APPENDICES

1. Member List of the Study Team

1-1. Field Survey Team

Team Leader	Satoru HAGIWARA	Deputy Director, Grant Aid and Loan Support Department Japan International Cooperation Agency
Grant Aid policy	Takahiro ARA	Grant Aid and Technical Cooperation Division, International Cooperation Bureau Ministry of Foreign Affairs
Project Planning	Yoshihiro OZAKI	Project Management Division Ⅲ Grant Aid and Loan Support Department Japan International Cooperation Agency
Chief Consultant / Operation and Maintenance Planner / Environmental and Social Considerations	Toshiya OGASAWARA	Fisheries Engineering Co,. Ltd.
Civil Engineer and Surveyor	Yasuhito MANO	Fisheries Engineering Co., Ltd.
Fisheries Researcher	Satoshi YAMANE	Fisheries Engineering Co., Ltd.
Architect and Equipment Planner	Yoshiharu MATSUMOTO	Fisheries Engineering Co., Ltd.
Engineering Work Planner and Cost Surveyor	Yuka AKAI	Fisheries Engineering Co., Ltd.

1-2. Consultation of Draft Basic Design Report Team

Team Leader	Satoru HAGIWARA	Deputy Director, Paddy Field Based Area Group, Rural Development Department, Japan International Cooperation Agency
Project Planning	Yohei HASHIMOTO	Program Officer, Field Crop Based Farming Area Division I, Rural Development Department Japan International Cooperation Agency
Chief Engineer / Operation and Maintenance Planner / Environment and Social Consideration	Toshiya OGASAWARA	Fisheries Engineering Co., Ltd.
Construction Planner / Facility Planner / Equipment Planner	Yoshiharu MATSUMOTO	Fisheries Engineering Co., Ltd.

2. Study Schedule

2-1. Field Survey

		Government official and JICA	Chief Consultant	Civil Engineer	Architect	Fisheries Researcher	Cost Surveyor
1	28, July Mon.		Narita(12:00)→(9:30)Chicago(13:55)→San Juan(19:40)				
2	29 Tue.	→Dominica Meeting with JICA/JOCV office	(12:35)San Juan→Dominica(14:28)				
3	30 Wed.	Courtesy visit to Ministry of Agriculture, Fisheries and Forestry, Courtesy visit to Ministry of Foreign affairs and and Ministry of Trade, Industry, Consumer and Diaspora affairs, Discussion with Fisheries Division					
4	31 Thu.	Visit to Portsmouth(Project site), Dublanc(one of the target fish landing sites of this project)					
5	1, Aug. Fri.	Discussion with Fisheries Division			Survey on Roseau Fisheries complex	Data collection of Fisheries	
6	2 Sat.	Discussion with Fisheries Division	Discussion with Fisheries Division, Survey on Roseau Fisheries complex, Visit to existing related facilities in Scotts Head				
7	3 Sun.		Visit to existing related facilities in southern part of Dominica				
8	4 Mon.		Data analysis and discussion within the team				
9	5 Tue.	Discussion with Fisheries Division			Facilities Survey on Roseau Fisheries complex	Discussion with Fisheries Division	Cost Survey
		Signing of Minutes of Discussions Report to JICA/JOCV office	Discussion with Fisheries Division, Data collection				
10	6 Wed.	Dominica→ Trinidad and Tobago	Operation and Maintenance survey at Roseau Fisheries Complex	Data collection of Natural Conditions		Data collection of Fisheries	Cost Survey
			Roseau → Portsmouth				
11	7 Thu.	Report to Embassy of Japan, Trinidad and Tobago→NY	Site Survey			Interview Survey(Capuchin, Clifton, Cottage, Toucarie, Bioche)	
12	8 Fri.	NY→	Site Survey			Interview Survey(Dublanc, Colihaut, Coulibistrie)	
13	9 Sat.	Narita	Visit to existing vegitable market, Meeting with Chief fisheries officer, Interview survey for owner of large fishing boats				
14	10 Sun.		Meeting with in the team / Data analysis				
15	11 Mon.		Interview survey for owner of large fishing boats, Natural conditions survey		Site survey	Interview survey for owner of large fishing boats, Water tests, cost survey	
16	12 Tue.		Site survey			Interview Survey (Dublanc, Bioche, Colihaut, Coulibistrie)	
17	13 Wed.		Survey on Marigot Fisheries Complex(Operation and Maintenance survey etc.)			Interview Survey (Portsmouth)	Survey on Marigot Fisheries Complex
18	14 Thu.		Discussion with Fisheries Division at Roseau Meeting with NAFCOOP, St.Peter fisheries Coop.		Site survey	Data collection at Roseau Meeting with NAFCOOP, St.Peter fisheries Coop.	
19	15 Fri.		Discussion with Fisheries Division at Roseau	Supervision of Natural conditions survey (Topographic and Hydrographic survey)		Interview Survey(Portsmouth)	
20	16 Sat.		Stakeholder meeting at Portsmouth				
21	17 Sun.		Meeting with in the team / Data analysis Portsmouth → Roseau				Dominica(15:15)→(15:55)Antigua and Barbuda(18:00)→ Trinidad and Tobago(20:30)
22	18 Mon.		Discussion with Fisheries Division at Roseau				Cost Survey
23	19 Tue.		Operation and Maintenance survey	Data collection	Data collection	Data collection of Fisheries	Trinidad and Tobago(12:55)→ NY(18:05)
24	20 Wed.		Discussion with Fisheries Division			Data collection of Fisheries	NY(10:00)→
25	21 Thu.		Discussion with Fisheries Division			Data collection of Fisheries	Narita(12:55)
26	22 Fri.		Signing of Technical Note Report to JICA/JOCV office	Dominica(9:25)→(11:18)San Juan(13:55)→NY(17:49)	Signing of Technical Note Report to JICA/JOCV office	Dominica(9:25)→(11:18)San Juan(13:55)→NY(17:49)	
27	23 Sat.		Data analysis	NY(10:00)→	Data analysis	NY(10:00)→	
28	24 Sun.		Dominica(15:15)→(15:55)Antigua and Barbuda(18:00)→ Trinidad and Tobago(20:30)	Narita(12:55)	Dominica(15:15)→(15:55)Antigua and Barbuda(18:00)→ Trinidad and Tobago(20:30)	Narita(12:55)	
29	25 Mon.		Report to Embassy of Japan, Trinidad and Tobago(12:55)→NY(18:05)		Report to Embassy of Japan, Trinidad and Tobago(12:55)→NY(18:05)		
30	26 Tue.		NY(10:00)→		NY(10:00)→		
31	27 Wed.		Narita(12:55)		Narita(12:55)		

2-2. Consultation of Draft Basic Design Report

	Date	Schedule
1	10, Dec. Wed.	Narita(11:30)→(10:05)NY
2	11 Thu.	NY(7:00)→(12:55)Trinidad and Tobago(Port of Spain) Courtesy visit to Embassy of Japan
3	12 Fri.	Trinidad and Tobago(6:30)→(9:05)Antigua and Barbuda(10:00)→Dominica(11:20) Meeting with JICA/JOCV office Discussion with Fisheries Division
4	13 Sat.	Discussion with Fisheries Division
5	14 Sun.	Visit to Portsmouth site
6	15 Mon.	Courtesy visit to Ministry of Foreign affairs Courtesy visit to Ministry of Agriculture, Fisheries & Forestry Discussion with Fisheries Division
7	16 Tue.	Discussion with Fisheries Division
8	17 Wed.	Signing of Minutes of Discussions Report to JICA/JOCV office
9	18 Thu.	Dominica(11:50)→(12:40)Antigua and Barbuda(14:43)→NY(18:25)
10	19 Fri.	NY(12:00)→
11	20 Sat.	Narita(16:20)

3. List of Parties Concerned in the Recipient Country

Name	Title
Ministry of Agriculture, Fisheries & Forestry	Minister
	Mr. Mathew Walters
Ministry of Agriculture, Fisheries & Forestry	Permanent Secretary
	Ms. Claudia Bellet
Ministry of Foreign affairs and Ministry of	Ambassador/Permanent Secretary
Trade, Industry, Consumer and Diaspora affairs	Mr. Steve Ferrol
Ministry of Foreign affairs and Ministry of	Foreign Service officer
Trade, Industry, Consumer and Diaspora affairs	Ms. Ezra Flomas
Ministry of Foreign affairs	Political Affairs Director
	Ms. Sonia Maglore Akapa
Ministry of Foreign affairs	Foreign Service Officer
	Mr. Ross Loramal
Fisheries Division,	Chief fisheries officer
Ministry of Agriculture, Fisheries & Forestry	Mr. Andrew Magloire
Fisheries Division	Senior Fisheries officer
	Mr. Harold Guiste
Fisheries Division	Fisheries officer
	Mr. Norman Norris
Fisheries Division	Fisheries Liasion officer
	Mr. Jullan Defoe
Fisheries Division	Fisheries officer
	Mr. Rniere Sebastian
Fisheries Division	Fisheries officer
	Ms. Kerr Serrant
Fisheries Division	Fisheries Liasion officer
	Mr. Derrick Theopuille
Fisheries Division	Field Data Collector in Portsmouth
	Ms. Glenda Thomas
Environmental Coordinating Unit	Meteorological Engineer/Environmental Officer
	Mr. Collin Guiste
Air and Sea Ports Authority	Chief Executive officer
	Mr. Benoit Bardouille
Land and Survey	Mr. Melrose Thomas
	Mr. Ali Cuffy

Name	Title
Dominica Water and Sewage Company	Engineering and Technical Services
（DOWASCO）	Mr. Jolly Larry Leblanc
Ministry of Public works and Infrastructure	Deputy Chief Technical Officer
Development, Technical Services Division	Mr. Vivian M. Trotter
Physical Planning	Chief Physical Planner, Mr. Kehvin Rolle
Physical Planning	Quantity Surveyor, Mr. Evic Shillingford
Marigot Fishery complex	Ms. Caren Thomas
Marigot fisheries Cooperative	President, Mr. John Davis
Roseau Fishery complex	Manager, Mr.Vrughn Casihir
National Association of Fisherfolk Cooperative	President (Board member)
Society Ltd. (NAFCOOP)	Mr. Glenis PoPo
	Secretary (Board member)
	Mr. Baylen Fontaine
	Board member, Mr. Jude Watty
	Board member, Mr. Joseph Sheuwa
	Board member, Mr. Huron Vidal
St. Peter’s Fisheries Cooperative Society Ltd.	Acting President, Mr. Herbert Sabaroche
	Member, Mr. Pascal Hicton
	Member, Mr. Desmond Bertrand
	Member, Ms. Heuita Josph
	Member (Eat Fish Day), Ms. Rosette Bertrand
	Member, Mr. Grayson Shillingford
	Member, Mr. Battiston Lewis
	Treasury, Mr. Huron Vidal

4. Minutes of Discussions

4-1. Field Survey

MINUTES OF DISCUSSION

ON THE BASIC DESIGN STUDY ON

THE PROJECT FOR CONSTRUCTION OF PORTSMOUTH FISHERIES CENTER

IN COMMONWEALTH OF DOMINICA

Based on the result of the Preliminary Study and the Note Verbal dated 4th, December, 2007, the Government of Japan decided to conduct a Basic Design Study on the project for construction of Portsmouth fisheries center (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Commonwealth of Dominica (hereinafter referred to as "Dominica") the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Satoru HAGIWARA, Deputy Director General for Rural Development and Environment Management, Grant Aid and Loan Support Department, JICA, and is scheduled to stay in the country from 29th July, 2008 to 24th August, 2008.

The Team held discussions with the Dominican officials concerned and conducted a field survey at the study area.

In the course of discussions and field survey, both sides confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Roseau, 5th August, 2008

Mr. Satoru HAGIWARA
Team Leader
Basic Design Study Team
Japan International Cooperation Agency

Hon. Mathew Walters
Minister
Ministry of Agriculture, Fisheries and Forestry
Dominica

Mr. Andrew MAGLOIRE
Director
Fisheries Division
Ministry of Agriculture, Fisheries and Forestry
Dominica

ATTACHMENT

1. Objective of the Project

The objective of the Project is to improve fish landing and fish marketing of the artisanal fishermen through construction of the landing jetty and fisheries center in Portsmouth.

2. Project sites

The site of the Project is located in Portsmouth as shown in Annex-1.

3. Responsible and Implementing Agency

3-1.The Responsible Agency is Ministry of Agriculture, Fisheries and Forestry.

3-2.The Implementing Agency is Fisheries Division, Ministry of Agriculture, Fisheries and Forestry.

3-3.The organizational chart of the Agencies is shown in Annex-2.

4. Components of the Project

Dominica side confirmed that components of the proposed Project were based on the Note Verbal dated 4th December, 2007. After discussions with the Team, the items described in Annex-3 were agreed as necessary components and considered as all and final. Dominica side agreed that through further study, the exact numbers, capacities or scales of the requested components will be determined, subject to budget approval.

Both sides agreed that based on the results of the study, JICA would evaluate and finalize the components of the Project, then recommend to the Government of Japan.

5. Japan's Grant Aid Scheme

5-1. Dominica side understood the Japan's Grant Aid Scheme explained by the Team, as described in Annex-4.

5-2. As a condition for the Japan's Grant Aid to be implemented, Dominica side will take the necessary measures as described in Annex-5, for the smooth implementation of the Project.

5-3. The Team will clarify the necessary measures to be taken by Dominica side, in addition to the general measures described in Annex-5.

6. Schedule of the Study

6-1. The consultant members of the Team will conduct further studies in Dominica until 24th August, 2008.

6-2. JICA will prepare the draft final report of the Study in English and dispatch a mission in order to explain its contents around December 2008 at the earliest pending timely receipt of relevant information requested by the Team from Dominica side.

6-3. In case that the contents of the draft final report are accepted in principal by Dominica side, JICA will complete the final report and send it to Dominica around April 2009.

6-4. Dominica side understood that the project implementation stage will proceed as indicated in attached flow-chart in Annex-4.

7. Other Relevant Issues

7-1. Operation and Maintenance

Dominica side explained that the Ministry of Agriculture, Fisheries and Forestry will take full responsibility for operation and maintenance after handing over the Project. Dominica side also explained that it is the intention of the Ministry of Agriculture, Fisheries and Forestry to engage in a partnership arrangement for the operation and maintenance of the facility with the newly founded national association of fishermen co-operative. Dominica side promised to submit to the Team, tentative operation and maintenance plan including budget, personnel arrangement and organizational chart by 23rd August, 2008.

The Team explained that based on the results of the study, the Team will prepare suggestions on operation and maintenance plan. Dominica side agreed to make the best effort to reflect the suggestions from the Team to their plan.

7-2. Construction permission and environmental consideration

Dominica side explained that Environmental Impact Statement had been approved in April, 2008 as shown in Annex-6 and construction permission will be finalized on completion of the Basic Design.

The Team explained the JICA Environmental and Social Consideration Guideline to Dominica side. Dominica side shall take necessary measures to mitigate any adverse effects of this Project on the natural and social environment.

7-3.Land Acquisition

Dominica side committed to secure the land for the Project including space for temporary construction office and stockpile area for materials before the commencement of the construction. Dominica side also committed to submit to the Team an official letter, which clarifies the usable lands allocated for the Project by the end of October, 2008.

7-4. Removal of obstacles at the Project site

Dominica side agreed to remove following items by its own means for the implementation of the Project.

- Existing lockers built by local fishermen
- Existing walls and old building(s) on the Project site
- Wreck(s) on the jetty construction site
- Trees in the project site

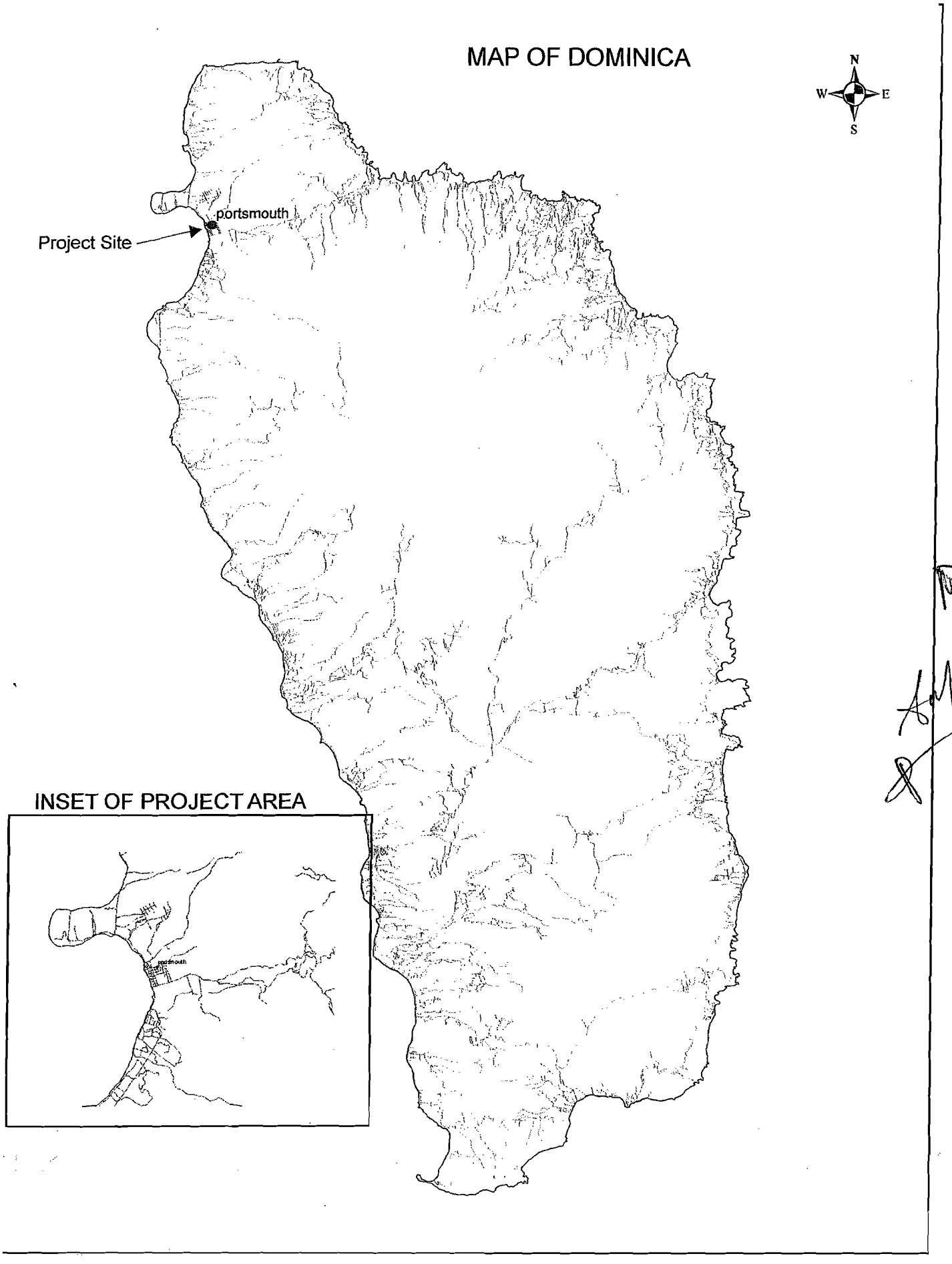
Both sides agreed that Dominica side will show the concrete plan of removal, including schedule and budget allocation to the next mission scheduled to be dispatched to Dominica in December, 2008.

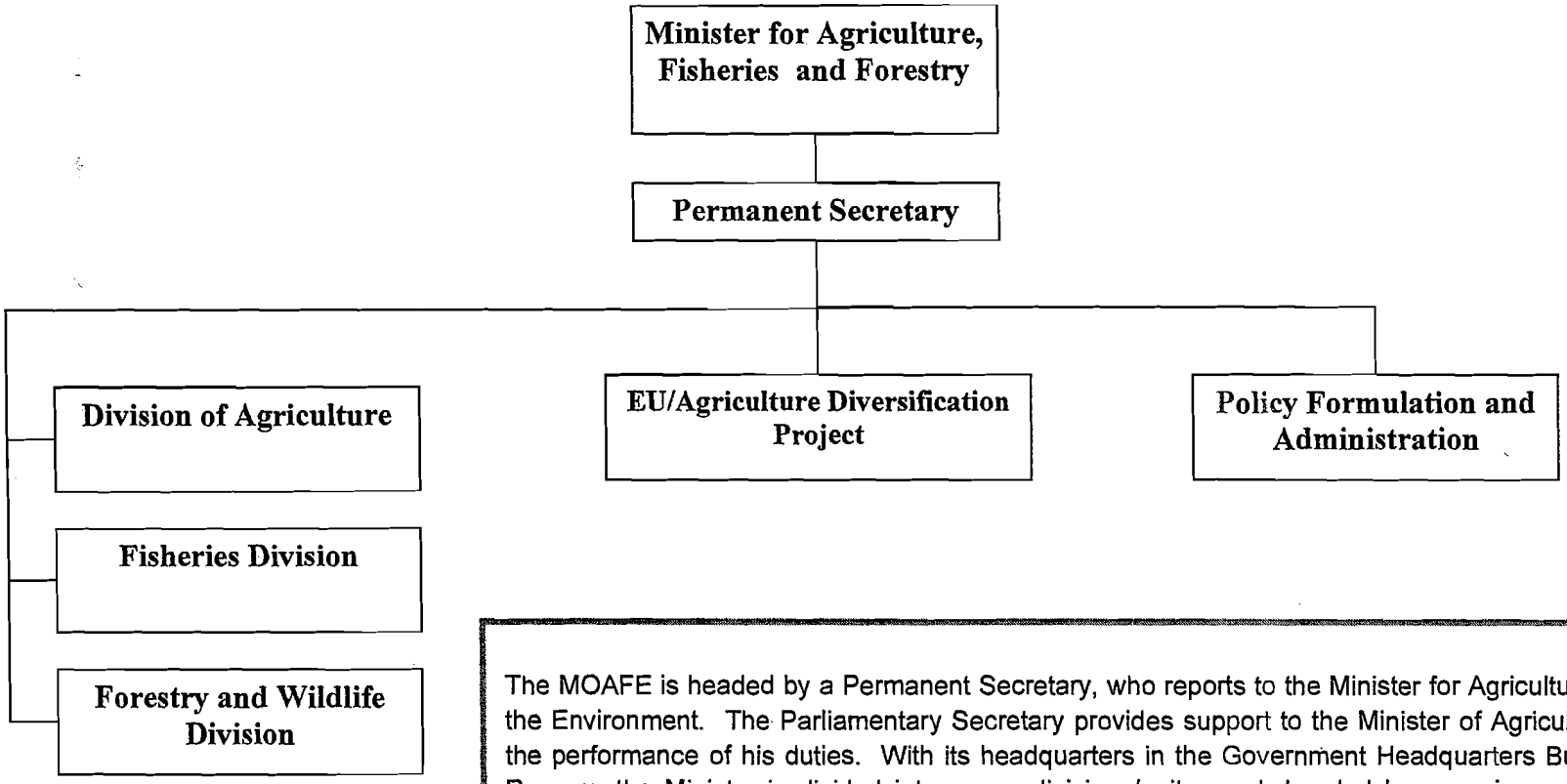
7-5. Security issues

The Team explained that security measures are indispensable for effective study. Dominica side promised to take necessary measures to secure the safety of the members of the Team.

[END]

Annex 1 : Site Map
Annex 2 : Organizational chart of responsible agency and implementing agency
Annex 3 : Final requested components by Dominica side
Annex 4 : Japan's Grant Aid Scheme
Annex 5 : Major Undertakings to be taken by Each Government
Annex-6 : EIS approval letter


MAP OF DOMINICA
N
W
E
S
portsmouth
Project Site
INSET OF PROJECT AREA



The MOAFE is headed by a Permanent Secretary, who reports to the Minister for Agriculture and the Environment. The Parliamentary Secretary provides support to the Minister of Agriculture in the performance of his duties. With its headquarters in the Government Headquarters Building, Roseau, the Ministry is divided into seven divisions/units, each headed by a senior manager. Senior managers are responsible for specific aspects of the Ministry's policy, programming, execution and administrative functions. The following organizational chart depicts the functional structure within the Ministry of Agriculture and the Environment. Divisional/Units' organizational charts can be found in Appendix 4.

Final Requested Components by Dominica Side

No.		Components	Remarks
1	Fishing Port Infrastracture		
		Sea-wall (function of the landing wharf will be considered)	Scale will be determined based on BD study
		Fish landing jetty, which is usable for ships up to 3m, draught (including mooring rings/bits, fenders,pilot lamp, oil and water supply pipes)	Scale will be determined based on BD study
2	On-shore Fishieries Infrastracture		
		Slipway	Scale will be determined based on BD study
		Mechanic shop	
		Repair shed	Scale will be determined based on BD study
		Fuel station	Capacity will be determined based on BD study
3	Exterior works		
		Site premise pavement	
		Lighting fittings	
		Power intake and distribution lines	
		Drainage/sawage system	
4	Main Building		
		Administration office quarter	
		- Rooms for market office, extension office and meeting and training room	Scale will be determined based on BD study
		Ice-making plant	Capacity will be determined based on BD study
		Ice storage	Capacity will be determined based on BD study
		Cold storage	Capacity will be determined based on BD study
		Fish processing room with equipments to meet minimum food handling standards in Dominica (table, cutting saw and power washer)	
		Retailing outlets	Numbers will be determined based on BD study
		Water tank, pumping unit, water supplying-network line	
5	Fishermen's Locker		
		Locker building (2 story-building)	Numbers will be determined based on BD study
6	Equipments		
		Insulated ice boxes	Numbers will be determined based on BD study
		Fish trays	Numbers will be determined based on BD study
		Scales for weighing	Numbers will be determined based on BD study
		Tools for mechanic shop	Contents will be determined based on BD study
		Engine flusing tank	Numbers will be determined based on BD study
		Plastic buoys and concrete anchors	Numbers will be determined based on BD study

Notes) Exact numbers, capacities or scales of the requested components will be determined, subject to budget approval.

ANNEX 4 : JAPAN'S GRANT AID SCHEME

The Grant Aid Program provides a recipient country 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. Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedure

1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA to conduct a study on the request. If necessary, JICA send a Preliminary Study Team to the recipient country to confirm the contents of the request.

Secondly, JICA conducts the study (Basic Design Study), using Japanese consulting firms.

Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Programme, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.

Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.

Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

1) Contents of the Study

The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by

JICA on a requested project (hereinafter referred to as "the Project"), is to provide a basic document necessary for the appraisal of the Project by the Government of Japan. The contents of the Study are as follows:

a) confirmation of the background, objectives and benefits of the Project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation;
b) evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from the technical, social and economic points of view;
c) confirmation of items agreed on by both parties concerning the basic concept of the Project;
d) preparation of a basic design of the Project; and
e) estimation of costs of the Project.

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.

The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even through 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 the smooth implementation of the Study, JICA uses a consulting firm selected through its own procedure (competitive proposal). The selected firm participates the Study and prepares a report based upon the terms of reference set by JICA.

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

3. Japan's Grant Aid Scheme

1) Exchange of Notes (E/N)

Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

2) "The period of the Grant" means the one fiscal year which the Cabinet approves the project for. Within the fiscal year, all procedure such as exchanging of the Notes, concluding contracts with consulting firms and contractors and final payment to them must be completed.
However, in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

3) Under the Grant, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.

When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.

However, the prime contractors, namely consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

4) Necessity of "Verification"
The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability of Japanese taxpayers.

5) Undertakings required to the Government of the recipient country

a) to secure a lot of land necessary for the construction of the Project and to clear the site;

b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities outside the site;

c) to ensure prompt unloading and customs clearance at ports of disembarkation in the recipient country and internal transportation therein of the products purchased under the Grant Aid;

d) to exempt Japanese nationals from customs duties, internal taxes and fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contracts;

e) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the verified contracts such as facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work;

f) to ensure that the facilities constructed and products purchased under the Grant Aid be maintained and used properly and effectively for the Project; and

g) to bear all the expenses, other than those covered by the Grant Aid, necessary for the Project.

6) "Proper Use"

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

7) "Re-export"

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

8) Banking Arrangement (B/A)

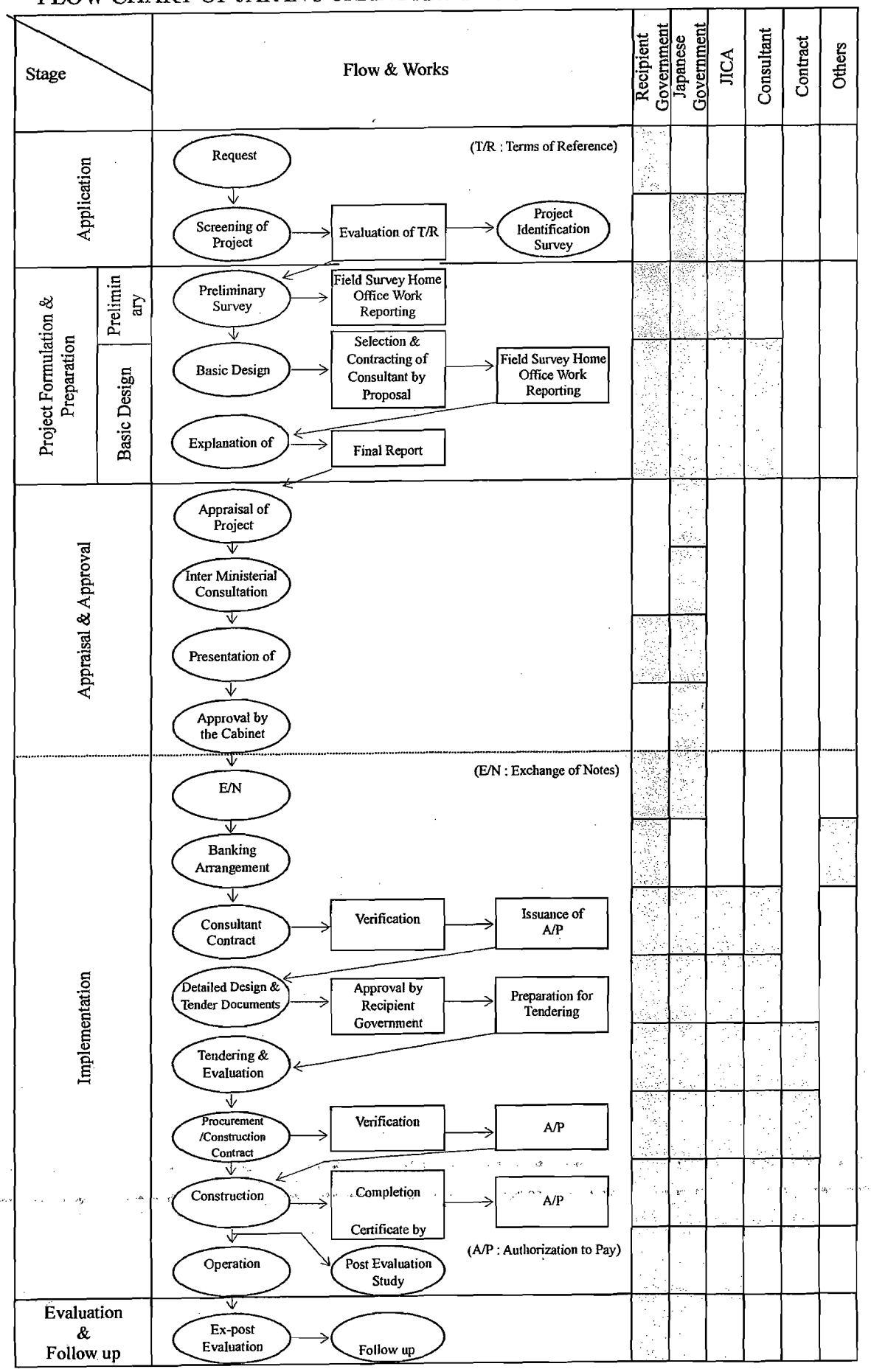
a) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments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

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

9) Authorization to Pay (A/P)

The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commission to the Bank.

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



Annex-5 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		●	
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/or 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 following commissions to a bank of Japan for the banking services based upon the B/A		
1) Advising commission of A/P			●
2) Payment commission			●
9	To ensure prompt unloading and customs clearance at the port of disembarkation in recipient country		
1) Marine(Air) transportation of the products from Japan to the recipient country		●	
2) Tax exemption and customs clearance of the products at the port of disembarkation			●
3) Internal transportation from the port of disembarkation to the project site		(●)	(●)

10	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		•
11	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the supply of the products and services under the verified contract		•
12	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant Aid		•
13	To bear all the expenses, other than those to be borne by the Grant Aid, necessary for construction of the facilities as well as for the transportation and installation of the equipment		•

Annex – 6

THE DEVELOPMENT AND PLANNING CORPORATION

THE DEVELOPMENT AND PLANNING CORPORATION ACT, CHAP 84:01

C/o Ministry of Housing, Lands, Telecoms, Energy & Ports
Physical Planning Division
3 Charles Ave., Roseau
Commonwealth of DOMINICA

Tel: (767) 448-2401 Ext 3451/2/3/4
Fax: (767) 448-4807

July 16th, 2008

Mr. Andrew Magloire
Fisheries
Ministry of Agriculture, Fisheries and Forestry
ME Charles Bolivard
Bayfront
Roseau
DOMINICA

Dear Sir

NOTICE OF APPROVAL – ENVIRONMENTAL IMPACT STATEMENT

I am directed to refer to your Environmental Impact Assessment submitted for Planning Approval on 25th April, 2008, for the construction of the Portsmouth Fisheries Center.

Please note that your E.I.A was taken up at a meeting of the Development and Planning Corporation held on 12th June, 2008 and was approved in principle. The following information is required for final planning permission.

1. Detailed architectural drawings for all structures.
2. Detailed site plan to include existing and proposed elevations, utility services of water, electricity and sewage disposal, drainage plan, parking layout access, and details of jetty.

3. **All drawings are to be signed by a registered local Engineer.**

wo (2) copies of are enclosed.

ours faithfully,

ECRETARY-MANAGER (Ag.)
EVELOPMENT & PLANNING CORPORATION

4-2. Consultation of Draft Basic Design Report

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY ON
THE PROJECT FOR CONSTRUCTION OF PORTSMOUTH FISHERIES CENTER
IN COMMONWEALTH OF DOMINICA
(EXPLANATION ON DRAFT REPORT)

In July 2008, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Construction of Portsmouth Fisheries Center (hereinafter referred to as "the Project") to the Commonwealth of Dominica (hereinafter referred to as "Dominica"), and through discussion, field survey, and technical examination in Japan, JICA prepared a draft report of the study.

In order to explain and to discuss with officials concerned of the Government of Dominica on the components of the draft report, JICA sent to Dominica the Draft Report Explanation Team (hereinafter referred to as "the Team"), headed by Mr. Satoru HAGIWARA, Deputy Director General, Rural Development Department, JICA, and was scheduled to stay in the country from 12th to 18th December, 2008.

As a result of discussion, both parties confirmed the items described on the attached sheets.

Roseau, 17th December, 2008

Mr. Satoru HAGIWARA
Team Leader
Basic Design Study Team
Japan International Cooperation Agency

Hon. Mathew Walters
Minister
Ministry of Agriculture, Fisheries and Forestry
Dominica

Mr. Andrew MAGLOIRE
Director
Fisheries Division
Ministry of Agriculture, Fisheries and Forestry
Dominica

ATTACHMENT

1. Components of the Draft Report

The Dominica side agreed and accepted in principle the components of the draft report explained by the Team.

2. Japan's Grant Aid scheme

The Team reconfirmed the Japan's Grant Aid Scheme and the necessary measures to be taken by the Dominica side as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on 5th August, 2008. The Team also explained that, since October, 2008, the role of JICA had been changed to include direct responsibility for implementation of the Project until completion of the construction and it is therefore necessary to have Grant Agreement (G/A) signed by JICA and Ministry of Agriculture, Fisheries and Forestry, Dominica at the same time of Exchange of Notes (E/N).

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to Dominica side in April, 2009.

4. Confidentiality of the Project Cost Estimation

The Team explained the cost estimation of the Project as described in Annex-1. Both sides agreed that the Project Cost Estimation should never be duplicated or released to any outside parties before signing of all the contract(s) for the Project. Dominica side understood that the Project Cost Estimation described in Annex-1 is a provisional one as a result of the Study and could be subject to change according to further examination by the Government of Japan.

5. Other Relevant Issues

5-1. Removal of obstacles at the Project site

Dominica side agreed to clear the sites and remove following items by its own expenses by the

end of September, 2009 and inform immediately the completion of removal to Japanese side.

This will include the removal of:

- Existing lockers built by local fisherman
- Existing walls and old building(s) on the Project site
- Trees in the Project site
- Wreck on the jetty construction site
- Wreck in front of existing boat yard site

5-2. Land Acquisition

Dominica side has already completed all the procedures to acquire the land for the Project including space for temporary construction office and stockpile area for materials as attached Annex-2.

5-3. Construction permission and environmental consideration

Both sides confirmed that Environmental Impact Statement had been approved in April, 2008, and Dominica side expressed that preliminary construction permission will be issued by the end of February, 2009 based on the Draft Report and final permission will be issued based on the result of Detail Design.

5-4. Damages by Hurricane Omar in October, 2008

Dominica side explained that the budget for repairing damaged boats and procurement of new boats to replace those lost by Hurricane Omar was already secured and procurement order to boat builder was completed. Therefore, the number of boats which will use the planned facility would surely increase within next year.

5-5. Additional locker room

The Team explained that although additional land requested for the placement of locker room was provided by Dominica side, those could not be considered for implementation due to budget constraint.

The Team explained that items described in article 5-1 to 5-3 will be preconditions for the implementation of the Project. Noncompletion of those procedures by required time deadline may cause a delay of the commencement of the Project.

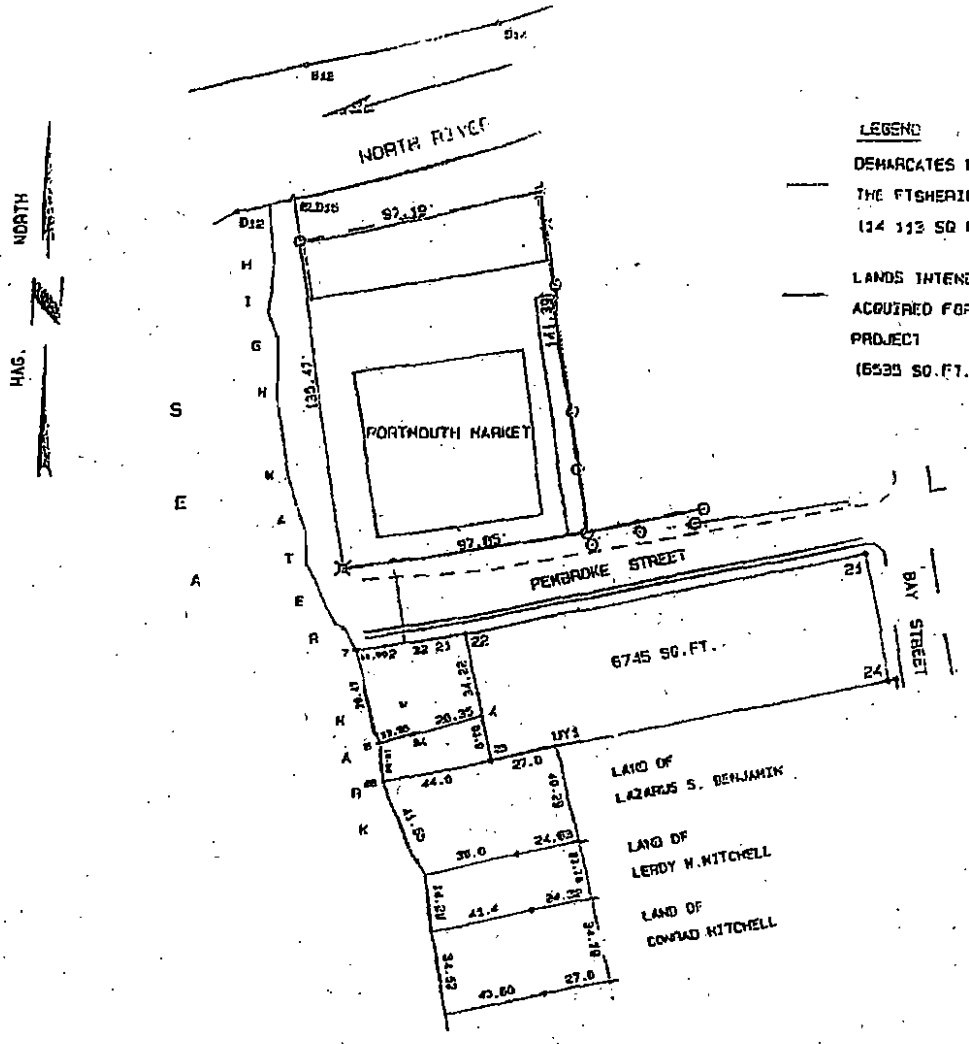
Annex -1 Project Cost Estimation

Annex -2 Site Ownership Document

ANNEX - 2

DISPLAY PLAN SHOWING LANDS ALLOCATED FOR THE PROPOSED PORTSMOUTH FISHERIES COMPLEX PROJECT SITUATE IN PORTSMOUTH, IN THE PARISH OF ST. JOHN

COMMONWEALTH OF DOMINICA



SCALE: 1 INCH TO 60 FEET

PREPARED BY:
LANDS AND SURVEYS DIVISION

5. Other Relevant Data

5-1. Results of Natural conditions survey

5-1-1. Results of Boring Survey

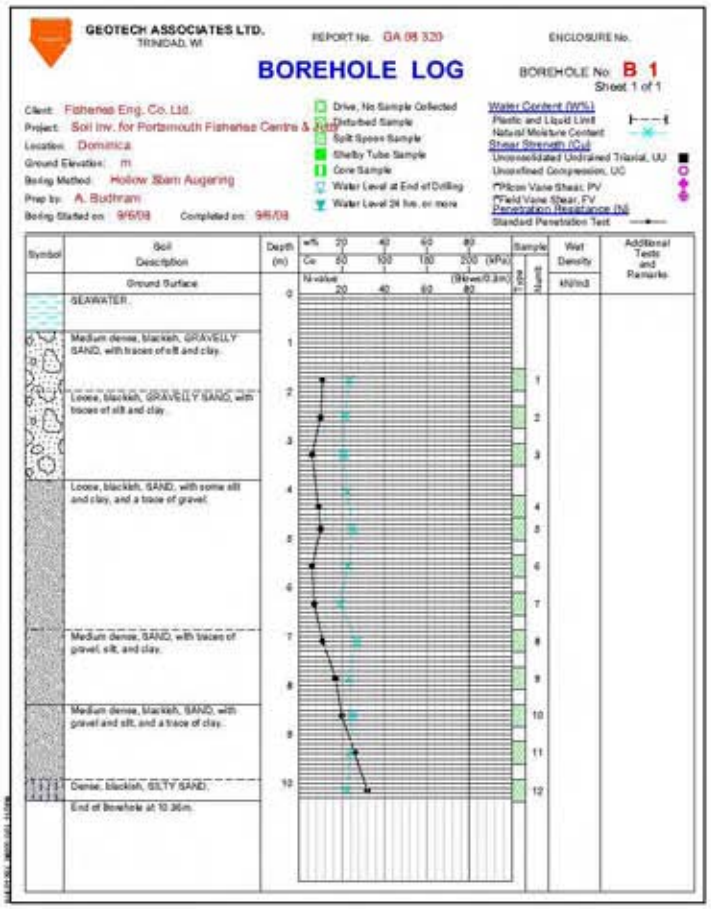
5-1-2. Results of Topographic and Bathymetric Survey

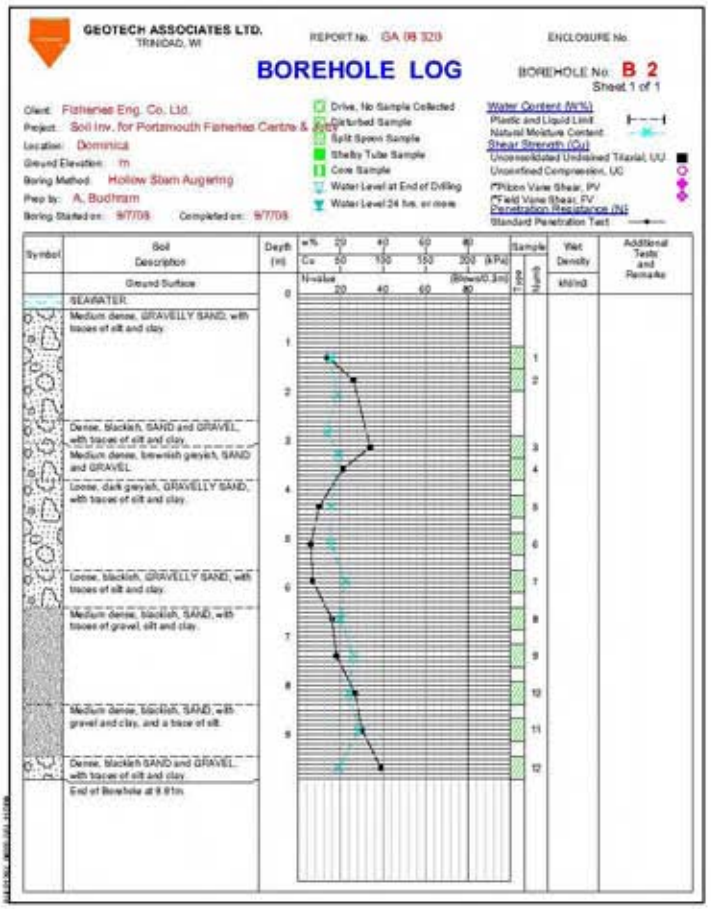
5-1-3. Calculation of Design Wave and Sea Wall Crown Height

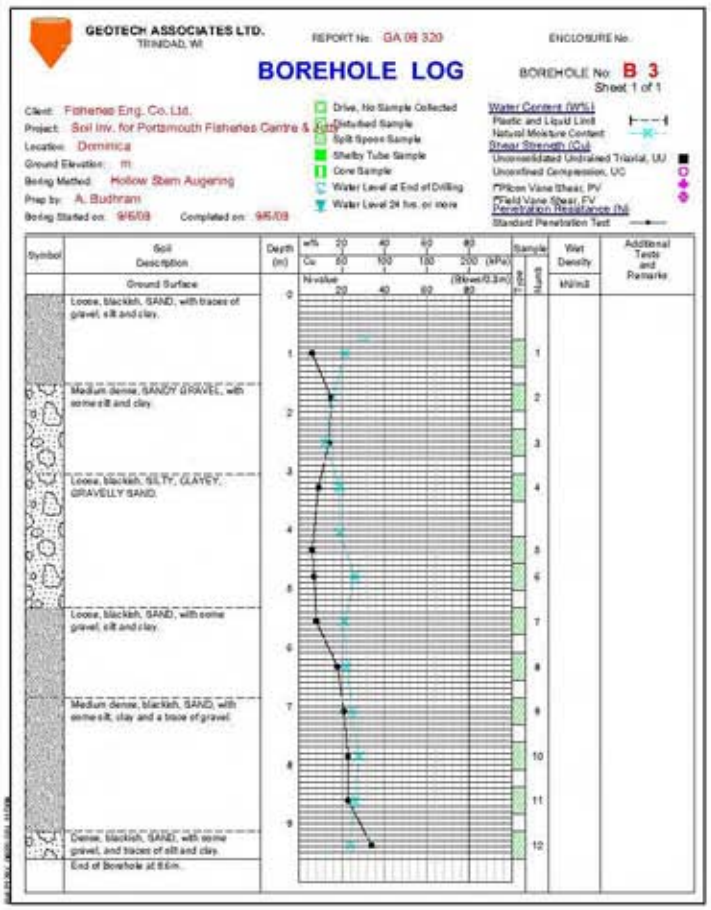
5-1-4. Results of Water tests

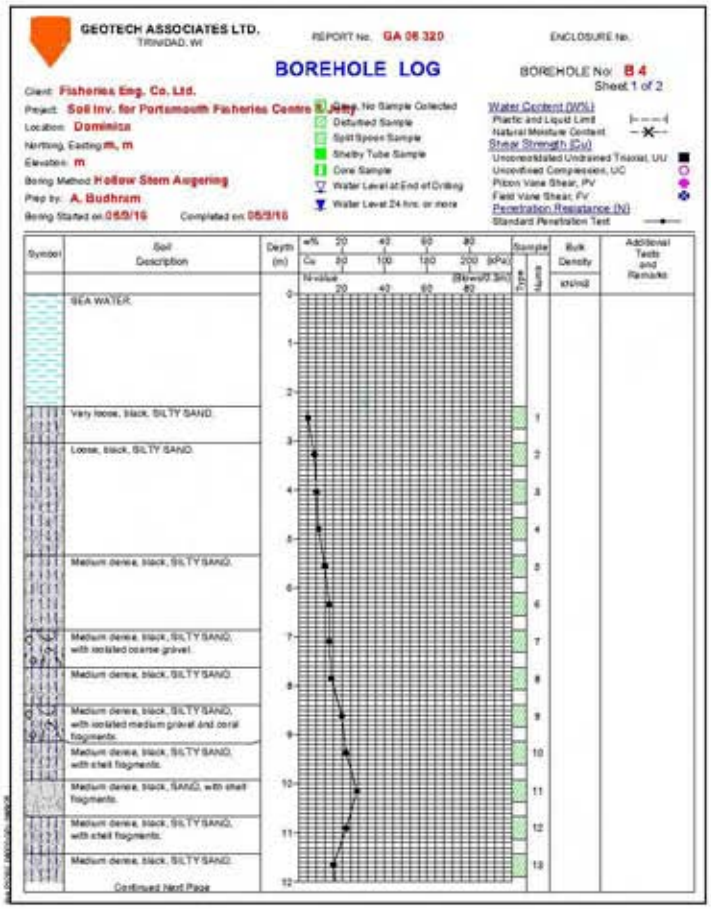
5-1-5. Overview of 5 rivers flowing into Prince Rupert Bay

5-1-1. Results of Boring Survey


GEOTECH ASSOCIATES LTD.
TRINIDAD, WI
REPORT No. GA 08 320
ENCLOSURE No.
BOREHOLE LOG
BOREHOLE No. B 1
Sheet 1 of 1
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Ground Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 9/5/08
Completed on: 9/6/08
Drive, No Sample Collected
Disturbed Sample
Split Spoon Sample
Shelby Tube Sample
Core Sample
Water Level at End of Drilling
Water Level 24 hrs. or more
Water Content (W%)
Plastic and Liquid Limit
Natural Moisture Content
Shear Strength (Cu)
Unconsolidated Undrained Triaxial, UU
Unconfined Compression, UC
Pilcon Vane Shear, PV
Field Vane Shear, FV
Penetration Resistance (N)
Standard Penetration Test
Symbol
Soil Description
Depth (m)
Sample
Wet Density
Additional Tests and Remarks
Ground Surface
SEAWATER.
Medium dense, blackish, GRAVELLY SAND, with traces of silt and clay.
Loose, blackish, GRAVELLY SAND, with traces of silt and clay.
Loose, blackish, SAND, with some silt and clay, and a trace of gravel.
Medium dense, SAND, with traces of gravel, silt, and clay.
Medium dense, blackish, SAND, with gravel and silt, and a trace of clay.
Dense, blackish, SILTY SAND.
End of Borehole at 10.36m.


GEOTECH ASSOCIATES LTD.
TRINIDAD, WI
REPORT No. GA 08 320
ENCLOSURE No.
BOREHOLE LOG
BOREHOLE No. B 2
Sheet 1 of 1
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Ground Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 9/7/08
Completed on: 9/7/08
Symbol
Soil Description
Depth (m)
Sample
Wet Density
Additional Tests and Remarks
Ground Surface
SEAWATER.
Medium dense, GRAVELLY SAND, with traces of silt and clay.
Dense, blackish, SAND and GRAVEL, with traces of silt and clay.
Medium dense, brownish greyish, SAND and GRAVEL.
Loose, dark greyish, GRAVELLY SAND, with traces of silt and clay.
Loose, blackish, GRAVELLY SAND, with traces of silt and clay.
Medium dense, blackish, SAND, with traces of gravel, silt and clay.
Medium dense, blackish, SAND, with gravel and clay, and a trace of silt.
Dense, blackish SAND and GRAVEL, with traces of silt and clay.
End of Borehole at 9.91m.


GEOTECH ASSOCIATES LTD.
TRINIDAD, WI
REPORT No. GA 08 320
ENCLOSURE No.
BOREHOLE LOG
BOREHOLE No. B 3
Sheet 1 of 1
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Ground Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 9/6/08
Completed on: 9/6/08
Symbol
Soil Description
Depth (m)
Sample
Wet Density
Additional Tests and Remarks
Ground Surface
Loose, blackish, SAND, with traces of gravel, silt and clay.
Medium dense, SANDY GRAVEL, with some silt and clay.
Loose, blackish, SILTY, CLAYEY, GRAVELLY SAND.
Loose, blackish, SAND, with some gravel, silt and clay.
Medium dense, blackish, SAND, with some silt, clay and a trace of gravel.
Dense, blackish, SAND, with some gravel, and traces of silt and clay.
End of Borehole at 8.6m.



GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. GA 06 320

ENCLOSURE No.

BOREHOLE LOG

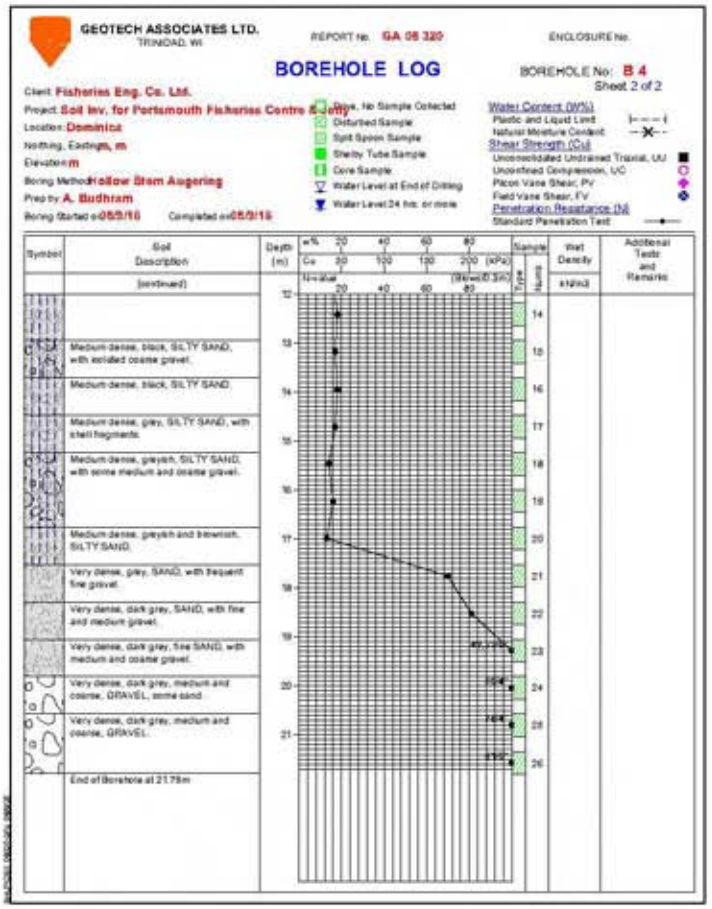
BOREHOLE No: B 4
Sheet 1 of 2

Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Northing, Easting: m, m
Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 05/3/15 Completed on: 05/3/15

Core, No Sample Collected
Disturbed Sample
Split Spoon Sample
Shelby Tube Sample
Core Sample
Water Level at End of Drilling
Water Level 24 hrs. or more

Water Content (W%)
Plastic and Liquid Limit
Natural Moisture Content
Shear Strength (Cu)
Unconsolidated Undrained Triaxial, UU
Unconfined Compression, UC
Pilcon Vane Shear, PV
Field Vane Shear, FV
Penetration Resistance (N)
Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% / Cu (kPa) / N-value (Blows/0.3m)	Sample Type	Sample Number	Bulk Density kN/m3	Additional Tests and Remarks
	SEA WATER.	0					
	Very loose, black, SILTY SAND.	1					
	Loose, black, SILTY SAND.	2					
	Medium dense, black, SILTY SAND.	3					
	Medium dense, black, SILTY SAND, with isolated coarse gravel.	4					
	Medium dense, black, SILTY SAND.	5					
	Medium dense, black, SILTY SAND, with isolated medium gravel and coral fragments.	6					
	Medium dense, black, SILTY SAND, with shell fragments.	7					
	Medium dense, black, SAND, with shell fragments.	8					
	Medium dense, black, SILTY SAND, with shell fragments.	9					
	Medium dense, black, SILTY SAND.	10					
	Continued Next Page	11					
		12					



GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. GA 06 320

ENCLOSURE No.

BOREHOLE LOG

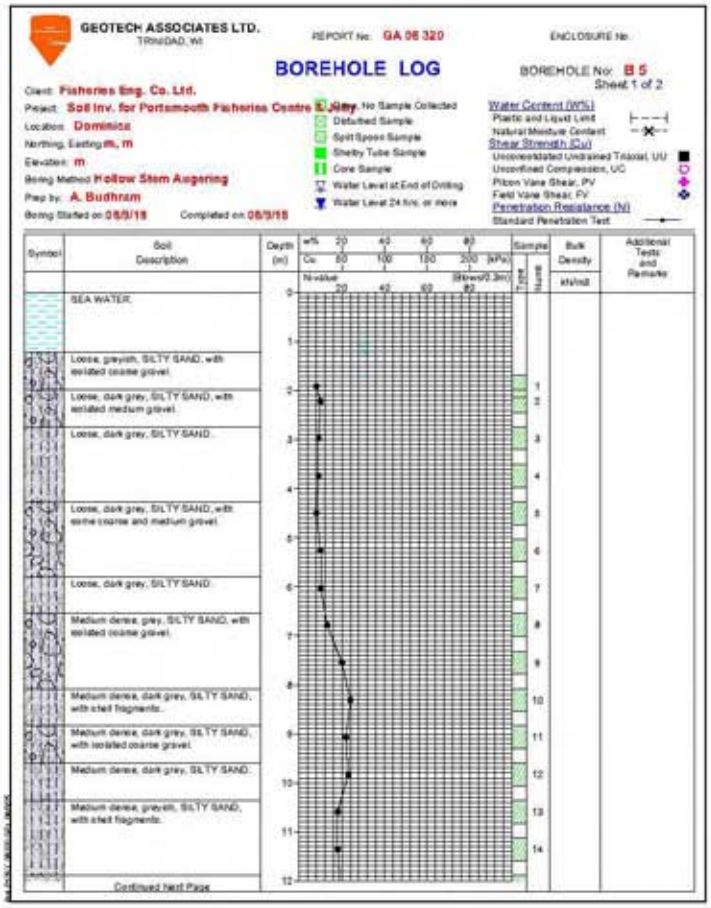
BOREHOLE No: B 4
Sheet 2 of 2

Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Northing, Easting: m, m
Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 05/3/15 Completed on: 05/3/15

Core, No Sample Collected
Disturbed Sample
Split Spoon Sample
Shelby Tube Sample
Core Sample
Water Level at End of Drilling
Water Level 24 hrs. or more

Water Content (W%)
Plastic and Liquid Limit
Natural Moisture Content
Shear Strength (Cu)
Unconsolidated Undrained Triaxial, UU
Unconfined Compression, UC
Pilcon Vane Shear, PV
Field Vane Shear, FV
Penetration Resistance (N)
Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% / Cu (kPa) / N-value (Blows/0.3m)	Sample Type	Sample Number	Wet Density kN/m3	Additional Tests and Remarks
	[continued]	12					
	Medium dense, black, SILTY SAND, with isolated coarse gravel.	13					
	Medium dense, black, SILTY SAND.	14					
	Medium dense, grey, SILTY SAND, with shell fragments.	15					
	Medium dense, greyish, SILTY SAND, with some medium and coarse gravel.	16					
	Medium dense, greyish and brownish, SILTY SAND.	17					
	Very dense, grey, SAND, with frequent fine gravel.	18					
	Very dense, dark grey, SAND, with fine and medium gravel.	19					
	Very dense, dark grey, fine SAND, with medium and coarse gravel.	20					
	Very dense, dark grey, medium and coarse, GRAVEL, some sand.	21					
	Very dense, dark grey, medium and coarse, GRAVEL.						
	End of Borehole at 21.79m						



GEOTECH ASSOCIATES LTD.
TRINIDAD, WI

REPORT No. GA 06 320

ENCLOSURE No.

BOREHOLE LOG

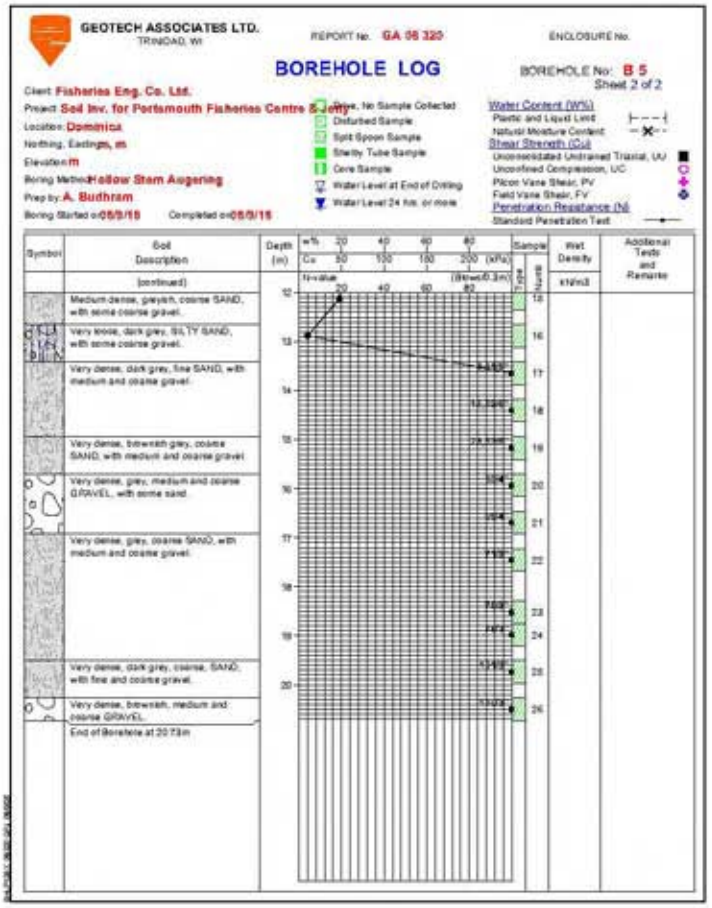
BOREHOLE No: B 5
Sheet 1 of 2

Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Northing, Easting: m, m
Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 05/3/15 Completed on: 05/3/15

Core, No Sample Collected
Disturbed Sample
Split Spoon Sample
Shelby Tube Sample
Core Sample
Water Level at End of Drilling
Water Level 24 hrs. or more

Water Content (W%)
Plastic and Liquid Limit
Natural Moisture Content
Shear Strength (Cu)
Unconsolidated Undrained Triaxial, UU
Unconfined Compression, UC
Pilcon Vane Shear, PV
Field Vane Shear, FV
Penetration Resistance (N)
Standard Penetration Test

Symbol	Soil Description	Depth (m)	w% / Cu (kPa) / N-value (Blows/0.3m)	Sample Type	Sample Number	Bulk Density kN/m3	Additional Tests and Remarks
	SEA WATER.	0					
	Loose, greyish, SILTY SAND, with isolated coarse gravel.	1					
	Loose, dark grey, SILTY SAND, with isolated medium gravel.	2					
	Loose, dark grey, SILTY SAND.	3					
	Loose, dark grey, SILTY SAND, with some coarse and medium gravel.	4					
	Loose, dark grey, SILTY SAND.	5					
	Medium dense, grey, SILTY SAND, with isolated coarse gravel.	6					
	Medium dense, dark grey, SILTY SAND, with shell fragments.	7					
	Medium dense, dark grey, SILTY SAND, with isolated coarse gravel.	8					
	Medium dense, dark grey, SILTY SAND.	9					
	Medium dense, greyish, SILTY SAND, with shell fragments.	10					
	Continued Next Page	11					
		12					



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TRINIDAD, WI

REPORT No. GA 06 320

ENCLOSURE No.

BOREHOLE LOG

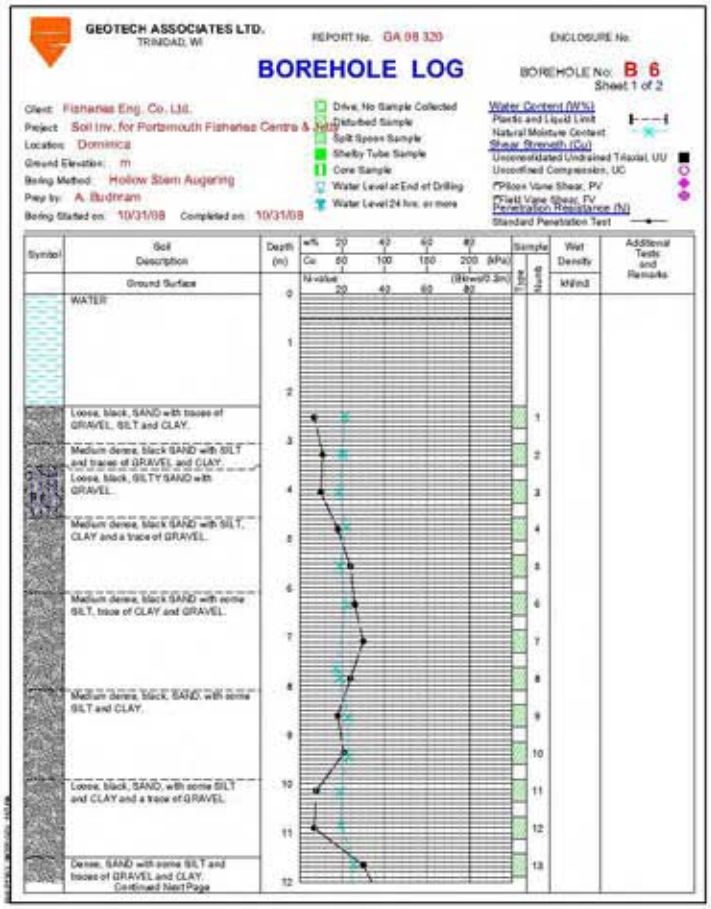
BOREHOLE No: B 5
Sheet 2 of 2

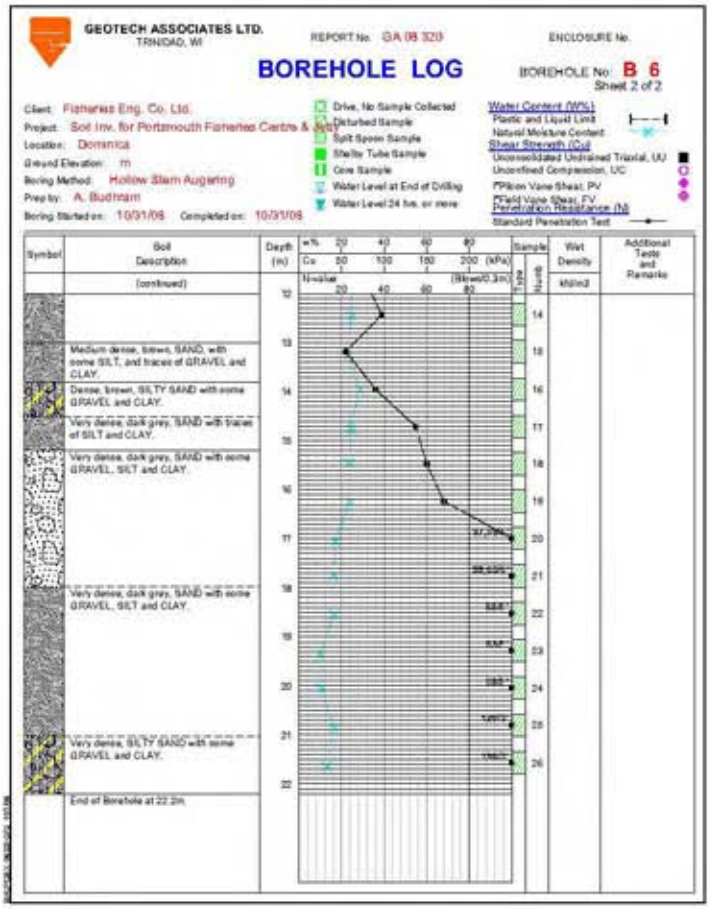
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Northing, Easting: m, m
Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 05/3/15 Completed on: 05/3/15

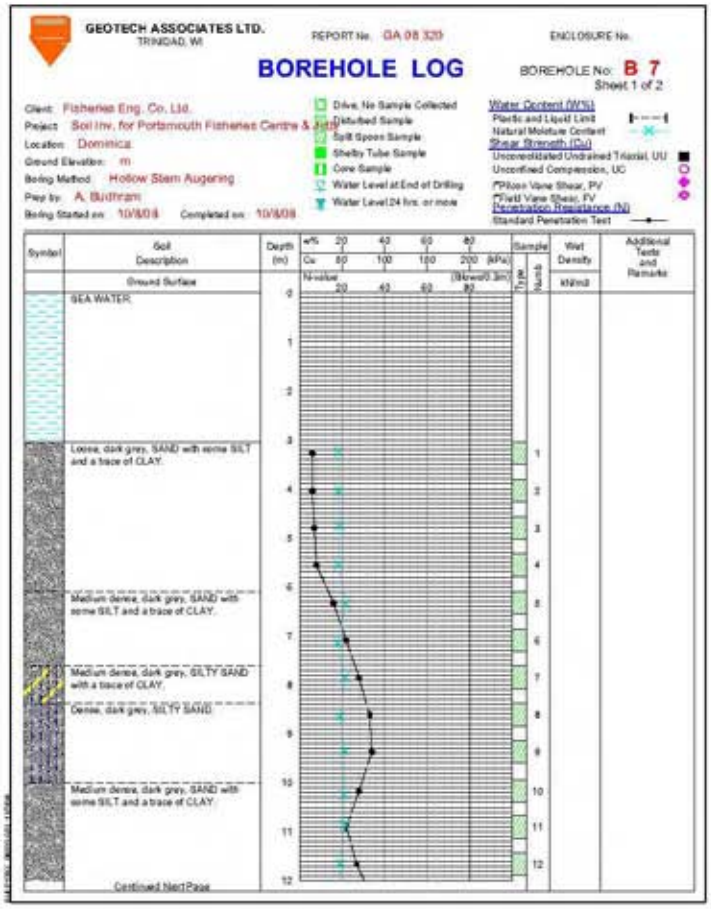
Core, No Sample Collected
Disturbed Sample
Split Spoon Sample
Shelby Tube Sample
Core Sample
Water Level at End of Drilling
Water Level 24 hrs. or more

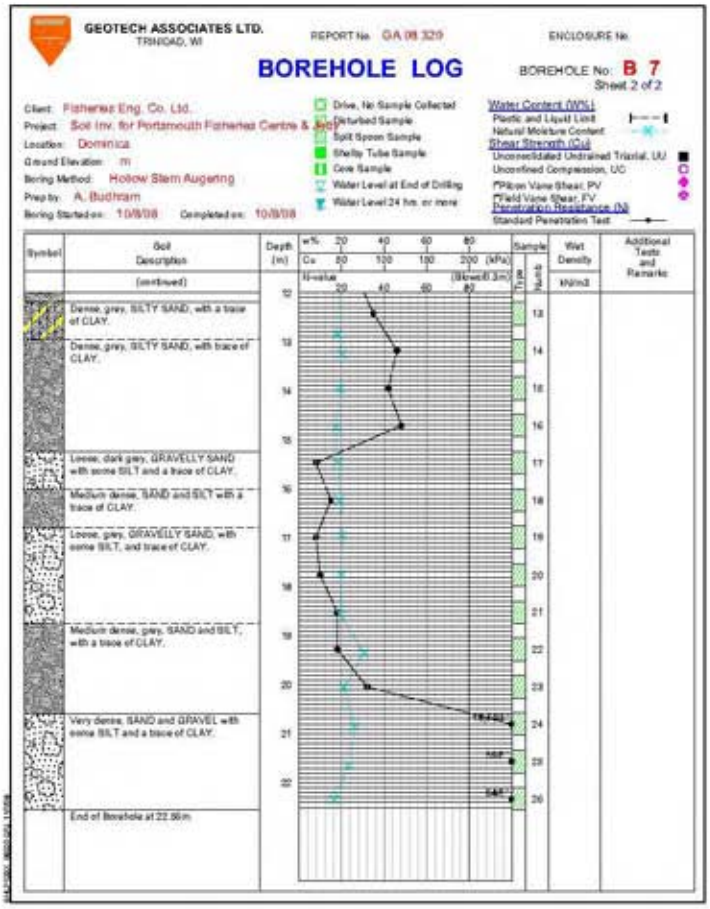
Water Content (W%)
Plastic and Liquid Limit
Natural Moisture Content
Shear Strength (Cu)
Unconsolidated Undrained Triaxial, UU
Unconfined Compression, UC
Pilcon Vane Shear, PV
Field Vane Shear, FV
Penetration Resistance (N)
Standard Penetration Test

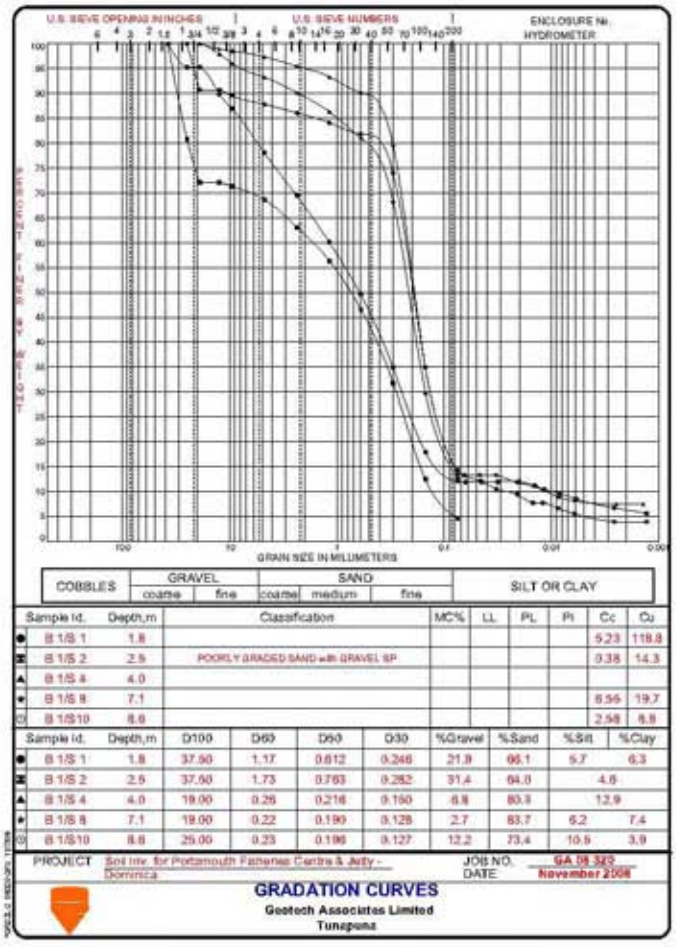
Symbol	Soil Description	Depth (m)	w% / Cu (kPa) / N-value (Blows/0.3m)	Sample Type	Sample Number	Wet Density kN/m3	Additional Tests and Remarks
	[continued]	12					
	Medium dense, greyish, coarse SAND, with some coarse gravel.	13					
	Very loose, dark grey, SILTY SAND, with some coarse gravel.	14					
	Very dense, dark grey, fine SAND, with medium and coarse gravel.	15					
	Very dense, brownish grey, coarse SAND, with medium and coarse gravel.	16					
	Very dense, grey, medium and coarse GRAVEL, with some sand.	17					
	Very dense, grey, coarse SAND, with medium and coarse gravel.	18					
	Very dense, dark grey, coarse, SAND, with fine and coarse gravel.	19					
	Very dense, brownish, medium and coarse GRAVEL.	20					
	End of Borehole at 20.73m						


GEOTECH ASSOCIATES LTD.
TRINIDAD, WI
REPORT No. GA 08 320
ENCLOSURE No.
BOREHOLE LOG
BOREHOLE No: B 6
Sheet 1 of 2
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Ground Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 10/31/08 Completed on: 10/31/08
Drive, No Sample Collected
Disturbed Sample
Split Spoon Sample
Shelby Tube Sample
Core Sample
Water Level at End of Drilling
Water Level 24 hrs. or more
Water Content (W%)
Plastic and Liquid Limit
Natural Moisture Content
Shear Strength (Cu)
Unconsolidated Undrained Triaxial, UU
Unconfined Compression, UC
Pilcon Vane Shear, PV
Field Vane Shear, FV
Penetration Resistance (N)
Standard Penetration Test
Symbol
Soil Description
Depth (m)
Sample
Wet Density
Additional Tests and Remarks
Ground Surface
WATER
Loose, black, SAND with traces of GRAVEL, SILT and CLAY.
Medium dense, black SAND with SILT and traces of GRAVEL and CLAY.
Loose, black, SILTY SAND with GRAVEL.
Medium dense, black SAND with SILT, CLAY and a trace of GRAVEL.
Medium dense, black SAND with some SILT, trace of CLAY and GRAVEL.
Medium dense, black, SAND, with some SILT and CLAY.
Loose, black, SAND, with some SILT and CLAY and a trace of GRAVEL.
Dense, SAND with some SILT and traces of GRAVEL and CLAY.
Continued Next Page


GEOTECH ASSOCIATES LTD.
TRINIDAD, WI
REPORT No. GA 08 320
ENCLOSURE No.
BOREHOLE LOG
BOREHOLE No: B 6
Sheet 2 of 2
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Ground Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 10/31/08 Completed on: 10/31/08
Symbol
Soil Description
Depth (m)
Sample
Wet Density
Additional Tests and Remarks
(continued)
Medium dense, brown, SAND, with some SILT, and traces of GRAVEL and CLAY.
Dense, brown, SILTY SAND with some GRAVEL and CLAY.
Very dense, dark grey, SAND with traces of SILT and CLAY.
Very dense, dark grey, SAND with some GRAVEL, SILT and CLAY.
Very dense, dark grey, SAND with some GRAVEL, SILT and CLAY.
Very dense, SILTY SAND with some GRAVEL and CLAY.
End of Borehole at 22.2m.


GEOTECH ASSOCIATES LTD.
TRINIDAD, WI
REPORT No. GA 08 320
ENCLOSURE No.
BOREHOLE LOG
BOREHOLE No: B 7
Sheet 1 of 2
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Ground Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 10/8/08 Completed on: 10/8/08
Symbol
Soil Description
Depth (m)
Sample
Wet Density
Additional Tests and Remarks
Ground Surface
SEA WATER
Loose, dark grey, SAND with some SILT and a trace of CLAY.
Medium dense, dark grey, SAND with some SILT and a trace of CLAY.
Medium dense, dark grey, SILTY SAND with a trace of CLAY.
Dense, dark grey, SILTY SAND
Medium dense, dark grey, SAND with some SILT and a trace of CLAY.
Continued Next Page


GEOTECH ASSOCIATES LTD.
TRINIDAD, WI
REPORT No. GA 08 320
ENCLOSURE No.
BOREHOLE LOG
BOREHOLE No: B 7
Sheet 2 of 2
Client: Fisheries Eng. Co. Ltd.
Project: Soil Inv. for Portsmouth Fisheries Centre & Jetty
Location: Dominica
Ground Elevation: m
Boring Method: Hollow Stem Augering
Prep by: A. Budhram
Boring Started on: 10/8/08 Completed on: 10/8/08
Symbol
Soil Description
Depth (m)
Sample
Wet Density
Additional Tests and Remarks
(continued)
Dense, grey, SILTY SAND, with a trace of CLAY.
Dense, grey, SILTY SAND, with trace of CLAY.
Loose, dark grey, GRAVELLY SAND with some SILT and a trace of CLAY.
Medium dense, SAND and SILT with a trace of CLAY.
Loose, grey, GRAVELLY SAND, with some SILT, and trace of CLAY.
Medium dense, grey, SAND and SILT, with a trace of CLAY.
Very dense, SAND and GRAVEL with some SILT and a trace of CLAY.
End of Borehole at 22.86m



Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 1/S 1	1.8						5.23	118.8
B 1/S 2	2.5	POORLY GRADED SAND with GRAVEL SP					0.38	14.3
B 1/S 4	4.0							
B 1/S 8	7.1						6.56	19.7
B 1/S10	8.8						2.58	8.8

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 1/S 1	1.8	37.50	1.17	0.812	0.246	21.9	69.1	9.7	6.3
B 1/S 2	2.5	37.50	1.73	0.763	0.282	31.4	64.0	4.6	
B 1/S 4	4.0	19.00	0.26	0.216	0.150	6.8	80.3	12.9	
B 1/S 8	7.1	19.00	0.22	0.190	0.128	2.7	83.7	6.2	7.4
B 1/S10	8.8	25.00	0.23	0.196	0.127	12.2	73.4	10.5	3.9

PROJECT Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO. GA 08 320
DATE November 2008

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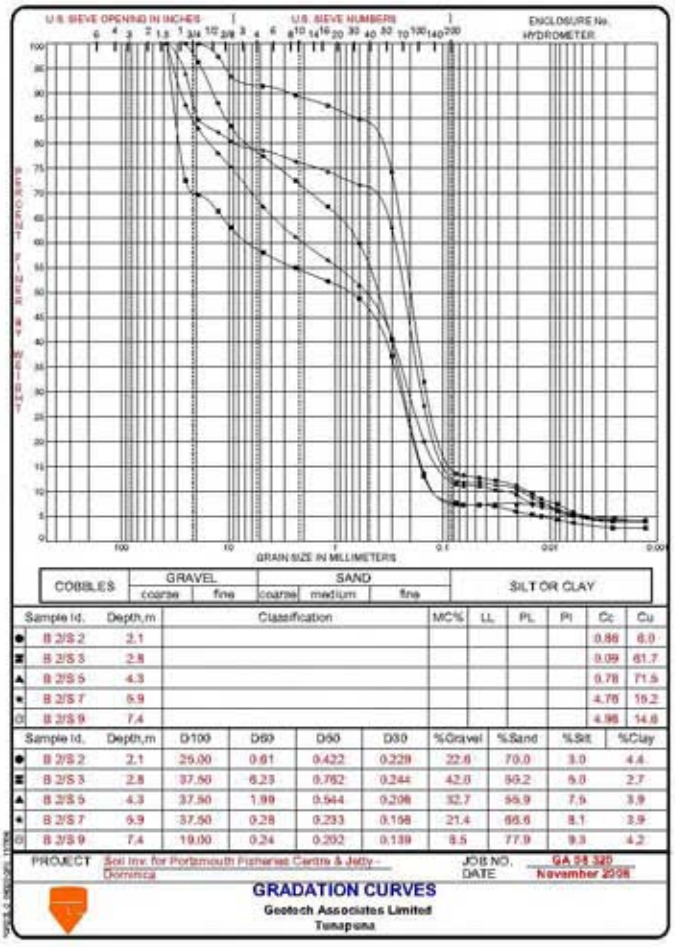

Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 2/S 2	2.1						0.86	6.0
B 2/S 3	2.8						0.09	61.7
B 2/S 5	4.3						0.78	71.5
B 2/S 7	6.9						4.78	16.2
B 2/S 9	7.4						4.98	14.6

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 2/S 2	2.1	25.00	0.61	0.422	0.229	22.6	70.0	3.0	4.4
B 2/S 3	2.8	37.50	6.23	0.782	0.244	42.0	50.2	5.0	2.7
B 2/S 5	4.3	37.50	1.99	0.544	0.208	32.7	55.9	7.5	3.9
B 2/S 7	6.9	37.50	0.28	0.233	0.158	21.4	66.6	8.1	3.9
B 2/S 9	7.4	19.00	0.24	0.202	0.139	8.5	77.9	9.3	4.2

PROJECT Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO. GA 08 320
DATE November 2008

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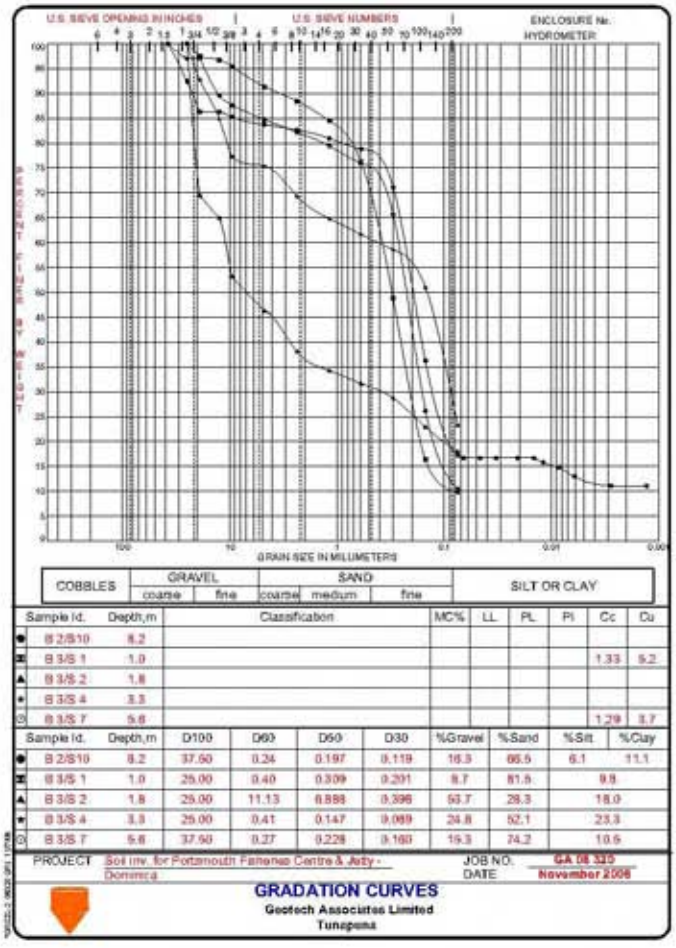

Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 2/S10	8.2							
B 3/S 1	1.0						1.33	9.2
B 3/S 2	1.8							
B 3/S 4	3.3							
B 3/S 7	5.8						1.29	3.7

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 2/S10	8.2	37.50	0.24	0.197	0.119	16.3	66.5	6.1	11.1
B 3/S 1	1.0	25.00	0.40	0.309	0.201	9.7	81.5	9.8	
B 3/S 2	1.8	25.00	11.13	0.888	0.396	53.7	28.3	18.0	
B 3/S 4	3.3	25.00	0.41	0.147	0.089	24.8	52.1	23.3	
B 3/S 7	5.8	37.50	0.27	0.228	0.160	19.3	74.2	10.6	

PROJECT Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO. GA 08 320
DATE November 2008

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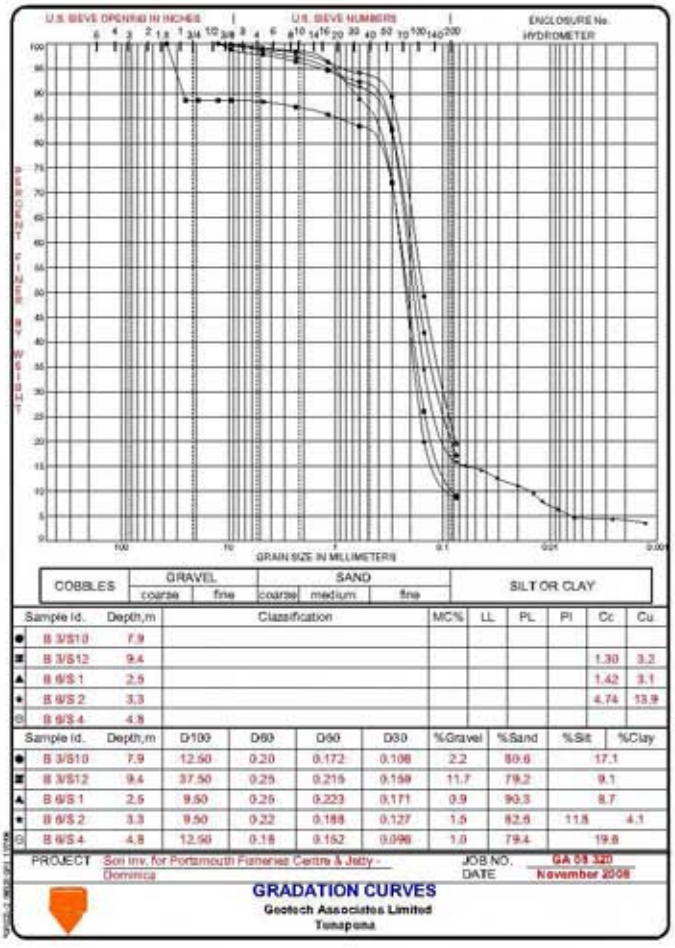

Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 3/S10	7.9							
B 3/S12	9.4						1.30	3.2
B 6/S 1	2.5						1.42	3.1
B 6/S 2	3.3						4.74	13.9
B 6/S 4	4.8							

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 3/S10	7.9	12.50	0.20	0.172	0.108	2.2	80.6	17.1	
B 3/S12	9.4	37.50	0.25	0.219	0.159	11.7	79.2	9.1	
B 6/S 1	2.5	9.50	0.25	0.223	0.171	0.9	90.3	8.7	
B 6/S 2	3.3	9.50	0.22	0.188	0.127	1.5	82.6	11.8	4.1
B 6/S 4	4.8	12.50	0.18	0.152	0.096	1.0	79.4	19.6	

PROJECT Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO. GA 08 320
DATE November 2008

GRADATION CURVES
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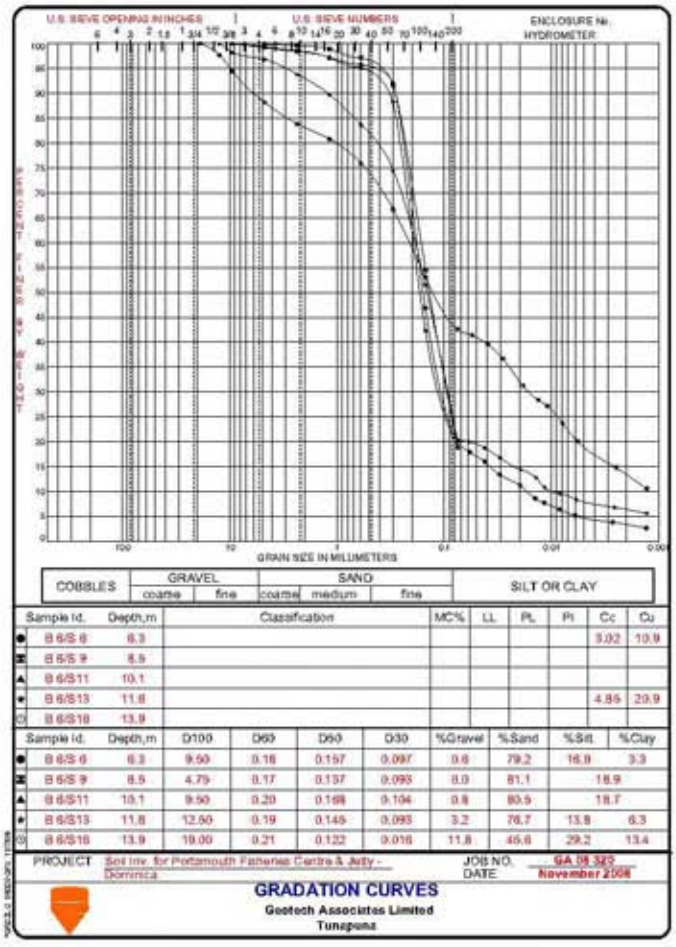

Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 6/S 6	6.3						3.02	10.9
B 6/S 9	8.5							
B 6/S11	10.1							
B 6/S13	11.8						4.85	29.9
B 6/S16	13.9							

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 6/S 6	6.3	9.50	0.18	0.157	0.097	0.0	79.2	16.9	3.9
B 6/S 9	8.5	4.75	0.17	0.157	0.093	0.0	81.1	18.9	
B 6/S11	10.1	9.50	0.20	0.168	0.104	0.8	80.5	18.7	
B 6/S13	11.8	12.50	0.19	0.145	0.093	3.2	76.7	13.8	6.3
B 6/S16	13.9	19.00	0.21	0.122	0.016	11.8	45.6	29.2	13.4

PROJECT: Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO.: GA 08 320
DATE: November 2008

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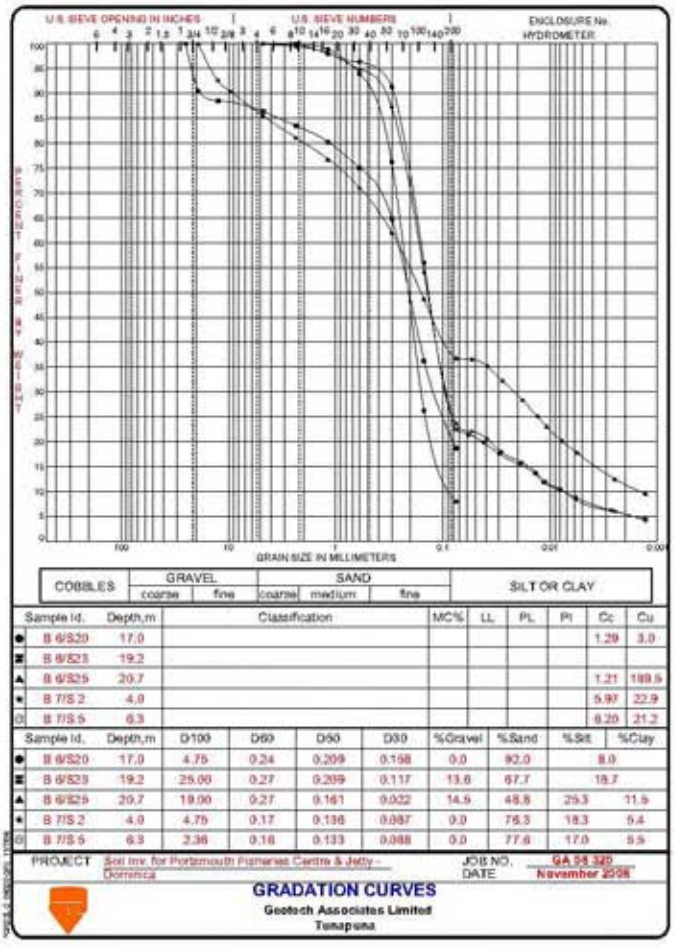

Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 6/S20	17.0						1.29	3.0
B 6/S23	19.2							
B 6/S25	20.7						1.21	189.5
B 7/S 2	4.0						5.97	22.9
B 7/S 5	6.3						6.20	21.2

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 6/S20	17.0	4.75	0.24	0.209	0.158	0.0	92.0	8.0	
B 6/S23	19.2	25.00	0.27	0.209	0.117	13.6	67.7	18.7	
B 6/S25	20.7	19.00	0.27	0.161	0.022	14.9	48.8	25.3	11.0
B 7/S 2	4.0	4.75	0.17	0.136	0.087	0.0	76.3	18.3	5.4
B 7/S 5	6.3	2.36	0.16	0.133	0.088	0.0	77.6	17.0	5.5

PROJECT: Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO.: GA 08 320
DATE: November 2008

GRADATION CURVES
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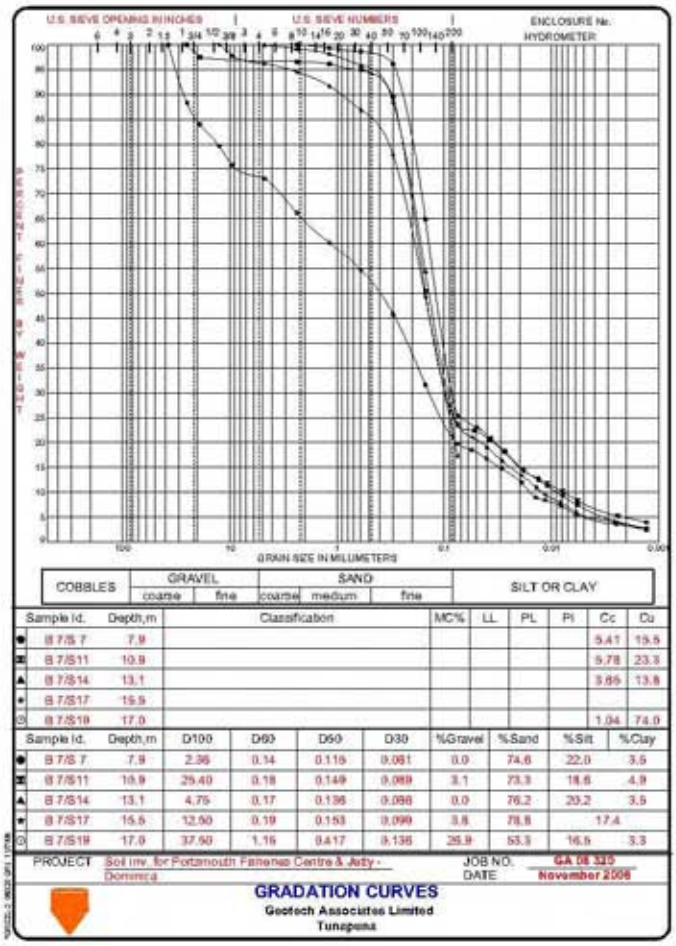

Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 7/S 7	7.9						5.41	15.5
B 7/S11	10.9						5.78	23.3
B 7/S14	13.1						3.65	13.8
B 7/S17	15.5							
B 7/S19	17.0						1.04	74.0

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 7/S 7	7.9	2.36	0.14	0.115	0.081	0.0	74.6	22.0	3.5
B 7/S11	10.9	25.40	0.18	0.149	0.089	3.1	73.3	18.6	4.9
B 7/S14	13.1	4.75	0.17	0.136	0.098	0.0	76.2	20.2	3.5
B 7/S17	15.5	12.50	0.19	0.153	0.099	3.8	78.8	17.4	
B 7/S19	17.0	37.50	1.16	0.417	0.136	26.9	53.3	16.5	3.3

PROJECT: Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO.: GA 08 320
DATE: November 2008

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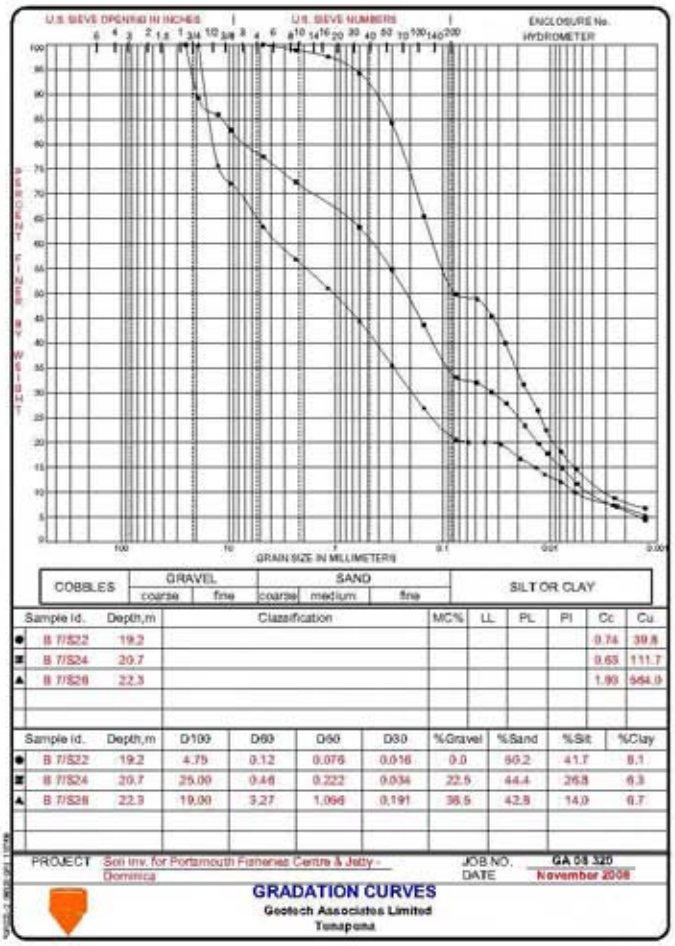

Sample Id.	Depth,m	Classification	MC%	LL	PL	PI	Cc	Cu
B 7/S22	19.2						0.74	39.8
B 7/S24	20.7						0.63	111.7
B 7/S26	22.3						1.99	564.0

Sample Id.	Depth,m	D100	D60	D50	D30	%Gravel	%Sand	%Silt	%Clay
B 7/S22	19.2	4.75	0.12	0.076	0.016	0.0	50.2	41.7	8.1
B 7/S24	20.7	25.00	0.46	0.222	0.034	22.5	44.4	26.8	6.3
B 7/S26	22.3	19.00	3.27	1.066	0.191	38.5	42.8	14.0	6.7

PROJECT: Soil Inv. for Portsmouth Fisheries Centre & Jetty - Dominica
JOB NO.: GA 08 320
DATE: November 2008

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5-1-2. Results of Topographic and sounding survey

456900X

457000X

457100X

457200X

457300X

1721500Y

1721400Y

1721300Y

N

PEMBROKE STREET

PEMBROKE STREET

BAY STREET

Market

Unnamed Street

Unnamed Street

Wreck

Wreck

Wreck

Vessel Moored

Vessel Moored

< 0.00
0.00 - 0.99
1.00 - 1.99
2.00 - 2.99
3.00 - 3.99
4.00 - 4.99
5.00 - 5.99
6.00 - 6.99
7.00 - 7.99
8.00 - 8.99
9.00 - 9.99
10.00 - 10.99
11.00 - 11.99
12.00 - 12.99
13.00 - 13.99
>= 14.00

Meters 0 25 50 100 150 Meters

all topographic data
relative to Chart Datum
(Chart datum = is 0.56m
belkow Mean Sea Level (MSL))

all topographic heights are
deemed as negative above
Chart Datum and all depths
are taken as positive below
Chart Datum

5-1-3. Calculation of Design wave and sea wall crown height

(1) Offshore wave parameters

In order to establish offshore wave parameters for the Project site, the results of previous calculations, the current status of facilities by the previous projects and the direction the Project site faces were studied. On the premise that three offshore wave directions could pose a threat to the location of the planned facilities at the Project site, the parameters of 30-year probability waves for the 3 main wave directions from the FY1996 implementation review study report (Basic design study report on the project for improvement of coastal fisheries development in the Commonwealth of Dominica) are used. Those are as follows:

Wave direction: W, WSW and SW
H_0=7.0m
T=10.5sec

(2) Estimated offshore wave height

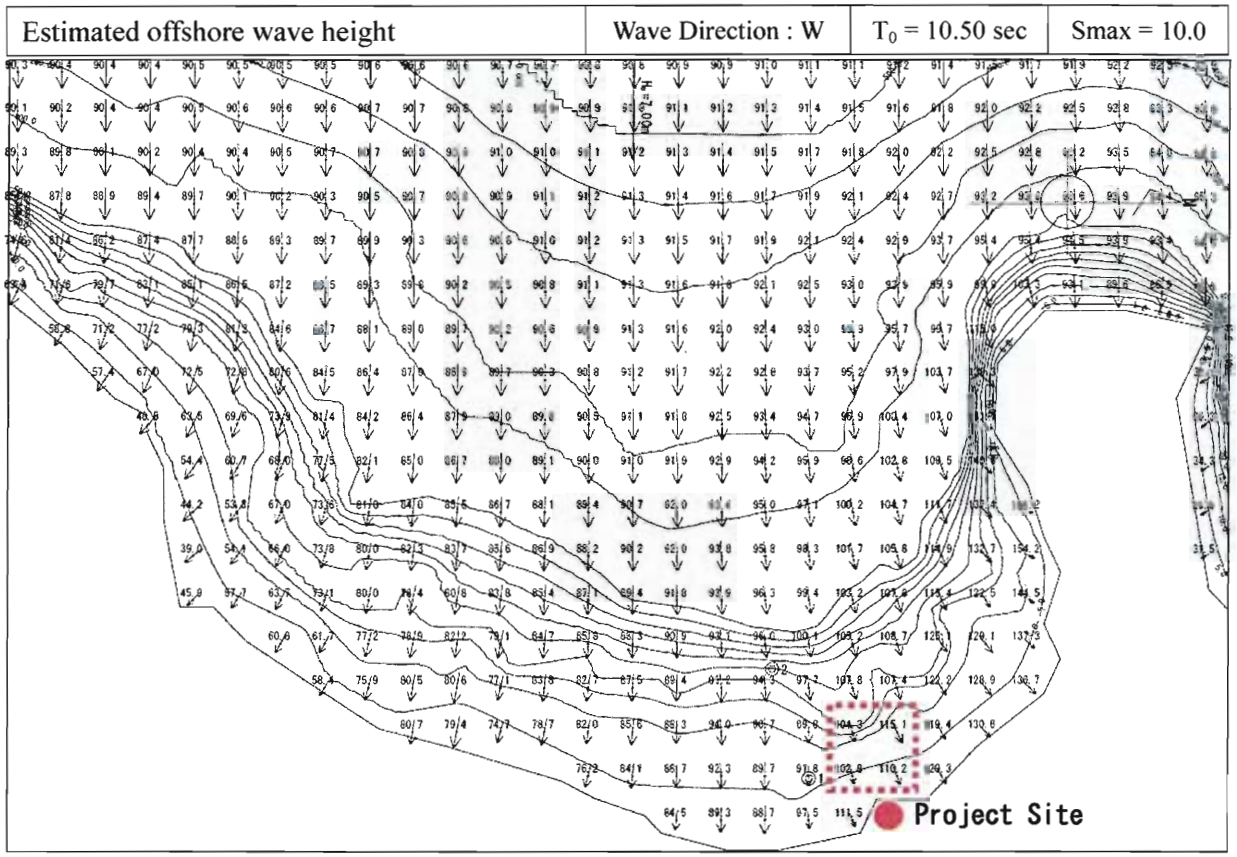
The estimated offshore wave height value for the area in front of the Project site is obtained using an energy balance equation.

The calculation results from the energy balance equation are shown in Figures (Appendix)-1 to –3. These are charts showing variations in wave direction and estimated offshore wave height distribution for each offshore wave direction (W, WSW and SW).

From these results and from the mean values for the entire Project site, the estimated offshore wave height and shallow-water wave directions in front of the Project site are calculated as shown in Table (Appendix)-1.

Table (Appendix)-1: Table of estimated offshore waves

Offshore wave direction	W	WSW	SW
Offshore wave height	H_0=7.0m		
Wave period	T=10.5sec		
Shallow-water wave direction	N108.10° W	N108.85° W	N113.68° W
Estimated offshore wave height (H_0')	4.61m	4.72m	4.35m



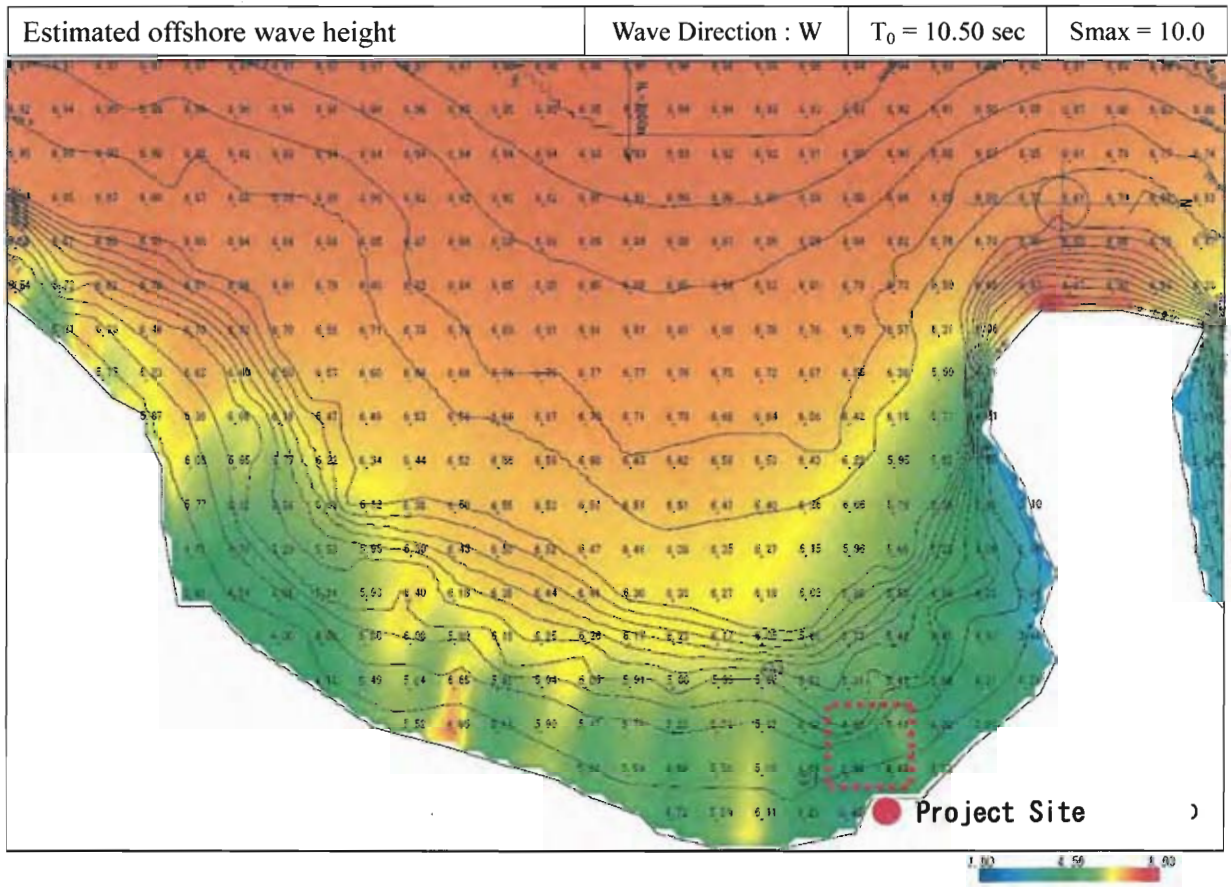


Figure (Appendix)-1: Calculation of wave transformation (wave direction: W)
(Top: Wave direction variation; Bottom: Estimated offshore wave height distribution)

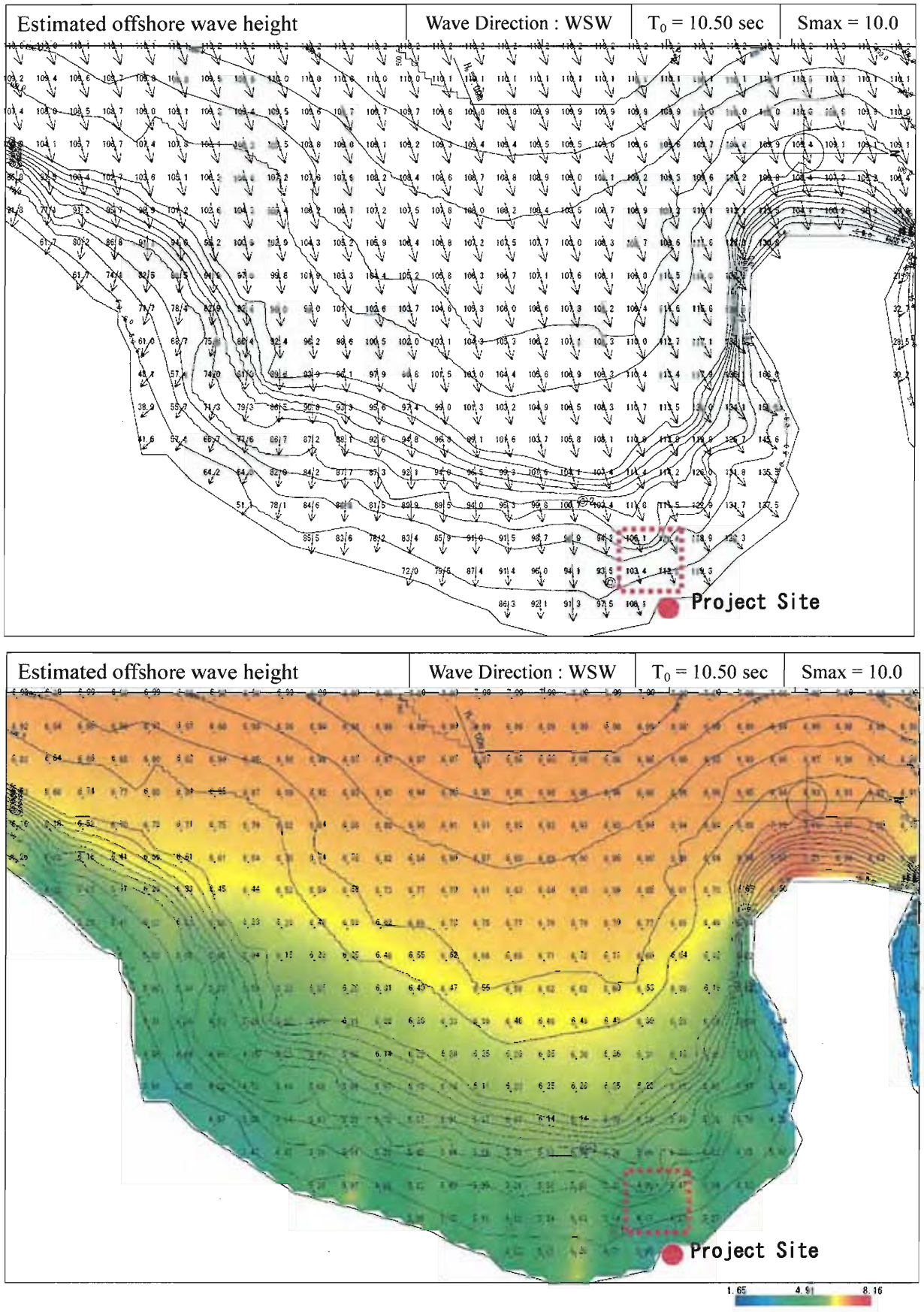


Figure (Appendix)-2: Calculation of wave transformation (wave direction: WSW)

(Top: Wave direction variation; Bottom: Estimated offshore wave height distribution)

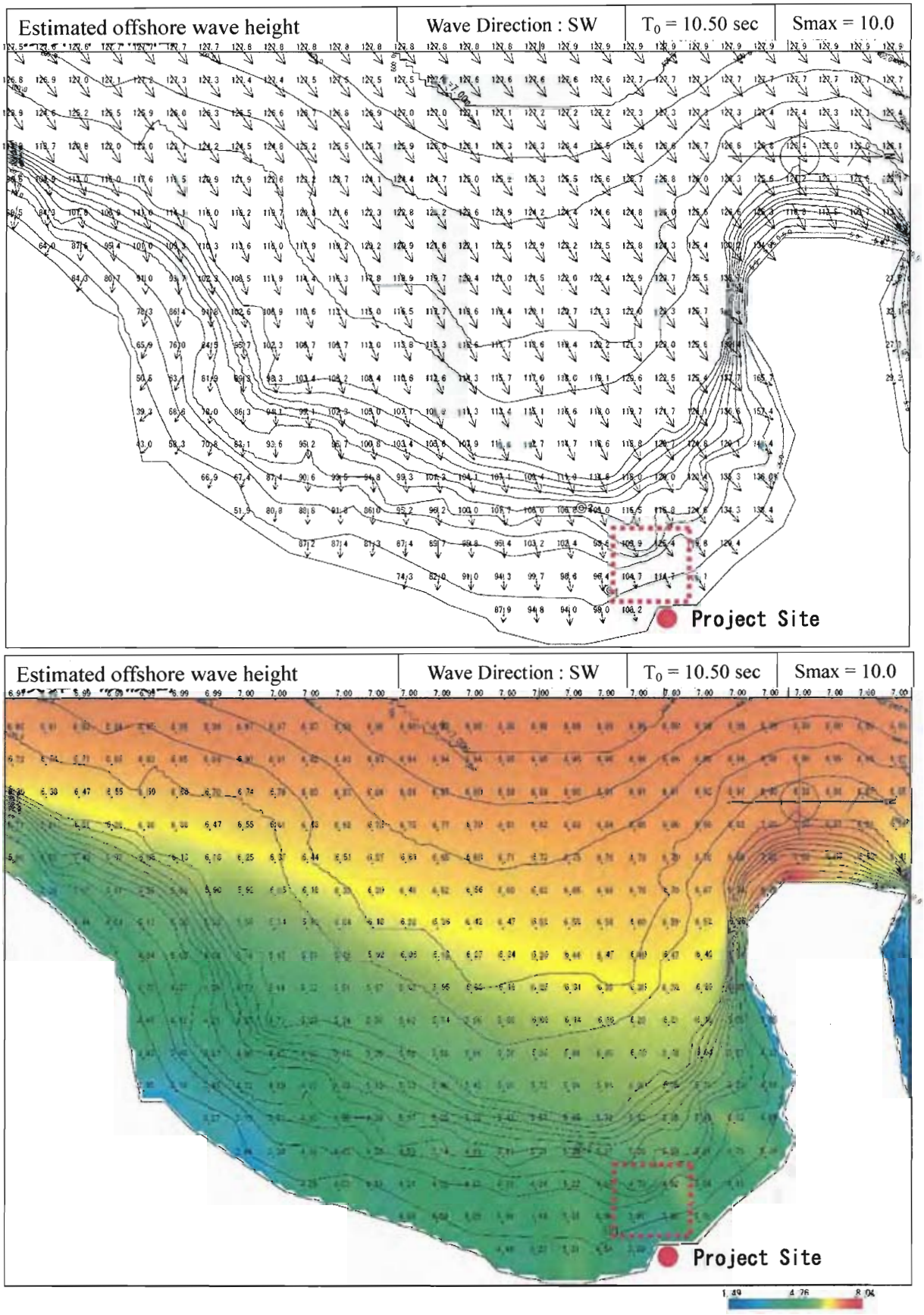


Figure (Appendix)-3: Calculation of wave transformation (wave direction: SW)
(Top: Wave direction variation; Bottom: Estimated offshore wave height distribution)

(3) Calculation of design wave height

The design wave height is determined by selecting one direction from the wave height data for the 3 main offshore wave directions at the water depth for each facility or for each construction area that could pose the greatest threat to the structure.

1) Height of existing seabed

a) Jetty

(i) End section for large-size fishing boats: D.L.- 2.2m

(ii) Intermediate section: D.L. -2.1m

(iii) End section for small-size fishing boats: D.L.- 1.3m

b) Sea wall: D.L. -0.7m

2) Seabed inclination

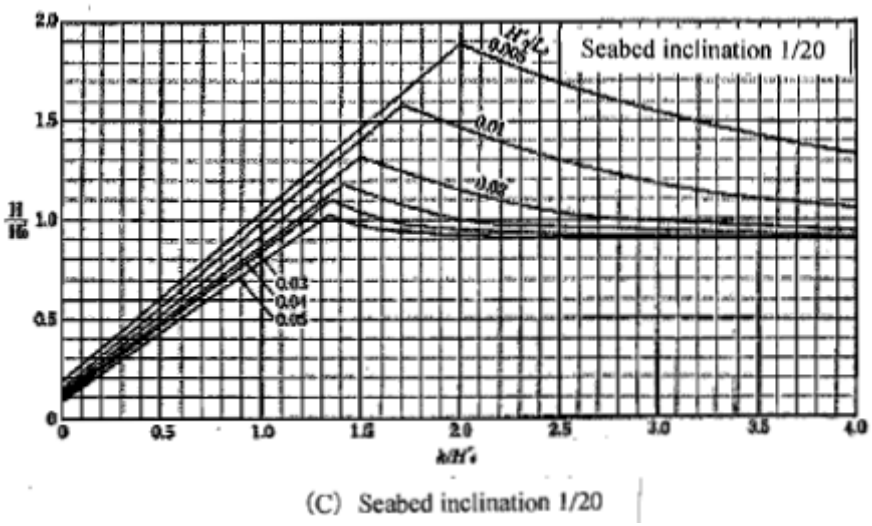
The seabed inclination as read from nautical charts for a range of $1.0 \leqq h/H_0' \leqq 2.5$ is taken to be 1/20.

3) Calculation of wave height

The wave height for each offshore wave direction was calculated at the water depth for each facility and for each construction section of the facility according to the “Guidelines for the Design of Fishing Ports and Fishing Ground Facilities (2003)”. The maximum design wave height can be obtained from the chart (Figure (Appendix)-4) showing wave height variation at different water depths, taking the tide level into account. First, a wave height is read out from the chart at a point of water depth which is a sum of the planned water depth for each facility (h(DL)) and the height of tide (+0.7m). Next, a distance equivalent to 5 times of this wave height is extended horizontally from the above point in the direction toward offshore and the largest wave height within this distance is established as the height of design wave (H1/3). The results of this calculation are shown in Table (Appendix)-2.

Table (Appendix)-2: Table of calculated design wave heights

wave direction		W	WSW	SW	Reference
H_0(m)		7.0			
T (sec)		10.5			
L_0(m)		171.99			
H'_0(m)		4.61	4.72	4.35	
H'_0/ L_0		0.027	0.027	0.025	
Breakwater					
H(DL)		D.L. – 0.7 m			
H(m)		1.4			Tide level taken into account
H/H'_0		0.30	0.30	0.32	Read out from the graph
$H_{1/3}/H'_0$		0.34	0.34	0.35	
$H_{1/3}$(m)		1.57	1.60	1.52	
Jetty					
for small-size fishing boats	H(DL)	D.L. – 1.4 m			
	H(m)	2.1			Tide level taken into account
	H/H'_0	0.46	0.44	0.48	Read out from the graph
	$H_{1/3}/H'_0$	0.46	0.45	0.49	
	$H_{1/3}$(m)	2.12	2.12	2.13	
Intermediate section	H(DL)	D.L. – 2.1 m			
	H(m)	2.8			Tide level taken into account
	H/H'_0	0.61	0.59	0.64	Read out from the graph
	$H_{1/3}/H'_0$	0.58	0.57	0.59	
	$H_{1/3}$(m)	2.67	2.69	2.57	
for large-size fishing boats	H(DL)	D.L. – 2.2 m			
	H(m)	2.9			Tide level taken into account
	H/H'_0	0.63	0.61	0.67	Read out from the graph
	$H_{1/3}/H'_0$	0.63	0.63	0.67	
	$H_{1/3}$(m)	2.90	2.97	2.91	



(C) Seabed inclination 1/20

Figure (Appendix)-4: Variation of wave height depending on water depth

4) Incident angle

The incident angle of waves against an architectural structure are obtained from their angle against the vertical face of the structure as shown in drawings, based on the results of wave direction variation in the calculation of wave transformation using the energy balance equation. According to Figures (Appendix)-1 to -3, the incident wave directions are as shown in Table (Appendix)-1.

Table (Appendix)-3: Incident wave directions for each offshore wave direction

Offshore wave direction	W	WSW	SW
Shallow-water wave direction	W（N108.10°W）	WSW（N108.85°W）	SW（N113.68°W）
Incident angle （θ）	-2°	-2°	3°

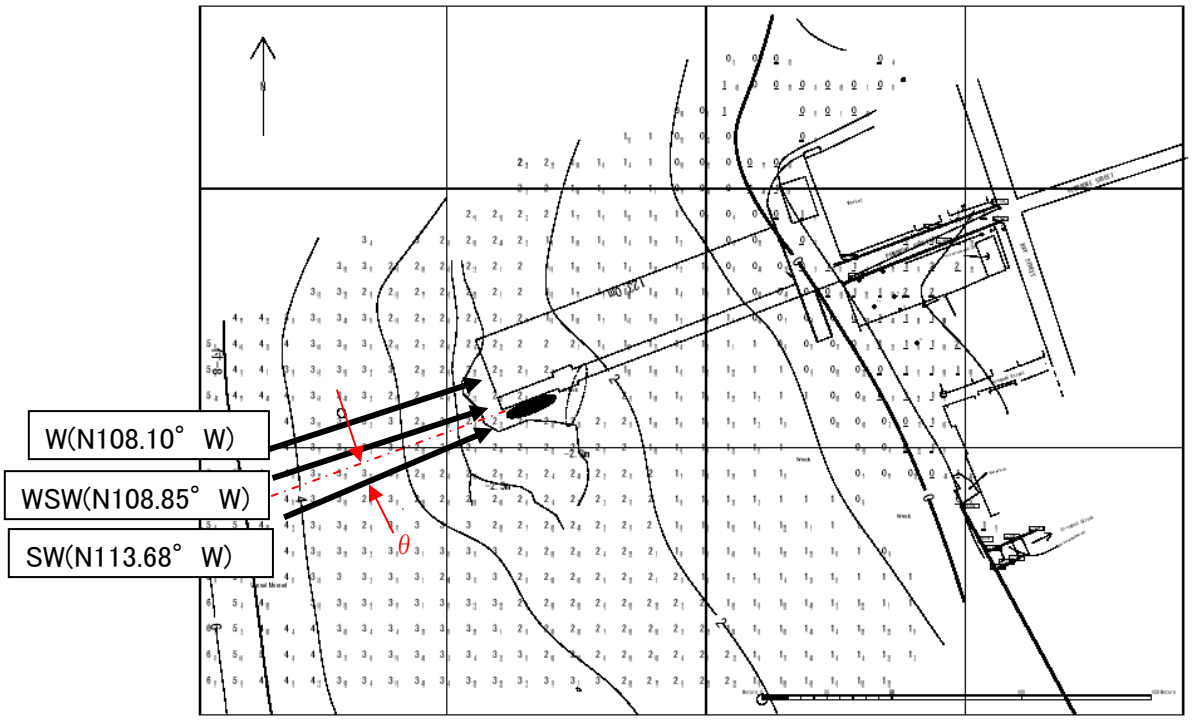


Figure (Appendix)-5: Shallow-water wave directions

5) Design wave parameters to be applied

The design wave parameters used are as shown in Table (Appendix)-4, selecting from the values for the 3 main offshore wave directions obtained at the water depth for each facility and for the facility's construction section those values that pose the greatest threat to the structure.

Table (Appendix)-4: Design wave parameters

Specifications of Offshore Waves			
Wave Direction	Wave Height	Period	Wave Length
W, WSW, SW	H_0=7.0m	T=10.5sec	L_0=171.99m
Specifications of Design Waves			
Jetty end for large fishing boats (D.L.-2.2m)	Middle section (D.L.-2.1m)	Jetty end for small fishing boats (D.L.-1.3m)	Breakwater (Foundation Design) (D/L/-0.7m)
H=3.0m (h=D.L.2.4m)	H=2.7m (h=D.L.2.1m)	H=2.1m (h=D.L.1.4m)	H=1.6m (h=D.L.0.7m)
Incidence Angle β =(±15°)	Angle of incidence β =0°	Angle of incidence β =0°	Angle of incidence β =0°

(4) Calculation of rise in sea level

a) Rise in water level caused by breaking waves

As the water depth is shallow at the Project site, the phenomenon occurs whereby breaking waves cause the sea surface to rise when a hurricane hits the area. Here we calculated the degree of rise in the sea level in front of the sea wall at the Project site.

The mean rise in sea level at the normal line of the sea wall is obtained for each offshore wave direction from Figure (Appendix)-6, based on the "Guidelines for the Design of Fishing Ports and Fishing Ground Facilities (2003)". The results are shown in Table (Appendix)-5.

Table (Appendix)-5: Calculation results of mean sea level rise caused by breaking waves

Wave Direction	W	WSW	SW	Reference
H_0(m)	7.0			
T (sec)	10.5			
L_0(m)	171.99			
H'_0(m)	4.61	4.72	4.35	
H'_0/ L_0	0.027	0.027	0.025	
H(DL)	D.L. – 0.7 m			
H(m)	1.4			Tide level taken into account
h / H'_0	0.30	0.30	0.32	Read out from the graph
n / H'_0	0.14	0.14	0.13	
n (m)	0.65	0.66	0.57	

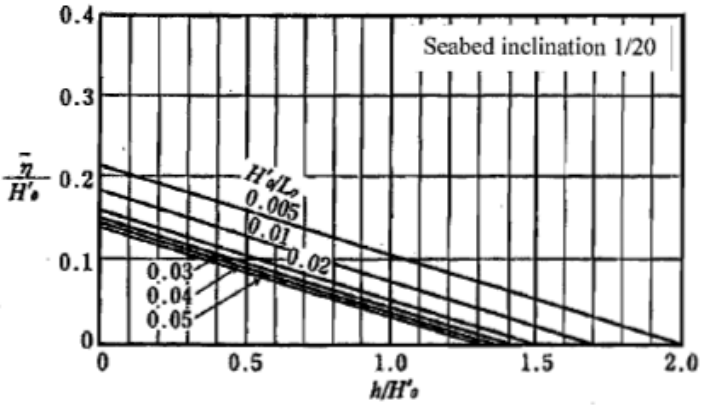


Figure (Appendix)-6: Mean rise in sea level caused by breaking waves

The rise of 0.66m in sea level will be caused by breaking waves at the sea wall.

b) Rise in mean sea level caused by wind-blown waves

The rise in sea level at the shoreline caused by wind-blown waves can be calculated using the following formula.

$$\eta_0 = k \frac{F}{h} (U\cos\alpha)^2$$

Where,

η_0 : Rise in mean sea level (cm) caused by wind-blown waves

R: Fetch distance (km)

Since there are no islands etc., to function as a shield, the fetch distance is determined to be infinite in length and is set at 100km.

U: Wind velocity (m/sec)

Observation data of local maximum wind velocity has not been obtained. In this Project, therefore, assuming a hurricane on the same scale of Hurricane Lenny of November 1999, which was the most damaging hurricane to hit the west coast of the Caribbean Sea countries including the Project site, the maximum wind velocity is taken to be U=69.4m/sec.

h: Mean water depth (m)

The offshore water depth to the west of the Project site is more than 1,000m. Thus the mean water depth is taken to be 1,000m.

k: Coefficient that differs for each bay.

From the Baltic Sea data ($k=48 \times 10^{-2}$).

α: Angle between wind direction and a line at right angles to the shoreline.

Taken as $\alpha=0°$.

From the above, the rise in sea level caused by wind-blown waves is calculated to be 23cm.

c) Static suction caused by a drop in atmospheric pressure

If atmospheric pressure drops gradually at the rate of ⊿P(hPa), the sea level in this area will rise because of the difference in pressure with surrounding areas where the atmospheric pressure has not dropped. The rise in sea level (cm) can be obtained using the following formula.

$\zeta=0.99\times\Delta P$

Where,

ζ: Rise in sea level (cm) caused by a drop in atmospheric pressure

⊿P: Atmospheric pressure anomaly (hPa)

The atmospheric pressure anomaly is calculated on the assumption of a hurricane on a scale equivalent to that of Hurricane Lenny which in November 1999 became the most damaging hurricane on record to hit the west coast of the Caribbean Sea countries, including the Project site. When the lowest atmospheric pressure recorded is U=933 (hPa) and the standard pressure at ordinary times is taken to be 1,010 (hPa), the calculation is as follows.

$$\zeta=0.99\times\Delta P=0.99\times(1010-933)=0.99\times77=76\text{cm}$$

From this, if breaking waves, wind-blown waves and a drop in atmospheric pressure all occur at the same time, the rise in sea level will be:

$$0.66+0.23+0.76=1.65\text{m}$$

In addition, if this rise in sea level occurs at the time of H.W.L., the water level in terms of D.L. will be :

$$\text{H.W.L.}+0.70+1.65=\text{D.L.}+2.35\text{m}$$

(5) Consideration of sea wall crown height

1) Consideration of permissible overtopping wave levels

The permissible levels of sea wall-topping waves are specified in the “Guidelines for the Design of Fishing Ports and Fishing Ground Facilities (2003).”

At the Project site, abnormally high waves are generated only by tropical storms or hurricanes. When the seas are high, fishing and other related operations cannot be performed and the related facilities cannot be used. In addition, there are no facilities immediately behind the sea wall that could be damaged severely in the event of waves breaching the seawall. Therefore, the

permissible overtopping wave level is set at a level at which no facilities would be damaged even if waves of a scale equivalent to that of design wave should hit the site. The area behind the sea wall is be paved in this Project, and so the permissible overtopping wave level is taken to be qa=0.20m³/m/sec.

Table (Appendix)-6: Permissible levels o rate of wave overtopping

Type	Covering work	Overtopping wave level q(m^3/m/sec)
Breakwater	Paved	0.20
	Not paved	0.05

Based on the established permissible level of seawall-topping waves (qa=0.20 m³/m/sec), the crown height is calculated for each offshore wave direction as shown in Figure (Appendix)-7. In this inference chart, two graphs are shown for the parameters of wave steepness (H'_0/L_0=0.017, 0.036) and seabed inclination (1/10 and 1/30), respectively; the wave steepness at the Project site is H'_0/L_0=0.025, 0.027 and the inclination of the seabed is 1/20. For the inclination of the seabed, the 1/10 graph, which represents the higher risk case, is used and for wave steepness, the necessary crown height is calculated proportionally.

The results of these calculations for each wave direction are shown in the table below. As a result, the necessary crown height is taken to be D.L.+2.5m for a critical level of seawall-topping waves of qa=0.20m³/m/sec.

Table (Appendix)-7: Calculation of necessary crown height

Wave Direction	W	WSW	SW	Reference
H_0(m)	7.0			
T (sec)	10.5			
L_0(m)	171.99			
H'_0(m)	4.61	4.72	4.35	
H'_0/L_0	0.027	0.027	0.025	
h (DL)	D.L. – 0.7 m			
h (m)	1.4			Tide level taken into account（H.W.L. +0.70）
h / H'_0	0.3037	0.2965	0.3217	
$q / \sqrt{(2gH_0'^3)}$	0.0046	0.0044	0.0050	qa = 0.2 m^3/m/sec
hc / H'_0	Read out from the graph			Seabed inclination 1/10
	0.5	0.5	0.5	H'_0/L_0 = 0.017
	0.25	0.25	0.25	H'_0/L_0 = 0.036
h_0 / H'_0 Average	0.38	0.38	0.38	
h_0(m)	1.73	1.77	1.63	
D.L. +(m)	2.43	2.47	2.33	Tide level taken into account（H.W.L. +0.70）

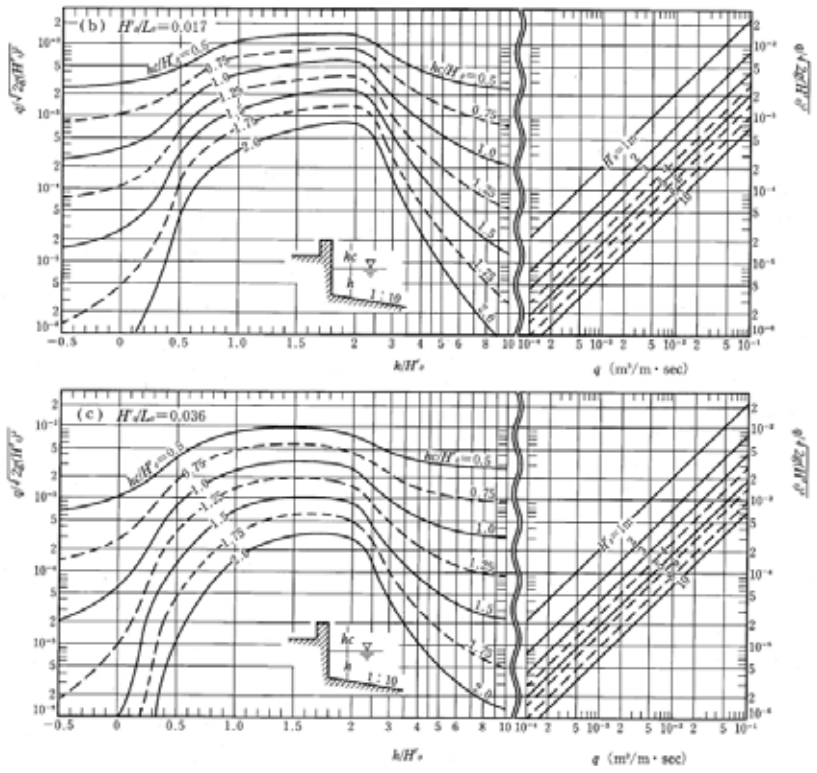


Figure (Appendix)-7: Estimate of seawall-topping wave level against a vertical sea wall (seabed inclination: 1/10)

2) Calculation of wave run-up height

The wave run-up height against the vertical wall after completion of the sea wall is calculated in accordance with the "Guidelines for the Design of Fishing Ports and Fishing Ground Facilities (2003)." The wave run-up height against the vertical wall can be obtained from Figure (Appendix)-8.

The calculation results for each wave direction are shown in Table (Appendix)-8. The maximum wave run-up height is D.L.+4.5m.

The graph used in this calculation was prepared on the basis of experiments conducted with a vertical wall of infinite height. With a wall height less than this, the waves hitting the structure will break directly above the vertical wall and dissipate as spray.

Table (Appendix)-8: Calculation of wave run-up height

Wave Direction	W	WSW	SW	Reference
H_0(m)	7.0			
T (sec)	10.5			
L_0(m)	171.99			
H'_0(m)	4.61	4.72	4.35	
H'_0/ L_0	0.027	0.027	0.025	
h (DL)	D.L. – 0.7 m			
h (m)	1.4			Tide level taken into account（H.W.L. +0.70）
h / L_0	0.008	0.008	0.008	
R / H'_0	0.80	0.80	0.80	Read out from the graph
R (m)	3.69	3.78	3.48	
D.L. + (m)	4.39	4.48	4.18	Tide level taken into account（H.W.L. +0.70）

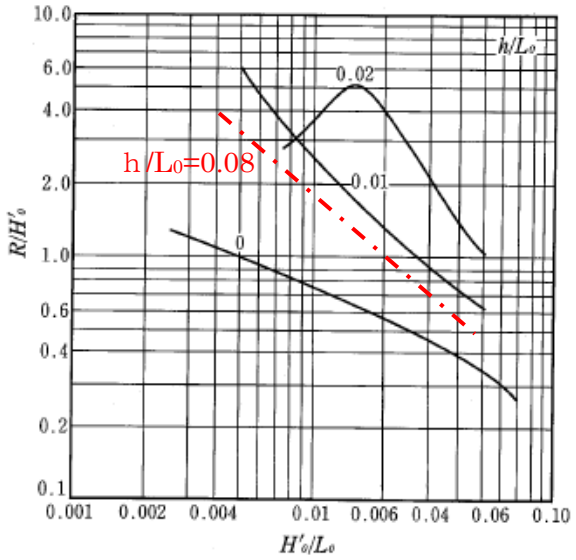


Figure (Appendix)-8: Wave run-up height (for vertical sea wall) (seabed inclination: 1/20)

3) Establishment of facility crown height

As a result of above studies, the crown height of the sea wall obtained from damage limits is set at D.L. +2.5m. This figure is similar to the height of the existing sea wall located to the south of the Project site as measured in this survey.

However, it is predicted that, when a hurricane hits the site, the erection of vertical structures close to the shoreline will cause the spray to fly high and to be carried inland by the wind. Thus the planned facilities have to be sturdy enough, and measures must be taken to prevent salt damage.

In addition, in the event of a hurricane of the largest scale to have hit the Project site in the past, the sea water level is expected to rise to D.L. +2.35m. It follows that in designing the facilities, therefore, it is necessary to ensure that flooding does not cause any damage.

5-1-4. Results of Water tests

Sampling Day : 11 Aug. 2008

Testing Items : Temperature, pH, COD, Coliform

Methodology : Temperature（Digital thermometer）
pH（Digital pH meter）
COD（PAC test）
Coliform（San Coli test paper）

Results：

Table (Appendix)-9: Results of Water tests

Item / Points No.	Temperature	pH	COD （mg/L）	Coliform （MPN／100ml）
①	26.7	7.0	8.0	8.0×10^3
②	29.0	7.6	2.0	6.0×10^2
③	29.0	7.7	2.0	1.0×10^2
④	29.0	7.7	2.0	3.0×10^2
⑤	29.0	7.7	6.0	1.1×10^3
⑥	29.0	7.2	8.0	Cannot counted

Table (Appendix)-10: Allowable Limit for Water quality according to Japanese Relevant Standards

Item / Sample	pH	COD	Coliform
1） Basic Environment Law Water Quality Standard for Public water Environment Conservation (Type C)	7.0 over Less than 8.3	Less than 8.0mg／L	—
2） Water Works Law Water Quality Standard	—	—	Not detected

5-1-5. Overview of 5 rivers flowing into Prince Rupert Bay

Figure (Appendix)-9: Location Map of 5 Rivers

Table (Appendix)-11: Overview of 5 rivers flowing into Prince Rupert Bay

Name of river	Distance between the Site and the river mouth	Conditions of the river and river mouth	Remarks
1 LAMOINS	3.1km to the south	・ Small stream 3m wide ・ Swampy some 200m upstream from the mouth. No signs of seawater running upstream ・ No blockage at the mouth	・ Box culvert at the mouth but blocked and not functioning ・ Sandy at the mouth
2 PICARD	1.6km to the south	・ 15m wide ・ About 50cm deep ・ Clear water with relatively large volume water flow ・ No sea wall ・ No blockage at the mouth, slow flow rate	・ Small-scale dam for water supply exists upstream ・ Gravel at the mouth
3 INDIAN	0.7km to the south	・ 30m wide ・ Abandoned steel boat behind breakwater ・ Murky water at the mouth and virtually zero flow rate ・ 30-meter breakwater to the south of the mouth collapsed due to hurricane ・ 10-meter stone masonry bank to the north ・ No erosion/sedimentation found at the base of the embankment running south to north ・ 1-2m deep at the mouth ・ No blockage at the mouth	・ Sea wall at the foot of bridge for sightseeing boats going upstream. 15 boats in total, use of engines is prohibited. ・ Swampy conditions 2-4km from the mouth; a brackish area with no riverbed inclination. Designated a nature conservation area for mangroves and brackish water life forms. ・ In the swampy area 2-4km from the river mouth, the river channel is canopied by tropical rainforest that shuts out even the wind; this is used by small-size fishing boats as a refuge during hurricanes ・ The concrete abutment of a railway bridge remains at a point about 1km upstream
4 NORTH	Immediately north	・ 15m wide ・ Slightly murky, slow flow rate ・ Sea wall to the north ・ During the survey, a sand spit was found stretching from the south side but there was no blockage.	・ During the survey, the flow rate increased immediately after a squall ・ Sand and gravel at the mouth
5 LAGON	0.3km to the north	・ 10m wide ・ Relatively new road bridge completed at the mouth ・ Slightly murky, slow flow rate ・ With sea wall ・ No blockage at the mouth	・ Sand and gravel at the mouth

NB. With the exception of the Picard River, upstream of the urban road the land is forested, and there are no roads providing easy access to the riverside.