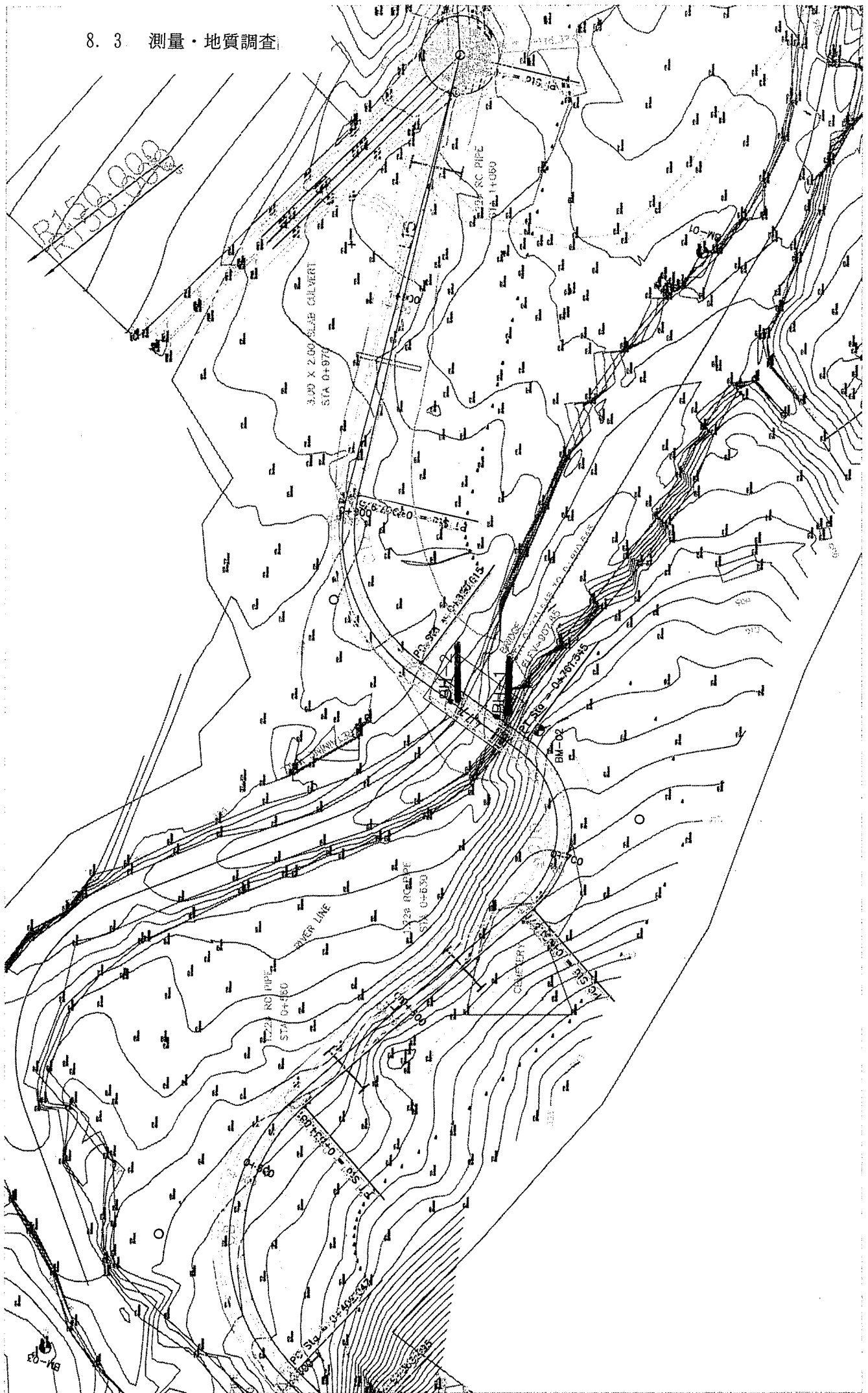


8. 3 測量・地質調査



GINDAE BRIDGE



**GENERAL DEVELOPMENT, ENGINEERING & CONSTRUCTION COMPANY, P.L.C.**  
*Civil/Environmental/Water Resources Consultants, Planners, Developers  
 and General Construction Contractors*

P. O. Box 5355 Asmara, Eritrea  
 Phone: 122440 Fax: 122275

## B O R I N G L O G

PROJECT	GINDAE BRIDGE		BOREHOLE NUMBER	BH - 1
LOCATION	GINDAE		DATE STARTED	2004/2/
CLIENT	JICA		DATE COMPLETED	2004/2/
COORDINATES	North: 1,706,800.97	East:37,510,240.99	ELEVATION (m)	899.00
DRILLING METHOD	Augering & Coring		COMPLETION DEPTH (m)	7.00
DRILL RIG TYPE	CME-550		GR. WATER LEVEL (m)	
CORE BARREL / BIT	NQ / Diamond		DRILLED / LOGGED BY	SR/ EA.
SPLIT SPOON DIA.	2.5-in. o.d.		PREPARED BY	

DESCRIPTION	SYMBOL	SAMPLE	CASING, ft	DEPTH, m	LABORATORY TEST PROPERTIES				IN-SITU PROPERTIES			REMARKS	
					NMC (%)	ATTERBERG LIMIT		STRENGTH (kPa)	Blows/15-cm N-Values	REC (%)	RQD		
						LL, (%)	PL, (%)						PI, (%)
Well-graded SAND with silt and few gravel, very dense, gray (SW-SM)				1.00	4.0	0.00	-	0.00		73	100	0	
GRANITE, high to moderately weathered, whitish with grayish spot				2.00							50	0.45	
...highly weathered				3.00									
...high to moderately weathered				4.00							82	0.40	
...extremely to highly weathered				5.00							80	0.41	
				6.00									
				7.00							41	0	

End of Boring at 7.0-m	Legend:
Note:	NV - N-Values                      q <sub>u</sub> - Unconfined Compressive Strength
	RQD - Rock Quality Designation    NP - None plastic
	REC - Recovery
This report should not be copied, divulged or reproduced without prior consent to and written approval from GEDECC-MAIN LABORATORY	
Sheet 1 of 1	



**GENERAL DEVELOPMENT, ENGINEERING & CONSTRUCTION COMPANY, P.L.C.**  
*Civil/Environmental/Water Resources Consultants, Planners, Developers  
 and General Construction Contractors*

P. O. Box 5355 Asmara, Eritrea  
 Phone: 122440 Fax: 122275

**B O R I N G L O G**

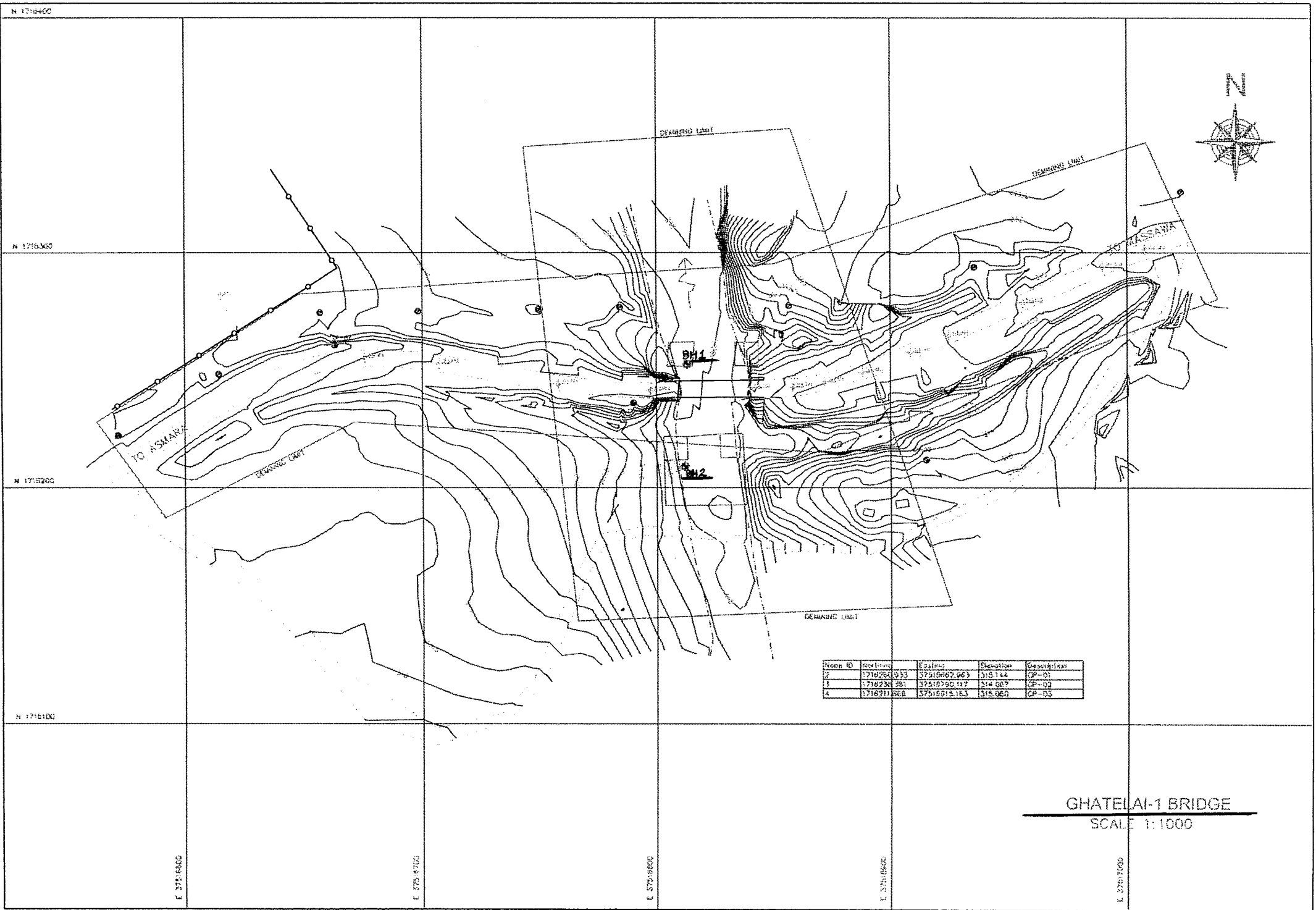
PROJECT	GINDAE BRIDGE		BOREHOLE NUMBER	BH - 2
LOCATION	GINDAE		DATE STARTED	2004/2/
CLIENT	JICA		DATE COMPLETED	2004/2/
COORDINATES	North: 1,706,821.83	East:37,510,248.13	ELEVATION (m)	901.8
DRILLING METHOD	Augering & Coring		COMPLETION DEPTH (m)	17.50
DRILL RIG TYPE	CME-550		GR. WATER LEVEL (m)	
CORE BARREL / BIT	NQ / Diamond		DRILLED / LOGGED BY	SR/ EA.
SPLIT SPOON DIA.	2.5-in. o.d.		PREPARED BY	

DESCRIPTION	SYMBOL	SAMPLE	CASING, m	DEPTH, m	LABORATORY TEST PROPERTIES				IN-SITU PROPERTIES			REMARKS	
					NMC (%)	ATTERBERG LIMIT			STRENGTH (kPa)	Blows/15-cm N-Values	REC (%)		RQD
						LL (%)	PL (%)	PI (%)					
Silty GRAVEL with few sand, very dense, gray (GM)	[Symbol: Checkerboard pattern]	[Symbol: Solid black]		1.00						100	0		
GRANITE, high to moderately weathered, intensely fractured, whitish mottled with gray. (GR)				2.00						33	0		
				3.00						56	0		
				4.00									
				5.00						42	0		
				6.00						52	0.25		
Silty SAND, gray (SM)				7.00									
				8.00						55	0.36		
				8.50									
	9.00												
	10.00						100	0					
	11.00												
...change to GRANITE @ 12.82m	[Symbol: Vertical lines]	[Symbol: Solid black]		12.00									
GRANITE, intensely fractured, highly weathered, whitish mottled with gray.				13.00						100	0		
				14.00						74	0		
				15.00									
				16.00						81	0.1		
				17.00						40	0		
				17.50									

**Note:** End of Boring at 10.0-m

**Legend:**  
 NV - N-Values                      q<sub>u</sub> - Unconfined Compressive Strength  
 RQD - Rock Quality Designation  
 REC - Recovery

*This report should not be copied, divulged or reproduced without prior consent to and written approval from GEDECC-MAIN LABORATORY*



Point ID	Northing	Easting	Elevation	Description
1	1716254.933	3751862.963	515.144	CP-01
2	1716234.881	37518790.417	514.867	CP-02
3	1716211.568	37518918.163	518.060	CP-03

**GHATELAI-1 BRIDGE**  
SCALE 1:1000



**GENERAL DEVELOPMENT, ENGINEERING & CONSTRUCTION COMPANY, P.L.C.**  
*Civil/Environmental/Water Resources Consultants, Planners, Developers  
 and General Construction Contractors*

P. O. Box 5355 Asmara, Eritrea  
 Phone: 122440 Fax: 122275

**B O R I N G L O G**

PROJECT	GAHTELAY-I BRIDGE		BOREHOLE NUMBER	BH - 1
LOCATION	GAHTELAY		DATE STARTED	09-Feb-04
CLIENT	JICA		DATE COMPLETED	13-Feb-04
COORDINATES	North: 1,716,250.98	East: b 37,516,811.18	ELEVATION (m)	309.20
DRILLING METHOD	Augering & Coring		COMPLETION DEPTH (m)	4.00
DRILL RIG TYPE	CME-550		GR. WATER LEVEL (m)	
CORE BARREL / BIT	NQ / Diamond		DRILLED / LOGGED BY	SR/ EA.
SPLIT SPOON DIA.	2.5-in. o.d.		PREPARED BY	

DESCRIPTION	SYMBOL	SAMPLE	CASING, ft	DEPTH, m	LABORATORY TEST PROPERTIES				IN-SITU PROPERTIES			REMARKS
					NMC (%)	ATTERBERG LIMIT		STRENGTH (kPa)	Blows/15-cm N-Values	REC (%)	RQD	
						LL, (%)	PL, (%)					
Heavy boulders, difficult to penetrate with Auger head	◆◆◆◆◆			1.00						30	0	
Boulder, the diameter of about 30 to 70 cm, smooth surface without cracks and slight greenish gray color granite.				2.50						35	0	
				4.00							38	0

**Note:** End of Boring at 4.0-m

**Legend:**  
 NV - N-Values                      q<sub>u</sub> - Unconfined Compressive Strength  
 RQD - Rock Quality Designation    NP - None plastic  
 REC - Recovery



**GENERAL DEVELOPMENT, ENGINEERING & CONSTRUCTION COMPANY, P.L.C.**  
*Civil/Environmental/Water Resources Consultants, Planners, Developers  
 and General Construction Contractors*

P. O. Box 5355 Asmara, Eritrea  
 Phone: 122440 Fax: 122275

## B O R I N G L O G

PROJECT	GAHTELAY-I BRIDGE		BOREHOLE NUMBER	BH - 2
LOCATION	GAHTELAY		DATE STARTED	20-Feb-04
CLIENT	JICA		DATE COMPLETED	28-Feb-04
COORDINATES	North: 1,716,207.25	East: 37,516,810.11	ELEVATION (m)	309.79
DRILLING METHOD	Augering & Coring		COMPLETION DEPTH (m)	10.00
DRILL RIG TYPE	CME-550		GR. WATER LEVEL (m)	
CORE BARREL / BIT	NQ / Diamond		DRILLED / LOGGED BY	SR/ EA.
SPLIT SPOON DIA.	2.5-in. o.d.		PREPARED BY	

DESCRIPTION	SYMBOL	SAMPLE	CASING, m	DEPTH, m	LABORATORY TEST PROPERTIES				IN-SITU PROPERTIES			REMARKS	
					NMC (%)	ATTERBERG LIMIT			STRENGTH (kPa)	Blows/15-cm N-Values	REC (%)		RQD
						LL, (%)	PL, (%)	PI, (%)					
Excavated boulders, replaced by Auger and surrounded by sandy soil for easy penetration.  Boulder, the diameter of about 30 to 70 cm, smooth surface without cracks and slight greenish gray color granite.	◆◆◆◆◆			1.00									
				2.00									
				3.00									
				4.00									
				5.00									
Deposites of aged river flow having thick boulder layer, with repetitive caving, difficult to recover samples.  Boulder, the diameter of about 30 to 50 cm, smooth surface without cracks and slight greenish gray color granite.	◆◆◆◆◆			6.00					CORING	10	0		
				7.50					CORING	18	0		
				9.00					CORING	12	0		
				10.00					CORING	23	0		

<p><b>Note:</b> End of Boring at 10.0-m</p>	<p><b>Legend:</b>          NV - N-Values                      q<sub>u</sub> - Unconfined Compressive Strength          RQD - Rock Quality Designation          REC - Recovery</p>
<i>This report should not be copied, divulged or reproduced without prior consent to and written approval from GEDECC-MAIN LABORATORY</i>	
Sheet 1 of 1	



N 1725000

N 1724000

N 1724800

E 37553700

E 37553200

E 37552700

E 37553000

E 37553500

E 37554000

DEMING LIMIT

DEMING LIMIT

DEMING LIMIT

DEMING LIMIT

ASMARA

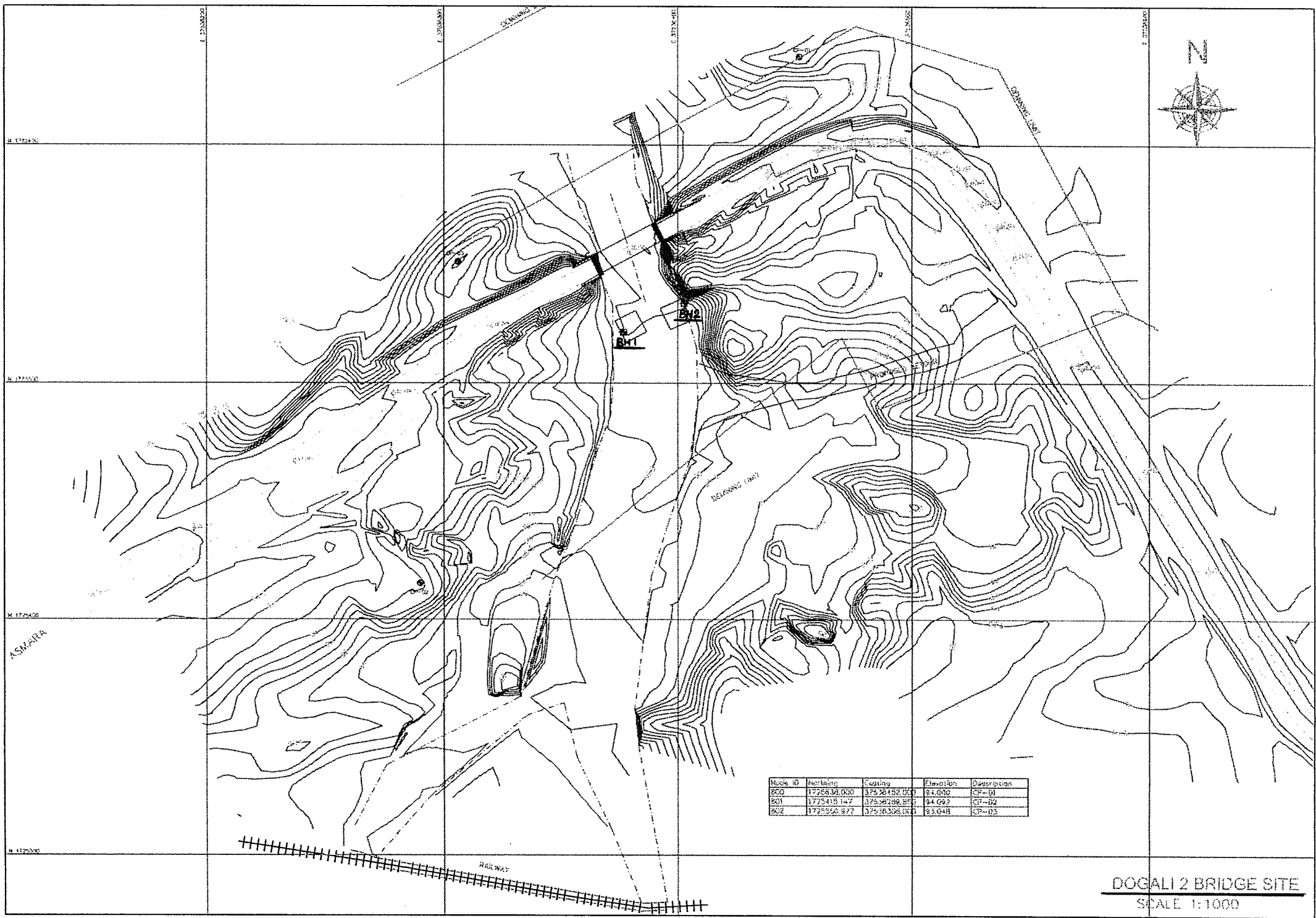
HELELANI

MASSEWA

CIRCULAR CONC.

Node ID	Northing	Easting	Elevation	Description
892	1734809.000	37532658.000	105.000	CP-01
895	1734846.433	37533003.882	104.632	CP-02

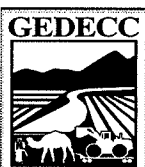
DOGALI 1 BRIDGE  
SCALE 1:1000



Node ID	Northing	Easting	Elevation	Description
B00	1725834.000	37526492.000	8.4000	SP-01
B01	1725415.147	37526498.873	84.092	SP-02
B02	1725500.977	37526320.000	83.048	SP-03

**DOGALI 2 BRIDGE SITE**  
SCALE 1:1000





**GENERAL DEVELOPMENT, ENGINEERING & CONSTRUCTION COMPANY, P.L.C.**  
*Civil/Environmental/Water Resources Consultants, Planners, Developers  
 and General Construction Contractors*

P. O. Box 5355 Asmara, Eritrea  
 Phone: 122440 Fax: 120629

## B O R I N G L O G

PROJECT	DOGALI-II BRIDGE		BOREHOLE NUMBER	BH - 1
LOCATION	DOGALI		DATE STARTED	19-Feb-04
CLIENT	JICA		DATE COMPLETED	20-Feb-04
COORDINATES	North: 1,725,521.82	East: 37,586,376.7	ELEVATION (m)	88.013
DRILLING METHOD	Augering & Coring		COMPLETION DEPTH (m)	11.50
DRILL RIG TYPE	CME-550		GR. WATER LEVEL (m)	9.0
CORE BARREL / BIT	NQ / Diamond		DRILLED / LOGGED BY	SR/ EA.
SPLIT SPOON DIA.	2.5-in. o.d.		PREPARED BY	

DESCRIPTION	SYMBOL	SAMPLE	CASING, ft	DEPTH, ft	LABORATORY TEST PROPERTIES				IN-SITU PROPERTIES			REMARKS		
					NMC (%)	ATTERBERG LIMIT		STRENGTH (kPa)	Blows/15-cm N-Values		REC (%)		RQD	
						LL, (%)	PL, (%)		PI, (%)					
Fragments of highly weathered out crop rock, volcanic rock of Basaltic origin.	[Symbol: Dotted pattern]	[Symbol: Solid black]	[Symbol: Solid black]	1.00					16	27	39	100		
SC- Clayey sand with gravel.				2.00	12.05	39.8	20.85	18.95	9	32	35	67	100	
				3.00					31	52	50	102	100	
The soil color is clear brown.				4.00					26	40	50	90	100	
				5.00	32.98	65.75	27.68	38.07	3	10	10	20	100	
Cohesive soil mixed with fragments of weathered rock.				6.00	32.68	70.75	38.54	32.21	8	10	14	24	100	
CH- Sandy fat clay with little gravel.														
MH- Sandy elastic clay, is light brown.														
Top of highly weathred basaltic bed rock, slight brownish gray color				7.50					35	46	50	96	70	
The top of fractured basaltic rock with about 1.0m thick.												CORING		
Basement rock of basalt, clear dark gray, smooth surface without cracks. The produced core cylinders during sampling at the site have a maximum length of 15 to 20cm.				9.00									37	0.04
	10.50									77	0.06			
	11.50									85	0.40			

<p>End of Boring at 11.50-m</p> <p>Note:</p>	<p><b>Legend:</b></p> <p>NV - N-Values                      q<sub>u</sub> - Unconfined Compressive Strength</p> <p>RQD - Rock Quality Designation    NP - None plastic</p> <p>REC - Recovery</p>
--	--



**GENERAL DEVELOPMENT, ENGINEERING & CONSTRUCTION COMPANY, P.L.C.**  
*Civil/Environmental/Water Resources Consultants, Planners, Developers*  
*and General Construction Contractors*

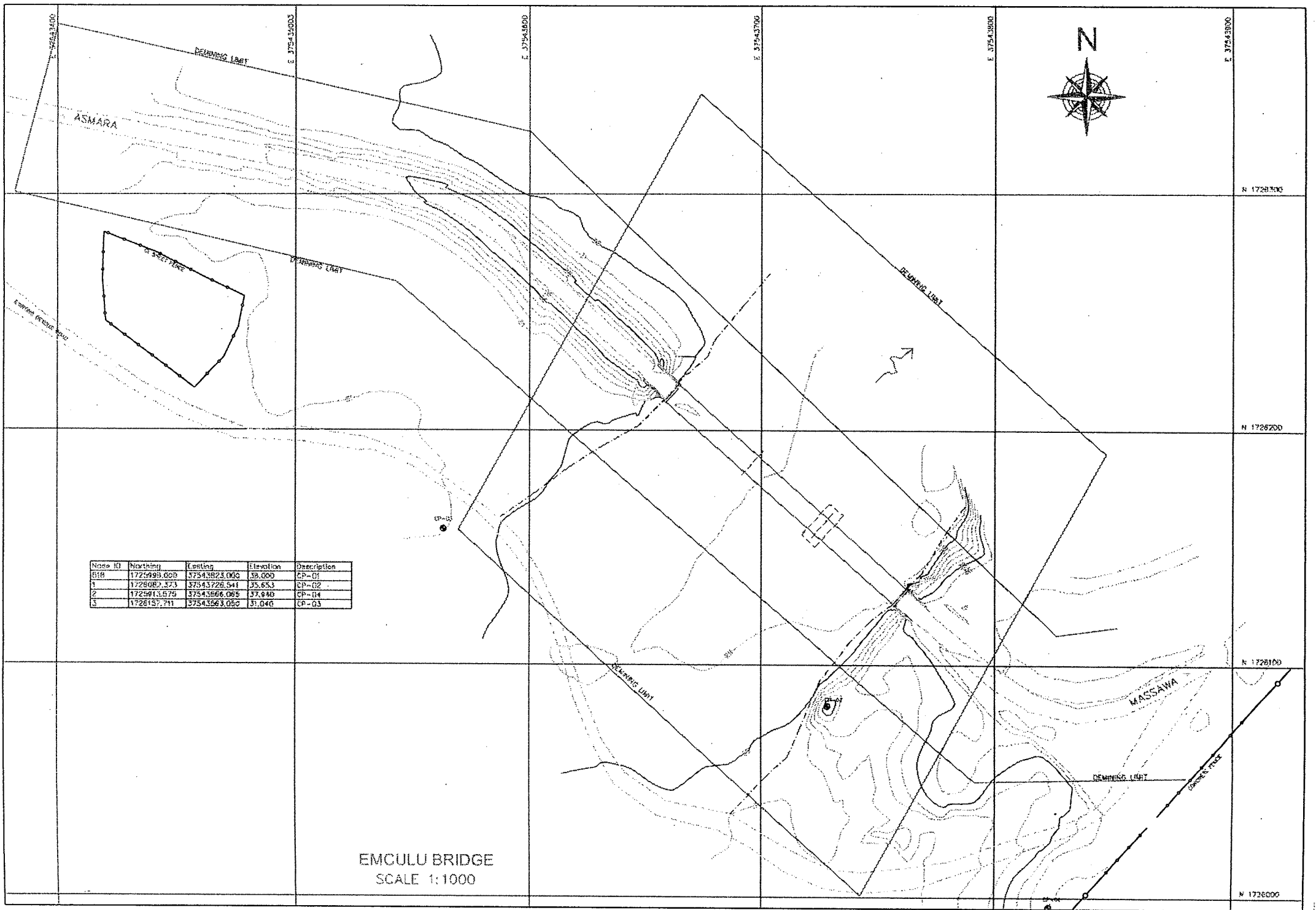
P. O. Box 5355 Asmara, Eritrea  
 Phone: 122440 Fax: 120629

**B O R I N G L O G**

PROJECT	DOGALI-II BRIDGE		BOREHOLE NUMBER	BH - 2
LOCATION	DOGALI		DATE STARTED	09-Feb-04
CLIENT	JICA		DATE COMPLETED	18-Feb-04
COORDINATES	North: 1,725,533.6	East: 37,536,402.73	ELEVATION (m)	88.055
DRILLING METHOD	Augering & Coring		COMPLETION DEPTH (m)	13.50
DRILL RIG TYPE	CME-550		GR. WATER LEVEL (m)	9.0
CORE BARREL / BIT	NQ / Diamond		DRILLED / LOGGED BY	SR/ EA.
SPLIT SPOON DIA.	2.5-in. o.d.		PREPARED BY	

DESCRIPTION	SYMBOL	SAMPLE	CASING, ft	DEPTH, m	LABORATORY TEST PROPERTIES				IN-SITU PROPERTIES			REMARKS		
					NMC (%)	ATTERBERG LIMIT			STRENGTH (kPa)	Blows/15-cm N-Values			REC (%)	RQD
						LL, (%)	PL, (%)	PI, (%)						
River deposits.				1.00					10   22   26		48	100		
Highly weathered basement rock with cohesive soils CH- Sandy fat clay with traces of gravel. The soil color is clear brown.				2.00	20.19	53.8	24.68	29.12		3   19   27		46	100	
SC- Clayey sand with traces of gravel.				3.00	21.11	47.8	23.61	24.19		18   42   52		94	100	
Weathered basalt and some interbedding clay, dark brown color and a maximum thickness of 10 to 15cm.				4.50								CORING	47	0.00
Weathered top of bed rock having basaltic origine and sand stone with some interbedding clay. The clay has brown color and sandy stone has slight greenish gray color. The core cylinders during sampling at the site have a maximum 10 to 15cm.				6.00								CORING	73	0.16
				7.50								CORING	37	0.17
The top of fractured basaltic rock with about 2.0m thick. Basement rock of basalt, clear dark gray, smooth surface without cracks. The produced core cylinders during sampling at the site have a maximum length of 20 to 25cm.				9.00								CORING	43	0.00
				10.50								CORING	86	0.47
				12.00								CORING	83	0.3
				13.50								CORING	90	0.63

<b>Note:</b> End of Boring at 13.50-m	<b>Legend:</b>
	NV - N-Values    q <sub>u</sub> - Unconfined Compressive Strength
	RQD - Rock Quality Designation
	REC - Recovery
<i>This report should not be copied, divulged or reproduced without prior consent to and written approval from GEDECC-MAIN LABORATORY</i>	
Sheet 1 of 1	



Point ID	Northing	Easting	Elevation	Description
BIB	1725990.000	37543823.000	39.000	CP-01
1	1725982.373	37543726.541	35.653	CP-02
2	1725913.575	37543666.065	37.940	CP-04
3	1726157.711	37543563.050	31.040	CP-03

EMCULU BRIDGE  
SCALE 1:1000

## 8. 4 目視観察調査による健全度評価

### 1. 目視観察調査

#### 1-1. 健全性調査の流れ

健全性調査は下図のフローにしたがい、橋梁の最終的な健全性を判定した。

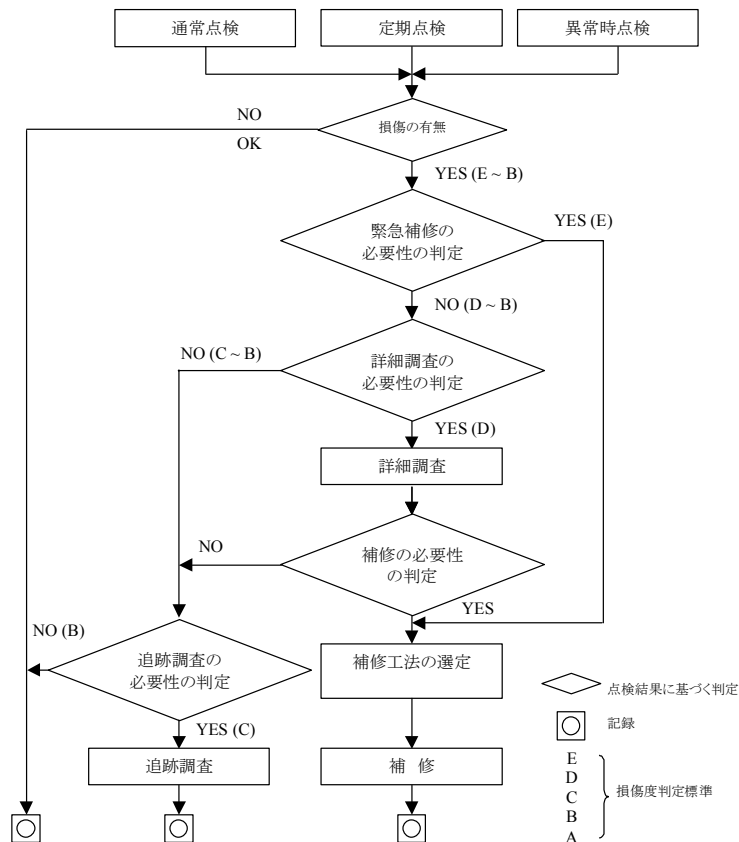


図 1-1 健全性の流れ

表 1-1 損傷度判定標準

判定区分	一般的状況
E	損傷が著しく、交通安全確保、又は、第三者に対し、支障となっているか、もしくはその恐れがあり、緊急補修の必要がある。
D	損傷が大きく、詳細調査を実施し補修するかどうかの検討を行なう必要がある。
C	損傷が認められ、追跡調査を行なう必要がある。
B	損傷が認められ、その程度を記録する必要がある。
A	点検の結果からは、損傷は認められない。

出典：既設橋梁の耐久性評価・向上技術に関する調査研究（建設省土木研究所）

## 1-2. 評価方法

目視点検による橋梁の健全度評価は、次の手順に従って実施した。

- ①調査シートを基に損傷・劣化を調査し、各チェック項目毎に5段階の評点を算定する。
- ②①の評価を基に、橋梁の部材毎の健全性評点を算定する。
- ③②の健全性評点を基に、総合評価判定式を使って耐久性 ( $\alpha$ ) および耐荷力 ( $\beta$ ) を算定する。
- ④ $\alpha$  値と  $\beta$  値を総合評価判定図にプロットし、橋梁としての健全度を判定する。

(調査シート)

STRUCTURAL CONDITION CHECKLIST DURING PERIODICAL INSPECTION													
KEY: _____		NAME OF BRIDGE/RIVER: _____			STATE: _____		DISTRICT: _____		SPAN NO.: _____				
NO.1 SUPERSTRUCTURE (CONCRETE BEAM/GIRDER, DECK AND BEARING)													
MATERIAL	MEMBER	CODE	TYPE OF DAMAGES	PATTERNS (X)	DEPTH (Y)	EXTENTIONS (Z)	RATING OF DAMAGE	RATING OF MEMBER					
* B E A M / G I R D E R	CONCRETE	Main Girder* <input type="checkbox"/> (Main Structure)	Mc	<input type="checkbox"/> (7)Crack	<input type="checkbox"/> Critical <input type="checkbox"/> Uncritical	<input type="checkbox"/> Wide Line <input type="checkbox"/> Hair Line	<input type="checkbox"/> Interval<50cm <input type="checkbox"/> Interval>50cm						
				<input type="checkbox"/> (8)Flaking, Rebar exposure	-	<input type="checkbox"/> Rebar Corroded <input type="checkbox"/> Flaking Only	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m						
				<input type="checkbox"/> (9)Free Lime	-	-	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m						
				<input type="checkbox"/> (21)Deterioration	-	-	<input type="checkbox"/> Widely <input type="checkbox"/> Locally						
				<input type="checkbox"/> (22)Water Leak	-	<input type="checkbox"/> Detected	-						
				<input type="checkbox"/> (24)Abnormal Vibration	-	<input type="checkbox"/> Detected	-						
	<input type="checkbox"/> (25)Abnormal Deflection	-	<input type="checkbox"/> Detected	-									
	<input type="checkbox"/> (32)Defect (Section Loss)	-	<input type="checkbox"/> Remarkable <input type="checkbox"/> Slight	-									
	CONCRETE	Cross Beam* <input type="checkbox"/>	Cc	<input type="checkbox"/> (7)Crack	<input type="checkbox"/> Critical <input type="checkbox"/> Uncritical	<input type="checkbox"/> Wide Line <input type="checkbox"/> Hair Line	<input type="checkbox"/> Interval<50cm <input type="checkbox"/> Interval>50cm						
				<input type="checkbox"/> (8)Flaking, Rebar exposure	-	<input type="checkbox"/> Rebar Corroded <input type="checkbox"/> Flaking Only	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m						
				<input type="checkbox"/> (9)Free Lime	-	-	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m						
				<input type="checkbox"/> (21)Deterioration	-	-	<input type="checkbox"/> Widely <input type="checkbox"/> Locally						
<input type="checkbox"/> (22)Water Leak				-	<input type="checkbox"/> Detected	-							
<input type="checkbox"/> (32)Defect (Section Loss)				-	<input type="checkbox"/> Remarkable <input type="checkbox"/> Slight	-							
CONCRETE	Vertical Hanger* <input type="checkbox"/>	Sc	<input type="checkbox"/> (7)Crack	<input type="checkbox"/> Critical <input type="checkbox"/> Uncritical	<input type="checkbox"/> Wide Line <input type="checkbox"/> Hair Line	<input type="checkbox"/> Interval<50cm <input type="checkbox"/> Interval>50cm							
			<input type="checkbox"/> (8)Flaking, Rebar exposure	-	<input type="checkbox"/> Rebar Corroded <input type="checkbox"/> Flaking Only	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m							
			<input type="checkbox"/> (9)Free Lime	-	-	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m							
			<input type="checkbox"/> (21)Deterioration	-	-	<input type="checkbox"/> Widely <input type="checkbox"/> Locally							
			<input type="checkbox"/> (22)Water Leak	-	<input type="checkbox"/> Detected	-							
			<input type="checkbox"/> (32)Defect (Section Loss)	-	<input type="checkbox"/> Remarkable <input type="checkbox"/> Slight	-							
CONCRETE	Deck Slab* <input type="checkbox"/>	Dc	<input type="checkbox"/> (8)Flaking, Rebar exposure	-	<input type="checkbox"/> Rebar Corroded <input type="checkbox"/> Flaking Only	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m							
			<input type="checkbox"/> (12)Slipping Off	-	<input type="checkbox"/> Detected	-							
			<input type="checkbox"/> (14)Cracks	<input type="checkbox"/> 2 ways <input type="checkbox"/> 1 way	<input type="checkbox"/> Rust Liquid <input type="checkbox"/> Water Leak <input type="checkbox"/> Crack Only	<input type="checkbox"/> Interval<50cm <input type="checkbox"/> Interval>50cm							
			<input type="checkbox"/> (21)Deterioration	-	-	<input type="checkbox"/> Widely <input type="checkbox"/> Locally							
			<input type="checkbox"/> (22)Water Leak	-	<input type="checkbox"/> Detected	-							
			<input type="checkbox"/> (32)Defect (Section Loss)	-	<input type="checkbox"/> Remarkable <input type="checkbox"/> Slight	-							
* B E A R I N G	CONCRETE	Main Body* <input type="checkbox"/>	Bc	<input type="checkbox"/> (7)Crack	<input type="checkbox"/> Critical <input type="checkbox"/> Uncritical	<input type="checkbox"/> Wide Line <input type="checkbox"/> Hair Line	<input type="checkbox"/> Interval<50cm <input type="checkbox"/> Interval>50cm						
				<input type="checkbox"/> (8)Flaking, Rebar exposure	-	<input type="checkbox"/> Rebar Corroded <input type="checkbox"/> Flaking Only	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m						
				<input type="checkbox"/> (9)Free Lime	-	-	<input type="checkbox"/> Damaged Area>0.1 sq.m <input type="checkbox"/> Damage Area<0.1sq.m						
				<input type="checkbox"/> (4)Falling Off (B/R)	-	-	<input type="checkbox"/> Many <input type="checkbox"/> Few						
				<input type="checkbox"/> (5)Rupture	-	<input type="checkbox"/> Detected	-						
				<input type="checkbox"/> (22)Ponding Water	-	<input type="checkbox"/> Detected	-						
				<input type="checkbox"/> (27)Sediment/Vegetation	-	<input type="checkbox"/> Remarkable <input type="checkbox"/> Slight	-						
				<input type="checkbox"/> (28)Settlement	-	<input type="checkbox"/> Remarkable <input type="checkbox"/> Slight	-						
				Note: Member with * and without * is main member and secondary member respectively Field Notes _____ Simple Diagram of Span Arrangement (To provide Span No. & Pier No. (P) in case of Multi span bridge) To( ) -----To( ) (A1) (A2)									

図 1-2 橋梁点検調査シート (NO.1 上部構造)

(総合評価判定式)

$$\begin{aligned}
 \text{耐久性 } (\alpha) &= a_1^{b1} * a_2^{b2} * a_3^{b3} * a_4^{b4} * a_5^{b5} * a_6^{b6} * a_7^{b7} * a_8^{b8} * a_9^{b9} \\
 &= a_1^{30} * a_2^3 * a_3^3 * a_4^{10} * a_5 * a_6^3 * a_7^3 * a_8^3 * a_9^3 \\
 \\ 
 \text{耐荷力 } (\beta) &= a_{10}^{b10} * a_{11}^{b11} * a_{12}^{b12} \\
 &= a_{10}^2 * a_{11} * a_{12}
 \end{aligned}$$

ai : 評価因子    bi : 重み係数

出典：東京都建設局

なお、総合評価判定式に代入する評価因子[ai]および重み係数[bi]別の評点は、次表に準拠した。

表 1 - 2 重み係数および評価因子別の評点

	Evaluation Items	i	Grade each members [ai]		Weight Coefficient [bi]
Durability (α)	Main Girder	1	1 to 5		30
	Cross Beam	2	1 to 5		3
	Vertical Hanger	3	1 to 5		3
	Deck Slab	4	1 to 5		10
	Bearing	5	1 to 5		1
	Abutment Body	6	1 to 5		3
	Abutment Foundation	7	1 to 5		3
	Pier Body	8	1 to 5		3
	Pier Foundation	9	1 to 5		3
Carrying Capacity (β)	Maximum Vehicle Load (ton)	10	- 20	1	2
			20 - 50	1.5	
			50 -	1.6	
	Traffic Volume (car/day)	11	- 4000	1	1
			4000 - 8000	2	
			8000 - 12000	3	
			12000 -	4	
	Service Life (year)	12	1975 -	1	1
			1950 - 1975	2	
			1925 - 1950	3	
			- 1925	4	

出典：橋梁の点検要領（東京都建設局）

### 1-3. 判定結果

各橋梁で行なった橋梁の健全性を評価する耐久性 ( $\alpha$ ) および耐荷力 ( $\beta$ ) の算定結果を下表に示す。

表 1-3 耐久性 ( $\alpha$ ) および耐荷力 ( $\beta$ ) の算定結果

No.	Name of Bridge	Durability ( $\alpha$ )	Carrying Capacity ( $\beta$ )
1	Gindae	3.35E+18	6.56
2	Gahteral-1	1.64E+21	6.56
3	Gahteral-2	1.08E+13	6.56
4	Dogali-1	4.22E+16	6.56
5	Dogali-2	3.51E+25	6.56
6	Emculu	9.50E+18	6.56

### 1-4. 判定基準

判定方法は、総合健全度判定式で算定した耐久性 ( $\alpha$ )、耐荷力 ( $\beta$ ) の数値を以下に示した総合評価判定図の縦軸と横軸にプロットし、その交点が A~E のどこのゾーンに入るかで判定する。なお、耐久性 ( $\alpha$ ) および耐荷力 ( $\beta$ ) は、下表中の境界値で A~E のゾーニングによる。

総合健全度を判定する耐久性 ( $\alpha$ ) および耐化力 ( $\beta$ ) の判定境界値と評価判定図を以下に示す。

表 1-4 耐久性および耐荷力の判定境界値

i	0	1	2	3	4	5
耐久性 ( $\alpha$ i)	1	2.0E+7	1.0E+14	9.0E+20	9.0E+27	9.0E+34
耐荷力 ( $\beta$ i)	1	6	13	28	41	***

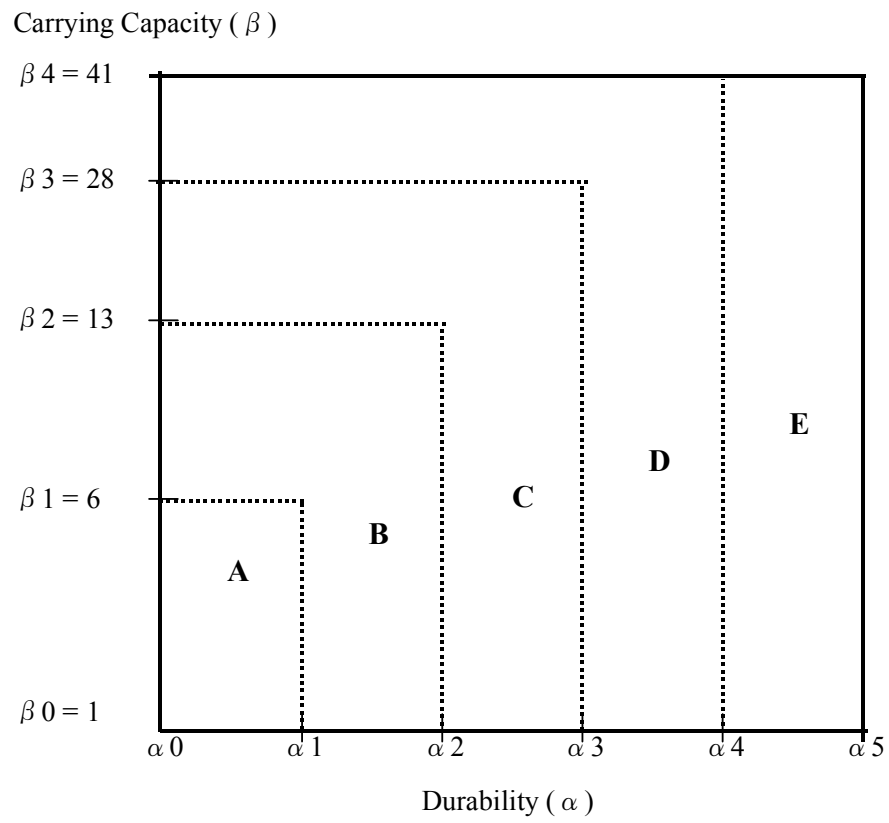


図 1 - 3 総合評価判定図