

[Appendices]

1. Study Team Member List

(1) Field Survey I

	Name	Position	Organization
a	Mr. Jun Sakuma	Team Leader	Senior Advisor, JICA
b	Ms. Minako Sugawara	Planning Management	Assistant Director, Basic Education Division II, Human Development Department, JICA
c	Mr. Ichiro Nomura	Project Manager, Facility Planning Architect	Fukunaga Architects-Engineers “FAE”
d	Mr. Kunio Nishimura	Educational Planning	FAE
e	Mr. Masao Okui	Architectural Planning Architect	FAE
f	Mr. Masayuki Asabuki	Construction and Procurement Planning, Cost Estimation Architect	FAE
g	Mr. Hiroo Mizushiro	Architectural Planning II Assistant Architect	FAE

(2) Field Survey II

	Name	Position	Organization
a	Mr. Toshiyuki Nakamura	Team Leader	Chief Representative, JICA South Africa Office
b	Ms. Minako Sugawara	Planning Management	Assistant Director, Basic Education Division II, Human Development Department, JICA
c	Mr. Shuji Uchida	Procurement Management	Technical Adviser JICS
d	Mr. Ichiro Nomura	Project Manager, Facility planning Architect	Fukunaga Architects-Engineers “FAE”
e	Mr. Kunio Nishimura	Educational planning	FAE
f	Mr. Masao Okui	Architectural Planning Architect	FAE
g	Mr. Masayuki Asabuki	Construction and Procurement Planning, Cost Estimation Architect	FAE
h	Mr. Hiroataka Hirooka	Procurement Planning/Cost Estimation 2 Architectural Planning2	FAE

(3) Field Survey III

	Name	Position	Organization
a	Mr. Toshiyuki Nakamura	Team Leader	Chief Representative, JICA South Africa Office
b	Mr. Takeshi Matsuyama	Planning Management	Assistant Director, Grant Aid Project Management Division 2, Financing Facilitation and Procurement Supervision Department, JICA
c	Mr. Ichiro Nomura	Project Manager/Facility Management Architect	Fukunaga Architects-Engineers (FAE)
d	Mr. Hirotaka Hirooka	Construction and Procurement Planning/Cost Estimation Architect	FAE
e	Mr. Yuya Fukada	Construction and Procurement Planning 2/Cost Estimation 2 Architect	FAE

(4) Field Survey IV

	Name	Position	Organization
a	Mr. Ichiro Nomura	Project Manager/Facility Management Architect	Fukunaga Architects-Engineers (FAE)
b	Mr. Hirotaka Hirooka	Construction and Procurement Planning/Cost Estimation Architect	FAE
c	Mr. Utaka Tatsuya	Construction and Procurement Planning 2/Architect	FAE

2. Study Schedule

(1) Field Survey I

Field Survey I

	Date		JICA Officials		Consultants, FAE						
			Team Leader	Planning Management	(a) Project Manager/ /Facility Management	(b) Educational Planning	(c) Architectural Planning	(d) Construction and Procurement Planning/Cost Estimation	(e) Architectural Planning II		
			Mr.Jun SAKUMA	Ms.Minako SUGAWARA	Mr.Ichiro NOMURA	Mr.Kunio NISHIMURA	Mr.Masao OKUI	Mr.Masayuki ASABUKI	Mr.Hiroo MIZUSHIRO		
1	18 Apr.	SUN	→Johannesburg		Narita→ Singapore →						
2	19 Apr.	Mon	•Meeting with JICA office •Meeting with Embassy of Japan → Mbabane		→Johannesburg •Follow with Official Members → Manzini		→Johannesburg → Manzini				
3	20 Apr.	Tue	•MOET/The Ministry of Economic Planning and Development/The Ministry of Public Works		•Follow with JICA Officials						
4	21 Apr.	Wed	•The Ministry of Economic Planning and Development/MOET/The Ministry of Public Works		•Follow with JICA Officials		•MOET/Discussion on Site Survey Schedule and Arrangement MNRE Surveyor General, The Ministry of Public Works/ Information on Construction in Swaziland				
5	22 Apr.	Thu	Visit of sites and Existing School								
6	23 Apr.	Fri	•MPIU/EU, other donors/		•Follow with JICA Officials		•MOET/The Ministry of Public Works				
7	24 Apr.	Sat	•Inner Meeting (site visit)								
8	25 Apr.	Sun	•Inner Meeting								
9	26 Apr.	Mon	•Inner Meeting		•Inner Meeting / Survey						
10	27 Apr.	Tue	•MPIU, M/D sinning Manzini → Johannesburg		•Follow with JICA Officials		•REO/Site Survey①②"Manzini Region"				
11	28 Apr.	Wed	•Japanese Embassy/Report to JICA →Johannesburg		•REO/Site Survey③④" Lubombo Region"						
12	29 Apr.	Thu	→ Narita airport		•REO/Site Survey⑤⑥"Shiselwini Region"						
13	30 Apr.	Fri			•REO/Site Survey⑦⑧" Hhohho Region"						
14	1 May.	Sat			•Inner Meeting						
15	2 May.	Sun			•Inner Meeting						
16	3 May.	Mon			•MOET/The Ministry of Public Works		•Site Survey⑨⑩"Manzini Region"		•Interview and Survey/ Contractors, Consultants		•Site Survey⑨⑩ "Manzini Region"
17	4 May.	Tue			•MOET/The Ministry of Public Works		•Site Survey⑪⑫" Lubombo Region"		•Interview and Survey/ Contractors, Consultants		•Site Survey⑪⑫ "Lubombo Region"
18	5 May.	Wed			•The Ministry of Economic Planning and Development		•Site Survey⑬⑭" Shiselwini Region"		•Interview and Survey/ Contractors, Consultants		•Site Survey⑬⑭ "Shiselwini Region"
19	6 May.	Thu			•Interview and Survey/ Contractors, Consultants		•Site Survey⑮⑯" Hhohho Region"		•Interview and Survey/ Contractors, Consultants		Mbabane → Johannesburg →
20	7 May.	Fri			•Interview and Survey/ Contractors, Consultants		•Site Survey "spare day"		•Interview and Survey/ Contractors, Consultants		→ Singapore → Narita
21	8 May.	Sat			•Inner Meeting						
22	9 May.	Sun			•Inner Meeting						
23	10 May.	Mon			•The Ministry of Education and training					Mbabane → Nelspruit •Interview and Survey/ Contractors, Consultants in the Republic of South Africa	
24	11 May.	Tue			•The Ministry of Education and training					•Interview and Survey/ Contractors, Consultants in the Swaziland	
25	12 May.	Wed			•The Ministry of Economic Planning and Development./MOET/The Ministry of Public Works/MPIU					•Interview and Survey/ Contractors, Consultants in the Swaziland	
26	13 May.	Thu			•The Ministry of Economic Planning and Development./MOET/The Ministry of Public Works/MPIU					•Interview and Survey/ Contractors, Consultants in the Swaziland	
27	14 May.	Fri	Manzini →Johannesburg •Interview and Survey/ Contractors, Consultants in the Swaziland								
28	15 May.	Sat	→Johannesburg → Singapore								
29	16 May.	Sun	→ Singapore → Narita								
	period		12days	12days	29days	29days	29days	29days	20days		

※ MPIU : Micro-Project Program Implementation Unit ※ MOET : The Ministry of Education and training※ MNRE : The Ministry of Natural Resource and Energy

(2) Field Survey II

Field Survey II									
Date	JICA Officials			Consultants, FAE					
	Team Leader	Planning Management	Procurement Management (JICS)	(a) Project Manager/ /Facility Management	(b) Educational Planning	(c) Architectural Planning	(d) Construction and Procurement Planning /Cost Estimation	(e) Procurement Planning /Cost Estimation 2 Architectural Planning2	
Date	Mr.Toshiyuki NAKAMURA (JICA SA)	Ms.Minako SUGAWARA	Mr. Shuji UCHIDA	Mr.Ichiro NOMURA	Mr.Kunio NISHIMURA	Mr.Masao OKUI	Mr.Masayuki ASABUKI	Mr.Hirofumi HIROOKA	
1 17 Jul. Sat				Narita ⇨					
2 18 Jul. SUN				⇨ Johannesburg Johannesburg ⇨ Mbabane					
3 19 Jul. Mon				•MOET/The Ministry of Economic Planning and Development/MPCU					
4 20 Jul. Tue				•MOET/The Ministry of Economic Planning and Development/MPCU	Preparation /Discussio		•Survey of Contractors and		
5 21 Jul. Wed				•MOET/The Ministry of Economic Planning and Development	•Survey of educational situation	•Site Survey	"		
6 22 Jul. Thu				Birthday of the Late King Sobhuza. •Survey of alternative school / check the Land survey map					
7 23 Jul. Fri				•Survey of alternative school	•Site Survey	•Survey of alternative school	•Survey of Contractors and		
8 24 Jul. Sat				•Survey of alternative school/preparation of outsourcing					
9 25 Jul. Sun			NRT ⇨	•Inner Meeting					
10 26 Jul. Mon		⇨ Johannesburg (Arr. 7:00) AM Meeting with JICA Office Johannesburg ⇨ Mbabane (Dep. 15:15 - Arr. 16:00) Internal Meeting	⇨ Johannesburg (Arr. 7:00) Johannesburg ⇨ Mbabane (Dep. 10:05 - Arr. 11:10) Internal Meeting	•Meeting/ SEC/Department of Water Affair (Ministry of Natural Resource)	•Gathering information (educational)	•Meeting/ SEC/Department of Water Affair (Ministry of Natural Resource)	•Preparation of outsourcing		
11 27 Jul. Tue		•MOET/The Ministry of Economic Planning and Development (discussion of site component)		•Follow with JICA Officials		•Lubombo Region Site Survey (2 schools)	"		
12 28 Jul. Wed	Johannesburg ⇨ Mbabane •PM~ Join the discussion	•MOET/The Ministry of Economic Planning and Development/MPWT/MPCU/The Ministry of Finance (discussion of operation system, responsibility, TAX exemption)		"	"	•Manzini Region Site Survey (2 schools)	•Survey of Construction and Procurement Planning/Cost Estimation		
13 29 Jul. Thu	•MOET/The Ministry of Economic Planning and Development M/D discussion			"	"	•Shiselweni Region Site Survey (2 schools)	"		
14 30 Jul. Fri	•MOET/The Ministry of Economic Planning and Development M/D sinning			"	"	•Hhohho Region Site Survey (2 schools)	"		
15 31 Jul. Sat		Mbabane ⇨ Johannesburg (Dep. 11:30 - Arr. 12:25)		•Inner Meeting					
16 1 Aug. Sun		Report Writing		•Inner Meeting					
17 2 Aug. Mon	AM Report to The Japanese Embassy/JICA PM Johannesburg ⇨ Hongkong (Dep. 16:35 - Arr. 12:15)			•Facility planning	•Survey of educational situation /operation system	•Facility planning	•Survey of Construction and Procurement Planning/Cost Estimation		
18 3 Aug. Tue		Hongkong ⇨ Narita (Dep. 15:10 - Arr. 20:20)		•Manzini Region formulation of site planning	"	•Manzini Region formulation of site planning	"		
19 4 Aug. Wed				•Lubombo Region formulation of site planning	"	•Lubombo Region formulation of site planning	"		
20 5 Aug. Thu				•Shiselweni Region formulation of site planning	"	•Shiselweni Region formulation of site planning	"		
21 6 Aug. Fri				•Survey of Construction and Procurement Planning	•Site Survey	•Hhohho Region formulation of site planning	"		
22 7 Aug. Sat				•Inner Meeting					Narita ⇨
23 8 Aug. Sun				•Inner Meeting					⇨ Johannesburg Johannesburg ⇨ Mbabane
24 9 Aug. Mon					•Survey of educational situation /operation system	Mbabane →Johannesburg			
25 10 Aug. Tue				•Survey of natural condition (outsourcing) /Survey of Procurement Planning /Cost Estimation	"	Johannesburg → Narita	•Survey of natural condition (outsourcing) /Survey of Procurement Planning /Cost Estimation	•Survey of natural condition (outsourcing) /Survey of Procurement Planning /Cost Estimation	
26 11 Aug. Wed					"				
27 12 Aug. Thu					•Site Survey				
28 13 Aug. Fri					"				
29 14 Aug. Sat				•Inner Meeting			•Inner Meeting		
30 15 Aug. Sun				•Inner Meeting			•Inner Meeting		
31 16 Aug. Mon				•Survey of construction /procurement management	•Survey of educational situation /operation system		•Survey of Procurement Planning /Cost Estimation	•Survey of Procurement Planning /Cost Estimation	
32 17 Aug. Tue				"	"		"	"	
33 18 Aug. Wed				"	"		"	"	
34 19 Aug. Thu				•Report to MOET/The Ministry of Economic Planning and Development/MPWT/MPCU			•Report to MOET/The Ministry of Economic Planning and Development/MPWT/MPCU		
35 20 Aug. Fri				Mbabane →Johannesburg			Mbabane →Johannesburg		
36 21 Aug. Sat				Johannesburg → Narita			Johannesburg → Narita		
period	6days	10 days	10 days	36 days	36 days	25 days	36 days	15days	

(3) Field Survey III

			JICA		Consultant		
			Leader	Planning management	(a) Project Mangier /Facility Management	(d) Construction and Procurement Planning/Cost Estimation	(e) Construction and Procurement Planning/ Cost Estimation III
No.	Date		T.Nakamura	T.Matsuyama	I.Nomura	H.Hirooka	Y.Fukada
1	6-Dec	mon			NRT→SIN→		
2	7-Dec	tue			→JNB→MZN		
					Meeting with MOET and MPCU	Interview and Survey/ Consultant	
3	8-Dec	wed			Meeting with MOET and MPED	REO Field survey Preparation for local	
4	9-Dec	thu			REO Field survey		
5	10-Dec	fri		JNB – MZN 0650-0740 (SA8012) AM Internal Meeting PM Meeting with MOET (PS) and MPED	Follow with Official Members	Preparation for tender documents	
6	11-Dec	sat		Revising M/D Field Survey	Relevant matters survey/ Field Survey	Preparation for tender documents	
7	12-Dec	sun	Arr. 13:25 (SA7994) Internal Meeting	Revising M/D Internal Meeting	Internal Meeting Documentation		
8	13-Dec	mon	AM Meeting with MOET and MPED (Confirmation of M/D) PM Signing M/D	AM Meeting with MOET and MPED (Confirmation of M/D) PM Signing M/D	Follow with Official Members	Preparation for tender documents	Interview and Survey/ Contractors
9	14-Dec	tue	MZN – JNB 0805-0900 1100 or 1130 Report to EOJ	MZN – JNB 0805-0900 1100 or 1130 Report to EOJ JNB – HKG	Relevant matters survey	Preparation for tender documents	
10	15-Dec	wed		HKG – NRT (1520-2015 SA7138)	MZN→JNB		
11	40528	thu			→SIN→NRT		

(4) Field Survey IV

Survey IV							
			Consultant				
			(a) Project Manager / Facility Management	(d) Construction and Procurement Planning/ Cost Estimation	(f) (construction management)		
No.	Date				I.Nomura	H.Hirooka	T.Udaka
1	2-Apr	sat			NRT→SIN→		
2	3-Apr	sun			→JNB→MZN		
3	4-Apr	mon			Internal Meeting		
4	5-Apr	tue			<ul style="list-style-type: none"> • Explanation of Tender Document • Collection of supplement data 		
5	6-Apr	wed					
6	7-Apr	thu					
7	8-Apr	fri					
8	9-Apr	sat			JNB→SIN		
9	10-Apr	sun			→SIN→NRT		
term					9 days	9 days	9 days

3. List of Relevant Parties in the Recipient Country

Relevant Ministries and Agencies		
Organization	Position	Name
Ministry of Education and Training (MOET)	Principal Secretary	Mr. Patrick Muir
	Director of Education	Mr. Israeh Simelane
	Principal Education Planner	Mr. Vusie Dlamini
	Planning Officer	Ms. Nonhlanhla Shongwe
		Mr. Mfanfikile Mabuza
	Senior Inspector; Mathematics	Ms. Fikile Mdluli
	Senior Inspector; ICT	Mr. Mggihelo Tsele
	Senior Inspector; Science	Ms. Celumsa Dlamini
	Senior Inspector; Agriculture	Mr. Samuel D. Maggula
Senior Inspector; Home Economics	Ms. Christabel Mkhonta	
Ministry of Public Works and Transport (MPWT)	Principal Building Engineer	Mr. Vusi Masilene
	Contracts Engineer	Mr. Bunnie Mhlanga
		Mr. Mhlanga Bunnie
	Quantity Surveyor	Mr. Mpendulo Mvubu
	Electrical Engineer	Mr. Dlamini Johanne
	Senior Quantity Surveyor	Mr. Sukati Mongi
	Architect	Mr. Nhlengethwa Sabelo
	Structural Engineer	Mr. Psimelane Patrick
Maintenance Engineer	Mr. Manji Lukhcle	
Ministry of Finance	Acting Principal Secretary	Mr. Victor Nxumalo
	Principal Finance Officer	Ms. Nokuthula Dlamini
	Director Budget	Mr. Bheki Bhembe
	Head of Department, customs and excise	Ms. Gugu Mahlinza
	Assistant Commissioner Taxes (legal)	Ms. Nomiebo Marrengane
Ministry of Economic Planning and Development (MOEPD)	Principal Secretary	Mr. Siceco Dlamini
	Chief Economist/Acting Principal Secretary	Ms. Lonknlnleko Sibandze
Ministry of Economic Planning and Development (MOEPD)	Economist	Ms. Ntombifuthi Nkambule
		Mr. Donald Ndwandwe

Relevant Ministries and Agencies		
Organization	Organization	Organization
Micro-project Programme Coordination Unit (MPCU)	Coordinator	Mr. Titus Mbingo
	Deputy Coordinator	Ms. Simeloene Khetsiwe
	Field Supervisor	Mr. Dumisa Ndzimandze
	Technical Project officer	Mr. Jabulani Dlamini
	Officer	Mr. Patrick Megula Ms. Sibusiso Mbingo
Surveyor General's Department (SGD)/Ministry of Natural Resources	Surveyor General	Mr. Albert B.N. Mhlanga
	Surveyor	Mr. Patrick Mkhonta
		Mr. Ksem · S · Dlamini
Department of Water Affairs/Ministry of Natural Resources	Senior Water Engineer	Ms. Sindy N. Mthimkhulu
	Design Engineer	Mr. Caiphus Sipho Dlamini
	Senior Design Technician	Mr. Cyril Bongani Kanya
EU/SET Programme Support to Education and Training	SET Coordinator/Imprest Administrator	Mr. Mboni. C. Dlamini
	Education Advisor	Mr. Claus D. Neumann
【Other Donors】		
UNICEF	Deputy Representative	Ms. Munel Maheo
	Educational Specialist	Ms. Cristina Brugiolo
UNESCO	Secretary General	Ms. Hazel Zungu
【Relevant Educational Institutions】		
National Curriculum Center (NCC)	Acting Director	Mr. Enock M. Mkhwanazi
Teaching Service Commission (TSC)	Executive Director	Mr. Mduduzi Elliot Nkambnule
Regional Education Office (REO) , Lubombo	Acting Regional Education Officer	Ms. Regina Shongwe
Regional Education Office (REO) , Lubombo	Acting Regional Education Officer	Ms. Wellington, S, Mnuli
	Advisory Board Member	Mr. Rev Peter
		Mr. Elliot, M, Shongwe
		Mr. Elizabeth, M, Dlamini
		Mr. Reggiel Nxumalo

Relevant Ministries and Agencies		
Organization	Organization	Organization
Regional Education Office (REO) , Shiselweni	Acting Regional Education Officer	Ms. Thabile, S, Nxumalo
	Inspector of Schools	Mr. Mfanyana, S, Fakudle
Regional Education Office (REO) , Hhohho	Acting Regional Education Officer	Ms. Brigid Lucia Dlamini
	Secretary of the board	Ms. Cathline Phekile Khumalo
	Advisory Board Member	Ms. Hope, B, Dlamini
		Mr. Aaron, K, Gininza
		Mr. Samson, M, Shongne
		Mr. Pastor Ezrome Khumalo
	Accountant	Ms. Trolwa Dlamini
	Inspector of Schools	Mr. Saxton, S, Dlamini
Advisory Board Member	Mr. Aaron, N, Dlalmxd	
【Schools】		
EKUKHANYENI High School	Principa	Mr. Sabelo W. Dlamini
MHLUME High School	Principal	Mr. Simon Maluza
MKHONDVO Secondary School	Principal	Mr. Dumisa Mdlovu
NKWENE High School	Principal	Mr. Benedict Ntuli
NKONYANI High School	Principal	Ms. Ntdubi Dlamini
MAGUGA High School	Principal	Mr. Zwelethu Depruk Dlamini
MAVULA Central High School	Principal	Mr. Bernard Dlamini
【Companies】		
Swaziland Electricity Company (SEC)	Managing Manager	Mr. James Mabundza
Regional Consulting Engineers	Managing Director	Mr. Justice Ncongwane

4. Minutes of Discussions I (M/D)

MINUTES OF DISCUSSIONS
ON
PREPARATORY SURVEY
ON
THE PROJECT
FOR
CONSTRUCTION OF SECONDARY SCHOOLS
IN
THE KINGDOM OF SWAZILAND

In response to the request from the Government of the Kingdom of Swaziland (hereinafter referred to as "Swaziland"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Construction of Secondary Schools in the Kingdom of Swaziland (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to Swaziland the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Jun SAKUMA, Senior Advisor, JICA and is scheduled to stay in the country from April 18, 2010 to May 14, 2010.

The Team had a series of discussions with the Swaziland officials concerned and conducted field surveys.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets.

Mbabane, Swaziland

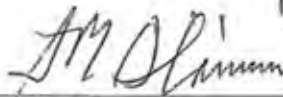
April 23, 2010



Mr. Patrick Muir
Principal Secretary,
Ministry of Education and Training,
Kingdom of Swaziland



Mr. Jun SAKUMA
Leader,
Preparatory Survey Team
Japan International Cooperation Agency



Mr. Sicelo Dlamini
Principal Secretary,
Ministry of Economic Planning and Development
Kingdom of Swaziland

ATTACHMENT

1. Objective of the Project

The main objective of the Project is to improve teaching and learning environment in secondary schools through construction of new secondary schools, particularly in rural areas in Swaziland. Through the achievement of this objective, it is expected that the Project contributes to the expansion of access to secondary education, which is described as one of the main priority objectives in education policy documents, namely National Education Policy (1999) and Education Sector Development Plan (2008).

2. Purpose of the Preparatory Survey

The Swaziland side understood that the purposes of this preparatory survey were to explain the Japan's Grant Aid Scheme to concerned organizations in Swaziland and to formulate the Project to satisfy the conditions of the Japan's Grant Aid, which were explained by the Team with the Inception Report. The Swaziland side further understood that the implementation of the project would be finally determined by the Government of Japan based on the result of this survey.

3. Responsible and Implementing Organization

The responsible organization of the Project is the Ministry of Education and Training (hereinafter referred to as "MOET") and the implementing organization is the Micro-project Programme Implementation Unit (hereinafter referred to as "MPIU"), under the Ministry of Economic Planning and Development (hereinafter referred to as "MEPD"). The organizational chart of each organization is shown in ANNEX 1 and ANNEX 2 respectively. The focal point of MOET to implement the Project is Principal Secretary.

4. Project Sites

Both sides agreed that the final candidate sites of the Project would be selected from the list of sixteen (16) proposed sites shown below (for the location of those sites, see ANNEX 3) based on the overall result of the survey and within the budget limitation of the Government of Japan. The list of candidate sites should be finalized and agreed in the next preparatory survey.

The list of proposed sites

Region/District	Area
Manzini Region	
School 1	Magojela
School 2	Nhlambeni
School 3	Mliba
School 4	Mandulo
Lubombo Region	
School 1	Sinceni

School 2	Mabhensane
School 3	Mabondvweni
School 4	Nyetane
Shiselweni Region	
School 1	Hlengela
School 2	Nzameya
School 3	Maseyisini
School 4	Kaliba
Hhohho Region	
School 1	Enkalangeni
School 2	Hhelehhele
School 3	Mantabeni/Siphocosini
School 4	Mangwaneni

Both sides agreed that the final candidate sites should satisfy the following conditions:

- There should be justifiable need for enrollment in secondary schools. (The need should be verified by enrollment data in surrounding primary schools, nearby secondary schools and population data in the catchments area.)
- The sites should be secured by the responsible organization. (The landownership or right to use the land should be verified by presenting valid documents.)
- There is no duplication with other kinds of support (from government, development partners, NGOs, etc.) for school construction at the sites.
- There is no critical obstacles for construction and supervision works (geographical conditions, access of construction vehicles/machines, and spaces).
- Water supply should be secured to the sites where the construction of boarding facilities is planned.

Both sides further agreed that the final candidate sites would be prioritized based on the following criteria:

- Demand of enrollment in the surrounding communities is high.
- Number of secondary schools around the site is not enough or the number of permanent structures as secondary schools is insufficient.
- Need for secondary education in the surrounding communities is high.

5. Project Components

Swaziland requested that the Project components should include, where necessary, following items:

- Classrooms (the number of classrooms will be estimated based on the technical assessment by the Team)

- Science Laboratory
- Home Economics Laboratory (where it is applicable)
- ICT Laboratory (where it is applicable)
- Agricultural Laboratory (where it is applicable)
- Library (where it is applicable)
- Staff houses
- Multi-purpose room
- Dining hall, kitchen
- Administration block
- Dormitory (one boarding school per region) (where it is applicable)
- water and sanitation facilities
- toilets
- furniture

The appropriateness and feasibility of the request would be further assessed by JICA from the technical and financial point of view. The components to be supported by the Project will be selected based on the result of this survey and within the budget limitation of the Government of Japan.

Both sides further agreed that the Project components should be selected and prioritized based on the following conditions:

- These should be the basic and minimum educational facilities for secondary schools.
- If these are not educational facilities, such as staff houses, dormitories, halls, dining, and kitchens, the necessity of construction should be justified based on the educational policy, the purpose, and frequency of utilization, etc.
- These should be standard facilities in government secondary schools and utilized effectively.
- These should be easily and effectively maintained and operated by the government and the schools.

6. Japan's Grant Aid Scheme

6-1. The Swaziland side understood the Japan's Grant Aid for Community Empowerment as described in ANNEX 4, ANNEX 5, ANNEX 6, and ANNEX 7, which was explained by the Team.

6-2. The Swaziland side assured to take the necessary measures, as described in ANNEX 8, for the smooth implementation of the Project. This is in terms of securing land, clearing level and reclaiming the site where necessary, constructing gates and fences in and around the site, constructing parking lot and roads outside the site, and providing electricity and water supply to the site, etc.

7. Framework of Project Implementation and Scope of Works

7-I. Japan's Grant Aid is extended in accordance with the "Exchange of Notes" by the two governments concerned and with the "Grant Agreement" between JICA and the

Government of Swaziland, in which the objectives of the Project, period of execution, conditions and amount of Grant Aid, etc., are confirmed.

7-2. After concluding the Exchange of Notes and Grant Agreement, the Swaziland side shall make the Agent Agreement with the Procurement Agent (hereinafter referred to as "the Agent"). In accordance with "Procurement Guidelines for Grand Aid for Community Empowerment (Type I -C)" of JICA (ANNEX 5 of the Inception Report), the Agent shall conduct the following works on behalf of the Government of Swaziland:

- (1) Administration of the Grant;
- (2) Preparation for and evaluation of tender;
- (3) Signing contracts with suppliers and service providers;
- (4) Procurement of necessary goods;
- (5) Payment to suppliers and service providers;
- (6) Assisting to organize committee meetings; and
- (7) Management of the progress of the project.

7-3. To implement the project smoothly, both sides confirmed to facilitate a consultative committee chaired by the head of the representatives of the Government of Swaziland. The members of the committee shall be as follows:

- (1) Representative(s) of MOET
- (2) Representative(s) of MEPD
- (3) Representative(s) of MPIU
- (4) Representative(s) of JICA South Africa Office

The Agent will appoint its representative to participate in the meetings of the committee as an advisor. Representatives of organizations other than the Agent, may be invited, whenever necessary, to participate in the meetings to provide advisory services. The major function of the committee is to discuss any matters that may arise from or in connection with the Grant Agreement for the Project. The terms of reference of the committee are: to confirm the implementation schedule of the Project, to discuss the modifications to the Project, to exchange views on allocations of the Grant and its accrued interest, to identify problems which may delay the utilization of the Grant and its accrued interest, and to explore solutions to such problems.

8. Schedule of the Survey

Some members of the Team (i.e. Consultant Team) will continue the survey until May 13, 2010 in Swaziland. If the result of field survey discovers no administrative and technical difficulties in implementing the Project by adopting the Japan's Grant Aid for Community Empowerment, JICA will send another preparatory survey team in July, 2010.



9. Other Relevant Issues

9-1. Tax exemption

In principle, Swaziland side agreed to exempt internal tax and custom duties, which may be imposed in Swaziland with respect to the implementation of the Project. In order to facilitate the internal procedures within the Government of Swaziland in related to the tax exemption, Japanese side agreed to provide MOET with a list of items and services to be purchased for the Project in the next preparatory survey.

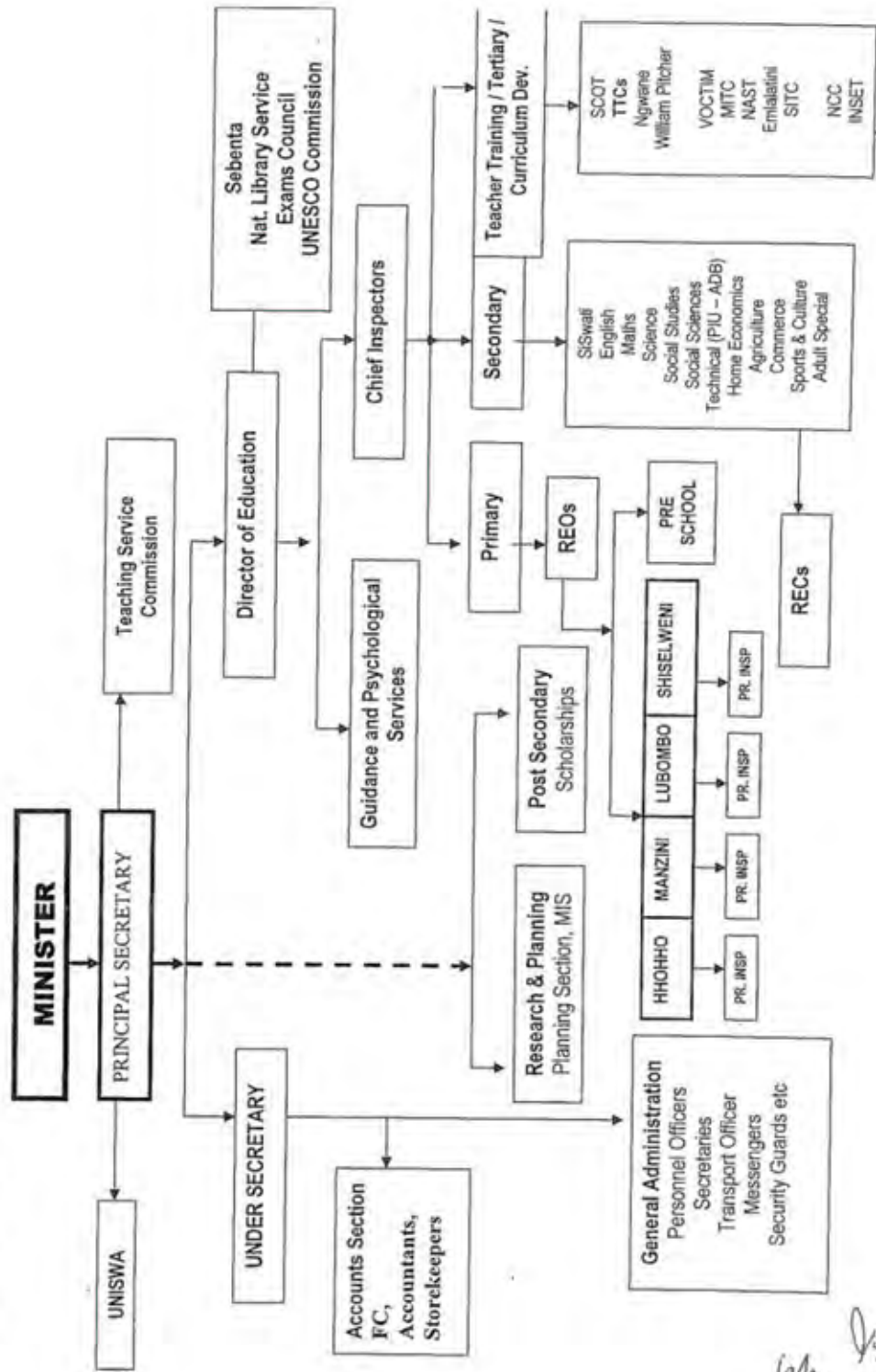
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- ANNEX 1: Organizational Chart of MOET
- ANNEX 2: Organizational Chart of MEPD and MPIU
- ANNEX 3: Candidate Sites for the Project
- ANNEX 4: Grant Aid for Community Empowerment of the Government of Japan
- ANNEX 5: Flow Chart of Japan's Grant Aid Procedures for Community Empowerment
- ANNEX 6: Flow of Funds for implementation under the Japan's Grant Aid for Community Empowerment
- ANNEX 7: Implementation Flow of Japan's Grant Aid for Community Empowerment after E/N and G/A
- ANNEX 8: Major Undertakings to be taken by Each Government

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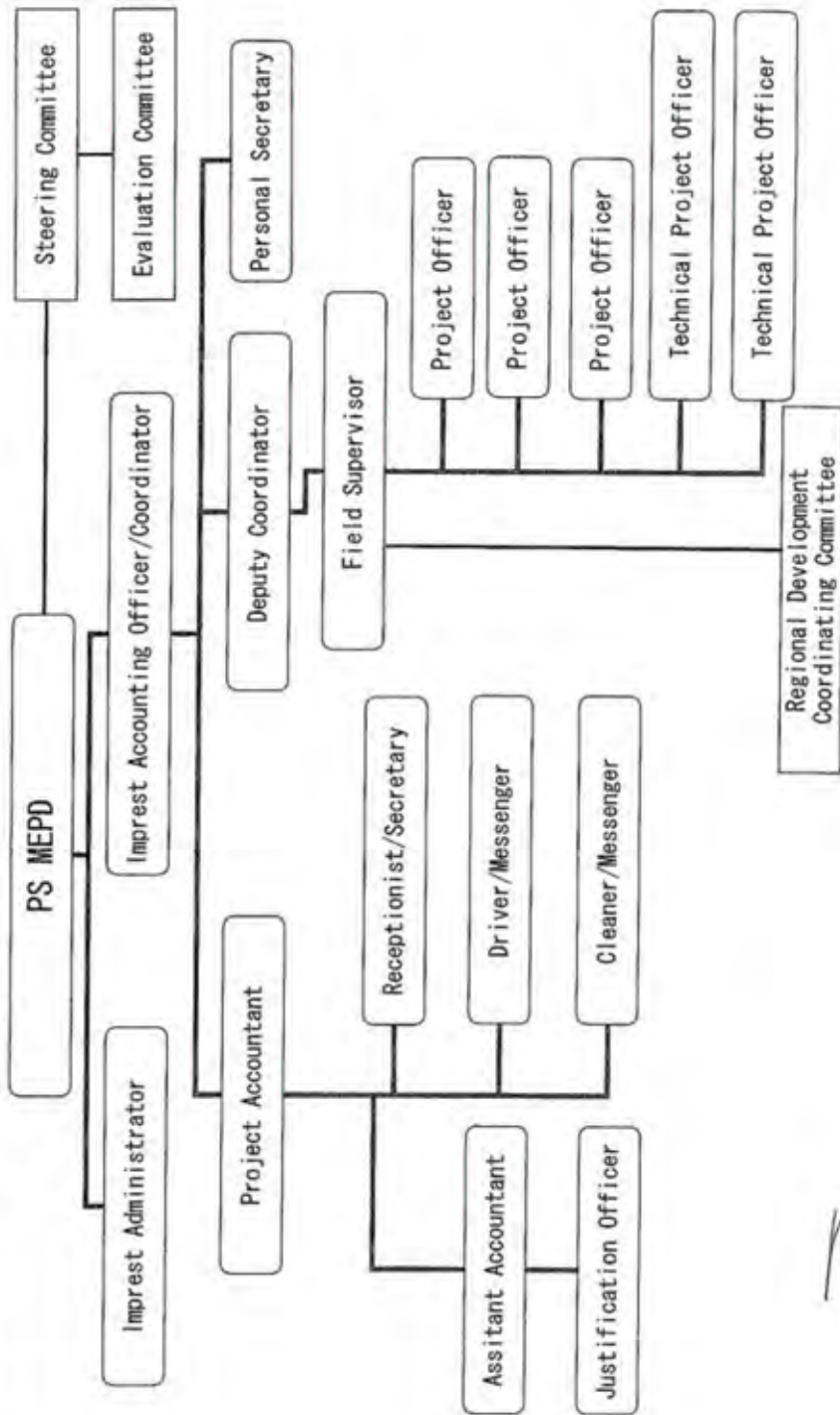
ANNEX 1

(Major Reporting Lines Only)



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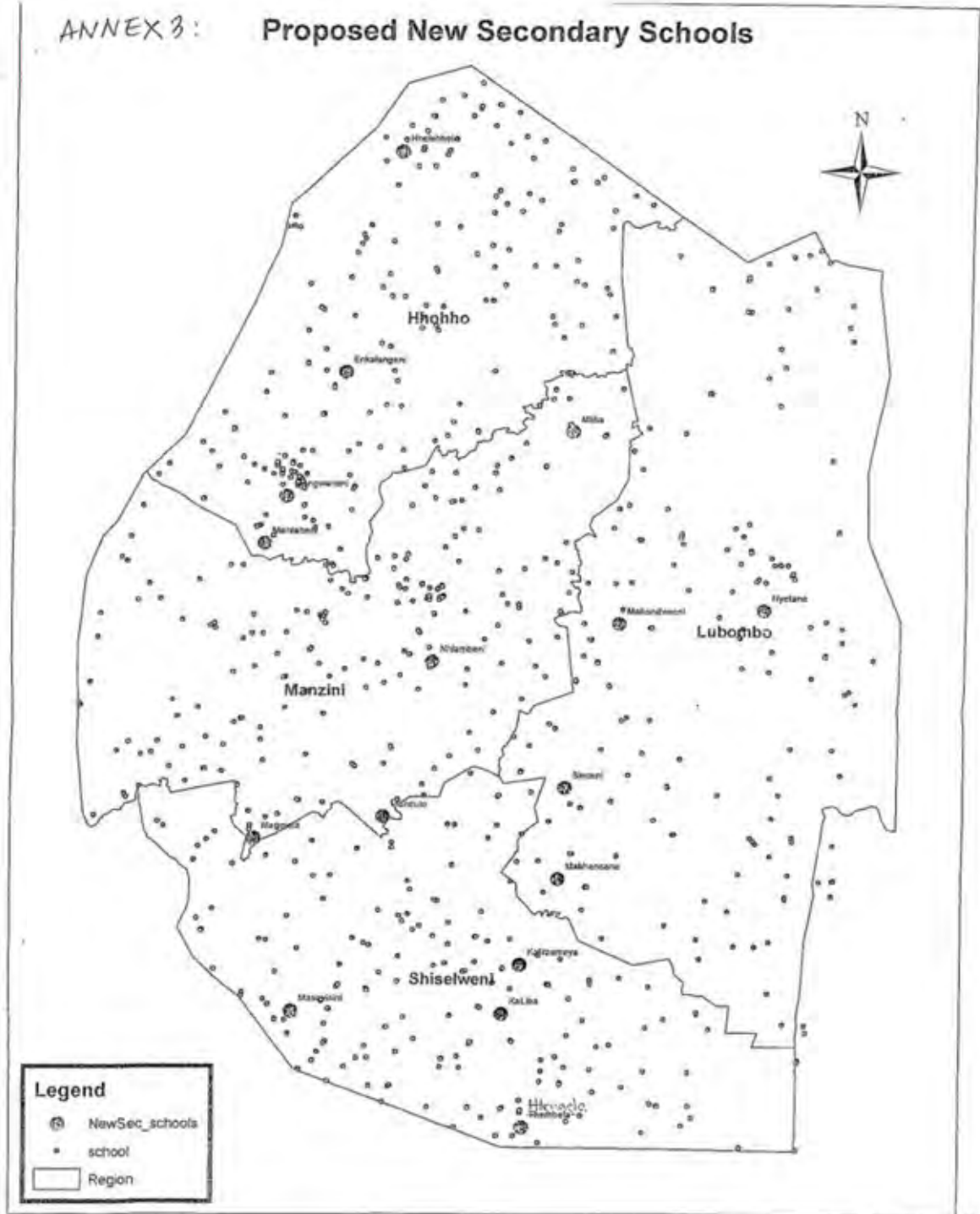
ANNEX 2: Organizational Chart of MEPD and MPIU



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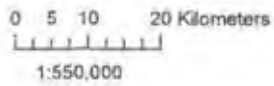
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ANNEX 3: Proposed New Secondary Schools



Legend

- NewSec_schools
- school
- Region



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MINISTRY OF EDUCATION AND TRAINING

ANNEX 4

Grant Aid for Community Empowerment of the Government of Japan (Provisional)

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, the new JICA law was entered into effect on October 1, 2008. Based on the law and the decision of the Government of Japan (hereinafter referred to as "the GOJ"), JICA has become the executing agency of Grant Aid for Community Empowerment (hereinafter referred to as "GACE").

The Grant Aid provides the government of a recipient country (hereinafter referred to as "the Recipient") with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan.

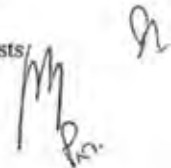
1. Procedures for GACE

GACE is executed through the following procedures.

Application	Request made by a recipient country
Survey	Preparatory Survey conducted by JICA
Appraisal & Approval	Appraisal by the Government of Japan and JICA, and Approval by the Japanese Cabinet
Determination of Implementation	The Notes (hereinafter referred to as "E/N") exchanged between the Governments of Japan and the recipient country
Grant Agreement (hereinafter referred to as "the G/A")	Agreement concluded between JICA and a recipient country
Implementation	Implementation of the Project on the basis of the G/A

Firstly, the application or request for a GACE Project submitted by the Recipient is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for GACE.

Secondly, if the request is deemed appropriate, the Government of Japan entrusts/



JICA (Japan International Cooperation Agency) to conduct the Preparatory Survey, using a Japanese consulting firm.

Thirdly, the Government of Japan and JICA appraise the Project to see whether or not it is suitable for Japan's GACE, based on the Preparatory Survey report prepared by JICA, and the results are then submitted to the Japanese Cabinet for approval.

Fourthly, the Project, once approved by the Cabinet, becomes official with the Exchange of Notes (E/N) signed by the Governments of Japan and the Recipient.

Simultaneously, the Grant will be made available by concluding a Grant Agreement (hereinafter referred to as "G/A") between the Government of the Recipient Country or its designated authority and the Japan International Cooperation Agency (JICA). JICA is designated by the Government of Japan as an organization responsible for the proper execution of the Grant.

Procurement Agent ("the Agent") is designated to conduct the procurement services of products and services (including fund management, preparing tenders, contracts and so on) for GACE on behalf of the Recipient. The Agent is an impartial and specialized organization and shall render services according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the Agreed Minutes ("A/M").

2. Preparatory Survey

1) Contents of the Survey

The aim of the Preparatory Survey ("the Survey"), conducted by JICA on a requested Project ("the Project"), is to provide a basic document necessary for the appraisal of the Project by the Government of Japan and JICA. The contents of the Survey are as follows:

- (1) Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of agencies and communities concerned of the recipient country necessary for the Project's implementation;
- (2) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme for Community Empowerment from a technical, social and economic point of view;
- (3) Confirmation of items agreed upon by both parties concerning the basic concept of the Project;
- (4) Preparation of an outline design of the Project ;
- (5) Estimation of cost for the Project ; and
- (6) Preparation of reference documents for tender.



The contents of the original request by the Government of the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed considering the guidelines of Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

2) Selection of Consultants

For smooth implementation of the Survey, JICA uses registered consulting firms. JICA selects firms based on the proposals submitted by interested firms. The firms selected carry out a Preparatory Survey and write a report, based upon terms of reference set by JICA. The consulting firms used for the Survey shall be nominated as a responsible Japanese consultant (hereinafter referred to as "the Japanese Consultant") for proceeding construction supervision for the Project under the Agent in order to maintain technical consistency. The Japanese Consultant shall organize an appropriate construction supervision team utilizing local consultants.

3) Result of the Survey

The Report on the Survey is reviewed by JICA. The appropriateness and feasibility of the Project is confirmed, JICA recommends the GOJ to appraise the implementation of the Project.

3. Implementation of GACE after the E/N and G/A

1) Exchange of Notes (E/N) and Grant Agreement (G/A)

After the project is approved by the Cabinet of Japan, the E/N will be signed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

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2) Procedural details

Procedural details on the procurement of products and services under GACE will be agreed upon between the Recipient and JICA at the time of the signing of the G/A. Essential points to be agreed upon are outlined as follows:

- a) JICA executes the Grant by making payments of the amount agreed upon in the E/N and pays serious attention to ensure the accountability on proper and effective use of the Grant for the Project.
- b) The products and services shall be procured and provided in accordance with "Procurement Guidelines of Japan's Grant Aid for Community Empowerment (Type I - C)".
- c) The Government of the recipient country shall conclude an employment contract with the Agent.
- d) The Government of the recipient country shall designate the Agent as the representative acting in the name of the Government of the recipient country concerning all transfers of funds to the Agent.

3) Focal Points of JICA's "Procurement Guidelines of Japan's Grant Aid for Community Empowerment (Type I - C)"

a) The Agent

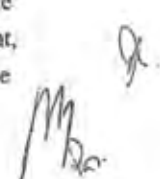
The Agent is the organization which provides procurement services of products and services on behalf of the Recipient according to the Agent Agreement with the Recipient. The Agent is recommended to the Recipient by the Government of Japan and agreed between the two Governments in the A/M.

b) Agent Agreement

The Recipient shall conclude an Agent Agreement, within two (2) months after the date of entry into force of the G/A, in accordance with the A/M. The scope of the Agent's services shall be clearly specified in the Agent Agreement.

c) Approval of the Agent Agreement

The Agent Agreement, which is prepared in two identical documents, shall be submitted to JICA by the Recipient through the Agent. JICA confirms whether or not the Agent Agreement is concluded in conformity with the E/N, the G/A, and the JICA's Procurement Guidelines of Japan's Grant Aid for Community Empowerment, and approves the Agreement. The Agent Agreement concluded between the

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Recipient and the Agent shall become effective after the approval by JICA in a written form.

d) Payment Methods

The Agent Agreement shall stipulate that "regarding all transfers of the fund to the Agent, the Recipient shall designate the Agent to act on behalf of the Recipient and issue a Blanket Disbursement Authorization ("the BDA") to conduct the transfer of the fund (Advances) to the Procurement Account from the Recipient Account."

The Agent Agreement shall clearly state that the payment to the Agent shall be made in Japanese yen from the Advances and that the final payment to the Agent shall be made when the total Remaining Amount becomes less than 3 % of the Grant and its accrued interest excluding the Agent's fees.

e) Products and Services Eligible for Procurement

Products and services to be procured shall be selected from those defined in the G/A.

f) Firms

In principle, the consultant firm who carried out the Preparatory Survey will be recommended by JICA to the recipient country as the supervisor of the Project's implementation after the E/N and the G/A signing, in order to maintain technical consistency. Besides, consultants of any nationality will be contracted for detailed design study and supervising works. Firms of any nationality could be contracted as contractors and suppliers as long as the firm satisfies the conditions specified in the tender documents.

g) Method of Procurement

In implementing procurement, sufficient attention shall be paid so that there is no unfairness among tenderers who are eligible for the procurement of products and services. For this purpose, competitive tendering shall be employed in principle.

h) Tender Documents

The tender documents should contain all information necessary to enable tenderers to prepare valid offers for the products and services to be procured by GACÉ. The rights and obligations of the Recipient, the Agent and the Suppliers of the products

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Recipient and the Agent shall become effective after the approval by JICA in a written form.

d) Payment Methods

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In principle, the consultant firm who carried out the Preparatory Survey will be recommended by JICA to the recipient country as the supervisor of the Project's implementation after the E/N and the G/A signing, in order to maintain technical consistency. Besides, consultants of any nationality will be contracted for detailed design study and supervising works. Firms of any nationality could be contracted as contractors and suppliers as long as the firm satisfies the conditions specified in the tender documents.

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In implementing procurement, sufficient attention shall be paid so that there is no unfairness among tenderers who are eligible for the procurement of products and services. For this purpose, competitive tendering shall be employed in principle.

h) Tender Documents

The tender documents should contain all information necessary to enable tenderers to prepare valid offers for the products and services to be procured by GACE. The rights and obligations of the Recipient, the Agent and the Suppliers of the products

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initial tender and a competitive tendering is judged to be disadvantageous, the additional procurement can be implemented by a direct contract with the successful tenderer of the initial tender.

(2) Other procurements

When products and services other than those mentioned above in (1) are to be procured, the procurement should be implemented through a competitive tendering. In this case, the products and services for additional procurement shall be selected from among those in accordance with the E/N and the G/A.

l) Conclusion of the Contracts

In order to procure products and services in accordance with the G/A, the Agent shall conclude contracts with firms selected by tendering or other methods.

m) Terms of Payment

The contract shall clearly state the terms of payment. The Agent shall make payment from the "Advances", against the submission of the necessary documents from the Firm on the basis of the conditions specified in the contract, after the obligations of the Firm have been fulfilled. When the services are the object of procurement, the Agent may pay certain portion of the contract amount in advance to the firms on the conditions that such firms submit the advance payment guarantee worth the amount of the advance payment to the Agent.

4) Major Undertakings to be taken by the Government of the recipient country

(a) In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as the following:

(1) to secure lots of land necessary for the implementation of the Project and to clear the sites;

(2) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities necessary for the implementation of the Project outside the sites referred to in (a) above;

(3) to ensure prompt customs clearance and to assist internal transportation in the recipient country and to assist internal transportation therein of the products;

(4) to ensure that customs duties, internal taxes and other fiscal levies which may

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be imposed in the recipient country with respect to the purchase of the Components as well as the employment of the Agent be exempted/be borne by its designated authority without using the Grant and its accrued interest;

(5) to accord Japanese nationals and / or nationals of third countries, including such nationals employed by the Agent, whose services may be required in connection with the supply of the Components such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work (The term "nationals" whenever used in the G/A means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons in the case of Japanese nationals, and physical or juridical persons of third countries in the case of nationals of third countries.);

(6) to ensure that the Facilities and the Components are maintained and used properly and effectively for the implementation of the Project;

(7) to bear all the expenses, other than those covered by the Grant and its accrued interest, necessary for the implementation of the Project; and

(8) to give due environmental and social consideration in the implementation of the Project.

(b) Upon the request of JICA, the Recipient shall provide JICA with necessary information on the Project.

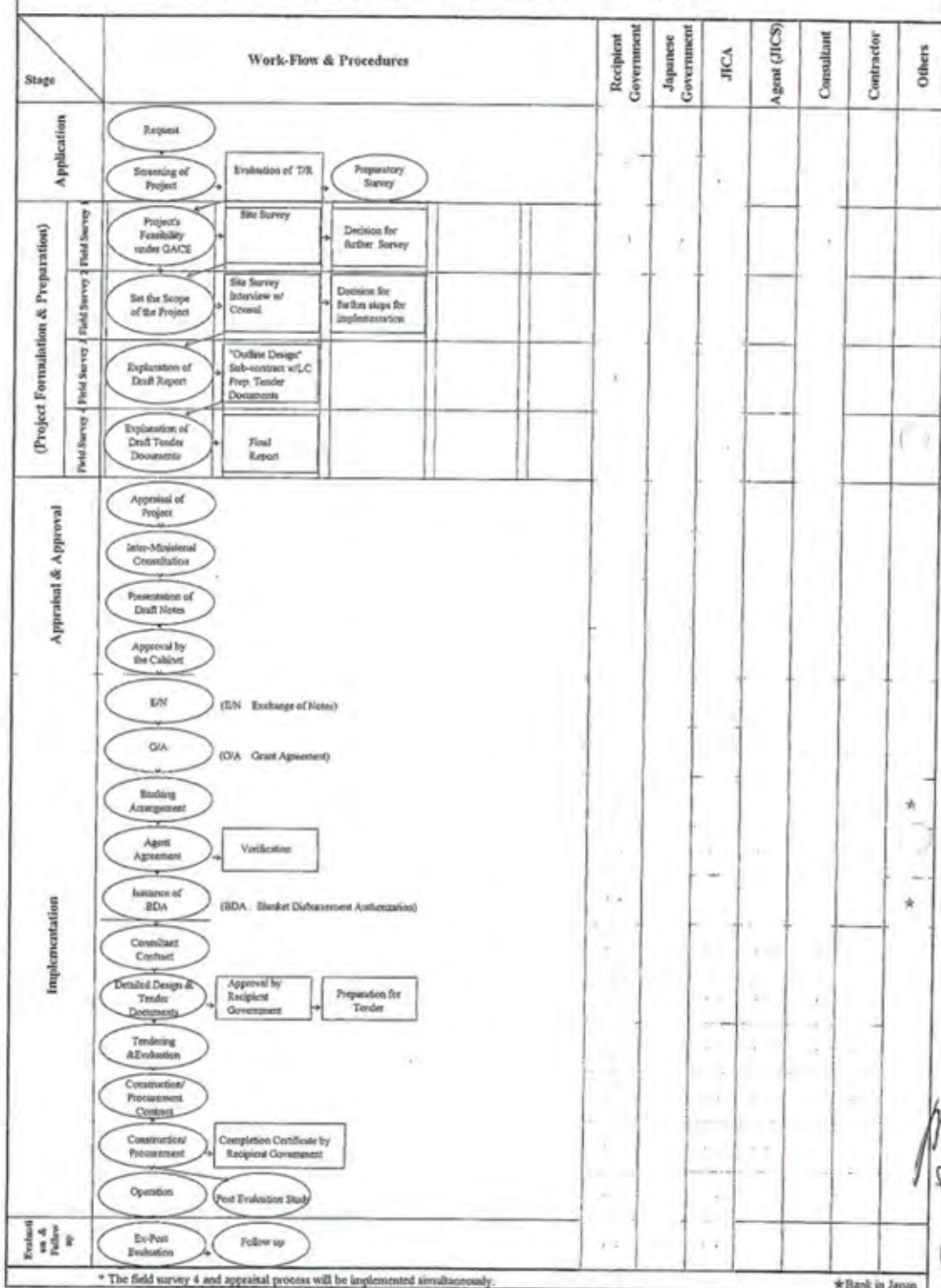
(c) With regard to the shipping and marine insurance of the products procured by the Project, the Recipient shall refrain from imposing any restrictions that may hinder fair and free competition among the shipping and marine insurance companies.

(d) The products procured by the Project shall not be exported or re-exported from the recipient country.

(e) The Recipient shall ensure that any official of its government does not undertake any part of the Japanese nationals' work and / or the work of nationals of third countries on purchase of the Components.

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Annex 5 Flow Chart of Japan's Grant Aid Procedures for Community Empowerment

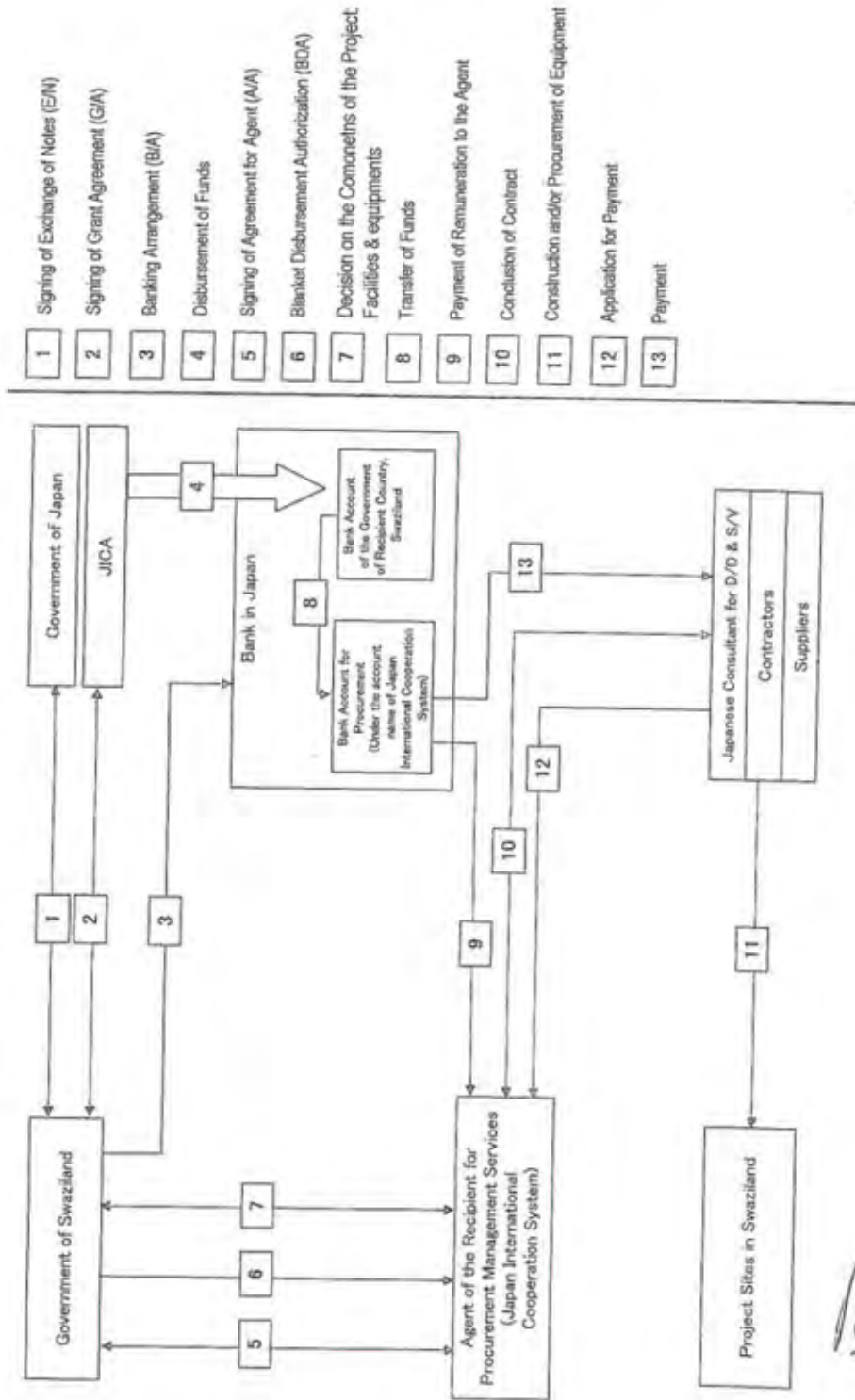


* The field survey 4 and appraisal process will be implemented simultaneously.

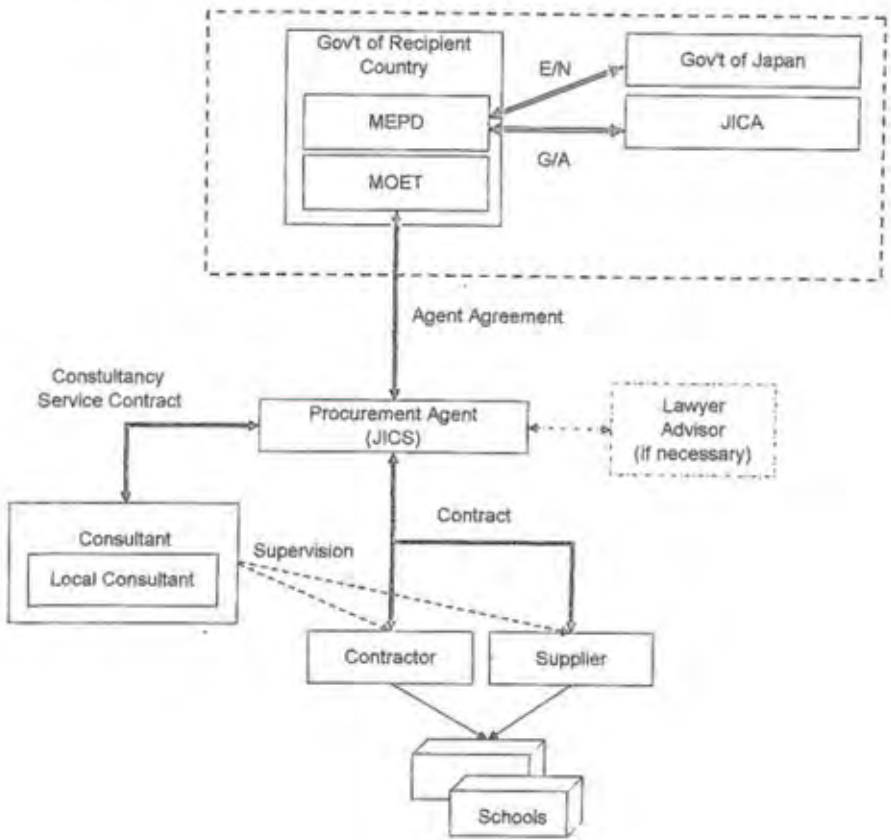
* Bank in Japan

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ANNEX 6 Flow of Funds & Services for the Implementation of Japan's Grant Aid for Community Empowerment



ANNEX 7 Implementation Flow of Japan's Grant Aid for Community Empowerment after E/N and G/A



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Annex 8 Major Undertakings to be Taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To secure land		●
2	To clear level and reclaim the site when needed		●
3	To construct gates and fences in and around the site		●
4	To Construct the Parking lot		●
5	To construct roads		
	1) Within the site	●	
	2) Outside the site		●
6	To construct the building	●	
7	To provide facilities for the distribution of electricity, water supply, drainage and other incidental facilities		
	1) Electricity		
	a. The distributing line to the site		●
	b. The drop wiring and internal wiring within the site (incl. connections between buildings)	●	
	c. The main circuit breaker and transformer	●	
	2) Water Supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	3) Drainage		
	a. The city drainage main (for storm sewer and others to the site)		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	4) Gas Supply		
	a. The city gas main to the site		●
	b. The gas supply system within the site	●	
	5) Telephone System		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	6) Furniture and Equipment		
	a. General furniture		●
	b. Project equipment	●	
8	To bear the commissions to the Japanese bank for banking services based upon B/A		●
9	To ensure prompt customs clearance and to assist internal transportation in the recipient country and to assist internal transportation therein of the products		●
10	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the Components as well as the employment of the Agent be exempted/be borne by its designated authority without using the Grant and its accrued interest.		●
11	To accord Japanese nationals and / or nationals of third countries, including such nationals employed by the Agent, whose services may be required in connection with the supply of the Components such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work (The term "nationals" whenever used in the G/A means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons in the case of Japanese nationals, and physical or juridical persons of third countries in the case of nationals of third countries.)		●
12	To ensure that the Facilities and the Components be maintained and used properly and effectively for the implementation of the Project		●
13	To bear all the expenses, other than those covered by the Grant and its accrued interest, necessary for the implementation of the Project		●
14	To give due environmental and social consideration in the implementation of the Project		●

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4. Minutes of Discussions II (M/D)

Field Survey II


**MINUTES OF DISCUSSIONS
ON
PREPARATORY SURVEY
ON
THE PROJECT
FOR
CONSTRUCTION OF SECONDARY SCHOOLS
IN
THE KINGDOM OF SWAZILAND**

In response to the request from the Government of the Kingdom of Swaziland (hereinafter referred to as "Swaziland"), the Government of Japan decided to conduct a Preparatory Survey on the Project for Construction of Secondary Schools in the Kingdom of Swaziland (hereinafter referred to as "the Project") and entrusted the survey to the Japan International Cooperation Agency (hereinafter referred to as "JICA").


JICA sent to Swaziland the Preparatory Survey Team (hereinafter referred to as "the Team"), which is headed by Mr. Toshiyuki NAKAMURA, Chief Representative of JICA South Africa Office and is scheduled to stay in the country from July 18, 2010 to August 20, 2010. The Team had a series of discussions with the officials concerned of the Government of Swaziland and conducted field surveys.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets.

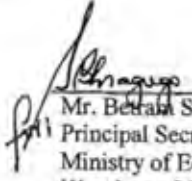
Mbabane, Swaziland
July 30, 2010



Mr. Patrick Muir
Principal Secretary,
Ministry of Education and Training,
Kingdom of Swaziland



Mr. Toshiyuki NAKAMURA
Leader,
Preparatory Survey Team
Japan International Cooperation Agency



Mr. Betrak Stewart
Principal Secretary,
Ministry of Economic Planning and Development
Kingdom of Swaziland

ATTACHMENT

1. Objective of the Project

The main objective of the Project is to improve teaching and learning environment in secondary schools through construction of new secondary schools, particularly in rural areas in Swaziland. Through the achievement of this objective, it is expected that the Project contributes to the expansion of access to secondary education, which is described as one of the main priority objectives in education policy documents, namely National Education Policy (1999) and Education Sector Development Plan (2008).

2. Project Sites

The Ministry of Education and Training (hereinafter referred to as "MOET") agreed that the final candidate sites for constructing new secondary schools would be selected from the list shown in ANNEX 1. The final candidate sites will be selected from the list based on the overall result of this survey and within the budget limitation of the Government of Japan. The order of priority shown in ANNEX 1 will be taken into consideration when selecting the final candidate sites.

Concerning Mantabeni of Hhohho region, the Team recommended MOET to rehabilitate the existing wooden bridge or construct a permanent structure instead of the existing bridge on the school-commuting pathway to the site from Manzini region in order to shorten and ease the commuting distance of students from Manzini region. MOET agreed to take necessary measures on this matter.

3. Project Components requested by the Government of Swaziland

The Team confirmed that the project components (buildings and facilities) shown below were finally requested by MOET. The components to be supported by the Project will be selected based on the overall result of this survey and within the budget limitation of the Government of Japan. Both sides agreed that project components to be supported by the Government of Japan were prioritized based on the following conditions:

- 1) These should be the basic and minimum educational facilities for secondary schools.
- 2) If these are not educational facilities, such as staff houses, dormitories, halls, dining, and kitchens, the necessity of construction should be justified based on the educational policy, the purpose, and frequency of utilization, etc.
- 3) These should be standard facilities in government secondary schools and utilized effectively.
- 4) These should be easily and effectively maintained and operated by the government and the schools.

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Project Components

Category	Components	Remarks
1 st Priority	Classrooms	The number of classrooms of each school will be determined based on the expected enrollment estimated by the Team.
	Science Laboratory	The number of Science Laboratory will be determined based on the expected enrollment estimated by the Team.
	Administration block	Administration block includes rooms for Head Teacher, Deputy Head Teacher, Accountant/Secretary, and Teachers.
	Kitchen (for school lunch)	
	Toilets	
	Water and sanitation facilities	
	Teachers' houses	The number of teachers' houses will be determined based on the planned number of teacher deployment.
Furniture	Furniture includes only basic educational furniture (desk, chair, cabinet). Equipment and general furniture, such as science laboratory instruments and furniture for staff houses, are not included.	
2 nd Priority:	ICT laboratory	The necessity of these facilities will be determined considering the following points: - curriculum requirements - current situation in other schools - the number of beneficiaries (students) - policy objectives (ICT in education) - teacher deployment plan for practical subjects
	Agricultural Laboratory	
	Home Economics Laboratory	
	Multi-purpose room	

MOET stressed the importance of these laboratories for practical subjects since the government intends to diversify the curriculum of secondary education in response to the social needs. They further explained that the Swaziland government put high priority on introducing ICT to schools at all levels, thus ICT laboratory should be provided to all schools to be constructed by the Project. In addition to ICT laboratory, MOET requested to provide either Agriculture laboratory or Home Economics Laboratory to each school. MOET agreed to provide equipment for these laboratories for practical subjects once constructed.

Although the Team basically understood the importance of these laboratories, the data and information currently available to the Team are not enough to justify their necessity. In order to assess the necessity of these laboratories, the Team requested MOET to provide the additional data and information as follows by 13th August, 2010:

- National level data for no. or % of secondary schools that have these facilities (by region)
- No. or % of students who take these subjects at final examination
- Policy of ICT in Education (to be approved by the Cabinet within a few weeks)
- Latest national curriculum framework (the number of periods per week for these practical subjects)
- Teacher deployment plan for these practical subjects

Both sides agreed that the components categorized as "2nd priority" will be included to the Project components only when the further analysis of the additional data and information find that these facilities satisfy the above-mentioned conditions. The Team explained that if these facilities were included to the Project component, they might consider the modification of the standard designs of these laboratories, including the possibility of establishing a multi-purpose room as a substitute for some of the laboratories.

4. Japan's Grant Aid Scheme

The Swaziland side understands the Japan's Grant Aid for Community Empowerment and the necessary measures to be taken by the Government of Swaziland as explained by the Team and described in the Minutes of Discussions signed by both parties on April 23, 2010. The details of the measures that the Government of Swaziland needs to take for each construction site, such as the construction of access roads to the sites, land preparation, and electricity and water supply, will be further assessed and reported to MOET by the consultants by the end of this field survey. The Team further requested Swaziland side to secure sufficient budget for above-mentioned preparation.

MOET further promised that they take necessary measures in time to open new schools, such as school registration, teacher deployment, student recruitment (registration) and budgetary support for school operation and maintenance. Concerning the plan of teacher deployment, the Team requested MOET to issue a letter that explains the general flow of teacher deployment to new secondary schools and timeframe of teacher deployment for this specific project by 13th August, 2010.

5. Framework of Project Implementation

(1) Responsible and Implementing Organization

Both sides had agreed that the responsible organization of the Project was the Ministry of Education and Training (hereinafter referred to as "MOET") and the implementing

organization was the Micro-project Programme Coordination Unit (hereinafter referred to as "MPCU"), under the Ministry of Economic Planning and Development (hereinafter referred to as "MEPD") in the previous Minutes of Discussion signed on April 23, 2010. However, as a result of discussions with concerned organizations, both sides agreed that MOET should play a role of the implementing organization with appropriate technical support from MPCU.

(2) Detailed flow of implementation

Both sides agreed on the detailed flow of implementation and the role of each organization as shown in ANNEX 2 and ANNEX 3 respectively.

6. Schedule of the Survey and Further Steps

The consultants will continue further studies in Swaziland until August 20, 2010. The Team will prepare the draft report of this survey, which includes the outline designs of each school, based on the technical survey by the consultants. The draft report will be presented to Swaziland side in the middle of December 2010.

After the contents of the report are accepted in principle by the Government of Swaziland, JICA will recommend to the Government of Japan for the final approval of the Project. Simultaneously, the Team will proceed to prepare the draft tender documents for the Project.

7. Other Relevant Issues

1) Title of the Project

Swaziland side explained to the Team that the current title of the Project, "Construction of Secondary Schools," was not appropriate to represent the intended scope of the project, since the term "secondary schools" sometimes means schools catering only for Form 1 to Form 3 students (junior secondary students). However, their actual intention of the proposed project is to expand access not only to junior secondary but also to senior secondary education. Thus, Swaziland side requested to rephrase it as "the Improvement of Secondary Education" so that it precisely reflects the purpose of the project. The Team agreed to consult this matter with the Government of Japan.

END

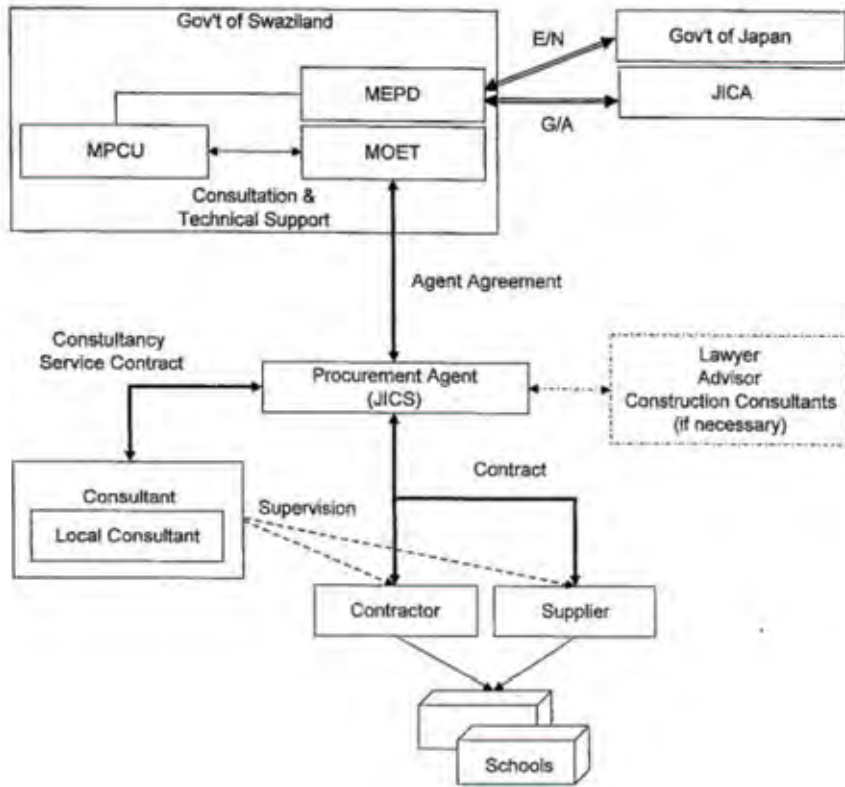
- ANNEX 1: The List of Candidate Sites
- ANNEX 2: Implementation Flow of Japan's Grant Aid for Community Empowerment after E/N and G/A
- ANNEX 3: Flow of Detail Design and Supervising Works

Annex 1

Priority	Region	Name of Site
1	Lubombo	Mabhensane
2	Lubombo	Mabondvweni
3	Lubombo	Nyctane
4	Manzini	Nhlambeni
5	Manzini	Mliba
6	Manzini	Mandulo
7	Shiselweni	Mlambo
8	Shiselweni	Mpakeni
9	Hhohho	Hawane and Forbes Reef
10	Hhohho	Etfuntini
11	Hhohho	Hhelehhele
12	Hhohho	Mantabeni



ANNEX 2 Implementation Flow of Japan's Grant Aid for Community Empowerment after E/N and G/A



E/N: Exchange of Notes
 G/A: Grant Agreement
 MEPD: Ministry of Economic Planning and Development
 MOET: Ministry of Education and Training
 MPCU: Micro-project Programme Coordinating Unit

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ANNEX 3: Flow of Detail Design and Supervising Works

Responsible Org./ Stage	MOET		MEPD	Procurement Agent (JICS, Tokyo HDQ)	Procurement Agent (JICS, Swaziland)	Japanese Consultant	Swazi Contractor
	PS	Planning	MPCU				
Detail Design and Preparation for Tender						Preparation of Tender and Contract Documents (incl. detailed drawings, technical specifications, Bill of Quantities, Forms of Tender, etc.)	
		(consultation)	(consultation)				
						Preparation of Tender and Contract Documents (incl. Invitation to Tender, Instructions to Tenderers, Model of Contracts, Contract Conditions, etc.)	
		(consultation)	(consultation)			Confirmation of the contents of construction contracts and tender documents Verification of procedure of payment and its contents	
	Approval			Approval			
Tendering		(support)	(support)			Notice of Tender (PQ)	
		(support)	(support)			Prequalification of possible tenderers	
		(support)	(support)			Invitation to Tender Distribution of Tender Documents	
		(support)	(support)			Tender	Bidding
		(support)	(support)			Evaluation of Tender	
	Approval	(consultation)	(consultation)	Approval			
		(support)				Concluding Contracts	
Supervising (monthly)		(support)	(support)			Supervision Monthly Report	Construction work
		(support)	(support)			Verification of completed amount Progress Report	
		(support)	(support)		Approval	Approval	
					Payment		
					Fund management		

* Planning Unit of MOET is the focal point at each stage and get technical support from MPCU when necessity arises.
 * Concerning the preparation of the tender document and tendering, Planning Unit of MOET, as a member of Internal Tender Committee of MOET, will consult with the Tender Committee, if it is necessary.

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4. Minutes of Discussions III (M/D)

Field Survey III

**MINUTES OF DISCUSSIONS
ON
PREPARATORY SURVEY
ON
THE PROJECT
FOR
THE IMPROVEMENT OF SECONDARY EDUCATION
IN
THE KINGDOM OF SWAZILAND**

From April 2010 to August 2010, the Japan International Cooperation Agency (hereinafter referred to as "JICA") had conducted two field surveys as a part of the Preparatory Survey on the Project for the Improvement of Secondary Education (hereinafter referred to as "the Project") in the Kingdom of Swaziland. Based on the results of the field surveys and subsequent technical examinations conducted in Japan, JICA prepared the Draft Preparatory Survey Report.

In order to explain the contents of the report and discuss with the officials concerned of the Government of Swaziland, JICA sent the Survey Team (hereinafter referred to as "the Team"), which was headed by Mr. Toshiyuki Nakamura, Chief Representative of JICA South Africa Office, from 7th December to 15th December 2010.

As a result of discussions, both sides have confirmed the main items described in the attached sheet.

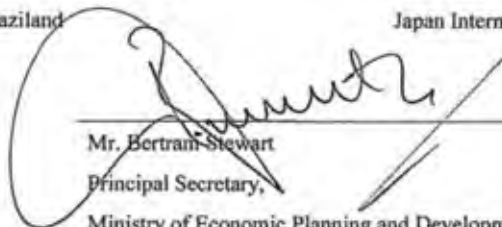
Mbabane, Swaziland
13th December 2010



Mr. Patrick Muir
Principal Secretary,
Ministry of Education and Training,
Kingdom of Swaziland



Mr. Toshiyuki NAKAMURA
Leader,
Preparatory Survey Team
Japan International Cooperation Agency



Mr. Bertram Stewart
Principal Secretary,
Ministry of Economic Planning and Development
Kingdom of Swaziland

ATTACHMENT

1. Contents of the Draft Report

The Swaziland side agreed and accepted in principle the contents of the draft report as explained by the Team.

2. Components and Facilities to be Covered by the Project

Both sides agreed on the list of components and facilities for each candidate school to be covered by the Project, their order of priority, and the division of procurement lots and batches as shown in ANNEX-1. The Swaziland side agreed that the Japanese side would make a final decision on this matter through further study in Japan.

3. Japan's Grant Aid Scheme and Major Undertakings

The Swaziland side understood the Japan's Grant Aid Scheme, and the Ministry of Education and Training assured that it shall take necessary measures as described in ANNEX-8 of the Minutes of Discussion signed by both parties on 23rd April 2010 and as indicated in ANNEX-2 of this Minutes of Discussion. Furthermore, the Government of Swaziland agreed to take a full responsibility for providing water, electricity, office equipment, equipment for science experiment and practical subjects, landscaping (fence, gate, gate keeper's hut, parking lots, etc.), and teaching staff to each site. The details of obligations to be covered by the Government of Swaziland are described in ANNEX-3.

4. Final Report of the Preparatory Survey

JICA will finalize the report in accordance with the result of discussions and forward it to the Government of Swaziland by the end of May 2011.

5. Project Cost Estimation

The Swaziland side understood that the Project cost estimation described in ANNEX-4 was not final at this stage and would be set and approved by the Government of Japan after thorough examinations.

6. Confidentiality of the Information Related to the Project

Both sides confirmed that all information related to the Project including design documents of facilities and furniture shall not be released to any outside parties before concluding all contracts for the Project. Furthermore, both sides agreed that the estimated cost of the Project as described in ANNEX-4 shall never be duplicated or released to any outside parties before concluding all contracts for the Project.

Handwritten signature and initials, possibly 'SM' and 'P.M.', in black ink.

7. Other relevant issues

7-1. Allocation of Necessary Budget and Personnel

The Swaziland side agreed to allocate necessary budget and personnel for the proper operation and maintenance of the facilities to be covered by the Project.

7-2. Proper Use and Maintenance

Both sides understood that proper use and maintenance of the facilities was indispensable for their long-term use. The Swaziland side assured the Team that it would facilitate the proper use and maintenance of the facilities in the schools to be covered by the Project with the active involvement of concerned parties such as principals and school boards, and other concerned organizations.

7-3. Title of the Project

Both sides confirmed that the title of the Project was altered to "the Project for the Improvement of Secondary Education" from "the Project for the Construction of Secondary Schools".

ANNEX-1 Components and Facilities to be covered by the Project

ANNEX-2 Major Undertakings by Each Government

ANNEX-3 The Details of the Obligation of the Government of Swaziland

ANNEX-4 Project cost estimation

A handwritten signature in black ink, consisting of a large, stylized initial 'A' followed by a cursive name. Below the signature, the initials 'P.M.' are written in a smaller, simpler hand.

ANNEX-1 Components and Facilities to be covered by the Project

Batch of Tender	Name of Site (in order of priority)	No. of facilities										
		classroom A*	Normal classroom B*	Laboratory	Science room A**	Multi-purpose room A**	Multi-purpose room B***	Multi-purpose building	Administration building	Kitchen	Toilets for the students****	Teacher's housing
1 st Tender	1. Mabhesane	1	1	1	1	1	1	1	1	1	C	4
	2. Mabondweni	1	1	1	1	1	1	1	1	1	C	4
	3. Nyetane	1	1	1	1	1	1	1	1	1	C	4
	4. Nhlambeni	2		1	1	1	1	1	1	1	B	4
	5. Mliba	2		1	1	1	1	1	1	1	B	4
	6. Mandulo		3	1	1	1	1	1	1	1	A	4
	7. Mlambo		3	1	1	1	1	1	1	1	A	4
	8. Mpakeni		3	1	1	1	1	1	1	1	A	4
2 nd Tender	9. Hawane - F.R.		3	1	1	1	1	1	1	1	A	4
	10. Etfuntini		3	1	1	1	1	1	1	1	A	4
	11. Hhelehhele	1	1	1	1	1	1	1	1	1	C	4
	12. Mantabeni	2		1	1	1	1	1	1	1	B	4
	Total No. of each facility	10	19	12	12	12	12	12	12	12	12	48
	Number of classrooms	40	57									
	Total No. of classrooms		97									

Remarks:

- * Type of classroom buildings: A (4-classroom building), B (3-classroom building)
- ** Multi-purpose room A (for Agriculture, Home-Economics, and other practical subjects)
- *** Multi-purpose room B (for ICT and other elective subjects)
- **** Type of Toilets for the students: Type A (9 booth), Type B (8 booth), Type C (7 booth)

A handwritten signature and initials, possibly 'P.M.' or similar, written in black ink.

ANNEX-2 Major Undertakings by Each Government

Relevant works	Japan	Swaziland
1. Land acquisition		•
2. Site preparation		•
3. Construction of facility components	•	
4. Installation of incidental facilities		
(1) Site fence and gate installation		•
(2) Power distribution work		
a. Bring power lines to the border of the site with transformer installation		•
b. Laying power lines within the site	•	
(3) Water supply and Drainage work		
a. Laying pipes from the city water pipe to the site border		•
b. Water supply and drainage facilities within the site	•	
c. Water drainage works outside the site		•
(4) Propane gas line work in science laboratories	•	
5. Procurement of furniture and equipments		
(1) Furniture procurement		
a. Furniture for normal classrooms and science rooms	•	
b. Furniture for Administration building, multipurpose rooms A & B, teacher's housing		•
(2) Equipment and apparatus for experiments/practical training		
a. Equipment and apparatus for science experiments		•
b. Practical training equipment for Agriculture and home economics (for Multi-purpose room A)		•
c. Equipment for kitchen		•
(3) Computers for ICT training (for Multi-purpose room B)		•
6. Environmental Impact Assessment		•
7. Bank fees according to B/A		•
8. All expenses needed for project implementation not covered by the Grant Aid		•
9. Ensuring that custom duties, internal taxes and other fiscal levies with respect to the purchase of the Components (all products and services necessary for the implementation of the Project) be exempted		•

Remarks:

1) Works required to be done before starting the construction

- Land acquisition & Site preparation
- Bring power lines to the border of the site
- Environmental assessment application fee and report creation

2) Works required to be done during the construction

- Installation of Site fence and gate installation
- Laying pipes from the city water pipe to the site border and water drainage works outside the site

3) Works required to be done after the completion of the construction

- Furniture procurement (Administration building, multipurpose rooms A & B, teacher housing)
- Equipment and apparatus for science experiments, agriculture, home-economics, personal computers (depending on the school curriculum of each schools)

A handwritten signature and the initials 'P.M.' are present in the bottom right corner of the page.

ANNEX-3 The Details of the Obligation of the Government of Swaziland

Site Name	District	Components							2. Power Supply					Teacher & Staff			
		Classroom	Science Lab	Multi-purpose Room A	Multi-purpose Room B	Administration	Student Toilet	Teacher House	Estimate (E)	Description	Estimate (E)	Fees/ Gate (E)	Furniture (E)		Equipment (E)	PC (E)	Environment Assessment (E)
1 Mkhamsane	Lubombo	7	1	1	1	1	7	4	0	New power line from nearest grid system.	220,000	75,000	130,000	13,000	42,500	21,500	17 Principal + 13 teachers + 3 staff
2 Mkhondweni	Lubombo	7	1	1	1	1	7	4	0	Existing power line in the front road.	0	75,000	130,000	13,000	42,500	21,500	17 Principal + 13 teachers + 3 staff
3 Nystane	Lubombo	7	1	1	1	1	7	4	60,000	New power line connection about 300M	70,000	75,000	130,000	13,000	42,500	21,500	17 Principal + 13 teachers + 3 staff
4 Ntshabeni	Manteni	8	1	1	1	1	8	4	0	Existing power line in the front road.	0	75,000	130,000	13,000	42,500	21,500	18 Principal + 14 teachers + 3 staff
5 Mlila	Manteni	8	1	1	1	1	8	4	150,000	New power line connection about 320M	100,000	75,000	130,000	13,000	42,500	21,500	18 Principal + 14 teachers + 3 staff
6 Mandulo	Manteni	9	1	1	1	1	9	4	0	Existing power line in the site.	0	75,000	131,000	13,000	42,500	21,500	20 Principal + 16 teachers + 3 staff
7 Mlombo	Shiselweni	9	1	1	1	1	9	4	80,000	New power line from nearest water source.	180,000	75,000	131,000	13,000	42,500	21,500	20 Principal + 16 teachers + 3 staff
8 Mzibani	Shiselweni	9	1	1	1	1	9	4	0	Existing power line at the site. Connection to the site.	60,000	75,000	131,000	13,000	42,500	21,500	20 Principal + 16 teachers + 3 staff
9 Nkwanzi-R.	Mhobho	9	1	1	1	1	9	4	100,000	New power line from nearest grid system.	100,000	75,000	131,000	13,000	42,500	21,500	20 Principal + 16 teachers + 3 staff
10 Ekhuzeni	Mhobho	9	1	1	1	1	9	4	50,000	Existing power line in the front road.	0	75,000	131,000	13,000	42,500	21,500	20 Principal + 16 teachers + 3 staff
11 Mshahle	Mhobho	7	1	1	1	1	7	4	0	Existing agricultural water pipes in front road. Confirm the availability of usage.	60,000	75,000	130,000	13,000	42,500	21,500	17 Principal + 13 teachers + 3 staff
12 Mntshabeni	Mhobho	8	1	1	1	1	8	4	60,000	New power line from nearest grid system.	150,000	75,000	130,000	13,000	42,500	21,500	18 Principal + 14 teachers + 3 staff
Σ		97	12	12	12	12	97	48	590,000		950,000	970,000	1,285,000	154,000	910,000	238,000	232

Power Supply: Power line specification to be provided A/GAP in order to determine requirement of transformers.
 Water Supply: The amount of water shall be enough for school operation.
 Water & Power: Above description and estimate are based on the survey drawings. In case of conflicts of information, required work shall be done according to the existing condition.
 Estimated cost is guideline only. Required work shall be done with the means of Government of Swaziland.

(Confidential)

ANNEX-4 Project cost estimation

Initial Cost Estimation of the Project

The provisional cost of the Project is estimated as below in accordance with the estimation conditions in (3) below. The cost would be further examined by the Government of Japan for the approval of the Grant.

This page is closed due to the confidentiality.

(3) Conditions of cost estimation

- Month & Year of estimation : August 2010
- Exchange rate : 1 lilangeni (emalangi) = 13.11 yen
- Cost estimation is based on the Grant Aid Project System of the Government of Japan.

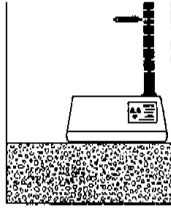
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5. Other Relevant Data (List of Materials)

No.	Name of Document	Form	Type	Issuer	Year	N.B.
A-1	Teaching Service Commission: End of Year Report	book	original	MOET	2009	
A-2	The Government of the Kingdom of Swaziland: Estimates for the Years from 1 st April 2010 to 31 st March 2013	book	original	Ministry of Finance	2010	
A-3	National Development Plan 2009/10 Developm	book	original	MOEPD	2009	
A-4	Unite for Children, Unite Against AIDS (set)	book	original	UNICEF Finance	2008/2009	
A-5	Swaziland Review: An Overview of the Kingdom of SwazilandIDSlandeporting	book	original	Swazi Review of Commerce and Industry (Pty) Ltd.	2009	
A-6	Swaziland Review: An Overview of the Kingdom of Swaziland' s Economy 2010	book	original	Swazi Review of Commerce and Industry (Pty) Ltd.	2009	
A-7	Performance Report: Second Quarter Performance Report 2009/2010	book	original	MOET	2009	
A-8	Performance Report: Annual Performance Report 2009/2010	book	original	MOET	2010	
A-9	EMIS Survey Report: 16 th Day Survey 2009	book	original	MOET	2009	
A-10	2010	book	original	MOET	2009	
A-11	Education and Training Sector Development Plan (Section of National Development Plan)	book	copy	MOEPD	2009	
A-12	National Policy Statement on Education 1999	book	copy	MOET	1999	
A-13	Swaziland: Education, Training and Skills Development for Shared Growth and Competitiveness	book	copy	MOET	2009	
A-14	Yingcamu (PRSAP): Towards Shared Growth and Empowerment	book	copy	MOEPD	2006	
A-15	Kingdom of Swaziland: Towards a Strategic Plan for the Education Sector	book	copy	WB/MOET	2010	
A-16	Draft Policy for Information and Communication Technology in Education	book	copy	MOET	2010	
A-17	Support to Education and Training (SET) Programme in Swaziland	book	copy	EU	2009	

No.	Name of Document	Form	Type	Issuer	Year	N.B.
A-18	Report on the Implementation of Capital Projects for the Ministry of Education and Training	book	copy	MPCU	2009	
A-19	School Guide Regulation Procedures	book	copy	MOET	1978	
A-20	Final Constitution of School Committees	book	copy	MOET	1982	
A-21	Syllabus(Junior): Home Economics, Science, English Language, Literature in English, Agriculture, History, Design and Technology, Religious Education, SiSwati, Mathematics & Additional Mathematics, Business Studies, Geography, Development Studies, Information and Communication Technology	book	original/ copy	NCC	2011- 2012	
A-22	Syllabus(Senior): Geography, Additional Mathematics, Development Studies, Dutch/French/German/Spanish, Information and Communication Technology, Combined Science, Mathematics, Literature in English, Religious Education, Economics, First Language SiSwati, Business Studies, History, Design and Technology, SiSwati as a Second Language, Accounting, Biology, Physical Science, Agriculture, Food and Nutrition, Fashion and Fabrics, English Language	book	original/ copy	NCC	2011- 2014	
A-23	Performance Report: 1st Quarter Performance Report 2010/20110	book	copy	MOET	2010	
A-24	The Education System in Swaziland	book	copy	WB	2010	
A-25	Final Report : Towards the Formulation of a National Policy for Science, Technology and Innovation for the Kingdom of Swaziland	book	copy	MOET/ UNICEF	2009	
A-26	Annual Report 2008: Support to Education and Training Program in Swaziland	book	copy	GOPA Consultant	2010	
A-27	Free Primary Education Handbook (Draft Copy for Discussion)	book	copy	MOET	2008	
A-28	School Post Allocation : 1985-1986	book	copy	MOET	1984	
A-29	Draft Policy for Information and Communication Technology in Education	book	copy	MOET	2010	
A-30	Support to Education and Training (SET) Program in Swaziland: Short Activity Report on PE4 Implementation Report no. 2	book	copy	EU	2009	
A-31	4 Regions: School ID, Name, Enrolment, Staff, Rural/Urban	book	copy	MOET	2009	

6. Ground Investigations



Laboratory Equipment Supplies

Conversion factors

SI units

In these conversion tables, SI units are shown in bold blue type.

Where SI units differ from technical metric units, the conversions are given for both.

The following list details the main SI units and their symbols which are used throughout these tables.

Length:	metre,	m
Area:	square metre,	m ²
Volume:	cubic metre,	m ³
Mass:	kilogram,	kg
Density:	kilograms per cubic metre,	kg/m ³
Force:	newton,	N
Pressure, stress:	pascal,	Pa (N/m ²)
Viscosity, dynamic:	pascal second	Pa s
Viscosity, kinematic:	square metre per second	m ² /s
Energy:	joule	J
Power:	watt	W (J/s)

Length

1 km	0.621371 mile
1 m	1.09361 yd 3.2808 ft
1 cm	0.393701 in
1 mm	0.03937 in
1 μm	39.3701 μin
1 mile	1.60934 km
1 yd	0.9144 m
1 ft	0.3048 m
1 in	25.4 mm
1 mill-in (thou)	25.4 μm
1 μin	0.0254 μm

Volume, capacity

1 m ³	1.30795 yd ³
1 dm ³ (litre)	0.03531 ft ³ 0.21997 imp gal 1.7605 pint 0.2642 US gal
1 cm ³ (ml)	0.06102 in ³ 0.0352 fl oz
1 litre (dm ³)	0.21997 imp gal 1.7605 pint
1 ml (cm ³)	0.0352 fl oz
1 yd ³	0.76455 m ³
1 ft ³	28.3168 dm ³
1 in ³	16.3871 cm ³
1 imp gal	4.54609 dm ³
1 US gal	3.78541 dm ³
1 pint	0.56826 dm ³
1 fl oz	28.4131 cm ³

Area

1 km ² (100 hectares)	247.105 acres
1 hectare (ha)	2.47105 acres
1 m ²	1.19599 yd ²
1 cm ²	0.155 in ²
1 mm ²	0.00155 in ²
1 mile ²	2.58999 km ²
1 acre (4840 yd ²)	4046.86 m ² 0.404686 ha
1 yd ²	0.836127 m ²
1 ft ²	0.092903 m ²
1 in ²	645.16 mm ²

Mass

1 tonne	1000 kg 0.98420 ton 2204.62 lb
1 kg	0.01968 cwt 2.20462 lb
1 g	0.03527 oz
1 ton	1016.05 kg 1.01605 tonne
1 cwt	50.8023 kg
1 lb	0.45359 kg
1 oz	28.349 g

Density

1 kg/m ³	1.686 lb.yd ³ 0.06243 lb ft ³
1 g/cm ³	62.4280 lb ft ³
1 ton/yd ³	1328.94 kg/m ³
1 lb./ft ³	0.593 kg/m ³
1 lb./in. ³	16.0185 kg/m ³
1 lb/in ³	27.6799 g/cm ³

Force

1 N	0.10197 kgf 0.22481 lbf
1 kN	101.971 kgf 224.809 lbf
1 kgf (kilopond)	9.80665 N 2.20462 lbf
1 dyn	10 ⁻⁵ N 0.224809 × 10 ⁻⁹ lbf
1 lbf	4.44822 N 0.45359 kgf
1 tonf	9.96402 kN 1016.05 kgf

Power

1 hp (horse power)	745.700 W (J/s)
1 ft lbf/s	1.35582 W

Pressure, stress

1 Pa (N/m ²)	0.01 mbar 0.000145 lbf/in ²
1 kPa (kN/m ²)	0.01 kgf/cm ² 10 mbar 20.885 lbf/ft ² 0.2953 in Hg
1 kgf/cm ²	98.0665 kPa 14.223 lbf/in ²
1 bar	100 kPa 14.5038 lbf/in ²
1 mbar	100 Pa 2.0885 lbf/ft ²
1 atm	101.325 kPa 14.6959 lbf/in ²
1 mm Hg (torr)	133.322 Pa 0.01934 lbf/in ²
1 mm H ₂ O	9.80665 Pa 0.001422 lbf/in ²
1 lbf/in ²	6.89476 kPa 0.07031 kgf/cm ² 68.9476 mbar
1 lbf/ft ²	47.8803 Pa 0.4788 mbar
1 tonf/ft ²	107.252 kPa 1.094 kgf/cm ²
1 in Hg	3.38639 kPa 0.491 lbf/in ²
1 ft H ₂ O	2.98907 kPa 0.030 kgf/cm ² 22.3997 mm Hg

Viscosity, dynamic

1 Pa s (N s/m ²)	0.0208854 lbf s/ft ²
1 cP (centipoise)	2.08854 × 10 ⁻⁵ lbf s/ft ²
	0.001 Pa s
1 lbf s/ft ²	47.8803 Pa s
1 lbf/ft s	1488.16 cP 1.48816 kg/m s

Viscosity, kinematic

1 m ² /s	10.7639 ft ² /s
1 cSt (centistokes)	5.58001 in ² /h 1 mm ² /s 10 ⁻⁶ m ² /s
1 ft ² /h	0.092903 m ² /h 25.8064 cSt
1 in ² /s	645.16 mm ² /s 645.16 cSt

Energy

1 MJ	0.277778 kWh
1 J	0.737562 ft lbf
1 kgf m	9.80665 J 7.23301 ft lbf
1 therm	105.506 MJ
1 kWh	3.6 MJ
1 Btu (British thermal unit)	1.05506 kJ

METHOD ST6

MEASUREMENT OF THE *IN SITU* STRENGTH OF SOILS BY THE DYNAMIC CONE PENETROMETER (DCP)

1 SCOPE

This method describes the determination of the rate of penetration of the Dynamic Cone Penetrometer (DCP) into a natural or compacted material by virtue of the built-in sliding hammer. The penetration rate is inversely proportional to the resistance of the ground to the penetration of the cone of the DCP and may be related, *inter alia*, to the *in situ* CBR or soil density (see 5.1).

2 APPARATUS

- 2.1 Dynamic Cone Penetrometer as illustrated in Figure ST6/1 with the appropriate spanners, spare cones, rods, etc. (see 5.2).
- 2.2 A pick or hand auger.
- 2.3 A spade.
- 2.4 A measuring tape, 2 m long.
- 2.5 Traffic cones, warning signs and flags as required.

3 METHOD

Assemble the DCP as shown in Figure ST6/1 ensuring that the parts are fitting properly and that the hammer can slide freely. Place the tip of the cone on the site to be tested (see 5.2). Hold the DCP vertically and by means of the hammer knock the cone into the surface up to the zero mark, which is the parallel-sided shoulder portion (± 3 mm wide) just above the cone-shaped tip.

Attach the measuring rod to the DCP and zero the sliding scale.

While holding the DCP vertically, lift the hammer as far as it can go and allow it to fall freely and strike the anvil, driving the cone into the ground surface.

The penetration can be read off after each blow of the hammer or after as many blows as are practical or required for the purpose of the test (see 5.3). Record the penetration (to the nearest 1 mm) and the number of blows on Form ST6/1 or a similar form (see 5.4).

On completion of the test, the DCP is extracted by ramming the hammer against the upper stop – usually after the measuring scale has been detached to prevent damage (see 5.5).

The strength of layers deeper than the reach of the DCP can be measured by removing some or all of the overlying material with a pick and spade or using a hand auger. At the start of the test the depth below the original datum level of the material to be tested is measured, using a tape measure, and recorded.

4 CALCULATIONS

- 4.1 The DCP penetration depths in mm are plotted against the number of blows on Form ST6/1 and a penetration curve is drawn, the angle of which is the penetration rate, known as the "DCP number" (DN) in mm/blow. A consistent slope angle thus indicates a consistent DN for that particular zone.

Special methods
Draft TMH6, Pretoria, South Africa, 1984

19

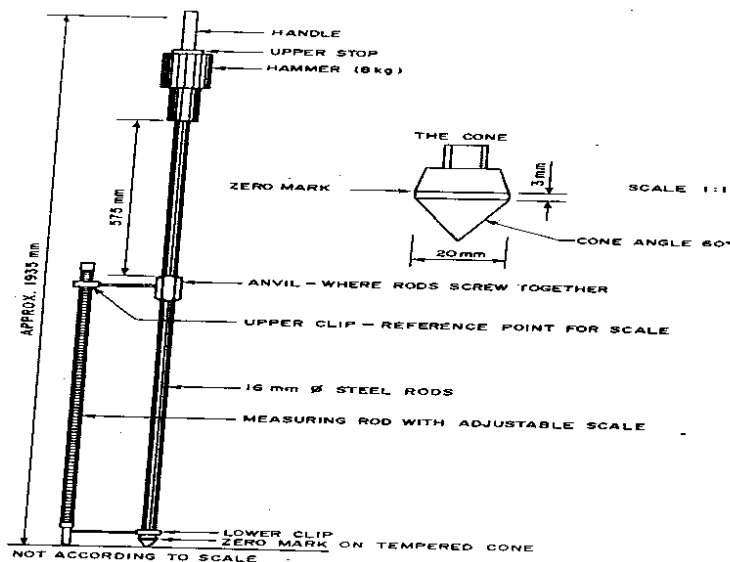
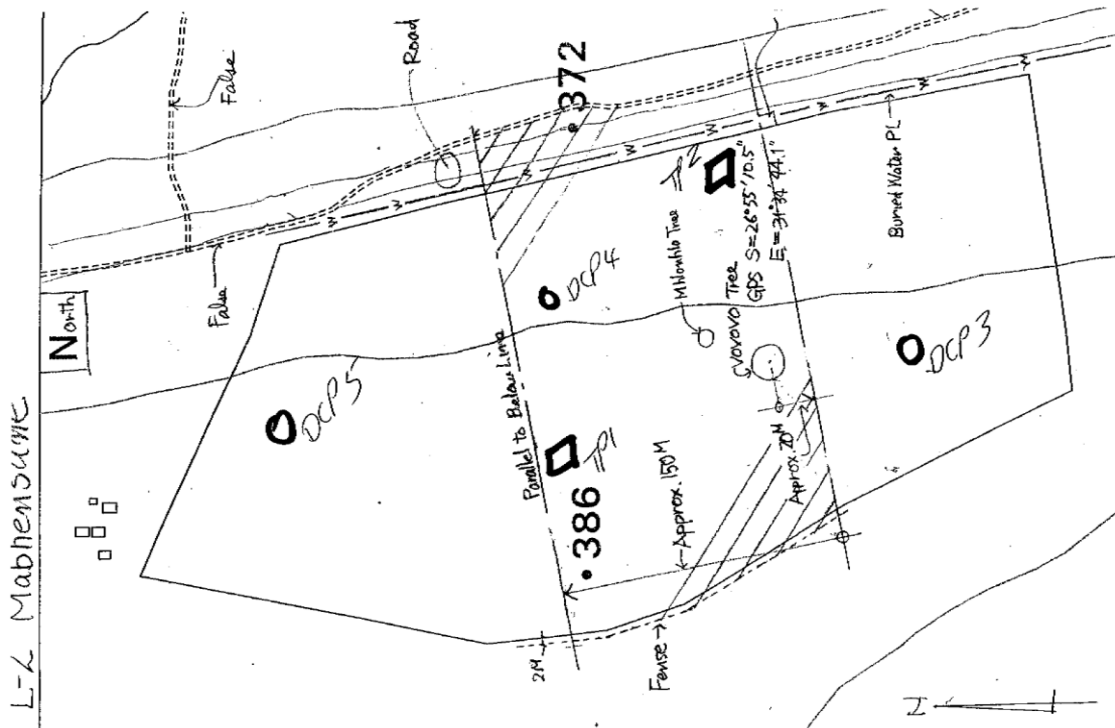


FIGURE ST6/1 THE DYNAMIC CONE PENETROMETER

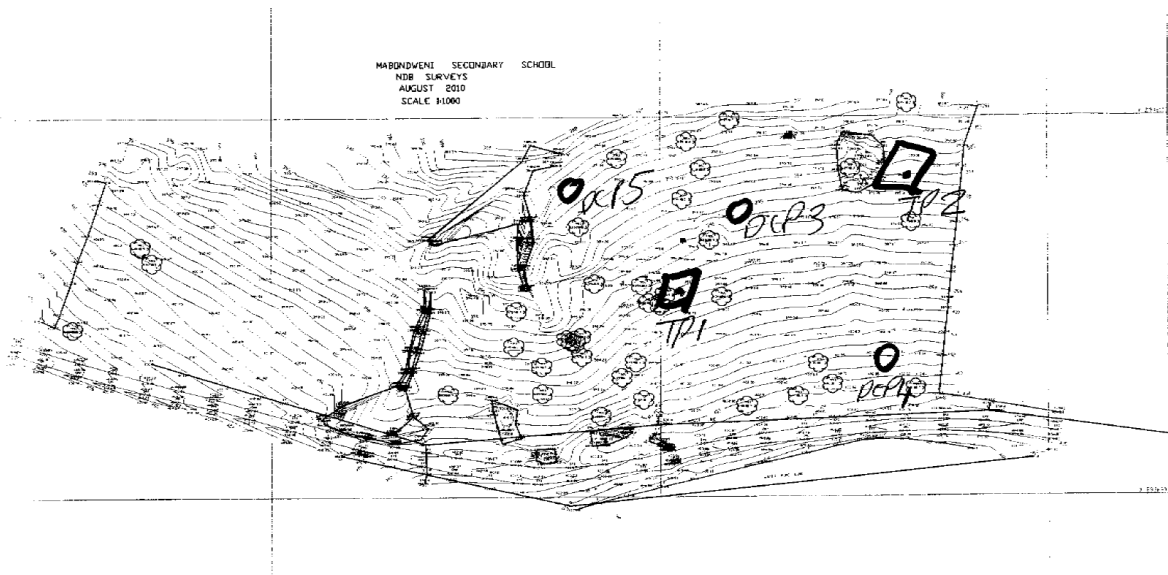
Special methods
Draft TMH6, Pretoria, South Africa, 1984

Survey points

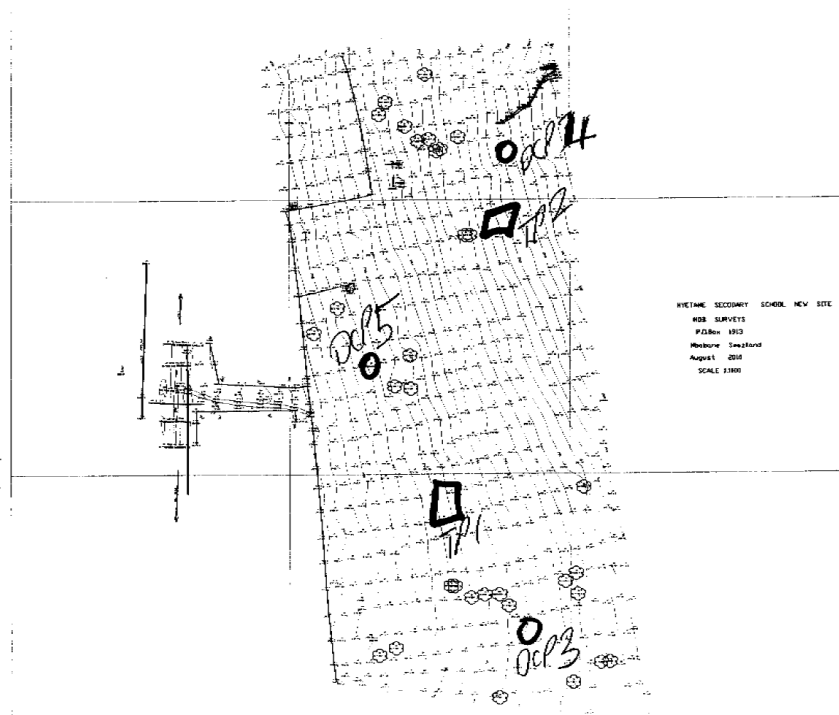
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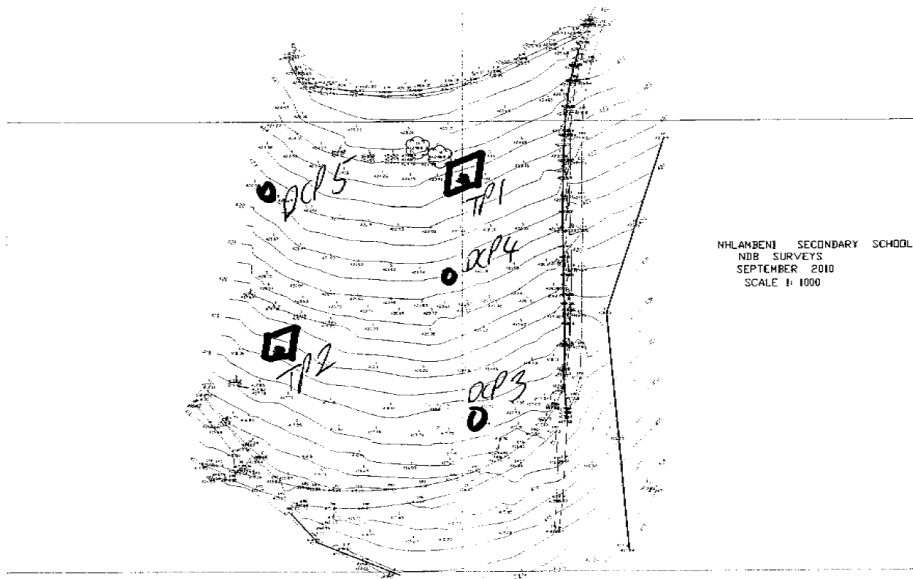
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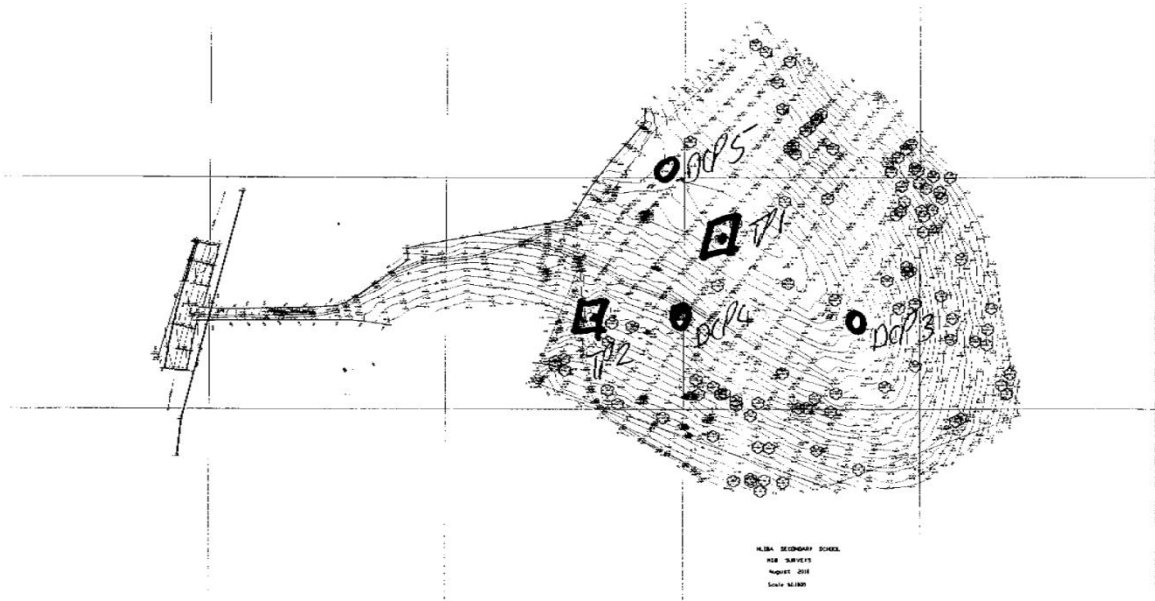
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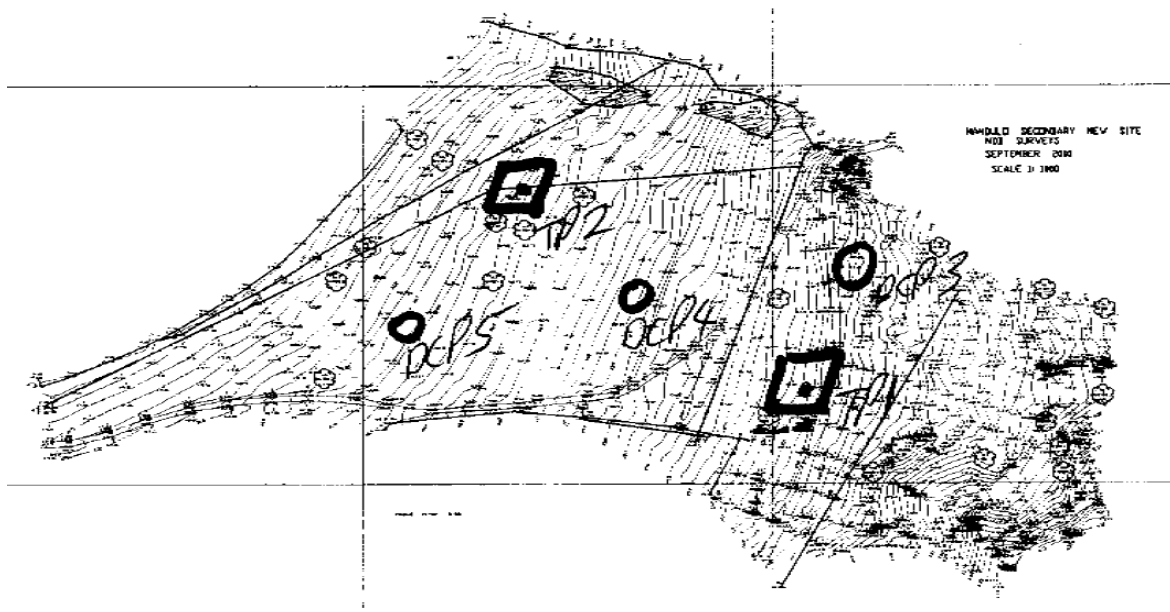
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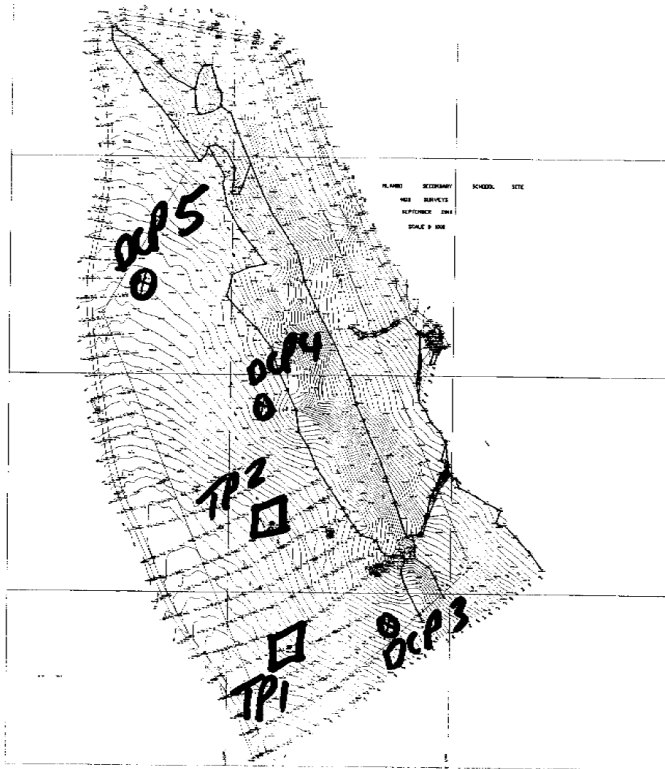
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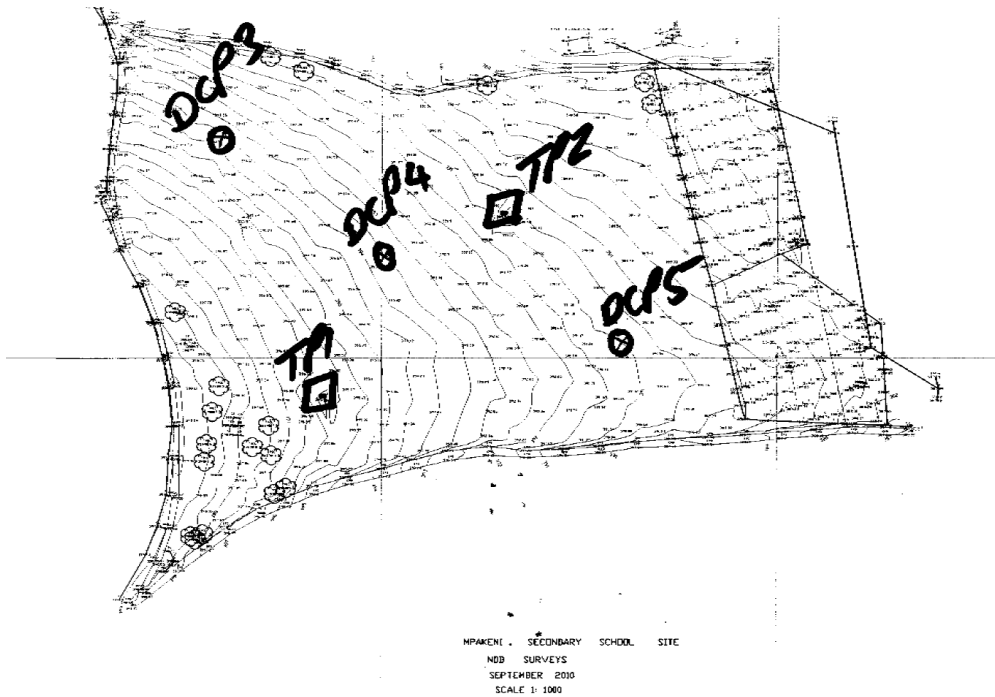
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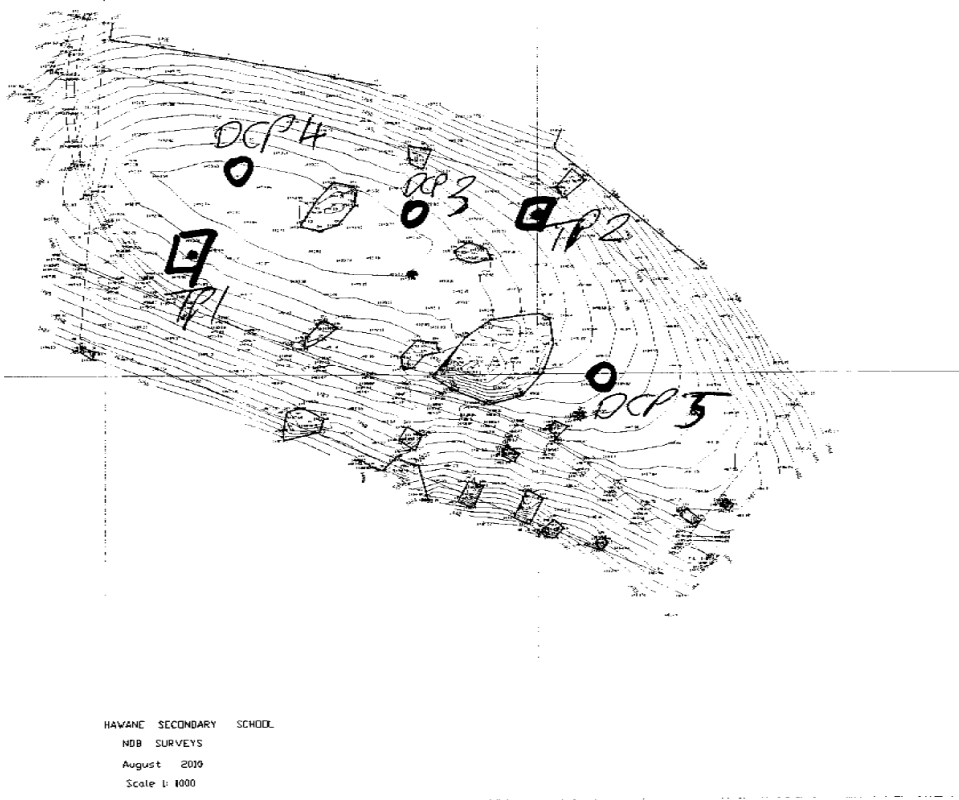
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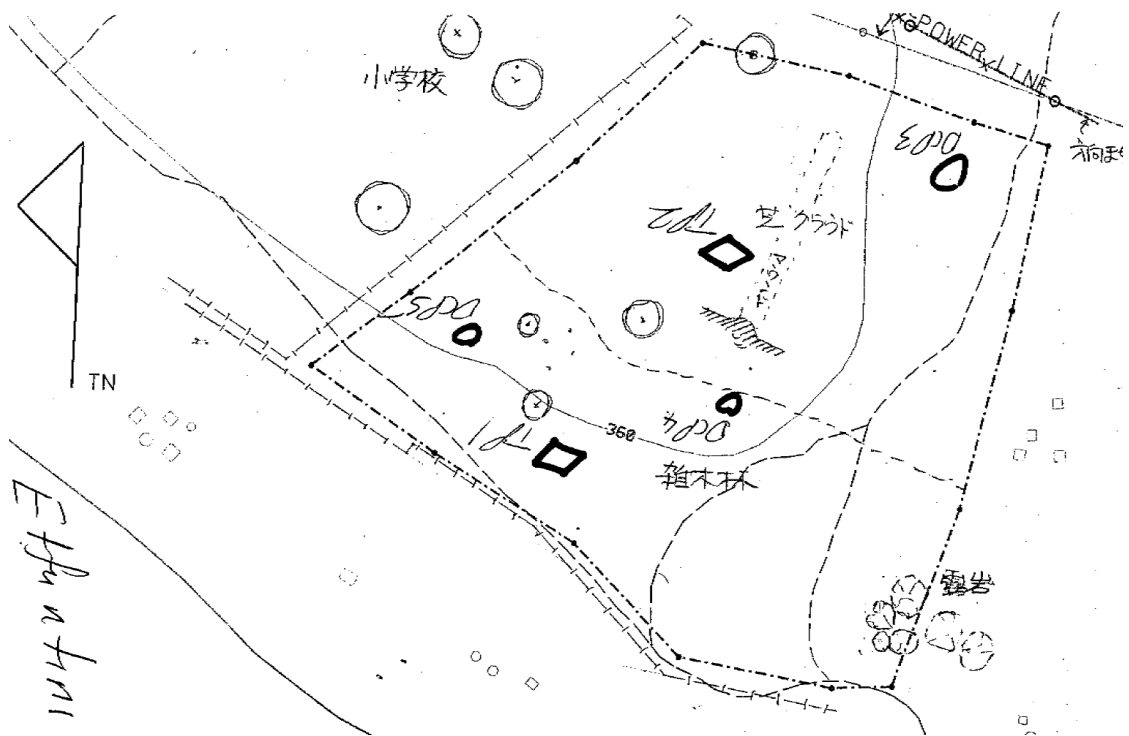
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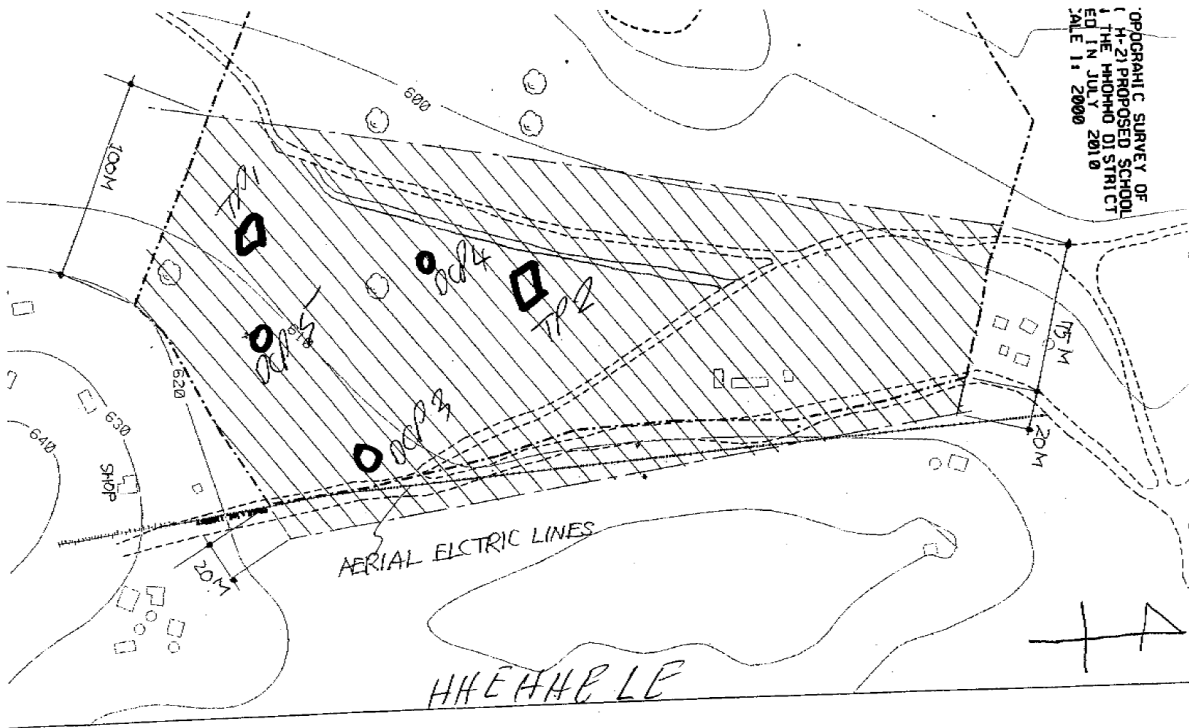
9. Hawane



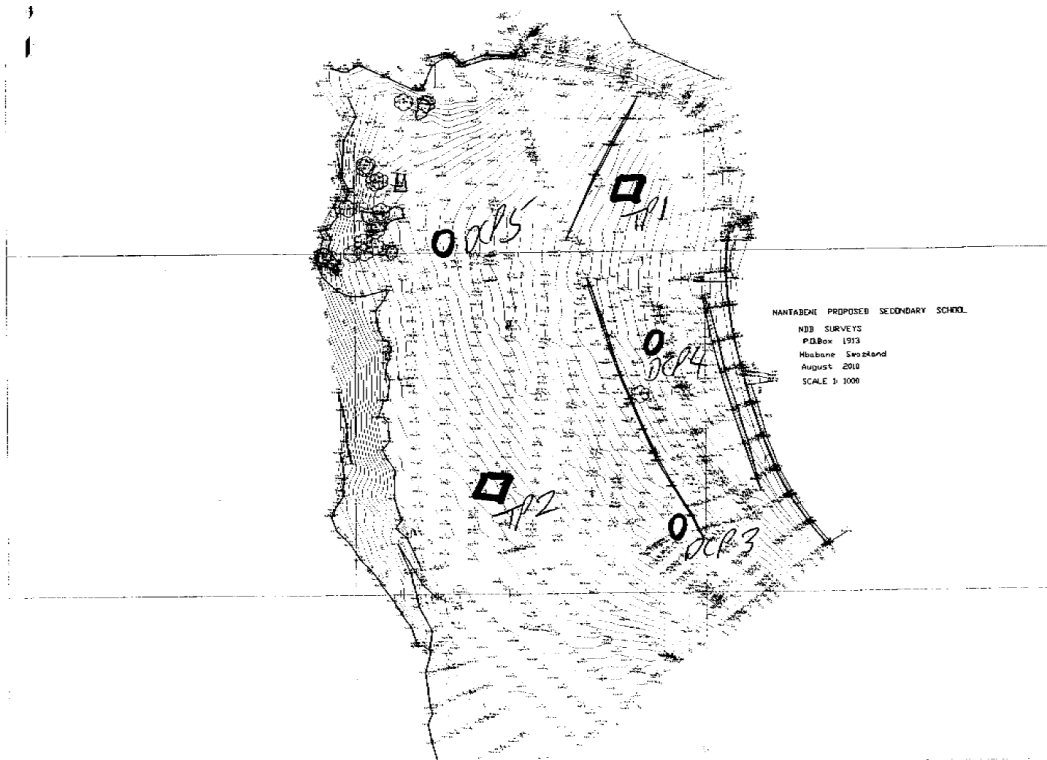
10. Eftuntini



11. Hhelehhele



12. Mantabeni



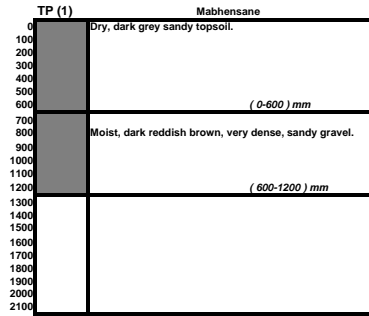
Ground investigation data

SOIL TESTING SERVICES									
SWAZILAND (PTY) LTD									
P.O. BOX A233 SWAZI PLAZA MBABANE SWAZILAND TEL. 42227/41956					SOILS LABORATORY, NORTH STREET, MBABANE, SWAZILAND, FAX: 4042227				
INDICATOR/CBR TEST REPORT									
PROJECT SWAZILAND SECONDARY SCHOOLS			CLIENT FUKUNAGA ARCHITECS			DATE 2010/2/9			
LABORATORY REFERENCE		Hhelehhele	Nyetane	Mpakeni	Mlambo	Nhlambeni			
SAMPLE NUMBER									
POSITION		TP (1)	TP (2)	TP (2)	TP (1)	TP (1)			
DESCRIPTION		0-1600 mm	300-900 mm	0-1500 mm	300-1400	240-1500			
SIEVE ANALYSIS: PERCENTAGE PASSING									
53.00									
37.50			100						
26.50			88						
19.00		100	83			100			
13.20		95	72	100	100	98			
4.75		88	40	100	95	85			
2.00	A	83	23	98	80	60			
0.425	B	74	17	87	54	38			
0.075	C	68	15	55	44	21			
SOIL MORTAR ANALYSIS									
COARSE SAND (2.0-0.425mm)		11	27	11	33	37			
COARSE FINE SAND (0.425-0.250mm)		2	3	13	5	12			
MEDIUM FINE SAND (0.250-0.150mm)		2	2	10	3	7			
FINE FINE SAND (0.150-0.050mm)		36	27	38	31	20			
SILT (0.050-0.005mm)		37	36	22	19	18			
CLAY (<0.005mm)		12	5	6	9	6			
SOIL CONSTANTS (ATTERBERG LIMITS)									
LIQUID LIMIT		53	65	29	45	24			
PLASTICITY INDEX		17	19	13	19	9			
LINEAR SHRINKAGE		9.9	14.7	8.8	7.8	4.0			
G.M & TRH 14 CLASSIFICATION									
G.M	300-A+B+C	0.75	2.45	0.6	1.22	1.81			
	100								
TRH 14 CLASSIFICATION									
C.B.R./UCS									
100% COMPACTION		N/A	N/A	N/A	N/A	N/A			
98% COMPACTION		"	"	"	"	"			
97% COMPACTION		"	"	"	"	"			
95% COMPACTION		"	"	"	"	"			
93% COMPACTION		"	"	"	"	"			
90% COMPACTION		"	"	"	"	"			
MAXIMUM DENSITY (KGS/M3)		N/A	N/A	N/A	N/A	N/A			
OPTIMUM MOISTURE CONTENT (%)		"	"	"	"	"			
NATURAL MOISTURE CONTENT (%)		"	"	"	"	"			
COMPACTION % SWELL %		N/A	N/A	N/A	N/A	N/A			
COMPACTION % SWELL %		"	"	"	"	"			
COMPACTION % SWELL %		"	"	"	"	"			

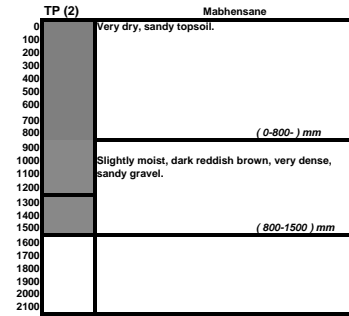
For Soil Testing Services

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
SOIL PROFILING

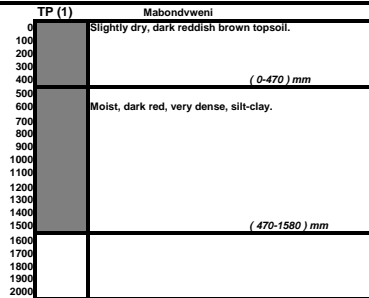
27/08/2010



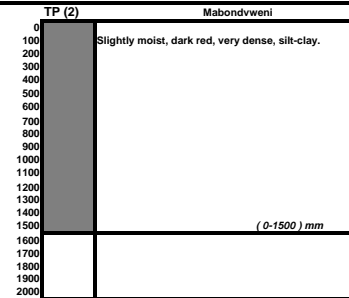
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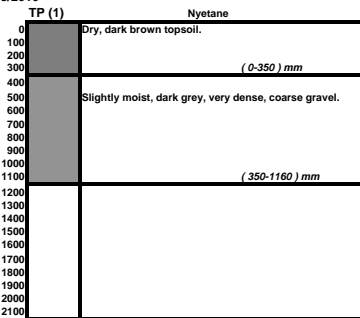
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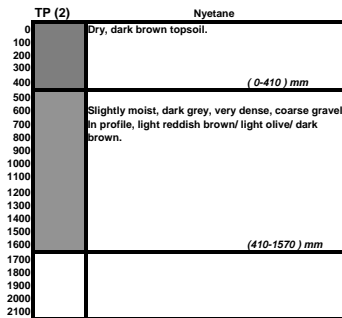
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SOIL PROFILING

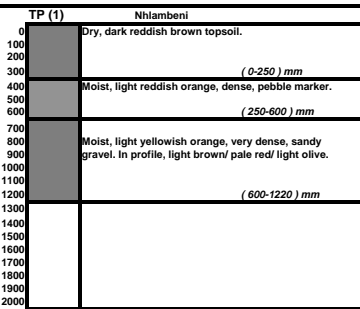
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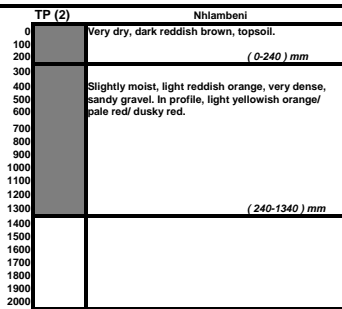
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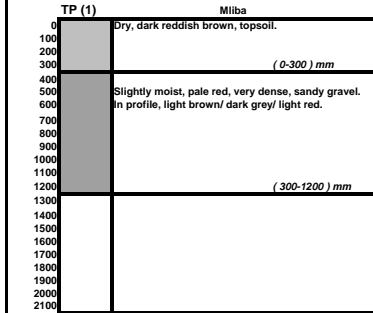
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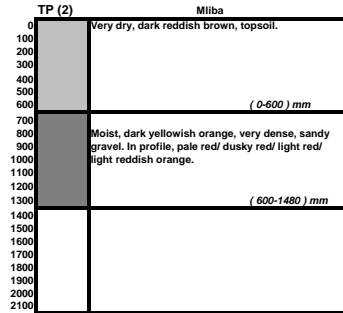
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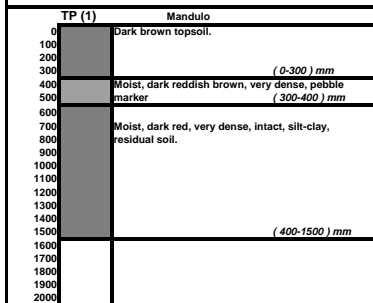
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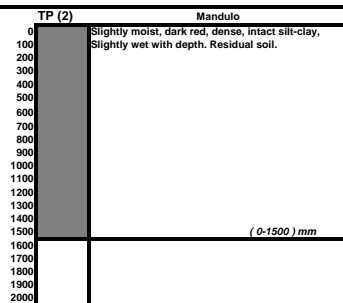
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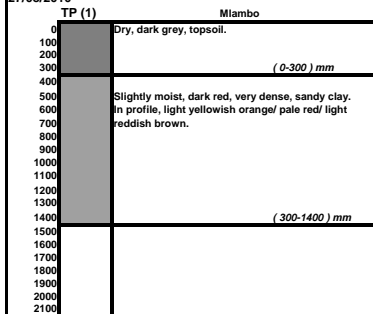
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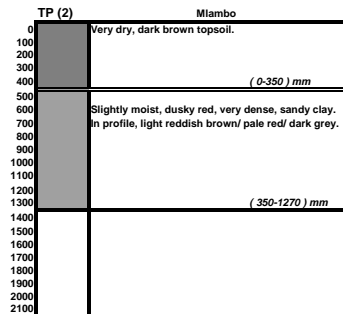
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SOIL PROFILING

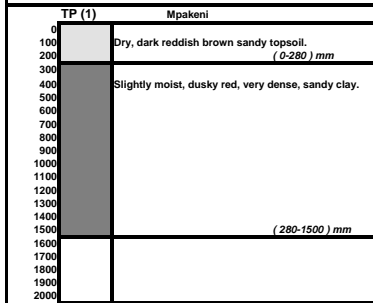
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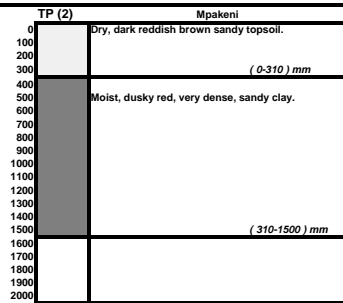
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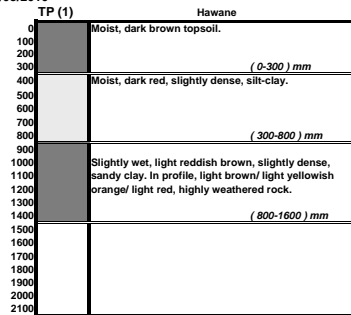
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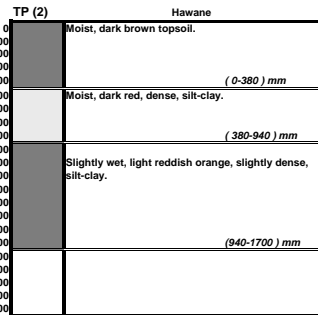
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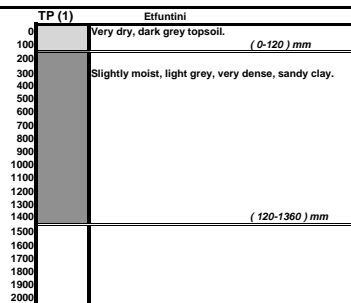
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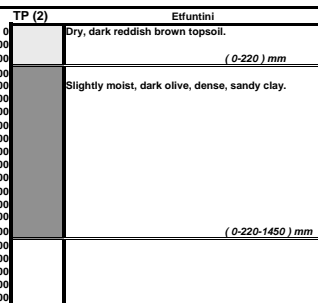
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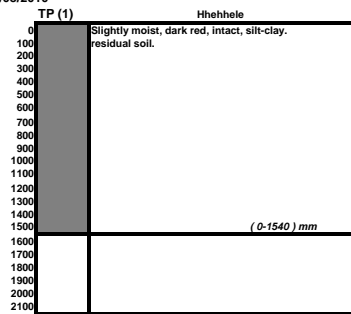
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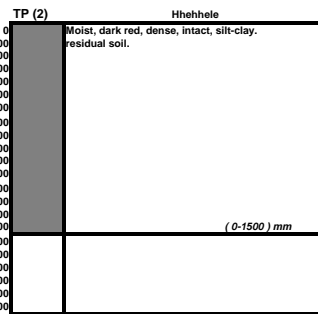
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SWAZILAND SECONDARY SCHOOLS PROJECT
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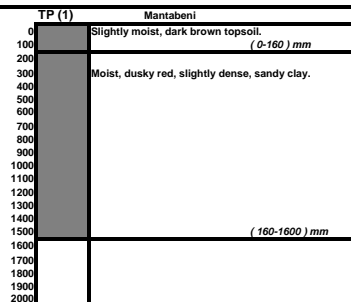
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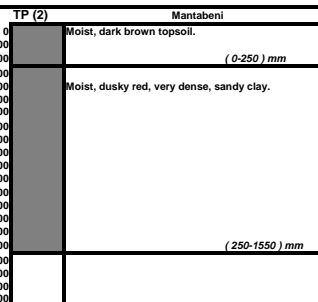
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FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

NYETANE

26/08/2010

DCP (1) TP (1) 1160 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
70	10	7	677
100	10	3	2039
105	10	1	20979
145	10	4	1402
200	10	6	927
220	10	2	3455
235	10	2	5024
245	10	1	8514
Refusal			

DCP (2) TP (2) 1570 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
95	10	890	455
135	10	800	1402
160	10	750	2585
185	10	700	2585
205	10	670	3455
255	10	640	1049
275	10	600	3455
300	10	550	2585
335	10	470	1668
360	10	430	2585
380	10	380	3455
395	10	330	5024
405	10	290	8514
425	10	220	3455
440	10	200	5024
460	10	180	3455
Refusal			

DCP (3) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
70	10	900	677
100	10	800	2039
125	20	760	6369
140	20	760	12379
200	20	760	2039
235	20	760	4111
260	20	760	6369
285	20	760	6369
325	20	760	3455
340	20	760	12379
355	20	760	12379
Refusal			

DCP (4) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	10	11	376
200	10	9	488
250	10	5	1049
300	10	5	1049
330	10	3	2039
360	10	3	2039
400	10	4	1402
450	10	5	1049
500	10	5	1049
530	10	3	2039
570	10	4	1402
620	10	5	1049
670	10	5	1049
710	10	4	1402
780	10	7	677
800	10	2	3455
820	10	2	3455
850	10	3	2039
870	10	2	3455
900	10	3	2039
930	10	3	2039
940	20	1	20979
Refusal			

DCP (5) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
100	10	10	426
200	10	10	426
240	10	4	1402
265	10	3	2585
280	10	2	5024
300	10	2	3455
315	15	1	8514
330	20	1	12379
350	10	2	3455
355	10	1	20979
Refusal			

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

MABONDVWENI

26/08/2010

DCP (1) TP (1) 1580 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	20	6	927
210	20	5	1049
300	20	5	1203
370	20	4	1668
430	20	3	2039
500	20	4	1668
540	20	2	3455
570	20	2	5024
620	20	3	2585
670	20	3	2585
710	20	2	3455
Refusal			

DCP (2) TP (2) 1500 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
105	10	11	400
175	10	7	677
235	10	6	827
300	10	7	746
355	10	6	927
385	10	3	2039
415	10	3	2039
440	10	3	2585
475	10	4	1668
500	10	3	2585
515	10	2	5024
530	10	2	5024
565	10	4	1668
575	10	1	8514
590	10	2	5024
600	10	1	8514
615	10	2	5024
625	10	1	8514
635	10	1	8514
640	10	1	20979
Refusal			

DCP (3) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
60	10	6	827
110	10	5	1049
150	10	4	1402
225	10	8	619
280	10	6	927
370	10	9	488
480	10	11	376
520	5	8	569
620	5	20	173
700	5	16	231
800	5	20	173
870	5	14	275
960	5	18	198
1000	5	8	569
1100	5	20	173
1200	5	20	173
1280	5	16	231
1345	5	13	303
1420	5	15	251
1480	5	12	336
1550	10	7	677
1600	10	5	1049
1635	10	4	1668
1680	10	5	1203
1720	10	4	1402
1760	10	4	1402
1800	10	4	1402

DCP (4) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
125	10	13	318
220	10	10	455
360	10	14	275
535	10	18	206
700	10	17	222
840	10	14	275
1000	10	16	231
1070	10	7	677
1210	10	14	275
1320	10	11	376
1380	10	6	827
1420	10	4	1402
1450	10	3	2039

DCP (5) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
135	5	27	117
210	5	15	251
280	5	14	275
335	5	11	376
435	10	10	426
535	10	10	426
630	10	10	455
730	10	10	426
810	10	8	569
880	10	7	677
960	10	8	569
1150	10	19	185
1180	10	3	2039
1200	10	2	3455
1215	10	2	5024
1235	10	2	3455
Refusal			

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

MABHENSANE

26/08/2010

DCP (1) TP (1) 1200 mm BGL				DCP (2) TP (2) 1500 mm BGL				DCP (3) NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0			0	0		
Refusal Rocks				100	10	10	426	100	10	10	426
				135	10	4	1668	175	10	8	619
				180	10	5	1203	250	10	8	619
				185	10	1	20979	325	10	8	619
				Refusal				400	10	8	619
								470	10	7	677
								580	10	11	376
								680	10	10	426
								710	10	3	2039
								755	10	5	1203
								820	10	7	746
								870	10	5	1049
								900	10	3	2039
								920	10	2	3455
								950	10	3	2039
								955	10	3	2039
								Refusal	10	1	20979

DCP (4) NGL				DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0		
270	5	54	47	100	5	20	173
400	5	26	123	200	5	20	173
460	5	12	336	270	5	14	275
500	5	8	569	350	5	16	231
560	10	6	827	430	5	16	231
630	10	7	677	500	5	14	275
670	10	4	1402	530	5	6	827
740	10	7	677	570	5	8	569
810	10	7	677	670	10	10	426
860	10	5	1049	740	10	7	677
930	10	7	677	820	10	8	569
1080	10	15	251	840	10	2	3455
1130	10	5	1049	855	10	2	5024
1150	10	2	3455	860	10	1	20979
Refusal				Refusal			

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

MPAKENI

26/08/2010

DCP (1) TP (1) 1500 mm BGL				DCP (2) TP (2) 1500 mm BGL				DCP (3) NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0			0	0		
130	10	13	303	200	10	20	173	100	10	10	426
315	10	19	151	300	10	10	426	150	10	5	1049
420	10	11	400	400	10	10	426	180	10	3	2039
480	10	6	827	500	10	10	426	300	10	12	336
620	10	14	275	600	10	10	426	390	10	9	488
735	10	12	355	700	10	10	426	490	10	10	426
820	10	9	526	800	10	10	426	580	10	9	488
970	10	15	251	870	10	7	677	680	10	10	426
1040	10	7	677	945	10	8	619	770	10	9	488
1100	10	6	827	970	10	3	2585	840	10	7	677
1150	10	5	1049	Refusal				930	10	9	488
1210	10	6	827					975	10	5	1203
1260	10	5	1049					980	10	1	20979
1320	10	6	827					Refusal			
1390	10	7	677								
1450	10	6	827								
1500	10	5	1049								
1570	10	7	677								
1630	10	6	827								
1690	10	6	827								
1730	10	4	1402								
Refusal											

DCP (4) NGL				DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0		
100	10	10	426	50	10	5	1049
170	10	7	677	100	10	5	1049
240	10	7	677	110	10	1	8514
290	10	5	1049	Refusal			
440	10	15	251				
600	10	16	231				
670	10	7	677				
750	10	8	569				
825	10	8	619				
900	10	8	619				
965	10	7	746				
980	10	2	5024				
1030	10	5	1049				
1080	10	5	1049				
1085	10	1	20979				
Refusal							
				1430	2	715	2

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

MLAMBO

26/08/2010

DCP (1) TP (1) 1400 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
130	5	26	123
200	5	14	275
235	5	7	677
275	5	8	569
335	5	12	336
385	5	10	426
430	5	9	488
470	5	8	569
510	5	8	569
520	5	2	3455
560	10	4	1402
600	10	4	1402
640	10	4	1402
685	10	5	1203
730	10	5	1203
810	10	8	569
850	10	4	1402
900	10	5	1049
905	10	1	20979
Refusal			

DCP (2) TP (2) 1270 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
120	10	12	336
160	10	4	1402
230	10	7	677
Refusal			

DCP (3) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
100	10	10	426
130	10	3	2039
240	10	11	376
Refusal			

DCP (4) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
10	20	1	20979
100	20	5	1203
Refusal			

DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
80	10	8	569
130	10	5	1049
160	10	3	2039
170	10	1	8514
Refusal			

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

MANDULO

26/08/2010

DCP (1) TP (1) 1200 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
335	5	21	162
440	5	21	162
555	5	23	144
660	5	21	162
770	5	22	153
855	5	17	213
960	5	21	162
1020	5	12	336
1050	5	6	827
1080	5	6	827
1110	10	3	2039
1140	10	3	2039
1150	10	1	8514
Refusal			

DCP (2) TP (2) 1500 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
200	5	40	70
360	5	32	94
480	5	24	136
570	5	18	198
640	5	14	275
690	5	10	426
730	5	8	569
765	5	7	677
800	5	7	677
840	5	8	569
875	5	7	677
910	5	7	677
945	5	7	677
1000	10	6	927
1060	10	6	827
1115	10	6	927
1170	10	6	927
1220	10	5	1049
1265	10	5	1203
1300	10	4	1668
1350	10	5	1049
1400	10	5	1049
Refusal			

DCP (3) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
200	10	20	173
350	10	15	251
450	5	20	173
530	5	16	231
575	5	9	488
620	5	9	488
660	5	8	569
710	5	10	426
770	5	12	336
830	5	12	336
880	5	10	426
930	5	10	426
1000	5	14	275
1050	5	10	426
1140	5	18	198
1265	5	25	129
1370	5	21	162
1460	5	18	198
1550	5	18	198
1630	5	16	231
1710	5	16	231
1800	5	18	198
1880	5	16	231
1950	5	14	275
2000	2	25	129

DCP (4) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	10	11	376
150	10	8	569
300	10	11	376
390	10	9	488
470	10	8	569
540	10	7	677
590	10	5	1049
650	10	6	827
720	10	7	677
780	10	6	827
860	10	8	569
920	10	6	827
1000	10	8	569
1090	10	9	488
1210	10	12	336
1360	10	15	251
1510	10	15	251
1650	10	14	275
1780	10	13	303
1900	10	12	336
2000	10	10	426

DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
120	10	12	336
205	10	9	526
275	10	7	677
375	10	10	426
470	10	10	455
570	10	10	426
650	10	8	569
740	10	9	488
850	10	11	376
950	10	10	426
1040	10	9	488
1210	10	17	213
1310	5	20	173
1410	5	20	173
1510	5	20	173
1590	5	16	231
1670	5	16	231
1740	5	14	275
1820	5	16	231
1880	5	12	336
1930	5	10	426
2000	4	18	206

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

NHLAMBENI

26/08/2010

DCP (1) TP (1) 1220 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	10	11	376
170	10	8	827
250	10	8	569
385	10	14	288
550	10	17	222
800	10	25	129
1050	10	25	129
1070	10	2	3455
Refusal			

DCP (2) TP (2) 1380 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
250	10	25	129
465	10	22	157
Refusal			

DCP (3) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
120	10	12	336
285	10	17	222
430	10	15	263
570	10	14	275
615	10	5	1203
Refusal			

DCP (4) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
160	10	16	231
290	10	13	303
360	10	7	677
430	10	7	677
510	10	8	569
590	10	7	677
750	10	17	213
920	10	17	213
1000	10	8	569
1030	10	3	2039
1050	10	2	3455
1085	10	4	1668
Refusal			

DCP (5) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
80	10	8	569
130	10	5	1049
210	10	8	569
340	10	13	303
430	10	9	488
550	10	12	336
670	10	12	336
710	10	4	1402
760	10	5	1049
815	10	6	927
860	10	5	1203
900	10	4	1402
910	10	1	8514
Refusal			

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

MLIBA

26/08/2010

DCP (1) TP (1) 1200 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
REFUSAL			
ROCKS			

DCP (2) TP (2) 1480 mm BGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	10	11	376
160	10	5	1049
200	10	4	1402
245	10	5	1203
290	10	5	1203
330	10	4	1402
390	10	6	827
475	10	9	526
530	10	6	927
575	10	5	1203
610	10	4	1668
650	10	4	1402
690	10	4	1402
750	10	6	827
790	10	4	1402
820	10	3	2039
850	10	3	2039
Refusal			

DCP (3) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
140	20	7	677
270	20	7	746
340	10	7	677
375	10	4	1668
400	10	3	2585
430	10	3	2039
460	10	3	2039
490	10	3	2039
510	10	2	3455
540	10	3	2039
580	10	4	1402
590	10	1	8514
Refusal			

DCP (4) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
80	20	4	1402
170	20	5	1203
270	20	5	1049
380	20	6	927
450	10	7	677
550	10	10	426
700	10	15	251
810	10	11	376
850	5	8	569
890	5	8	569
930	5	8	569
1000	5	14	275
1080	5	16	231
1140	5	12	336
1220	5	16	231
1260	5	8	569
1300	5	8	569
1320	5	4	1402
1360	5	8	569
1400	5	8	569
1440	5	8	569
1460	5	4	1402
Refusal			

DCP (5) NGL

Depth (mm)	No. Blows	mm/blows	kPa
0	0		
120	10	12	336
200	10	8	569
270	10	7	677
390	10	12	336
440	5	10	426
490	5	10	426
530	5	9	569
580	5	10	426
640	5	12	336
700	5	12	336
780	5	16	231
860	5	16	231
940	5	16	231
1000	5	12	336
1010	5	2	3455
1180	5	34	87
1230	5	10	426
1280	5	10	426
1330	5	10	426
1400	5	14	275
1440	5	8	569
1530	5	18	198
1570	5	8	569
1600	5	6	827
1620	5	4	1402
1660	5	8	569
1700	5	5	569
1750	10	5	1049
1790	10	4	1402
1830	10	4	1402
1870	10	4	1402
1940	10	7	677
1980	10	2	3455
2000	7	6	882

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

MANTABENI

26/08/2010

DCP (1) TP (1) 1600 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
160	2	80	28
220	2	30	102
245	2	13	318
370	5	25	129
460	5	18	198
545	5	17	213
615	5	14	275
680	5	13	303
740	5	12	336
790	5	10	426
870	5	16	231
920	5	10	426
965	5	9	488
1025	5	12	336
1080	5	11	376
1125	5	9	488
1215	10	9	488
1305	10	9	488
1400	10	10	455
1490	10	9	488
1560	10	7	677
1630	10	7	677
1690	10	6	827
1750	10	6	827
1800	10	5	1049
1860	10	6	827
1920	10	6	827
1980	10	6	827
2000	10	2	3455

DCP (2) TP (2) 1550 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
180	2	90	24
240	2	30	102
300	2	30	102
360	2	30	102
380	2	10	426
415	2	18	206
450	2	18	206
525	2	38	76
580	5	11	376
630	5	10	426
680	5	10	426
735	5	11	376
780	5	9	488
865	10	9	526
950	10	9	526
1030	10	8	569
Refusal	10	8	569

DCP (3) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
200	5	40	70
340	5	28	112
560	4	55	46
680	2	60	41
755	2	38	76
815	2	30	102
860	2	23	148
910	2	25	129
940	2	15	251
1040	5	20	173
1140	5	20	173
1210	5	14	275
1260	5	10	426
1310	5	10	426
1360	5	10	426
1400	5	8	569
1435	5	7	677
1480	5	9	488
1520	5	8	569
1560	5	8	569
1600	5	8	569
1635	5	7	677
1675	5	8	569
1705	5	6	827
1740	5	7	677
1775	5	7	677
1850	10	8	619
1905	10	6	927
1955	10	5	1049
2000	10	5	1203

DCP (4) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	5	22	153
310	5	40	70
350	5	8	569
430	2	40	70
510	2	40	70
580	2	35	83
630	2	25	129
670	2	20	173
760	5	18	198
850	5	18	198
910	5	12	336
975	5	13	303
1020	5	9	488
1070	5	10	426
1110	5	8	569
1140	5	6	827
1220	10	8	569
1290	10	7	677
1345	10	6	827
1410	10	7	746
1470	10	6	827
1535	10	7	746
1600	10	7	746
1665	10	7	746
1725	10	6	827
1800	10	8	619
1865	10	7	746
1925	10	6	827
2000	10	8	619

DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
190	5	38	75
400	5	42	66
610	5	42	66
745	5	27	117
825	5	16	231
865	5	8	569
1000	10	14	288
1110	10	11	376
1190	10	8	569
1265	10	8	619
1340	10	8	619
Refusal	10	8	619

FUKUNAGA ARCHITECTS-ENGINEERS
SWAZILAND SECONDARY SCHOOLS PROJECT
DCP TEST RESULTS

HAWANE

26/08/2010

DCP (1) TP (1) 1600 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
360	5	72	33
650	5	58	43
910	5	52	50
1120	5	42	66
1320	5	40	70
1380	2	30	102
1440	2	30	102
1500	2	30	102
1570	2	35	83
1610	2	20	173
1655	2	23	148
1710	2	28	114
1765	2	28	114
1810	2	23	148
1870	2	30	102
1900	2	15	251
1940	2	20	173
2000	2	30	102

DCP (2) TP (2) 1700 mm BGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
200	2	100	21
260	2	30	102
370	2	55	46
430	2	30	102
500	2	35	83
570	2	35	83
630	2	30	102
700	2	35	83
760	2	30	102
830	2	35	83
930	5	20	173
1060	5	26	123
1160	5	20	173
1260	5	20	173
1360	5	20	173
1460	5	20	173
1570	5	22	153
1700	2	65	37
1800	5	20	173
1900	5	20	173
2000	5	20	173

DCP (3) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
80	5	16	231
180	5	20	173
265	5	17	213
300	5	7	677
340	5	8	569
410	5	14	275
550	5	28	112
630	2	40	70
730	2	50	52
810	2	40	70
910	2	50	52
980	2	35	83
1070	2	45	60
1170	2	50	52
1260	2	45	60
1310	2	25	129
1360	2	25	129
1410	2	25	129
1470	2	30	102
1490	2	10	426
1560	2	35	83
1620	2	30	102
1670	2	25	129
1730	2	30	102
1790	2	30	102
1850	2	30	102
1900	2	25	129
1950	2	25	129
2000	2	25	129

DCP (4) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	5	22	153
190	5	16	231
250	5	12	336
300	5	10	426
340	5	8	569
410	5	14	275
510	5	20	173
630	5	24	136
780	5	30	102
900	5	24	136
1000	5	20	173
1080	5	16	231
1170	5	18	198
1260	5	18	198
1320	5	12	336
1400	5	16	231
1500	5	20	173
1570	5	14	275
1670	5	20	173
1820	5	30	102
1930	5	22	153
2000	5	14	275

DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa
0	0		
110	5	22	153
180	5	14	275
240	5	12	336
310	5	14	275
400	5	18	198
500	5	20	173
600	5	20	173
750	5	32	94
870	2	55	46
950	2	40	70
1020	2	35	83
1110	2	45	60
1150	2	20	173
1200	2	25	129
1250	2	25	129
1300	2	25	129
1350	2	25	129
1385	2	18	206
1430	2	23	148
1470	2	20	173
1510	2	20	173
1560	2	25	129
1600	2	20	173
1650	2	25	129
1680	2	15	251
1730	2	25	129
1770	2	20	173
1810	2	20	173
1860	2	25	129
1940	2	40	70
1960	2	10	426
2000	2	20	173

FUKUNAGA ARCHITECTS-ENGINEERS				SWAZILAND SECONDARY SCHOOLS PROJECT				DCP TEST RESULTS				HHELEHHELE			
26/08/2010				DCP (1)				DCP (2)				DCP (3)			
TP (1) 1540 mm BGL				TP (2) 1500 mm BGL				NGL				NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0			0	0			0	0		
200	2	100	21	380	2	190	9	160	5	32	94	160	5	32	94
365	2	83	27	600	2	110	19	250	5	18	198	250	5	18	198
415	2	25	129	685	2	43	65	330	5	16	231	330	5	16	231
540	2	63	39	800	2	58	44	440	5	22	153	440	5	22	153
660	2	60	41	890	2	45	60	540	5	20	173	540	5	20	173
770	2	55	46	1000	2	55	46	675	5	27	117	675	5	27	117
850	2	40	70	1085	2	43	65	835	5	32	94	835	5	32	94
955	2	53	49	1165	2	40	70	900	2	33	92	900	2	33	92
1050	2	48	56	1225	2	30	102	930	2	15	251	930	2	15	251
1155	2	53	49	1325	2	50	52	980	2	25	129	980	2	25	129
1230	2	38	76	1410	2	43	65	1030	2	25	129	1030	2	25	129
1320	2	45	60	1470	2	30	102	1070	2	20	173	1070	2	20	173
1420	2	50	52	1530	2	30	102	1110	2	20	173	1110	2	20	173
1510	2	45	60	1600	2	35	83	1150	2	20	173	1150	2	20	173
1580	2	35	83	1665	2	33	92	1190	2	20	173	1190	2	20	173
1650	2	35	83	1735	2	35	83	1215	5	5	1049	1215	5	5	1049
1700	2	25	129	1800	2	33	92	1250	5	7	677	1250	5	7	677
1760	2	30	102	1850	2	25	129	1350	2	50	52	1350	2	50	52
1810	2	25	129	1900	2	25	129	1400	2	25	129	1400	2	25	129
1850	2	20	173	1950	2	25	129	1430	2	15	251	1430	2	15	251
1900	2	25	129	2000	2	25	129	1470	2	20	173	1470	2	20	173
1950	2	25	129					1530	2	30	102	1530	2	30	102
2000	2	25	129					1535	2	3	2585	1535	2	3	2585
								1555	5	4	1402	1555	5	4	1402
								1610	5	11	488	1610	5	11	488
								1655	5	9	488	1655	5	9	488
								1700	5	9	488	1700	5	9	488
								1720	5	4	1402	1720	5	4	1402
								1755	5	7	677	1755	5	7	677
								1800	5	9	488	1800	5	9	488
								1840	5	8	569	1840	5	8	569
								1920	5	16	231	1920	5	16	231
								2000	4	20	173	2000	4	20	173

DCP (4) NGL				DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0		
85	5	17	213	220	5	44	62
125	5	8	569	310	5	18	198
160	5	7	677	420	5	22	153
200	5	8	569	530	5	22	153
250	5	10	426	625	2	48	56
310	5	12	336	700	2	38	76
385	5	15	251	765	2	33	92
460	5	15	251	820	2	28	114
540	5	16	231	865	2	23	148
620	5	16	231	910	2	23	148
720	5	20	173	960	2	25	129
820	5	20	173	1000	2	20	173
910	5	18	198	1050	5	10	426
1010	5	20	173	1155	5	21	162
1130	5	24	136	1280	5	25	129
1230	5	20	173	1405	5	25	129
1350	5	24	136	1460	5	11	376
1440	5	18	198	1680	5	58	56
1520	5	16	231	1790	5	20	173
1630	5	22	153	1900	5	22	153
1730	5	20	173	2000	5	20	173
1810	5	16	231				
1900	5	18	198				
2000	5	20	173				

FUKUNAGA ARCHITECTS-ENGINEERS				SWAZILAND SECONDARY SCHOOLS PROJECT				DCP TEST RESULTS				ETFUNTINI			
26/08/2010				DCP (1)				DCP (2)				DCP (3)			
TP (1) 1360 mm BGL				TP (2) 1450 mm BGL				NGL				NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0			0	0			0	0		
145	10	15	263	130	10	13	303	180	10	18	198	180	10	18	198
220	10	8	619	255	10	13	318	290	10	11	376	290	10	11	376
Refusal				330	10	8	619	470	5	36	80	470	5	36	80
				400	10	7	677	580	2	55	46	580	2	55	46
				470	10	7	677	670	2	75	31	670	2	75	31
				570	10	10	426	730	2	65	37	730	2	65	37
				640	10	7	677	860	2	55	46	860	2	55	46
				760	10	12	336	970	2	33	92	970	2	33	92
				860	10	10	426	1035	2	14	275	1035	2	14	275
				950	10	9	488	1105	5	11	376	1105	5	11	376
				1020	10	7	677	1160	5	8	569	1160	5	8	569
				1060	10	4	1402	1200	5	12	336	1200	5	12	336
				1105	10	5	1203	1260	5	8	569	1260	5	8	569
				1135	10	3	2039	1300	5	7	677	1300	5	7	677
				1165	10	3	2039	1335	5	7	677	1335	5	7	677
				1180	10	2	5024	1370	5	7	677	1370	5	7	677
				1200	10	2	3455	1410	5	8	569	1410	5	8	569
				1220	10	2	3455	1455	5	9	488	1455	5	9	488
				Refusal				1465	5	2	3455	1465	5	2	3455

DCP (4) NGL				DCP (5) NGL			
Depth (mm)	No. Blows	mm/blows	kPa	Depth (mm)	No. Blows	mm/blows	kPa
0	0			0	0		
20	20	1	8514	100	20	5	1049
30	20	1	20979	130	20	2	5024
Refusal				140	20	1	20979
				Refusal			