1/m<sup>2</sup>

5) Unit Cost for 3 times the Floor Area of Low Rise

Housing:  $\text{M}\$11.1/\text{m}^2 \times 3 \div \text{M}\$33.3/\text{m}^2$

c. Unit Cost for Medium Rise Housing

1) Unit Cost of Timber Pile [6" Sq.]

Same to the unit cost of timber pile (6" Sq.) shown at ii) in a on page H-14:  $M\$46.4/m^2$

2) Earth Work

i) Grubbing, Clearing, Spreading Earth and Surface Compaction:

$M\$1.0/m^2$

ii) Loss of Material due to Settlement:

$$(0.5 \text{ m} \times M\$9) + (0.7 \text{ m} \times M\$6) = M\$8.7/m^2$$

iii) Other Loss of Material:  $0.2 \text{ m} \times M\$6/m^3 = M\$1.2/m^2$

iv) Transportation for Transferring Preloading Material to Next Site:

$$2.3 \text{ m}^3/m^2 \times M\$2/m^3 = M\$4.6/m^2$$

---

Total

$M\$15.5/m^2$

v) Unit Cost for 3 times the Floor Area of Medium Rise Housing

$$M\$15.5 \times 3 = M\$46.5/m^2$$

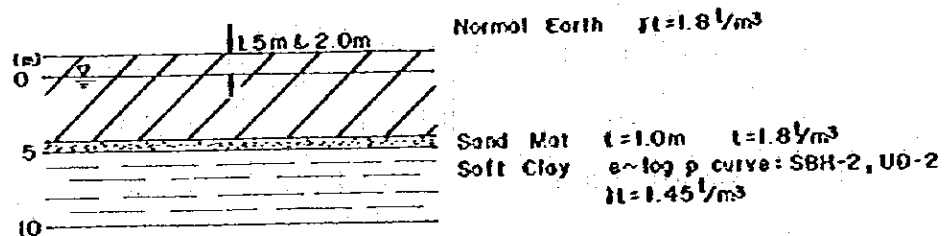
3) Total:  $1) + 2) = M\$46.4/m^2 + M\$46.5/m^2 = \underline{M\$92.9/m^2}$

H.2.5 Ground Condition E

(1) Unit Cost of Sand Mat + Normal Earth (with Surface Compaction)

a. Conditions

1) Soil Conditions



2) Settlement

In case of  $t = 1.0$  m (Sand) +  $5.5$  m (Normal earth) =  $6.5$  m

$$P_0 = (1.45 - 1.0) \times 2.5 = 1.125 \text{ t/m}^2 \rightarrow e_0 = 2.11$$

$$P_1 = 1.125 + (1.8 \times 1.5) + (1.8 - 1.0) \times 5$$

$$\rightarrow e_1 = 1.62$$

$$S = \frac{2.11 - 1.62}{1 + 2.11} \times 500 \approx 80 \text{ cm}$$

In case of  $t = 1.0$  m +  $6.0$  m =  $7.0$  m

$$P_0 = (1.45 - 1.0) \times 2.5 = 1.125 \text{ t/m}^2 \rightarrow e_0 = 2.11$$

$$P_1 = 1.125 + (1.8 \times 2) + (1.8 - 1.0) \times 5 = 8.725 \text{ t/m}^2$$

$$\rightarrow e_1 = 1.59$$

$$S = \frac{2.11 - 1.59}{1 + 2.11} \times 500 \approx 85 \text{ cm}$$

b. Unit Cost for Low Rise Housing

- 1) Spreading Earth, Surface Compaction: M\$1.0/m<sup>2</sup>
- 2) Sand Mat:  $1.0 \text{ m}^3/\text{m}^2 \times \text{M}\$9/\text{m}^3 = \text{M}\$9.0/\text{m}^2$
- 3) Normal Earth for Fill:  
 $4.0 \text{ m}^3/\text{m}^2 \times \text{M}\$6/\text{m}^3 = \text{M}\$24.0/\text{m}^2$
- 4) Loss of Material due to Settlement:  
 $0.80 \text{ m} \times \text{M}\$6/\text{m}^3 = \text{M}\$4.8/\text{m}^2$
- 5) Other Loss of Material:  
 $0.20 \text{ m} \times \text{M}\$6/\text{m}^3 = \text{M}\$1.2/\text{m}^2$
- 6) Transportation for Transferring Preloading Material  
to Next Site:  $0.5 \text{ m} \times \text{M}\$2/\text{m}^3 = \text{M}\$1.0/\text{m}^2$

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 Total
M\$41.0/m<sup>2</sup>

- 7) Unit Cost for 3 times the Floor Area of Low Rise  
 Housing  $\text{M}\$41.0/\text{m}^2 \times 3 = \underline{\text{M}\$123.0/\text{m}^2}$

c. Unit Cost for Medium Rise Housing

## 1) Unit Cost of Timber Pile [6" Sq.]

Same to the unit cost of timber pile (6" Sq.) shown at ii) in a on page H-14:  $M\$46.4/m^2$

## 2) Earth Work

i) Spreading Earth, Surface Compaction:  $M\$1.0/m^2$

ii) Sand Mat:  $1.0 m^3/m^2 \times M\$9/m^3 = M\$9.0/m^2$

iii) Normal Earth for Fill:

$4.0 m^3/m^2 \times M\$6/m^3 = M\$24.0/m^2$

iv) Loss of Material due to Settlement:

$0.85 m \times M\$6/m^3 = M\$5.1/m^2$

v) Other Loss of Material:

$0.2 m \times M\$6/m^3 = M\$1.2/m^2$

vi) Transportation for Transferring Preloading Material

to Next Site:  $0.95 m \times M\$2/m^3 = M\$1.9/m^2$

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Total  $M\$42.2/m^2$

vii) Unit Cost for 3 times the Floor Area:

$M\$42.2/m^2 \times 3 = M\$126.6/m^2$

3) Total : 1) + 2) =  $46.4 + 126.6 = M\$173.0/m^2$

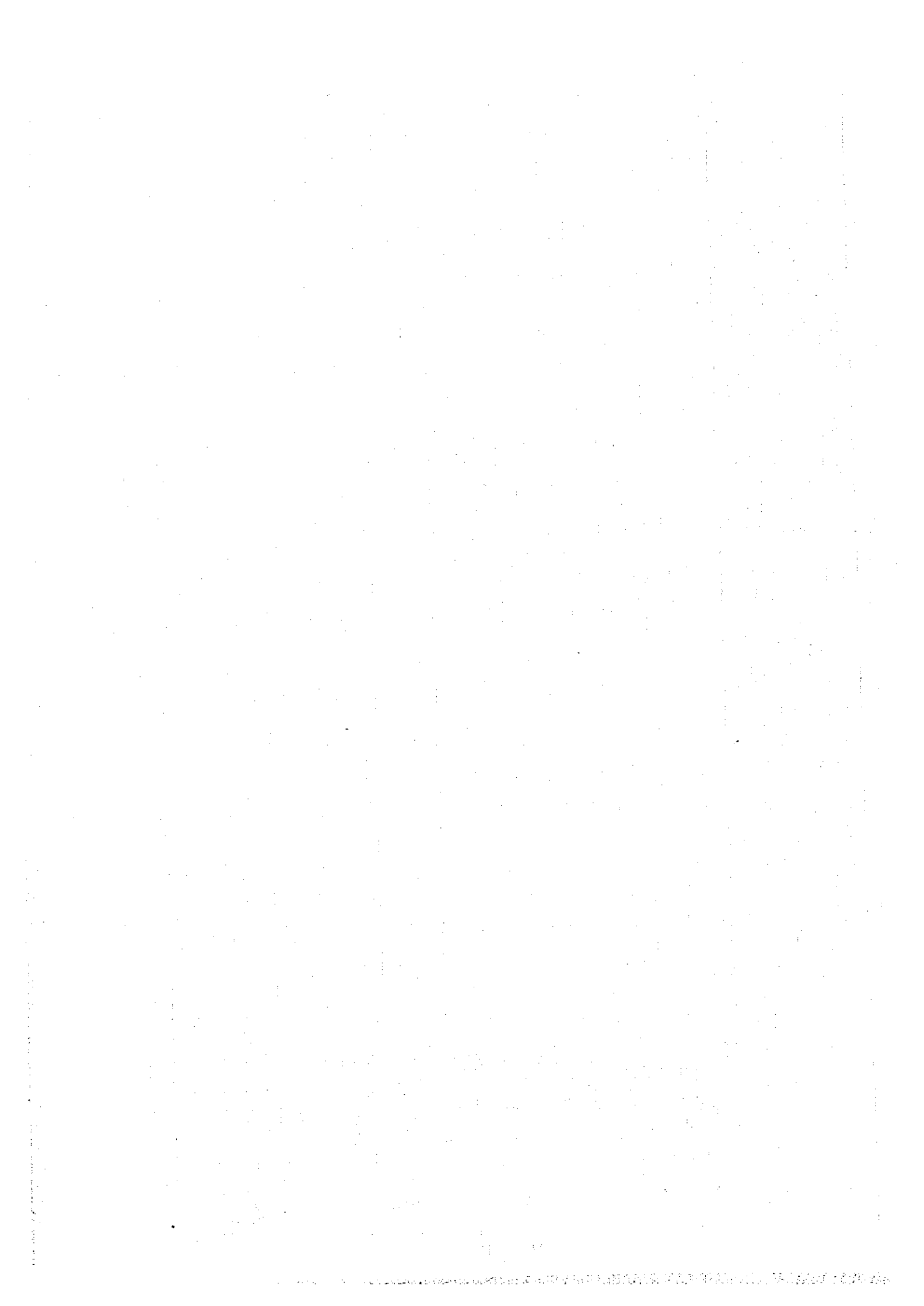
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Unit costs of pile foundations and ground improvement methods other than preloading are summarised in Table H-7.

Table H-7 Cost of Pile Foundation and Ground Improvement

① Size of Structure	② Structural Design Load	③ Type of Foundation/ Ground Improvement Method	④ Applied for Ground Condi- tion	Cost for Pile Foundation						Cost for Ground Improvement*1				⑮ Unit Cost of ⑩ or ⑬ per Floor Area of Building (MS/m <sup>2</sup> )	Remarks		
				⑤ Length of pile (m)	⑥ Unit Cost (MS/ m)	⑦ ② x ⑤ x ⑥ (MS/m <sup>2</sup> )	⑧ ⑦ x 1.3 Cost for 1.3xA(bldg) (MS/m <sup>2</sup> )	⑨ Cost for Joint (MS/m <sup>2</sup> )	⑩ ⑧ + ⑨ (MS/m <sup>2</sup> )	⑪ Thick- ness of Improve- ment (m)	⑫ Unit Cost per Length (MS/m)	⑬ Unit Cost per Area (MS/m <sup>2</sup> )	⑭ Cost for 1.5 or 2.0 (MS/m <sup>2</sup> )				
Low-Rise Housing [1F]	0.72 t/m <sup>2</sup>	Direct Foundation (+Preloading) <sup>*2</sup>	A, B, C, D, E	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Medium-Rise Housing [5F]	3.90 t/m <sup>2</sup>	Direct Founda- tion + Ground Improvement															
		1) Vibro-Rod	A	-	-	-	-	-	-	5	6.67	33.34	50.01	50.0	50.0	1.5 times the Floor Area of Building Refer Table H-2	
		2) Dynamic Consolida- tion	A	-	-	-	-	-	-	5	-	33.35	50.03	50.0	50.0		
		3) Vibro- floatation	A	-	-	-	-	-	-	5	7.20	36.00	54.00	54.0	54.0		
		4) Sand Compac- tion Pile	A	-	-	-	-	-	5	10.15	50.73	76.10	76.1	76.1			
		Direct Foundation + Replacement	C	-	-	-	-	-	-	5	9.00	45.00	90.00	90.0	90.0	2 times the Floor Area of Building	
High-Rise Housing [18F]	16.75 t/m <sup>2</sup>	Pile Foundation (+Preloading) <sup>*2</sup>															
		1) Treated Timber Pile	A, B, C, D, E	10.5	0.8	32.8	42.6	3.8	46.4	-	-	-	-	46.4	46.4	1 joint/ pile	
		2) Steel Pile		30.0	1.0	117.0	152.1	-	152.1	-	-	-	-	152.1	152.1		
		Pile Foundation (+Preloading) <sup>*2</sup>															
		1) Steel Pile	A, B, C, D, E	13.0 30.0	1.0 1.0	217.8 502.5	283.1 653.3	-	283.1 653.3	-	-	-	-	283.1 653.3	283.1 653.3		
		2) RC Pile	A, B, C, D, E	11.5	0.7	134.8	175.3	-	175.3	-	-	-	-	175.3	175.3		

\*1 Without Grubbing, Clearing, Spreading Surface Compaction, Preloading and Filling  
\*2 Refer Table H-1  
\*3 See Remarks  
\*4 Either ⑩ or ⑬ will be employed.



**資料 I 財務・經濟分析詳細計算結果**

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Case		Ground type	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1		A	3.0%	Sole	Low cost	Low-rise		
Year	Expenditure				Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	23291	349	23640	0	0	0	-23640
2	1982	0	728	728	26140	855	27079	26351
3	1983	0	0	0	0	0	227	26578
4	1984	0	0	0	0	0	217	26795
5	1985	0	0	0	0	0	203	27098
6	1986	0	0	0	0	0	251	27349
7	1987	0	0	0	0	0	269	27618
8	1988	0	0	0	0	0	290	27908
9	1989	0	0	0	0	0	311	28219
10	1990	0	0	0	0	0	335	28554
11	1991	0	0	0	0	0	358	28912
12	1992	0	0	0	0	0	387	29299
13	1993	0	0	0	0	0	416	29715
14	1994	0	0	0	0	0	447	30162
15	1995	0	0	0	0	0	480	30642
16	1996	0	0	0	0	0	516	31158
17	1997	0	0	0	0	0	555	31713
18	1998	0	0	0	0	0	597	32310
19	1999	0	0	0	0	0	641	32951
20	2000	0	0	0	0	0	688	33639
21	2221	0	0	0	0	0	741	34380

Case		Ground Type	Interest rate	Ownership	Price policy	Structure	M\$1,000	
2		A	3.0%	Sole	Commercial	Low-rise		
Year	Expenditure				Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	23291	349	23640	0	0	0	-23640
2	1982	0	728	728	42167	1445	43612	19972
3	1983	0	0	0	42162	2894	45056	64328
4	1984	0	0	0	0	4874	4874	69202
5	1985	0	0	0	0	5186	5186	74388
6	1986	0	0	0	0	5575	5575	79963
7	1987	0	0	0	0	5993	5993	85956
8	1988	0	0	0	0	6462	6462	92368
9	1989	0	0	0	0	6925	6925	99293
10	1990	0	0	0	0	7445	7445	106738
11	1991	0	0	0	0	8283	8283	114921
12	1992	0	0	0	0	8583	8583	123504
13	1993	0	0	0	0	9248	9248	132652
14	1994	0	0	0	0	9942	9942	142394
15	1995	0	0	0	0	10668	10668	152762
16	1996	0	0	0	0	11489	11489	163851
17	1997	0	0	0	0	12351	12351	175602
18	1998	0	0	0	0	13277	13277	188079
19	1999	0	0	0	0	14273	14273	201252
20	2000	0	0	0	0	15344	15344	215196
21	2221	0	0	0	0	16494	16494	230690

Case		Ground Type	Interest rate	Ownership	Price policy	Structure	M\$1,000	
3		A	3.0%	Rental	Low cost	Low-rise		
Year	Expenditure				Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	23291	349	23640	0	0	0	-23640
2	1982	865	722	1627	1728	59	1787	-24508
3	1983	915	718	1633	1728	59	1787	-25326
4	1984	846	713	1608	1728	59	1787	-26178
5	1985	978	718	1683	1728	59	1787	-27079
6	1986	1012	728	1719	1728	59	1787	-28011
7	1987	1246	728	1752	1728	59	1787	-28975
8	1988	1852	725	1787	1728	59	1787	-29975
9	1989	1118	728	1824	1728	59	1787	-31012
10	1990	1156	728	1854	1728	59	1787	-32083
11	1991	1196	711	1826	1728	59	1787	-33228
12	1992	1226	715	1851	1728	59	1787	-34371
13	1993	1278	728	1893	1728	59	1787	-35533
14	1994	1322	727	1949	1728	59	1787	-36744
15	1995	1357	725	2012	1728	59	1787	-38012
16	1996	1413	746	2155	1728	59	1787	-39332
17	1997	1451	758	2219	1728	59	1787	-40703
18	1998	1511	772	2283	1728	59	1787	-42122
19	1999	1582	757	2358	1728	59	1787	-43591
20	2000	1636	805	2412	1728	59	1787	-45104
21	2221	1676	815	2491	1728	59	1787	-46667

Case		Ground type	Interest rate	Ownership	Price policy	Structure	M\$1,000	
4		A	3.0%	Rentol	Commercial	Low-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	23731	369	24100	0	0	0	-24100
2	1982	285	722	1007	2772	55	2827	-7281
3	1983	915	635	1550	5544	151	5695	-18246
4	1984	546	552	1098	5544	191	5735	-14819
5	1985	978	435	1413	5544	191	5735	-3659
6	1986	1012	206	1218	5544	191	5735	-5282
7	1987	1046	174	1222	5544	191	5735	-767
8	1988	1082	38	1121	5544	191	5735	3845
9	1989	1118	17	1135	5544	479	6023	8734
10	1990	1156	17	1174	5544	846	6390	13950
11	1991	1196	18	1214	5544	1237	6781	19517
12	1992	1236	19	1255	5544	1654	7198	25461
13	1993	1278	19	1298	5544	2100	7644	31807
14	1994	1322	20	1342	5544	2576	8120	38505
15	1995	1367	21	1387	5544	2935	8629	45627
16	1996	1413	21	1434	5544	3628	9172	53154
17	1997	1461	22	1483	5544	4228	9752	61183
18	1998	1511	23	1534	5544	4828	10372	70711
19	1999	1562	23	1586	5544	5491	11035	81728
20	2000	1616	24	1640	5544	6208	11744	94224
21	2001	1672	25	1695	5544	6957	12501	108232
		-11264						112398

Case		Ground Type	Interest rate	Ownership	Price policy	Structure	M\$1,000	
5		A	7.5%	Sale	Low cost	Low-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	23731	873	24604	0	0	0	-24604
2	1982	0	1812	1812	26160	893	27053	1022
3	1983	0	0	0	0	88	88	1141
4	1984	0	0	0	0	86	86	1227
5	1985	0	0	0	0	92	92	1319
6	1986	0	0	0	0	99	99	1418
7	1987	0	0	0	0	106	106	1524
8	1988	0	0	0	0	114	114	1639
9	1989	0	0	0	0	123	123	1762
10	1990	0	0	0	0	132	132	1894
11	1991	0	0	0	0	142	142	2036
12	1992	0	0	0	0	153	153	2188
13	1993	0	0	0	0	164	164	2353
14	1994	0	0	0	0	176	176	2529
15	1995	0	0	0	0	188	188	2719
16	1996	0	0	0	0	204	204	2923
17	1997	0	0	0	0	219	219	3142
18	1998	0	0	0	0	236	236	3377
19	1999	0	0	0	0	253	253	3631
20	2000	0	0	0	0	272	272	3903
21	2001	0	0	0	0	293	293	4196

Case		Ground Type	Interest rate	Ownership	Price policy	Structure	M\$1,000	
6		A	7.5%	Sale	Commercial	Low-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	23731	873	24604	0	0	0	-24604
2	1982	0	1812	1812	42162	1449	43611	17635
3	1983	0	0	0	42162	2772	46934	62569
4	1984	0	0	0	0	4693	4693	67261
5	1985	0	0	0	0	5045	5045	72306
6	1986	0	0	0	0	5423	5423	77729
7	1987	0	0	0	0	5830	5830	83558
8	1988	0	0	0	0	6267	6267	89825
9	1989	0	0	0	0	6737	6737	96562
10	1990	0	0	0	0	7242	7242	103804
11	1991	0	0	0	0	7785	7785	111589
12	1992	0	0	0	0	8369	8369	119959
13	1993	0	0	0	0	8997	8997	128956
14	1994	0	0	0	0	9672	9672	138627
15	1995	0	0	0	0	10397	10397	148924
16	1996	0	0	0	0	11177	11177	160701
17	1997	0	0	0	0	12015	12015	172216
18	1998	0	0	0	0	12916	12916	185133
19	1999	0	0	0	0	13885	13885	199217
20	2000	0	0	0	0	14926	14926	213944
21	2001	0	0	0	0	16046	16046	229990

		Case	Ground type	Interest rate	Ownership	Price policy	Structure		
		7	A	7.6%	Rental	Low cost	Low-Rise	M\$1,000	
Year		Expenditure			Revenue				
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	Financial Balance	
1	1981	25251	875	26126	0	0	0	-26126	
2	1982	865	1846	2731	1728	59	1787	-25108	
3	1983	915	1917	2832	1728	59	1787	-25153	
4	1984	946	1997	2943	1728	59	1787	-27308	
5	1985	978	2085	3053	1728	59	1787	-26584	
6	1986	1012	2182	3193	1728	59	1787	-23958	
7	1987	1045	2268	3335	1728	59	1787	-31537	
8	1988	1082	2426	3487	1728	59	1787	-33237	
9	1989	1118	2535	3653	1728	59	1787	-35103	
10	1990	1156	2676	3832	1728	59	1787	-37148	
11	1991	1196	2831	4027	1728	59	1787	-39387	
12	1992	1236	3000	4237	1728	59	1787	-41837	
13	1993	1278	3185	4464	1728	59	1787	-44513	
14	1994	1322	3388	4710	1728	59	1787	-47435	
15	1995	1367	3605	4976	1728	59	1787	-50524	
16	1996	1413	3838	5263	1728	59	1787	-54108	
17	1997	1461	4112	5574	1728	59	1787	-57885	
18	1998	1511	4398	5909	1728	59	1787	-62868	
19	1999	1562	4723	6272	1728	59	1787	-68132	
20	2000	1616	5048	6663	1728	59	1787	-73688	
21	2001	1678	5415	7086	1728	59	1787	-79583	
		-11364							

		Case	Ground type	Interest rate	Ownership	Price policy	Structure		
		8	A	7.5%	Rental	Commercial	Low-Rise	M\$1,000	
Year		Expenditure			Revenue				
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	Financial Balance	
1	1981	25231	875	26106	0	0	0	-26106	
2	1982	865	1846	2731	2772	55	2827	-24028	
3	1983	915	1836	2751	5544	191	5735	-21045	
4	1984	946	1814	2560	5544	191	5735	-17878	
5	1985	978	1877	2355	5544	191	5735	-14631	
6	1986	1012	1125	2136	5544	191	5735	-10893	
7	1987	1045	855	1922	5544	191	5735	-7868	
8	1988	1082	578	1652	5544	191	5735	-2377	
9	1989	1118	265	1384	5544	191	5735	1374	
10	1990	1156	43	1208	5544	294	5838	6012	
11	1991	1196	45	1241	5544	641	6185	18556	
12	1992	1236	45	1283	5544	1812	6556	16230	
13	1993	1278	49	1326	5544	1428	6992	21855	
14	1994	1322	58	1371	5544	1838	7374	27859	
15	1995	1367	51	1418	5544	2288	7824	34264	
16	1996	1413	53	1466	5544	2768	8304	41102	
17	1997	1461	55	1516	5544	3273	8817	48403	
18	1998	1511	57	1568	5544	3821	9365	56208	
19	1999	1562	59	1621	5544	4405	9950	64528	
20	2000	1616	61	1676	5544	5038	10574	73426	
21	2001	1678	63	1733	5544	5698	11242	82935	
		-11364							

		Case	Ground type	Interest rate	Ownership	Price policy	Structure		
		9	B	3.0%	Safe	Low cost	Medium-Rise	M\$1,000	
Year		Expenditure			Revenue				
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	Financial Balance	
1	1981	2355	35	2425	0	0	0	-2425	
2	1982	6335	1268	67403	0	0	0	-69828	
3	1983	0	2855	2855	56201	1932	58133	-13798	
4	1984	0	414	414	0	0	0	-14203	
5	1985	0	426	426	0	0	0	-14629	
6	1986	0	439	439	0	0	0	-15068	
7	1987	0	452	452	0	0	0	-15520	
8	1988	0	466	466	0	0	0	-15986	
9	1989	0	480	480	0	0	0	-16465	
10	1990	0	494	494	0	0	0	-16959	
11	1991	0	509	509	0	0	0	-17468	
12	1992	0	524	524	0	0	0	-17992	
13	1993	0	540	540	0	0	0	-18532	
14	1994	0	556	556	0	0	0	-19088	
15	1995	0	573	573	0	0	0	-19661	
16	1996	0	592	592	0	0	0	-20258	
17	1997	0	608	608	0	0	0	-20888	
18	1998	0	626	626	0	0	0	-21484	
19	1999	0	645	645	0	0	0	-22128	
20	2000	0	664	664	0	0	0	-22792	
21	2001	0	684	684	0	0	0	-23476	
22	2002	0	704	704	0	0	0	-24180	

Case		Ground Type	Interest Rate	Ownership	Price Policy	Structure	M\$1,000	
10		B	3.0%	Sole	Commercial	Medium-Rise		
Year	Expenditure			Revenue			Financial Balance	
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2389	36	2425	0	0	0	-2425
2	1982	66335	1868	67403	0	0	0	-69828
3	1983	0	2055	2055	92248	3116	93764	21822
4	1984	0	0	0	92248	4754	95402	117244
5	1985	0	0	0	0	8733	8733	126037
6	1986	0	0	0	0	9453	9453	135490
7	1987	0	0	0	0	10162	10162	145652
8	1988	0	0	0	0	10324	10324	156576
9	1989	0	0	0	0	11743	11743	168319
10	1990	0	0	0	0	12624	12624	182942
11	1991	0	0	0	0	13571	13571	194513
12	1992	0	0	0	0	14588	14588	203102
13	1993	0	0	0	0	15683	15683	224784
14	1994	0	0	0	0	16859	16859	241643
15	1995	0	0	0	0	18123	18123	259766
16	1996	0	0	0	0	19482	19482	279249
17	1997	0	0	0	0	20944	20944	280192
18	1998	0	0	0	0	22516	22516	322707
19	1999	0	0	0	0	24203	24203	346910
20	2000	0	0	0	0	26018	26018	372328
21	2001	0	0	0	0	27970	27970	403898
22	2002	0	0	0	0	30257	30257	438965

Case		Ground Type	Interest Rate	Ownership	Price Policy	Structure	M\$1,000	
11		B	3.0%	Rentol	Low Cost	Medium-Rise		
Year	Expenditure			Revenue			Financial Balance	
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2389	36	2425	0	0	0	-2425
2	1982	66335	1868	67403	0	0	0	-69828
3	1983	1831	2122	3953	3696	127	3823	-69958
4	1984	1893	2127	4020	3696	127	3823	-78155
5	1985	1559	2134	4032	3696	127	3823	-78624
6	1986	2024	2143	4167	3696	127	3823	-78768
7	1987	2033	2154	4247	3696	127	3823	-71192
8	1988	2164	2168	4332	3696	127	3823	-71782
9	1989	2238	2185	4422	3696	127	3823	-72301
10	1990	2314	2204	4518	3696	127	3823	-72996
11	1991	2393	2226	4619	3696	127	3823	-73791
12	1992	2474	2251	4725	3696	127	3823	-74692
13	1993	2559	2279	4837	3696	127	3823	-75707
14	1994	2645	2311	4956	3696	127	3823	-76839
15	1995	2735	2346	5081	3696	127	3823	-78097
16	1996	2828	2385	5213	3696	127	3823	-79487
17	1997	2924	2428	5352	3696	127	3823	-81017
18	1998	3023	2476	5499	3696	127	3823	-82693
19	1999	3126	2528	5654	3696	127	3823	-84524
20	2000	3232	2584	5817	3696	127	3823	-86518
21	2001	3342	2646	5988	3696	127	3823	-88683
22	2002	3456	2712	6168	3696	127	3823	-91028
		3532		6368				-57495

Case		Ground Type	Interest Rate	Ownership	Price Policy	Structure	M\$1,000	
12		B	3.0%	Rentol	Commercial	Medium-Rise		
Year	Expenditure			Revenue			Financial Balance	
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2389	36	2425	0	0	0	-2425
2	1982	66335	1868	67403	0	0	0	-69828
3	1983	1831	2122	3953	5552	285	6157	-67624
4	1984	1893	2057	3950	11924	409	12313	-59261
5	1985	1559	1807	3765	11924	409	12313	-58713
6	1986	2024	1552	3576	11924	409	12313	-41976
7	1987	2033	1291	3394	11924	409	12313	-33045
8	1988	2164	1824	3168	11924	409	12313	-23921
9	1989	2238	751	2959	11924	409	12313	-14597
10	1990	2314	473	2785	11924	489	12313	-8270
11	1991	2393	183	2580	11924	489	12313	4563
12	1992	2474	37	2511	11924	759	12863	14814
13	1993	2559	38	2595	11924	1520	13424	25642
14	1994	2645	48	2695	11924	2332	14236	37194
15	1995	2735	41	2776	11924	3159	15103	49521
16	1996	2828	42	2870	11924	4123	16027	62678
17	1997	2924	44	2968	11924	5118	17014	76724
18	1998	3023	45	3069	11924	6164	18058	91723
19	1999	3126	47	3173	11924	7269	19192	107742
20	2000	3232	48	3281	11924	8452	20394	124655
21	2001	3342	50	3393	11924	9773	21677	143148
22	2002	3456	52	3508	11924	11145	23249	162681
		3532		3508				182681

Case		Ground Type	Interest Rate	Ownership	Price Policy	Structure	MS1,000	
13		B	7.5%	Sole	Low Cost	Medium-Rise		
Year	Expenditure			Revenue			Financial Balance	
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2385	92	2475	0	0	0	-2475
2	1982	66335	2673	69008	0	0	0	-71487
3	1983	0	5362	5362	56281	1932	58213	-18716
4	1984	0	1424	1424	0	0	0	-20119
5	1985	0	1589	1589	0	0	0	-21628
6	1986	0	1622	1622	0	0	0	-23250
7	1987	0	1744	1744	0	0	0	-24934
8	1988	0	1875	1875	0	0	0	-26669
9	1989	0	2015	2015	0	0	0	-28484
10	1990	0	2166	2166	0	0	0	-31350
11	1991	0	2329	2329	0	0	0	-34273
12	1992	0	2503	2503	0	0	0	-37252
13	1993	0	2691	2691	0	0	0	-40287
14	1994	0	2893	2893	0	0	0	-43380
15	1995	0	3110	3110	0	0	0	-46530
16	1996	0	3343	3343	0	0	0	-49737
17	1997	0	3594	3594	0	0	0	-53001
18	1998	0	3864	3864	0	0	0	-56325
19	1999	0	4153	4153	0	0	0	-59708
20	2000	0	4465	4465	0	0	0	-63153
21	2001	0	4800	4800	0	0	0	-66663
22	2002	0	5168	5168	0	0	0	-70231

Case		Ground Type	Interest Rate	Ownership	Price Policy	Structure	MS1,000	
14		B	7.5%	Sole	Commercial	Medium-Rise		
Year	Expenditure			Revenue			Financial Balance	
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2389	50	2439	0	0	0	-2439
2	1982	66335	2673	69008	0	0	0	-71467
3	1983	0	5362	5362	92245	3116	95361	-19915
4	1984	0	0	0	92245	4355	96600	11946
5	1985	0	0	0	0	8055	8055	122344
6	1986	0	0	0	0	3026	3026	123378
7	1987	0	0	0	0	5723	5723	139273
8	1988	0	0	0	0	10478	10478	149583
9	1989	0	0	0	0	11213	11213	160716
10	1990	0	0	0	0	12054	12054	172772
11	1991	0	0	0	0	12558	12558	185727
12	1992	0	0	0	0	13938	13938	199657
13	1993	0	0	0	0	14974	14974	214631
14	1994	0	0	0	0	16857	16857	231488
15	1995	0	0	0	0	17325	17325	248813
16	1996	0	0	0	0	18883	18883	267636
17	1997	0	0	0	0	19993	19993	287633
18	1998	0	0	0	0	21498	21498	308131
19	1999	0	0	0	0	23110	23110	329241
20	2000	0	0	0	0	24843	24843	351084
21	2001	0	0	0	0	26785	26785	374569
22	2002	0	0	0	0	28783	28783	411528

Case		Ground Type	Interest Rate	Ownership	Price Policy	Structure	MS1,000	
15		B	7.5%	Rentol	Low Cost	Medium-Rise		
Year	Expenditure			Revenue			Financial Balance	
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2389	50	2439	0	0	0	-2439
2	1982	66335	2673	69008	0	0	0	-71467
3	1983	1831	5470	7301	3595	127	3722	-74925
4	1984	1893	5692	7584	3695	127	3822	-82755
5	1985	1558	5975	7533	3695	127	3822	-87282
6	1986	2024	6266	8310	3695	127	3822	-92176
7	1987	2893	6625	9718	3695	127	3822	-97512
8	1988	2184	6994	9159	3695	127	3822	-103324
9	1989	2238	7397	9635	3695	127	3822	-109651
10	1990	2314	7836	10150	3695	127	3822	-116534
11	1991	2393	8314	10706	3695	127	3822	-123917
12	1992	2474	8833	11307	3695	127	3822	-131850
13	1993	2558	9397	11955	3695	127	3822	-140382
14	1994	2645	10010	12655	3695	127	3822	-149578
15	1995	2735	10676	13411	3695	127	3822	-159474
16	1996	2828	11399	14227	3695	127	3822	-170017
17	1997	2924	12183	15107	3695	127	3822	-181257
18	1998	3023	13033	16056	3695	127	3822	-193217
19	1999	3126	13954	17080	3695	127	3822	-205929
20	2000	3232	14952	18184	3695	127	3822	-219433
21	2001	3342	16024	19366	3695	127	3822	-233787
22	2002	3455	17224	20679	3695	127	3822	-249057

Case		Ground type	Interest rate	Ownership	Price policy	Structure	NS1,000	
16		B	7.5%	Rental	Commercial	Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2359	52	2411	0	0	0	-2411
2	1982	65335	2673	68008	0	0	0	-68008
3	1983	1831	5430	7261	5552	205	6157	-7261
4	1984	1893	5515	7409	11524	483	12313	-5767
5	1985	1958	5158	7116	11524	479	12313	-6781
6	1986	2024	4752	6776	11524	485	12313	-5554
7	1987	2093	4350	6443	11524	489	12313	-5184
8	1988	2164	3912	6076	11524	479	12313	-4698
9	1989	2238	3447	5685	11524	489	12313	-3270
10	1990	2314	2993	5307	11524	489	12313	-3174
11	1991	2393	2428	4821	11524	489	12313	-23581
12	1992	2474	1859	4333	11524	489	12313	-16710
13	1993	2558	1274	3832	11524	489	12313	-7229
14	1994	2645	641	3286	11524	489	12313	1738
15	1995	2725	183	2907	11524	544	12468	11428
16	1996	2820	175	2994	11524	1165	13169	21643
17	1997	2924	118	2842	11524	2832	13556	32945
18	1998	3023	113	3136	11524	2652	14754	46153
19	1999	3126	117	3243	11524	3721	15625	55545
20	2000	3232	121	3353	11524	4850	16554	65746
21	2001	3342	123	3465	11524	5640	17544	75822
22	2002	3455	122	3587	11524	6655	18588	86837
		-32532						132159

Case		Ground type	Interest rate	Ownership	Price policy	Structure	NS1,000	
17		B	3.0%	Sale	Low cost	High-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	18	1237	0	0	0	-1237
2	1982	95782	1488	98190	0	0	0	-98190
3	1983	0	2983	2983	78250	2415	72665	-2983
4	1984	0	892	892	0	0	0	-892
5	1985	0	519	519	0	0	0	-519
6	1986	0	547	547	0	0	0	-547
7	1987	0	975	975	0	0	0	-975
8	1988	0	1004	1004	0	0	0	-1004
9	1989	0	1034	1034	0	0	0	-1034
10	1990	0	1065	1065	0	0	0	-1065
11	1991	0	1097	1097	0	0	0	-1097
12	1992	0	1130	1130	0	0	0	-1130
13	1993	0	1164	1164	0	0	0	-1164
14	1994	0	1199	1199	0	0	0	-1199
15	1995	0	1235	1235	0	0	0	-1235
16	1996	0	1272	1272	0	0	0	-1272
17	1997	0	1310	1310	0	0	0	-1310
18	1998	0	1350	1350	0	0	0	-1350
19	1999	0	1390	1390	0	0	0	-1390
20	2000	0	1432	1432	0	0	0	-1432
21	2001	0	1475	1475	0	0	0	-1475
22	2002	0	1519	1519	0	0	0	-1519

Case		Ground type	Interest rate	Ownership	Price policy	Structure	NS1,000	
18		B	3.0%	Sale	Commercial	High-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	18	1237	0	0	0	-1237
2	1982	95782	1488	98190	0	0	0	-98190
3	1983	0	2983	2983	113310	3695	117285	14795
4	1984	0	0	0	113310	5025	118315	153110
5	1985	0	0	0	0	9983	9983	143893
6	1986	0	0	0	0	10732	10732	153625
7	1987	0	0	0	0	11537	11537	163362
8	1988	0	0	0	0	12402	12402	173764
9	1989	0	0	0	0	13332	13332	184137
10	1990	0	0	0	0	14332	14332	194469
11	1991	0	0	0	0	15407	15407	204736
12	1992	0	0	0	0	16563	16563	214999
13	1993	0	0	0	0	17825	17825	225124
14	1994	0	0	0	0	19168	19168	235192
15	1995	0	0	0	0	20576	20576	245208
16	1996	0	0	0	0	22119	22119	255189
17	1997	0	0	0	0	23778	23778	265037
18	1998	0	0	0	0	25561	25561	274778
19	1999	0	0	0	0	27478	27478	284356
20	2000	0	0	0	0	29539	29539	293895
21	2001	0	0	0	0	31755	31755	303350
22	2002	0	0	0	0	34136	34136	312766

Case		Ground Type	Interest rate	Ownership	Price policy	Structure		M\$1,000
19	B					3.0%	Rental	
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	18	1237	0	0	0	-1237
2	1982	96702	1468	98170	0	0	0	-99427
3	1983	2268	3217	5485	4620	159	4779	-93553
4	1984	2366	3274	5640	4620	159	4779	-102574
5	1985	2446	3254	5700	4620	159	4779	-101296
6	1986	2529	3277	5806	4620	159	4779	-102123
7	1987	2615	3183	5798	4620	159	4779	-103063
8	1988	2704	3132	5836	4620	159	4779	-104121
9	1989	2756	3166	5922	4620	159	4779	-105324
10	1990	2891	3282	6173	4620	159	4779	-106619
11	1991	2992	3243	6235	4620	159	4779	-108073
12	1992	3091	3289	6380	4620	159	4779	-109674
13	1993	3196	3338	6534	4620	159	4779	-111428
14	1994	3205	3282	6487	4620	159	4779	-113348
15	1995	3217	3252	6469	4620	159	4779	-115439
16	1996	3274	3216	6490	4620	159	4779	-117710
17	1997	3254	3286	6540	4620	159	4779	-120171
18	1998	3278	3262	6540	4620	159	4779	-122762
19	1999	3226	3244	6470	4620	159	4779	-125783
20	2000	4839	3232	8071	4620	159	4779	-128755
21	2001	4177	3227	8404	4620	159	4779	-132119
22	2002	4319	4228	8547	4620	159	4779	-135668
		-47778						-67312

Case		Ground Type	Interest rate	Ownership	Price policy	Structure		M\$1,000
20	B					3.0%	Rental	
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	18	1237	0	0	0	-1237
2	1982	96702	1468	98170	0	0	0	-99427
3	1983	2268	3217	5485	7442	256	7698	-97836
4	1984	2366	2947	5312	14880	512	15392	-86557
5	1985	2446	2645	5091	14880	512	15392	-76657
6	1986	2529	2338	4867	14880	512	15392	-66133
7	1987	2615	2873	5488	14880	512	15392	-55320
8	1988	2704	1782	4486	14880	512	15392	-44395
9	1989	2796	1374	4170	14880	512	15392	-33173
10	1990	2891	1839	4730	14880	512	15392	-21712
11	1991	2992	696	3688	14880	512	15392	-10226
12	1992	3091	247	3338	14880	512	15392	1948
13	1993	3196	48	3244	14880	653	15533	14241
14	1994	3205	50	3255	14880	1520	16400	27346
15	1995	3217	51	3268	14880	2562	17442	41319
16	1996	3274	53	3327	14880	3610	18490	56223
17	1997	3254	55	3309	14880	4720	19600	72123
18	1998	3278	57	3335	14880	5921	20801	89269
19	1999	3226	59	3285	14880	7193	22073	107197
20	2000	4839	61	4900	14880	8551	23431	126528
21	2001	4177	63	4240	14880	10001	24981	147178
22	2002	4319	65	4384	14880	11549	26429	169216
		-47778						216936

Case		Ground Type	Interest rate	Ownership	Price policy	Structure		M\$1,000
21	B					7.5%	Sale	
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	46	1265	0	0	0	-1265
2	1982	96702	3721	100423	0	0	0	-101688
3	1983	0	7627	7627	70250	2415	72665	-34650
4	1984	0	2749	2749	0	0	0	-39358
5	1985	0	2555	2555	0	0	0	-42353
6	1986	0	3176	3176	0	0	0	-45530
7	1987	0	3415	3415	0	0	0	-48944
8	1988	0	3571	3571	0	0	0	-52615
9	1989	0	3946	3946	0	0	0	-56561
10	1990	0	4242	4242	0	0	0	-60824
11	1991	0	4560	4560	0	0	0	-65384
12	1992	0	4902	4902	0	0	0	-70286
13	1993	0	5270	5270	0	0	0	-75536
14	1994	0	5665	5665	0	0	0	-81201
15	1995	0	6092	6092	0	0	0	-87291
16	1996	0	6547	6547	0	0	0	-93838
17	1997	0	7038	7038	0	0	0	-100876
18	1998	0	7566	7566	0	0	0	-108442
19	1999	0	8133	8133	0	0	0	-116575
20	2000	0	8743	8743	0	0	0	-125318
21	2001	0	9399	9399	0	0	0	-134717
22	2002	0	10124	10124	0	0	0	-144621



Case		Ground type	Interest rate	Ownership	Price policy	Structure	H\$1,000	
22		B	7.5%	Sale	Commercial	High-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	45	1265	0	0	0	-1265
2	1982	96782	3721	100473	0	0	0	-101698
3	1983	2	7527	7627	113310	2895	117205	7891
4	1984	0	0	0	113310	4687	117797	120687
5	1985	0	0	0	0	9427	9427	135114
6	1986	0	0	0	0	18134	18134	145247
7	1987	0	0	0	0	18694	18694	166141
8	1988	0	0	0	0	11711	11711	167852
9	1989	0	0	0	0	12589	12589	188440
10	1990	0	0	0	0	13533	13533	193974
11	1991	0	0	0	0	14548	14548	208522
12	1992	0	0	0	0	15639	15639	224161
13	1993	0	0	0	0	16812	16812	240973
14	1994	0	0	0	0	18073	18073	259046
15	1995	0	0	0	0	19428	19428	278474
16	1996	0	0	0	0	20886	20886	299260
17	1997	0	0	0	0	22452	22452	321812
18	1998	0	0	0	0	24136	24136	345947
19	1999	0	0	0	0	25946	25946	371894
20	2000	0	0	0	0	27892	27892	399786
21	2001	0	0	0	0	29984	29984	429769
22	2002	0	0	0	0	32233	32233	462002

Case		Ground type	Interest rate	Ownership	Price policy	Structure	H\$1,000	
23		B	7.5%	Rental	Low cost	High-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	45	1265	0	0	0	-1265
2	1982	96782	3721	100423	0	0	0	-101688
3	1983	2283	7712	10000	4620	159	4779	-106303
4	1984	2366	8187	10473	4620	159	4779	-112603
5	1985	2446	8537	10983	4620	159	4779	-118828
6	1986	2529	8925	11535	4620	159	4779	-125564
7	1987	2615	9315	12131	4620	159	4779	-132916
8	1988	2704	9708	12774	4620	159	4779	-140911
9	1989	2796	10273	13469	4620	159	4779	-149582
10	1990	2891	10829	14220	4620	159	4779	-159243
11	1991	2990	11478	15028	4620	159	4779	-169924
12	1992	3091	12213	15884	4620	159	4779	-181628
13	1993	3196	13035	16781	4620	159	4779	-194469
14	1994	3305	13946	17721	4620	159	4779	-208469
15	1995	3417	14946	18713	4620	159	4779	-223661
16	1996	3534	16035	19759	4620	159	4779	-239992
17	1997	3654	17212	20866	4620	159	4779	-257507
18	1998	3778	18478	22036	4620	159	4779	-276251
19	1999	3906	19832	23278	4620	159	4779	-296276
20	2000	4039	21273	24592	4620	159	4779	-317600
21	2001	4177	22800	26077	4620	159	4779	-340225
22	2002	4319	24425	27744	4620	159	4779	-364252

Case		Ground type	Interest rate	Ownership	Price policy	Structure	H\$1,000	
24		B	7.5%	Rental	Commercial	High-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	45	1265	0	0	0	-1265
2	1982	96782	3721	100423	0	0	0	-101688
3	1983	2283	7712	10000	7440	256	7696	-103993
4	1984	2366	7868	10254	14880	512	15392	-98855
5	1985	2446	7966	9952	14880	512	15392	-93416
6	1986	2529	7101	9630	14880	512	15392	-87654
7	1987	2615	6572	9208	14880	512	15392	-81551
8	1988	2704	6218	8922	14880	512	15392	-75081
9	1989	2796	5736	8532	14880	512	15392	-69222
10	1990	2891	5225	8116	14880	512	15392	-63947
11	1991	2990	4683	7673	14880	512	15392	-59228
12	1992	3091	4103	7199	14880	512	15392	-55036
13	1993	3196	3498	6694	14880	512	15392	-51338
14	1994	3305	2849	6154	14880	512	15392	-48101
15	1995	3417	2161	5578	14880	512	15392	-45288
16	1996	3534	1429	4963	14880	512	15392	-42859
17	1997	3654	651	4305	14880	512	15392	-40727
18	1998	3778	162	3920	14880	629	15709	-38816
19	1999	3906	166	4053	14880	1713	16593	-37056
20	2000	4039	151	4191	14880	2653	17533	-35498
21	2001	4177	157	4333	14880	3654	18534	-34099
22	2002	4319	162	4481	14880	4715	19599	-32817

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1001		B	7.5%	Sale		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2389	52	2479	0	0	0	-2479
2	1982	66335	2673	69228	0	0	0	-71487
3	1983	0	5362	5362	39020	1031	31031	-65817
4	1984	0	2476	2476	32020	1031	31031	-18222
5	1985	0	1367	1367	0	0	0	-19589
6	1986	0	1469	1469	0	0	0	-21059
7	1987	0	1579	1579	0	0	0	-22638
8	1988	0	1698	1698	0	0	0	-24335
9	1989	0	1825	1825	0	0	0	-26161
10	1990	0	1962	1962	0	0	0	-28123
11	1991	0	2109	2109	0	0	0	-30232
12	1992	0	2267	2267	0	0	0	-32493
13	1993	0	2437	2437	0	0	0	-34937
14	1994	0	2620	2620	0	0	0	-37557
15	1995	0	2817	2817	0	0	0	-40374
16	1996	0	3028	3028	0	0	0	-43402
17	1997	0	3255	3255	0	0	0	-46657
18	1998	0	3499	3499	0	0	0	-50156
19	1999	0	3762	3762	0	0	0	-53918
20	2000	0	4044	4044	0	0	0	-57962
21	2001	0	4347	4347	0	0	0	-62309
22	2002	0	4673	4673	0	0	0	-66982

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1002		B	7.5%	Sale		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2389	50	2479	0	0	0	-2479
2	1982	66335	2673	69228	0	0	0	-71487
3	1983	0	5362	5362	35020	1203	36223	-42645
4	1984	0	2448	2448	35020	1203	36223	-7491
5	1985	0	562	562	0	0	0	-2253
6	1986	0	624	624	0	0	0	-2876
7	1987	0	649	649	0	0	0	-3525
8	1988	0	698	698	0	0	0	-4224
9	1989	0	750	750	0	0	0	-4974
10	1990	0	807	807	0	0	0	-5781
11	1991	0	867	867	0	0	0	-6647
12	1992	0	932	932	0	0	0	-7580
13	1993	0	1002	1002	0	0	0	-8582
14	1994	0	1077	1077	0	0	0	-9649
15	1995	0	1158	1158	0	0	0	-10787
16	1996	0	1245	1245	0	0	0	-11997
17	1997	0	1339	1339	0	0	0	-13281
18	1998	0	1438	1438	0	0	0	-14649
19	1999	0	1546	1546	0	0	0	-16104
20	2000	0	1662	1662	0	0	0	-17756
21	2001	0	1787	1787	0	0	0	-19603
22	2002	0	1921	1921	0	0	0	-21654

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1003		B	7.5%	Sale		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2389	50	2479	0	0	0	-2479
2	1982	66335	2673	69228	0	0	0	-71487
3	1983	0	5362	5362	37520	1269	38789	-36262
4	1984	0	2854	2854	37520	1269	38789	-2125
5	1985	0	159	159	0	0	0	-2284
6	1986	0	171	171	0	0	0	-2456
7	1987	0	184	184	0	0	0	-2640
8	1988	0	198	198	0	0	0	-2838
9	1989	0	213	213	0	0	0	-3051
10	1990	0	229	229	0	0	0	-3279
11	1991	0	246	246	0	0	0	-3525
12	1992	0	264	264	0	0	0	-3792
13	1993	0	284	284	0	0	0	-4074
14	1994	0	305	305	0	0	0	-4379
15	1995	0	328	328	0	0	0	-4708
16	1996	0	353	353	0	0	0	-5061
17	1997	0	380	380	0	0	0	-5441
18	1998	0	408	408	0	0	0	-5849
19	1999	0	438	438	0	0	0	-6287
20	2000	0	472	472	0	0	0	-6759
21	2001	0	507	507	0	0	0	-7265
22	2002	0	545	545	0	0	0	-7811

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1004		B	7.5 %	Sole		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2788	52	2840	2	0	2	-2479
2	1982	5537.5	2673	8210.5	0	0	0	-7148.7
3	1983	0	5362	5362	5222	1373	6595	-3727.5
4	1984	0	2777	2777	3652	1373	5025	21
5	1985	0	0	0	0	2	2	23
6	1986	0	0	0	0	2	2	25
7	1987	0	0	0	0	2	2	27
8	1988	0	0	0	0	2	2	29
9	1989	0	0	0	0	2	2	31
10	1990	0	0	0	0	2	2	33
11	1991	0	0	0	0	2	2	35
12	1992	0	0	0	0	3	3	38
13	1993	0	0	0	0	3	3	41
14	1994	0	0	0	0	3	3	44
15	1995	0	0	0	0	3	3	47
16	1996	0	0	0	0	4	4	51
17	1997	0	0	0	0	4	4	55
18	1998	0	0	0	0	4	4	59
19	1999	0	0	0	0	4	4	63
20	2000	0	0	0	0	5	5	68
21	2001	0	0	0	0	5	5	73
22	2002	0	0	0	0	5	5	78

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1005		B	7.5 %	Sole		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2788	52	2840	2	0	2	-2479
2	1982	5537.5	2673	8210.5	0	0	0	-7148.7
3	1983	0	5362	5362	4022	1375	5397	-3547.4
4	1984	0	2881	2881	4022	1375	5397	-3241
5	1985	0	0	0	0	263	263	-2484
6	1986	0	0	0	0	261	261	-2745
7	1987	0	0	0	0	281	281	-4026
8	1988	0	0	0	0	282	282	-4328
9	1989	0	0	0	0	325	325	-4653
10	1990	0	0	0	0	349	349	-5002
11	1991	0	0	0	0	375	375	-5377
12	1992	0	0	0	0	423	423	-5780
13	1993	0	0	0	0	434	434	-6214
14	1994	0	0	0	0	452	452	-6682
15	1995	0	0	0	0	501	501	-7181
16	1996	0	0	0	0	539	539	-7719
17	1997	0	0	0	0	579	579	-8298
18	1998	0	0	0	0	622	622	-8920
19	1999	0	0	0	0	669	669	-9589
20	2000	0	0	0	0	719	719	-10308
21	2001	0	0	0	0	773	773	-11082
22	2002	0	0	0	0	831	831	-11913

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1006		B	7.5 %	Sole		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2788	52	2840	2	0	2	-2479
2	1982	5537.5	2673	8210.5	0	0	0	-7148.7
3	1983	0	5362	5362	5222	1719	6941	-25130
4	1984	0	1855	1855	5222	1719	6941	-24704
5	1985	0	0	0	0	1853	1853	-26557
6	1986	0	0	0	0	1932	1932	-28549
7	1987	0	0	0	0	2141	2141	-30690
8	1988	0	0	0	0	2302	2302	-32992
9	1989	0	0	0	0	2474	2474	-35466
10	1990	0	0	0	0	2663	2663	-38129
11	1991	0	0	0	0	2859	2859	-40980
12	1992	0	0	0	0	3074	3074	-44054
13	1993	0	0	0	0	3324	3324	-47364
14	1994	0	0	0	0	3552	3552	-50916
15	1995	0	0	0	0	3819	3819	-54735
16	1996	0	0	0	0	4125	4125	-58840
17	1997	0	0	0	0	4413	4413	-63253
18	1998	0	0	0	0	4744	4744	-67987
19	1999	0	0	0	0	5102	5102	-73037
20	2000	0	0	0	0	5492	5492	-78429
21	2001	0	0	0	0	5925	5925	-84154
22	2002	0	0	0	0	6335	6335	-90289

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1007		B	7.5 %	Sole		Medium-Rise		
Year	Expenditure				Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2289	50	2472	0	0	0	-2472
2	1982	65335	2673	68008	0	0	0	-71487
3	1983	0	5082	5082	92549	3116	93764	16315
4	1984	0	0	0	92548	4225	55833	111948
5	1985	0	0	0	0	5296	2196	122344
6	1986	0	0	0	0	5216	1276	129376
7	1987	0	0	0	0	2703	5723	139273
8	1988	0	0	0	0	12470	18470	145503
9	1989	0	0	0	0	11213	11213	166716
10	1990	0	0	0	0	11654	10854	172770
11	1991	0	0	0	0	11558	12558	185727
12	1992	0	0	0	0	12320	12320	198057
13	1993	0	0	0	0	14974	14974	214531
14	1994	0	0	0	0	15257	15257	232723
15	1995	0	0	0	0	17225	17225	246873
16	1996	0	0	0	0	18583	18583	266536
17	1997	0	0	0	0	19582	19582	286574
18	1998	0	0	0	0	21458	21458	308131
19	1999	0	0	0	0	23118	23118	331241
20	2000	0	0	0	0	24643	24643	356224
21	2001	0	0	0	0	26726	26726	382792
22	2002	0	0	0	0	28709	28709	411500

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1008		B	7.5 %	Rental		Medium-Rise		
Year	Expenditure				Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2289	50	2473	0	0	0	-2473
2	1982	65335	2673	68008	0	0	0	-71487
3	1983	1831	5432	7261	2222	63	2285	-75673
4	1984	1893	5922	7715	4222	138	4138	-82257
5	1985	1558	5233	6791	4222	138	4138	-84172
6	1986	2024	6189	8213	4222	138	4138	-82445
7	1987	2293	6712	9005	4222	138	4138	-93113
8	1988	2124	7255	9379	4222	138	4138	-98224
9	1989	2272	7449	9697	4222	138	4138	-102754
10	1990	2314	7868	10182	4222	138	4138	-103758
11	1991	2393	8329	10717	4222	138	4138	-116378
12	1992	2474	8821	11295	4222	138	4138	-123535
13	1993	2558	9351	11919	4222	138	4138	-131317
14	1994	2645	9948	12593	4222	138	4138	-139772
15	1995	2735	10585	13320	4222	138	4138	-148855
16	1996	2828	11270	14106	4222	138	4138	-158923
17	1997	2914	12023	14953	4222	138	4138	-169738
18	1998	3023	12844	15867	4222	138	4138	-181468
19	1999	3126	13727	16854	4222	138	4138	-194184
20	2000	3232	14685	17918	4222	138	4138	-207964
21	2001	3342	15723	19065	4222	138	4138	-222691
22	2002	3456	16846	20203	4222	138	4138	-238255

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1009		B	7.5 %	Rental		Medium-Rise		
Year	Expenditure				Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	2289	50	2479	0	0	0	-2479
2	1982	65335	2673	68008	0	0	0	-71487
3	1983	1831	5432	7261	3222	103	3103	-75545
4	1984	1893	5744	7637	6222	226	6222	-77876
5	1985	1558	5054	6612	6222	226	6222	-78882
6	1986	2024	5977	8001	6222	226	6222	-82477
7	1987	2293	6114	8407	6222	226	6222	-82478
8	1988	2164	6267	8431	6022	226	6222	-84783
9	1989	2238	6437	8674	6222	226	6222	-87171
10	1990	2314	6625	8938	6222	226	6222	-89923
11	1991	2393	6832	9225	6222	226	6222	-92922
12	1992	2474	7052	9526	6222	226	6222	-96252
13	1993	2558	7295	9873	6222	226	6222	-99918
14	1994	2645	7563	10208	6222	226	6222	-103552
15	1995	2735	7853	10634	6222	226	6222	-108377
16	1996	2828	8164	11052	6222	226	6222	-113233
17	1997	2924	8497	11526	6222	226	6222	-118553
18	1998	3023	8855	12028	6222	226	6222	-124378
19	1999	3126	9245	12572	6222	226	6222	-130740
20	2000	3232	9667	13159	6222	226	6222	-137593
21	2001	3342	10122	13795	6222	226	6222	-145282
22	2002	3456	10612	14482	6222	226	6222	-153557

Case		Foundation	Interest rate	Ownership	Price policy	Structure	Financial Balance
1010		B	7.5 %	Rentol		Medium-Rise	
Year	Expenditure			Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2385	50	2479	0	0	-2479
2	1982	66335	2673	69008	0	0	-71487
3	1983	1831	5478	7261	4000	138	-74511
4	1984	1893	5567	7560	8000	275	-73835
5	1985	1958	5616	7573	8200	275	-73194
6	1986	2024	5565	7592	8200	275	-72589
7	1987	2093	5577	7610	8000	275	-71843
8	1988	2154	5459	7634	8200	275	-71282
9	1989	2230	5424	7662	8000	275	-70523
10	1990	2314	5381	7655	8000	275	-70228
11	1991	2393	5340	7733	8200	275	-69466
12	1992	2474	5303	7777	8200	275	-68828
13	1993	2558	5269	7826	8200	275	-68513
14	1994	2645	5238	7883	8200	275	-68127
15	1995	2735	5212	7947	8200	275	-67753
16	1996	2828	5191	8019	8200	275	-67368
17	1997	2924	5175	8099	8200	275	-67022
18	1998	3023	5166	8189	8200	275	-66722
19	1999	3126	5163	8280	8200	275	-66427
20	2000	3232	5168	8381	8200	275	-66122
21	2001	3342	5187	8524	8200	275	-65772
22	2002	3456	5205	8661	8200	275	-65458
		-33532					-34536

Case		Foundation	Interest rate	Ownership	Price policy	Structure	Financial Balance
1011		B	7.5 %	Rentol		Medium-Rise	
Year	Expenditure			Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2389	50	2479	0	0	-2479
2	1982	66335	2673	69008	0	0	-71487
3	1983	1831	5436	7261	4300	160	-74208
4	1984	1893	5544	7537	8000	296	-72942
5	1985	1958	5564	7582	8000	296	-71548
6	1986	2024	5462	7666	8000	296	-70118
7	1987	2093	5337	7630	8000	296	-68553
8	1988	2164	5258	7394	8000	296	-67157
9	1989	2230	5120	7358	8000	296	-65616
10	1990	2314	5093	7322	8000	296	-64050
11	1991	2393	4993	7265	8000	296	-62478
12	1992	2474	4775	7249	8000	296	-60783
13	1993	2558	4655	7213	8000	296	-59160
14	1994	2645	4532	7177	8000	296	-57581
15	1995	2735	4406	7141	8000	296	-55976
16	1996	2828	4278	7106	8000	296	-54336
17	1997	2924	4147	7071	8000	296	-52682
18	1998	3023	4014	7038	8000	296	-51014
19	1999	3126	3879	7005	8000	296	-49263
20	2000	3232	3741	6973	8000	296	-47541
21	2001	3342	3601	6943	8000	296	-45789
22	2002	3456	3459	6915	8000	296	-44083
		-33532					-8976

Case		Foundation	Interest rate	Ownership	Price policy	Structure	Financial Balance
1012		B	7.5 %	Rentol		Medium-Rise	
Year	Expenditure			Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2383	50	2479	0	0	-2479
2	1982	66335	2673	69008	0	0	-71487
3	1983	1831	5436	7261	4000	151	-74197
4	1984	1893	5636	7529	8000	303	-72624
5	1985	1958	5570	7478	8000	303	-70993
6	1986	2024	5401	7425	8000	303	-69321
7	1987	2093	5278	7371	8000	303	-67589
8	1988	2164	5150	7315	8000	303	-65801
9	1989	2230	5019	7257	8000	303	-63956
10	1990	2314	4883	7197	8000	303	-62058
11	1991	2393	4744	7135	8000	303	-60204
12	1992	2474	4599	7073	8000	303	-58284
13	1993	2558	4458	7009	8000	303	-56284
14	1994	2645	4296	6941	8000	303	-54250
15	1995	2735	4137	6872	8000	303	-52158
16	1996	2828	3974	6802	8000	303	-49967
17	1997	2924	3825	6729	8000	303	-47693
18	1998	3023	3670	6654	8000	303	-45345
19	1999	3126	3511	6577	8000	303	-42919
20	2000	3232	3358	6498	8000	303	-40314
21	2001	3342	3204	6416	8000	303	-37528
22	2002	3456	2977	6333	8000	303	-34559
		-33532					-326

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1013		B	7.5 %	Rental		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2385	58	2473	0	0	0	-2473
2	1982	66335	2673	69008	0	0	0	-71487
3	1983	1831	5478	7261	4500	155	4655	-74034
4	1984	1893	5678	7521	9000	309	9309	-72385
5	1985	1958	5486	7454	9000	309	9309	-78458
6	1986	2224	5360	7384	9000	309	9309	-66524
7	1987	2093	5218	7311	9000	309	9309	-65526
8	1988	2164	5071	7235	9000	309	9309	-64451
9	1989	2238	4918	7156	9000	309	9309	-62797
10	1990	2314	4759	7873	9000	309	9309	-60861
11	1991	2393	4594	6987	9000	309	9309	-57738
12	1992	2474	4423	6897	9000	309	9309	-55326
13	1993	2558	4245	6803	9000	309	9309	-52620
14	1994	2645	4061	6706	9000	309	9309	-50116
15	1995	2735	3869	6604	9000	309	9309	-47511
16	1996	2828	3669	6497	9000	309	9309	-44698
17	1997	2924	3462	6386	9000	309	9309	-41775
18	1998	3023	3245	6278	9000	309	9309	-38735
19	1999	3126	3022	6169	9000	309	9309	-35575
20	2000	3232	2799	6022	9000	309	9309	-32287
21	2001	3342	2547	5869	9000	309	9309	-28867
22	2002	3456	2295	5751	9000	309	9309	-25382
		-33532						3224

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1014		B	7.5 %	Rental		Medium-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	2385	58	2473	0	0	0	-2473
2	1982	66335	2673	69008	0	0	0	-71487
3	1983	1831	5478	7261	5222	172	5172	-73576
4	1984	1893	5599	7482	10220	344	10344	-78715
5	1985	1958	5377	7335	10220	344	10344	-67006
6	1986	2224	5154	7178	10220	344	10344	-64548
7	1987	2093	4919	7012	10220	344	10344	-61289
8	1988	2164	4672	6806	10220	344	10344	-57781
9	1989	2238	4411	6649	10220	344	10344	-54026
10	1990	2314	4137	6451	10220	344	10344	-50114
11	1991	2393	3849	6241	10220	344	10344	-46011
12	1992	2474	3544	6017	10220	344	10344	-41684
13	1993	2558	3222	5780	10220	344	10344	-37121
14	1994	2645	2893	5528	10220	344	10344	-32325
15	1995	2735	2525	5260	10220	344	10344	-27222
16	1996	2828	2149	4976	10220	344	10344	-21853
17	1997	2924	1749	4675	10220	344	10344	-16182
18	1998	3023	1327	4350	10220	344	10344	-10189
19	1999	3126	881	4028	10220	344	10344	-3953
20	2000	3232	418	3643	10220	344	10344	2848
21	2001	3342	125	3418	10220	557	10557	5938
22	2002	3456	138	3586	10220	1059	11059	17441
		-33532						52573

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1015		B	7.5 %	Sole		High-Rise		
Year		Expenditure			Revenue			Financial Balance
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	46	1265	0	0	0	-1265
2	1982	58782	3721	192423	0	0	0	-181683
3	1983	0	7627	7627	50220	1719	51719	-57556
4	1984	0	4300	4300	50220	1719	51719	-10157
5	1985	0	765	765	0	0	0	-12961
6	1986	0	822	822	0	0	0	-11784
7	1987	0	884	884	0	0	0	-12667
8	1988	0	950	950	0	0	0	-13617
9	1989	0	1021	1021	0	0	0	-14539
10	1990	0	1098	1098	0	0	0	-15737
11	1991	0	1180	1180	0	0	0	-16917
12	1992	0	1269	1269	0	0	0	-18188
13	1993	0	1364	1364	0	0	0	-19549
14	1994	0	1466	1466	0	0	0	-21015
15	1995	0	1576	1576	0	0	0	-22592
16	1996	0	1694	1694	0	0	0	-24286
17	1997	0	1821	1821	0	0	0	-26108
18	1998	0	1959	1959	0	0	0	-28058
19	1999	0	2105	2105	0	0	0	-30171
20	2000	0	2263	2263	0	0	0	-32433
21	2001	0	2433	2433	0	0	0	-34866
22	2002	0	2615	2615	0	0	0	-37481

Case		Foundation	Interest rate	Ownership	Price policy	Structure	HS1,000
1016		B	7.5 %	Sole		High-Rise	
Year	Expenditure			Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	46	1265	0	0	-1265
2	1982	95782	3721	102423	0	0	-101888
3	1983	0	7627	7627	54750	1681	-52783
4	1984	0	3953	3953	54750	1681	-45
5	1985	0	0	0	0	0	-46
6	1986	0	0	0	0	0	-51
7	1987	0	0	0	0	0	-55
8	1988	0	0	0	0	0	-59
9	1989	0	0	0	0	0	-64
10	1990	0	0	0	0	0	-69
11	1991	0	0	0	0	0	-74
12	1992	0	0	0	0	0	-78
13	1993	0	0	0	0	0	-85
14	1994	0	0	0	0	0	-82
15	1995	0	0	0	0	0	-89
16	1996	0	0	0	0	0	-105
17	1997	0	0	0	0	0	-114
18	1998	0	0	0	0	0	-123
19	1999	0	0	0	0	0	-132
20	2000	0	0	0	0	0	-142
21	2001	0	0	0	0	0	-152
22	2002	0	0	0	0	0	-164

Case		Foundation	Interest rate	Ownership	Price policy	Structure	HS1,000
1017		B	7.5 %	Sole		High-Rise	
Year	Expenditure			Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	46	1265	0	0	-1265
2	1982	95782	3721	102423	0	0	-101888
3	1983	0	7627	7627	54750	1682	-52682
4	1984	0	3951	3951	54750	1682	-2
5	1985	0	0	0	0	0	-2
6	1986	0	0	0	0	0	-2
7	1987	0	0	0	0	0	-2
8	1988	0	0	0	0	0	-2
9	1989	0	0	0	0	0	-2
10	1990	0	0	0	0	0	-2
11	1991	0	0	0	0	0	-3
12	1992	0	0	0	0	0	-3
13	1993	0	0	0	0	0	-3
14	1994	0	0	0	0	0	-3
15	1995	0	0	0	0	0	-4
16	1996	0	0	0	0	0	-4
17	1997	0	0	0	0	0	-4
18	1998	0	0	0	0	0	-4
19	1999	0	0	0	0	0	-5
20	2000	0	0	0	0	0	-5
21	2001	0	0	0	0	0	-5
22	2002	0	0	0	0	0	-6

Case		Foundation	Interest rate	Ownership	Price policy	Structure	HS1,000
1018		B	7.5 %	Sole		High-Rise	
Year	Expenditure			Revenue			Financial Balance
Project Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue	
1	1981	1219	46	1265	0	0	-1265
2	1982	95782	3721	102423	0	0	-101888
3	1983	0	7627	7627	55822	1691	-52424
4	1984	0	3952	3952	55820	1691	525
5	1985	0	0	0	0	40	575
6	1986	0	0	0	0	43	618
7	1987	0	0	0	0	46	665
8	1988	0	0	0	0	50	714
9	1989	0	0	0	0	54	768
10	1990	0	0	0	0	58	826
11	1991	0	0	0	0	62	888
12	1992	0	0	0	0	67	954
13	1993	0	0	0	0	72	1026
14	1994	0	0	0	0	77	1103
15	1995	0	0	0	0	83	1185
16	1996	0	0	0	0	89	1274
17	1997	0	0	0	0	96	1370
18	1998	0	0	0	0	103	1472
19	1999	0	0	0	0	110	1583
20	2000	0	0	0	0	118	1702
21	2001	0	0	0	0	126	1829
22	2002	0	0	0	0	137	1966

		Case	Foundation	Interest rate	Ownership	Price policy	Structure		
		1019	B	7.5 %	Sold		High - Rise	M\$1,000	
Year		Expenditure			Revenue			Financial Balance	
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	1219	46	1265	0	0	0	-1265	
2	1982	96782	3721	100423	0	0	0	-101698	
3	1983	0	7627	7627	13220	2053	62053	-47152	
4	1984	0	3544	3544	22220	2253	62053	11267	
5	1985	0	0	0	0	845	845	12112	
6	1986	0	0	0	0	920	920	13032	
7	1987	0	0	0	0	976	976	13956	
8	1988	0	0	0	0	1050	1050	15046	
9	1989	0	0	0	0	1120	1120	16175	
10	1990	0	0	0	0	1213	1213	17388	
11	1991	0	0	0	0	1304	1304	18692	
12	1992	0	0	0	0	1402	1402	20094	
13	1993	0	0	0	0	1507	1507	21601	
14	1994	0	0	0	0	1600	1600	23221	
15	1995	0	0	0	0	1742	1742	24962	
16	1996	0	0	0	0	1872	1872	26835	
17	1997	0	0	0	0	2013	2013	28847	
18	1998	0	0	0	0	2164	2164	31011	
19	1999	0	0	0	0	2326	2326	33337	
20	2000	0	0	0	0	2500	2500	35837	
21	2001	0	0	0	0	2680	2680	38525	
22	2002	0	0	0	0	2899	2899	41424	

		Case	Foundation	Interest rate	Ownership	Price policy	Structure		
		1020	B	7.5 %	Rentol		High - Rise	M\$1,000	
Year		Expenditure			Revenue			Financial Balance	
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	1219	46	1265	0	0	0	-1265	
2	1982	96782	3721	100423	0	0	0	-101698	
3	1983	2268	7712	10000	6000	205	5205	-105482	
4	1984	2366	8272	10638	12000	413	12413	-107435	
5	1985	2446	7849	10295	12000	413	12413	-121316	
6	1986	2529	7694	10223	12000	413	12413	-99129	
7	1987	2615	7533	10148	12000	413	12413	-96565	
8	1988	2704	7366	10071	12000	413	12413	-94523	
9	1989	2796	7194	9990	12000	413	12413	-92108	
10	1990	2891	7016	9907	12000	413	12413	-89555	
11	1991	2990	6832	9821	12000	413	12413	-87024	
12	1992	3091	6641	9733	12000	413	12413	-84524	
13	1993	3196	6446	9641	12000	413	12413	-82052	
14	1994	3305	6248	9545	12000	413	12413	-79605	
15	1995	3417	6038	9447	12000	413	12413	-77178	
16	1996	3534	5811	9345	12000	413	12413	-74762	
17	1997	3654	5586	9240	12000	413	12413	-72360	
18	1998	3778	5353	9131	12000	413	12413	-69970	
19	1999	3906	5111	9018	12000	413	12413	-67593	
20	2000	4039	4862	8901	12000	413	12413	-65232	
21	2001	4177	4603	8780	12000	413	12413	-62889	
22	2002	4319	4335	8655	12000	413	12413	-60562	
		-47778						-4124	

		Case	Foundation	Interest rate	Ownership	Price policy	Structure		
		1021	B	7.5 %	Rental		High - Rise	M\$1,000	
Year		Expenditure			Revenue			Financial Balance	
Project	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income	Total Revenue		
1	1981	1219	46	1265	0	0	0	-1265	
2	1982	96782	3721	100423	0	0	0	-101698	
3	1983	2268	7712	10000	6250	215	6465	-105223	
4	1984	2366	7908	10274	12570	430	12930	-107640	
5	1985	2446	7798	10244	12500	430	12930	-99845	
6	1986	2529	7591	10120	12500	430	12930	-97137	
7	1987	2615	7383	9998	12500	430	12930	-94285	
8	1988	2704	7167	9871	12500	430	12930	-91147	
9	1989	2796	6941	9737	12500	430	12930	-87555	
10	1990	2891	6705	9596	12500	430	12930	-84522	
11	1991	2990	6459	9445	12500	430	12930	-81148	
12	1992	3091	6201	9283	12500	430	12930	-77503	
13	1993	3196	5933	9129	12500	430	12930	-73783	
14	1994	3305	5652	8957	12500	430	12930	-69930	
15	1995	3417	5358	8775	12500	430	12930	-65975	
16	1996	3534	5051	8584	12500	430	12930	-61920	
17	1997	3654	4729	8383	12500	430	12930	-57783	
18	1998	3778	4393	8171	12500	430	12930	-53525	
19	1999	3906	4041	7947	12500	430	12930	-49142	
20	2000	4039	3672	7711	12500	430	12930	-44724	
21	2001	4177	3288	7465	12500	430	12930	-40257	
22	2002	4319	2891	7200	12500	430	12930	-35727	
		-47778						-2151	



Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
1022		B	7.5 %	Rental		High-Rise		
Year		Expenditure			Revenue		Financial Balance	
Pro-ject	Calendar	Construction & Maintenance Payment	Interest Payment	Total Expenses	Revenue	Interest Income		Total Revenue
1	1981	1219	46	1265	0	0	0	-1265
2	1982	98702	3721	102423	0	0	0	-103688
3	1983	2203	7712	9915	6500	223	6723	-104965
4	1984	2366	7961	10327	13000	447	13447	-101845
5	1985	2446	7730	10176	13000	447	13447	-98574
6	1986	2529	7482	10011	13000	447	13447	-55145
7	1987	2615	7274	9889	13000	447	13447	-91547
8	1988	2704	6567	9271	13000	447	13447	-87772
9	1989	2795	6600	9395	13000	447	13447	-83929
10	1990	2891	6394	9285	13000	447	13447	-79648
11	1991	2990	6006	9006	13000	447	13447	-75276
12	1992	3091	5762	8853	13000	447	13447	-70882
13	1993	3196	5421	8617	13000	447	13447	-66553
14	1994	3305	5053	8358	13000	447	13447	-60774
15	1995	3417	4686	8103	13000	447	13447	-55431
16	1996	3534	4298	7832	13000	447	13447	-49908
17	1997	3656	3873	7529	13000	447	13447	-44387
18	1998	3778	3433	7211	13000	447	13447	-38851
19	1999	3906	2978	6884	13000	447	13447	-33301
20	2000	4039	2493	6532	13000	447	13447	-27756
21	2001	4177	1968	6145	13000	447	13447	-22221
22	2002	4319	1426	5745	13000	447	13447	-16684
		-47778						38875

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
Year		Expenditure			Revenue		Amounts of excess values	
Pro-ject	Calendar	Construction & maintenance payment	Interest payment	Total expenses	Revenue	Financial income		Total revenue

Case		Foundation	Interest rate	Ownership	Price policy	Structure	M\$1,000	
Year		Expenditure			Revenue		Amounts of excess values	
Pro-ject	Calendar	Construction & maintenance payment	Interest payment	Total expenses	Revenue	Financial income		Total revenue



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