APPENDIX 3 LIST OF PARTIES CONCERNED IN THE RECIPIENT COUNTRY

Ministry of Education, Train and Technology (METT)

Minister	Mr. Willie Tokataake
Secretary	Mr. Taakei Taoaba
Education Officer (Primary)	Mr. Timau Tiira

King George V and Elaine Bernacci Secondary School (KGV/EBS)

Acting Principal	Mr. Tataua Naboua
Teacher (Computer)	Mr. Arebaio Erika
Teacher (Home Economics)	Ms. Terengaeta Babo
Teacher (Industrial Art)	Mr. Temerita Mwakaea
Teacher (Fine Art)	Mr. Natan Itonga
Teacher (Music)	Ms. Eriita Temper Temeae
Teacher (Science)	Mr. Gail Townsend

Tarawa Teacher's College (TTC)

Acting Principal	Mr. Tiribo Tabanga

Tarawa Technical Institute (TTI)

Acting Principal	Mr. Nantei Tenanai
Technical Adviser	Ms. Nikki Hill
Teacher (Computer)	Mr. Pinto Katia

Moroni High School

Church Educational System	Mr. Elder Findlay

St. Louis High School

Principal	Mr. Donald Teixeira

University of South Pacific Institute of Education

Director	Ms. Beta Tewareke

Fisheries Trainning Centre (FTC)

Chief Instructor	Mr. Shigeyuki Tomizuka
OFCF (Overseas Fishery Cooperation Foundation) Expert	
(Japanese Teacher)	Mr. Hiroshi Tsukamoto

Curriculum Development Resourse Center (CDRC)

Curriculum Development Officer	Mr. Tebania Tebakabo

Ministry of Works and Energy

Acting Duputy Secretary	Mr. Tokia Greig

Ministry of Home Affair and Rural Development

Chief Surveyor	Mr. Erene Nikora
Assistant Land Surveyor	Mr. Tebtonga Ereata

Public Works Division (PWD)

Acting Chief Engineer	Mr. Tapetulu Merang

Public Utility Board (PUB)

General manager	Mr. Rameka Takirua
Water & Sewerage Advisor	Mr. Laslo Erdei

Kiribati Shipping Services Limited

Agency Superintendant	Mr. Tekaai Mikaere

Tungaru Central Hospital (TCH)

Secretary for Health	Dr. Tetaua Taitai
Surgical Department	Dr. Kabwea Tiban
Laboratory Department	Ms. Tiero Tebabea
X-Ray Department	Ms. Ata Timau

Embassy of Japan (Fiji)

Counsellor	Mr. Yoshiaki Kotani
First Secretary	Mr. Hiroyuki Onishi
Second Secretary	Mr. Yasuhiro Tojo

JICA Fiji Office

Resident Representative	Mr. Shiro Kinouchi
Asst. Resident Representative	Mr. Takayuki Jinbo

APPENDIX 4 MINUTES OF DISCUSSION

Minutes of Discussions
on
the Basic Design Study on the Project for
Upgrading and Development of
King George V and Elaine Bernacchi School (KGV · EBS)
in
the Republic of Kiribati
(Consultation on Draft Basic Design)

In December 1995 , Japan International Cooperation Agency (JICA) dispatched a Basic Design Study team on the Project for Upgrading and Development of King George V and Elaine Bernacchi School (hereinafter referred to as "the Project") to the Republic of Kiribati , and through discussions, field survey , and technical examination of the result in Japan , has prepared the draft report of the study.

In order to explain and to consult the Kiribati side on the component of the draft basic design, JICA sent to Kiribati a Study Team , which headed by Mr. Masaru TAKIMOTO, Development Specialist, JICA , and is scheduled to stay in the country from March 4 to March 8 , 1996.

As a result of discussions and field survey, both parties confirmed the main items described on the attached sheets.

Tarawa, March 7, 1996

Masaru TAKIMOTO,
Leader,
Basic Design Study Team, JICA
Japan

Willie TOKATAAKE
Hon.Minister
Ministry of Education,Training and Technology
The Republic of Kiribati

A T T A C H M E N T

1. COMPONENTS OF DRAFT BASIC DESIGN
   The Government of Kiribati has agreed and accepted in principal the components of the Draft Basic Design proposed by the team.

2. EXECUTING AGENCY
   The Ministry of Education,Training and Technology is responsible for administration and execution of the Project.

3. ITEMS TO BE COVERED BY THE PROJECT
   Both Parties have confirmed the major items to be covered under the Project as listed in Annex 1.

4. JAPAN'S GRANT AID SYSTEM
   Kiribati side has understood the system of Japan's Grant Aid Programme explained in Annex 2.

5. NECESSARY MEASURES TO BE TAKEN BY KIRIBATI SIDE
   The Government of Kiribati will take necessary measures described in Annex 3 for smooth implementation of the Project on condition that the Grant Aid by the Government of Japan is extended to the Project.

6. FURTHER SCHEDULE OF THE STUDY
   The Team will make the final report in accordance with the confirmed items , and send it to the Government of Kiribati by the end of May, 1996.

Adding to the 3 as listed above:
Also the Both Parties have agreed the item of ablution block for boys' dormitory to be covered under the Project as shown in Annex 4, as the result of discussions on items such as dormitories, ablution blocks attached to the dormitories and dining hall which were requested additionally by the Kiribati side.

ANNEX- 1 ITEMS TO BE COVERED BY THE PROJECT

(1) Facilities
1) General Classrooms
2) Science (Physics and Chemistry)
3) Typing / Computing
4) Home Economics / Cookery / Sewing
5) Workshop
6) Music
7) Art (Fine)
8) Administration Building
9) Water Tanks

(2) Equipment
1) Science Equipment (Physics / Chemistry), such as:
   Micro Scopes
   Human Skeleton
   Water Deionizer
   Laboratory Glass
2) Typing / Computing Equipment,such as:
   Computers
   Dot Matrix Printers
   Basic Soft Wares
   Voltage Regretters
3) Sewing / Food Preparation,such as:
   Sewing Machines
   Freezer / Refrigerators
   Cooking / Table Wares
   Cupboards
4) Workshop Tools,such as:
   Circular Saw
   Bench Grinder
   Tool Sets
5) Musical Equipment,such as:
   Key Boards
6) Art,such as:
   Electric Drill,Saw and Curving
   Sketch Boards
7) Sports Equipment,such as:
   Succor Balls
   Tennis Rackets, Balls and Net

ANNEX-2 JAPAN'S GRANT AID PROGRAMME

1.Japan's Grant Aid Procedures

The Japan's Grant Aid Programme is extended in the following procedures:

1) · Application (A request made by the recipient country)
- Study (Basic Design Study conducted by JICA)
- Appraisal & Approval (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
- Determination of Implementation (Exchange of Notes between both Governments)
- Implementation (Implementation of the Project)

2)At the first step (Application), a request made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs), whether or not it is suitable for Grant Aid. If the request is confirmed that it has a high priority as the Project for Grant Aid, the Government of Japan instructs JICA to conduct the Study.

At the second step (the Study), the Basic Design Study is conducted by JICA basically under contracts with a Japanese consulting firm to carry out.

At the third step (Appraisal & Approval), the Government of Japan appraises whether or not the Project is suitable for Japan's Grant Aid Programme based on the Basic Design Study Report prepared by JICA and then submitted for approval by Cabinet.

At the fourth step(Determination of Implementation),the Project approved by the Cabinet is officially determined to implement by signing the Exchange of Notes between both Governments.

In the course of implementation of the Project, JICA will take charge of expediting the execution by assisting the recipient country in terms of the procedures of tender, contract and others.

2.Contents of the study

1)Contents of the study

The purpose of the study (the Basic Design Study) conducted by JICA is to provide basic documents necessary for the appraisal by the Government of Japan whether or not the project is viable for Japan's Grant Aid Programme. The contents of the Study are as follows;

a)to confirm the background of the request, objectives and effects of the Project and maintenance ability of the recipient country necessary for the implementation,

b)to evaluate the appropriateness of the Grant Aid from the technological, social and economical points of views,

c)to confirm the basic concept of the plan mutually agreed upon through discussion between both sides,

d)to prepare a basic design of the Project,

e)to estimate the rough cost of the Project,

The Contents of the original request are not necessarily approved as the contents of the Grant Aid as it is. The Basic Design of the Project is confirmed considering the Japan's Grant Aid Scheme. In the implementation of the Project, the Government of Japan requests the recipient country to take necessary measures in order to promote it's self-reliance. Those undertakings shall be guaranteed even if the recipient implementing entity does not have jurisdiction. Therefore, the implementation of the Project is confirmed by all relevant organizations in the recipient country in the Minutes of Discussions.

2)Selection of a Consultant

For the smooth implementation of the Study, JICA selects a consultant among those consultants who registered to JICA by evaluating proposals submitted by those consultants. The selected consultant carries out the Basic Design Study and prepares a report based upon the terms of reference made by JICA.

At the stage of implementation after the Exchange of Notes, for concluding the contract regarding the Detailed Design and Construction Supervision of the Project between a consultant and the recipient country, JICA recommends the same consultant which participated in the Basic Design Study to the recipient country in order to maintain the technical consistency between the Basic Design Study and the Detailed Design as well as to avoid undue delay caused by the selection of a new consultant.

3.Japan's Grant Aid Scheme

1)What is Grant Aid ?

The Grant Aid Programme provides the recipient country with nonreimbursable funds needed to procure facilities, equipment and services (labor or transportation, etc.) for economic and social development in the country under the following principles in accordance with the relevant laws and regulations of Japan.The Grant Aid is not a form of donation in kind to the country.

2)Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes between both Governments, in which the objectives of the Projects, period, conditions, amount of the grant, etc.are confirmed.

3) Period

The period of the Grant Aid is within the Japanese fiscal year in which the Cabinet approved the Project. Within the fiscal year, all procedure such as Exchange of Notes, concluding contracts by the recipient country with the consultant and contractors, and the final payment to them shall be completed.

In the case of a big project which requires net construction period more than 12 months, the period of the Grant Aid is designated covering more than one fiscal year depending on Basic Design Study Report.

However in case of the delay of delivery, installation or construction due to events such as weather, the period of the Grant Aid can be further extended for one fiscal year at most by mutual agreement between both Governments.

4)Purchase of the Products and or Services

The Grant Aid is used properly and exclusively for the purchase of the products, in principle, of Japan or the recipient country and of the services of the Japanese or the recipient country's nationals. The term "Japanese" means juridical persons controlled by Japanese physical persons.

When both Governments deem it necessary, the Grant Aid may be used for the purchase of the products and/or services of the third country (other than Japan or the recipient country).

However, in terms of the principle of the Grant Aid, the prime contractors, that is the consultant, contractor and procurement firm, necessary for the the implementation of the Grant Aid are limited to "Japanese nationals".

5)Verification

The Government of recipient country or its designated authority will conclude the contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is necessary because the source of the Grant Aid is the taxes of Japanese nationals.

6)Undertakings required to the Government of Recipient Country

(As described in ANNEX 3)

7)Proper Use

The recipient country is required to maintain and use the facilities constructed and the equipment purchased under the Grant Aid properly and effectively and to assign the necessary staff for operation and maintenance of them as well as to bear all the expenses other than those to borne by the Grant Aid.

8)Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

9)Banking Arrangement(B/A)

a)The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the contracts verified.

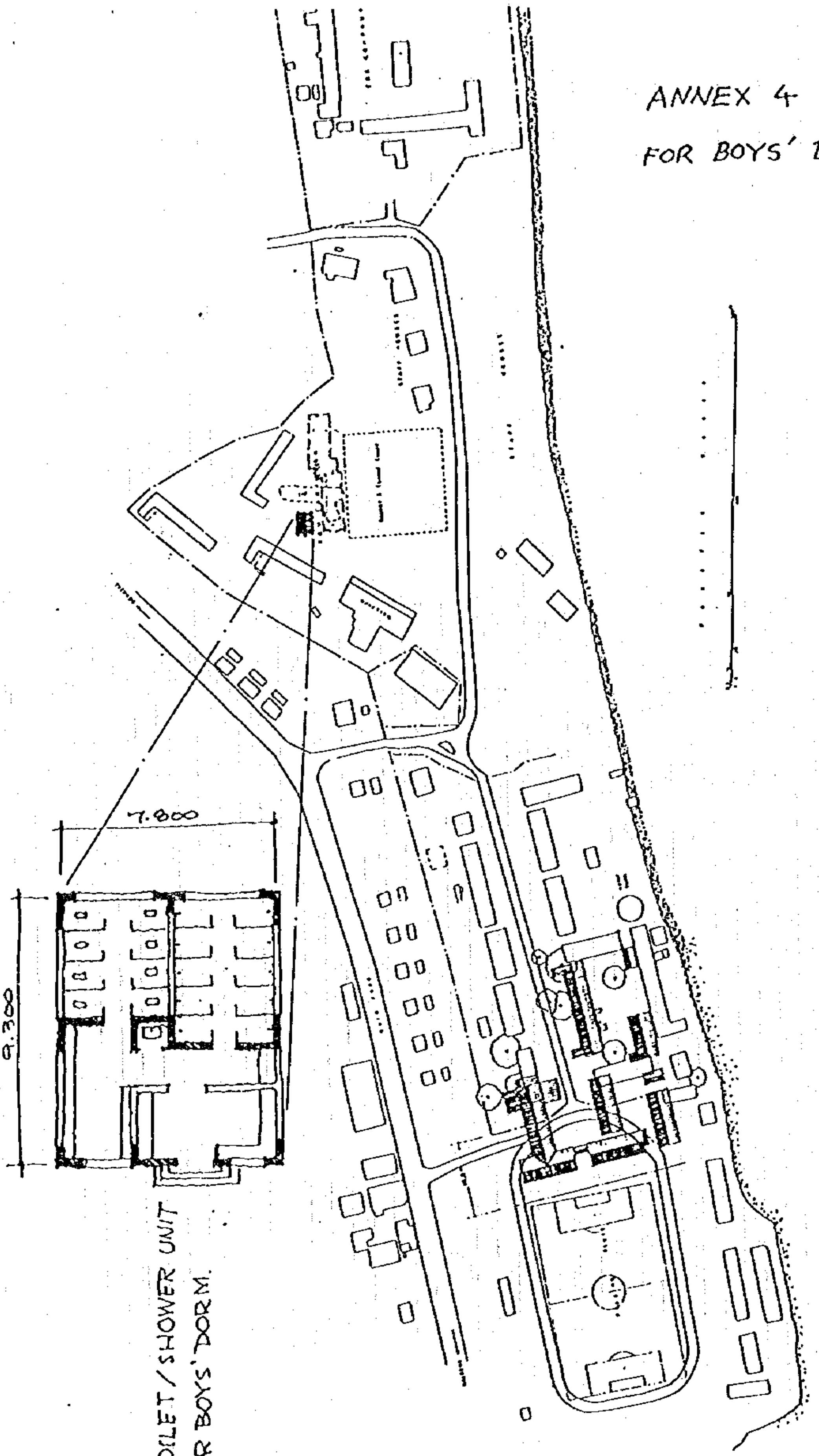
b)The payments will be made when payment requests are presented by the Bank to the Government of Japan under the an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

ANNEX 3 NECESSARY MEASURES TO BE TAKEN BY THE KIRIBATI SIDE

Following necessary measures should be taken by the Government of Kiribati on condition that the Grant Aid by the Government of Japan is extended to the Project:

1. To provide data and information necessary for the Project.
2. To secure, clear, level and reclaim the site for the Project prior to the Project implementation;
3. To provide proper access road to the Project area.
4. To undertake incidental outdoor works, such as gardening, fencing, exterior lighting, and other incidental facilities in and around the Project site, if necessary.
5. To bear commissions to the Japanese foreign exchange bank for its banking services based upon the Banking Arrangement, namely the advising commission of the "Authorization to Pay" and payment commission.
6. To ensure prompt unloading, tax exemption, customs clearance at the port of disembarkation in Kiribati and prompt internal transportation therein of the materials and equipment for the Project purchased under the Grant Aid.
7. To exempt Japanese juridical and physical nationals engaged in the Project from customs duties, internal taxes and other fiscal levies which may be imposed in Kiribati with respect to the supply of the products and services under the verified contracts.
8. To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into Kiribati and stay therein for the performance of their work
9. To provide necessary permissions, licenses and other authorizations for implementing the Project, if necessary.
10. To assign appropriate budget and teaching and administrative staff members for proper and effective operation and maintenance of equipment provided under the Grant Aid.
11. To maintain and use properly and effectively the facilities constructed and the equipment provided under the Project.
12. To bear all the expenses, other than those to be borne by the Japan's Grant Aid within the scope of the Project.

ANNEX 4 ABLUTION BLOCK FOR BOYS' DORMITORY



APPENDIX 5 COST ESTIMATION BORN BY THE RECIPIENT COUNTRY

(1)	Demolition and Land Preparation		A$ 59,980
1)	Cut and Detour of Existing Utility Lines		A$ 4,480
2)	Demolition of Existing Buildings	approx. $630m^2 \times$ A$ 50 =	A$ 31,500
3)	Land Preparation	approx. $12{,}000m^2 \times$ A$ 2 =	A$ 24,000
(2)	Extention of Electricity Supply		A$ 4,288
1)	Excavation and Backfilling for Cables		A$ 1,852
2)	Electric Supply Line from Sub Station to Main Panel		A$ 2,436
(3)	Extention of Water Supply & Drainage		A$ 2,517
1)	Excavation and Backfilling		A$ 695
2)	Piping & Manholes		A$ 822
3)	Government fee for Water Supply		A$ 1,000
(4)	Arrangement of Temporary Facilities		A$ 87,405
1)	Renovation of Existing Buildings	approx. 675 $m^2 \times$ A$ 80 =	A$ 54,000
2)	Preparation of Utilities	approx. 675 $m^2 \times$ A$ 25 =	A$ 16,875
3)	Rearrangement of Equipments		A$ 16,530

APPENDIX 6 TEST DIGGING AND PLATE LOAD TEST

1. Report of Test Results

The figures indicated in the following table were obtained from the test. From these results, it is considered that the ground strength is sufficiently safe and able to withstand the provisional design load that has been set as qa = 10.0 tf/m^2.

Bearing Power Calculation Results

No. 3A	Allowable Bearing Power (qt)	Allowable Bearing Power (qa)
Long term	18.78 tf/m^2	20.16 tf/m^2
Short term	37.56 tf/m^2	38.94 tf/m^2

2. Outline of Testing

Project name: Project for the Improvement of Secondary Education Facilities at KGV/EBS in the Republic of Kiribati

Location	:	Republic of Kiribati, Tarawa Island, Bikenibeu
Test sites	:	Test digging 5 sites (No. 1 - No. 4) (see map in appendix)
		Plate load test 1 site
Test depth	:	Playing field level - 1150
Test ground	:	Fine sand and gravel
Provisional design load	:	qa = 10.0 tf/m^2
Maximum actual load	:	4.0 tf (56.34 tf/m^2)
Loading platform	:	ø 300 × t 25 mm
Reaction method	:	Actual load method
Test date	:	December 15 and 18, 1995

3. Equipment Used

Loading platform	:	ø 300 × t 25 mm	
		Round steel platform (area: 0.071 m^2)	1
Displacement gauge	:	Direct-reading dial gauge	
		(measurement length: 20 mm; 1/100 readings)	2
Displacement gauge contact unit	:	Two points measurement type	1 set

Displacement gauge stand	:	Magnet type	2
Jack	:	Oil jack for max. 10 tf use	1
Weight for pressing down	:	Back hoe (Mitsubishi MS280) with an overall weight of 28 tf	
Other	:	Support material, level gage, watch, stopwatch, plumb-bob	

4. Setting of Maximum Test Load

The above-mentioned loading platform (0.071 m^2) was used in the test with the main intention of determining whether or not the bearing power of the foundation ground is safe with respect to the provisional design load.

The prescribed safety ratio in plate load testing is 3, meaning that the load placed on the ground has to be at least three times as great as the load value that wants to be checked.

Consequently, the maximum test load (Pmax) that needs to be placed on the loading platform is calculated by the following expression:

Provisional design load qa (tf/m^2) $\times$ 0.071 (m^2) $\times$ 3

As the provisional design load targeted for confirmation in the test was qa = 10.0 tf/m^2, the maximum test load was calculated as follows:

$10.0 \times 0.071 \times 3 = 2.13$ tf < Maximum test load (tf)

Pmax was set at 4.0 tf (56.34 tf/m^2) to satisfy the aforementioned criteria, and the test was performed with this figure as the target.

5. Setting of the Plate Load Test Equipment

5-1 Selection of Test Position and Depth

When performing load testing, ample consideration needs to be first given to factors such as type of intended structure, size of structure, size of foundations and the soil layer composition of the bearing ground, and the testing is performed in a position and at a depth that is representative of the bearing power conditions of the ground within the intended site. In this case, prior to the test, hand digging to approximately 1.0 m was done in five places in order to estimate the soil layer conditions, and the area next to the seemingly weakest one of these hand-dug points was selected as the test position.

5-2 Excavation of Test Hole

Taking care not to ruin the natural state of the test ground, a hole was excavated to the set depth in the middle of the chosen test position, and the ground was then leveled as much as possible. However, the final leveling of the earth was not performed until just before the test in order to avoid any changes or disruption in the ground.

5-3 Weight for Pressing Down

The test was performed in line with the actual load method, and the load material used was a back hoe (Mitsubishi MS-280) with an overall weight of 28 t, which was placed directly above the test position. (See photograph at the end of this report).

5-4 Placing of the Loading Platform

The loading platform was placed horizontally on the finally leveled ground in a way so that it would uniformly hug the ground surface.

5-5 Assembly of the Measuring Equipment

The central support material, oil jack and displacement gauge were successively placed on the loading platform, and then an adjustment base plate was attached in order to keep the load concentrated directly from above on the loading platform at all times. The adjustment base plate, etc. were also connected to the load on top so as to transmit the weight to the loading platform.

The dial gauges were installed on the magnetic attachments on the gauge stands in the two corners of the loading platform, and positioned so that they were in contact with the gauge rods on the criterion bar set beside the loading platform. Care was taken when placing to maintain the smoothness of the connection between the criterion bar and gauge rods.

6. Test Method

6-1 Loading Stages

The test was performed in single cycles, and each load was maintained for a set uniform period of time. Load changes were performed by means of the oil jack, and the load measurements were made with the displacement gauge.

As for the loading stages, the maximum test load of 4.0 tf (56.34 tf/m^2) was applied in the six stages indicated in the table below.

Table: Loading Stages (Unit: tf)

Surcharging	0.0→	0.8→	1.6→	2.4→	3.2→	4.0
Discharging	4.0→	3.2→	2.4→	1.6→	0.8→	0.0

Moreover, prior to the start of the test, an advance load of 0.40 tf was loaded two or three times in order to allow inspection of the safety and perpendicularity of the equipment and to adjust the measuring equipment to zero.

6-2 Measurement of Sinkage

The overall sinkage was assumed to be the average of the readings obtained from the dial gauges (with an accuracy of 1/100 mm and 20 mm stroke) attached to the two corners of the loading platform.

6-3 Load Holding Times

All loads were maintained for a uniform time of 30 minutes when surcharging. In the case of discharging, each load stage was maintained for a uniform time of five minutes.

6-4 Sinkage Measurement Intervals

Surcharging : Sinkage was measured every 0, 1, 2, 5, 10, 15, 20, 25 and 30 minutes after each specified load had been reached.

Discharging : Sinkage was measured five minutes after each specified load was reached.

7. Test Results and Assessment

Calculation of the Long-Term Allowable Bearing Power (ql)

7-1 Examination of the Ultimate Allowable Bearing Power (qd)

According to the book "Ground Plate Load Testing Methodology and Commentary", prepared by the Japan Soil Character Engineering Society, the ultimate bearing power is defined as either: "① The point where sinkage starts to increase rapidly on the load vs. sinkage curve, or ; ② The load per unit area at the point where the loading platform and surrounding ground conditions start to undergo sudden change and the loading becomes difficult."

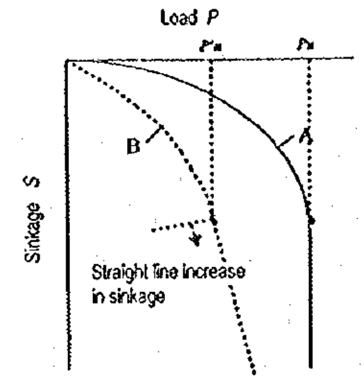


Fig. 1 Shape of the Load vs. Sinkage Curve and the Ultimate Bearing Power

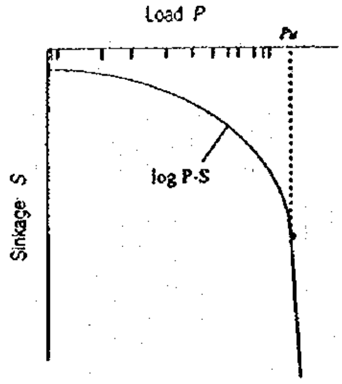


Fig. 2 Log P-S Curve and the Ultimate Bearing Power

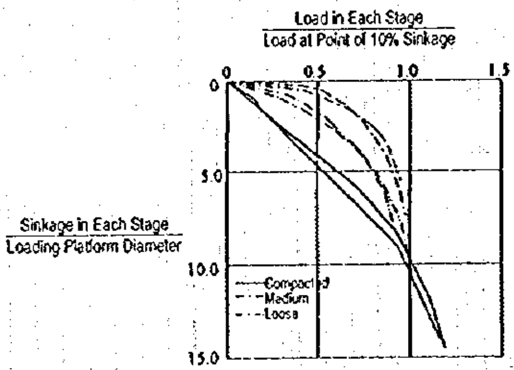


Fig. 3 Example Plate Load Test Results (Sandy Soil)

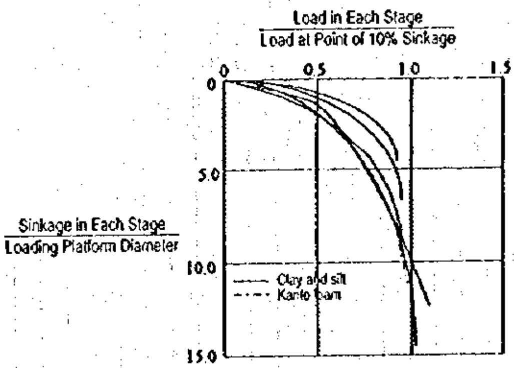


Fig.4 Example Flat Slab Loading Test Results (Viscous Soil)

Definition ① can be seen in the case of Figure 1, where the ultimate bearing power is reached when sinkage suddenly increases and the addition of any further load becomes difficult, as is shown by Curve-A at the point "Pu" where it becomes almost parallel with the sinkage axis.

The ultimate bearing power in the sense of definition ② would occur when the addition of any further load becomes impossible due to the occurrence of destructive ground conditions such as, for example, the large leaning of the loading platform during the test or the occurrence of large cracks and bulging in the ground around the loading platform.

However, the ultimate bearing power does not always become apparent in forms that are so clear cut as this. In actual fact, it is often the case that a curve similar to Curve B in Figure 1 is formed, and it is difficult to determine the ultimate bearing power. In cases such as this, where sinkage does not exceed 5 cm (approximately 15% of the loading platform diameter), the ultimate bearing power is assumed to be the smaller load of ③ and ④ described below.

③ The load where the sinkage starts to increase rapidly in a straight line (like at point Pu' on Curve B in Figure 1).
④ The load where the Log P-S curve starts to become almost parallel to the sinkage axis (like at point Pu in Figure 2).

Furthermore, in cases where sinkage is below 5 cm and it is impossible to determine either of the loads described in ③ or ④, it must be concluded that the ultimate bearing power has not been reached.

As an appendage to the above definitions of ultimate bearing power, according to the "Building Foundation Structure Design Guidelines" edited by the Japan Building Society, in cases where the maximum amount of sinkage is over 3 cm, judging from the kind of test results indicated in Figure 3 and Figure 4, there is no great error in assuming the ultimate bearing power to be the load where the sinkage amounts to 10% of the loading platform diameter (3 cm sinkage).

In view of the above definitions of ultimate bearing power, it was decided to be on the safe side and set a sinkage standard of around 3 cm, by using 3) and 4) above as the criteria for judgment.

The results of the test are shown in the table below.

Test No. No. 3A (test depth: Playing Field Level - 1,150)

Load Stages and Final Sinkage Levels

(Unit: mm)

Cycle	Load tf/m^2	0.00	11.27	22.54	33.80	45.07	56.34
1	Surcharging	0.00	0.27	0.91	2.57	4.55	6.05
	Discharging	4.85	5.72	5.90	5.98	5.98	

From the above table, it can be seen that the final sinkage at the maximum load level was No. 3A = 6.05 mm, which is equivalent to approximately 2.01% (6.05/300 × 100) of the loading platform diameter.

Moreover, as it is judged from the Load vs. Sinkage Curve in the appendix that the test ground has enough bearing capacity to withstand further load surcharge, it was judged that the ultimate bearing capacity of the test ground is in excess of the maximum confirmed test load.

[See Appendix: P-S Curve, Log P-S Curve, graph 1, 2]

Result of Examination of Ultimate Bearing Power

NO. 3A. Ultimate bearing power qd = Not reached = > 56.34 tf/m^2

7-2 Examination of Maximum Test Load (qd')

As was described above, as a result of applying the maximum test load, it was found that the test ground completed the test without showing any signs of the ultimate state. Thus, qd' was assumed to be the final confirmed load of 56.34 tf/m^2.

Result of the Examination of Maximum Test Load

NO. 3A. Maximum test load qd' = 56.34 tf/m^2

7-3 Examination of Yield Loading Condition (yp)

The fold point of the load vs. sinkage (Log P vs. Log S) curve plotted on both logarithmic graphs from final sinkage levels at virgin load stages was obtained, and the load at this point was taken to be the yield loading condition "yp."

[See Appendix: Log P vs. Log S Curve, Log T-S Curve, graph 3)

Result of the Examination of Yield Loading Condition

No. 3A. Yield Load yp = 45.07 tf/m^2

The value for the allowable bearing power (qt) is defined as follows in the "Building Foundation Structure Design Guidelines" of the Japan Building Society:

"The value of qt shall be either 1/3 of the ultimate bearing power obtained by load testing or 1/3 of the maximum test load, whichever one may be the smaller."

Furthermore, in consideration of the conventionally used definition, which assumes the allowable bearing power to be 1/2 of the yield loading condition, it was decided to adopt the smallest value of the three alternatives for the purposes of this test.

As a result of the aforementioned examinations, the ultimate bearing power, maximum test load and yield loading condition were obtained as shown in the table below.

(Unit: tf/m^2)

Point	Ultimate Bearing Power	Maximum Test Load	Yield Loading Condition
No.3A	>56.34	56.34	45.07

From the above, the long-term allowable bearing capacity (qt) was obtained as follows.

Ultimate bearing power	$qd \times 1/3 > 56.34 \times 1/3 = 18.78\ tf/m^2$
Maximum test load	$qd' \times 1/3 = 56.34 \times 1/3 = 18.78\ tf/m^2$
Yield loading condition	$yp \times 1/2 = 45.07 \times 1/2 = 22.54\ tf/m^2$

As the smallest value of the above three alternatives is $qd' \times 1/3 = 18.78\ tf/m^2$, the following long-term allowable bearing power was obtained: $qt = 18.78\ tf/m^2$.

Therefore, as a result of the plate loading test, it was found that the long-term allowable bearing power (qt) satisfied the provisional design bearing power of $qa = 10\ tf/m^2$ that was set for the project structures. (The subsequent pages show reference materials explaining the difference between qa and qt).

Moreover, assuming the short-term allowable bearing power to be 2qt, this was found to be the following.

Point	Long Term Allowable Bearing Power	Short Term Allowable Bearing Power
No.3A	18.78 tf/m^2	37.56 tf/m^2

8. Long-Term Allowable Bearing Power qa (reference)

The expression used to calculate the long-term allowable bearing power of ground based on the plate loading test, while taking the foundation setting depth into consideration, is as follows.

$$qa = qt \times 1/3\ \gamma_2 DfNq$$

qa : Long-term allowable bearing power (tf/m^2)

qt : Long-term allowable bearing power (tf/m^2) of ground according to load testing results

γ_2 : Unit volume weight (tf/m^2) of ground above the foundation ground base (Use the submerged unit volume if underwater).

Df : Foundation setting depth (m)

Nq : Bearing power coefficient of ground below the foundation base (coefficient of the internal angle of friction ø; See Table 8-1)

Table 8-1

ø (degrees)	Nc	Nr	Nq
0°	5.3	0	3.0
5°	5.3	0	3.4
10°	5.3	0	3.9
15°	6.5	1.2	4.7
20°	7.9	2.0	5.9
25°	9.9	3.3	7.6
28°	11.4	4.4	9.1
32°	20.9	10.6	16.1
36°	42.2	30.5	33.6
40° and over	95.7	114.0	83.2

As stated above, the value of Nq is determined by the internal angle of friction of the ground. However, when seeking to obtain the allowable bearing power of ground through load testing, it is sometimes the case that geological testing is not performed at the same time. In such cases, the rough estimations of Nq (Nq') shown in Table 8-2 are used.

Table 8-2

Ground		Nq' Value Adopted	γ_2 (tf/m³)	
			Above the Groundwater Level	Below the Groundwater Level
Sandy Ground	Loose Ground	6	1.6	0.6
	Compacted Ground	12	1.8	0.8
Viscous Ground		3	1.5	0.5

In consideration of the above, the long-term allowable bearing power at point No. 3A was obtained in the following way.

qt = 18.78 tf/m² (from the results of the load test)

γ_2 = 0.6 tf/m³ (using the submerged unit volume weight of sandy soil to be on the safe side)

Df = 1.15 m (using the test depth)

Nq' = 6 (assuming loose sandy ground to be on the safe side)

Long-Term Allowable Bearing Power: No. 3A qa = 20.16 tf/m²

The short-term allowable bearing power is obtained by means of the following expression:

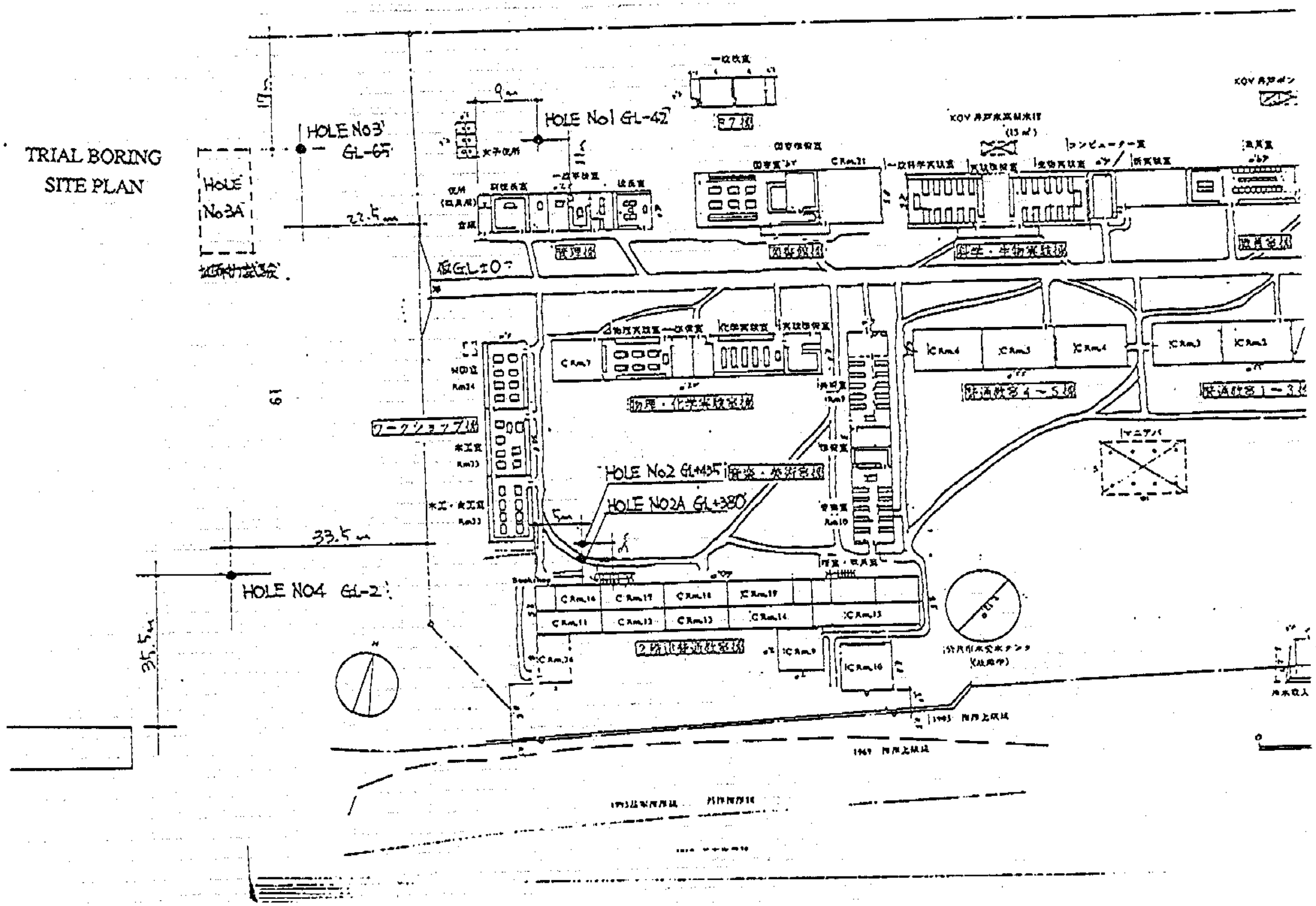
$$qa = 2qt + 1/3\ r2DfNq' = 2 \times 18.78 + 1/3 \times 0.6 \times 1.15 \times 6$$
$$= 37.56 + 1.38$$
$$= 38.94$$

Short-Term Allowable Bearing Power: No. 3A qa = 38.94 tf/m²

Bearing Power Calculation Results

No. 3A	Allowable Bearing Power (qt)	Allowable Bearing Power (qa)
Long-term	18.78 tf/m²	20.16 tf/m²
Short-term	37.56 tf/m²	38.94 tf/m²

TRIAL BORING
SITE PLAN



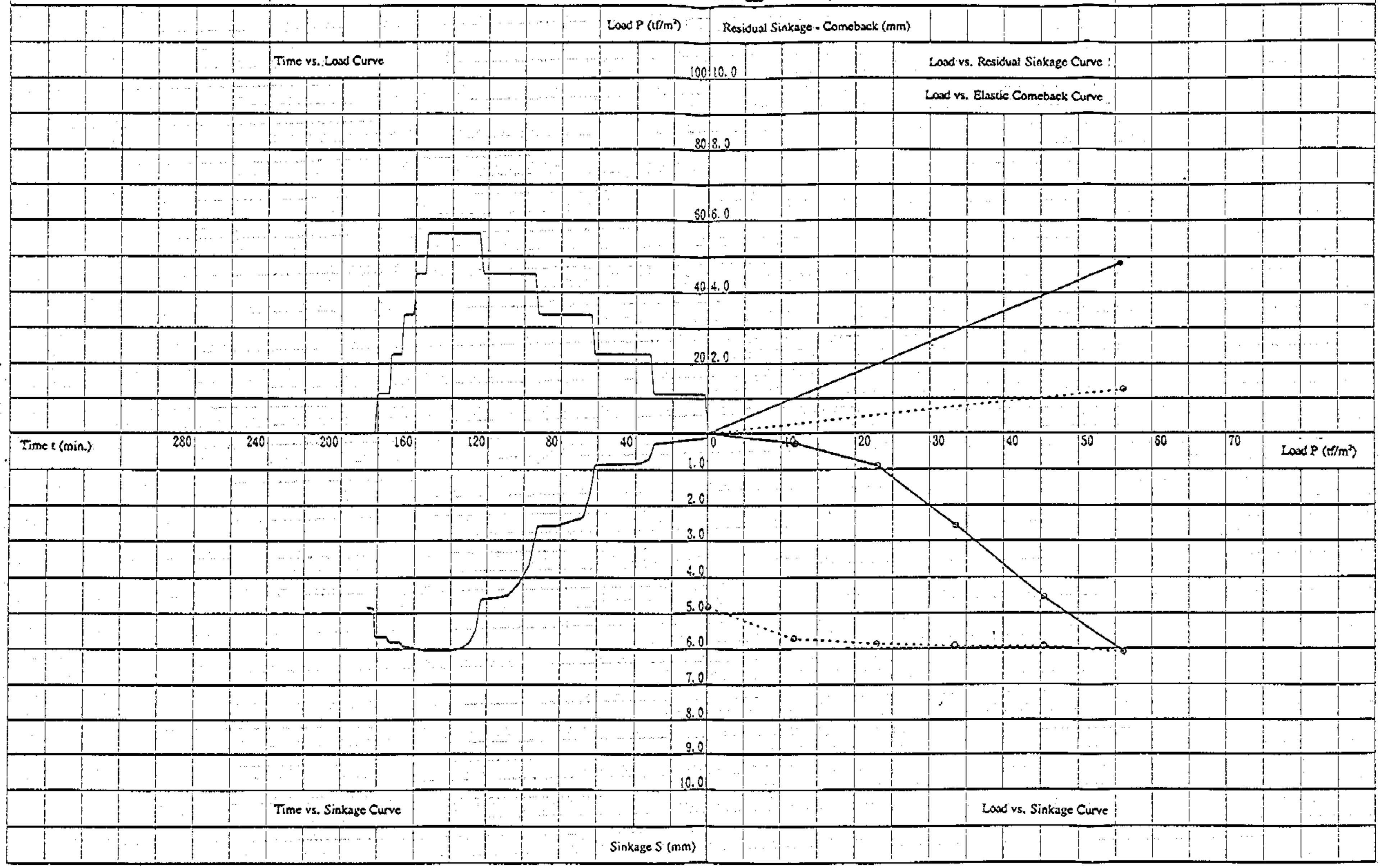
J S F T 25			Ground Plate Load Test						Record Paper (1/2)	
Survey Name • Survey Point			KGV PLAYING FIELD HOLE No. 3A						Test Date: December 18, 1995	
Test No. : No			1.0			Weather	FINE	Tester		
Cycle	Actual Load p tf	Load P tf/m2	Elapsed Time t min	Time Hour:Minute	Displacement Gage Reading 1/100 mm 1.0	2.0	3.0	4.0	Average of Displacement Gage Readings mm	Aggregate Sinkage mm
	0.0	0.00	0.0	11:46	0.0	0.0			0.000	0.00
	0.4	5.63	1.0	11:48	1.0	1.0			0.010	0.01
	0.0	0.00	1.0	11:50	0.0	0.0			0.000	0.00
	0.4	5.63	1.0	11:52	0.5	0.5			0.005	0.01
	0.0	0.00	1.0	11:54	0.0	0.0			0.000	0.00
	0.4	5.63	1.0	11:56	3.0	2.0			0.025	0.03
	0.0	0.00	1.0	11:58	0.0	0.0			0.000	0.00
	0.0	0.00	0.0	11:59	0.0	0.0			0.000	0.00
1	0.8	11.27	0.0	12:00	13.0	12.0			0.125	0.13
	0.8	11.27	1.0	12:01	17.0	16.0			0.165	0.17
	0.8	11.27	2.0	12:02	19.0	18.0			0.185	0.19
	0.8	11.27	5.0	12:05	21.0	20.0			0.205	0.21
	0.8	11.27	10.0	12:10	22.0	21.0			0.215	0.22
	0.8	11.27	15.0	12:15	24.0	23.0			0.235	0.24
	0.8	11.27	20.0	12:20	25.0	24.0			0.245	0.25
	0.8	11.27	25.0	12:25	25.0	24.0			0.245	0.25
	0.8	11.27	30.0	12:30	27.0	26.0			0.265	0.27
	1.6	22.54	0.0	12:31	56.0	55.0			0.555	0.56
	1.6	22.54	1.0	12:32	66.0	64.0			0.650	0.65
	1.6	22.54	2.0	12:33	72.0	69.0			0.705	0.71
	1.6	22.54	5.0	12:36	82.0	78.0			0.800	0.80
	1.6	22.54	10.0	12:41	86.0	81.0			0.835	0.84
	1.6	22.54	15.0	12:46	88.0	84.0			0.860	0.86
	1.6	22.54	20.0	12:51	91.0	87.0			0.890	0.89
	1.6	22.54	25.0	12:56	92.0	88.0			0.900	0.90
	1.6	22.54	30.0	13:01	92.0	89.0			0.905	0.91
	2.4	33.80	0.0	13:02	165.0	168.0			1.665	1.67
	2.4	33.80	1.0	13:03	175.0	178.0			1.765	1.77
	2.4	33.80	2.0	13:04	193.0	196.0			1.945	1.95
	2.4	33.80	5.0	13:07	243.0	244.0			2.435	2.44
	2.4	33.80	10.0	13:12	245.0	245.0			2.450	2.45
	2.4	33.80	15.0	13:17	249.0	249.0			2.490	2.49
	2.4	33.80	20.0	13:22	252.0	253.0			2.525	2.53
	2.4	33.80	25.0	13:27	255.0	256.0			2.555	2.56
	2.4	33.80	30.0	13:32	256.0	257.0			2.565	2.57
	3.2	45.07	0.0	13:33	282.0	288.0			2.850	2.85
	3.2	45.07	1.0	13:34	326.0	331.0			3.285	3.29
	3.2	45.07	2.0	13:35	360.0	372.0			3.660	3.66
	3.2	45.07	5.0	13:38	406.0	416.0			4.110	4.11
	3.2	45.07	10.0	13:43	430.0	438.0			4.340	4.34
	3.2	45.07	15.0	13:48	441.0	449.0			4.450	4.45
	3.2	45.07	20.0	13:53	449.0	456.0			4.525	4.53
	3.2	45.07	25.0	13:58	451.0	457.0			4.540	4.54
	3.2	45.07	30.0	14:03	452.0	458.0			4.550	4.55

Measured at a point 1150 from the Playing Field Level

Cycle	Actual Load p tf	Load P tf/m2	Elapsed Time t min	Time Hour:Minute	Displacement Gage Reading 1/100 mm 1.0	2.0	3.0	4.0	Average of Displacement Gage Readings mm	Aggregate Sinkage mm
	4.0	56.34	0.0	14:04	485.0	497.0			4.910	4.91
	4.0	56.34	1.0	14:05	535.0	546.0			5.405	5.41
	4.0	56.34	2.0	14:06	550.0	565.0			5.575	5.58
	4.0	56.34	5.0	14:09	582.0	594.0			5.880	5.88
	4.0	56.34	10.0	14:14	592.0	605.0			5.985	5.99
	4.0	56.34	15.0	14:19	595.0	607.0			6.010	6.01
	4.0	56.34	20.0	14:24	595.0	607.0			6.010	6.01
	4.0	56.34	25.0	14:29	596.0	610.0			6.030	6.03
	4.0	56.34	30.0	14:34	598.0	611.0			6.045	6.05
	3.2	45.07	0.0	14:35	595.0	605.0			6.000	6.00
	3.2	45.07	5.0	14:40	593.0	603.0			5.980	5.98
	2.4	33.80	0.0	14:41	592.0	603.0			5.975	5.98
	2.4	33.80	5.0	14:46	592.0	603.0			5.975	5.98
	1.6	22.54	0.0	14:47	586.0	592.0			5.890	5.89
	1.6	22.54	5.0	14:52	592.0	588.0			5.900	5.90
	0.8	11.27	0.0	14:53	574.0	578.0			5.760	5.76
	0.8	11.27	5.0	14:58	570.0	573.0			5.715	5.72
	0.0	0.00	0.0	14:59	482.0	498.0			4.900	4.90
	0.0	0.00	5.0	15:04	476.0	493.0			4.845	4.85

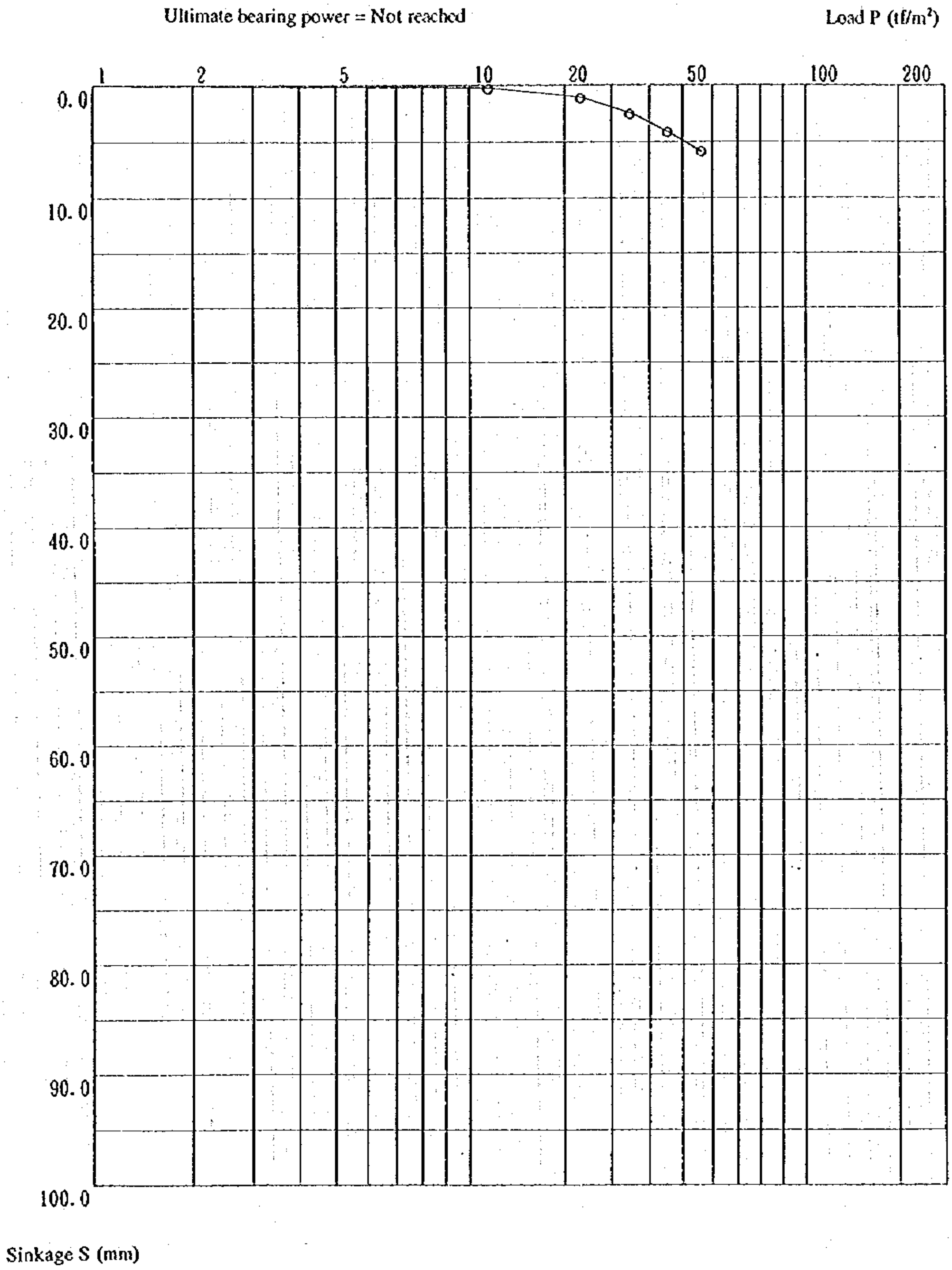
Measured at a point 1150 from the Playing Field Level graph 1

Ground Plate Load Test (Load vs. Sinkage vs. Time Curve)

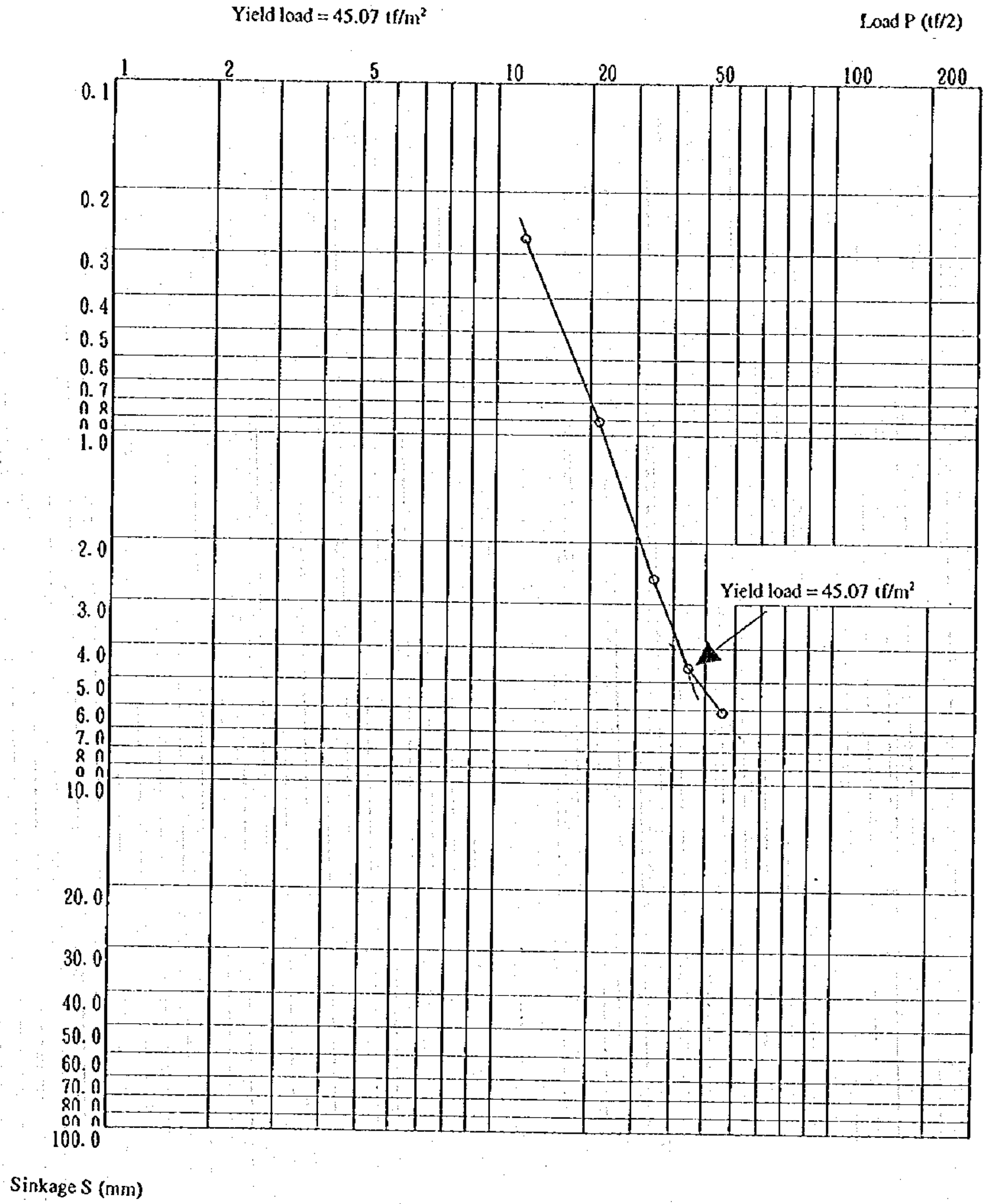


graph 2	Ground Plate Load Test (Log P-S Curve)

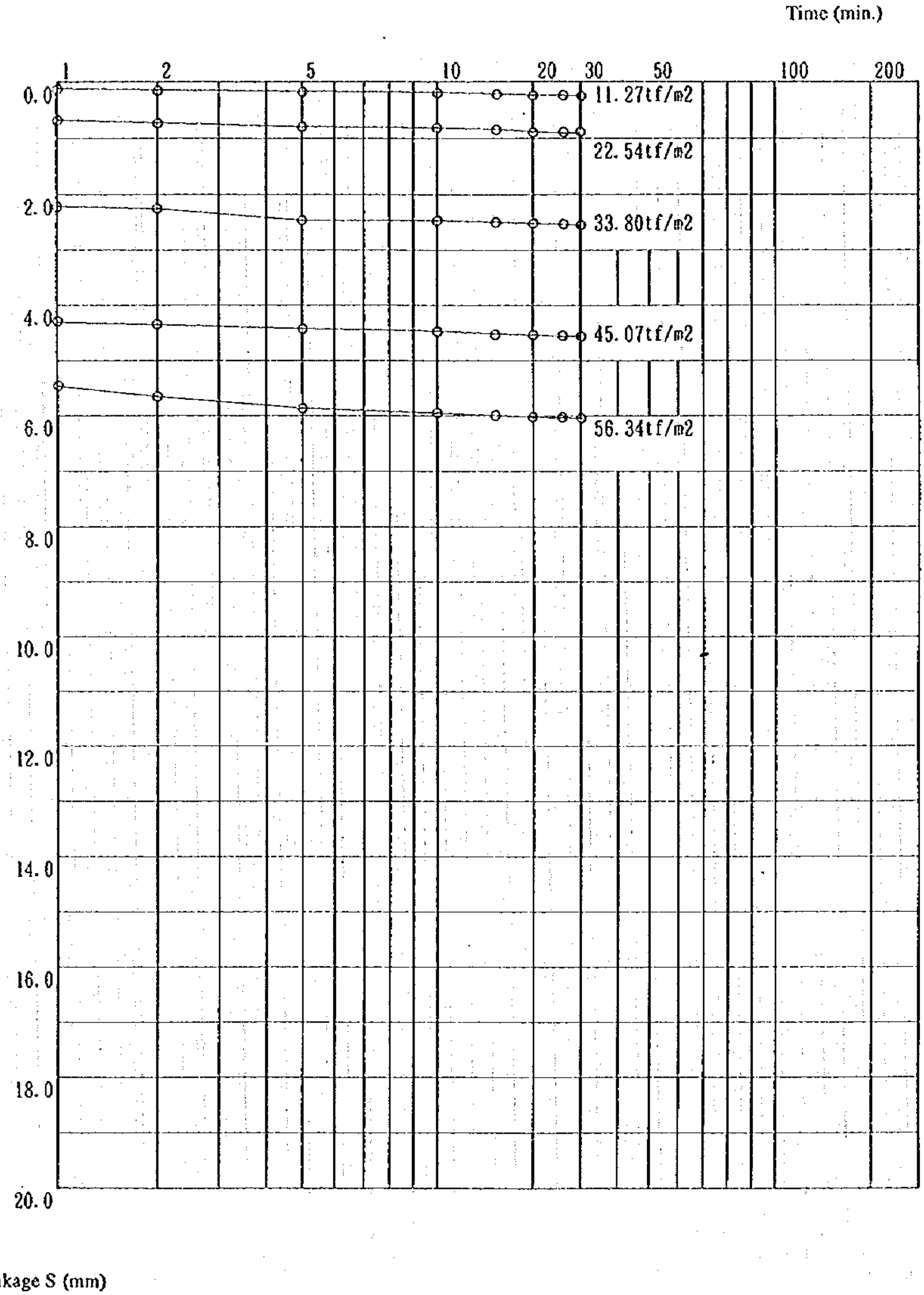
Ultimate bearing power = Not reached



graph 3	Ground Plate Load Test (LogP vs. LogS Curve)



graph 4	Ground Plate Load Test (Log T-S Curve)



APPENDIX 7 LIST OF REFERENCE MATERIALS

1. Policy Statement (31 Oct. 1994)
2. The World Bank Pacific Islands Education Study (Feb. 1995)
3. 1996 Development Budget and 1995 Supplementaries Summary Tables (5 Dec. 1995)
4. Table; Minimum Wages (Public Works Division: PWD)
5. Construction Machinery Rental List (PWD)
6. Table; Inland Transportation Costs (Kiribati Shipping Service Limited)
7. Kiribati Government Computer Standards
8. Schooling Sequences of Kiribati, and Others (MOEIT)
9. Builder Marchants - Products Offered
10. Catalogue (Doors & Roofing) [AUSTRALIA]
11. Kiriobati Supply Company Limited Catalogue (1995)
12. Rowlinsons - Construction Cost Guide (1995) [AUSTRALIA]

BASIC DESIGN STUDY REPORT ON THE PROJECT FOR UPGRADING AND
DEVELOPMENT OF KING GEORGE V & ELAINE BERNACCHI SCHOOL IN THE REPUBLIC OF KIRIBATI

MARCH [illegible]

JICA