

**SUPPORTING REPORT D**  
**RIVER BED MATERIAL SURVEY**

# SUPPORTING-D : RIVER BED MATERIAL SURVEY

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## SUPPORTING-D RIVER BED MATERIAL SURVEY

### 1. INTRODUCTION

This is the Supporting Report D of River Bed Material Survey for the project entitled “The Study on Flood Control and Landslide Prevention in Tegucigalpa Metropolitan Area in the Republic of Honduras”.

River bed material survey was carried out to comprehend the physical properties of river bed material along the Choluteca River and the Chiquito River.

### 2. RIVER BED MATERIAL SURVEY

#### 2.1 SURVEY ITEMS AND SURVEY QUANTITY

The survey items are as follows;

- Sampling of river bed materials,
- Grain size analysis, and
- Specific gravity test.

The number of sampling, analysis and test is as follows.

Item No.	Description	Unit	Quantity
1.	Sampling		
1.1	Choluteca River:12 sites	l.s.	24
1.2	Chiquito River :3 sites	l.s.	6
2.	Grain size analysis	sample	30
3	Specific gravity test	sample	30

#### 2.2 SURVEY SCHEDULE

All survey works including sampling and test were completed by the middle of May 2001.

#### 2.3 STANDARD OF TEST

The standard of American Society for Testing and Materials (ASTM) was applied to all the test method of materials.

#### 2.4 SAMPLING OF RIVER BED MATERIALS

- (1) The sampling sites were selected with 1km interval. (Refer to *Figure D.2.1*)
- (2) Sampling of river bed material was carried out in the following sequence at each sampling site.
  - To take photos of river channel for its upstream and downstream views from the sampling site.
  - To remove river surface which deposited during the Mitch-flood, if any, and to take a photo of sampling spot with scale to show the grain sizes.

## Supporting-D : River Bed Material Survey

- To take a sample. The quantity of material to be taken is as follows according to the maximum grain size.

Max. grain size (mm)	Materials taken (kg)	Sample (kg)	Remarks
less than 10	4	1	For laboratory analysis
10 to 20	20	5	For field analysis
20 to 40	60	15	For field analysis
40 to 60	80	20	For field analysis
60 to 80	120	30	For field analysis
more than 80	140	35	For field analysis

- The materials taken out are put on a clean vinyl sheet spread over the ground and mixed well. A photo of the material is taken. Then, a quarter of the material is sampled.
- If the maximum grain size is smaller than 10 mm, the sample is kept in a clean container with site name clearly written for the indoor grain size analysis.
- If maximum grain size is larger than 10 mm, the sample is put on a vinyl sheet and dried up to surface dry conditions in the air for the grain size analysis at site.

### 2.5 GRAIN SIZE ANALYSIS

(1) Grain size analysis was carried out to determine the grain size distribution of the river bed materials.

(2) Sieve indoor analysis was carried out as follows:

- The sieve set used for indoor analysis consists of 9.52 mm, 4.76 mm, 2.00 mm, 0.84 mm, 0.42 mm, 0.25 mm, 0.105 mm and 0.074 mm.
- The balance to be used for weighing the materials remaining on each sieve is used of sensitivity higher than 0.1 g.

(3) Grain size indoor analysis at site was carried out in the following procedures:

- Weigh the whole sample.
- Screen the sample by a standard sieve set and to weigh the weight of materials remained on each sieve and materials passing through the smallest sieve of the set.
- The standard sieves set consist of sieves 50.8 mm, 38.1 mm, 25.4 mm, 19.1 mm and 9.52 mm.
- Each of grain remaining on 50.8 mm sieve is measured for its grain size and weight. The grain size is measured by scale for three dimensions of length, width and thickness.
- The materials remaining on sieves less than 38.1 mm is mixed after the sieve analysis and about 1 kg of sample is taken out for specific gravity test. The sample is put in a clean container with its site name clearly written.

### 2.6 SPECIFIC GRAVITY TEST

(1) Specific gravity test was carried out for about 1 kg of samples used for the sieve analysis according to ASTM.

(2) Specific gravity test was carried out twice dividing a sample into two.

### **3. SURVEY RESULT**

#### **3.1 RIVER BED MATERIAL OF CHOLUTECA RIVER**

Grading curves of river bed materials are shown in *Figures D.3.1 to D.3.4*. Distribution of grain size along the Choluteca River is shown in *Figure D.3.6*. The grain size distribution is comparatively uniform along the river. According the survey result, grain size of river bed materials is coarse, as  $d_{60}=20\text{mm} - 60\text{mm}$ . The result of specific gravity test is shown in *Table D.3.1*. Distribution of specific gravity of the river bed material of the Choluteca River is shown in *Figure D.3.8*.

#### **3.2 RIVER BED MATERIAL OF CHIQUITO RIVER**

Grading curves of river bed materials are shown in *Figure D.3.5*. Distribution of grain size along the Chiquito River is shown in *Figure D.3.7*. The grain size distribution is uniform along the river. According the survey result, grain size of river bed materials is coarse, as  $d_{60}=40\text{mm}$ . The result of specific gravity test is shown in *Table D.3.1*. Distribution of specific gravity of the river bed material of the Chiquito River is shown in *Figure D.3.9*.



Table D.3.1 Specific Gravity

<b>Cholteca River</b>	<b>No.1</b>	<b>No.2</b>	<b>No.3</b>	<b>No.4</b>
C25	2.25	2.26	2.27	2.25
C45	2.47	2.49	2.11	2.15
C60	2.53	2.54	2.22	2.24
C65	2.16	2.17	2.28	2.27
C75	2.27	2.26	2.25	2.24
C85	2.24	2.25	2.28	2.23
C95	2.02	2	2.27	2.27
C105	2.2	2.23	2	2.01
C115	2.08	2.06	2.11	2.11
C125	2.67	2.68	2.5	2.51
C135	2.01	2.05	2.12	2.13
C155	2.15	2.21	2.53	2.53
<b>Chiquito River</b>	<b>No.1</b>	<b>No.2</b>	<b>No.3</b>	<b>No.4</b>
CQ5	2.59	2.57	1.84	1.84
CQ15	3.12	3.13	3.19	3.19
CQ25	2.57	2.55	2.75	2.12

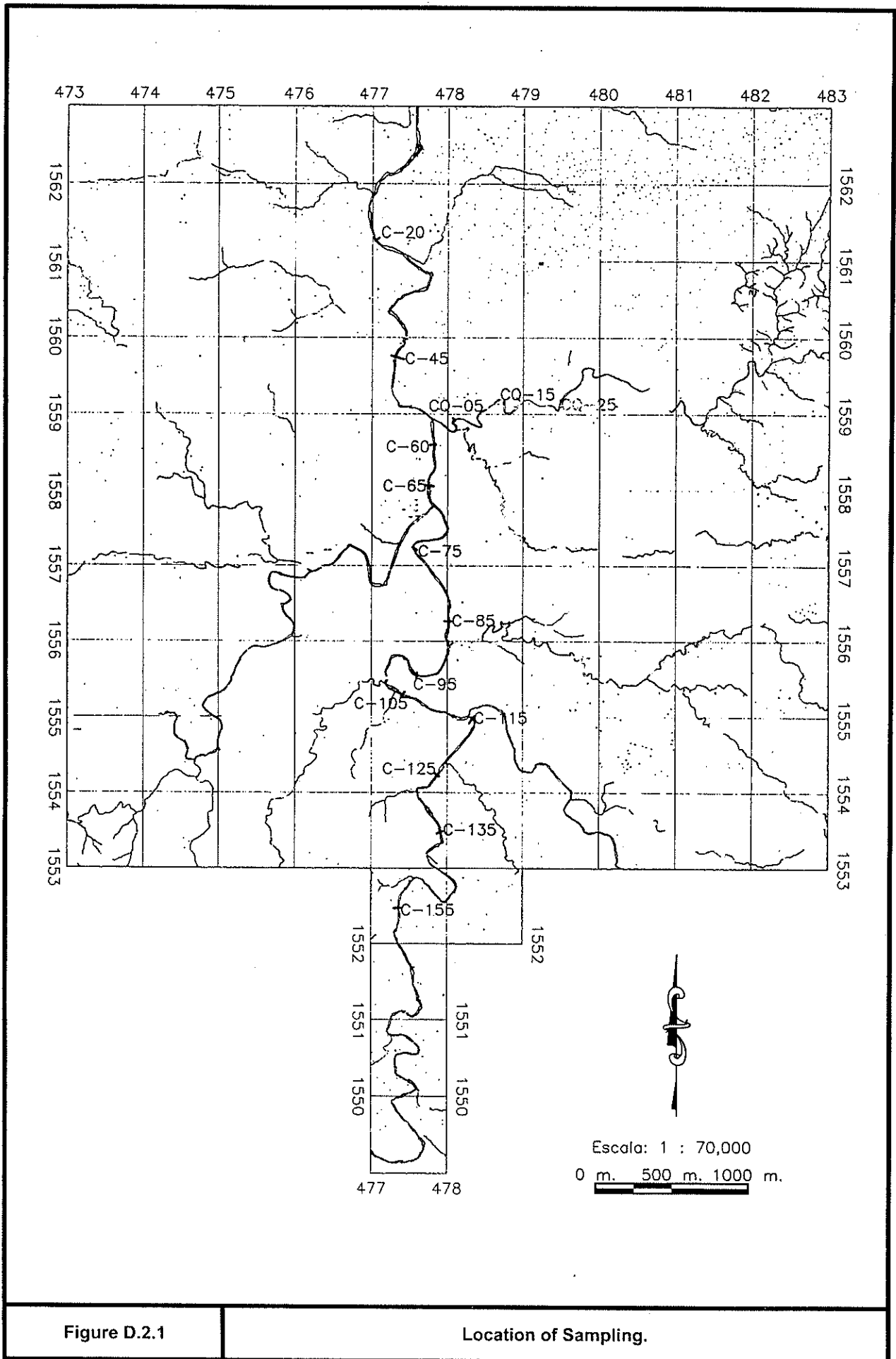
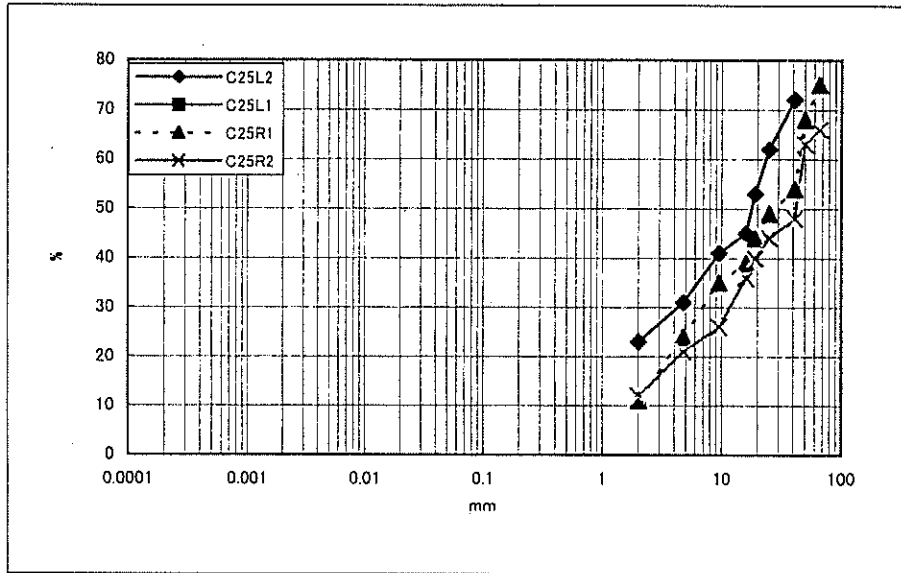


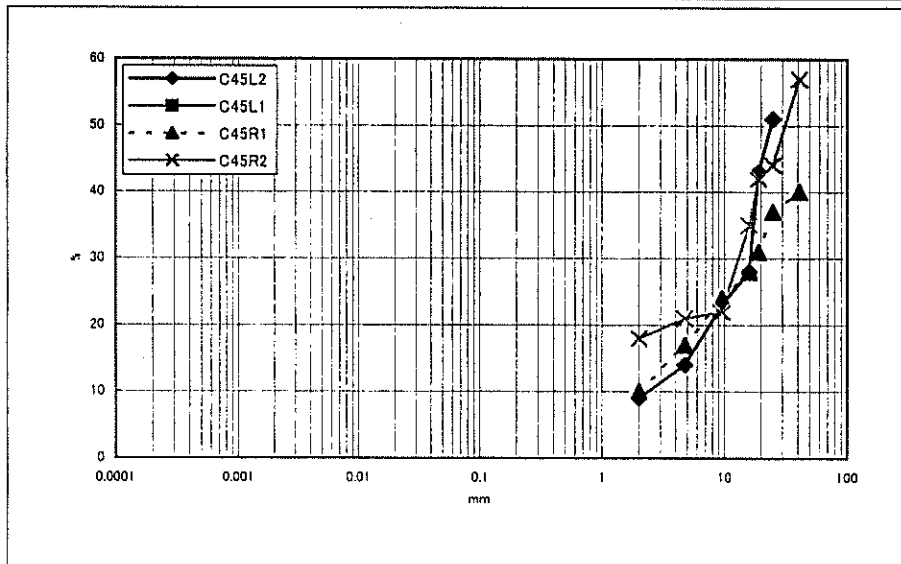
Figure D.2.1

Location of Sampling.

C25



C45



C60

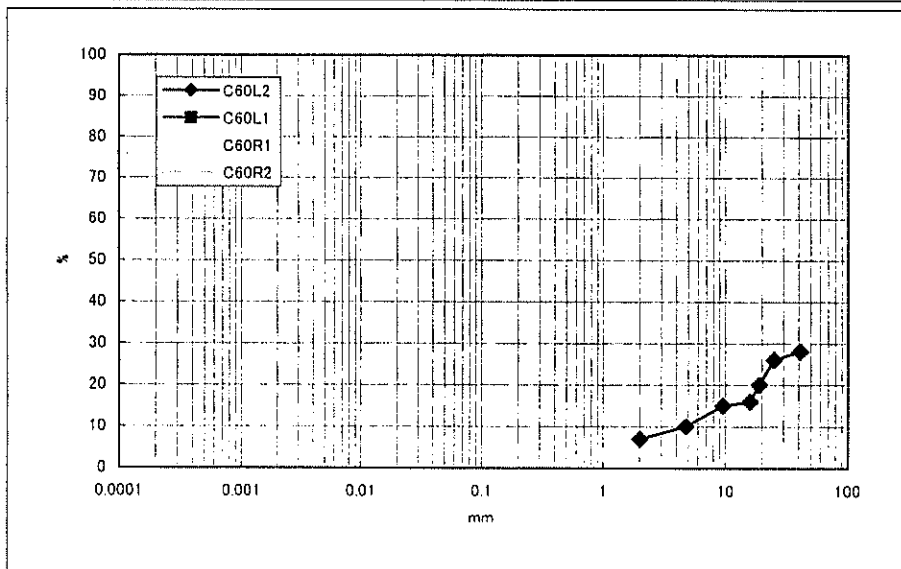
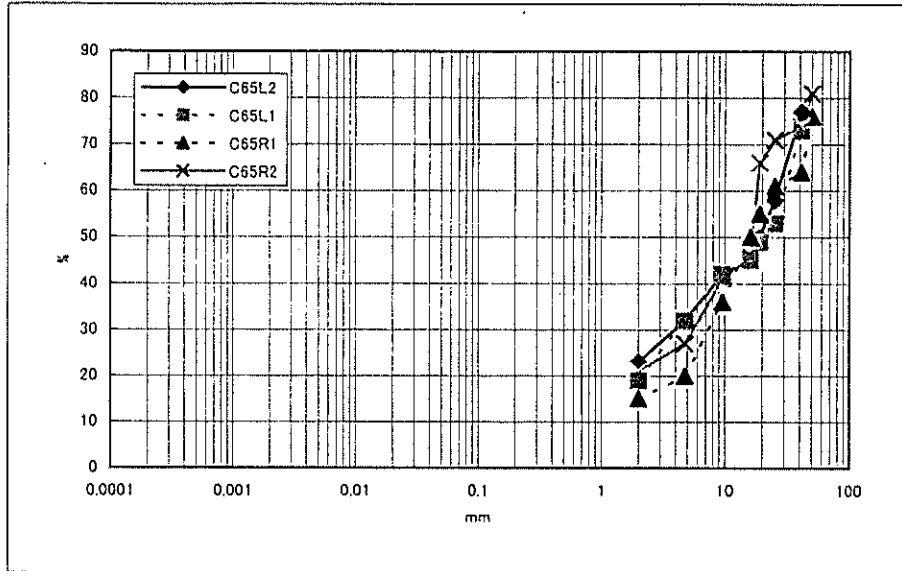


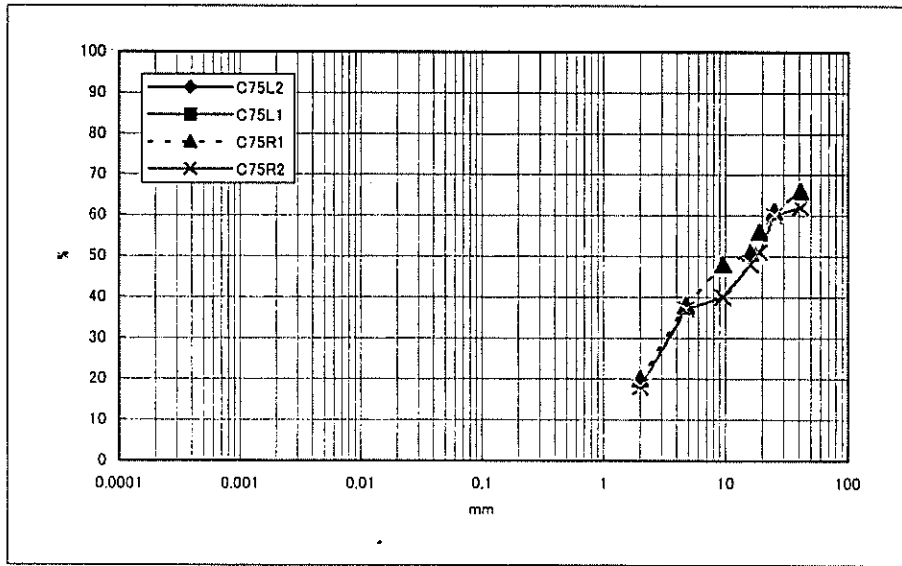
Figure D.3.1

Grading Curves of Cholteca River Bed Material (1/4)

C65



C75



C85

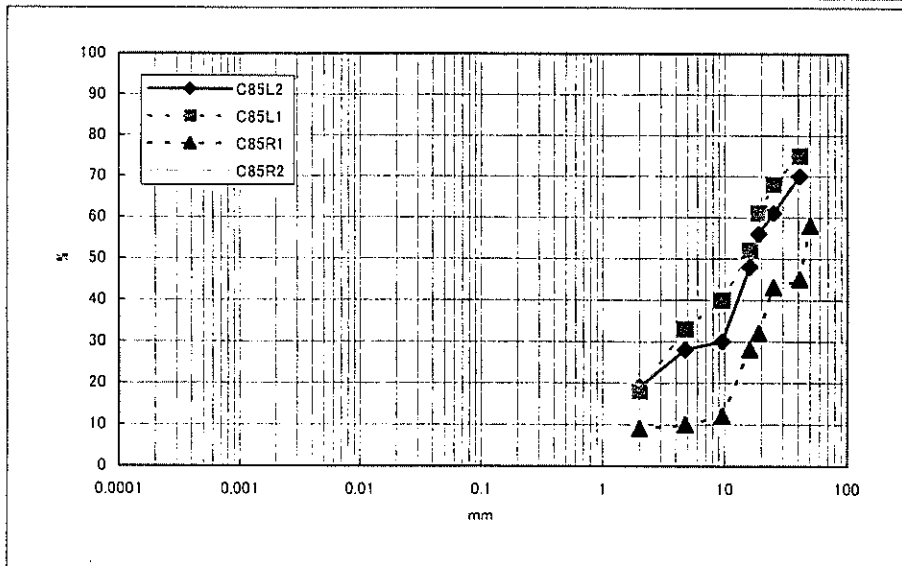
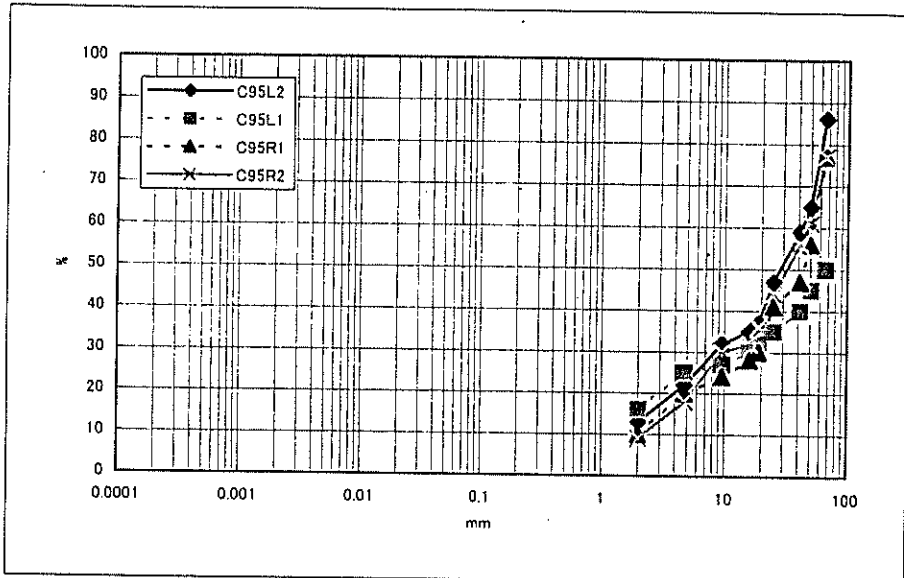


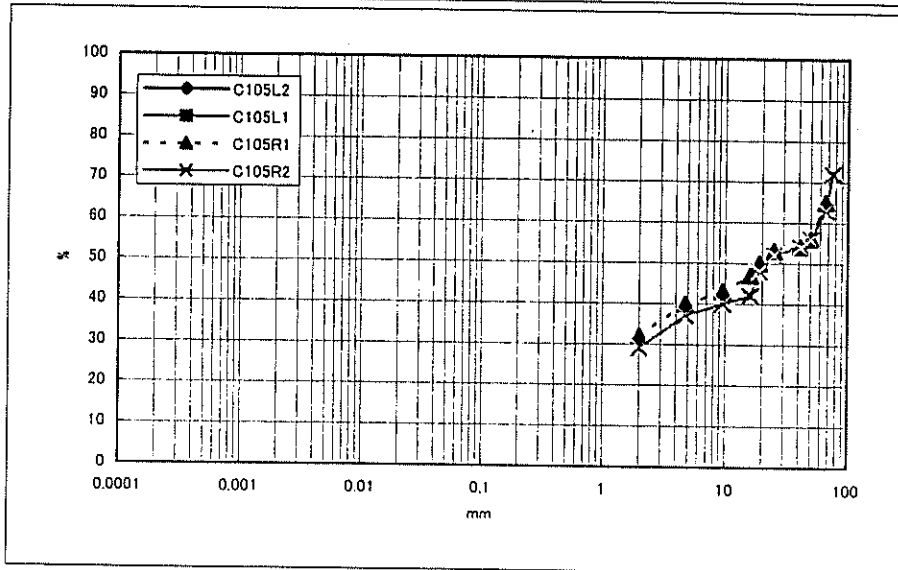
Figure D.3.2

Grading Curves of Cholteca River Bed Material (2/4)

C95



C105



C115

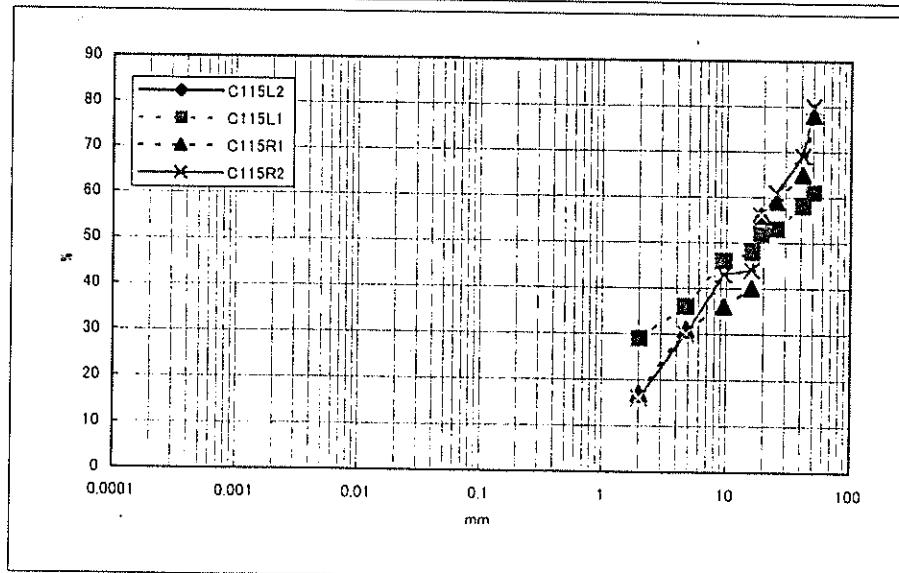
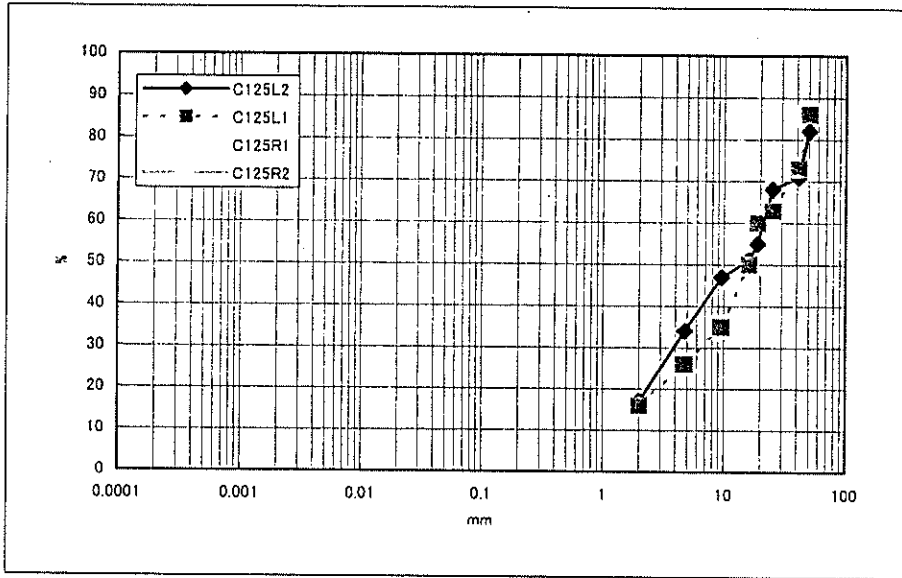


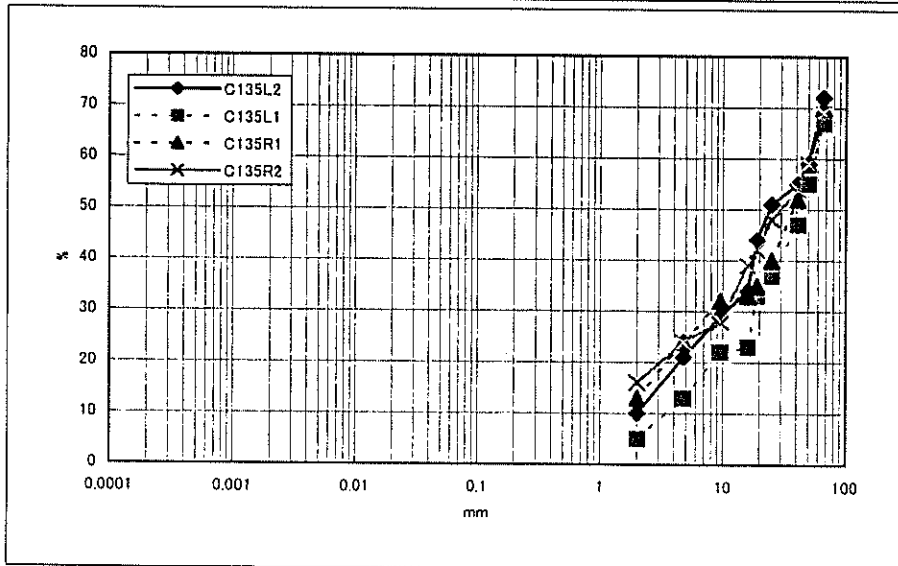
Figure D.3.3

Grading Curves of Cholteca River Bed Material (3/4)

C125



C135



C155

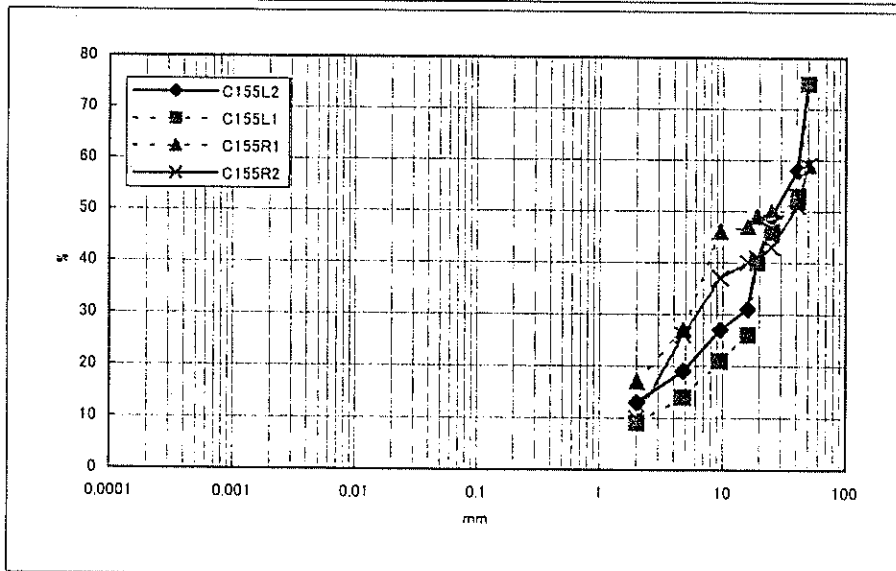
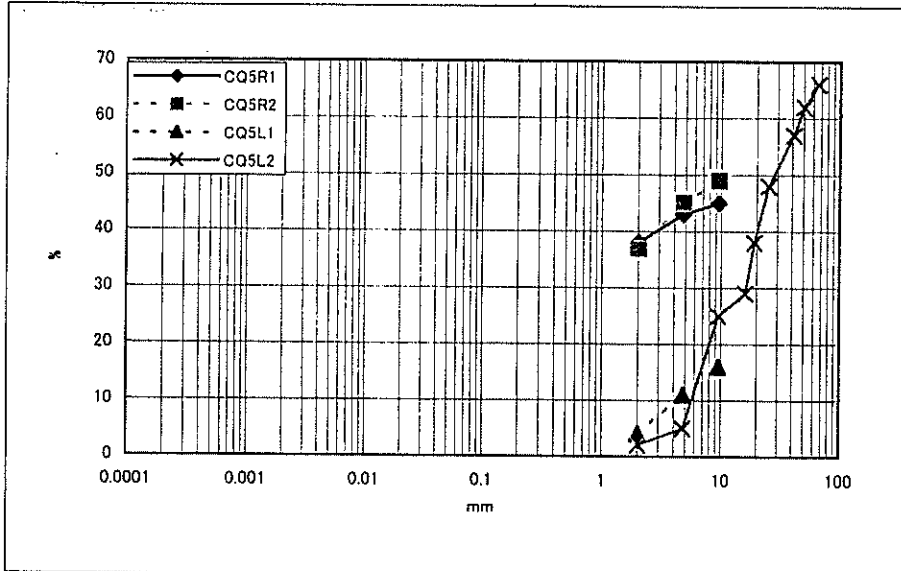


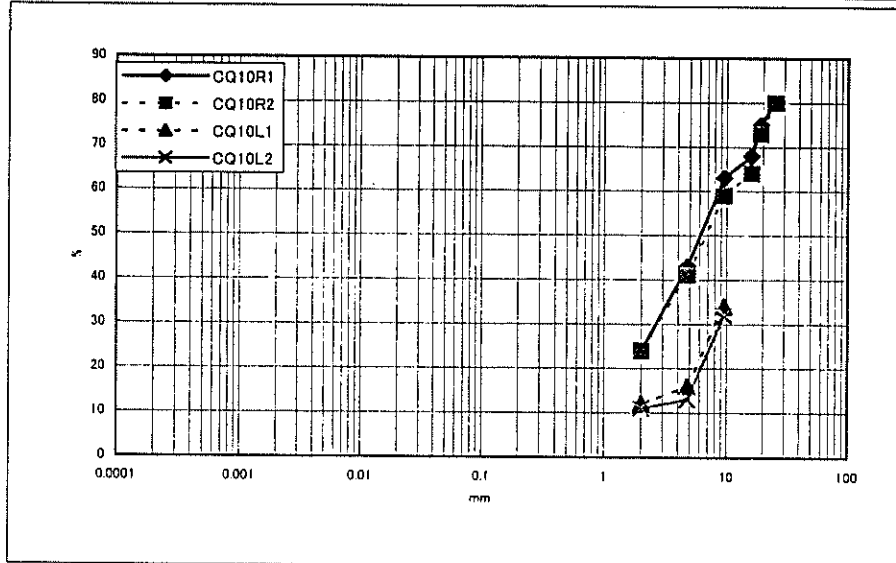
Figure D.3.4

Grading Curves of Cholteca River Bed Material (4/4)

CQ5



CQ10



CQ15

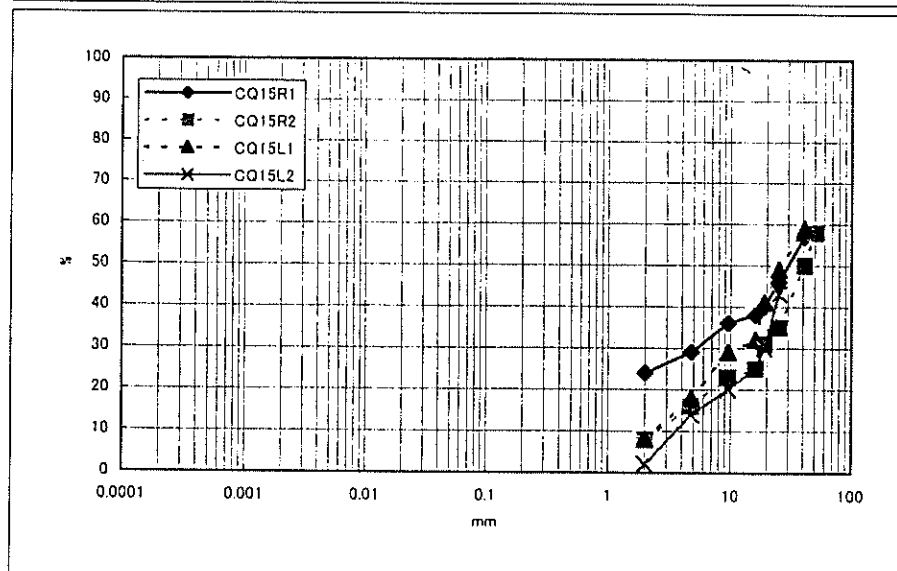


Figure D.3.5

Grading Curves of Chiquito River Bed Material

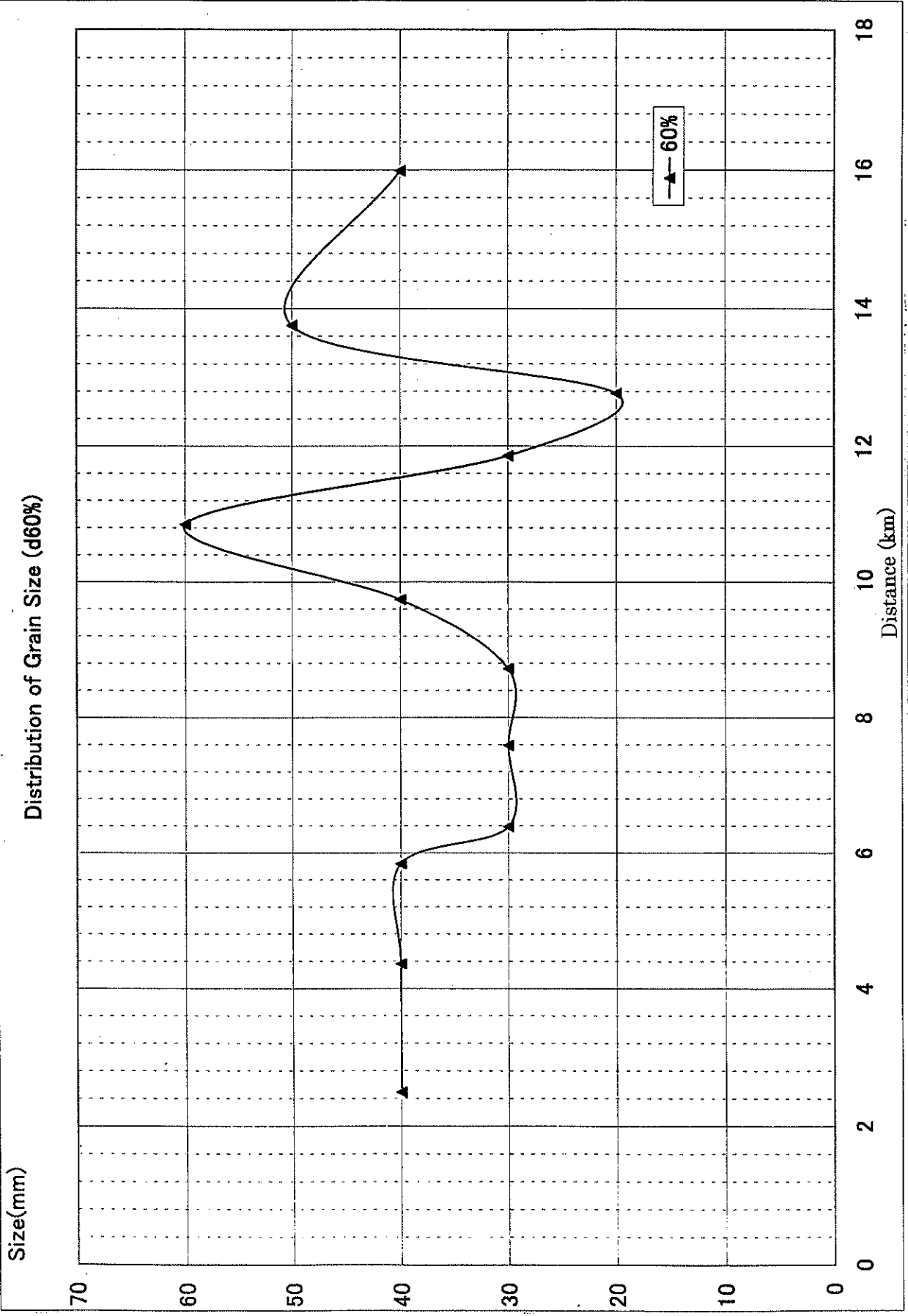


Figure D.3.6

Distribution of Grain Size along Cholteca River



Size(mm)

Grain Size (d60) of Chiquito River Bed Material

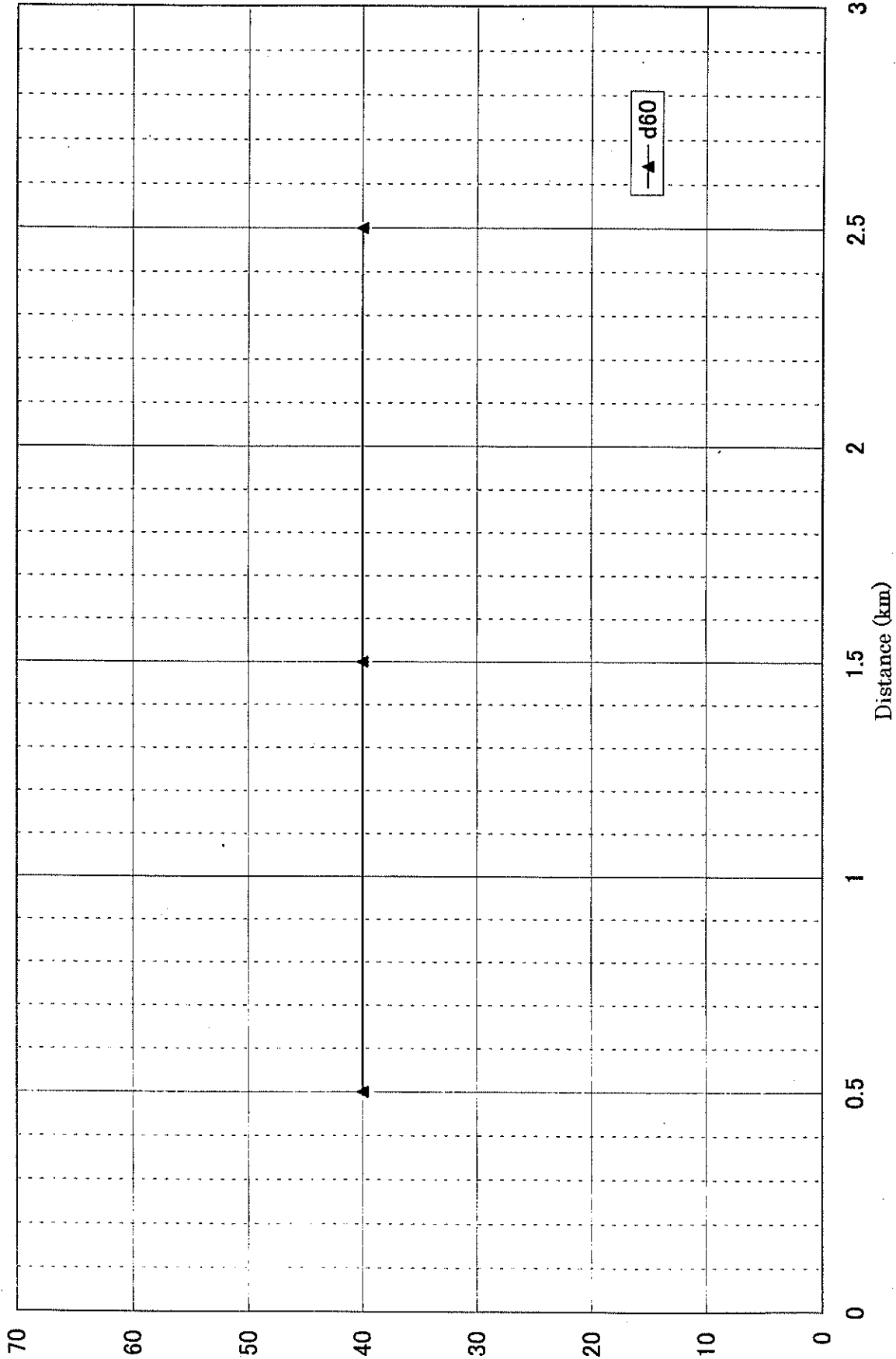


Figure D.3.7

Distribution of Grain Size along Chiquito River

Specific Gravity of Cholteca River Bed Material

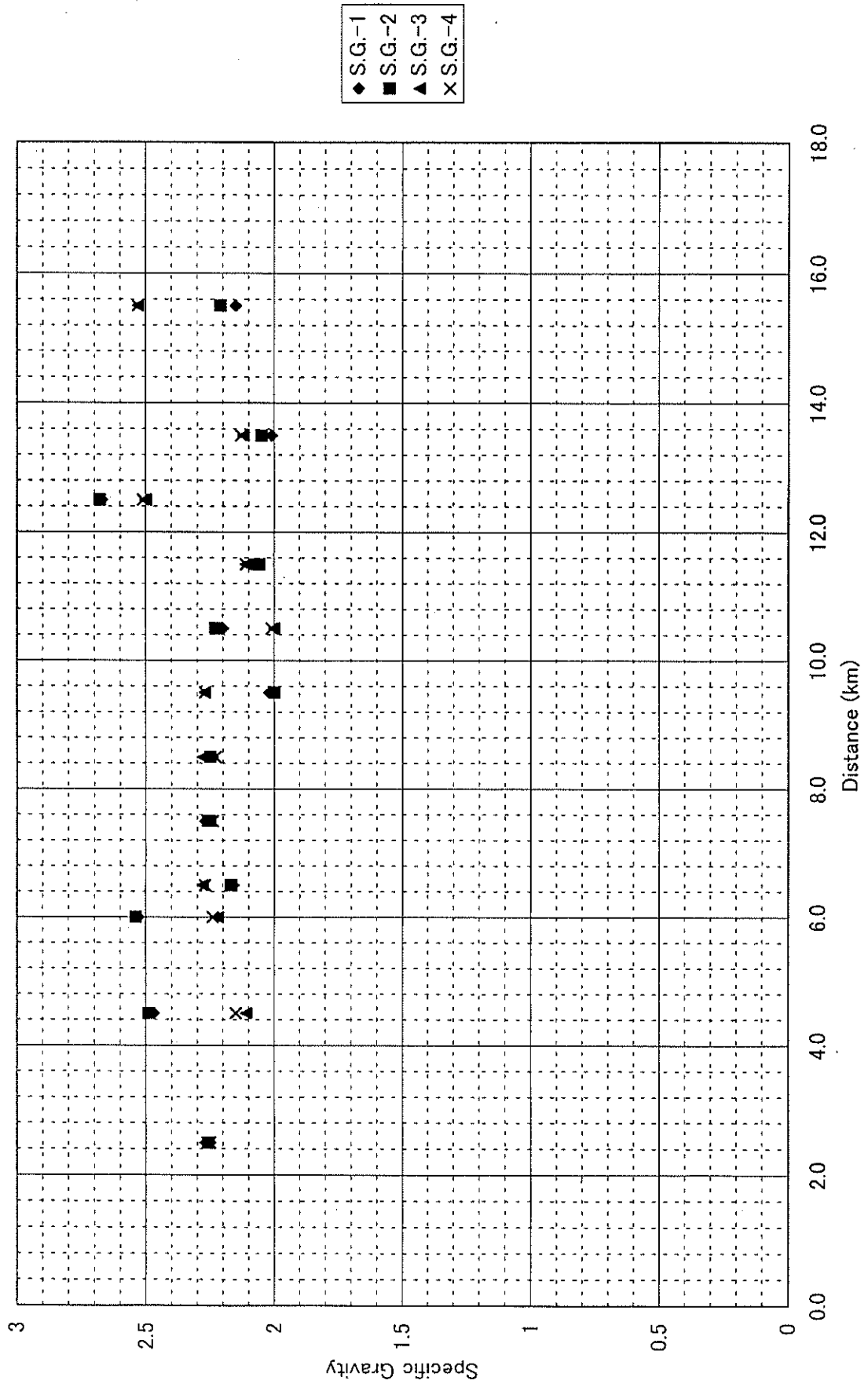


Figure D.3.8

Distribution of Specific Gravity of Cholteca River Bed Material

Specific Gravity of Chiquito River Bed Material

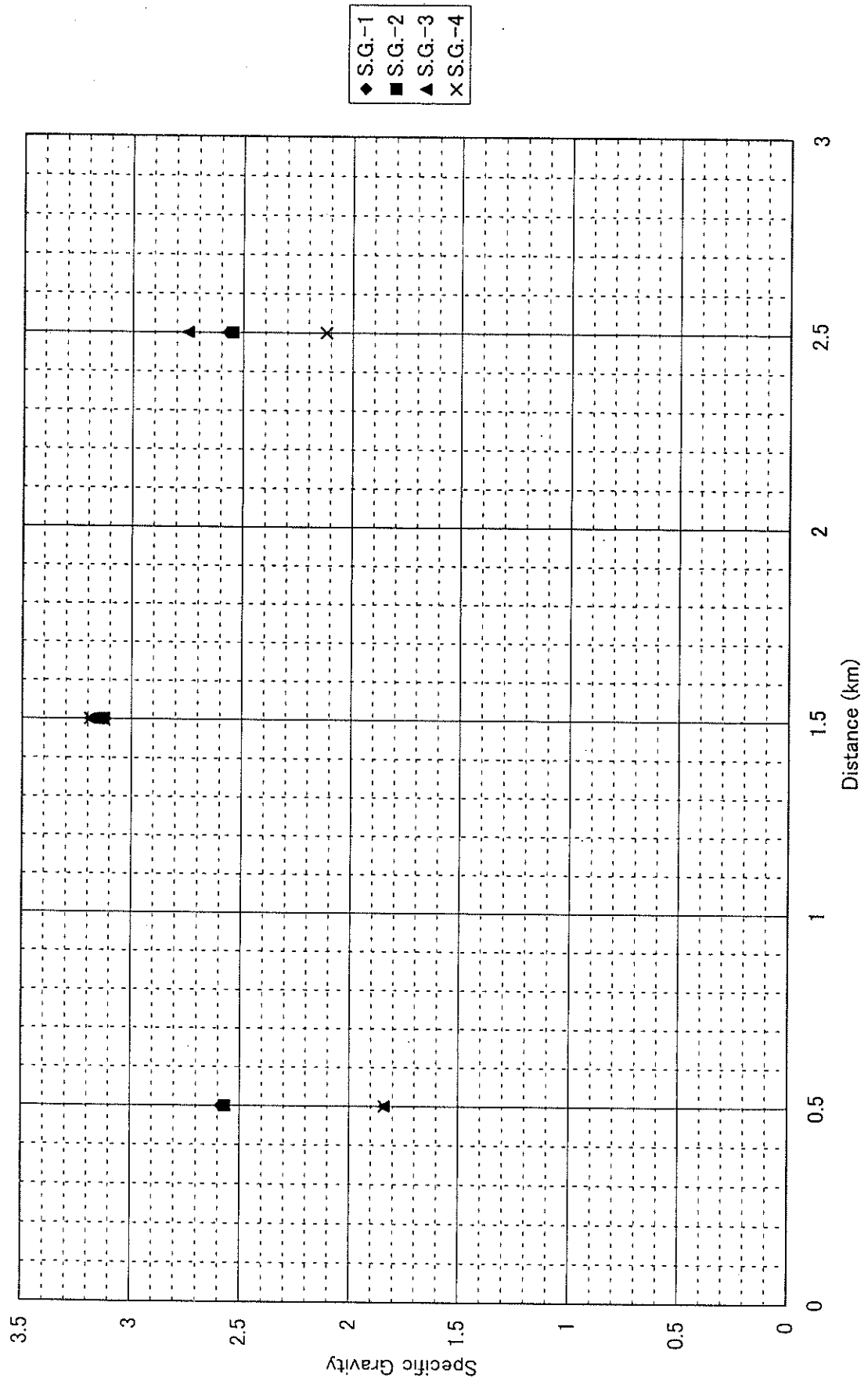


Figure D.3.9

Distribution of Specific Gravity of Chiquito River Bed Material

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