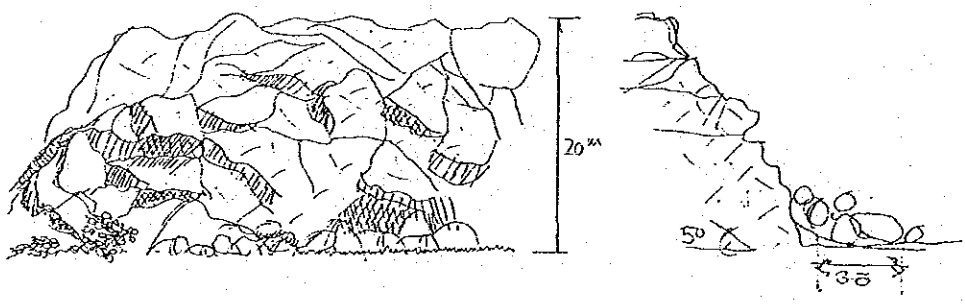
APPENDIX 7.1-2 CHECK TABLE

LUCENA ~ ATIMONAN SECTION

CHECK TABLE OF FALL

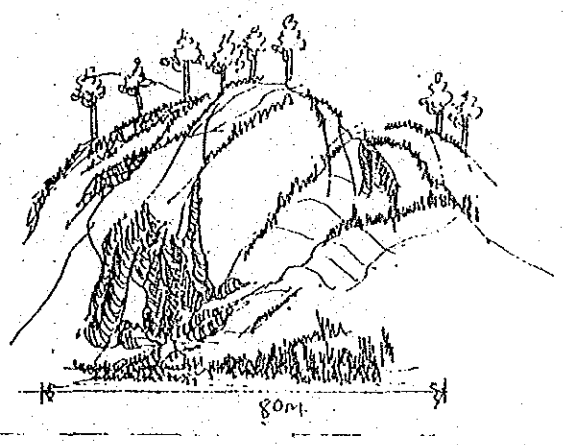
								Sheet No.	S-5
Route		M.H (TVA - 5)	Km. Post	153.900	Width	150 M		Region	TVA
Evidence of Falls	1	Kind of Slope	(1) Cut Slope		(2) Natural Slope				
	2	Type of Fall	(1) Debris Fall		(2) Rock Fall				
	3	Fallen Rock Size	(1) 20cm >		(2) 20cm ~ 50cm	(3) 50cm <			
	4	Date Occured	Day		Month	Year			
	5	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )		(2) Removal of Fallen Rock		(3) Others		
	7	Rainfall Intensity/ Day	(1) 100mm >		(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >		(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <		
	9	Slope Gradient	(1) 45° >		(2) 45° ~ 60°	(3) 60° <	(4) Overhung		
	10	Degree of Saturation	(1) Dry		(2) Wet	(3) Seepage	(4) Spring		
	11	Surface Water Concentration	(1) None		(2) Low	(3) High			
	12	Berm	(1) Existing Number ( ) With ( )			(2) Nothing			
	13	Slope Protection	(1) Structure ( )		(2) Vegetation	(3) Nothing			
	14	Drainage Facilities	(1) Existing ( )		(2) Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard		(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1) Rare		(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1) Nothing		(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	19	Weathering Condition	(1) Fresh		(2) Slightly Weathered	(3) Highly Weathered			
	20	Condition of Crack	(1) Sparse		(2) Regular	(3) Developed			
	21	Direction of Crack	(1) Inclined to Mountain		(2) Irregular Inclination	(3) Inclined to Slope			
Engi-neering Judge-ment	22	Impact to Road	(1) Low		(2) Average	(3) High			
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.							Photo No.		

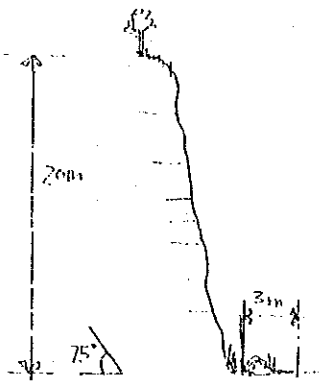


Date of Survey	Day 29	Month Oct	Year 1984	Surveyor	E. IWATA

CHECK TABLE OF FALL

								Sheet No.	S-6
Route		MH(IVA-7)	Km. Post	154.100	Width	80 M		Region	IVA
Evidence of Falls	1	Kind of Slope	(1) ✓ Cut Slope	(2) Natural Slope					
	2	Type of Fall	(1) Debris Fall	(2) ✓ Rock Fall					
	3	Fallen Rock Size	(1) 20cm >	(2) 20cm ~ 50cm	(3) ✓ 50cm <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock			(3) Others		
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm		(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) ✓ 10m ~ 30m	(3) 30m ~ 50m		(4) 50m <		
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) ✓ 60° <		(4) Overhung		
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage		(4) Spring		
	11	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High				
	12	Berm	(1) Existing Number ( ) With ( )		(2) ✓ Nothing				
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) ✓ Nothing				
	14	Drainage Facilities	(1) Existing ( )	(2) ✓ Nothing					
Geological Condition – Debris Fall	15	Matrix Condition	(1) ✓ Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble			
	16	Gully	(1) Rare	(2) Common	(3) Frequently				
	17	Detached Rock or cabble	(1) ✓ Nothing	(2) Supported Stably	(3) Supported Unstably				
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) ✓ Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics						
	19	Weathering Condition	(1) Fresh	(2) ✓ Slightly Weathered	(3) Highly Weathered				
	20	Condition of Crack	(1) Sparse	(2) Regular	(3) ✓ Developed				
	21	Direction of Crack	(1) ✓ Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope				
Engineering Judgement	22	Impact to Road	(1) Low	(2) ✓ Average	(3) High				
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.								Photo No.	

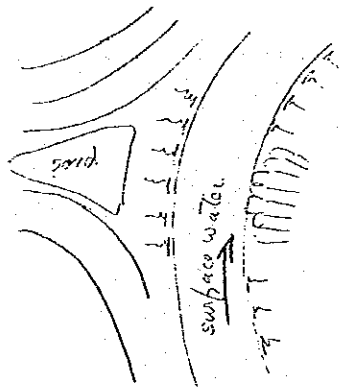




Date of Survey	Day 29	Month Oct	Year 1984	Surveyor	E IWATA

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

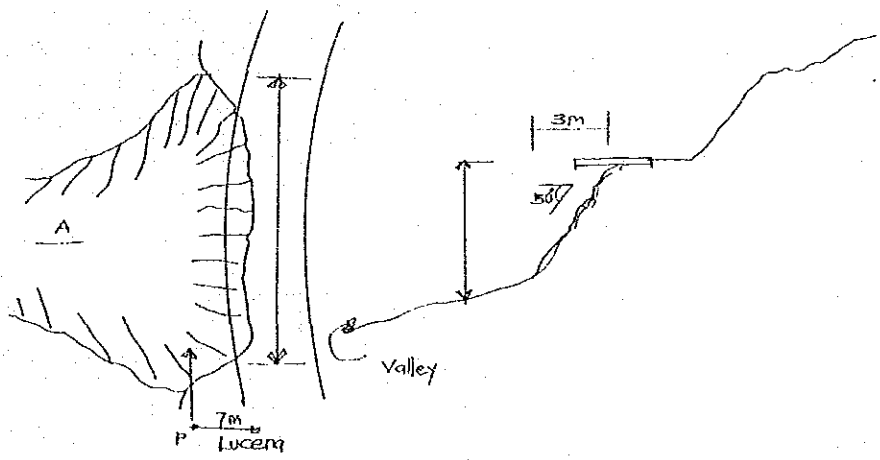
								Sheet No.	S-7
Route		M.H (TVA-8)	Km. Post	155.100	Width	20 M		Region	TVA
Evidence of Failure	1	Kind of Slope	(1) Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others			
	2	Location	(1) Approach of Bridge	(2) Adjacent to River or Sea	(3) Inside of Curve	(4) Others			
	3	Size of Disaster	(1) 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3) 100^{m3} <				
	4	Date Occured	Day	Month	Year 1983 (Behind)				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Only Fill	(2) Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/ Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <			
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} <				
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <				
	10	Surface Water Concentration	(1) None	(2) Low	(3) High				
	11	Slope Protection	(1) Nothing	(2) Vegetation	(3) Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1) Nothing	(2) Existing					
Engi-neering Judge-ment	13	Impact to Road	(1) Low	(2) Average	(3) High				
	14	Cause of Disaster	(1) Concentration of Surface Water	(2) River Stream	(3) Sea Wave	(4) Others			
	15	Counter Measure							
Sketch, etc.							Photo No.		



Date of Survey	Day 29	Month Oct.	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

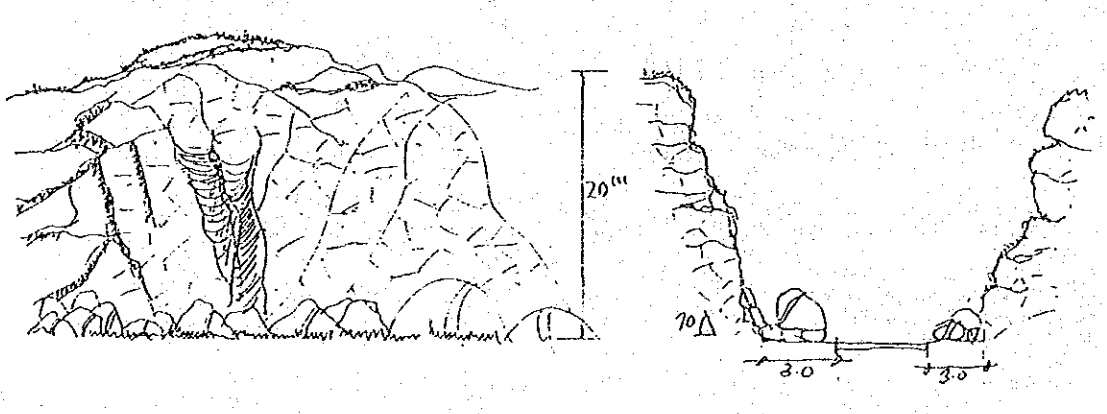
								Sheet No.	S-10-1
Route		M.11 (IVA-13-1)	Km. Post	156,700	Width	40 M		Region	IVA
Evidence of Failure	1	Kind of Slope	(1)✓ Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others			
	2	Location	(1) Approach of Bridge	(2) Adjacent to River or Sea	(3) Inside of Curve	(4)✓ Others			
	3	Size of Disaster	(1) 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3)✓ 100^{m3} <				
	4	Date Occured	Day 21	Month Oct.	Year 1984				
	5	Traffic Interruption Period	(1) 1 day >	(2)✓ 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1)✓ Only Fill	(2) Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3)✓ 200^{mm} ~ 300^{mm}	(4) 300^{mm} <			
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3)✓ 10^{m} <				
	9	Slope Gradient	(1)✓ 45° >	(2) 45° ~ 60°	(3) 60° <				
	10	Surface Water Concentration	(1) None	(2)✓ Low	(3) High				
	11	Slope Protection	(1) Nothing	(2)✓ Vegetation	(3) Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1)✓ Nothing	(2) Existing					
Engineering Judgement	13	Impact to Road	(1) Low	(2) Average	(3)✓ High				
	14	Cause of Disaster	(1)✓ Concentration of Surface Water	(2) River Stream	(3) Sea Wave	(4) Others			
	15	Counter Measure							
Sketch, etc.								Photo No.	



Date of Survey	Day 29	Month Oct.	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF FALL

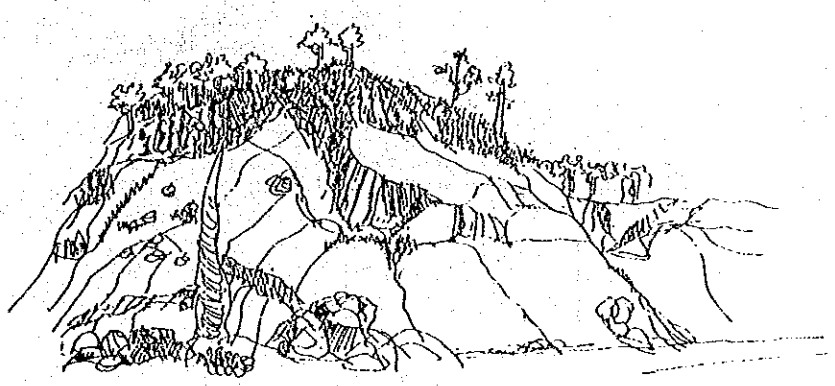
								Sheet No.	S - 11
Route		M.H (TVA - 15)	Km. Post	157.600	Width	150 M		Region	TVA
Evidence of Falls	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope					
	2	Type of Fall	(1) Debris Fall	(2) Rock Fall					
	3	Fallen Rock Size	(1) 20m >	(2) 20m ~ 50m	(3) 50m <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock			(3) Others		
	7	Rainfall Intensity/ Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm		(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m		(4) 50m <		
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <		(4) Overhung		
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage		(4) Spring		
	11	Surface Water Concentration	(1) None	(2) Low	(3) High				
	12	Berm	(1) Existing Number ( ) With ( )		(2) Nothing				
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing				
	14	Drainage Facilities	(1) Existing ( )	(2) Nothing					
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble			
	16	Gully	(1) Rare	(2) Common	(3) Frequently				
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably				
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered				
	20	Condition of Crack	(1) Sparse	(2) Regular	(3) Developed				
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope				
Engi-neering Judge-ment	22	Imoact to Road	(1) Low	(2) Average	(3) High				
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.							Photo No.		

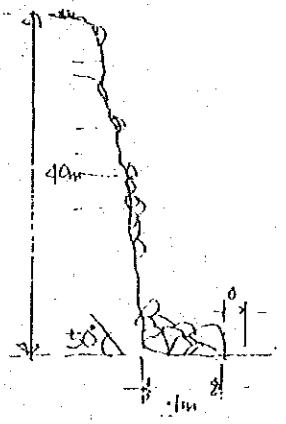


Date of Survey	Day 29	Month Oct.	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF SLOPE FAILURE

								Sheet No.	S-12
Route		M.H (NA-17)	Km. Post	158.500		Width	120M	Region	NA
Evidence of Failure	1	Kind of Slope	(1) Cut Slope		(2) Natural Slope				
	2	Kind of Failure	(1) Nothing		(2) Surface Failure		(3) Deep Failure		
	3	Size of Failure	(1) 50^{m3} >		(2) 50^{m3} ~ 500^{m3}		(3) 500^{m3} ~ $2,000^{m3}$	(4) $2,000^{m3}$ <	
	4	Date Occured	Day		Month		Year		
	5	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days		(3) 7 days <		
	6	Counter Measure Taken	(1) Structure ( )		(2) Removal of Slide Materials			(3) Others	
	7	Rainfall Intensity/Day	(1) 100 mm >		(2) 100^{mm} ~ 200^{mm}		(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <	
Existing Slope Condition	8	Height	(1) 10^{m} >		(2) 10^{m} ~ 30^{m}		(3) 30^{m} ~ 50^{m}	(4) 50^{m} <	
	9	Gradient	(1) 45° >		(2) 45° ~ 60°		(3) 60° <	(4) Overhung	
	10	Berm	(1) Existing		Number ( )		Width ( )	(2) Nothing	
	11	Slope Protection	(1) Structure ( )		(2) Vegetation		(3) Nothing		
Geological Condition, Rock	12	Hardness	(1) Hard Rock		(2) Soft Rock				
	13	Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccia (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics						
	14	Weathering Condition	(1) Fresh		(2) Slightly Weathered		(3) Highly Weathered	(4) Nearly Soil	
	15	Condition of Crack	(1) Sparse		(2) Regular		(3) Developed		
	16	Direction of Crack	(1) Inclined to Mountain		(2) Irregular Inclination		(3) Inclined to Slope		
Geological Condition, Soil	17	Thickness	(1) 5^{m} >		(2) 5^{m} ~ 10^{m}		(3) 10^{m} ~ 20^{m}	(4) 20^{m} <	
	18	Compactness	(1) Tight		(2) Slightly loose		(3) Loose		
Water Condition	19	Degree of Saturation	(1) Dry		(2) Wet		(3) Seepage	(4) Spring	
	20	Surface Water Concentration	(1) None		(2) Low		(3) High		
	21	Drainage Facilities	(1) Existing ( )		(2) Nothing				
Engineering Judgement	22	Impact to Road	(1) Low		(2) Average		(3) High		
	23	Cause of Disaster							
	24	Counter Measure							
Sketch, etc.							Photo No.		

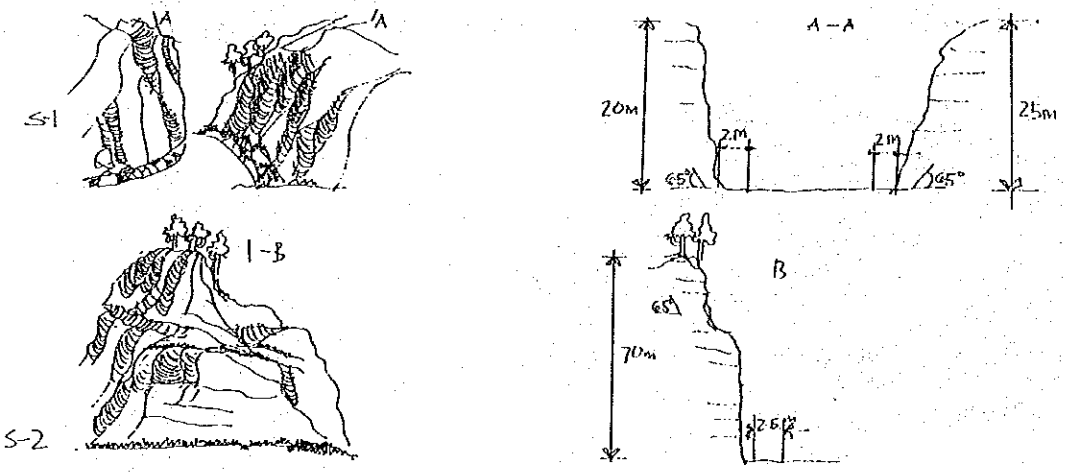




Date of Survey	Day 29	Month Oct	Year 1984	Surveyor	E. IWATA		

CHECK TABLE OF FALL

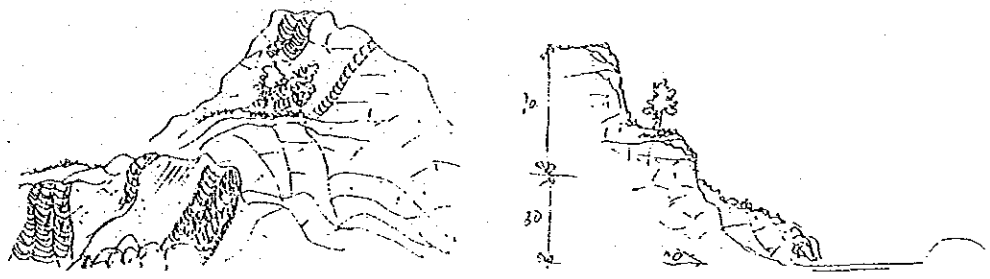
								Sheet No.	S-12-1
Route		M.H (IVA-18)	Km. Post	158,900	Width	500 M		Region	IVA
Evidence of Falls	1	Kind of Slope	(1)✓ Cut Slope		(2) Natural Slope				
	2	Type of Fall	(1) Debris Fall		(2)✓ Rock Fall				
	3	Fallen Rock Size	(1) 20m >		(2) 20m ~ 50m	(3)✓ 50m <			
	4	Date Occured	Day		Month		Year		
	5	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )		(2) Removal of Fallen Rock			(3) Others	
	7	Rainfall Intensity/Day	(1) 100mm >		(2) 100mm ~ 200mm	(3) 200mm ~ 300mm		(4) 300mm <	
Existing Slope Condition	8	Slope Height	(1) 10m >		(2) 10m ~ 30m	(3) 30m ~ 50m		(4)✓ 50m <	
	9	Slope Gradient	(1) 45° >		(2) 45° ~ 60°	(3)✓ 60° <		(4) Overhung	
	10	Degree of Saturation	(1)✓ Dry		(2) Wet	(3) Seepage		(4) Spring	
	11	Surface Water Concentration	(1)✓ None		(2) Low	(3) High			
	12	Berm	(1) Existing Number ( ) With ( )			(2)✓ Nothing			
	13	Slope Protection	(1) Structure ( )		(2) Vegetation	(3)✓ Nothing			
	14	Drainage Facilities	(1) Existing ( )		(2)✓ Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard		(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1) Rare		(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1) Nothing		(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8)✓ Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics						
	19	Weathering Condition	(1) Fresh		(2) Slightly Weathered	(3)✓ Highly Weathered			
	20	Condition of Crack	(1) Sparse		(2) Regular	(3)✓ Developed			
	21	Direction of Crack	(1) Inclined to Mountain		(2)✓ Irregular Inclination	(3) Inclined to Slope			
Engineering Judgement	22	Impact to Road	(1) Low		(2) Average	(3)✓ High			
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.								Photo No.	



Date of Survey	Day 29	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF LANDSLIDE

								Sheet No.	9-13
Route	-	M.H (WA-20)	Km. Post	160.800	Width	150 M		Region	WA
Evidence of Landslide	1	Kind of Slope	(1) Cut Slope		(2) Natural Slope				
	2	Kind of Landslide	(1) Rock		(2) Talus	(3) Soil			
	3	Size of Landslide	(1) 2,000^{m2} >		(2) 2,000^{m2} ~ 5,000^{m2}	(3) 5,000^{m2} <			
	4	Date Occured	Day		Month	Year			
	5	Traffic Interruptions Period	(1) day >		(2) 1 day ~ 7 days	(3) 7 days <			
	6	Rainfall Intensity/ Day	(1) 100 mm >		(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <		
Topographic and Geological Condition	7	Existence of irregular surface with steps, sharp cliff and puddles	(1) Unnoticed		(2) Medium	(3) Remarkable			
	8	Geology	(1) Others		(2) Sedimentary Rock	(3) Highly Weathered Sedimentary Rock or Talus or Soil			
Others Condition	9	Degree of Saturation	(1) Dry		(2) Wet	(3) Seepage	(4) Spring		
	10	Gradient of Slide Plane	(1) 10° >		(2) 10° ~ 20°	(3) 20° <			
	11	Continuity of Slide Movement	(1) Unnoticed		(2) Medium	(3) Remarkable			
Engineering Judgement	12	Impact to Road	(1) Low		(2) Average	(3) High			
	13	Cause of Landslide							
	14	Counter Measure							
Sketch, etc.						Photo No.			

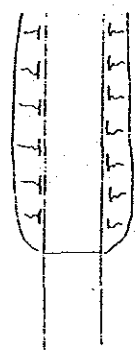


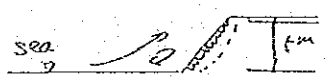
Date of Survey	Day 19	Month Oct	Year 1984	Surveyor	E. Iwata		

ALLEN ~ CALBAYOG SECTION

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

								Sheet No.	S-54
Route		M.H (VIII - 1)	Km. Post	664.400	Width	300 M		Region	VIII
Evidence of Failure	1	Kind of Slope	(1) Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others			
	2	Location	(1) Approach of Bridge	(2) Adjacent to River or Sea	(3) Inside of Curve	(4) Others			
	3	Size of Disaster	(1) 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3) 100^{m3} <				
	4	Date Occured	Day	Month 12	Year 1981. 1982				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <	2 Times destroyed riprap			
	6	Counter Measure Taken	(1) Only Fill	(2) Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/ Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <			
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} <				
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <				
	10	Surface Water Concentration	(1) None	(2) Low	(3) High				
	11	Slope Protection	(1) Nothing	(2) Vegetation	(3) Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1) Nothing	(2) Existing					
Engi-neering Judge-ment	13	Impact to Road	(1) Low	(2) Average	(3) High				
	14	Cause of Disaster	(1) Concentration of Surface Water	(2) River Stream	(3) Sea Wave	(4) Others			
	15	Counter Measure							
Sketch, etc.							Photo No.		





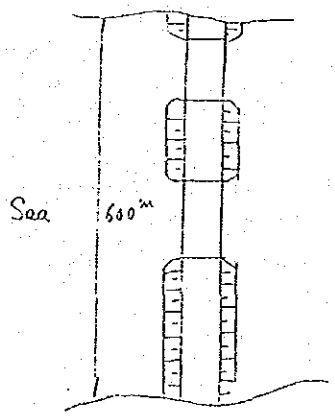
Date of Survey	Day 6	Month Oct	Year 1984	Surveyor	B. IWATA		

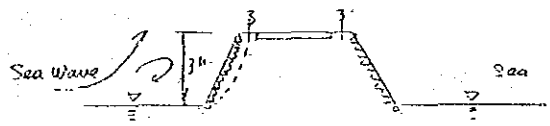
CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

						Sheet No.	S-55
Route		M.H (VII - 2)	Km. Post	681.700	Width	600 M	Region VII

Evidence of Failure	1	Kind of Slope	(1) Embankment Slope	(2) Natural Slope	(3) Overflow Section (5) Others
	2	Location	(1) Approach of Bridge	(2) Adjacent to River or Sea	(3) Inside of Curve (4) Others
	3	Size of Disaster	(1) 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3) 100^{m3} <
	4	Date Occured	Day	Month	Year Heavy Typhoon over.
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days < Wave.
	6	Counter Measure Taken	(1) Only Fill	(2) Riprap	(3) Other Structure ( )
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm} (4) 300^{mm} <
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} <
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <
	10	Surface Water Concentration	(1) None	(2) Low	(3) High
	11	Slope Protection	(1) Nothing	(2) Vegetation	(3) Riprap (4) Other Structure ( )
	12	Drainage Facilities	(1) Nothing	(2) Existing	
Engi-neering Judge-ment	13	Impact to Road	(1) Low	(2) Average	(3) High
	14	Cause of Disaster	(1) Concentration of Surface Water	(2) River Stream	(3) Sea Wave (4) Others
	15	Counter Measure			

Sketch, etc.	Photo No.





Date of Survey	Day 6	Month Oct	Year 1984	Surveyor	S. IWATA		

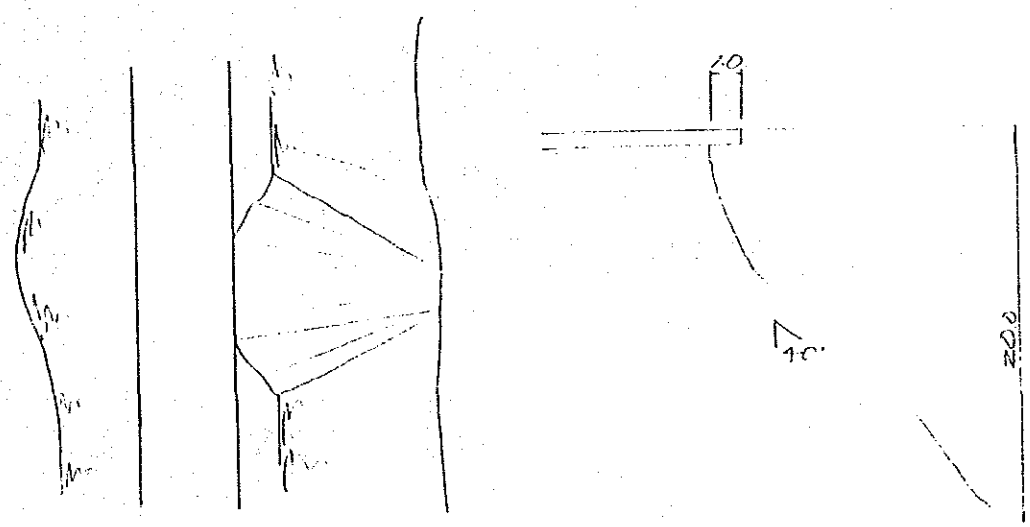
CHECK TABLE OF FALL

								Sheet No.	S-56
Route		M.H (VIII-6)	Km. Post	686.900	Width	250 M		Region	VIII
Evidence of Falls	1	Kind of Slope	(1) Cut Slope		(2) Natural Slope				
	2	Type of Fall	(1) Debris Fall		(2) Rock Fall				
	3	Fallen Rock Size	(1) 20cm >		(2) 20cm ~ 50cm	(3) 50cm <			
	4	Date Occured	Day		Month	Year			
	5	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )		(2) Removal of Fallen Rock		(3) Others		
	7	Rainfall Intensity/Day	(1) 100mm >		(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >		(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <		
	9	Slope Gradient	(1) 45° >		(2) 45° ~ 60°	(3) 60° <	(4) Overhung		
	10	Degree of Saturation	(1) Dry		(2) Wet	(3) Seepage	(4) Spring		
	11	Surface Water Concentration	(1) None		(2) Low	(3) High			
	12	Berm	(1) Existing Number ( ) With ( )			(3) Nothing			
	13	Slope Protection	(1) Structure ( )		(2) Vegetation	(3) Nothing			
	14	Drainage Facilities	(1) Existing ( )		(2) Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard		(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1) Rare		(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1) Nothing		(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	19	Weathering Condition	(1) Fresh		(2) Slightly Weathered	(3) Highly Weathered			
	20	Condition of Crack	(1) Soarse		(2) Regular	(3) Developed			
	21	Direction of Crack	(1) Inclined to Mountain		(2) Irregular Inclination	(3) Inclined to Slope			
Engineering Judgement	22	Impact to Road	(1) Low		(2) Average	(3) High	Shoulder 3.0		
	23	Cause of Fall	Overmature						
	24	Counter Measure							
Sketch, etc.							Photo No.		

Date of Survey	Day 6	Month Oct	Year 1984	Surveyor	S. [illegible]	

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

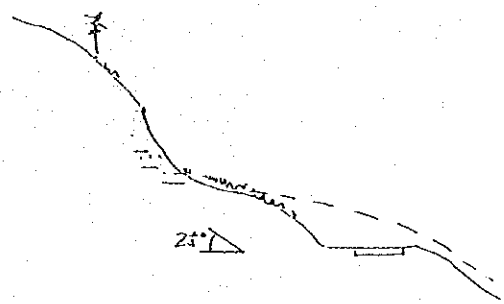
								Sheet No.	S-57-2
Route		MH(Km-13-1)	Km. Post	694-700	Width	10 M		Region	VIII
Evidence of Failure	1	Kind of Slope	(1)✓ Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others			
	2	Location	(1) Approach of Bridge	(2)✓ Adjacent to River or Sea	(3) Inside of Curve	(4) Others			
	3	Size of Disaster	(1) 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3)✓ 100^{m3} <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Only Fill	(2)✓ Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <			
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3)✓ 10^{m} <				
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3)✓ 60° <				
	10	Surface Water Concentration	(1)✓ None	(2) Low	(3) High				
	11	Slope Protection	(1) Nothing	(2) Vegetation	(3)✓ Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1)✓ Nothing	(2) Existing					
Engineering Judgement	13	Impact to Road	(1) Low	(2)✓ Average	(3) High				
	14	Cause of Disaster	(1)✓ Concentration of Surface Water	(2) River Stream	(3) Sea Wave	(4) Others			
	15	Counter Measure							
Sketch, etc.								Photo No.	



Date of Survey	Day 6	Month Oct	Year 1984	Surveyor	B. Ivinta

CHECK TABLE OF DEBRIS FLOW

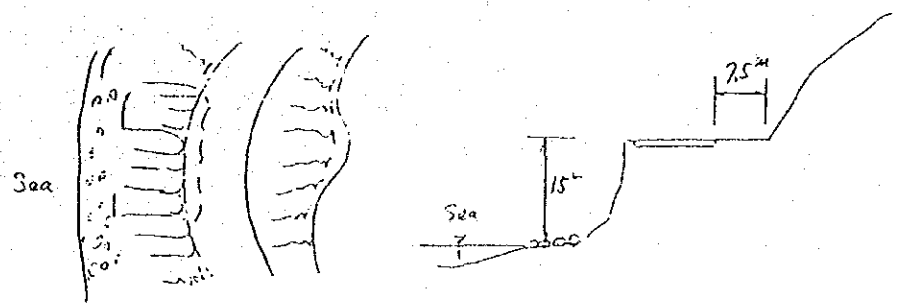
								Sheet No.	3-58
Route		M.H (VIII - 16)	Km. Post	698.300	Width	150 M		Region	VIII
Evidence of Debris Flow	1	Existence of Depositional Toe	(1) Nothing		(✓) Existing				
	2	Size of Disaster	(1) 50^{m3} >		(2) $50^{m3} \sim 500^{m3}$	(✓) $500^{m3} \sim 2,000^{m3}$	(4) $2,0000^{m3}$ <		
	3	Date Occured	Day		Month	Year Every year small Failure at typhoon			
	4	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	5	Counter Measure Taken	(1) Structure ( )		(✓) Removal of Deposit Materials		(3) Others		
	7	Rainfall Intensity/Day	(1) 100 mm >		(2) $100^{mm} \sim 200^{mm}$	(3) $200^{mm} \sim 300^{mm}$	(4) 300^{mm} <		
Existing Stream Condition	8	Average Gradient	(1) 20° >		(✓) 20° <				
	9	Area of Basin	(✓) 0.24 Km^2 >		(2) 0.24 Km^2 <				
	10	Deposit on River Bed	(1) Nothing		(✓) Rare	(3) Abudance			
	11	Plant Condition	(1) 50% > Occupancy Rate of Bare Land or Thin Forest				(✓) 50% <		
Engineering Judgment	12	Impact to Road	(1) Low		(✓) Average	(3) High			
	13	Cause of Disaster							
	14	Counter Measure							
Sketch, etc.							Photo No.		



Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

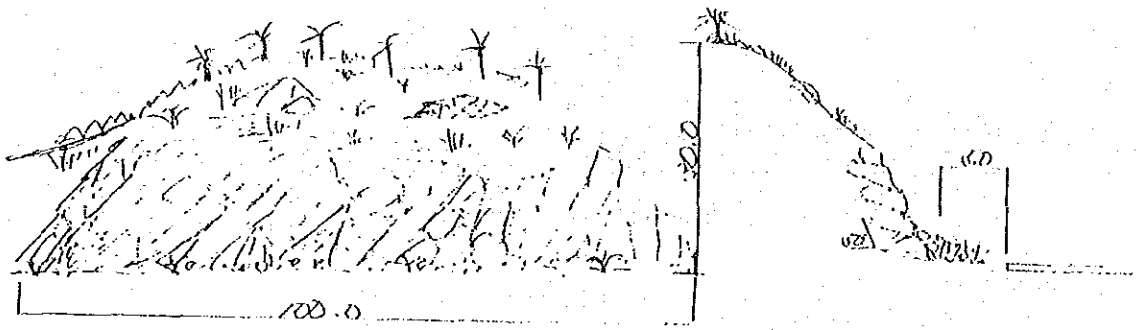
							Sheet No.	S-60
Route		M.H (Ⅲ - 18)	Km. Post	701.200	Width	30 M	Region	Ⅷ
Evidence of Failure	1	Kind of Slope	(1) ✓ Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others		
	2	Location	(1) Approach of Bridge	(2) ✓ Adjacent to River or Sea	(3) Inside of Curve	(4) Others		
	3	Size of Disaster	(1) 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3) ✓ 100^{m3} <			
	4	Date Occured	Day	Month	Year			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Only Fill	(2) ✓ Riprap	(3) Other Structure ( )			
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <		
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) ✓ 10^{m} <			
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) ✓ 60° <			
	10	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High			
	11	Slope Protection	(1) ✓ Nothing	(2) Vegetation	(3) Riprap	(4) Other Structure ( )		
	12	Drainage Facilities	(1) ✓ Nothing	(2) Existing				
Engineering Judgement	13	Impact to Road	(1) Low	(2) ✓ Average	(3) High			
	14	Cause of Disaster	(1) Concentration of Surface Water	(2) River Stream	(3) ✓ Sea Wave	(4) Others		
	15	Counter Measure						
Sketch, etc.							Photo No.	



Date of Survey	Day	7	Month	Oct	Year	1984	Surveyor	B. IWATA

CHECK TABLE OF FALL

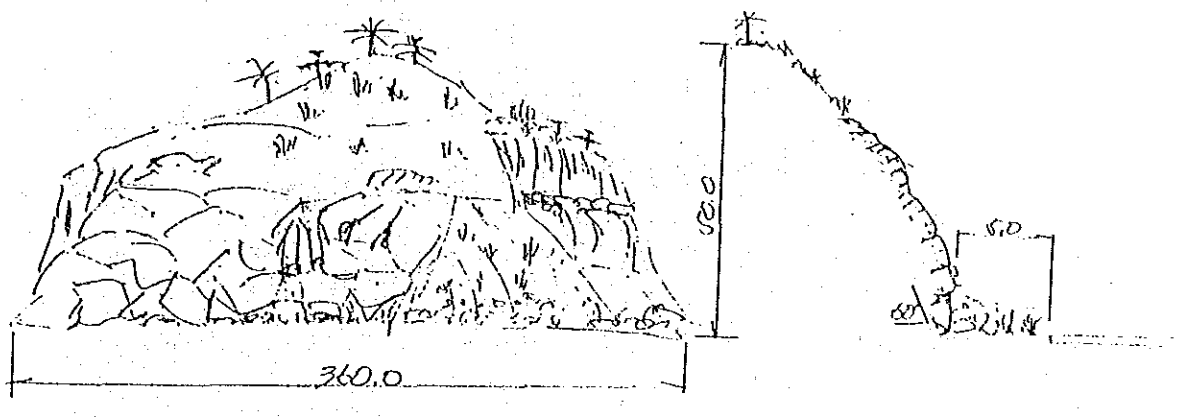
								Sheet No.	S-60-1
Route		M.H (VIII-21)	Km. Post	703.800	Width	100 M		Region	VIII.
Evidence of Falls	1	Kind of Slope	(1) ✓ Cut Slope	(2) Natural Slope					
	2	Type of Fall	(1) Debris Fall	(2) ✓ Rock Fall					
	3	Fallen Rock Size	(1) 20cm >	(2) 20cm ~ 50cm	(3) ✓ 50cm <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) ✓ Removal of Fallen Rock				(3) Others	
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm			(4) 300mm <	
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) ✓ 30m ~ 50m			(4) 50m <	
	9	Slope Gradient	(1) 45° >	(2) ✓ 45° ~ 60°	(3) 60° <			(4) Overhung	
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage			(4) Spring	
	11	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High				
	12	Berm	(1) Existing Number ( ) With ( )		(2) ✓ Nothing				
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) ✓ Nothing				
	14	Drainage Facilities	(1) Existing ( )	(2) ✓ Nothing					
Geological Condition – Debris Fall	15	Matrix Condition	(1) ✓ Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble			
	16	Gully	(1) Rare	(2) Common	(3) Frequently				
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably				
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) ✓ Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics						
	19	Weathering Condition	(1) Fresh	(2) ✓ Slightly Weathered	(3) Highly Weathered				
	20	Condition of Crack	(1) Sparse	(2) ✓ Regular	(3) Developed				
	21	Direction of Crack	(1) Inclined to Mountain	(2) ✓ Irregular Inclination	(3) Inclined to Slope				
Engineering Judgement	22	Impact to Road	(1) Low	(2) ✓ Average	(3) High				
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.							Photo No.		



Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	F. IWATA

CHECK TABLE OF FALL

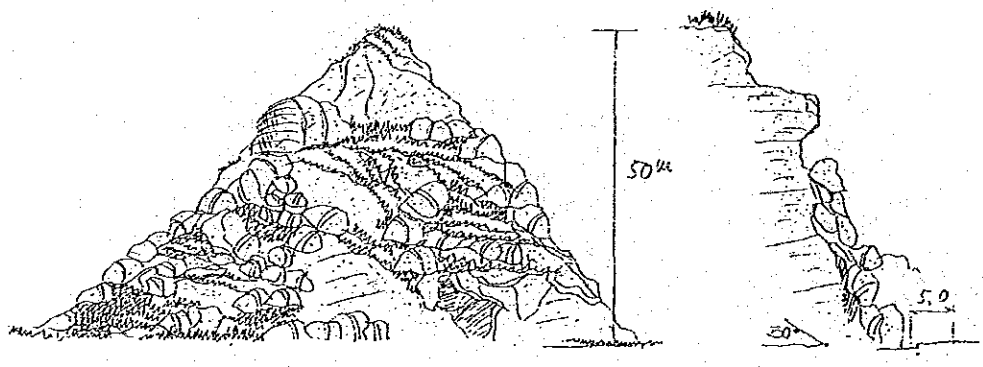
								Sheet No.	S-62
Route		MH (VII-27)	Km. Post	705.200	Width	360 M		Region	VII
Evidence of Falls	1	Kind of Slope	(1) ✓ Cut Slope	(2) Natural Slope					
	2	Type of Fall	(1) Debris Fall	(2) ✓ Rock Fall					
	3	Fallen Rock Size	(1) 20m >	(2) 20m ~ 50m	(3) ✓ 50m <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) ✓ Removal of Fallen Rock	(3) Others				
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <			
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m	(4) ✓ 50m <			
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) ✓ 60° <	(4) Overhung			
	10	Degree of Saturation	(1) ✓ Dry	(2) Wet	(3) Seepage	(4) Spring			
	11	Surface Water Concentration	(1) None	(2) Low	(3) High				
	12	Berm	(1) Existing Number ( ) With ( )	(2) ✓ Nothing					
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) ✓ Nothing				
	14	Drainage Facilities	(1) Existing ( )	(2) ✓ Nothing					
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) ✓ Soft	(3) Loose	(4) Loose with detached cabble			
	16	Gully	(1) Rare	(2) Common	(3) Frequently				
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably				
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) ✓ Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) ✓ Highly Weathered				
	20	Condition of Crack	(1) ✓ Sparse	(2) Regular	(3) ✓ Developed				
	21	Direction of Crack	(1) Inclined to Mountain	(2) ✓ Irregular Inclination	(3) Inclined to Slope				
Engineering Judgement	22	Impact to Road	(1) Low	(2) ✓ Average	(3) High				
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.								Photo No.	



Date of Survey	Day 7	Month Oct.	Year 1984	Surveyor	P. Iwata

CHECK TABLE OF FALL

							Sheet No.	S-62-1
Route		M.H (VIII - 28)	Km. Post	705.600	Width	240 M	Region	VIII
Evidence of Falls	1	Kind of Slope	(1) ✓ Cut Slope	(2) Natural Slope				
	2	Type of Fall	(1) Debris Fall	(2) ✓ Rock Fall				
	3	Fallen Rock Size	(1) 20m >	(2) 20m ~ 50m	(3) ✓ 50m <			
	4	Date Occured	Day	Month	Year			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )	(2) ✓ Removal of Fallen Rock	(3) Others			
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) ✓ 30m ~ 50m	(4) 50m <		
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) ✓ 60° <	(4) Overhung		
	10	Degree of Saturation	(1) ✓ Dry	(2) Wet	(3) Seepage	(4) Spring		
	11	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High			
	12	Berm	(1) Existing Number ( ) With ( )	(2) ✓ Nothing				
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) ✓ Nothing			
	14	Drainage Facilities	(1) Existing ( )	(2) ✓ Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1) ✓ Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1) Rare	(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) ✓ Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics					
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) ✓ Highly Weathered			
	20	Condition of Crack	(1) Sparse	(2) ✓ Regular	(3) Developed			
	21	Direction of Crack	(1) Inclined to Mountain	(2) ✓ Irregular Inclination	(3) Inclined to Slope			
Engineering Judgement	22	Impact to Road	(1) Low	(2) ✓ Average	(3) High			
	23	Cause of Fall						
	24	Counter Measure						
Sketch, etc.							Photo No.	



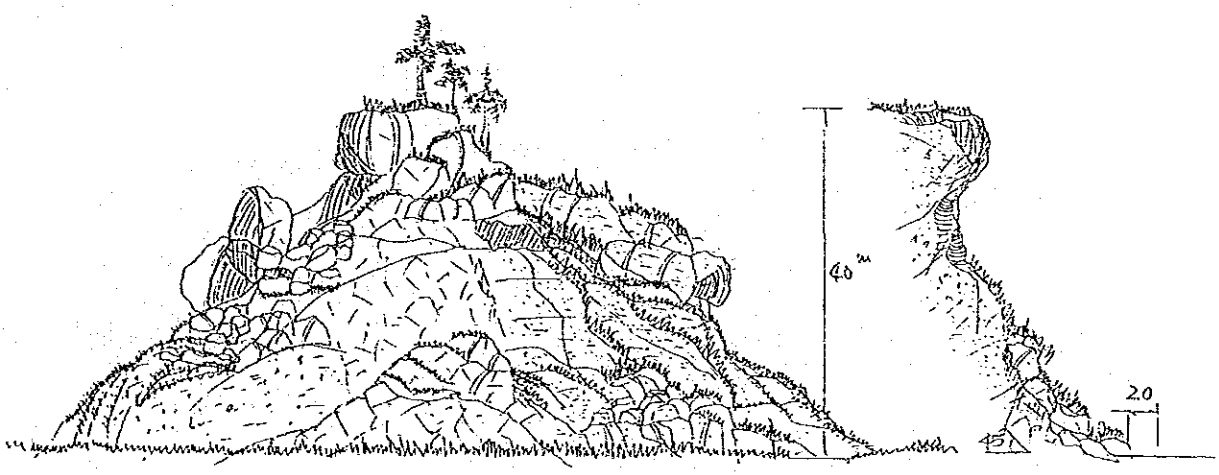
Date of Survey	Day	7	Month	Oct	Year	1984	Surveyor	B. IWATA

CHECK TABLE OF FALL

						Sheet No.	S-63
Route		M.H (VIII – 29)	Km. Post	708.200	Width	180 M	Region VIII

Evidence of Falls	1	Kind of Slope	(1) ✓ Cut Slope	(2) Natural Slope		
	2	Type of Fall	(1) Debris Fall	(2) ✓ Rock Fall		
	3	Fallen Rock Size	(1) 20m >	(2) 20m ~ 50m	(3) ✓ 50m <	
	4	Date Occured	Day	Month	Year	
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <	
	6	Counter Measure Taken	(1) Structure ( )	(2) ✓ Removal of Fallen Rock		(3) Others
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) ✓ 30m ~ 50m	(4) 50m <
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) ✓ 60° <	(4) ✓ Overhung
	10	Degree of Saturation	(1) ✓ Dry	(2) Wet	(3) Seepage	(4) Spring
	11	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High	
	12	Berm	(1) Existing Number ( )	With ( )	(3) ✓ Nothing	
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) ✓ Nothing	
	14	Drainage Facilities	(1) Existing ( )	(2) ✓ Nothing		
Geological Condition – Debris Fall	15	Matrix Condition	(1) ✓ Hard	(2) ✓ Soft	(3) Loose	(4) Loose with detached cabble
	16	Gully	(1) Rare	(2) Common	(3) Frequently	
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably	
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) ✓ Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) ✓ Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics			
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) ✓ Highly Weathered	
	20	Condition of Crack	(1) Sparse	(2) Regular	(3) ✓ Developed	
	21	Direction of Crack	(1) Inclined to Mountain	(2) ✓ Irregular Inclination	(3) Inclined to Slope	
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) ✓ High	
	23	Cause of Fall	Open cracks			
	24	Counter Measure				

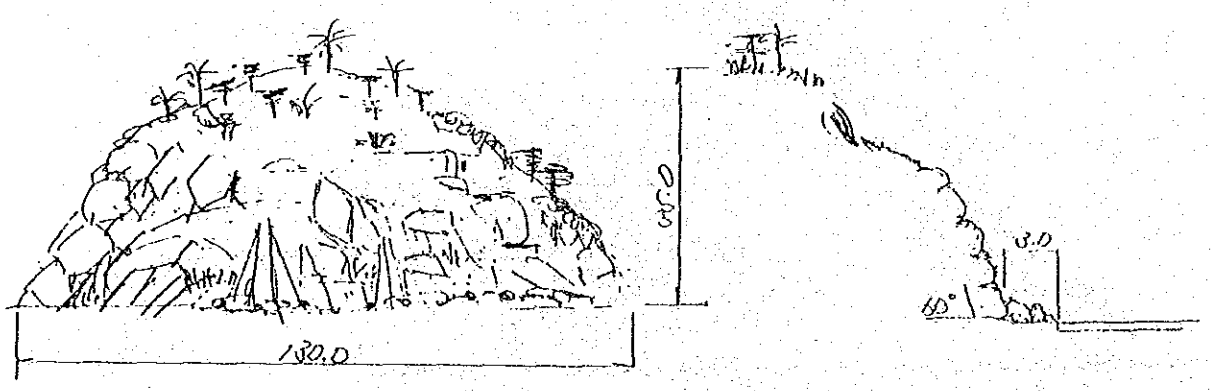
Sketch, etc.		Photo No.	



Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	B. Iwata		

CHECK TABLE OF FALL

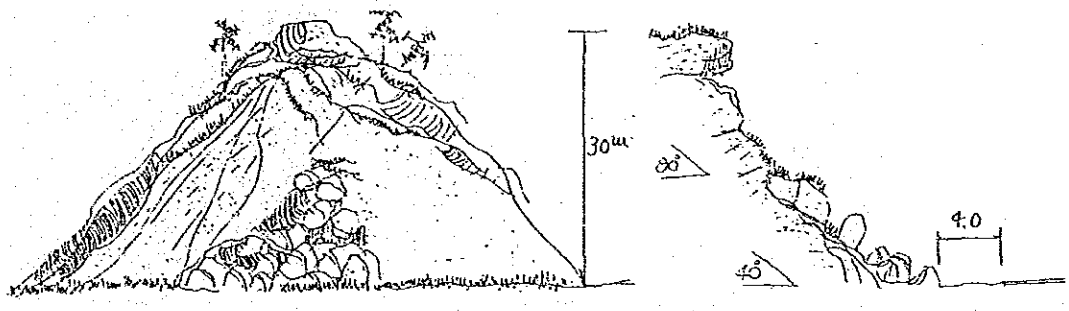
								Sheet No.	S-63-1
Route		M.H(VII-30)	Km. Post	708.600	Width	130 M		Region	VIII
Evidence of Falls	1	Kind of Slope	(1) Cut Slope		(2) Natural Slope				
	2	Type of Fall	(1) Debris Fall		(2) Rock Fall				
	3	Fallen Rock Size	(1) 20cm >		(2) 20cm ~ 50cm	(3) 50cm <			
	4	Date Occured	Day		Month	Year			
	5	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )		(2) Removal of Fallen Rock		(3) Others		
	7	Rainfall Intensity/Day	(1) 100mm >		(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >		(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <		
	9	Slope Gradient	(1) 45° >		(2) 45° ~ 60°	(3) 60° <	(4) Overhung		
	10	Degree of Saturation	(1) Dry		(2) Wet	(3) Seepage	(4) Spring		
	11	Surface Water Concentration	(1) None		(2) Low	(3) High			
	12	Berm	(1) Existing Number ( ) With ( )			(2) Nothing			
	13	Slope Protection	(1) Structure ( )		(2) Vegetation	(3) Nothing			
	14	Drainage Facilities	(1) Existing ( )		(2) Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard		(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1) Rare		(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1) Nothing		(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics						
	19	Weathering Condition	(1) Fresh		(2) Slightly Weathered	(3) Highly Weathered			
	20	Condition of Crack	(1) Sparse		(2) Regular	(3) Developed			
	21	Direction of Crack	(1) Inclined to Mountain		(2) Irregular Inclination	(3) Inclined to Slope			
Engineering Judgement	22	Impact to Road	(1) Low		(2) Average	(3) High			
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.								Photo No.	



Date of Survey	Day 7	Month 01	Year 1994	Surveyor	A. Ivan

CHECK TABLE OF FALL

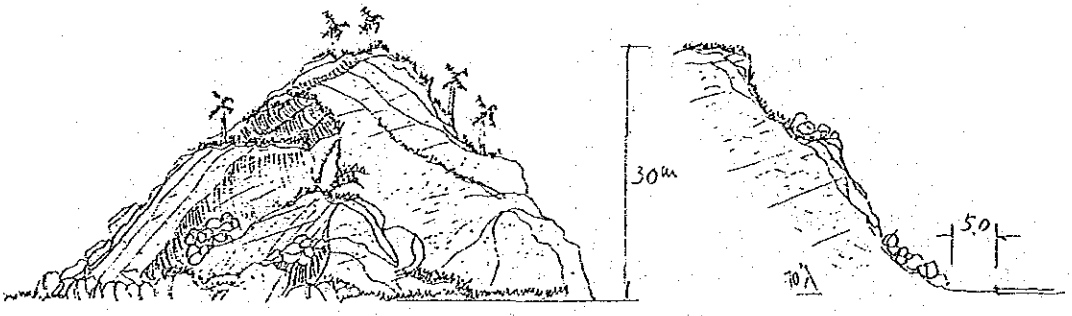
							Sheet No.	S-68
Route		M.H (VIII - 31)	Km. Post	708.650	Width	60 M	Region	VIII
Evidence of Falls	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope				
	2	Type of Fall	(1) Debris Fall	(2) Rock Fall				
	3	Fallen Rock Size	(1) 20cm >	(2) 20cm ~ 50cm	(3) 50cm <			
	4	Date Occured	Day	Month	Year			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock		(3) Others		
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <		
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung		
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring		
	11	Surface Water Concentration	(1) None	(2) Low	(3) High			
	12	Berm	(1) Existing Number ( ) With ( )		(2) Nothing			
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing			
	14	Drainage Facilities	(1) Existing ( )	(2) Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1) Rare	(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics					
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered			
	20	Condition of Crack	(1) Soarse	(2) Regular	(3) Developed			
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope			
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) High			
	23	Cause of Fall						
	24	Counter Measure						
Sketch, etc.						Photo No.		



Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF FALL

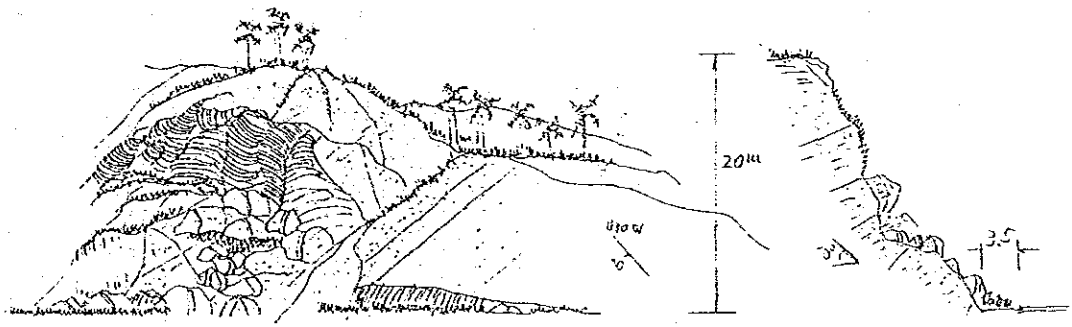
								Sheet No.	S-65
Route		M.H (VIII - 32)	Km. Post	709.600	Width	120 M		Region	VIII
Evidence of Falls	1	Kind of Slope	(1) ✓ Cut Slope	(2) Natural Slope					
	2	Type of Fall	(1) Debris Fall	(2) ✓ Rock Fall					
	3	Fallen Rock Size	(1) 20cm >	(2) ✓ 20cm ~ 50cm	(3) 50cm <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) ✓ Removal of Fallen Rock	(3) Others				
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <			
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) ✓ 30m ~ 50m	(4) 50m <			
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) ✓ 60° <	(4) ✓ Overhung			
	10	Degree of Saturation	(1) ✓ Dry	(2) Wet	(3) Seepage	(4) Spring			
	11	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High				
	12	Berm	(1) Existing Number ( ) With ( )	(2) ✓ Nothing					
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) ✓ Nothing				
	14	Drainage Facilities	(1) Existing ( )	(2) ✓ Nothing					
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) ✓ Soft	(3) Loose	(4) Loose with detached cabble			
	16	Gully	(1) Rare	(2) Common	(3) ✓ Frequently				
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably				
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) ✓ Sandstone (13) ✓ Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	19	Weathering Condition	(1) Fresh	(2) ✓ Slightly Weathered	(3) Highly Weathered				
	20	Condition of Crack	(1) Sparse	(2) Regular	(3) ✓ Developed				
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) ✓ Inclined to Slope				
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) ✓ High				
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.							Photo No.		



Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF SLOPE FAILURE

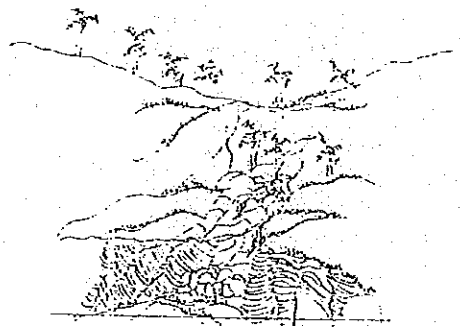
								Sheet No.	S-66
Route		H.H (VIII - 33)	Km. Post	717.700	Width	120 M		Region	VIII
Evidence of Failure	1	Kind of Slope	(1) ✓ Cut Slope	(2) Natural Slope					
	2	Kind of Failure	(1) Nothing	(2) ✓ Surface Failure	(3) Deep Failure				
	3	Size of Failure	(1) 50^{m3} >	(2) 50^{m3} ~ 500^{m3}	(3) ✓ 500^{m3} ~ $2,000^{m3}$	(4) $2,000^{m3}$ <			
	4	Date Occured	Day	Month 12	Year 1982				
	5	Traffic Interruption Period	(1) 1 day >	(2) ✓ 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) ✓ Removal of Slide Materials	(3) Others				
	7	Rainfall Intensity/ Day	(1) 100 mm >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <			
Existing Slope Condition	8	Height	(1) 10^{m} >	(2) ✓ 10^{m} ~ 30^{m}	(3) 30^{m} ~ 50^{m}	(4) 50^{m} <			
	9	Gradient	(1) 45° >	(2) 45° ~ 60°	(3) ✓ 60° <	(4) Overhung			
	10	Berm	(1) Existing	Number ( )	Width ( )	(2) ✓ Nothing			
	11	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) ✓ Nothing				
Geological Condition — Rock	12	Hardness	(1) ✓ Hard Rock	(2) ✓ Soft Rock					
	13	Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) ✓ Sandstone (13) ✓ Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	14	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) ✓ Highly Weathered	(4) Nearly Soil			
	15	Condition of Crack	(1) Soarse	(2) Regular	(3) ✓ Developed				
	16	Direction of Crack	(1) ✓ Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope				
Geological Condition — Soil	17	Thickness	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} ~ 20^{m}	(4) 20^{m} <			
	18	Compactness	(1) Tight	(2) Slightly loose	(3) Loose				
Water Condition	19	Degree of Saturation	(1) ✓ Dry	(2) Wet	(3) Seepage	(4) Spring			
	20	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High				
	21	Drainage Facilities	(1) Existing ( )	(2) ✓ Nothing					
Engi-neering Judge-ment	22	Impact to Road	(1) Low	(2) ✓ Average	(3) High				
	23	Cause of Disaster	Open cracks						
	24	Counter Measure							
Sketch, etc.							Photo No.		

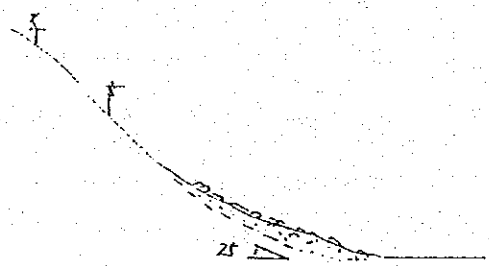


Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	B. IWATA	

CHECK TABLE OF DEBRIS FLOW

								Sheet No.	S-67
Route		MH (VIII-36)	Km. Post	718.100	Width	20 M		Region	VIII
Evidence of Debris Flow	1	Existence of Depositional Toe	(1) Nothing		(2) Existing				
	2	Size of Disaster	(1) 50^{m3} >		(2) $50^{m3} \sim 500^{m3}$	(3) $500^{m3} \sim 2,000^{m3}$	(4) $2,0000^{m3}$ <		
	3	Date Occured	Day		Month	Year Every year at Typhoon			
	4	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	5	Counter Measure Taken	(1) Structure ( )		(2) Removal of Deposit Materials		(3) Others		
	7	Rainfall Intensity/Day	(1) 100 mm >		(2) $100^{mm} \sim 200^{mm}$	(3) $200^{mm} \sim 300^{mm}$	(4) 300^{mm} <		
Existing Stream Condition	8	Average Gradient	(1) 20° >		(2) 20° <				
	9	Area of Basin	(1) 0.24 Km^2 >		(2) 0.24 Km^2 <				
	10	Deposit on River Bed	(1) Nothing		(2) Rare	(3) Abudance			
	11	Plant Condition	(1) 50% > Occupancy Rate of Bare Land or Thin Forest			(2) 50% <			
Engineering Judgment	12	Impact to Road	(1) Low		(2) Average	(3) High			
	13	Cause of Disaster							
	14	Counter Measure							
Sketch, etc.							Photo No.		

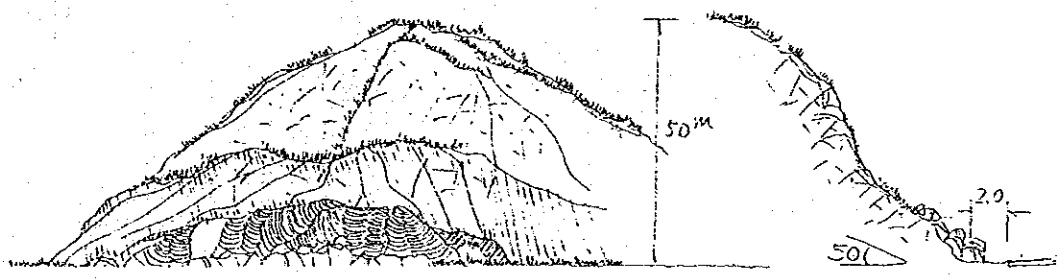




Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF FALL

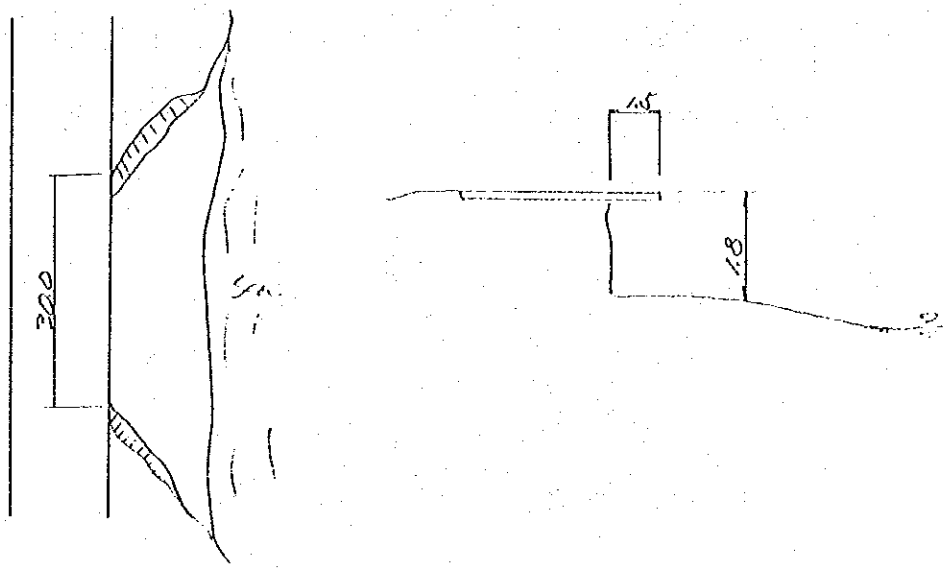
							Sheet No.	8 - 68
Route		M.H (VIII - 37)	Km. Post	718.500	Width	180 M	Region	VIII
Evidence of Falls	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope				
	2	Type of Fall	(1) Debris Fall	(2) Rock Fall				
	3	Fallen Rock Size	(1) 20cm >	(2) 20cm ~ 50cm	(3) 50cm <			
	4	Date Occured	Day	Month	Year			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock		(3) Others		
	7	Rainfall Intensity/ Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <		
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung		
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring		
	11	Surface Water Concentration	(1) None	(2) Low	(3) High			
	12	Berm	(1) Existing Number ( ) With ( )		(3) Nothing			
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing			
	14	Drainage Facilities	(1) Existing ( )	(2) Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1) Rare	(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties					
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered			
	20	Condition of Crack	(1) Sparse	(2) Regular	(3) Developed			
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope			
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) High			
	23	Cause of Fall						
	24	Counter Measure						
Sketch, etc.							Photo No.	



Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

								Sheet No.	S-69-1
Route		M.H (VII-39-1)	Km. Post	721.800	Width	65 M		Region	VII
Evidence of Failure	1	Kind of Slope	(1) ✓ Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others			
	2	Location	(1) Approach of Bridge	(2) ✓ Adjacent to River or Sea	(3) Inside of Curve	(4) Others			
	3	Size of Disaster	(1) 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3) ✓ 100^{m3} <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) ✓ Only Fill	(2) Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <			
Existing Slope Condition	8	Slope Height	(1) ✓ 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} <				
	9	Slope Gradient	(1) ✓ 45° >	(2) 45° ~ 60°	(3) 60° <				
	10	Surface Water Concentration	(1) ✓ None	(2) Low	(3) High				
	11	Slope Protection	(1) ✓ Nothing	(2) Vegetation	(3) Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1) ✓ Nothing	(2) Existing					
Engineering Judgement	13	Impact to Road	(1) Low	(2) ✓ Average	(3) High				
	14	Cause of Disaster	(1) Concentration of Surface Water	(2) River Stream	(3) ✓ Sea Wave	(4) Others			
	15	Counter Measure							
Sketch, etc.								Photo No.	

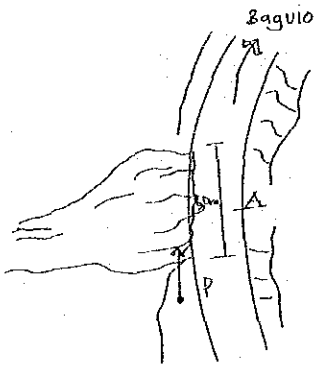


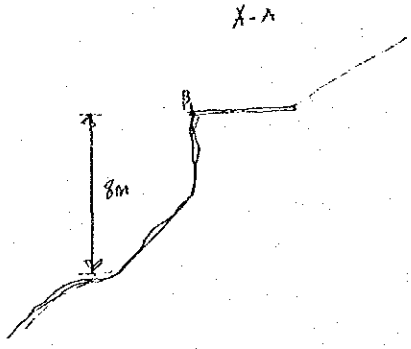
Date of Survey	Day 7	Month Oct	Year 1984	Surveyor	K. Iwata

NAGUILIAN ROAD

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

								Sheet. No.	B-86-1
Route		N (IN-3-2)	Km. Post	276,500	Width	30 M		Region	I
Evidence of Failure	1	Kind of Slope	(1)✓ Embankment Slope (2) Natural Slope (3) Overflow Section (5) Others						
	2	Location	(1) Approach of Bridge (2) Adjacent to River or Sea (3) Inside of Curve (4)✓ Others						
	3	Size of Disaster	(1) 60^{m3} > (2)✓ 50^{m3} ~ 100^{m3} (3) 100^{m3} <						
	4	Date Occured	Day 27~30 Month Aug. Year 1984. by Maring						
	5	Traffic Interruption Period	(1) 1 day > (2) 1 day ~ 7 days (3) 7 days <						
	6	Counter Measure Taken	(1) Only Fill (2) Riprap (3) Other Structure ( )						
	7	Rainfall Intensity/Day	(1) 100^{mm} > (2) 100^{mm} ~ 200^{mm} (3) 200^{mm} ~ 300^{mm} (4)✓ 300^{mm} <						
Existing Slope Condition	8	Slope Height	(1) 5^{m} > (2)✓ 5^{m} ~ 10^{m} (3) 10^{m} <						
	9	Slope Gradient	(1) 45° > (2)✓ 45° ~ 60° (3) 60° <						
	10	Surface Water Concentration	(1) None (2)✓ Low (3) High						
	11	Slope Protection	(1)✓ Nothing (2) Vegetation (3) Riprap (4) Other Structure ( )						
	12	Drainage Facilities	(1)✓ Nothing (2) Existing						
Engineering Judgement	13	Impact to Road	(1) Low (2)✓ Average (3) High						
	14	Cause of Disaster	(1)✓ Concentration of Surface Water (2) River Stream (3) Sea Wave (4) Others						
	15	Counter Measure							
Sketch, etc.								Photo No.	

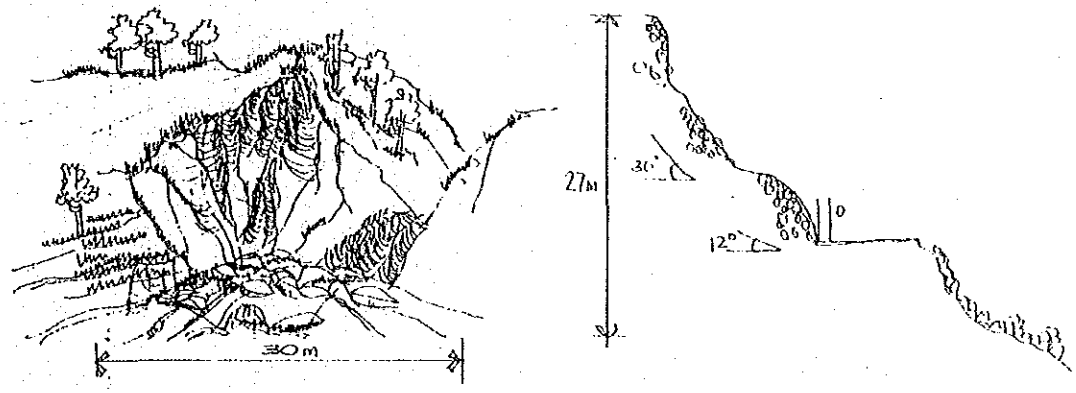




Date of Survey	Day 23 Month Oct Year 1984			Surveyor	B. IWATA

CHECK TABLE OF SLOPE FAILURE

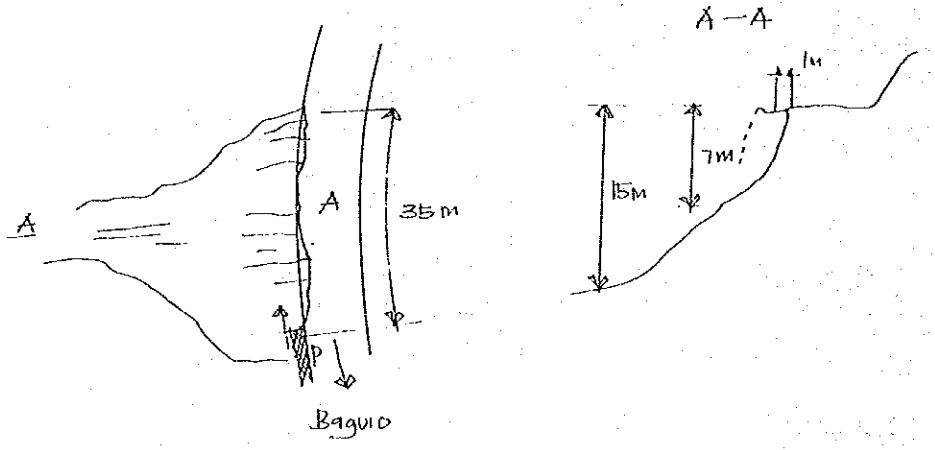
								Sheet No.	B-86-2
Route		N(IN-4-1)	Km. Post	281.500	Width	30 M		Region	I
Evidence of Failure	1	Kind of Slope	(1)✓ Cut Slope	(2) Natural Slope					
	2	Kind of Failure	(1) Nothing	(2) Surface Failure	(3)✓ Deep Failure				
	3	Size of Failure	(1) 50^{m3} >	(2) 50^{m3} ~ 500^{m3}	(3)✓ 500^{m3} ~ $2,000^{m3}$	(4) $2,000^{m3}$ <			
	4	Date Occured	Day 27~30	Month Aug.	Year 1786	by Maury			
	5	Traffic Interruption Period	(1)✓ 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2)✓ Removal of Slide Materials	(3) Others				
	7	Rainfall Intensity/Day	(1) 100 mm >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4)✓ 300^{mm} <			
Existing Slope Condition	8	Height	(1) 10^{m} >	(2)✓ 10^{m} ~ 30^{m}	(3) 30^{m} ~ 50^{m}	(4) 50^{m} <			
	9	Gradient	(1)✓ 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung			
	10	Berm	(1) Existing	Number ( )	Width ( )	(2)✓ Nothing			
	11	Slope Protection	(1) Structure ( )	(2)✓ Vegetation	(3) Nothing				
Geological Condition: Rock	12	Hardness	(1) Hard Rock	(2)✓ Soft Rock					
	13	Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccia (12)✓ Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	14	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3)✓ Highly Weathered	(4)✓ Nearly Soil			
	15	Condition of Crack	(1) Sparse	(2) Regular	(3)✓ Developed				
	16	Direction of Crack	(1) Inclined to Mountain	(2)✓ Irregular Inclination	(3) Inclined to Slope				
Geological Condition: Soil	17	Thickness	(1)✓ 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} ~ 20^{m}	(4) 20^{m} <			
	18	Compactness	(1) Tight	(2) Slightly loose	(3)✓ Loose				
Water Condition	19	Degree of Saturation	(1) Dry	(2) Wet	(3)✓ Seepage	(4) Spring			
	20	Surface Water Concentration	(1) None	(2) Low	(3)✓ High				
	21	Drainage Facilities	(1) Existing ( )	(2)✓ Nothing					
Engineering Judgement	22	Impact to Road	(1) Low	(2)✓ Average	(3) High				
	23	Cause of Disaster							
	24	Counter Measure							
Sketch, etc.							Photo No.		



Date of Survey	Day 23	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

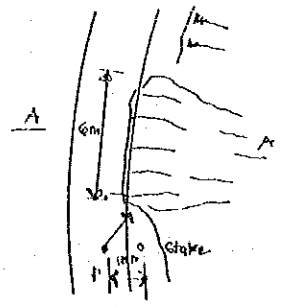
								Sheet. No.	B-86-3
Route		N(IN-4-4)	Km. Post	286,600	Width	35 M		Region	I
Evidence of Failure	1	Kind of Slope	(1)✓Embankment Slope (2) Natural Slope (3) Overflow Section (5) Others						
	2	Location	(1) Approach of Bridge (2) Adjacent to River or Sea (3) Inside of Curve (4)✓Others						
	3	Size of Disaster	(1) 50^{m3} >	(2)✓50^{m3} ~ 100^{m3}	(3) 100^{m3} <				
	4	Date Occured	Day 27~30	Month Aug.	Year 1984	by Maring			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Only Fill	(2) Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4)✓300^{mm} <			
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3)✓10^{m} <				
	9	Slope Gradient	(1) 45° >	(2)✓45° ~ 60°	(3) 60° <				
	10	Surface Water Concentration	(1) None	(2) Low	(3)✓High				
	11	Slope Protection	(1) Nothing	(2) Vegetation	(3)✓Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1)✓Nothing	(2) Existing					
Engineering Judgement	13	Impact to Road	(1) Low	(2)✓Average	(3) High				
	14	Cause of Disaster	(1)✓Concentration of Surface Water (2) River Stream (3) Sea Wave (4) Others						
	15	Counter Measure							
Sketch, etc.								Photo No.	

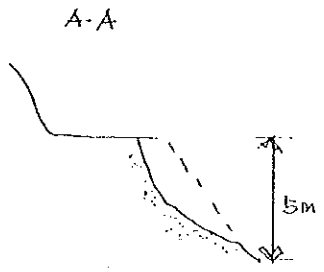


Date of Survey	Day 23	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

								Sheet. No.	B-86-4
Route		N (IN-4-5)	Km. Post	287.800	Width	6 M		Region	I
Evidence of Failure	1	Kind of Slope	(1)✓ Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others			
	2	Location	(1) Approach of Bridge	(2) Adjacent to River or Sea	(3)✓ Inside of Curve	(4) Others			
	3	Size of Disaster	(1)✓ 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3) 100^{m3} <				
	4	Date Occured	Day 27~30	Month Aug.	Year 1984	by Maring			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Only Fill	(2) Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4)✓ 300^{mm} <			
Existing Slope Condition	8	Slope Height	(1)✓ 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} <				
	9	Slope Gradient	(1) 45° >	(2)✓ 45° ~ 60°	(3) 60° <				
	10	Surface Water Concentration	(1) None	(2) Low	(3)✓ High				
	11	Slope Protection	(1)✓ Nothing	(2) Vegetation	(3) Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1)✓ Nothing	(2) Existing					
Engineering Judgement	13	Impact to Road	(1) Low	(2)✓ Average	(3) High				
	14	Cause of Disaster	(1)✓ Concentration of Surface Water	(2) River Stream	(3) Sea Wave	(4) Others			
	15	Counter Measure							
Sketch, etc.								Photo No.	





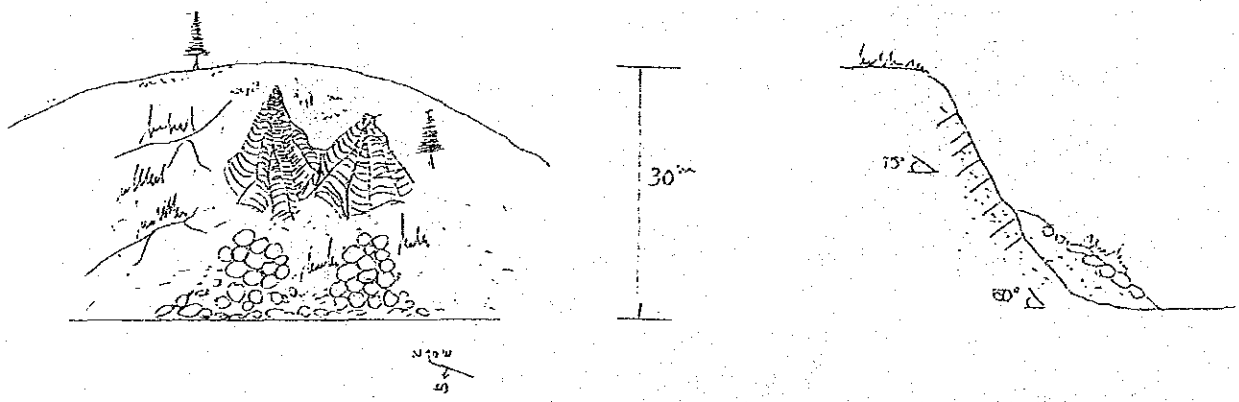
Date of Survey	Day 23	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF FALL

						Sheet No.	B-87
Route		N-(EN-5)	Km. Post	288,300	Width	20 M	Region I

Evidence of Falls	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope		
	2	Type of Fall	(1) Debris Fall	(2) Rock Fall		
	3	Fallen Rock Size	(1) 20m >	(2) 20m ~ 50m	(3) 50m <	
	4	Date Occured	Day	Month	Year	
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <	
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock		(3) Others
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring
	11	Surface Water Concentration	(1) None	(2) Low	(3) High	
	12	Berm	(1) Existing Number ( ) With ( )		(3) Nothing	
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing	
	14	Drainage Facilities	(1) Existing ( )	(2) Nothing		
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble
	16	Gully	(1) Rare	(2) Common	(3) Frequently	
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably	
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics			
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered	
	20	Condition of Crack	(1) Sparse	(2) Regular	(3) Developed	
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope	
Engi-neering Judge-ment	22	Impact to Road	(1) Low	(2) Average	(3) High	
	23	Cause of Fall				
	24	Counter Measure				

Sketch, etc.	Photo No.

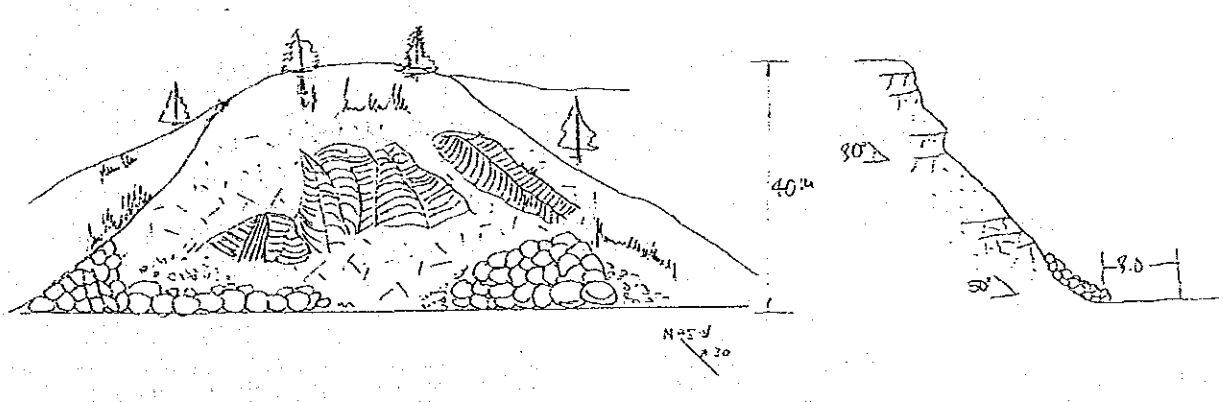


Date of Survey	Day 23	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF FALL

						Sheet No.	B-88
Route	N (IN-7)	Km. Post	288.700	Width	50 M	Region	I

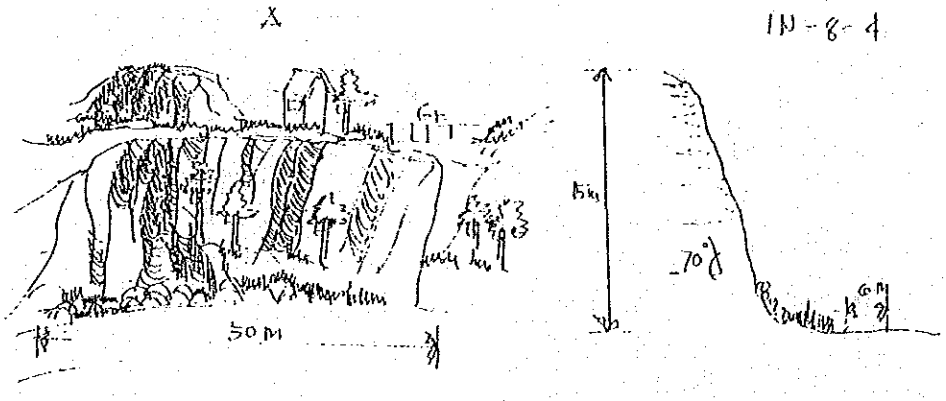
Evidence of Falls	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope		
	2	Type of Fall	(1) Debris Fall	(2) Rock Fall		
	3	Fallen Rock Size	(1) 20cm >	(2) 20cm ~ 50cm	(3) 50cm <	
	4	Date Occured	Day	Month	Year	
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <	
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock		(3) Others
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring
	11	Surface Water Concentration	(1) None	(2) Low	(3) High	
	12	Berm	(1) Existing Number ( ) With ( )		(2) Nothing	
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing	
	14	Drainage Facilities	(1) Existing ( )	(2) Nothing		
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble
	16	Gully	(1) Rare	(2) Common	(3) Frequently	
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably	
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties			
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered	
	20	Condition of Crack	(1) Sparse	(2) Regular	(3) Developed	
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope	
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) High	
	23	Cause of Fall				
	24	Counter Measure				
Sketch, etc.					Photo No.	



Date of Survey	Day 23	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF SLOPE FAILURE

								Sheet No.	B-88-1
Route		N (IN-8-4)	Km. Post	291,000		Width	50 M	Region	I
Evidence of Failure	1	Kind of Slope	(1) ✓ Cut Slope		(2) ✓ Natural Slope				
	2	Kind of Failure	(1) Nothing		(2) ✓ Surface Failure	(3) Deep Failure			
	3	Size of Failure	(1) ✓ 50^{m3} >		(2) $50^{m3} \sim 500^{m3}$	(3) $500^{m3} \sim 2,000^{m3}$	(4) $2,000^{m3}$ <		
	4	Date Occured	Day 27-30		Month Aug.	Year 1984	by Marine		
	5	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )		(2) ✓ Removal of Slide Materials		(3) Others		
	7	Rainfall Intensity/Day	(1) 100 mm >		(2) $100^{mm} \sim 200^{mm}$	(3) $200^{mm} \sim 300^{mm}$	(4) ✓ 300^{mm} <		
Existing Slope Condition	8	Height	(1) 10^{m} >		(2) ✓ $10^{m} \sim 30^{m}$	(3) $30^{m} \sim 50^{m}$	(4) 50^{m} <		
	9	Gradient	(1) 45° >		(2) 45° ~ 60°	(3) ✓ 60° <	(4) Overhung		
	10	Berm	(1) Existing		Number ( )	Width ( )	(2) ✓ Nothing		
	11	Slope Protection	(1) Structure ( )		(2) ✓ Vegetation	(3) Nothing			
Geological Condition — Rock	12	Hardness	(1) Hard Rock		(2) ✓ Soft Rock				
	13	Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) ✓ Tuff (11) Tuffbreccia (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclastics						
	14	Weathering Condition	(1) Fresh		(2) Slightly Weathered	(3) ✓ Highly Weathered	(4) Nearly Soil		
	15	Condition of Crack	(1) Sparse		(2) Regular	(3) ✓ Developed			
	16	Direction of Crack	(1) Inclined to Mountain		(2) ✓ Irregular Inclination	(3) Inclined to Slope			
Geological Condition — Soil	17	Thickness	(1) 5^{m} >		(2) $5^{m} \sim 10^{m}$	(3) $10^{m} \sim 20^{m}$	(4) 20^{m} <		
	18	Compactness	(1) Tight		(2) Slightly loose	(3) Loose			
Water Condition	19	Degree of Saturation	(1) ✓ Dry		(2) Wet	(3) Seepage	(4) Spring		
	20	Surface Water Concentration	(1) None		(2) ✓ Low	(3) High			
	21	Drainage Facilities	(1) Existing ( )		(2) ✓ Nothing				
Engineering Judgement	22	Impact to Road	(1) Low		(2) ✓ Average	(3) High			
	23	Cause of Disaster							
	24	Counter Measure							
Sketch, etc.							Photo No.		

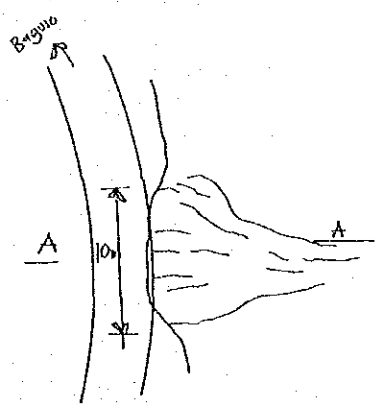


Date of Survey	Day 23	Month Oct	Year 1984	Surveyor	B. IWATA

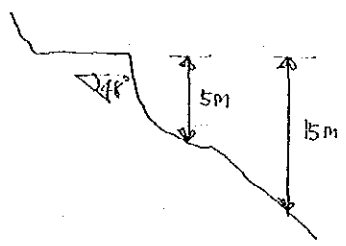
CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

							Sheet No.	B-88-2
Route		N.C IN-8-5	Km. Post	291.050	Width	10 M	Region	I
Evidence of Failure	1	Kind of Slope	(1)✓ Embankment Slope (2) Natural Slope (3) Overflow Section (5) Others					
	2	Location	(1) Approach of Bridge (2) Adjacent to River or Sea (3) Inside of Curve (4)✓ Others					
	3	Size of Disaster	(1) 50^{m3} >	(2)✓ 50^{m3} ~ 100^{m3}	(3) 100^{m3} <			
	4	Date Occured	Day 27~30	Month Aug.	Year 1984 by Haring			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1)✓ Only Fill	(2) Riprap	(3) Other Structure ( )			
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4)✓ 300^{mm} <		
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3)✓ 10^{m} <			
	9	Slope Gradient	(1) 45° >	(2)✓ 45° ~ 60°	(3) 60° <			
	10	Surface Water Concentration	(1) None	(2)✓ Low	(3) High			
	11	Slope Protection	(1) Nothing	(2)✓ Vegetation	(3) Riprap	(4) Other Structure ( )		
	12	Drainage Facilities	(1)✓ Nothing	(2) Existing				
Engineering Judgement	13	Impact to Road	(1) Low	(2)✓ Average	(3) High			
	14	Cause of Disaster	(1)✓ Concentration of Surface Water (2) River Stream (3) Sea Wave (4) Others					
	15	Counter Measure						
Sketch, etc.							Photo No.	

S-5



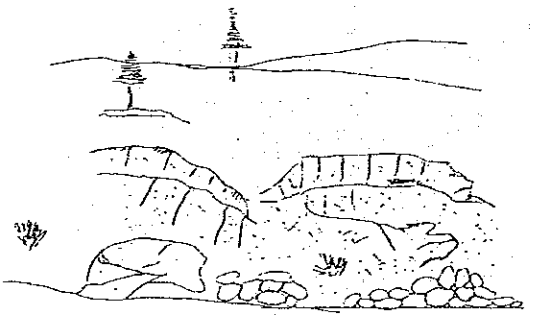
A-A

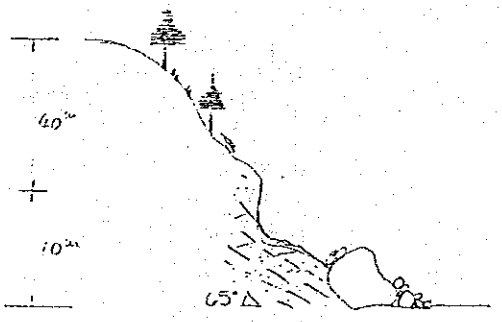


Date of Survey	Day 23	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF FALL

								Sheet No.	B-39
Route		N (IN-10)	Km. Post	293.500	Width	40 M		Region	I
Evidence of Falls	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope					
	2	Type of Fall	(1) Debris Fall	(2) Rock Fall					
	3	Fallen Rock Size	(1) 20cm >	(2) 20cm ~ 50cm	(3) 50cm <				
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock		(3) Others			
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <			
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <			
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung			
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring			
	11	Surface Water Concentration	(1) None	(2) Low	(3) High				
	12	Berm	(1) Existing Number ( ) With ( )	(2) Nothing					
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing				
	14	Drainage Facilities	(1) Existing ( )	(2) Nothing					
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble			
	16	Gully	(1) Rare	(2) Common	(3) Frequently				
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably				
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered				
	20	Condition of Crack	(1) Soarse	(2) Regular	(3) Developed				
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope				
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) High				
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.							Photo No.		

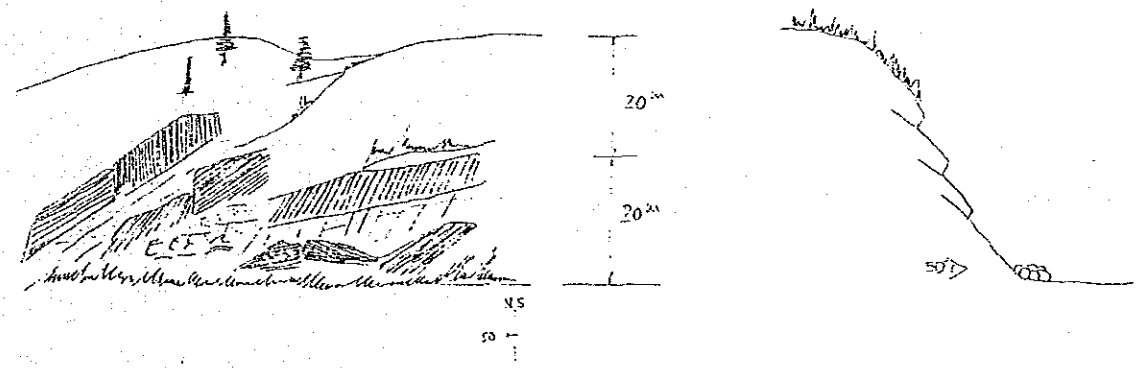




Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF FALL

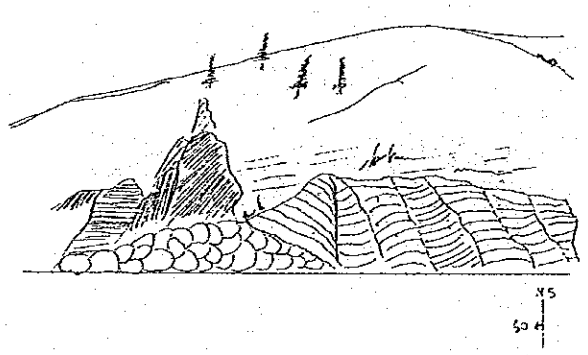
						Sheet No.	B-90
Route		N (IN-12)	Km. Post	294.100	Width	50 M	Region I
Evidence of Falls	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope			
	2	Type of Fall	(1) Debris Fall	(2) Rock Fall			
	3	Fallen Rock Size	(1) 20m >	(2) 20m ~ 50m	(3) 50m <		
	4	Date Occured	Day	Month	Year		
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <		
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Fallen Rock		(3) Others	
	7	Rainfall Intensity/Day	(1) 100mm >	(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4) 300mm <	
Existing Slope Condition	8	Slope Height	(1) 10m >	(2) 10m ~ 30m	(3) 30m ~ 50m	(4) 50m <	
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung	
	10	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring	
	11	Surface Water Concentration	(1) None	(2) Low	(3) High		
	12	Berm	(1) Existing Number ( ) With ( )		(2) Nothing		
	13	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing		
	14	Drainage Facilities	(1) Existing ( )	(2) Nothing			
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard	(2) Soft	(3) Loose	(4) Loose with detached cabble	
	16	Gully	(1) Rare	(2) Common	(3) Frequently		
	17	Detached Rock or cabble	(1) Nothing	(2) Supported Stably	(3) Supported Unstably		
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties				
	19	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered		
	20	Condition of Crack	(1) Soarse	(2) Regular	(3) Developed		
	21	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope		
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) High		
	23	Cause of Fall					
	24	Counter Measure					
Sketch, etc.						Photo No.	

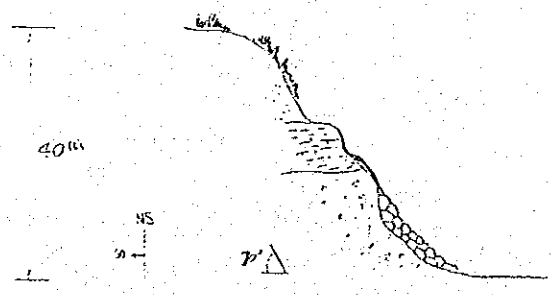


Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF SLOPE FAILURE

							Sheet No.	B-91
Route		N (IN-13)	Km. Post	294.400	Width	50 M	Region	I
Evidence of Failure	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope				
	2	Kind of Failure	(1) Nothing	(2) Surface Failure	(3) Deep Failure			
	3	Size of Failure	(1) 50^{m3} >	(2) 50^{m3} ~ 500^{m3}	(3) 500^{m3} ~ $2,000^{m3}$	(4) $2,000^{m3}$ <		
	4	Date Occured	Day	Month	Year			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Slide Materials	(3) Others			
	7	Rainfall Intensity/Day	(1) 100 mm >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <		
Existing Slope Condition	8	Height	(1) 10^{m} >	(2) 10^{m} ~ 30^{m}	(3) 30^{m} ~ 50^{m}	(4) 50^{m} <		
	9	Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung		
	10	Berm	(1) Existing	Number ( )	Width ( )	(2) Nothing		
	11	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing			
Geological Condition – Rock	12	Hardness	(1) Hard Rock	(2) Soft Rock				
	13	Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties					
	14	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered	(4) Nearly Soil		
	15	Condition of Crack	(1) Soarse	(2) Regular	(3) Developed			
	16	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope			
Geological Condition – Soil	17	Thickness	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} ~ 20^{m}	(4) 20^{m} <		
	18	Compactness	(1) Tight	(2) Slightly loose	(3) Loose			
Water Condition	19	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring		
	20	Surface Water Concentration	(1) None	(2) Low	(3) High			
	21	Drainage Facilities	(1) Existing ( )	(2) Nothing				
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) High			
	23	Cause of Disaster						
	24	Counter Measure						
Sketch, etc.							Photo No.	

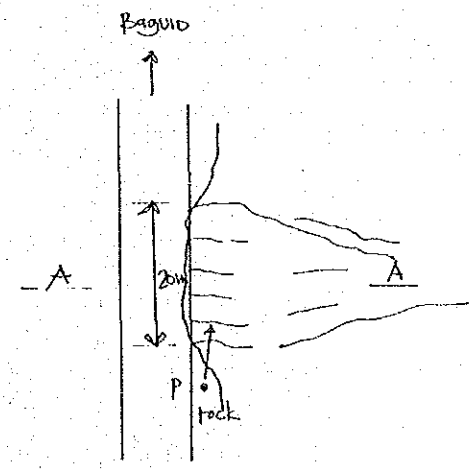


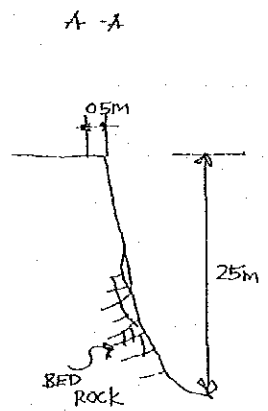


Date of Survey	Day 24	Month Oct.	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

							Sheet No.	S-91-1
Route		N(1N-14)	Km. Post	294.600	Width	20 M	Region	I
Evidence of Failure	1	Kind of Slope	(1)✓ Embankment Slope	(2) Natural Slope	(3) Overflow Section	(5) Others		
	2	Location	(1) Approach of Bridge	(2) Adjacent to River or Sea	(3)✓ Inside of Curve	(4) Others		
	3	Size of Disaster	(1)✓ 50^{m3} >	(2) 50^{m3} ~ 100^{m3}	(3) 100^{m3} <			
	4	Date Occured	Day	Month	Year			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Only Fill	(2) Riprap	(3) Other Structure ( )			
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <		
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3)✓ 10^{m} <			
	9	Slope Gradient	(1) 45° >	(2) 45° ~ 60°	(3)✓ 60° <			
	10	Surface Water Concentration	(1) None	(2)✓ Low	(3) High			
	11	Slope Protection	(1)✓ Nothing	(2) Vegetation	(3) Riprap	(4) Other Structure ( )		
	12	Drainage Facilities	(1)✓ Nothing	(2) Existing				
Engineering Judgement	13	Impact to Road	(1) Low	(2)✓ Average	(3) High			
	14	Cause of Disaster	(1)✓ Concentration of Surface Water	(2) River Stream	(3) Sea Wave	(4) Others		
	15	Counter Measure						
Sketch, etc.							Photo No.	



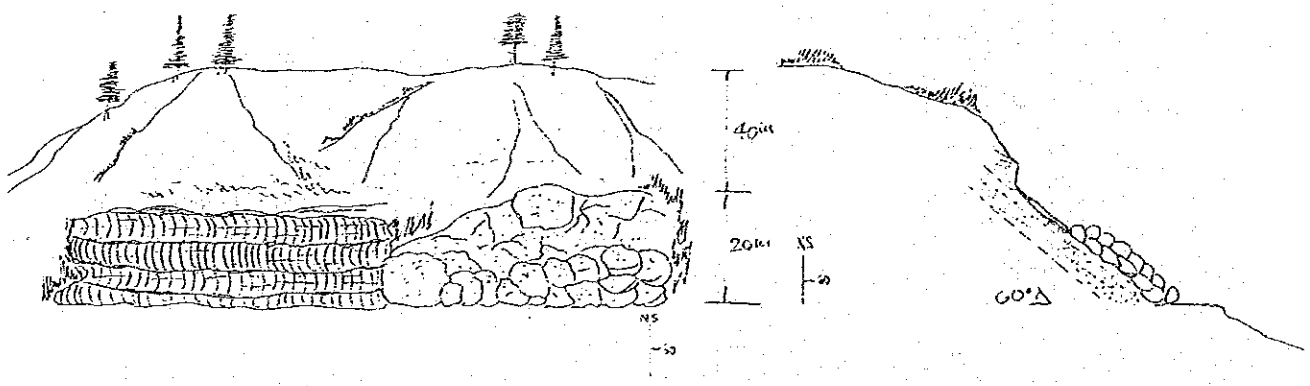


Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF FALL

						Sheet No.	B-92
Route		N (IN-15)	Km. Post	294.600	Width	50 M	Region I

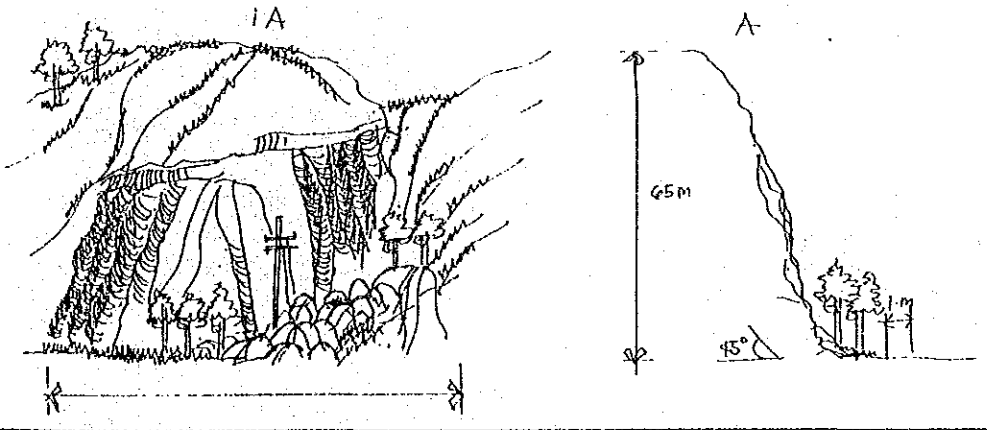
Evidence of Falls	1	Kind of Slope	(1)✓ Cut Slope (2)✓ Natural Slope
	2	Type of Fall	(1) Debris Fall (2)✓ Rock Fall
	3	Fallen Rock Size	(1) 20m > (2) 20m ~ 50m (3)✓ 50m <
	4	Date Occured	Day Month Year
	5	Traffic Interruption Period	(1) 1 day> (2) 1 day ~ 7 days (3) 7 days <
	6	Counter Measure Taken	(1) Structure ( ) (2)✓ Removal of Fallen Rock (3) Others
	7	Rainfall Intensity/Day	(1) 100mm> (2) 100mm ~ 200mm (3) 200mm ~ 300mm (4) 300mm <
Existing Slope Condition	8	Slope Height	(1) 10m > (2)✓ 10m ~ 30m (3) 30m ~ 50m (4) 50m <
	9	Slope Gradient	(1) 45° > (2) 45° ~ 60° (3)✓ 60° < (4)✓ Overhung
	10	Degree of Saturation	(1)✓ Dry (2) Wet (3) Seepage (4) Spring
	11	Surface Water Concentration	(1) None (2) Low (3)✓ High
	12	Berm	(1) Existing Number ( ) With ( ) (2)✓ Nothing
	13	Slope Protection	(1) Structure ( ) (2) Vegetation (3)✓ Nothing
	14	Drainage Facilities	(1) Existing ( ) (2)✓ Nothing
Geological Condition – Debris Fall	15	Matrix Condition	(1) Hard (2) Soft (3) Loose (4) Loose with detached cabble
	16	Gully	(1) Rare (2) Common (3) Frequently
	17	Detached Rock or cabble	(1) Nothing (2) Supported Stably (3) Supported Unstably
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10)✓ Tuff (11)✓ Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties
	19	Weathering Condition	(1)✓ Fresh (2) Slightly Weathered (3) Highly Weathered
	20	Condition of Crack	(1) Soarse (2)✓ Regular (3) Developed
	21	Direction of Crack	(1) Inclined to Mountain (2) Irregular Inclination (3)✓ Inclined to Slope
Engineering Judgement	22	Impact to Road	(1) Low (2) Average (3)✓ High
	23	Cause of Fall	Inclined to slope
	24	Counter Measure	
Sketch, etc.			Photo No.



Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF FALL

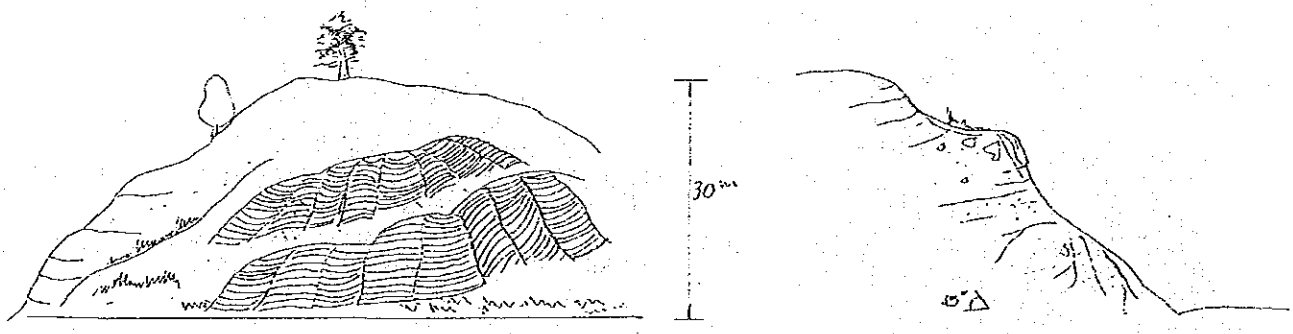
								Sheet No.	B-92-1
Route		N(IN-15-1)	Km. Post	294,800	Width	50 M		Region	I
Evidence of Falls	1	Kind of Slope	(1)✓ Cut Slope		(2)✓ Natural Slope				
	2	Type of Fall	(1) Debris Fall		(2)✓ Rock Fall				
	3	Fallen Rock Size	(1) 20m >		(2) 20m ~ 50m	(3)✓ 50m <			
	4	Date Occured	Day 27~30		Month Aug.	Year 1984 by Maing			
	5	Traffic Interruption Period	(1) 1 day >		(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Structure ( )		(2)✓ Removal of Fallen Rock		(3) Others		
	7	Rainfall Intensity/Day	(1) 100mm >		(2) 100mm ~ 200mm	(3) 200mm ~ 300mm	(4)✓ 300mm <		
Existing Slope Condition	8	Slope Height	(1) 10m >		(2) 10m ~ 30m	(3) 30m ~ 50m	(4)✓ 50m <		
	9	Slope Gradient	(1)✓ 45° >		(2) 45° ~ 60°	(3) 60° <	(4) Overhung		
	10	Degree of Saturation	(1) Dry		(2)✓ Wet	(3) Seepage	(4) Spring		
	11	Surface Water Concentration	(1) None		(2) Low	(3)✓ High			
	12	Berm	(1) Existing Number ( ) With ( )			(2)✓ Nothing			
	13	Slope Protection	(1) Structure ( )		(2)✓ Vegetation	(3) Nothing			
	14	Drainage Facilities	(1) Existing ( )		(2)✓ Nothing				
Geological Condition – Debris Fall	15	Matrix Condition	(1)✓ Hard		(2) Soft	(3) Loose	(4) Loose with detached cabble		
	16	Gully	(1)✓ Rare		(2) Common	(3) Frequently			
	17	Detached Rock or cabble	(1)✓ Nothing		(2) Supported Stably	(3) Supported Unstably			
Geological Condition – Rock Fall	18	Rock Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10)✓ Tuff (11)✓ Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	19	Weathering Condition	(1)✓ Fresh		(2) Slightly Weathered	(3) Highly Weathered			
	20	Condition of Crack	(1) Sparse		(2)✓ Regular	(3) Developed			
	21	Direction of Crack	(1) Inclined to Mountain		(2) Irregular Inclination	(3)✓ Inclined to Slope			
Engineering Judgement	22	Impact to Road	(1) Low		(2) Average	(3)✓ High			
	23	Cause of Fall							
	24	Counter Measure							
Sketch, etc.								Photo No.	



Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF SLOPE FAILURE

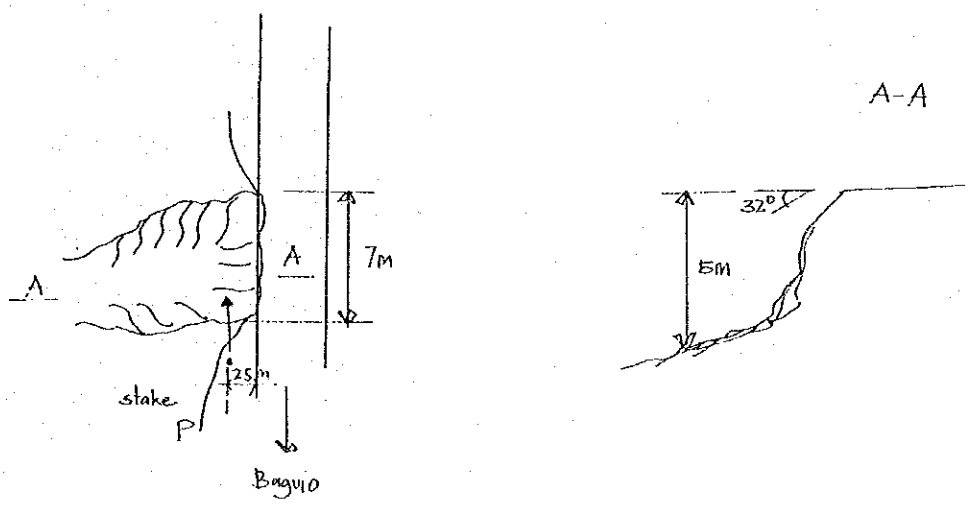
								Sheet No.	B-93
Route		N (IN-16)	Km. Post	298.200	Width	60 M		Region	I
Evidence of Failure	1	Kind of Slope	(1) Cut Slope	(2) Natural Slope					
	2	Kind of Failure	(1) Nothing	(2) Surface Failure	(3) Deep Failure				
	3	Size of Failure	(1) 50^{m3} >	(2) 50^{m3} ~ 500^{m3}	(3) 500^{m3} ~ $2,000^{m3}$	(4) $2,000^{m3}$ <			
	4	Date Occured	Day	Month	Year				
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1) Structure ( )	(2) Removal of Slide Materials	(3) Others				
	7	Rainfall Intensity/ Day	(1) 100 mm >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) 300^{mm} <			
Existing Slope Condition	8	Height	(1) 10^{m} >	(2) 10^{m} ~ 30^{m}	(3) 30^{m} ~ 50^{m}	(4) 50^{m} <			
	9	Gradient	(1) 45° >	(2) 45° ~ 60°	(3) 60° <	(4) Overhung			
	10	Berm	(1) Existing	Number ( )	Width ( )	(2) Nothing			
	11	Slope Protection	(1) Structure ( )	(2) Vegetation	(3) Nothing				
Geological Condition, Rock	12	Hardness	(1) Hard Rock	(2) Soft Rock					
	13	Name	(1) Granite (2) Diorite (3) Diabase (4) Andesite (5) Dacite (6) Schist (7) Slate (8) Limestone (9) Schalstein (10) Tuff (11) Tuffbreccie (12) Sandstone (13) Shale (14) Mudstone (15) Conglomerate (16) Masa (17) Volcaniclasties						
	14	Weathering Condition	(1) Fresh	(2) Slightly Weathered	(3) Highly Weathered	(4) Nearly Soil			
	15	Condition of Crack	(1) Sparse	(2) Regular	(3) Developed				
	16	Direction of Crack	(1) Inclined to Mountain	(2) Irregular Inclination	(3) Inclined to Slope				
Geological Condition, Soil	17	Thickness	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) 10^{m} ~ 20^{m}	(4) 20^{m} <			
	18	Compactness	(1) Tight	(2) Slightly loose	(3) Loose				
Water Condition	19	Degree of Saturation	(1) Dry	(2) Wet	(3) Seepage	(4) Spring			
	20	Surface Water Concentration	(1) None	(2) Low	(3) High				
	21	Drainage Facilities	(1) Existing ( )	(2) Nothing					
Engineering Judgement	22	Impact to Road	(1) Low	(2) Average	(3) High				
	23	Cause of Disaster							
	24	Counter Measure							
Sketch, etc.							Photo No.		



Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA		

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

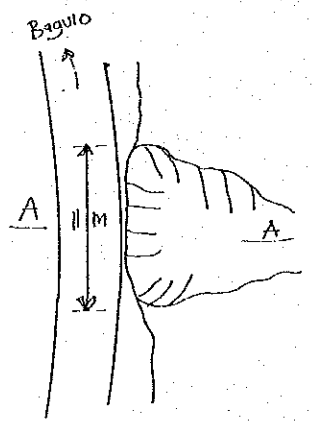
								Sheet. No.	B-94-1
Route		N (IN-19-1)	Km. Post	301.000	Width	7 M		Region	I
Evidence of Failure	1	Kind of Slope	(1)✓Embankment Slope (2) Natural Slope (3) Overflow Section (5) Others						
	2	Location	(1) Approach of Bridge (2) Adjacent to River or Sea (3) Inside of Curve (4)✓Others						
	3	Size of Disaster	(1) 50^{m3} > (2)✓ 50^{m3} ~ 100^{m3} (3) 100^{m3} <						
	4	Date Occured	Day 27~30 Month Aug. Year 1984, by Haring						
	5	Traffic Interruption Period	(1) 1 day > (2) 1 day ~ 7 days (3) 7 days <						
	6	Counter Measure Taken	(1) Only Fill (2) Riprap (3) Other Structure ( )						
	7	Rainfall Intensity/Day	(1) 100^{mm} > (2) 100^{mm} ~ 200^{mm} (3) 200^{mm} ~ 300^{mm} (4)✓ 300^{mm} <						
Existing Slope Condition	8	Slope Height	(1)✓ 5^{m} > (2) 5^{m} ~ 10^{m} (3) 10^{m} <						
	9	Slope Gradient	(1) 45° > (2)✓ 45° ~ 60° (3) 60° <						
	10	Surface Water Concentration	(1) None (2)✓Low (3) High						
	11	Slope Protection	(1) Nothing (2) Vegetation (3)✓Riprap (4) Other Structure ( )						
	12	Drainage Facilities	(1)✓Nothing (2) Existing						
Engineering Judgement	13	Impact to Road	(1) Low (2)✓Average (3) High						
	14	Cause of Disaster	(1)✓ Concentration of Surface Water (2) River Stream (3) Sea Wave (4) Others						
	15	Counter Measure							
Sketch, etc.								Photo No.	

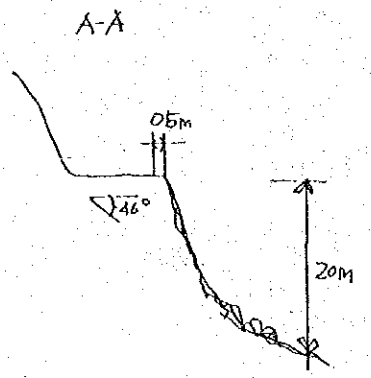


Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

								Sheet. No.	B-94-2
Route		N (IN-19-2)	Km. Post	301,600	Width	11 M		Region	I
Evidence of Failure	1	Kind of Slope	(1)✓ Embankment Slope (2) Natural Slope (3) Overflow Section (5) Others						
	2	Location	(1) Approach of Bridge (2) Adjacent to River or Sea (3) Inside of Curve (4)✓ Others						
	3	Size of Disaster	(1) 50^{m3} >	(2)✓ 50^{m3} ~ 100^{m3}	(3) 100^{m3} <				
	4	Date Occured	Day 29~30	Month Aug.	Year 1984	by Having			
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <				
	6	Counter Measure Taken	(1)✓ Only Fill	(2) Riprap	(3) Other Structure ( )				
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4)✓ 300^{mm} <			
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3)✓ 10^{m} <				
	9	Slope Gradient	(1) 45° >	(2)✓ 45° ~ 60°	(3) 60° <				
	10	Surface Water Concentration	(1) None	(2)✓ Low	(3) High				
	11	Slope Protection	(1)✓ Nothing	(2) Vegetation	(3) Riprap	(4) Other Structure ( )			
	12	Drainage Facilities	(1)✓ Nothing	(2) Existing					
Engineering Judgement	13	Impact to Road	(1) Low	(2)✓ Average	(3) High				
	14	Cause of Disaster	(1)✓ Concentration of Surface Water (2) River Stream (3) Sea Wave (4) Others						
	15	Counter Measure							
Sketch, etc.								Photo No.	

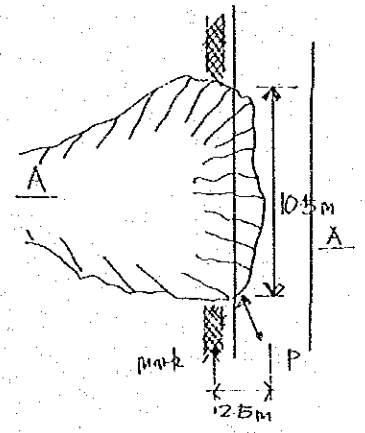


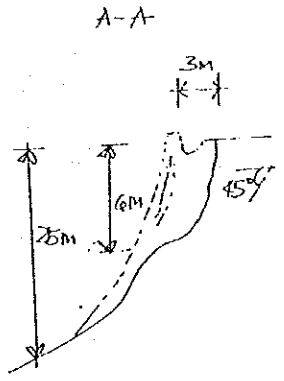


Date of Survey	Day 24 Month Oct. Year 1984	Surveyor	B. IWATA

CHECK TABLE OF EMBANKMENT
SLOPE FAILURE

							Sheet No.	B-95-1
Route		N(IN-23-1)	Km. Post	304,500	Width	10.5 M	Region	I
Evidence of Failure	1	Kind of Slope	(1) ✓ Embankment Slope (2) Natural Slope (3) Overflow Section (5) Others					
	2	Location	(1) Approach of Bridge (2) Adjacent to River or Sea (3) Inside of Curve (4) ✓ Others					
	3	Size of Disaster	(1) 50^{m3} >	(2) ✓ 50^{m3} ~ 100^{m3}	(3) 100^{m3} <			
	4	Date Occured	Day 27~30	Month Augi	Year 1984	by Maring		
	5	Traffic Interruption Period	(1) 1 day >	(2) 1 day ~ 7 days	(3) 7 days <			
	6	Counter Measure Taken	(1) Only Fill	(2) Riprap	(3) Other Structure ( )			
	7	Rainfall Intensity/Day	(1) 100^{mm} >	(2) 100^{mm} ~ 200^{mm}	(3) 200^{mm} ~ 300^{mm}	(4) ✓ 300^{mm} <		
Existing Slope Condition	8	Slope Height	(1) 5^{m} >	(2) 5^{m} ~ 10^{m}	(3) ✓ 10^{m} <			
	9	Slope Gradient	(1) 45° >	(2) ✓ 45° ~ 60°	(3) 60° <			
	10	Surface Water Concentration	(1) None	(2) Low	(3) ✓ High			
	11	Slope Protection	(1) Nothing	(2) Vegetation	(3) ✓ Riprap	(4) Other Structure ( )		
	12	Drainage Facilities	(1) Nothing	(2) ✓ Existing				
Engineering Judgement	13	Impact to Road	(1) Low	(2) ✓ Average	(3) High			
	14	Cause of Disaster	(1) ✓ Concentration of Surface Water (2) River Stream (3) Sea Wave (4) Others					
	15	Counter Measure						
Sketch, etc.							Photo No.	





Date of Survey	Day 24	Month Oct	Year 1984	Surveyor	B. IWATA

APPENDICES FOR CHAPTER 8

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8.5-1	Project Cost	235
8.5-2	Cash Flow	237

APPENDIX 8.2-1 UNIT COST ANALYSIS

NAME OF PROJECT : THE FEASIBILITY STUDY OF PHILIPPINE ROAD DISASTER PREVENTION PROJECT

ITEM NO. 302.2 NAME OF ITEM: Concrete Spraying Thickness = 15 cm QUANTITY: 100 m^2

UNIT PRICE: ₱822/m^2

DESCRIPTION	QUANTITY / NO. OF DAYS	UNIT	UNIT RATE/ DAILY RATE	COMPONENTS			FINANCIAL COST
				FOREIGN	LOCAL	TAX	
1. Materials							
Concrete Class A	18	m^3	1,261.53	12,716.22	6,821.26	3,179.26	22,707.54
PVC Pipe	5.25	Lm	54.00	206.96	28.34	48.20	283.50
Wire Net Ø 2.0mm - 50mm x 50mm (JIS 3552)	140	m^2	32.00	3,270.40	448.00	761.60	4,480.00
Anchore Bolt Ø 16mm - 400mm	30	each	10.54	230.83	31.62	53.75	316.20
Steel Reinforcement	418	kg	10.83	3,168.86	543.23	814.85	4,526.94
Sub-Total				19,593.27	7,863.45	4,857.46	32,314.18
2. Equipments							
Air Compressor 10.5 m^3	2.7	days	5,097.68	9,221.71	2,615.11	1,926.92	13,763.74
Hard Hammer 15 kg	0.5	days	96.00	32.16	9.60	6.24	48.00
Dynamo-Electric Machine 7.5 RVA	1.7	days	304.00	346.26	103.36	67.18	516.80
Belt Conveyor 7 m	5.1	days	224.00	765.41	228.48	148.51	1,142.40
Concrete Spraying Machinr 0.8 ~ 1.2 m^3/hour	18.0	days	3,072.00	3,704.83	1,050.63	774.14	5,529.60
Water Pump Ø 50 mm	3.4	days	294.24	660.28	190.08	150.06	1,000.42
Sub-Total				14,730.65	4,197.26	3,073.05	22,000.96

NAME OF PROJECT : THE FEASIBILITY STUDY OF PHILIPPINE ROAD DISASTER PREVENTION PROJECT

ITEM NO. 302.2 NAME OF ITEM: Concrete Spraying Thickness = 15 cm QUANTITY: 100 m^2

UNIT PRICE: ₱822/m^2

DESCRIPTION	QUANTITY / NO. OF DAYS	UNIT	UNIT RATE/ DAILY RATE	COMPONENTS			FINANCIAL COST
				FOREIGN	LOCAL	TAX	
3. Labor							
Foreman	5	days	89.10	-	445.50	-	445.50
Assistant Foreman	10	days	86.90	-	869.00	-	869.00
Skilled Labor	50	days	60.10	-	3,005.00	-	3,005.00
Unskilled Labor	30	days	53.70	-	1,611.00	-	1,611.00
Technical Expert	2	days	1,500.00	3,000.00	-	-	3,000.00
Sub-Total				3,000.00	5,930.50	-	8,930.50
Total (1 + 2 + 3)				37,323,92	17,991.21	7,930.51	63,245.64
Unit Cost		m^2		373.24	179.91	79.31	632.46
4. Overhead & Profit : 30%		m^2		111.98	53.97	23.79	189.74
Total Unit Cost		m^2		485.22	233.88	102.10	822.20
%				59%	28%	13%	100%

NAME OF PROJECT : THE FEASIBILITY STUDY OF PHILIPPINE ROAD DISASTER PREVENTION PROJECT

ITEM NO. 401 NAME OF ITEM: Anchor Wire Net QUANTITY: 640 m^2

UNIT PRICE: ₱475.89/m^2

DESCRIPTION	QUANTITY / NO. OF DAYS	UNIT	UNIT RATE/ DAILY RATE	COMPONENTS			FINANCIAL COST
				FOREIGN	LOCAL	TAX	
1. Materials							
Wire Net (Ø4.0mm - 50mm x 50mm) (JIS 3552)	690	m^2	174	87,643.80	12,006.00	20,410.20	120,060.00
Wire Rope Ø16 (JIS 3525)	363	Lm	48	12,719.52	1,742.40	2,962.08	17,424.00
Wire Rope Ø12 (JIS 3525)	234	Lm	32	5,466.24	748.80	1,272.96	7,488.00
Cross Clip (Ø16)	74	each	87	4,699.74	643.80	1,094.46	6,438.00
Cross Clip (Ø12)	18	each	80	1,051.20	144.00	244.80	1,440.00
Wire Connection Clip	48	each	45	1,576.80	216.00	367.20	2,160.00
Connection Coil	232	each	30	5,080.80	696.00	1,183.20	6,960.00
Rock Anchor	17	each	692	8,587.72	1,176.40	1,999.88	11,764.00
Sub-Total				126,825.82	17,373.40	29,534.78	173,734.00

NAME OF PROJECT : THE FEASIBILITY STUDY OF PHILIPPINE ROAD DISASTER PREVENTION PROJECT

ITEM NO. 401 NAME OF ITEM: Anchor Wire Net QUANTITY: 640 m^2

UNIT PRICE: ₱475.89/m^2

DESCRIPTION	QUANTITY / NO. OF DAYS	UNIT	UNIT RATE/ DAILY RATE	COMPONENTS			FINANCIAL COST
				FOREIGN	LOCAL	TAX	
2. Equipments							
Truck Crane 20 - 22 ton	16.20	hours	1,430.23	15,523.72	4,402.25	3,243.76	23,169.73
Winch 1.0 ton 10 ps	10.40	days	432.00	1,797.12	2,156.54	539.14	4,492.80
Sub-Total				17,320.84	6,558.79	3,782.90	27,662.53
3. Labor							
Foreman	10	days	89.10	-	891.00	-	891.00
Asst. Foreman	30	days	86.90	-	2,607.00	-	2,607.00
Skilled Labor	200	days	60.10	-	12,020.00	-	12,020.00
Unskilled Labor	100	days	53.70	-	5,370.00	-	5,370.00
Technical Expert	8	days	1,500.00	12,000.00	-	-	12,000.00
Sub-Total				12,000.00	20,888.00	-	32,888.00
Total (1+2+3)				156,146.66	44,820.19	33,317.68	234,284.53
Direct Unit Cost		₱/m^2		243.98	70.03	52.06	366.07
4. Overhead & Profit 30%		₱/m^2		73.19	21.01	15.62	109.82
Total Unit Cost		₱/m^2		317.17	91.04	67.68	475.89
%				67%	19%	14%	100%

NAME OF PROJECT : THE FEASIBILITY STUDY OF PHILIPPINE ROAD DISASTER PREVENTION PROJECT

ITEM NO. 501 NAME OF ITEM: Stone Masonry for Embankment Slope QUANTITY: 56 m^2

UNIT PRICE: ₱ 552/m^2

DESCRIPTION	QUANTITY / NO. OF DAYS	UNIT	UNIT RATE/ DAILY RATE	COMPONENTS			FINANCIAL COST
				FOREIGN	LOCAL	TAX	
1. Material							
Boulder Concrete	19.6	m^3	274.44	3,496.36	1,183.39	699.27	5,379.02
Lean Concrete	14	m^3	914.19	4,936.63	2,651.15	1,554.12	9,141.90
Concrete Class A	1.5	m^3	1,824.04	1,422.75	930.26	383.05	2,736.06
Riverrun Aggregate	30.6	m^3	117.54	2,158.03	1,007.08	431.61	3,596.72
PVC Pipe	14	Lm	54.00	551.88	75.60	128.52	756.00
Sub-Total				12,565.65	5,847.48	3,196.57	21,609.70
2. Labor							
Foreman	1	days	89.10	-	89.10	-	89.10
Assistant Foreman	2	days	86.90	-	173.80	-	173.80
Skilled Labor	12	days	60.10	-	721.20	-	721.20
Unskilled Labor	22	days	53.70	-	1,181.40	-	1,181.40
Sub-Total				-	2,165.50	-	2,165.50
Total (1 + 2)				12,565.65	8,012.98	3,196.57	23,775.20
Unit Cost		m^2		224.39	143.09	57.08	424.56
3. Overhead & Profit ; 30%		m^2		67.32	42.93	17.12	127.37
Total Unit Cost		m^2		291.71	186.02	74.20	551.93
%				53%	34%	13%	100%

APPENDIX 8.2-2 CONSTRUCTION COST

APPENDIX 8.2-2(1) CONSTRUCTION COST - November 1984 Price -

a) Lucena-Calauag Section

Unit Pesos

Description	Unit	Quantity	Construction Cost	Component		
				Foreign	Local	Tax
. Earth Work			8,074,780	5,113,355	1,793,557	1,167,868
. Forming of Slope	Sq.M.	7,518	1,444,320	909,922	346,636	187,762
. Removal	Cu.M.	5,792	1,391,876	862,963	334,050	194,863
. Re-cutting	Cu.M.	11,465	4,081,540	2,612,186	857,123	612,231
. Excavation	Cu.M.	13,415	1,129,815	713,036	247,307	169,472
. Re-filling	Cu.M.	295	27,229	15,248	8,441	3,540
. Drainage Work			2,196,755	1,208,427	702,675	285,653
. Surface drain	Li.M.	4,121	2,160,705	1,188,388	691,425	280,892
. Subsurface drain	Li.M.	-	-	-	-	-
. Pipe culvert	Li.M.	10	36,050	20,039	11,250	4,761
. Slope Protection Work			6,466,685	3,788,084	1,837,933	840,668
. Vegetation	Sq.M.	7,205	324,225	175,082	106,994	42,149
. Concrete spraying	Sq.M.	7,518	5,921,460	3,493,662	1,658,009	769,789
. Stone Pitching	Li.M.	170	221,000	119,340	72,930	28,730
. Catch Work			1,944,200	1,167,725	514,663	261,812
. Catch wall	Li.M.	854	1,037,610	560,310	342,411	134,889
. Catch fence	Li.M.	-	-	-	-	-
. Anchor wire net	Sq.M.	1,905	906,590	607,415	172,252	126,923
. Structural Work			86,320	45,750	29,349	11,221
. Stone masonry	Li.M.	40	86,320	45,750	29,349	11,221
. Gravity type retaining wall	Li.M.	-	-	-	-	-
. Anchoring	Li.M.	-	-	-	-	-
. River and Torrent Work		-	-	-	-	-
. Other Work		-	1,529,590	886,977	413,268	229,345
Total			20,298,330	12,210,318	5,291,445	2,796,567
			(100%)	(60.2%)	(26.1%)	(13.7%)

* Physical contingency is not included.

APPENDIX 8.2-2(2) CONSTRUCTION COST - November 1984 Price -

b) Allen-Calbayog Section

Unit Pesos

Description	Unit	Quantity	Construction Cost	Component Foreign	Component Local	Component Tax
. Earth Work			11,319,988	7,246,617	2,483,409	1,589,962
. Forming of Slope	Sq.M.	4,995	1,097,925	691,693	263,502	142,730
. Removal	Cu.M.	2,838	698,417	435,709	168,615	94,093
. Re-cutting	Cu.M.	29,566	6,069,929	3,863,626	1,354,317	851,986
. Excavation	Cu.M.	11,197	3,275,763	2,155,935	641,809	478,019
. Re-filling	Cu.M.	1,928	177,954	99,654	55,166	23,134
. Drainage Work			3,139,172	1,734,386	986,689	418,097
. Surface drain	Li.M.	4,566	2,437,382	1,340,560	779,962	316,860
. Subsurface drain	Li.M.	680	644,000	361,760	188,664	93,576
. Pipe culvert	Li.M.	15	57,790	32,066	18,063	7,661
. Slope Protection Work			5,927,880	3,454,909	1,702,347	770,624
. Vegetation	Sq.M.	7,120	320,400	173,016	105,732	41,652
. Concrete spraying	Sq.M.	7,300	5,077,080	2,995,477	1,421,583	660,020
. Stone Pitching	Li.M.	408	530,400	286,416	175,032	68,952
. Catch Wall			2,264,282	1,292,622	671,926	299,734
. Catch wall	Li.M.	1,421	1,726,515	932,318	569,750	224,447
. Catch fence	Li.M.	-	-	-	-	-
. Anchor wire net	Sq.M.	1,130	537,767	360,304	102,176	75,287
. Structural Work			606,740	327,685	203,235	75,820
. Stone masonry	Li.M.	112	301,100	159,583	102,374	39,143
. Gravity type retaining wall	Li.M.	36	305,640	168,102	100,861	36,677
. Anchoring	Li.M.	-	-	-	-	-
. River and Torrent Work			271,200	200,688	40,680	29,832
. Other Work			1,774,850	1,029,413	479,210	266,227
Total			25,304,112	15,286,320	6,567,496	3,450,296
			(100%)	(60.4%)	(26.0%)	(13.6%)

* Physical contingency is not included.

APPENDIX 8.2-2(3) CONSTRUCTION COST - November 1984 Price -

c) Naguilian Road

Unit Pesos

Description	Unit	Quantity	Construction Cost	Component Foreign	Component Local	Tax
. Earth Work			3,751,228	2,387,778	825,146	538,304
. Forming of Slope	Sq.M.	-	-	-	-	-
. Removal	Cu.M.	302	97,854	61,648	23,485	12,721
. Re-cutting	Cu.M.	9,353	3,149,128	2,024,362	667,617	457,149
. Excavation	Cu.M.	1,779	144,123	90,798	31,707	21,618
. Re-filling	Cu.M.	3,009	360,123	210,970	102,337	46,816
. Drainage Work			734,623	404,456	234,593	95,574
. Surface drain	Li.M.	1,310	678,539	373,198	217,132	88,209
. Subsurface drain	Li.M.	-	-	-	-	-
. Pipe culvert	Li.M.	17	56,084	31,258	17,461	7,365
. Slope Protection Work			2,240,056	1,308,188	640,661	291,207
. Vegetation	Sq.M.	3,260	146,700	79,218	48,411	19,071
. Concrete spraying	Sq.M.	2,398	1,971,156	1,162,982	551,924	256,250
. Stone Pitching	Li.M.	94	122,200	65,988	40,326	15,886
. Catch Work			4,451,723	2,969,958	861,015	620,750
. Catch wall	Li.M.	70	85,050	45,927	28,067	11,056
. Catch fence	Li.M.	40	164,000	108,240	34,440	21,320
. Anchor wire net	Sq.M.	8,831	4,202,673	2,815,791	798,508	588,374
. Structural Work			2,378,246	1,460,378	623,409	294,459
. Stone masonry	Li.M.	314	907,134	480,781	308,427	117,926
. Gravity type retaining wall	Li.M.	82	696,180	382,899	229,739	83,542
. Anchoring	Li.M.	302	774,932	596,698	85,243	92,991
. River and Torrent Work		-	-	-	-	-
. Other Work		-	262,235	141,606	77,125	43,504
Total			13,818,111	8,672,364	3,261,949	1,883,798
			(100%)	(62.8%)	(23.6%)	(13.6%)

* Physical contingency is not included.

APPENDIX 8.5-1 PROJECT COST

APPENDIX 8.5-1 PROJECT COST
- November 1984 Price -

Unit : ₱ x Million

WORK ITEM \ SECTION	LUCENA - CALAUAG SECTION				ALLEN - CALBAYOG SECTION				NAGUILIAN ROAD				T O T A L			
	Financial Cost	Component (%)			Financial Cost	Component (%)			Financial Cost	Component (%)			Financial Cost	Component (%)		
		F	L	T		F	L	T		F	L	T		F	L	T
100 Earth work	8.07	5.11	1.79	1.17	11.32	7.25	2.48	1.59	3.75	2.39	0.82	0.54	23.14	14.75	5.09	3.30
200 Drainage Work	2.20	1.21	0.70	0.29	3.14	1.73	0.99	0.42	0.74	0.40	0.24	0.10	6.08	3.34	1.93	0.81
300 Slope Protection Work	6.47	3.79	1.84	0.84	5.93	3.46	1.70	0.77	2.24	1.31	0.64	0.29	14.64	8.56	4.18	1.90
400 Catch Work	1.94	1.17	0.51	0.26	2.25	1.29	0.67	0.30	4.46	2.97	0.86	0.62	8.65	5.43	2.04	1.18
500 Structure Work	0.09	0.05	0.03	0.01	0.61	0.33	0.20	0.08	2.38	1.46	0.62	0.30	3.08	1.84	0.85	0.39
600 River or Torrent Work	-	-	-	-	0.27	0.20	0.04	0.03	-	-	-	-	0.27	0.20	0.04	0.03
700 Other Work	1.53	0.89	0.41	0.23	1.77	1.03	0.48	0.26	0.26	0.14	0.08	0.04	3.56	2.06	0.97	0.53
T o t a l	20.30	12.22 (60.2)	5.28 (26.1)	2.80 (13.7)	25.30	15.29 (60.4)	6.56 (26.0)	3.45 (13.6)	13.82	8.67 (62.8)	3.26 (23.6)	1.89 (13.6)	59.42	36.18 (60.9)	15.10 (25.4)	8.14 (13.7)
Physical Contingency (10%)	2.03	1.22	0.53	0.28	2.53	1.53	0.66	0.34	1.38	0.87	0.32	0.19	5.94	3.62	1.51	13.7
Total Construction Cost	22.33	13.44 (60.2)	5.81 (26.0)	3.08 (13.8)	27.83	16.82 (60.4)	7.22 (26.0)	3.79 (13.6)	15.20	9.54 (62.8)	3.58 (23.6)	2.08 (13.6)	65.36	39.80 (60.9)	16.61 (25.4)	8.95 (13.7)
Detailed Engineering (7%)	1.56	1.01	0.47	0.08	1.95	1.27	0.58	0.10	1.06	0.69	0.32	0.05	4.57	2.97	1.37	0.23
Construction Supervision (7%)	1.56	1.01	0.47	0.08	1.95	1.27	0.58	0.10	1.06	0.69	0.32	0.05	4.57	2.97	1.37	0.23
Total Cost	25.45	15.46 (60.7)	6.75 (26.6)	3.24 (12.7)	31.73	19.36 (61.0)	8.38 (26.4)	3.99 (12.6)	17.32	10.92 (63.0)	4.22 (24.4)	2.18 (12.6)	74.50	45.74 (61.4)	19.35 (26.0)	9.41 (12.6)

APPENDIX 8.5-2 CASH FLOW

APPENDIX 8.5-2 CASH FLOW (1)

Price Level : As of November 1984
Exchange Rate : ₱ 20.00 = US$ 1.00 = ¥ 246.43
Unit : ₱ x Million

Description / Year		1987	1988	1989	1990	1991
. Detailed Engineering			(40%)	(60%)		
. Construction Supervision and Construction					(60%)	(40%)
LUCENA - CALAUAG SECTION	Foreign		0.40	0.61	8.67	5.78
	Local/Tax		0.22	0.33	5.66	3.78
	T O T A L		0.62	0.94	14.33	9.56
ALLEN - CALBAYOG SECTION	Foreign		0.51	0.76	10.85	7.23
	Local/Tax		0.27	0.41	7.02	4.68
	T O T A L		0.78	1.17	17.87	11.91
NAGUILIAN ROAD	Foreign		0.28	0.41	6.14	4.10
	Local/Tax		0.15	0.22	3.61	2.41
	T O T A L		0.43	0.63	9.75	6.51
T O T A L	Foreign		1.19	1.78	25.66	17.11
	Local/Tax		0.64	0.96	16.29	10.87
	T O T A L		1.83	2.74	41.95	27.98

APPENDIX 8.5-2 CASH FLOW (2)
(PRICES ESCALATED)

Unit : ₱ x Million

Description \ Year		1985	1986	1987	1988	1989	1990	1991
. Detailed Engineering					(40%)	(60%)		
. Construction Supervision and Construction							(60%)	(40%)
LUCENA - CALAUAG SECTION	Foreign				0.52	0.84	12.59	8.90
	Local/Tax				0.39	0.63	11.48	8.20
	Total				0.91	1.47	24.07	17.10
ALLEN - CALBAYOG SECTION	Foreign				0.66	1.04	15.76	11.13
	Local/Tax				0.48	0.78	14.23	10.15
	Total				1.14	1.82	29.99	21.28
NAGUILIAN ROAD	Foreign				0.36	0.56	8.92	6.31
	Local/Tax				0.27	0.42	7.32	5.23
	Total				0.63	0.98	16.24	11.54
TOTAL	Foreign				1.54	2.44	37.27	26.34
	Local/Tax				1.14	1.83	33.03	23.58
	Total				2.68	4.27	70.30	49.92
Escalation Rate*	Foreign	7.5%	7.0%	6.0%	6.0%	6.0%	6.0%	6.0%
	Local	25.0%	15.0%	12.0%	10.0%	7.0%	7.0%	7.0%

Note * : Data Source NEDA.

APPENDICES FOR CHAPTER 9

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APPENDIX 9.2-1 BASIC VEHICLE OPERATING COSTS

APPENDIX 9.2-1 BASIC VEHICLE OPERATING COSTS

1) General

The Basic Vehicle Operating Costs (BVOC) are expressed in November 1984 price levels. The manual on Basic Traffic Cost procedures, [1/] prepared by MPWH was main reference for the study with some minor modifications to be consistent with the findings of the Study Team.

2) Vehicle Characteristics

The characteristics of representative vehicles selected in the Study are shown in Appendix 9.2-1 (1).

3) Basic Running Costs

Running costs are defined as part of vehicle operating costs which vary in proportion to the operating distance run by vehicles and comprise the following component:

a) Fuel Cost

Fuel cost was estimated by multiplying fuel consumption (liter/km) for each representative vehicle by fuel price (pesos/liter). Price of fuel and lubricant are shown in Appendix 9.2-1 (2).

[1/] Basic Road Traffic Cost, Highway Planning Manual, Vol. 4 (August 1982)

APPENDIX 9.2-1 (1) VEHICLE CHARACTERISTICS

		Average Vehicle Cost (₱)		Service Life	Yearly Performance		Fuel		Lubricant	
		I. Tax	E. Tax	(Years)	(km)	(Hours)	Type	Consumption	Type	Consumption
Car	Light Car	158,275	93,414	10	15,000	2,000	PG	0.10 l/km	10	0.70 l/Mm
	Medium Car	190,386	112,366	10	17,000	2,000	PG	0.12	10	1.00
	Heavy Car	160,000	94,432	15	20,000	2,000	D	0.12	10	1.10
	Jeep	79,482	69,555	15	20,000	2,000	RG	0.12	10	1.00
	Van	116,873	102,276	10	25,000	2,400	D	0.08	10	0.80
Jeepney (Ford Fiera)		127,370	111,461	5	60,000	3,000	D	0.09	10	0.90
Bus	Small	292,195	252,253	6	70,000	3,000	D	0.16	90	2.50
	Large	557,000	479,157	8	80,000	3,000	D	0.24	90	3.00
Truck	Small	209,695	160,605	12	30,000	2,400	D	0.14	90	2.00
	Medium	298,955	229,256	12	45,000	2,700	D	0.26	90	3.00
	Heavy (2-axles)	463,245	352,115	12	50,000	3,000	D	0.28	90	3.50
	Heavy (3-axles)	285,000	210,387	12	50,000	3,000	D	0.32	90	4.00
	Semi-Trailer	1,133,000	905,667	10	60,000	3,500	D	0.42	90	4.00

Note;

Fuel Type

PG : Premium Gasoline
RG : Regular Gasoline
D : Diesel

Lubricant Type

10 : Petron Motor Oil 10
90 : Mobil HD 90 Super

APPENDIX 9.2-1 (2) PRICE OF FUEL AND LUBRICANT

Unit : Pesos/Liter

	Including Taxes	Custom Duty	Specific Tax	Energy Tax	Special Fund	Excluding Taxes
Fuel						
Premium Gasoline	9.24	1.20	1.74	0.63	-	5.67
Regular Gasoline	8.81	1.20	1.62	0.68	-	5.31
Diesel Fuel	7.26	1.20	0.66	-	-	5.40
Lubricant						
Petron Motor Oil 10	31.00	1.20	1.50	0.65	0.12	27.53
Mobil HD90 Super	32.50	1.20	1.50	0.65	0.12	29.03

b) Tire Cost

Tire cost was estimated by dividing the price of a set of tires by tire life expressed in kilometers. The following assumptions were made:

- The tire life will be extended by 50% of the original life at 85% use,
- The cost of recapping will be 30% of the brand new price,
- Recapping will be done once per original tire on average for commercial vehicles,
- Only 30% of light, medium and heavy cars are considered to be in commercial use, and
- Jeeps, vans, jeepneys, buses and trucks are considered as commercial vehicles.

Tire costs are shown in Appendix 9.2-1 (3).

APPENDIX 9.2-1 (3) TIRE COSTS

		No. of Tires	Type/Size	Ave. Tire Set Price (₱) I. Tax	Ave. Tire Set Price (₱) E. Tax	Life (1000 km)	Percent Recapped	Traffic Cost (₱/km) I. Tax	Traffic Cost (₱/km) E. Tax
Car	Light Car	4	Tl 4PR 5.60, 6.00	2,329	2,117	35	30	0.06	0.06
	Medium Car	4	Radial 175 SR	2,515	2,286	40	30	0.06	0.05
	Heavy Car	4	Tube 6PR 7.00	4,409	4,008	50	30	0.08	0.07
	Jeep	4	Tube 6PR 6.00	3,515	3,196	45	100	0.07	0.07
	Van	4	Tube 8PR 7.00	4,340	3,946	35	100	0.12	0.10
Jeepney (Ford Fiera)		4	Tube 4PR 6.50	2,264	2,058	30	100	0.07	0.06
Bus	Small	6	Tube 8PR 7.00	7,228	6,571	50	100	0.13	0.12
	Large	6	Tube 14PR 10.00	23,417	21,288	60	100	0.36	0.33
Truck	Small	6	Tube 8PR 7.50	9,072	8,247	40	100	0.21	0.19
	Medium	6	Tube 8PR 7.50	9,072	8,247	50	100	0.17	0.15
	Heavy (2 axles)	6	Tube 14PR 10.00	23,417	21,288	60	100	0.36	0.33
	Heavy (3 axles)	10	Tube 14PR 10.00	39,028	35,480	60	100	0.60	0.55
	Semi-Trailer	14	Tube 18PR 11.00	62,753	57,048	60	100	0.97	0.88

c) Maintenance and Repair Cost

The maintenance and repair cost per kilometer are calculated as follows:

- Cost of Parts : Percent of retail price reduced by cost of tire set divided by the annual operating distance.
- Cost of Labor : Retail labor rate times annual number of labor hours divided by the annual operating distance.

APPENDIX 9.2-1 (4) MAINTENANCE AND REPAIR COSTS

Unit : Pesos/Km

		Spare Parts (%)	Cost of Parts I. Tax	Cost of Parts E. Tax	Labor (man-h/year)	Cost of Labor I. Tax	Cost of Labor E. Tax
Car	Light Car	2.5	0.26	0.15	60	0.10	0.10
	Medium Car	2.5	0.28	0.16	70	0.11	0.10
	Heavy Car	5.0	0.39	0.23	100	0.13	0.13
	Jeep	5.0	0.19	0.17	100	0.13	0.13
	Van	5.0	0.23	0.20	100	0.10	0.10
Jeepney (Ford Fiera)		10.0	0.21	0.18	200	0.09	0.08
Bus	Small	10.0	0.41	0.35	250	0.09	0.08
	Large	8.0	0.53	0.46	300	0.10	0.09
Truck	Small	6.0	0.40	0.30	125	0.11	0.11
	Medium	7.0	0.45	0.34	250	0.14	0.14
	Heavy (2-axles)	7.0	0.62	0.46	300	0.16	0.15
	Heavy (3-axles)	6.0	0.30	0.21	300	0.16	0.15
	Semi-Trailer	7.0	1.25	0.99	350	0.15	0.15

Note; Labor rate for mechanic (₱/hour) = ₱ 25.31
Minimum Wage (₱/day) = ₱ 54.00

d) Distance-Related Depreciation Cost

The distance related depreciation costs per kilometer are calculated as the distance related share in percent of the retail vehicle price, reduced by the cost of the tire set in use, divided by the life time kilometrage. The split of the capital costs into distance and time related cost is shown in Appendix 9.2-1 (5).

APPENDIX 9.2-1 (5) SPLIT RATIO OF DEPRECIATION COSTS

(in Percent)

	Distance Related	Time Related
Light Car	50	50
Medium Car	50	50
Heavy Car	65	35
Jeep, Van	65	35
Jeepney, Bus	85	15
Truck	65	35

e) Basic Running Costs

Basic running costs at each sections are calculated by the basic running costs by vehicle type summarized in Appendix 9.2-1 (6) and the modal share of each vehicle type shown in Appendix 9.2-1 (7).

APPENDIX 9.2-1 (6) BASIC RUNNING COST/VEHICLE-KILOMETER IN PESOS, NOVEMBER 1984

		Fuel		Lubricant		Tires		Maintenance				Depreciation		Total	
								Parts		Labor					
		I.T.	E.T.	I.T.	E.T.	I.T.	E.T.	I.T.	E.T.	I.T.	E.T.	I.T.	E.T.	I.T.	E.T.
Car	Light Car	0.92	0.57	0.02	0.02	0.06	0.06	0.26	0.15	0.10	0.10	0.52	0.30	1.89	1.20
	Medium Car	1.11	0.68	0.03	0.03	0.06	0.05	0.28	0.16	0.11	0.10	0.55	0.32	2.13	1.35
	Heavy Car	0.87	0.65	0.03	0.03	0.08	0.07	0.39	0.23	0.13	0.13	0.34	0.20	1.84	1.30
	Jeep	1.06	0.64	0.03	0.03	0.07	0.07	0.19	0.17	0.13	0.13	0.16	0.14	1.65	1.17
	Van	0.58	0.43	0.02	0.02	0.12	0.10	0.23	0.20	0.10	0.10	0.29	0.26	1.34	1.11
Jeepney (Ford Fiera)		0.65	0.49	0.03	0.02	0.07	0.06	0.21	0.18	0.09	0.08	0.35	0.31	1.40	1.15
Bus	Small	1.16	0.86	0.08	0.07	0.13	0.12	0.41	0.35	0.09	0.09	0.58	0.50	2.45	1.99
	Large	1.74	1.30	0.09	0.08	0.36	0.33	0.53	0.46	0.10	0.09	0.71	0.61	3.54	2.87
Truck	Small	1.02	0.76	0.06	0.06	0.21	0.19	0.40	0.30	0.11	0.11	0.36	0.28	2.16	1.69
	Medium	1.89	1.40	0.09	0.08	0.17	0.15	0.45	0.34	0.14	0.14	0.35	0.27	3.09	2.39
	Heavy (2-axles)	2.03	1.51	0.11	0.10	0.36	0.33	0.62	0.46	0.16	0.15	0.48	0.36	3.75	2.91
	Heavy (3-axles)	2.32	1.73	0.12	0.11	0.60	0.55	0.30	0.21	0.16	0.15	0.27	0.19	3.77	2.94
	Semi-Trailer	3.05	2.27	0.12	0.11	0.97	0.88	1.25	0.99	0.15	0.15	1.16	0.92	6.71	5.32

APPENDIX 9.2-1 (7) MODAL SHARE BY SECTION

(in Percent)

		Lucena-Calauag Section	Allen-Calbayog Section	Naguilian Road
Car	Light Car	19	9	27
	Medium Car	19	9	27
	Heavy Car	5	3	10
	Jeep	12	53	3
	Van	45	26	33
	Total	100	100	100
Jeepney (Ford Fiera)		100	100	100
Bus	Small	72	10	0
	Large	28	90	100
	Total	100	100	100
Truck	Small	20	30	12
	Medium	25	30	24
	Heavy (2-axles)	25	40	24
	Heavy (3-axles)	23	0	40
	Semi-Trailer	7	0	0
	Total	100	100	100

APPENDIX 9.2-1 (8) BASIC RUNNING COSTS EXCLUDING TAXES BY SECTION (PESOS/VEHICLE - KILOMETER)

	Lucena-Calauag Section	Allen-Calbayog Section	Naguilian Road
Car	1.19	1.18	1.22
Jeepney	1.15	1.15	1.15
Bus	2.24	2.78	2.87
Truck	2.71	2.39	2.65

4) Basic Fixed Cost

Defined as the part of vehicle operating costs which vary directly with operating time (running and waiting time), this cost component is composed of the following cost items:

a) Time-Related Depreciation Costs

The time dependent depreciation costs are calculated as the time dependent share in percent of the vehicle retail price, reduced by the tire set costs, and divided by the product of vehicle life in years and annual operating hours. The calculations method was based on the straight line depreciation and no salvage value was assumed. Refer to Appendix 9.2-1 (5).

b) Opportunity Cost of Capital

The average capital employed over a vehicle's lifetime is assumed to be half the initial purchasing costs in the absence of any salvage value. Using 15%, which is the estimated annual opportunity cost of capital for the country, this cost component is calculated by the following equation:

$$\text{Opportunity Cost of Capital} = \frac{\text{Vehicle Price Including Tire} \times 0.50 \times 0.15}{\text{Annual Operating Hours}}$$

c) Crew Cost

The estimated costs per hour including salary, allowance, social benefits and commission and the crew sizes are as follows:

APPENDIX 9.2-1 (9) CREW COST

(Unit : Pesos/hour)

	Driver	Conductor	Helper
Car, Jeep	—	—	—
V a n	1 at ₱ 9.25	—	—
Jeepney	1 at ₱ 9.25	—	—
B u s	1 at ₱ 9.25	1 at ₱ 6.08	—
Small truck	1 at ₱ 9.25	—	1 at ₱ 6.08
Medium, Heavy truck Semi-trailer	1 at ₱ 9.25	—	2 at ₱ 6.08 = ₱12.16

d) Overheads, Licenses, Motor Vehicle Fees

The assumed overhead cost figures as of November 1984 are as follows:

Car, Jeep	0.00	(₱/Veh-year)
Van, Small truck	10,526.32	
Jeepney	22,368.42	
Small bus	23,684.21	
Large bus, Truck	25,000.00	

The registration fees are as follows:

Light Car	300 ₱Veh-year
Medium Car	600 ₱/Veh-year
Heavy Car, Jeep	1,200 ₱/Veh-year
Van (2,050 kg)	15.00 ₱/Veh-year
Jeepney (2,100 kg)	do.
Small bus (4,700 kg)	do.
Large bus (14,000 kg)	do.
Small truck (4,560 kg)	do.
Medium truck (10,500 kg)	do.

Heavy truck - 2 axles (15,500 kg)	15.00 ₱/Veh-year
Heavy truck - 3 axles (21,000 kg)	do.
Semi-trailer (31,000 kg)	10.00 ₱ 100 kg-year

e) Insurance Cost

The insurance cost per vehicle per hour could be calculated as the annual premiums over the annual operating hours.

f) Basic Fixed Cost Reduction Factors

Based on the MPWH Highway Planning Manual, only 30% of light and medium cars are considered to be in commercial use.

The fleet reduction factors are supposed to express the degree at which time saving due to road improvement can lead to productivity gain in the form of fleet reduction. Fleet reduction factors will vary with the type of vehicle, type of operation and area.

The utilization of saved time will probably be highest for vehicle characterized by traditionally short and frequent trips such as jeepney and commercial cars, while large vehicles would not be utilized effectively because they were subject to extensive repair and rescheduling trips over longer distances.

Basic fixed cost reduction factors comprising commercial use and fleet reduction factors were assumed as follows:

APPENDIX 9.2-1 (10) REDUCTION FACTOR

Vehicle Tyep	Reduction Factor	
	Commercial Use	Fleet
Light, Medium Car	0.30	1.00
Heavy Car	0.60	1.00
Jeep	0.40	1.00
Van, Small truck	1.00	0.40
Jeepney	1.00	0.90
Small bus	1.00	0.80
Large bus	1.00	0.70
Medium truck	1.00	0.60
Heavy truck, Semi-trailer	1.00	0.75

g) Basic Fixed Costs

Basic fixed costs at each sections are calculated by the basic fixed costs by vehicle type summarized in Appendix 9.2-1 (11) and the modal share of each vehicle type shown in Appendix 9.2-1 (7.)

APPENDIX 9.2-1 (12) BASIC FIXED COSTS EXCLUDING TAXES BY SECTION (PESOS/VEHICLE-HOUR)

	Lucena - Calauag Section	Allen - Calbayog Section	Naguilian Road
C a r	4.78	3.50	4.26
Jeepney	20.21	20.21	20.21
B u s	27.36	28.56	28.75
T r u c k	26.97	24.50	27.58

APPENDIX 9.2-1 (11) BASIC FIXED COST/VEHICLE-HOUR IN PESOS

		Depreciation		Opportuntiy Cost of Capital		Crew Cost	Overhead, Taxes and Licenses		Insurance		Fixed Costs		Basic Fixed Costs	
		I.T.	E.T.	I.T.	E.T.		I.T	E.T.	I.T.	E.T.	I.T.	E.T.	I.T.	E.T
Car	Light Car	3.90	2.28	5.94	3.50	0	0.15	0	1.24	1.20	11.23	6.98	3.37	2.09
	Medium Car	4.70	2.75	7.14	4.21	0	0.30	0	1.49	1.45	13.63	8.41	4.09	2.52
	Heavy Car	1.82	1.05	6.00	3.54	0	0.60	0	2.28	2.21	10.70	6.80	6.42	4.08
	Jeep	0.89	0.77	2.98	2.61	0	0.60	0	1.13	1.10	5.60	4.48	2.24	1.79
	Van	1.64	1.43	3.65	3.20	9.25	4.51	4.39	1.10	1.07	20.15	19.34	8.06	7.74
Jeepney (Ford Fiera)		1.25	1.09	3.18	2.79	9.25	7.56	7.46	1.93	1.87	23.17	22.46	20.85	20.21
Bus	Small	2.37	2.05	7.30	6.31	15.32	8.13	7.89	2.02	1.96	35.14	33.53	28.11	26.82
	Large	3.33	2.86	13.93	11.98	15.32	9.03	8.33	2.66	2.58	44.27	41.07	30.99	28.75
Truck	Small	2.44	1.85	6.55	5.02	15.32	4.67	4.39	0.84	0.82	29.82	27.40	11.93	10.96
	Medium	3.13.	2.39	8.30	6.37	21.40	9.84	9.26	1.52	1.48	44.19	40.90	26.51	24.54
	Heavy (2-axles)	4.28	3.22	11.58	8.80	21.40	9.11	8.33	1.69	1.64	48.06	46.17	36.05	34.63
	Heavy (3-axles)	2.39	1.70	7.13	5.26	21.40	9.38	8.33	1.69	1.64	41.99	40.20	31.49	30.15
	Semi-trailer	10.70	8.49	24.28	19.41	21.40	8.03	7.14	1.69	1.64	66.10	58.08	49.58	43.56

5) Time Cost

Basic time costs are defined as those costs which are incurred by drivers of cars and passengers in passenger transport vehicles, such as cars, jeepneys and buses.

Time cost was allocated a monetary value for those "at work" and "to/from work", while no time cost was assumed for travels with other purposes. The updated hourly rate value of time is shown below:

APPENDIX 9.2-1 (13) UNIT TIME VALUE/HOUR-PERSON IN PESOS

	In Work	To/From Work	Leisure
Car Driver Owner	24.47	12.23	0
Not Owner	9.28	4.64	0
Car Passenger	9.28	4.64	0
Jeepney Passenger	4.22	2.11	0
Bus Passenger	5.06	2.53	0

Based on the survey conducted by the Study Team, the average passenger occupancies were as follows:

APPENDIX 9.2-1 (14) PASSENGER OCCUPANCY RATES (P.O.R.)

		Lucena-Calauag Section	Allen-Calbayog Section	Naguilian Road
Car (in work)	No. of Passenger	1,033	102	460
	No. of Vehicle	278	31	162
	P.O.R.	3.7	3.3	2.8
Car (to/from work)	No. of Passenger	239	98	137
	No. of Vehicle	75	31	60
	P.O.R.	3.2	3.2	2.3
Jeepney	No. of Passenger	483	1,598	5,354
	No. of Vehicle	115	85	415
	P.O.R.	4.2	18.8	12.9
Bus	No. of Passenger	12,750	1,369	3,335
	No. of Vehicle	512	50	85
	P.O.R.	24.9	27.4	39.2

Appendix 9.2-1 (15) and 9.2-1 (16) show the survey result on the number of cars and passengers by trip purpose distribution.

Using those survey results, the passenger time value per hour per vehicle and the assumption that driver-owners are 80% and 20% are employed drivers, the time cost by vehicle type are calculated as follows:

a) Time Cost for Cars with Business Purpose

$$\text{Time Cost} = \{24.47 \times 0.80 + 9.28 \times 0.20 + 9.28 + (\text{P.O.R.}-1)\} \times C + \{12.23 \times 0.80 + 4.64 \times 0.20 + 4.64 \times (\text{P.O.R.}-1)\} \times C'$$

Where, P.O.R. : Passenger occupancy rate
C : Rate of the car in work
C' : Rate of the car to/from work

APPENDIX 9.2-1 (15) NUMBER OF CAR TRAFFIC AND CAR PASSENGER BY TRIP PURPOSE

	No. of Car Traffic (Veh./Day)						No. of Car Passenger (Pass./Day)					
	Lucena-Calauag		Allen-Calbayog		Naguilian Road		Lucena-Calauag		Allen-Calbayog		Naguilian Road	
In Work	278	(79%)	31	(50%)	162	(73%)	1,033	(81%)	102	(51%)	460	(77%)
To/From Work	75	(21%)	31	(50%)	60	(27%)	239	(19%)	98	(49%)	137	(23%)
Sub-Total	353	(100%)	62	(100%)	222	(100%)	1,272	(100%)	200	(100%)	597	(100%)
Leisure	145		58		243		518		156		785	
T o t a l	498		120		465		1,790		356		1,382	

APPENDIX 9.2-1 (16) NUMBER OF JEEPNEY AND BUS PASSENGER BY TRIP PURPOSE

	No. of Jeepney Passenger (Pass./Day)						No. of Bus Passenger (Pass./Day)					
	Lucena-Calauag		Allen-Calbayog		Naguilian Road		Lucena-Calauag		Allen-Calbayog		Naguilian Road	
In Work	104	(21%)	313	(19%)	1,005	(19%)	2,899	(23%)	253	(19%)	485	(15%)
To/From Work	60	(12%)	114	(7%)	844	(16%)	1,192	(9%)	119	(9%)	581	(17%)
Leisure	319	(67%)	1,171	(74%)	3,505	(65%)	8,659	(68%)	997	(72%)	2,269	(68%)
T o t a l	483	(100%)	1,598	(100%)	5,354	(100%)	12,750	(100%)	1,369	(100%)	3,335	(100%)

b) Time Cost for Jeepney and Bus Passenger

Time Cost = T x P.O.R. x P + T' x P.O.R. x P'

Where, T : Unit time value of passenger in work

T' : Unit time value of passenger to/from work

P : Rate of the passenger in work

P' : Rate of the passenger to/from work

APPENDIX 9.2-1 (17) PASSENGER TIME COST/VEHICLE-HOUR IN PESOS

	Lucena-Calauag Section	Allen-Calbayog Section	Naguilian Road
Car with Business Purpose	41.12	31.85	32.35
Jeepney	4.78	17.85	14.70
B u s	34.65	32.58	46.61