SULTANATE OF OMAN
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF ROADS

CONSTRUCTION OF FLYOVER
AT
BARKA ROUNDABOUT
BATINAH HIGHWAY

TENDER DOCUMENT

DRAWINGS

PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

MARCH, 1997

DRAWING SCHEDULE
(FO2-R/A3 BARKA)

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W-30	Re-bar Arrangement (9)
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	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE : DRAWING SCHEDULE
		DATE — DWG NO. G - 1

GENERAL NOTES

LOADING SPECIFICATIONS

The loading specifications used for the design of structures are as follows:

- HIGHWAY DESIGN MANUAL, February 1994, Sultanate of Oman
- STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 1990, Ameriacn Association of State Highway and Transportation Officials
- SPECIFICATIONS FOR HIGHWAY BRIDGES, February 1994, Japan Road Association

Accoding to the above specifications, basic design condition are as follows:

1. CLASSIFICATION OF LIVE LOAD

- Special truck type A (Oman)
- Special truck type B (Oman)
- HS20-44 increased 100% (AASHTO)
- TL-25 (Japan)

2. SEISMIC LOAD

0.1g of acceleration coefficient for seismic loads is applied in accordance with the Highway Design Manual in the Sultanate of Oman.

3. DESIGN METHOD

Allowable stress design is applied for this detailed design study in accordance with Specifications for Highway Bridges by Japan Road Association. Allowable stress design is similar to service load design by AASHTO.

4. STRUCTURAL ANALYSIS

The load distribution is calculated by using of Guyon - Masonnet's method based on orthotropic plate theory.

MATERIALS FOR STRUCTURES

1. CONCRETE

Design strength of concrete is specified as follows:

Class of concrete	Specified compressive strength (28days) (kgf/cm²)	Characteristic strength at 28 days: Cylinders (N/mm²)	Cylinders (kgf/cm²)	Cubes (N/mm²)	Cubes (kgf/cm²)	Application
16	160	16	163	20	204	Blinding(leveling), Stone masonry
24	240	24	245	30	306	Substructure, Retaining wall, Box culvert
32	320	32	326	40	408	Floor slab, Cross beam, Felloe guard & parapet (precast), Cast-in-place concrete pile
40[A]	400	40	408	50	510	Prestressed concrete girder

[A] Concrete class 40 is not prescribed in General Specification for Roads in the Sultanate of Oman, however, it is necessary for prestressed concrete girder.

2. REINFORCING STEEL

Reinforcing bars are deformed bars according to AASHTOM31/M31M.
Grades and tensile requirements are specified as follows:

Grade	Tensile strength, min (kgf/cm²)	Yeiled strength, min (kgf/cm²)
Grade40	4921	2812
Grade60	6327	4218

Bar designaton numbers used in this design are correspond to ones by AASHTO as follows:

AASHTONo.	3	4	5	6	7	8	9	10
This design	D9	D13	D16	D19	D22	D25	D28	D32

3. PRESTRESSING TENDON

Prestressing strand comply with the requirements of AASHTO M203, M204 and M275 or BS5896 and BS4486. Prestressing strands for this design are based on Japanese specifications prescribed as follows:

Type	Area (mm²)	Designation	Ultimate strength (kgf/mm²)	Yeiled strength (kgf/mm²)
12T15.2	1664.40	SWPR7B	190	160
1T15.2	138.70	SWPR7B	190	160

ALLOWABLE STRESSES

1. CONCRETE

The allowable stresses in concrete for each class and type are as follows:

(1) Prestressed concrete structures (kgf/cm²)

	Class32	Class40
Allowable compressive stress		
- Temporary stress before losses due to creep and shrinkage	140	180
- Stress at service load after losses have occured	110	140
Allowable tensile stress		
- Temporary stress before losses due to creep and shrinkage	-12	-15
- Stress at service load after losses have occured at dead load	0	0
- Stress at service load after losses have occured at service load	-12	-15
Allowable shearing stress		
- Stress at service load after losses have occured at service load		5.5
- Stress at service load after losses have occured at ultimate load		53
Allowable diagonal stress		
- Stress at service load after losses have occured at service load		-10

(2) Reinforced concrete structures (kgf/cm²)

	Class20	Class24	Class28	Class32
Allowable compressive stress				
- Flexural commpressive stress	65	80	90	100
- Axial compressive stress	50	65	75	85
Allowable shear stress				
- only by concrete	3.5	3.9	4.2	4.5
- with diaagonal reinforcement	15	17	18	19
- Puncning shear stress	8.0	9.0	9.5	10.0
Allowable bond stress				
- with round bar	7.0	8.0	8.5	9.0
- with deformed bar	14	16	17	18

(3) Cast-in-plcae concrete pile

Cast-in-concrete piles are constructed by concrete class32, but its allowable stresses are for concrete class24.

(4) Reinforcing Bar

Allowable stresses(kgf/cm²) for each grade of reiforcing bar are as follows:

	Grade40	Grade60
General use	1400	1800
Under water	1400	1600

OTHER DESIGN CONDITIONS

- Lap splicing is applied for all reinforcing bars
- Minimum N-value of bearing layer is 30.

OTHERS

- Elevations, staitions and coordinetes are shown in meters.
- Other dimensions are shown in millimeters

NOTES:

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

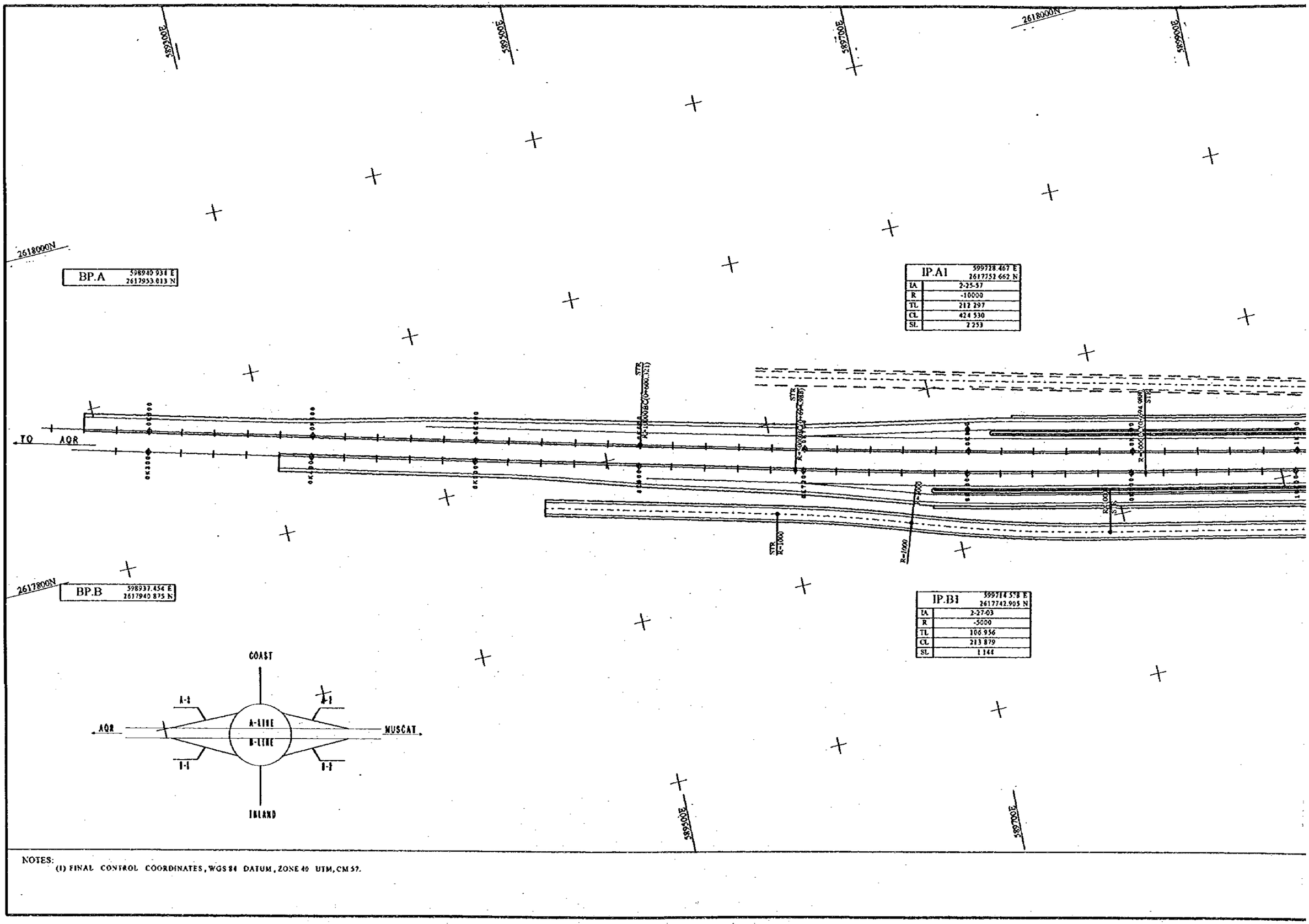
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

TITLE GENERAL NOTES

DATE

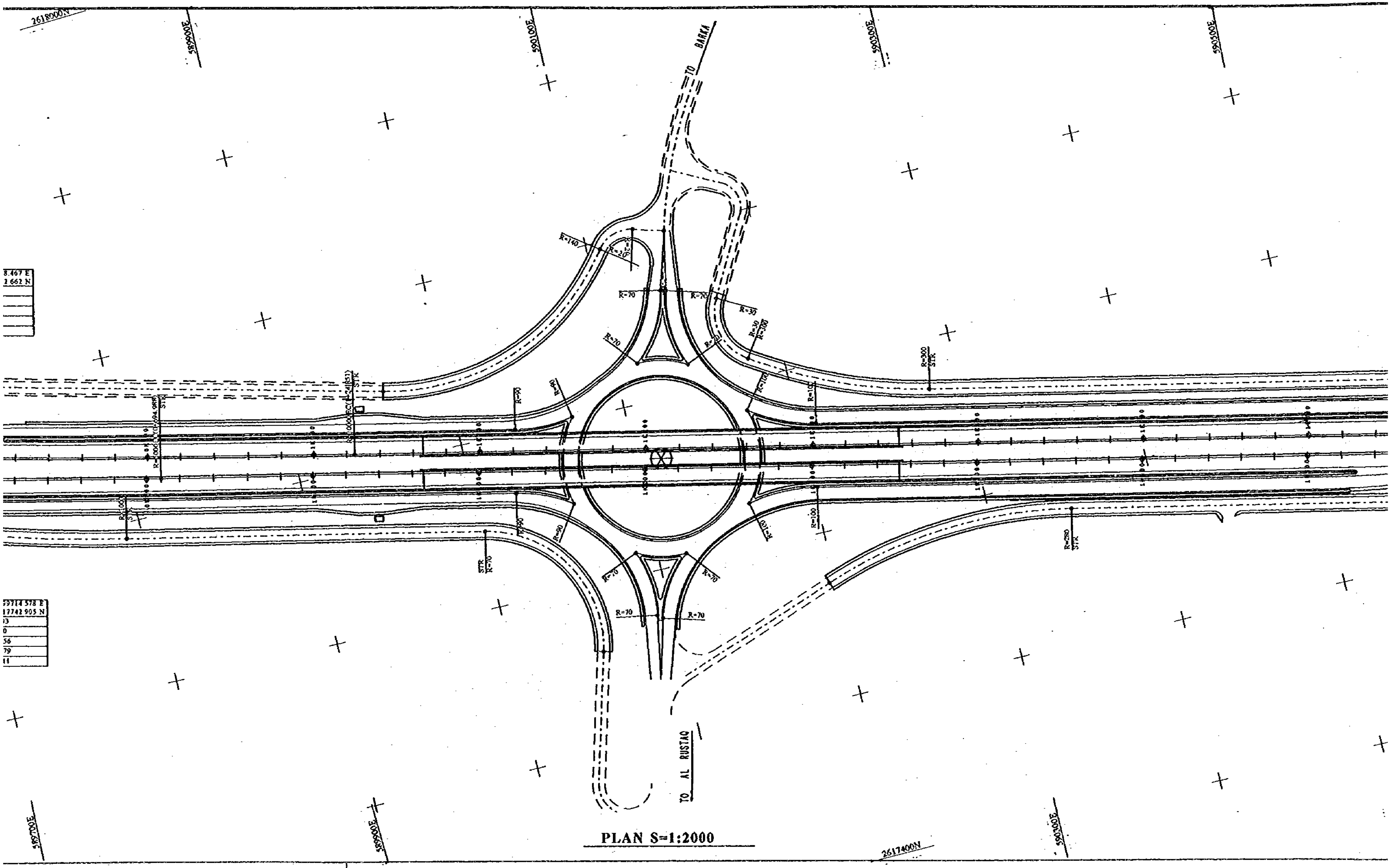
DWG NO. G - 2

ROAD



NOTES:

(1) FINAL CONTROL COORDINATES, WGS 84 DATUM, ZONE 40 UTM, CM 57.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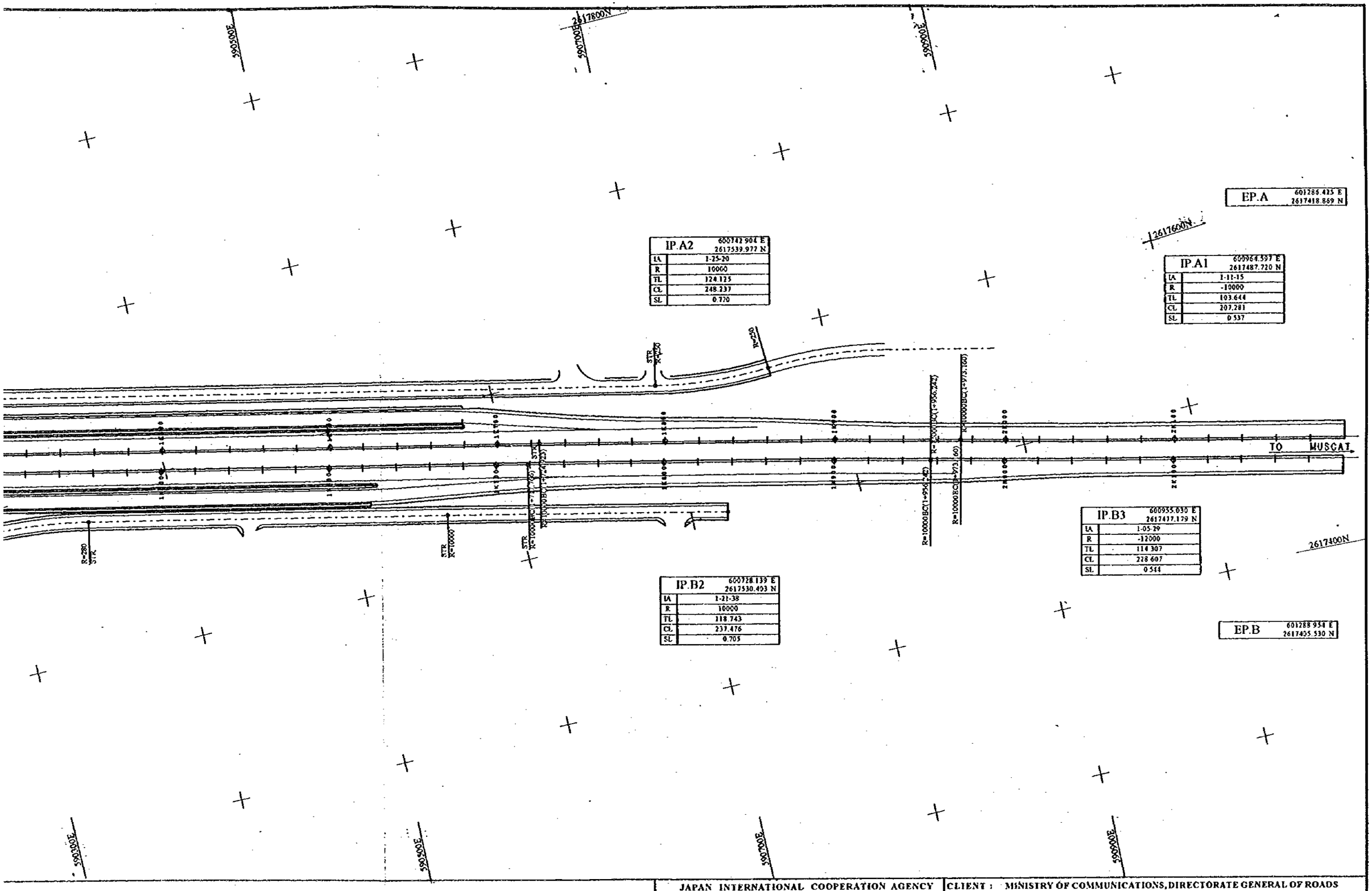
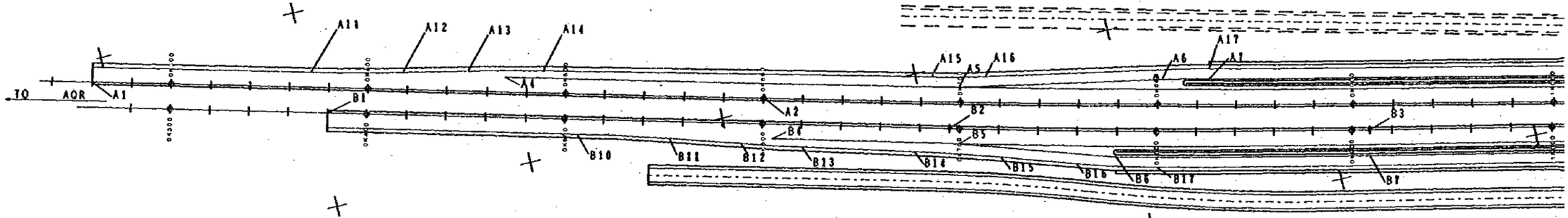
589900E
590100E
590300E
590500E
TO BARKA
R=140
R=70
R=30
R=300
R=90
R=100
R=280
TO AL RUSTAQ
589700E
589900E
590100E
2617400N

PLAN S=1:2000

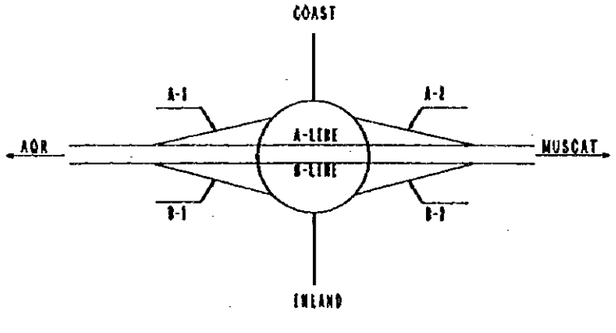


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/3 BARKA ALIGNMENT LAYOUT
	DATE: DWG NO. R-1

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
A1	2617888.910	589192.908	A11	2617868.864	589302.159	A21	2617779.026	590136.573
A2	2617805.004	589522.724	A12	2617858.421	589347.581	A22	2617724.190	590114.007
A3	2617709.100	589936.246	A13	2617851.835	589379.699	A23	2617763.791	590137.678
A4	2617844.611	589397.458	A14	2617843.488	589416.734	A24	2617798.302	590147.959
A5	2617785.470	589620.406	A15	2617796.556	589608.122			
A6	2617769.416	589721.441	A16	2617790.766	589634.853			
A7	2617764.449	589745.236	A17	2617769.318	589746.336			
A8	2617721.826	589938.937	A18	2617708.549	590026.595			
A9	2617701.993	590033.493	A19	2617718.305	590089.406			
A10	2617701.684	590068.885	A20	2617757.254	590127.927			



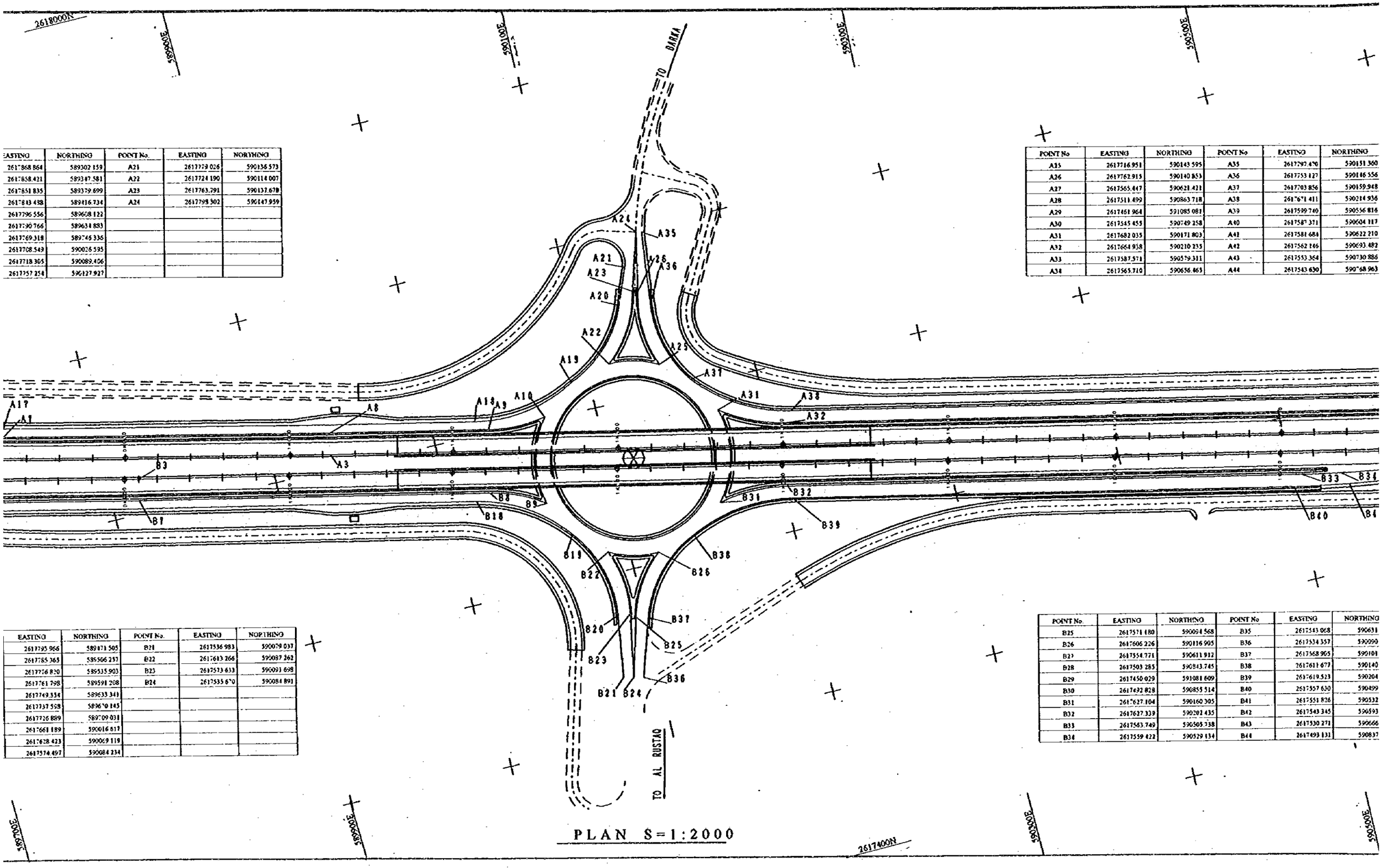
2617800N



POINT No.	EASTING	NORTHING	POINT No	EASTING	NORTHING	POINT No	EASTING	NORTHING
B1	2617847.067	589305.693	B11	2617795.968	589474.505	B21	2617536.983	590079.037
B2	2617769.308	589610.933	B12	2617785.365	589506.757	B22	2617613.266	590087.262
B3	2617720.958	589819.258	B13	2617776.820	589535.903	B23	2617573.633	590091.638
B4	2617784.255	589521.878	B14	2617761.798	589591.208	B24	2617535.670	590084.891
B5	2617760.819	589613.886	B15	2617749.354	589633.341			
B6	2617736.435	589690.231	B16	2617737.598	589670.145			
B7	2617708.235	589816.591	B17	2617726.889	589709.031			
B8	2617664.427	590025.539	B18	2617663.189	590016.617			
B9	2617650.459	590058.127	B19	2617628.423	590069.119			
B10	2617808.320	589426.626	B20	2617574.497	590084.234			

NOTES:

(1) FINAL CONTROL COORDINATES, WGS 84 DATUM, ZONE 40 UTM, CM 57.



PLAN S=1:2000

EASTING	NORTHING	POINT No.	EASTING	NORTHING
2617868.864	589302.159	A21	2617779.026	590136.573
2617858.421	589347.581	A22	2617724.190	590114.007
2617851.835	589379.699	A23	2617763.791	590137.678
2617813.438	589416.734	A24	2617798.302	590147.959
2617796.556	589608.122			
2617790.766	589634.883			
2617769.318	589746.336			
2617708.549	590026.595			
2617718.305	590089.406			
2617757.254	590127.927			

POINT No	EASTING	NORTHING	POINT No	EASTING	NORTHING
A35	2617716.951	590143.595	A35	2617797.470	590151.360
A26	2617762.915	590140.853	A36	2617753.127	590146.556
A27	2617565.447	590621.421	A37	2617703.856	590159.948
A28	2617511.499	590863.718	A38	2617671.411	590214.936
A29	2617461.964	591085.083	A39	2617599.740	590556.816
A30	2617545.455	590749.258	A40	2617587.371	590604.117
A31	2617682.035	590171.803	A41	2617581.684	590622.210
A32	2617664.938	590210.235	A42	2617562.146	590693.482
A33	2617587.571	590579.311	A43	2617553.364	590730.886
A34	2617565.710	590656.463	A44	2617543.630	590768.963

EASTING	NORTHING	POINT No.	EASTING	NORTHING
2617795.966	589471.505	B21	2617536.983	590079.037
2617785.365	589506.237	B22	2617613.266	590087.262
2617776.820	589535.903	B23	2617573.633	590093.698
2617761.798	589598.208	B24	2617535.670	590084.891
2617749.334	589633.343			
2617737.558	589670.845			
2617726.889	589709.031			
2617681.189	590016.617			
2617628.423	590069.119			
2617574.497	590084.234			

POINT No.	EASTING	NORTHING	POINT No	EASTING	NORTHING
B25	2617571.180	590094.568	B35	2617543.068	590631
B26	2617606.226	590116.905	B36	2617534.357	590599
B27	2617554.771	590611.912	B37	2617568.965	590101
B28	2617503.285	590843.745	B38	2617611.677	590140
B29	2617450.029	591081.609	B39	2617619.523	590204
B30	2617492.828	590855.514	B40	2617557.630	590499
B31	2617627.104	590160.305	B41	2617551.826	590532
B32	2617627.339	590202.435	B42	2617543.345	590593
B33	2617563.749	590505.738	B43	2617530.271	590666
B34	2617559.422	590529.134	B44	2617493.131	590837

POINT No	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
A25	2617716.951	590143.595	A35	2617797.476	590151.360	A45	2617534.411	590802.317
A26	2617762.915	590140.853	A36	2617753.227	590146.556	A46	2617524.323	590841.874
A27	2617565.447	590621.421	A37	2617703.856	590159.918			
A28	2617511.499	590863.718	A38	2617671.411	590214.936			
A29	2617451.964	591085.081	A39	2617599.740	590556.816			
A30	2617585.455	590749.258	A40	2617587.371	590604.117			
A31	2617682.035	590171.803	A41	2617581.684	590622.210			
A32	2617664.938	590210.235	A42	2617562.146	590693.492			
A33	2617587.571	590579.331	A43	2617553.364	590730.886			
A34	2617565.719	590656.465	A44	2617543.630	590768.963			

POINT No.	EASTING	NORTHING	POINT No	EASTING	NORTHING	POINT No.	EASTING	NORTHING
B25	2617571.180	590054.568	B35	2617543.068	590631.073	B45	2617486.306	590971.954
B26	2617606.226	590116.905	B36	2617538.337	590690.746	B46	2617480.182	590965.895
B27	2617554.771	590611.932	B37	2617568.905	590101.740	B47	2617471.695	590947.714
B28	2617503.285	590843.745	B38	2617611.677	590140.086			
B29	2617450.029	591081.609	B39	2617619.523	590204.134			
B30	2617493.828	590855.514	B40	2617557.630	590499.345			
B31	2617627.104	590160.305	B41	2617551.826	590532.617			
B32	2617627.339	590202.435	B42	2617543.345	590593.133			
B33	2617563.749	590505.538	B43	2617530.271	590666.500			
B34	2617559.422	590529.134	B44	2617493.131	590837.650			

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/3 BARKA SETTING OUT DETAILS
	DATE: DWG NO. R-1

PIPE CULVERT
D=1.8m, 1CELL L=23.6m

GUARD RAIL (TYPE C) L=820.0m

GUARD RAIL (TYPE A) L=650.0m

GRAVITY L=32.0m

REVERSED-T L=687.(

DITCH LINING L=256.0m

TAPER L=52m

PARALLEL LANE L=238m

NOSE L=52m

LIMIT OF CONSTRUCTION

TO AQR

LIMIT OF CONSTRUCTION

LIMIT OF CONSTRUCTION

TAPER L=52m

PARALLEL LANE L=52m

NOSE L=52m

GUARD RAIL (TYPE A) L=536.4m

GRAVITY L=75.0m

REVERSED-T L=169.(

GUARD RAIL (TYPE C) L=250.0m

COAST

A-1

A-2

AQR

A-LINE

B-LINE

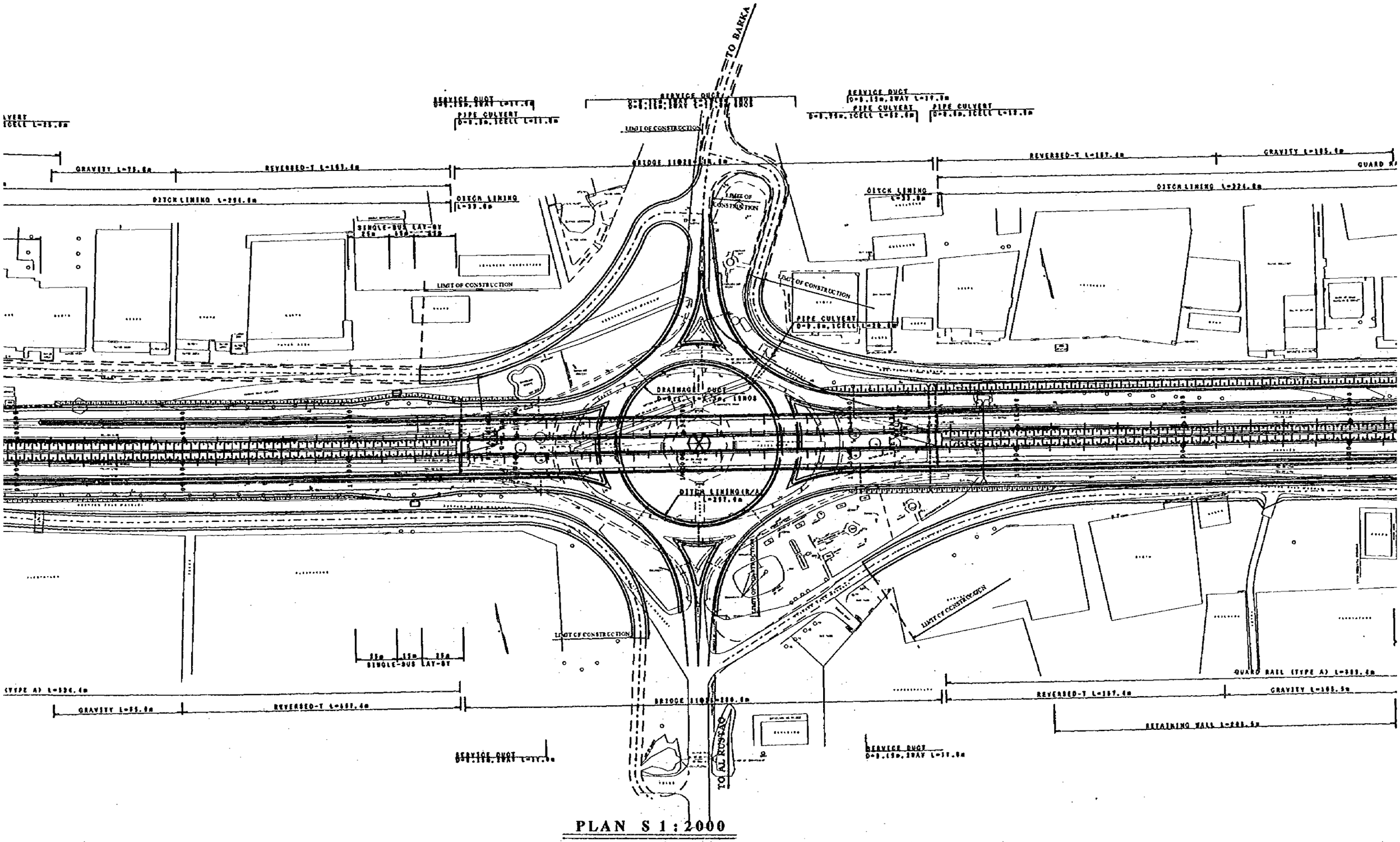
MUSCAT

B-1

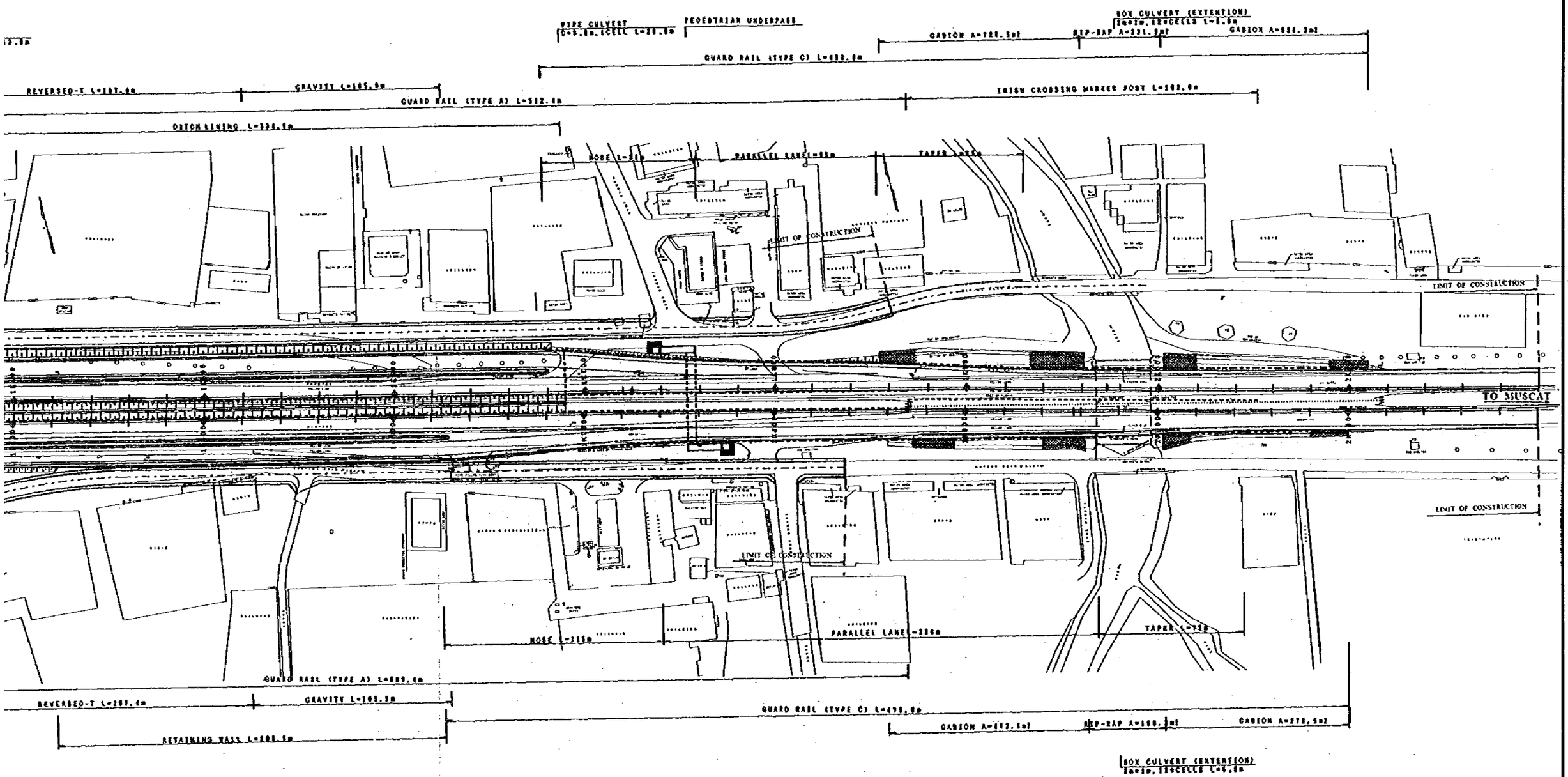
B-2

INLAND

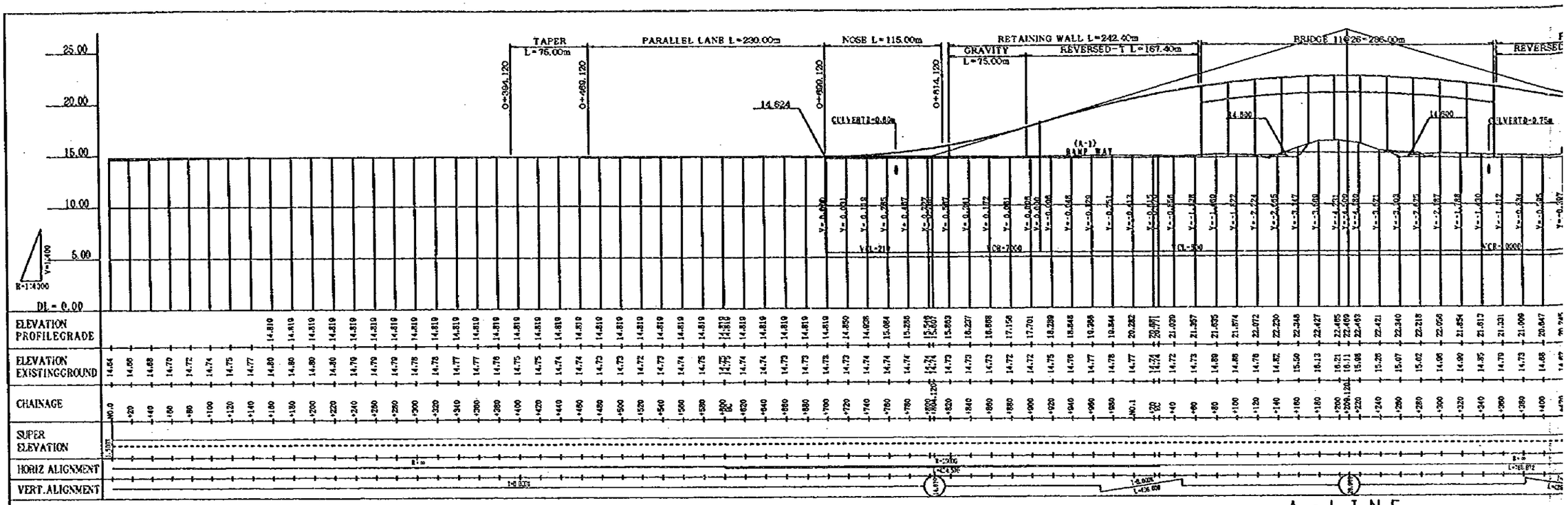
NOTES:

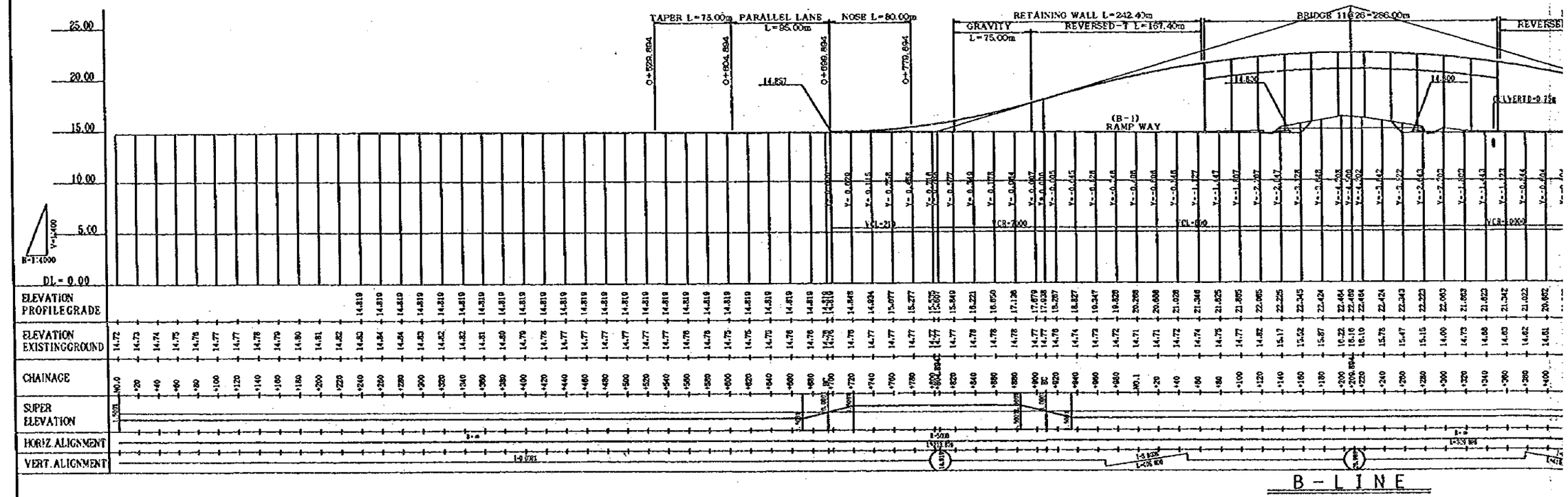

TO BARKA
LIMIT OF CONSTRUCTION
GRAVITY L=93.6m
REVERSED-T L=163.4m
DITCH LINING L=296.8m
DITCH LINING L=33.8m
SINGLE-BUS LAY-BY
LIMIT OF CONSTRUCTION
DRAINAGE DUCT
DITCH LINING (R/A) L=297.4m
REVERSED-T L=197.4m
GRAVITY L=105.5m
DITCH LINING L=324.8m
DITCH LINING L=33.8m
PIPE CULVERT
LIMIT OF CONSTRUCTION
LIMIT OF CONSTRUCTION
LIMIT OF CONSTRUCTION
LIMIT OF CONSTRUCTION
33m 15m 33m
SINGLE-BUS LAY-BY
GRAVITY L=93.6m
REVERSED-T L=651.4m
REVERSED-T L=197.4m
GRAVITY L=105.5m
RETAINING WALL L=283.5m
TO AL RUSTAQ

PLAN S 1:2000



	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE RA/3 BARKA PLAN
		DATE — DWGNO. R-3


TAPER L=75.00m
PARALLEL LANE L=230.00m
NOSE L=115.00m
RETAINING WALL L=242.40m
GRAVITY L=75.00m
REVERSED-T L=167.40m
BRIDGE 11@26=286.00m
REVERSED
CULVERT@-0.60m
CULVERT@-0.75m
(A-1) RAMP WAY
14.624
14.830
14.830
25.00
20.00
15.00
10.00
5.00
DL = 0.00
ELEVATION PROFILEGRADE
ELEVATION EXISTINGGROUND
CHAINAGE
SUPER ELEVATION
HORIZ ALIGNMENT
VERT. ALIGNMENT
A-LINE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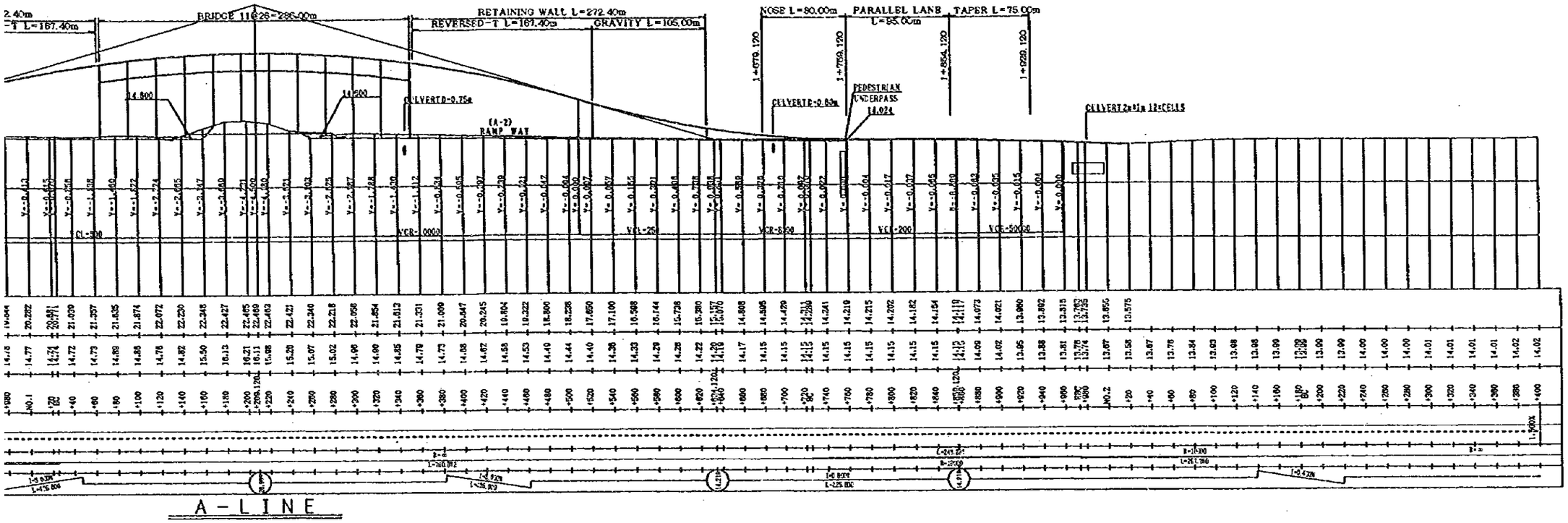
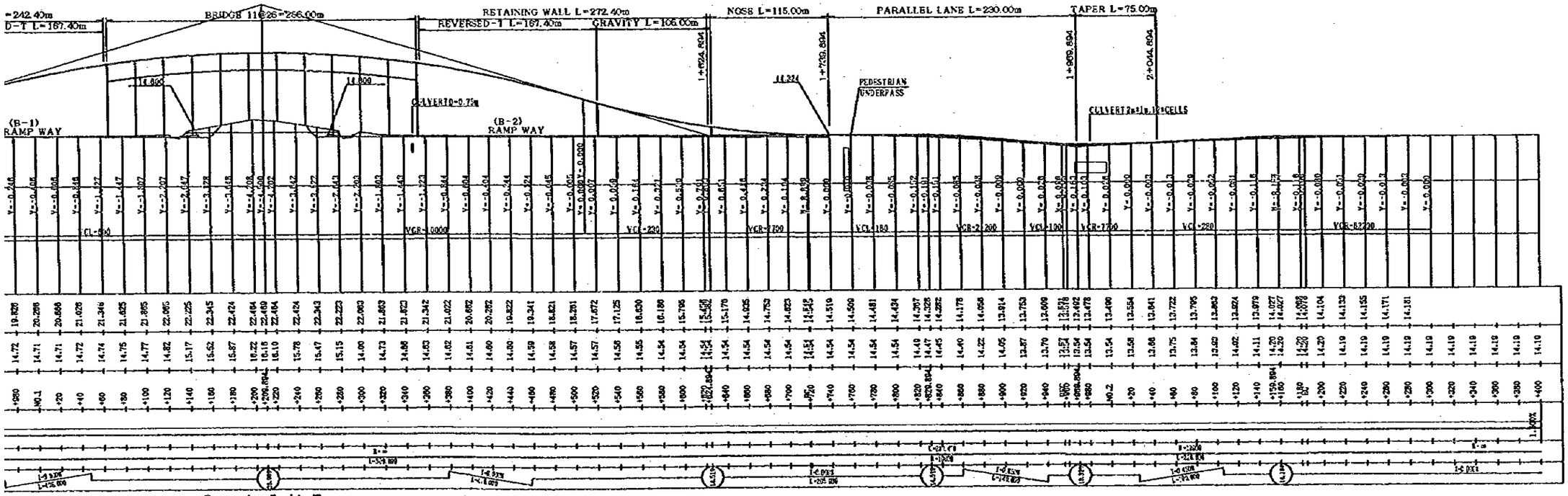
PARALLEL LANE L=85.00m
NOSE L=80.00m
RETAINING WALL L=242.40m
GRAVITY L=75.00m
REVERSED-T L=167.40m
BRIDGE 11@26=286.00m
REVERSE
CULVERT@-0.75m
(B-1) RAMP WAY
14.857
14.830
14.830
25.00
20.00
15.00
10.00
5.00
DL = 0.00
ELEVATION PROFILEGRADE
ELEVATION EXISTINGGROUND
CHAINAGE
SUPER ELEVATION
HORIZ. ALIGNMENT
VERT. ALIGNMENT
B-LINE

NOTES:

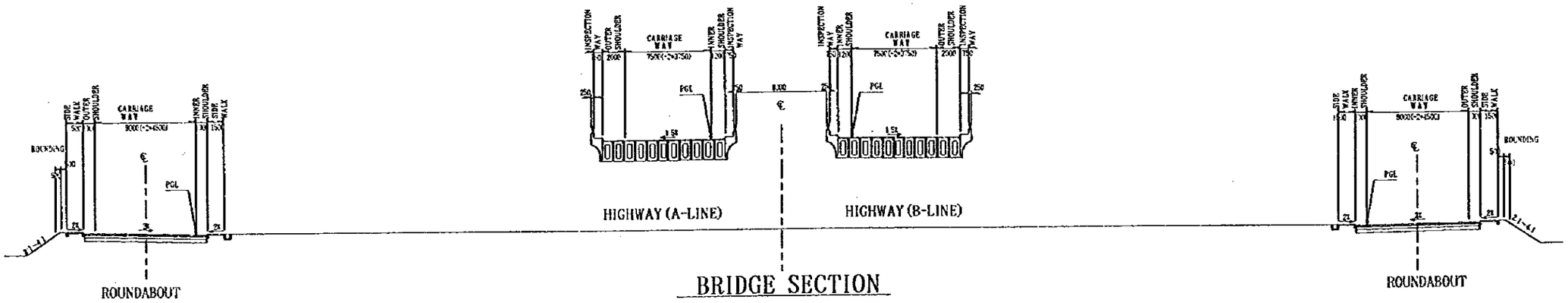


A-LINE

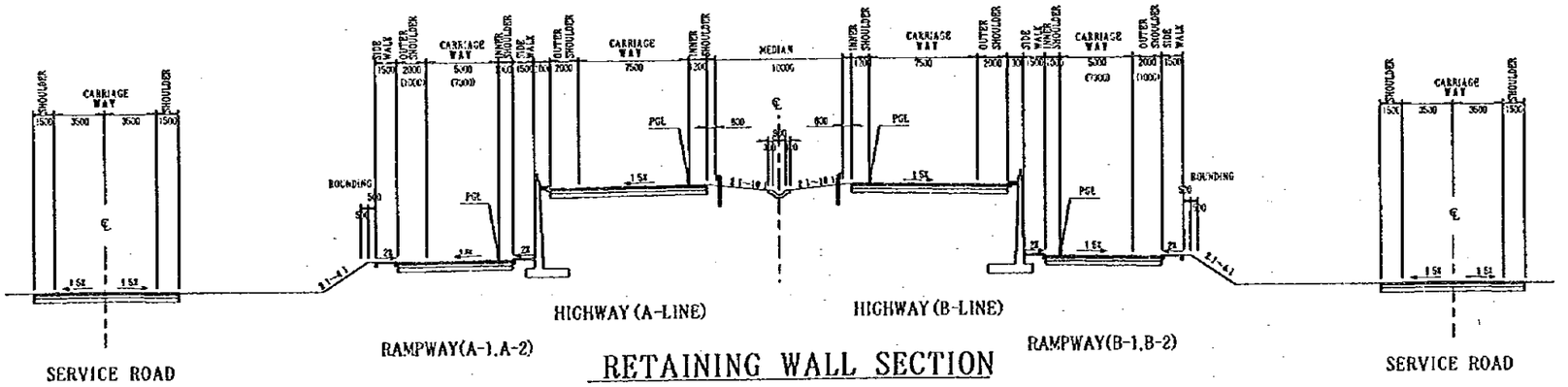


B-LINE

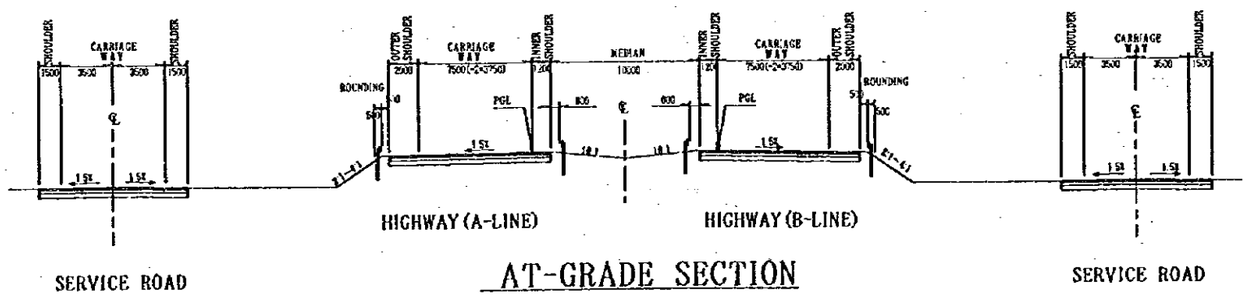
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT :	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE	RA/3 BARKA PROFILE-HIGHWAY
	DATE	DWG NO. R-4



BRIDGE SECTION



RETAINING WALL SECTION



AT-GRADE SECTION

NOTES:
(1) SCALE 1:400, DIMENSIONS IN MILLIMETER.
(2) NUMBERS INSIDE BRACKETS ARE DIMENSIONS OF MUSCAT-SIDE RAMPWAY.
(3) THE TRASITIONAL STRETCH FOR WIDTH AND CROSS FALL ADJUSTMENT SHOULD BE PROVIDED AT THE BEGINING AND THE END.

JAPAN INTERNATIONAL COOPERATION AGENCY
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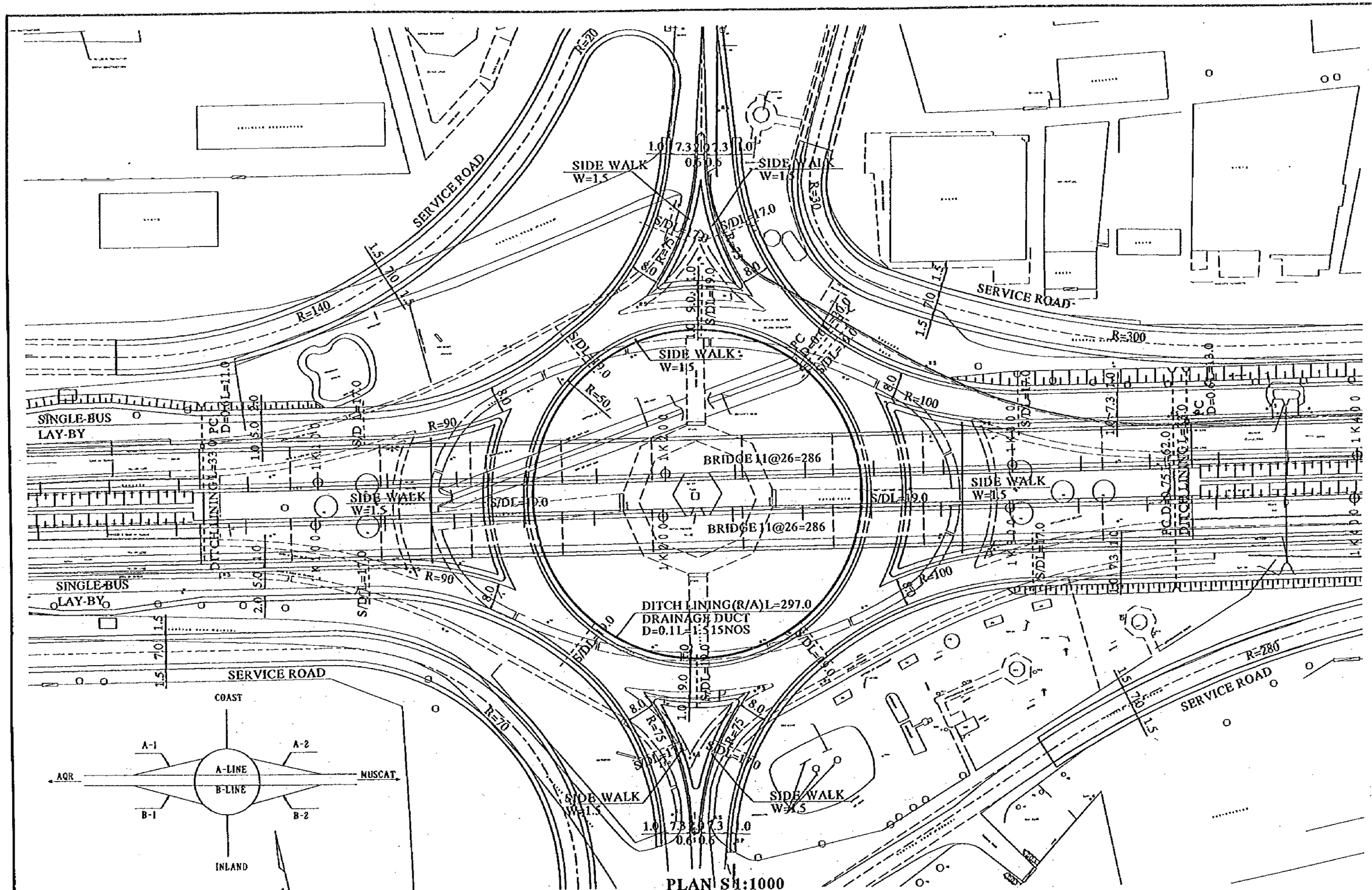
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT:	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE:	RA/3 BARKA TYPICAL CROSS SECTION
DATE:	DWG NO. : R-5

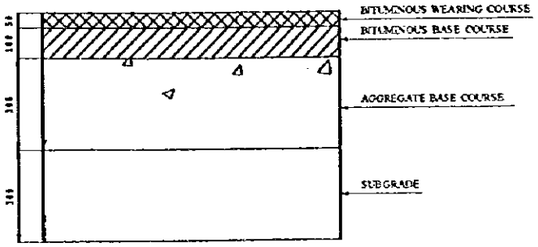


PLAN S=1:1000

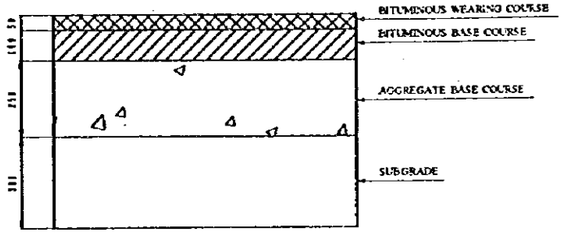
NOTES:
(1) ALL DIMENSIONS ARE IN METER.
(2) S/D INDICATES SERVICE DUCT (D=0.15m, 2WAY)
(3) PC AND BC REPRESENTS PIPE CULVERT AND BOX CULVERT RESPECTIVELY.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/3 BARKA PLAN DETAIL
	DATE: - DWG NO.: R-6

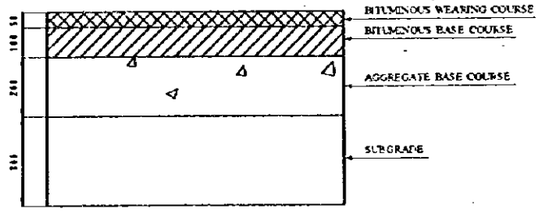
TYPE'A'



TYPE'B'



TYPE'C'



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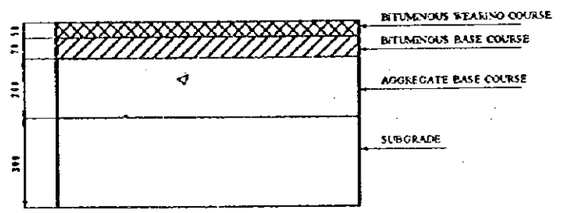
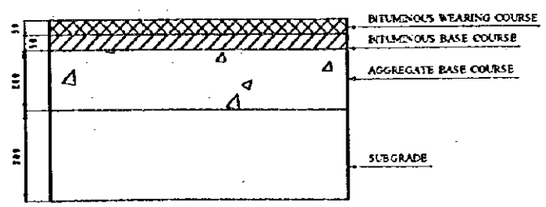
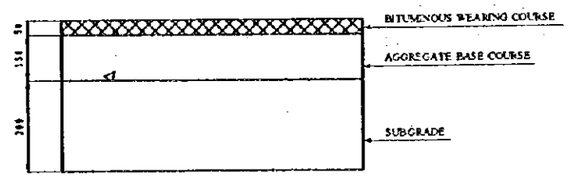
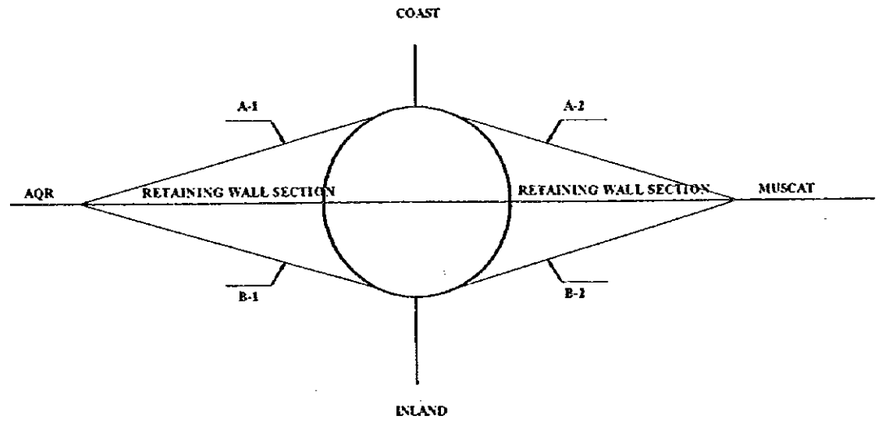


TYPE'E'



TYPE FOR SERVICE ROADS





CLASSIFICATION OF PAVEMENT STRUCTURE

HIGHWAY			ROUNDABOUT	RAMPWAY				CROSSROAD	
AT-GRADE		RETAINING WALL		A-1	B-1	A-2	B-2	INLAND	COAST
AQR	MUSCAT								
C	C	C	C	C	C	C	C	D	D

NOTES:
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
(2) PRIME COATING PRECEDES BITUMINOUS WEARING COURSE AND TACK COATING PRECEDES BITUMINOUS BASE COURSE.

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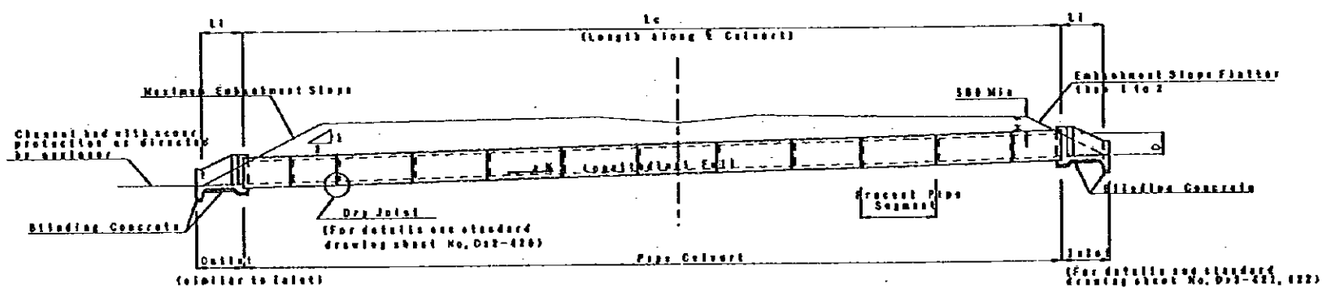
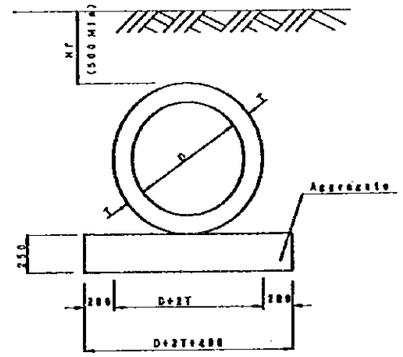
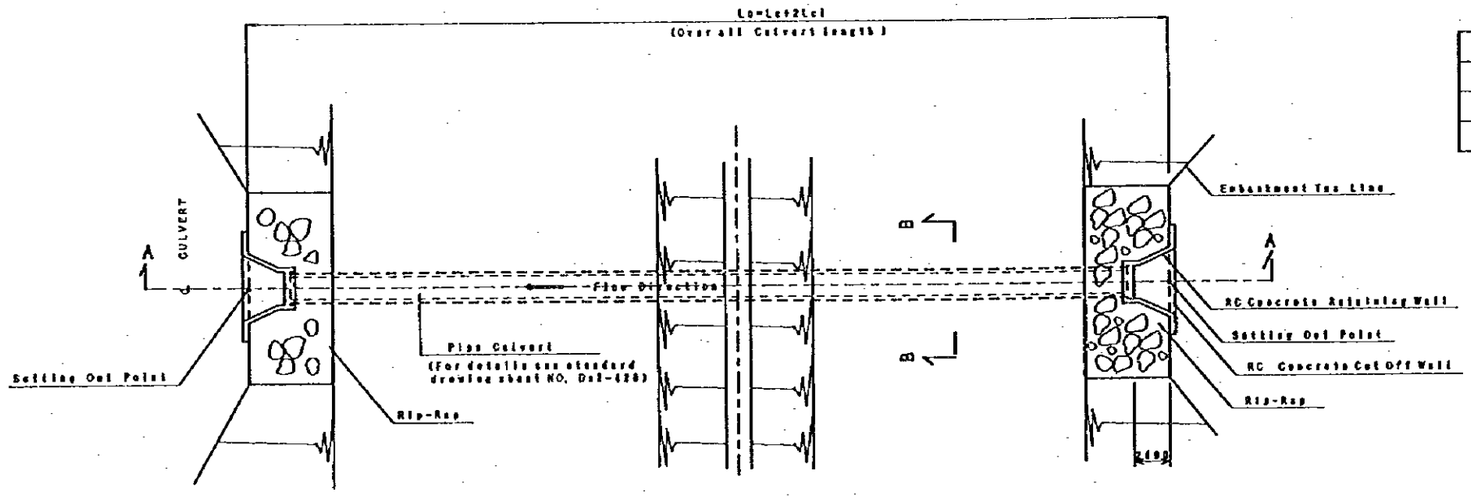
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/3 BARKA PAVEMENT DETAILS
DATE:
DWG NO.: R-7



SECTION A — A



SECTION B — B



P L A N

LIST OF PIPE CULVERT

STA	AorB LINE	DIMENSION	PIPE CLASS	LONGITUDINAL FALL : n	LENGTH (m)	REMARK
1K347	A-B	ϕ0.75x1CELL	N	1.59%	62.0	New Construction

NOTES:
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
(2) D ;INTERNAL DIAMETER OF THE PIPE.
(3) Hf;HEIGHT OF FILL FROM ABOVE THE PIPE TO THE TOP OF PAVEMENT.

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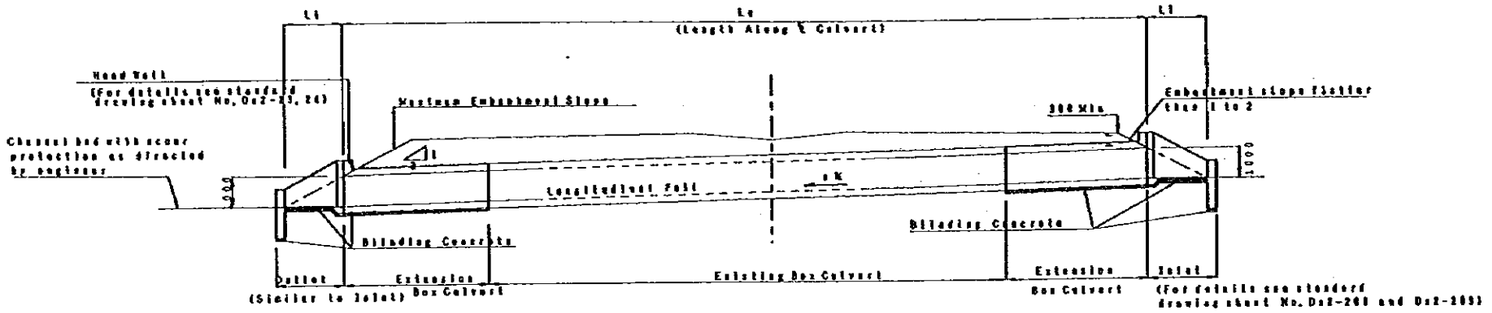
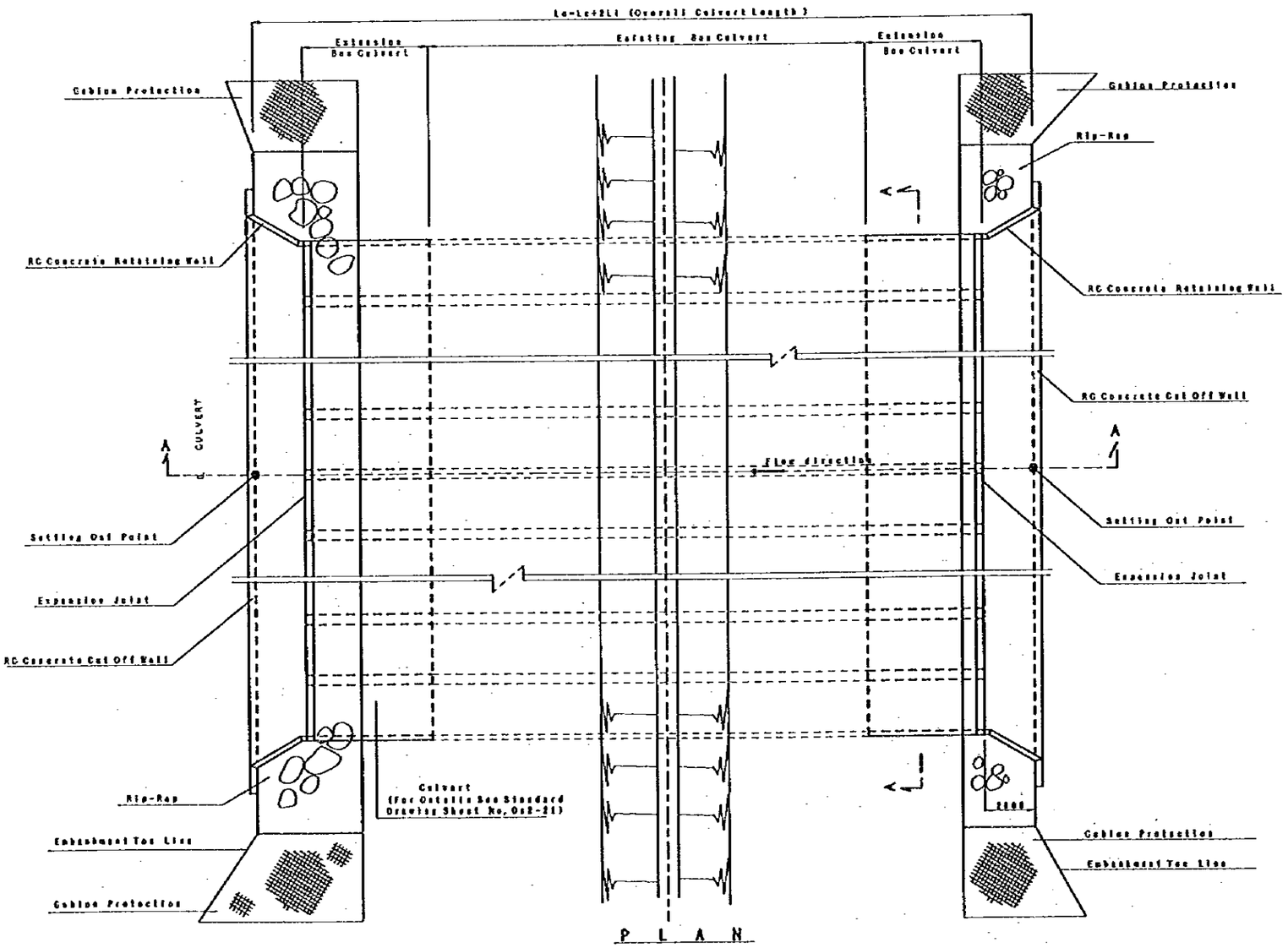
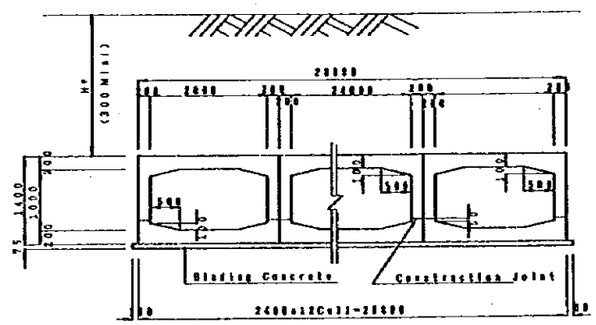
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/3 BARKA DRAINAGE STRUCTURE (1/4)
DATE :
DWG NO. : R-8

12



SECTION B — B





SECTION B — B

LIST OF BOX CULVERT

STA	A or B LINE	DIMENSION (m)	LONGITUDINAL FALL : n	LENGTH (m)	REMARK
1K981	A	2, 8.0, 4.0 x 2.0 CELL	0.34 %	6.8	Extention type
1K982	B			6.8	

NOTES:
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
(2) Hf ; HEIGHT FROM ABOVE THE CULVERT ROOF TO THE TOP OF PAVEMENT.

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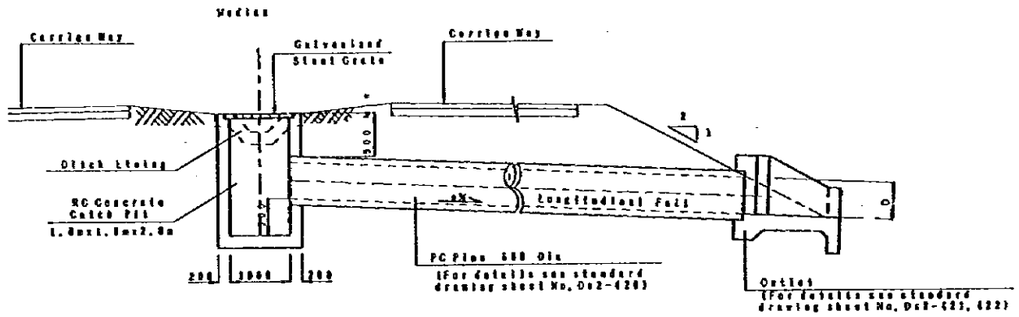
PROJECT : D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE : RA/3 BARKA DRAINAGE STRUCTURE (2/4)
DATE :
DWG NO. : R-9

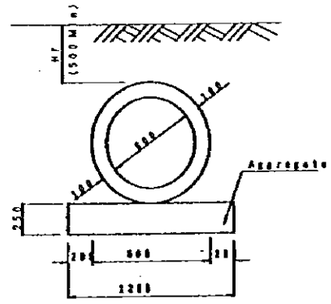


SECTION

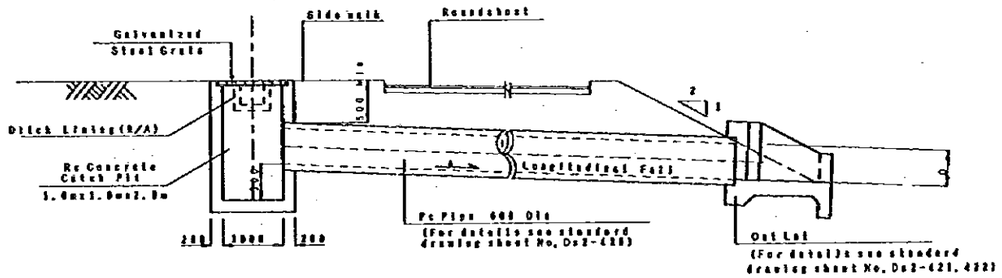
DRAIN SYSTEM OF MEDIAN

LIST OF DRAIN SYSTEM AT MEDIAN

STA	A or B LINE	DIMENSION(m)	PIPE CLASS	LONGITUDINAL FALL : a	LENGTH (m)	REMARK
0K769	A	ϕ0.60x1CELL	M	0.3%	25.0	
1K689	A	ϕ0.60x1CELL	M	0.3%	28.0	



TYPICAL CROSS SECTION

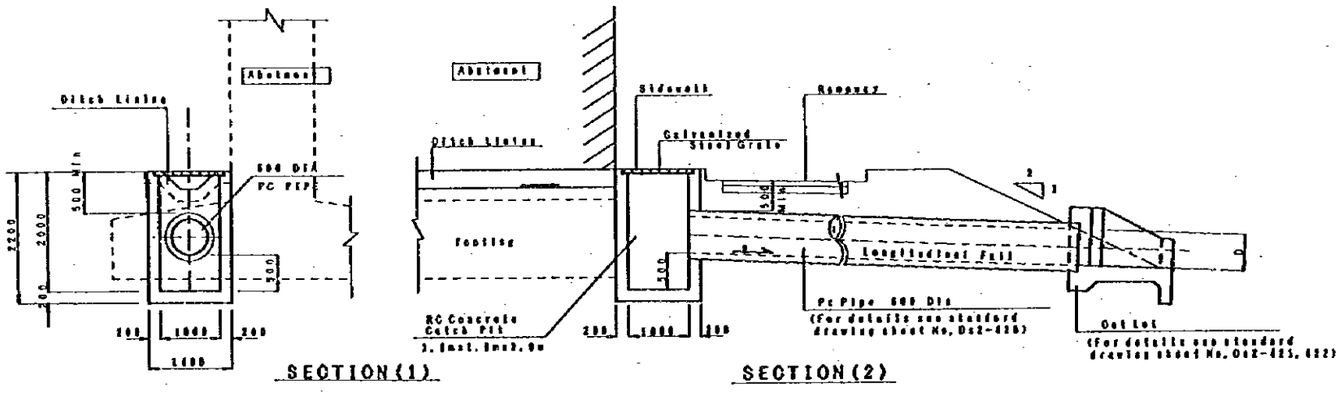


SECTION

DRAIN SYSTEM OF ROUNDABOUT

LIST OF DRAIN SYSTEM AT ROUNDABOUT

STA	A or B LINE	DIMENSION(m)	PIPE CLASS	LONGITUDINAL FALL : a	LENGTH (m)	REMARK
1K245	A	ϕ0.60x1CELL	M	0.3%	20.0	



SECTION(1) SECTION(2)

DRAIN SYSTEM IN FRONT OF ABUTMENT

LIST OF DRAIN SYSTEM IN FRONT OF ABUTMENT

STA	A or B LINE	DIMENSION(m)	PIPE CLASS	LONGITUDINAL FALL : a	LENGTH (m)	REMARK
1K068(A1)	A	ϕ0.60x1CELL	M	0.3%	11.0	
1K351(A2)	A	ϕ0.60x1CELL	M	0.3%	13.0	

NOTES:
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
(2) D ; INTERNAL DIAMETER OF THE PIPE.
(3) Hf ; HEIGHT OF FILL FROM ABOVE THE PIPE TO THE TOP OF PAVEMENT.

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

JICA STUDY TEAM
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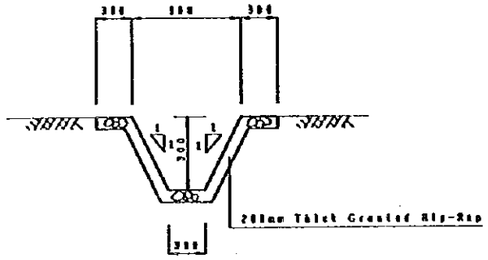
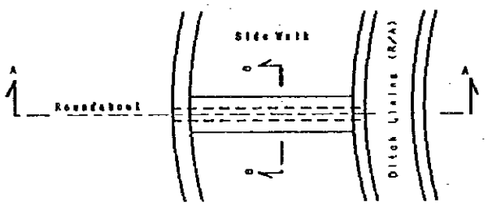
FUKUYAMA CONSULTANTS INTERNATIONAL

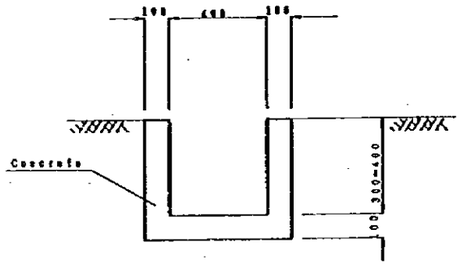
CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/3 BARKA DRAINAGE STRUCTURE (3/4)
DATE:
DWG NO. : R-10



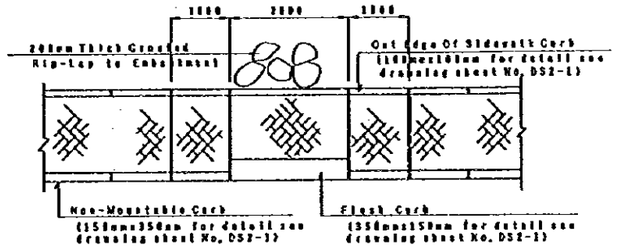
DITCH LINING



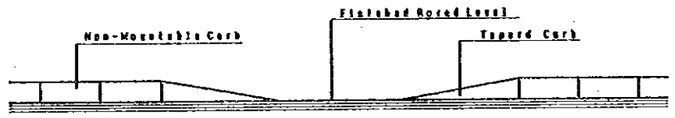
P L A N



DITCH LINING (R/A)

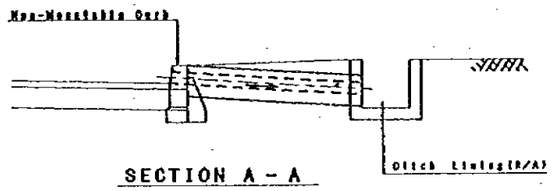


P L A N

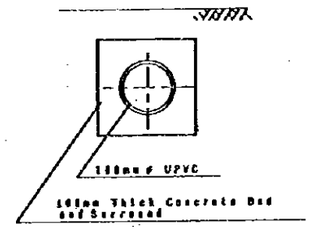


Elevation

DROPPED SIDEWALK

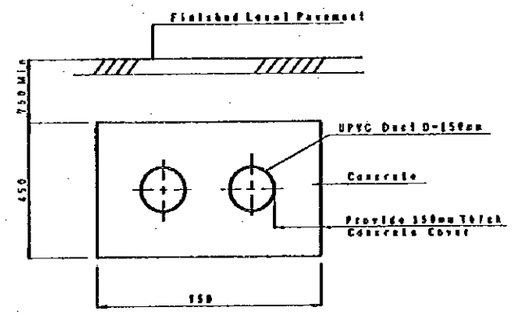


SECTION A - A



SECTION B - B

DRAIN SYSTEM AROUND ROUNDABOUT



SECTION

SERVICE DUCTS

NOTES:
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
(2) THE UPVC OF 100mm IN DIAMETER IS INSTALLED AT AN INTERVAL OF ABOUT 20m.
(3) THE DROPPED SIDEWALK IS INSTALLED ALONG RAMPWAYS AT AN INTERVAL OF 50m.

JAPAN INTERNATIONAL COOPERATION AGENCY
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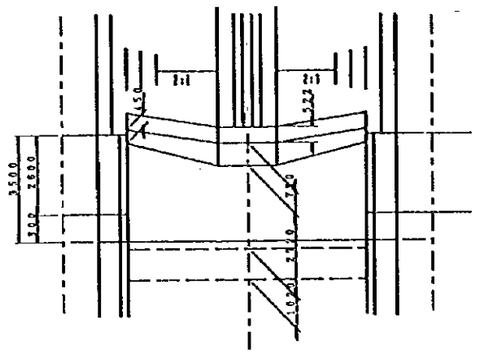
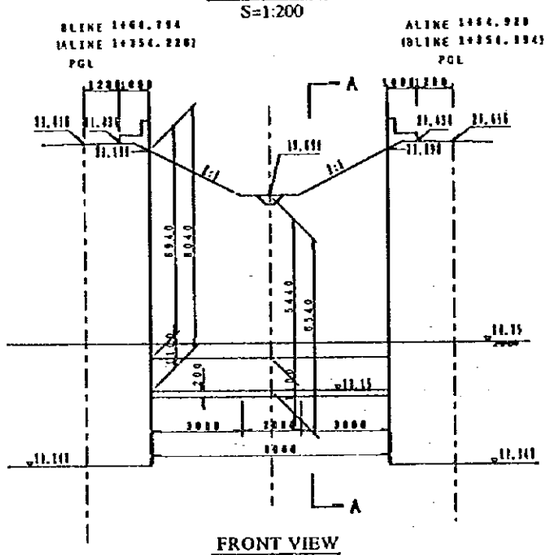
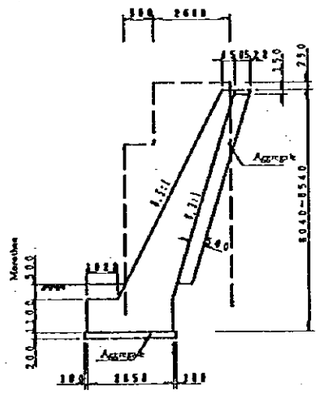
CLIENT:	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE:	RA/3 BARKA DRAINAGE STRUCTURE(4/4)SERVICE AND DUCTS
DATE:	DWG NO. : R-11



PLAN
S=1:200

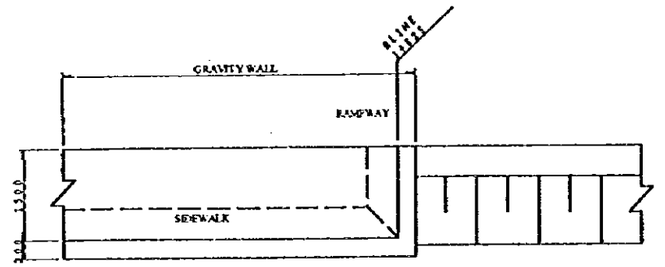


FRONT VIEW
S=1:200

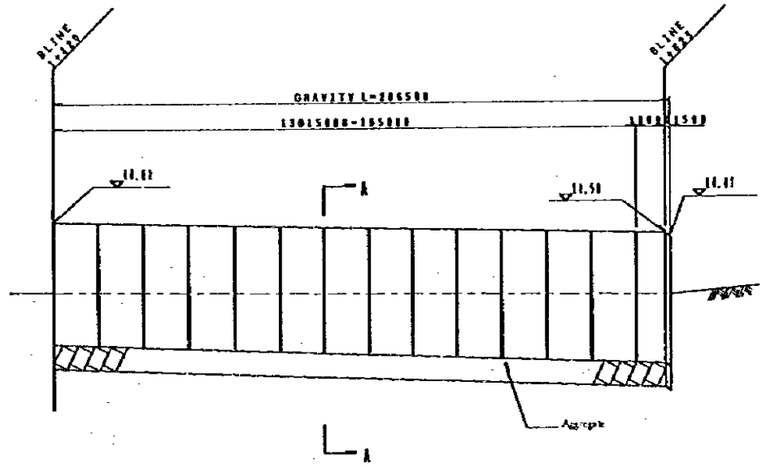


SECTION A-A
S=1:200

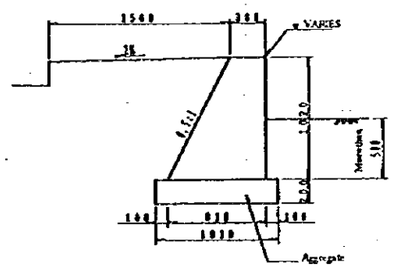
RETAINING WALL BETWEEN ABUTMENTS



PLAN
S=1:100



FRONT VIEW
H=1:2000
V=1:50



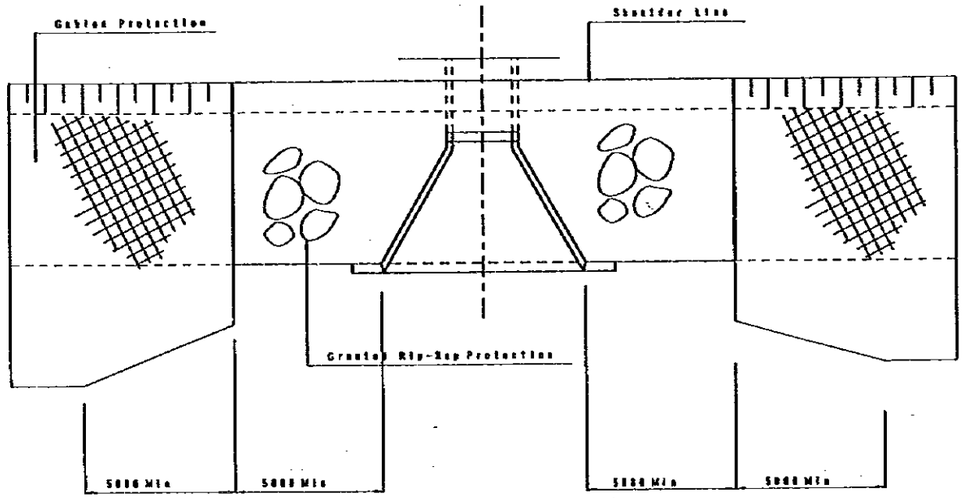
SECTIONA-A
S=1:50

RETAINING WALL ALONG RAMPWAY (B-2)

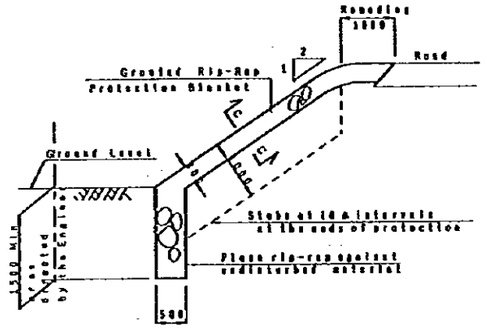
NOTES:
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
(2) NUMBERS IN BRACKETS INDICATE DIMENSION OF RETAINING WALL AT MUSCAT SIDE.
(3) JOINTS SHOULD BE PROVIDED AT AN INTERVALS OF 15m.

JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)
JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

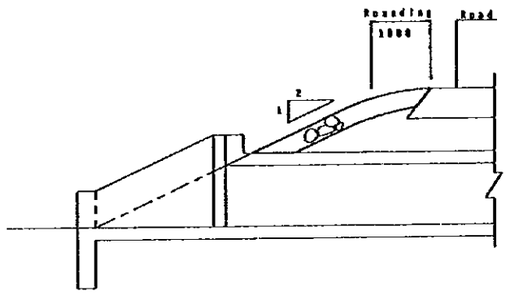
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/3 BARKA RETAINING WALL
DATE:
DWG NO. : R-12



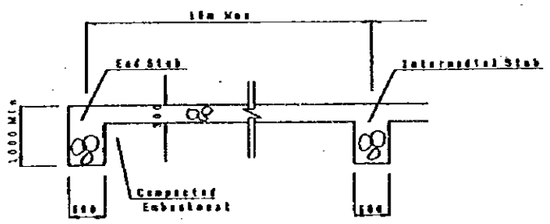
PLAN



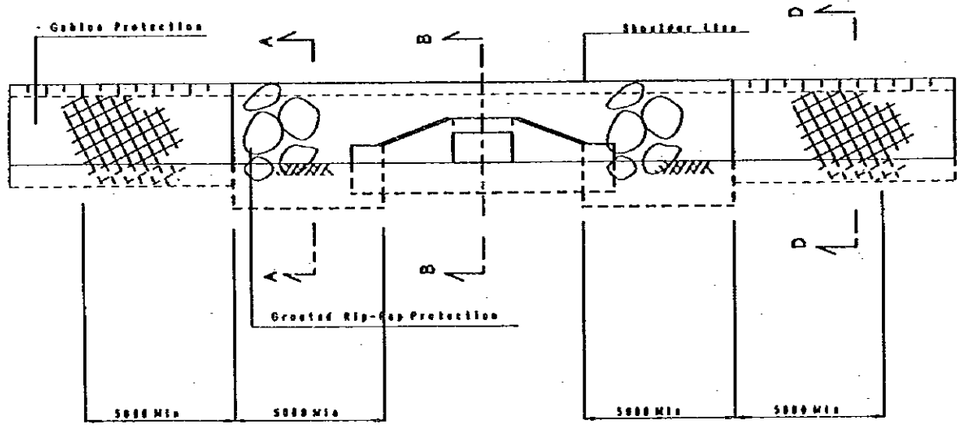
SECTION A — A



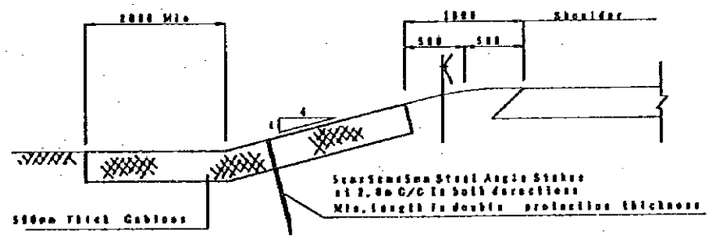
SECTION B — B



SECTION C — C



FRONT VIEW

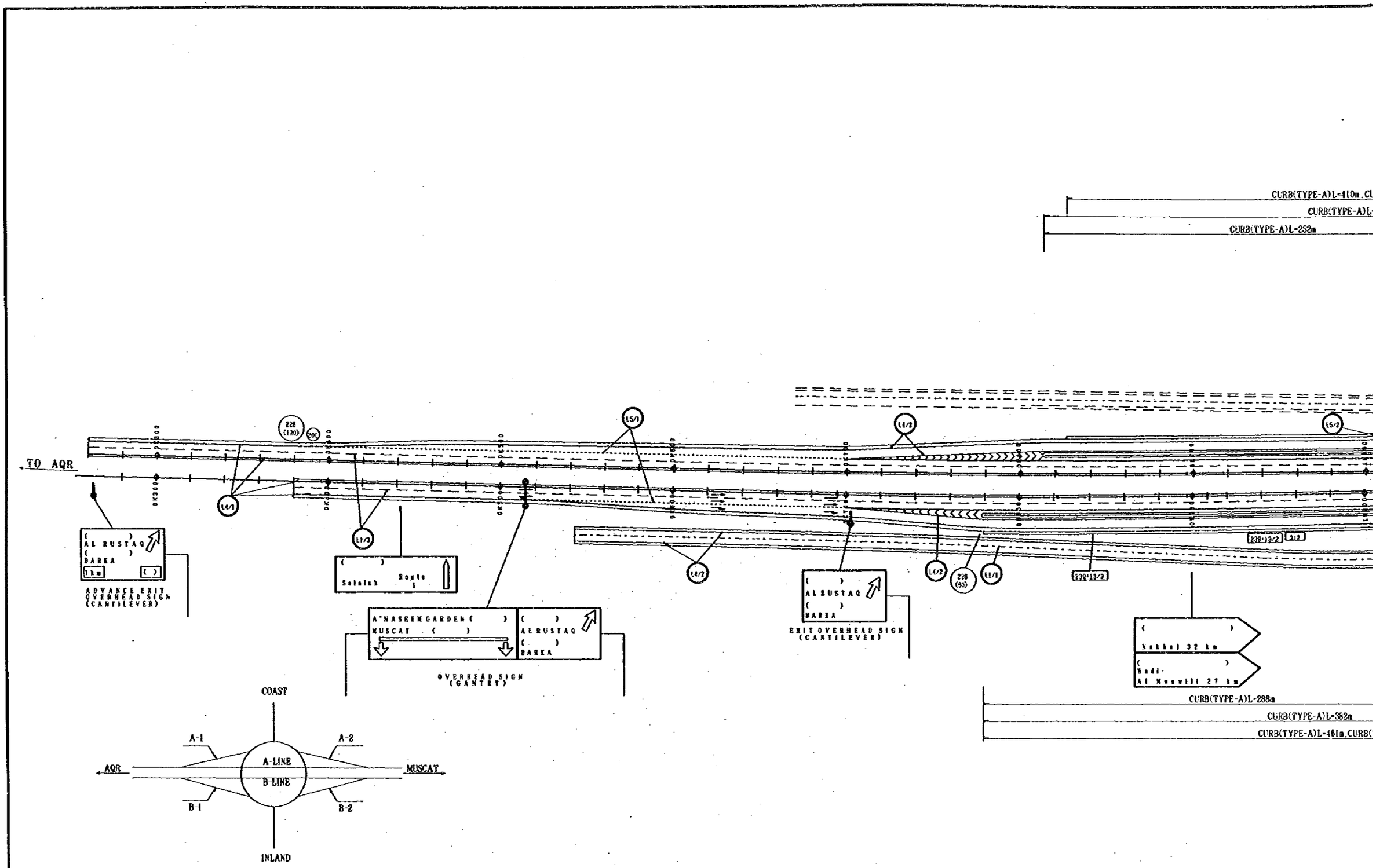


SECTION D — D

NOTES:
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.

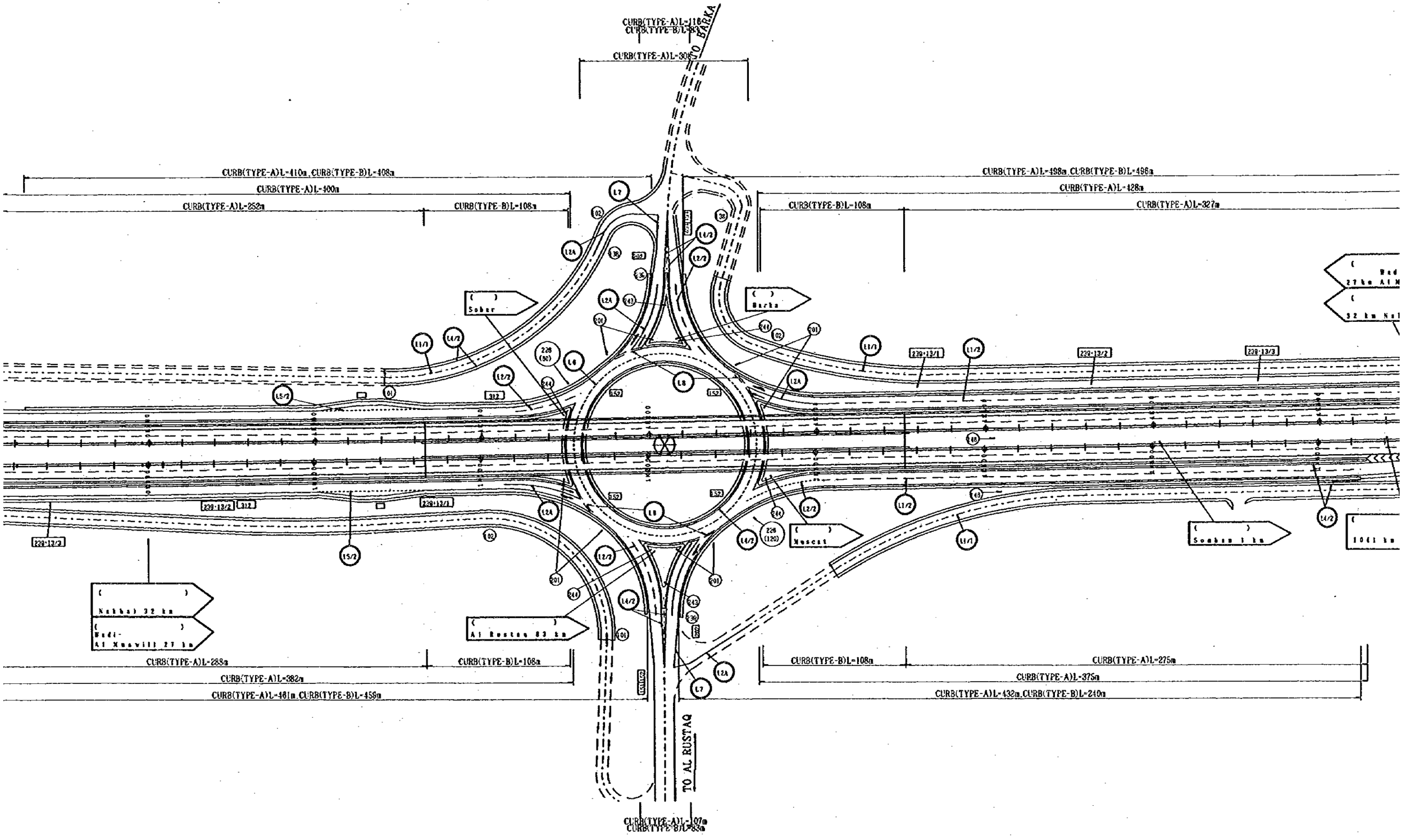
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)
JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/3 BARKA SLOPE PROTECTION
DATE: DWG NO. : R-13



NOTES:

(1) FOR DETAILS OF ROAD SIGNS, ROAD MARKINGS REFER TO THE HIGHWAY DESIGN MANUAL.
(2) DIMENSIONS OF CURB TYPE-A AND TYPE-B ARE 150mm x 350mm AND 100mm x 200mm RESPECTIVELY. FOR DETAILS REFER STANDARD DRAWING SHEET NO. SCD2.1
(3) PAINTING (YELLOW AND BLACK) IS APPLIED TO CURB TYPE-A.
(4) FOR DETAILS OF INFORMATION SIGNBOARDS CONFIRM WITH DOR OR THE RELEVANT AUTHORITIES.
(5) FINAL LOCATION OF ROAD SIGNS AND ARABIC NAMES ARE TO BE FINALIZED DURING CONSTRUCTION.
(6) ADVANCE EXIT OVERHEAD SIGN SHALL BE PROVIDED AT APPROPRIATE LOCATION 300-1000m AHEAD FROM OVERHEAD SIGN.



NSTRUCTION.
HEAD FROM OVERHEAD SIGN.

URB(TYPE-A)L=488m,CURB(TYPE-B)L=406m

CURB(TYPE-A)L=428m

CURB(TYPE-A)L=327m

( )
Wadi-
27 km Al Maawil

( )
32 km Nakhal

( )
BARKA
( )
AL RUSTAQ

EXIT OVERHEAD SIGN
(CANTILEVER)

MASNA'AH ( )
SOHAR ( )

( )
BARKA
( )
AL RUSTAQ

OVERHEAD SIGN
(GANTRY)

( )
BARKA
( )
AL RUSTAQ
km ( )

ADVANCE EXIT
OVERHEAD SIGN
(CANTILEVER)

228
(90)

239+13/2

239+13/3

L4/2

L4/1

L1/2

L5/1

L4/1

TO MUSCAT

2K+000

2K+100

2K+200

2K+300

2K+400

2K+500

2K+600

2K+700

2K+800

2K+900

2K+000

2K+100

2K+200

2K+300

2K+400

2K+500

2K+600

2K+700

2K+800

2K+900

L1/2

L5/1

2K+000

2K+100

2K+200

2K+300

2K+400

2K+500

2K+600

2K+700

2K+800

2K+900

201

228
(120)

L4/1

( )
Sunban 1 km

L4/2

( )
1063 km Salalah

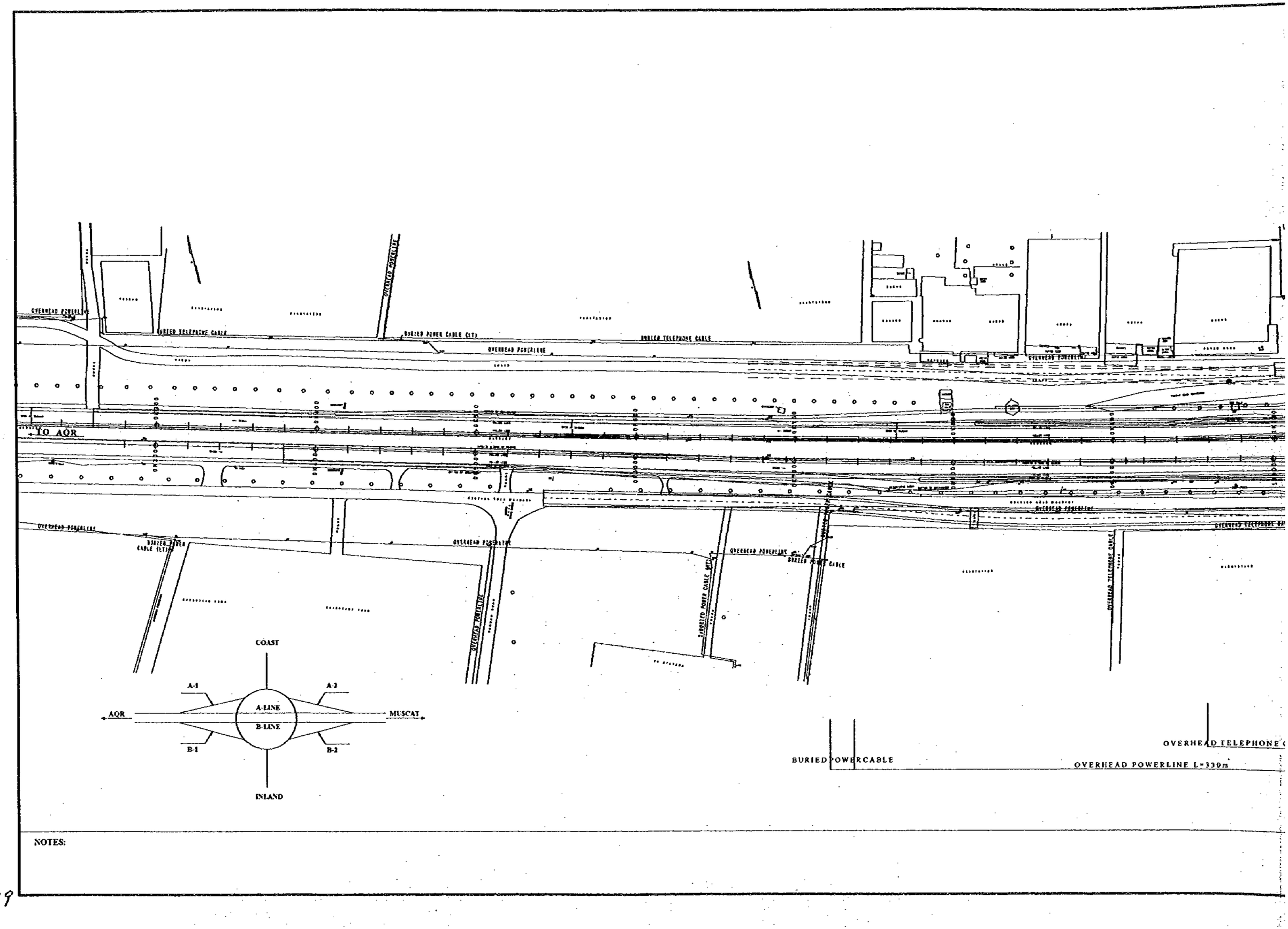
L4/1

CURB(TYPE-A)L=275m

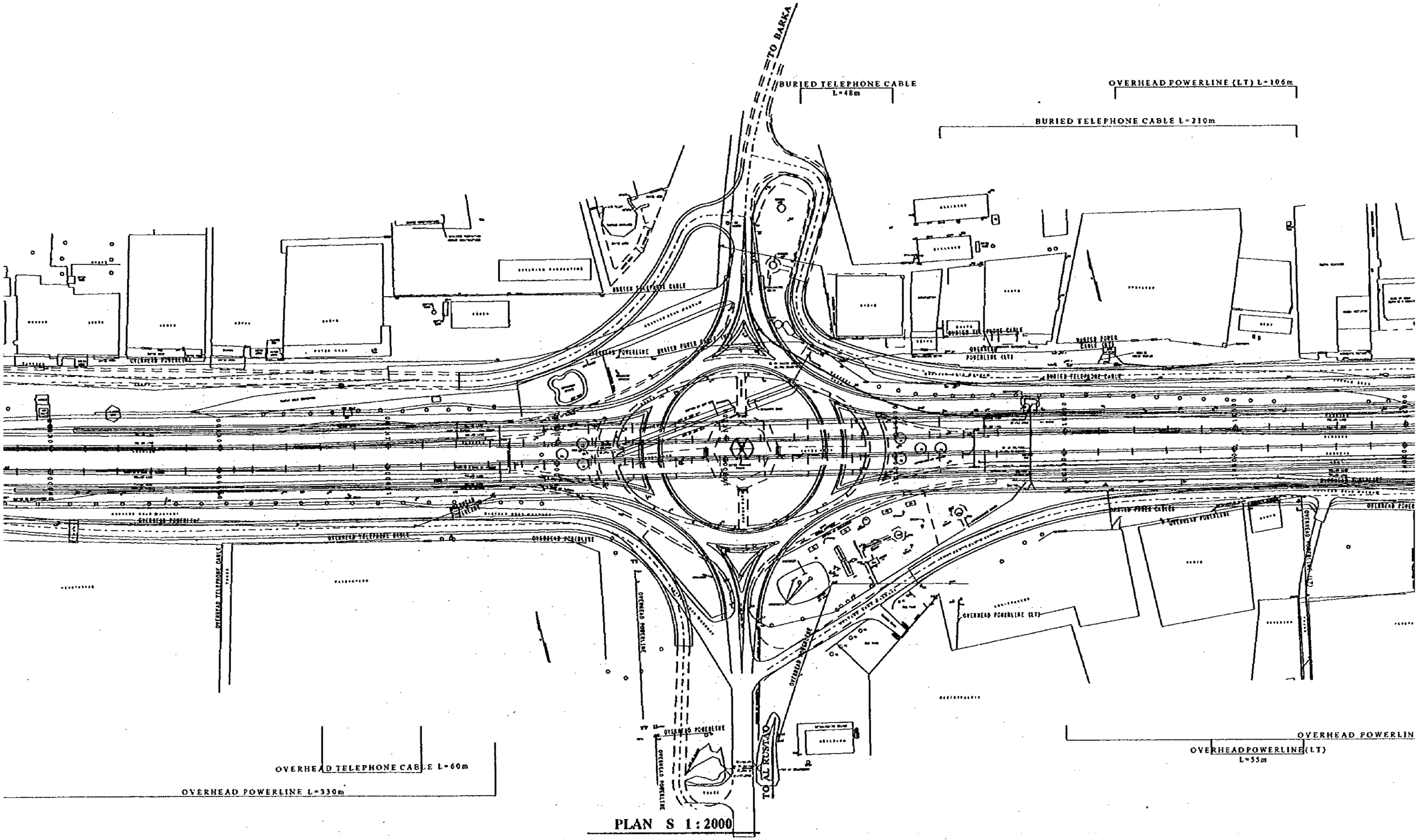
CURB(TYPE-A)L=375m

)L=432m,CURB(TYPE-B)L=240m

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE RA/3 BARKA ROAD MARKING & ROAD SIGN
	DATE / DWG NO. R-14


OVERHEAD POWERLINE
BURIED TELEPHONE CABLE
BURIED POWER CABLE (LT)
OVERHEAD POWERLINE
BURIED TELEPHONE CABLE
OVERHEAD POWERLINE
TO AQR
OVERHEAD POWERLINE
BURIED POWER CABLE (LT)
OVERHEAD POWERLINE
OVERHEAD POWERLINE
BURIED POWER CABLE
BURIED POWER CABLE (LT)
OVERHEAD TELEPHONE CABLE
COAST
A-1
A-2
AQR
A-LINE
B-LINE
MUSCAT
B-1
B-2
INLAND
BURIED POWERCABLE
OVERHEAD TELEPHONE
OVERHEAD POWERLINE L=330m

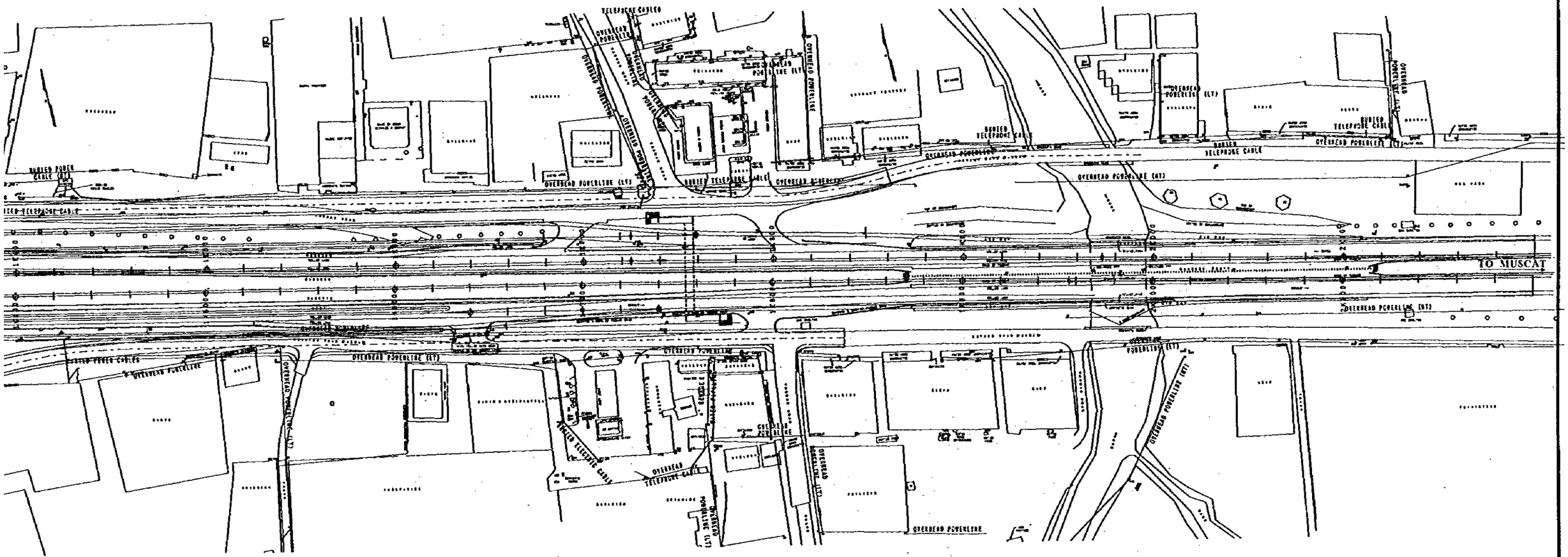
NOTES:


TO BARKA
BURIED TELEPHONE CABLE
L=48m
OVERHEAD POWERLINE (LT) L=106m
BURIED TELEPHONE CABLE L=210m
OVERHEAD TELEPHONE CABLE
OVERHEAD POWERLINE
OVERHEAD POWERLINE (LT)
OVERHEAD TELEPHONE CABLE L=60m
OVERHEAD POWERLINE L=330m
TO AL RUSTAQ
OVERHEADPOWERLINE(LT)
L=55m

PLAN S 1:2000

OVERHEAD POWERLINE (LT) L=106m

IED TELEPHONE CABLE L=210m



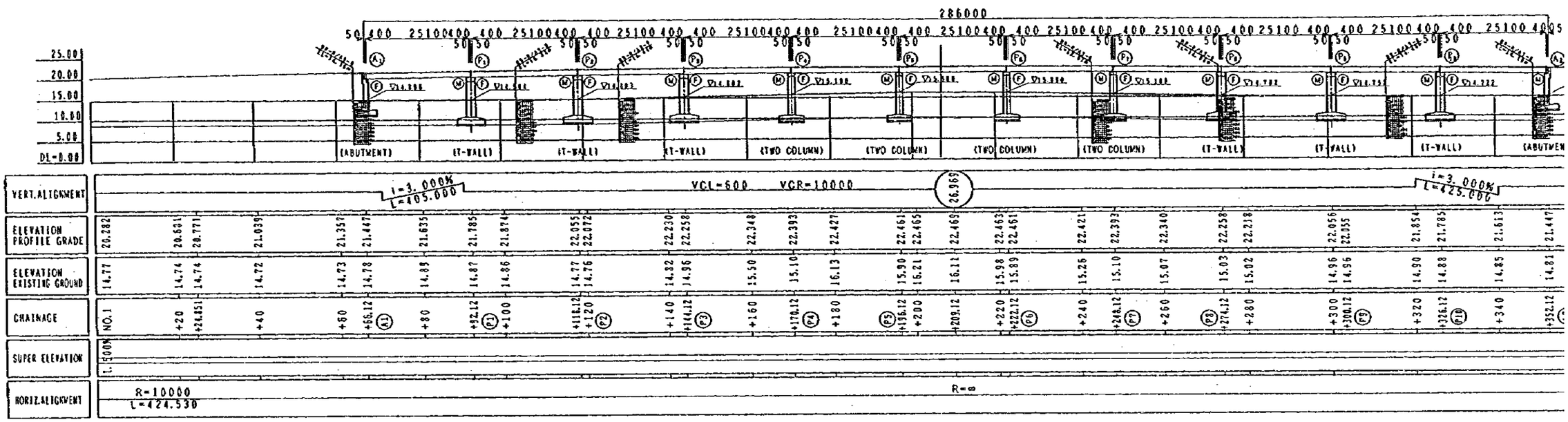
OVERHEAD POWERLINE L=384m

OVERHEAD POWERLINE (LT) L=55m

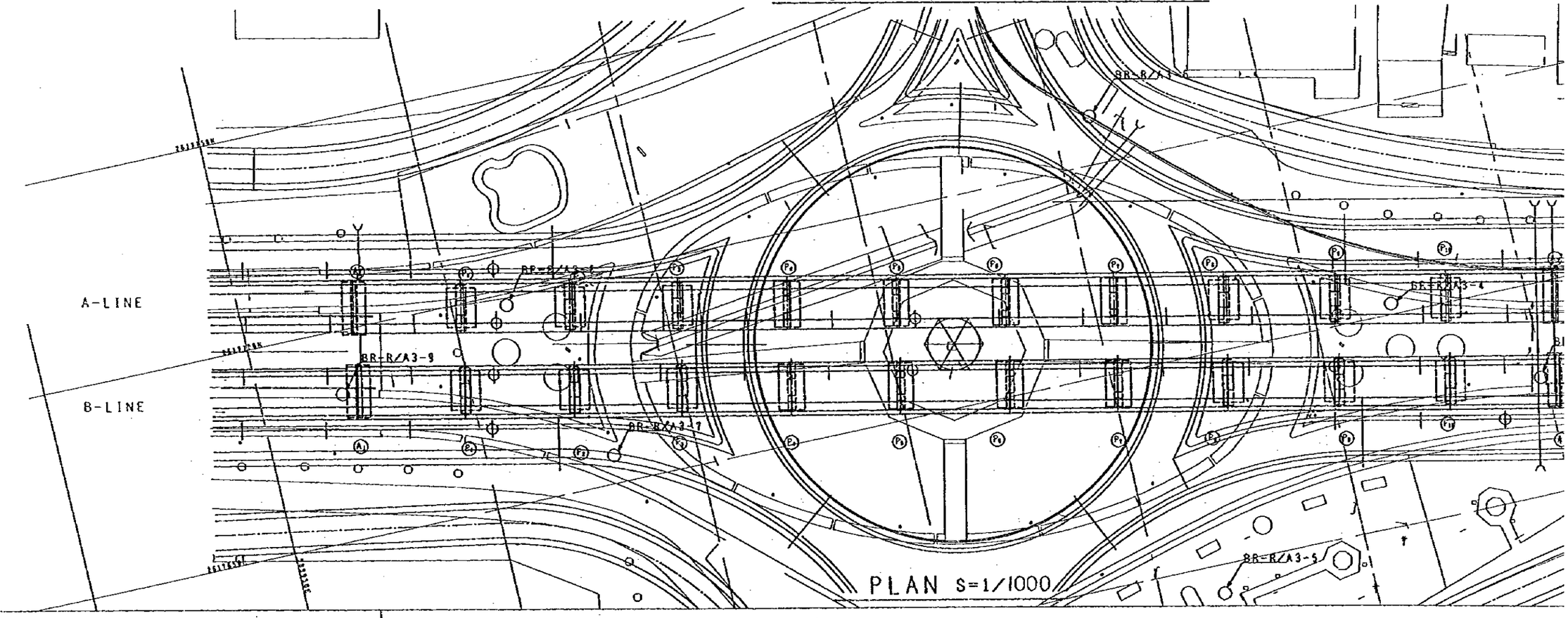
	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT :	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
		PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE	RA/3 BARKA REMOVAL & RELOCATION OF UTILITIES
		DATE	DWG NO. R-15

STRUCTURE
-BRIDGE

GENERAL VIEW RA/3 BARK

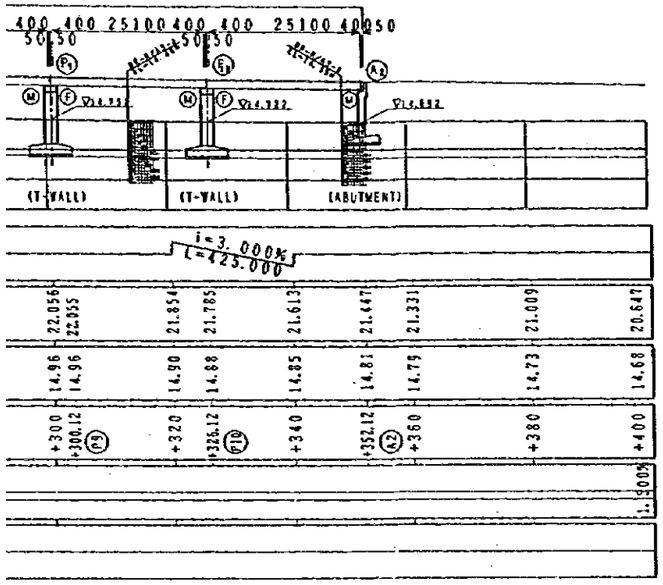


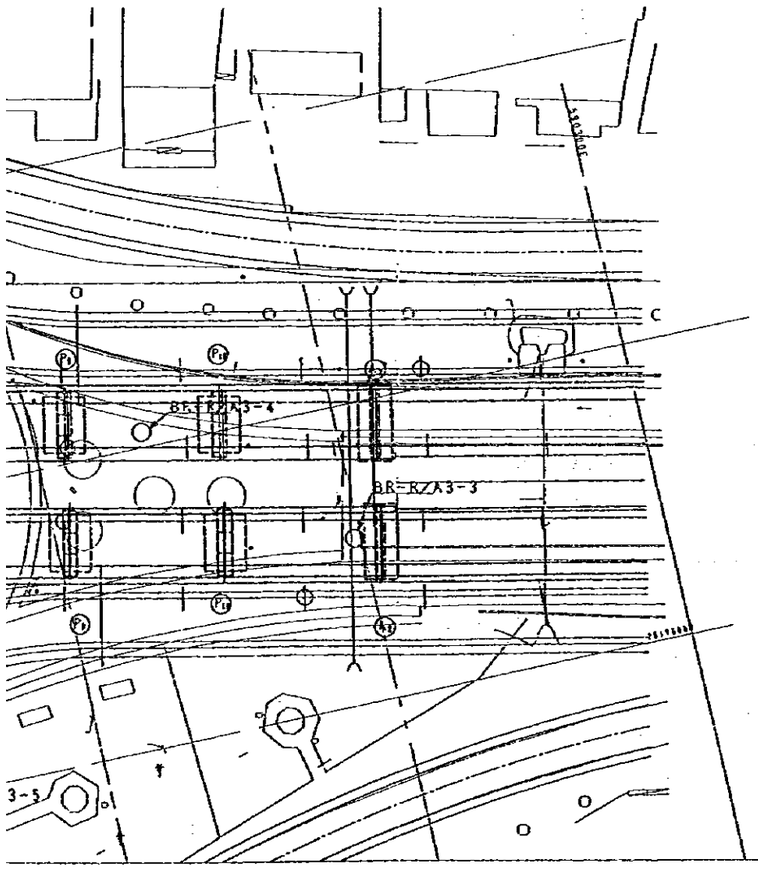
PROFILE (A-LINE) S=1/1000

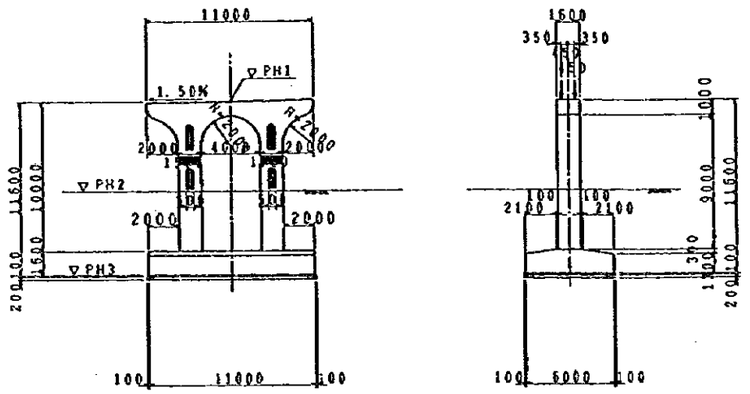


NOTES:

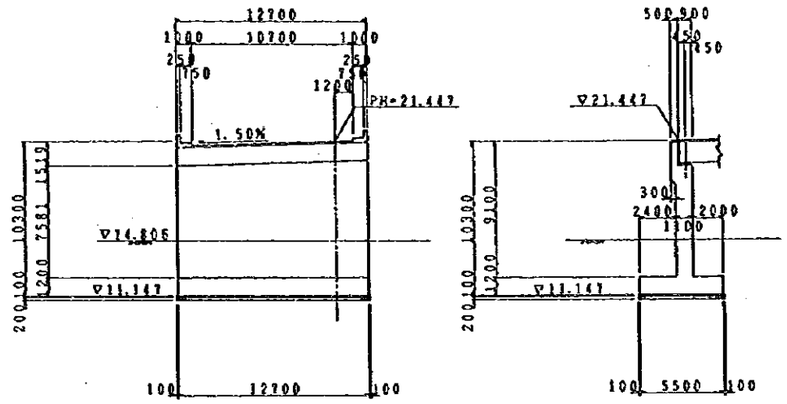
VIEW RA/3 BARKA (A-LINE)



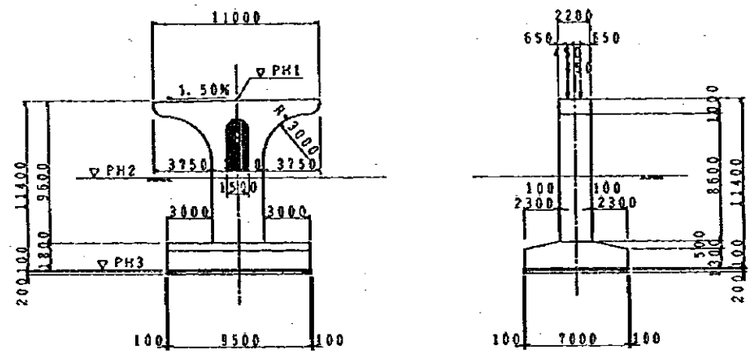




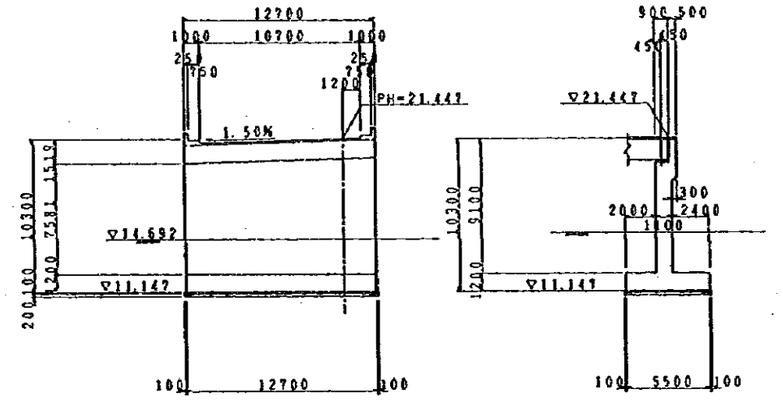
SECTION OF PIERS(Two Column) S=1/400



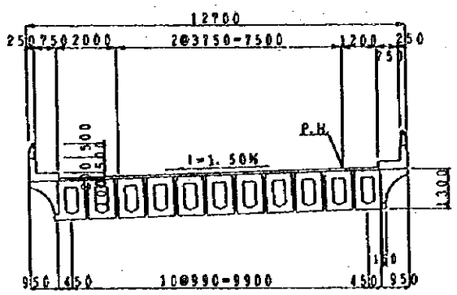
SECTION OF A1 ABUTMENT S=1/400



SECTION OF PIERS(T-Wall) S=1/400



SECTION OF A2 ABUTMENT S=1/400



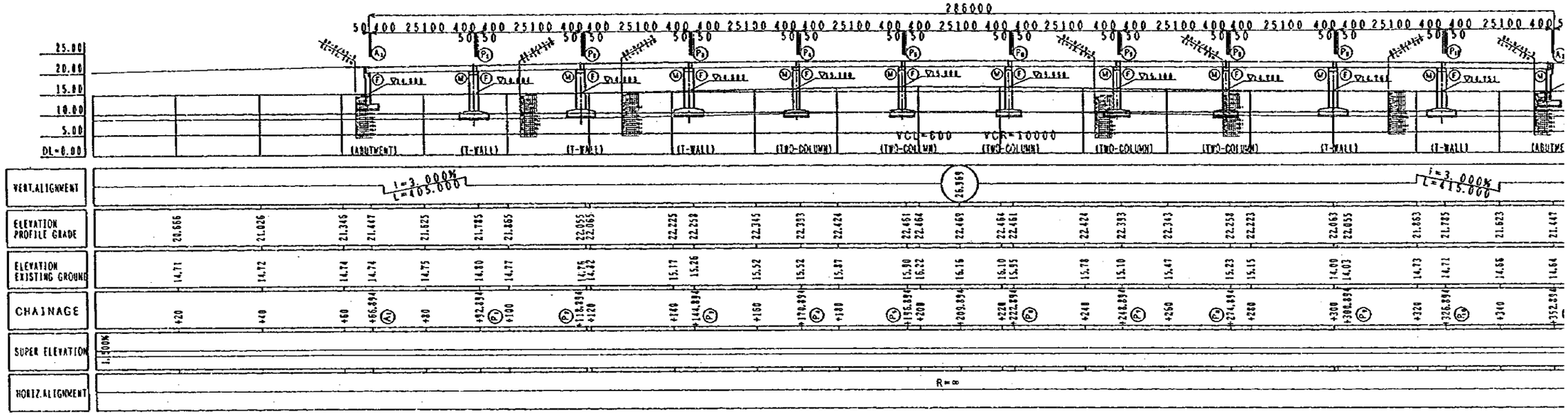
SECTION OF PC BOX GIRDER S=1/200

LIST OF PIER ELEVATION

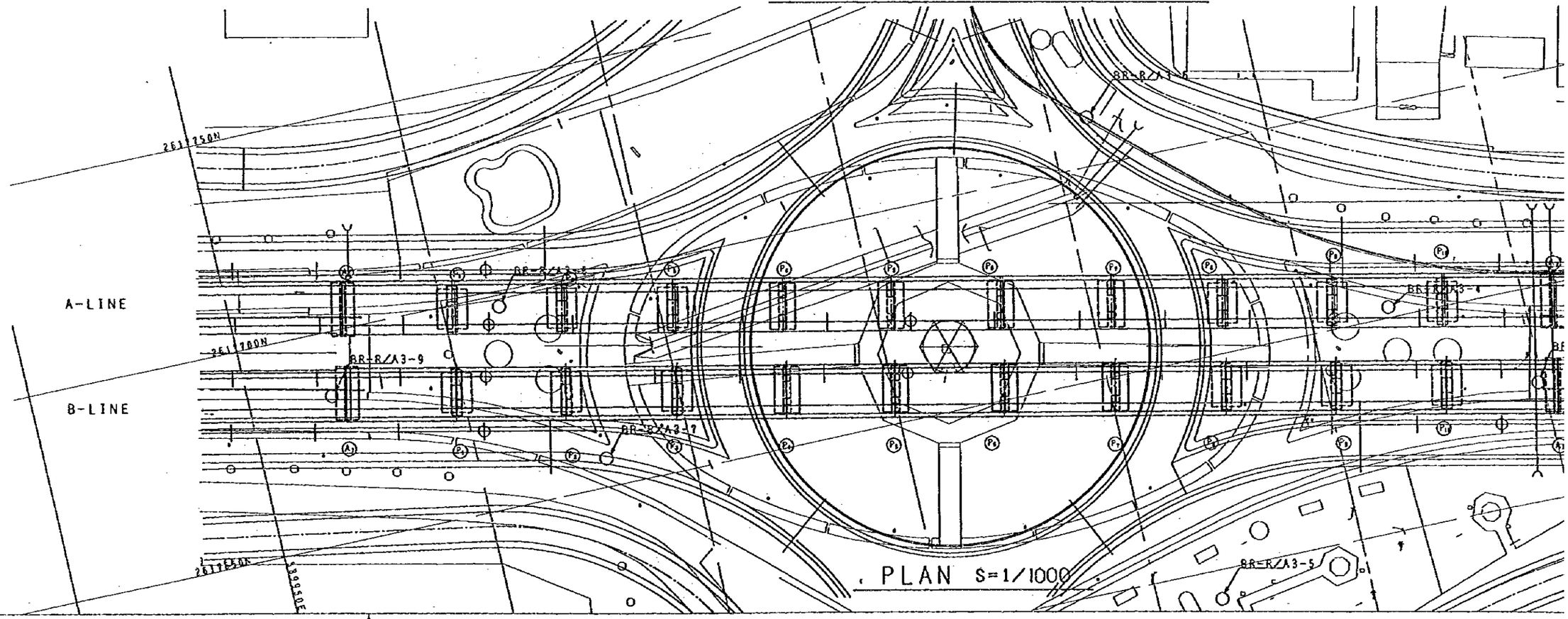
	PH1	PH2	PH3	REMARKS
P1	20.187	14.804	8.787	T-Wall
P2	20.458	14.803	9.058	〃
P3	20.661	14.802	9.261	〃
P4	20.796	15.100	9.196	Two Colums
P5	20.863	15.900	9.263	〃
P6	20.863	15.890	9.263	〃
P7	20.796	15.100	9.196	〃
P8	20.661	14.782	9.261	T-Wall
P9	20.458	14.752	9.058	〃
P10	20.187	14.722	8.787	〃

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE	GENERAL VIEW RA/3 BARKA (A-LINE)
	DATE	DWGNO. B-1

GENERAL VIEW RA/3



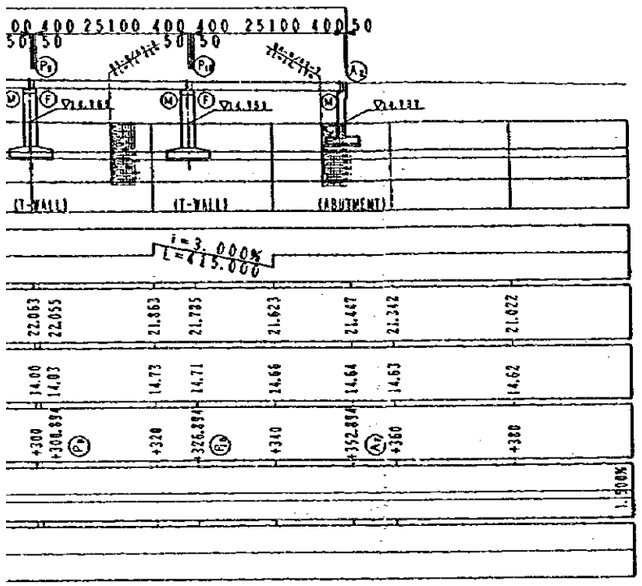
PROFILE (B-LINE) S=1/1000

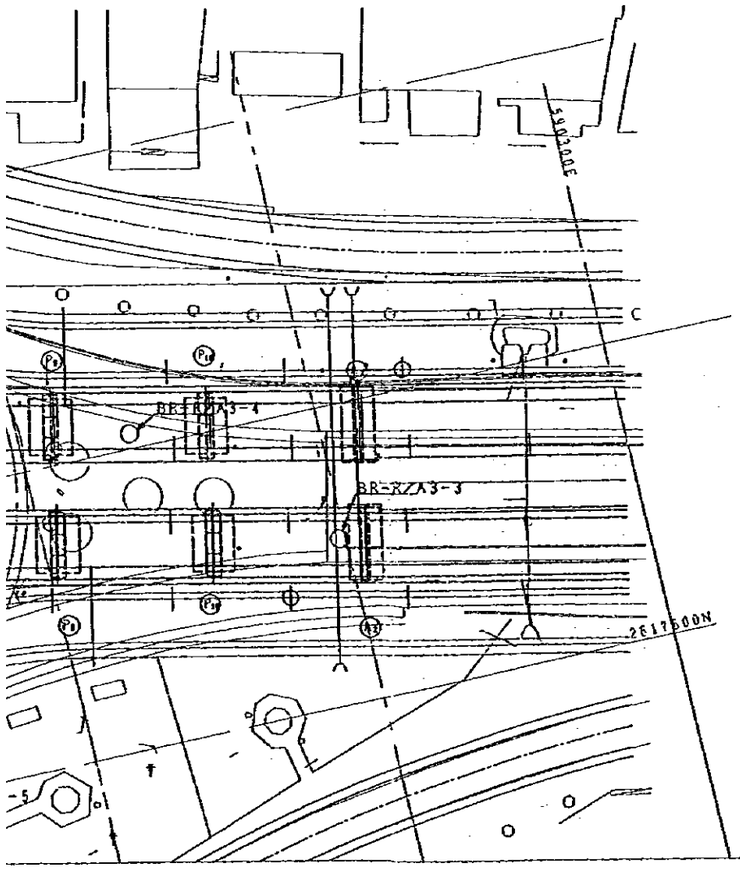


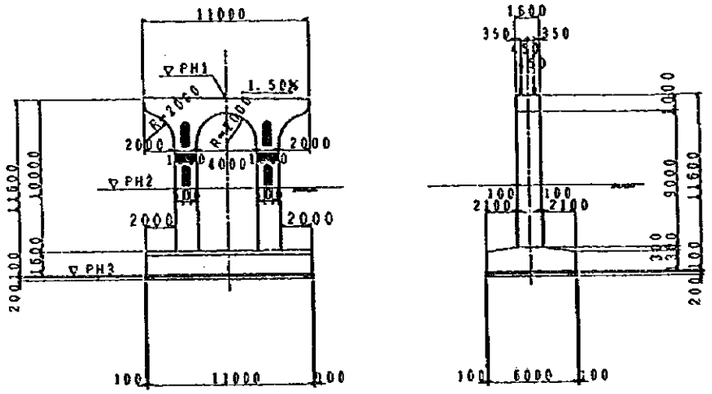
PLAN S=1/1000

NOTES:

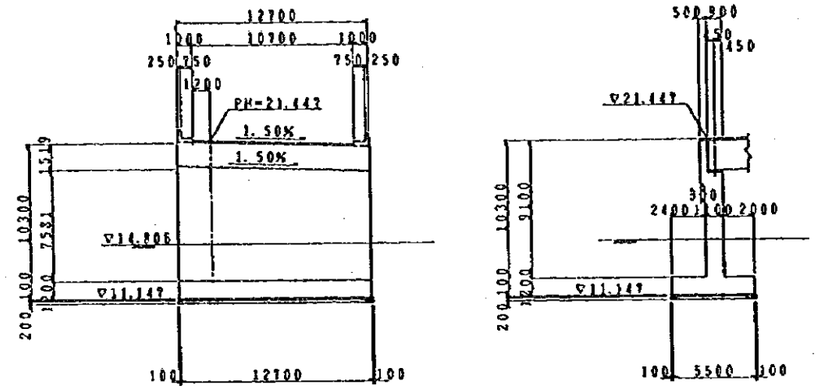
VIEW RA/3 BARKA (B-LINE)



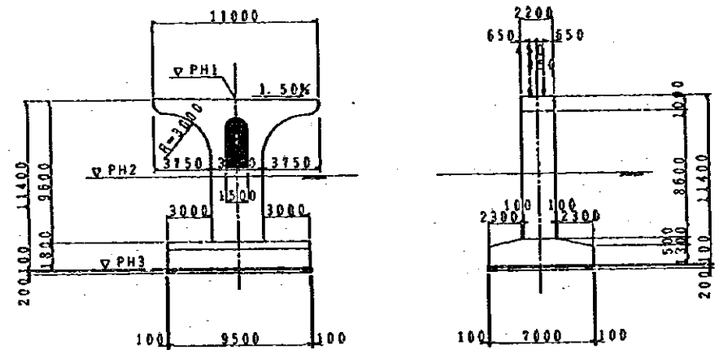




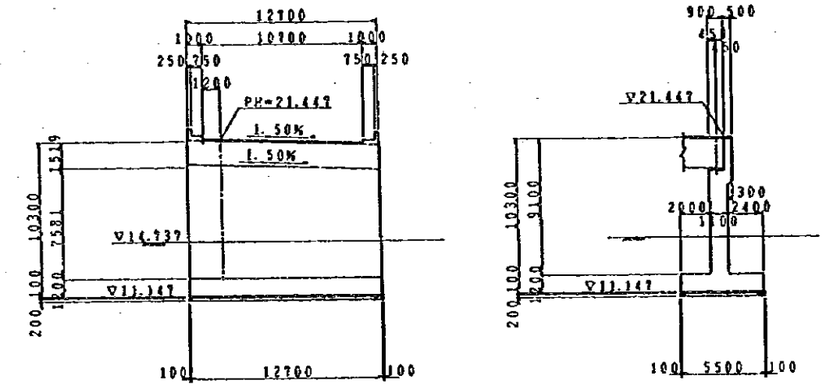
SECTION OF PIERS(Two Column) S=1/400



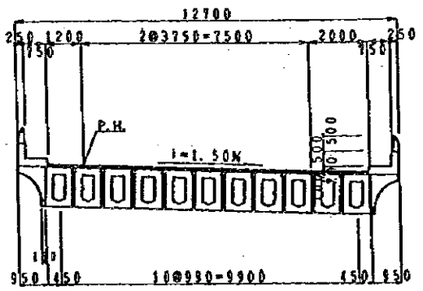
SECTION OF A1 ABUTMENT S=1/400



SECTION OF PIERS(T-Wall) S=1/400



SECTION OF A2 ABUTMENT S=1/400

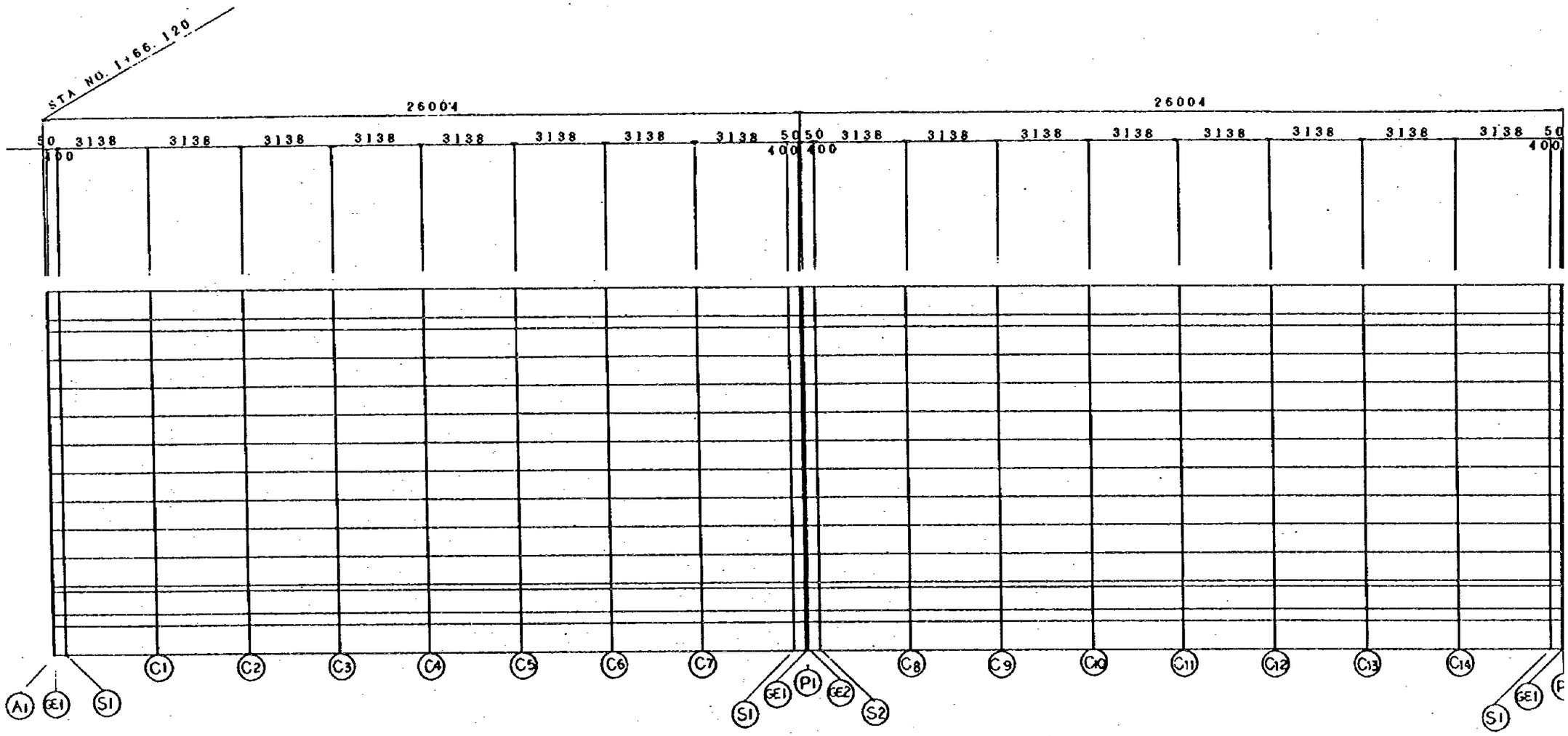


SECTION OF PC BOX S=1/200

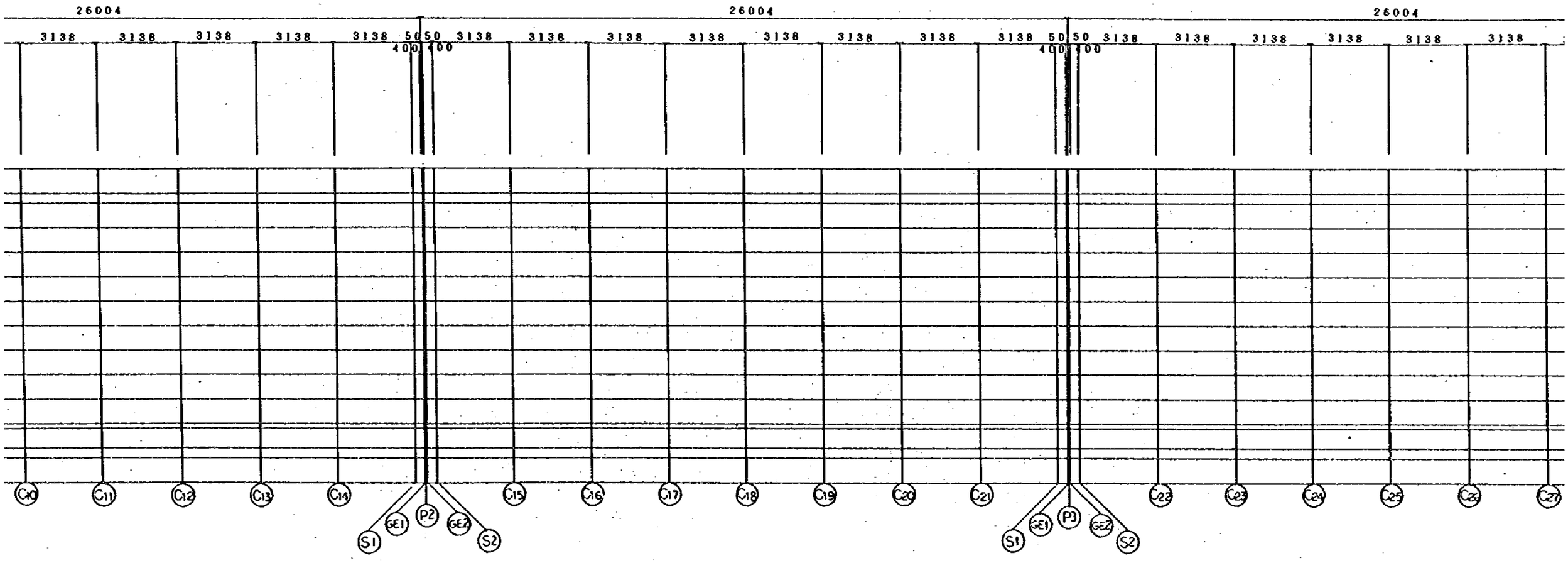
LIST OF PIER ELEVATION

	PH1	PH2	PH3	REMARKS
P1	20.187	14.804	8.787	T-Wall
P2	20.458	14.803	9.058	〃
P3	20.661	14.802	9.261	〃
P4	20.796	15.100	9.196	Two Colums
P5	20.863	15.900	9.263	〃
P6	20.863	15.950	9.263	〃
P7	20.796	15.100	9.196	〃
P8	20.661	14.780	9.261	T-Wall
P9	20.458	14.765	9.058	〃
P10	20.187	14.751	8.787	〃

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: GENERAL VIEW RA/3 BARKA (B-LINE)
	DATE: DWG NO. B-2


STA NO. 1+66.120
26004
26004
50 3138 3138 3138 3138 3138 3138 3138 3138 50
400
50 3138 3138 3138 3138 3138 3138 3138 3138 50
400
C1
C2
C3
C4
C5
C6
C7
C8
C9
C10
C11
C12
C13
C14
A1
GE1
S1
S1
GE1
P1
GE2
S2
S1
GE1

NOTES:


26004
26004
26004
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3138
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400 400
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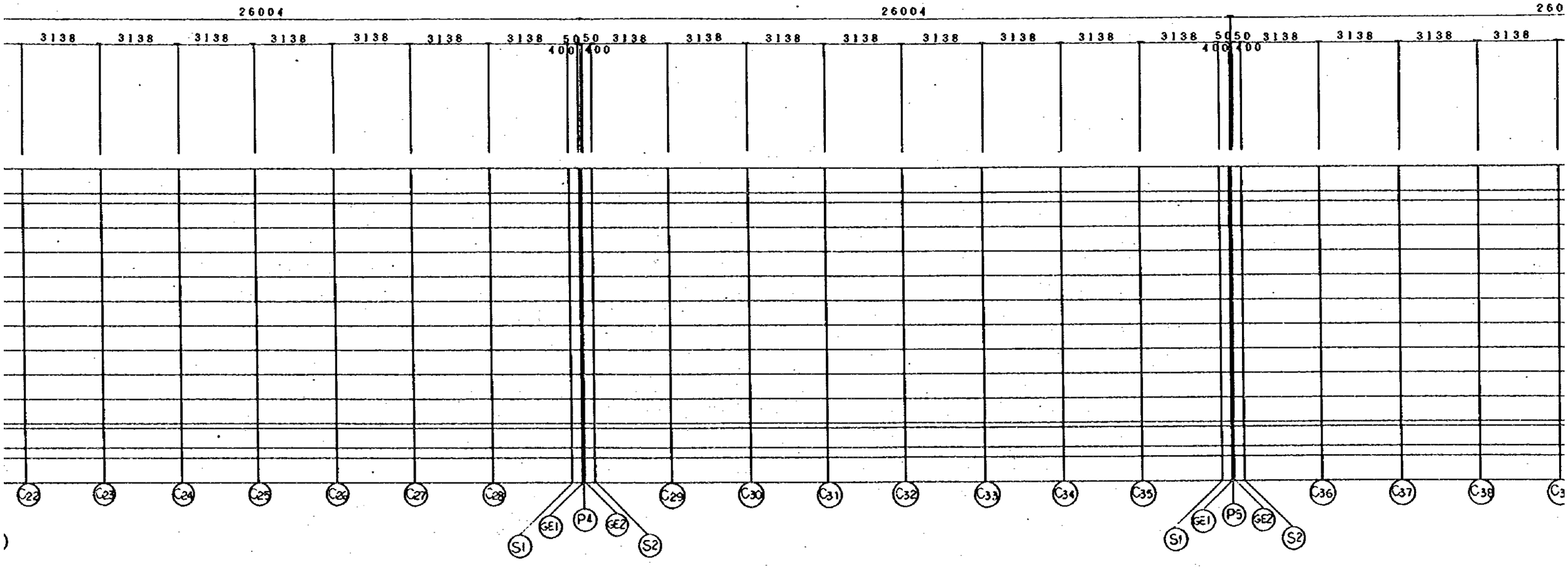
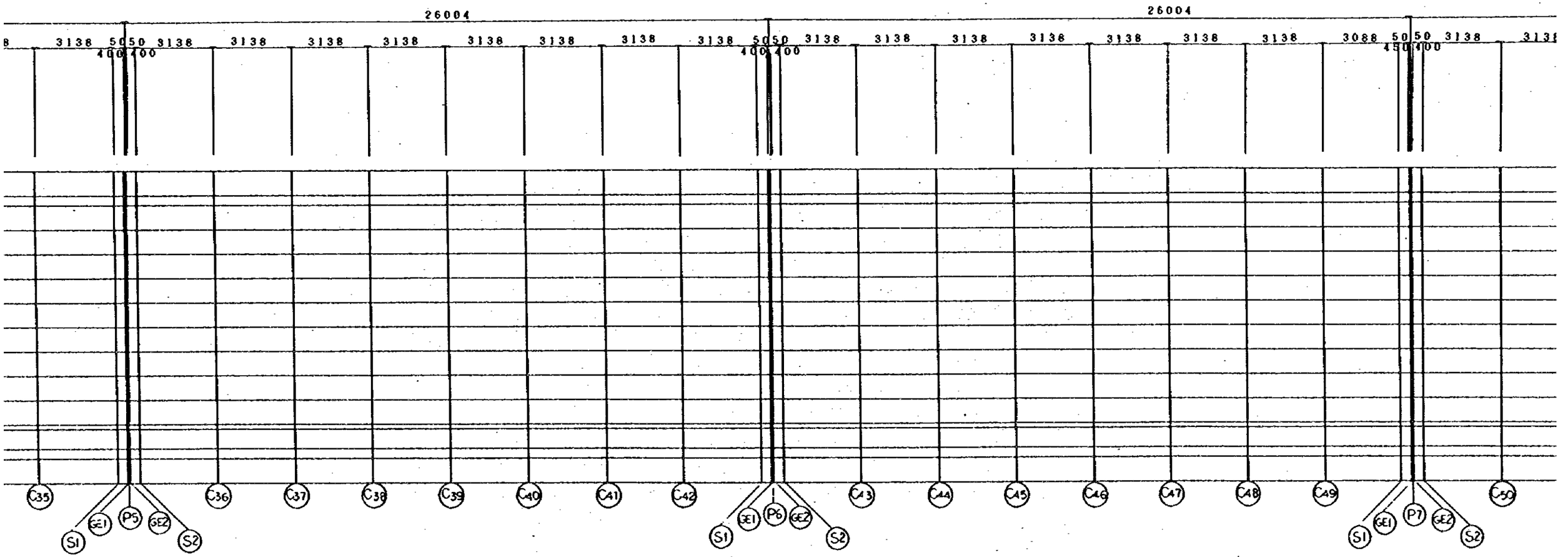
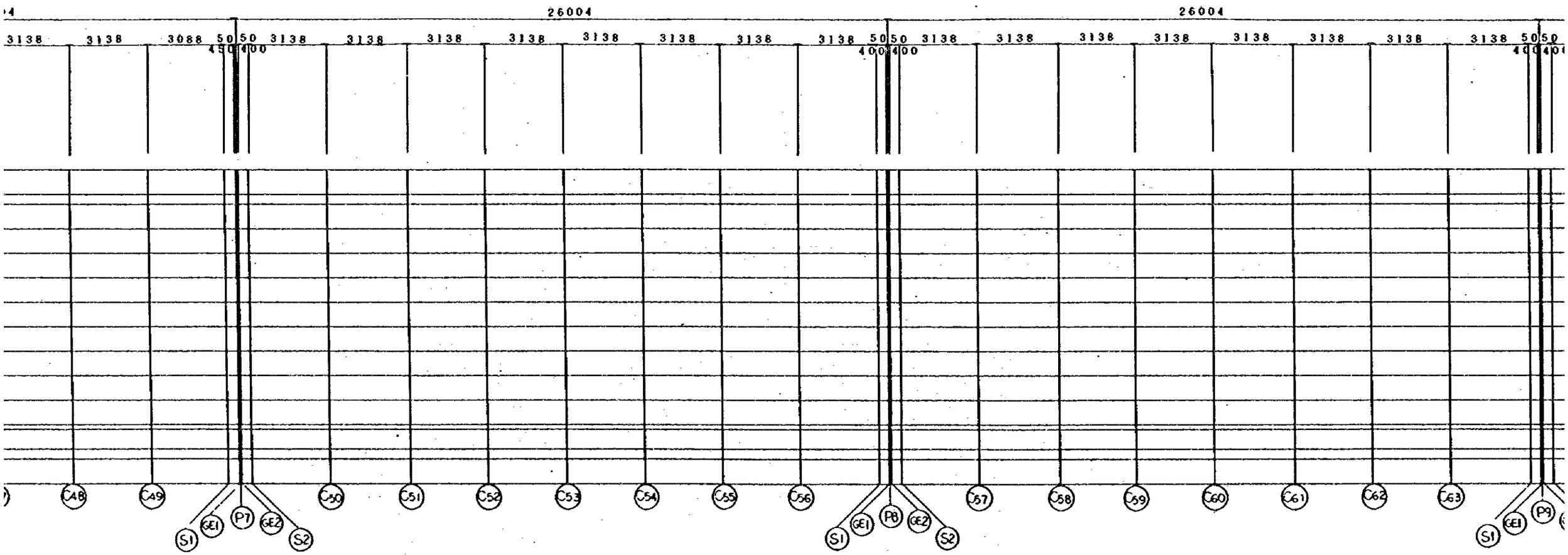
3138
5050
400 400
3138
3138
3138
3138
3138
3138
C10
C11
C12
C13
C14
C15
C16
C17
C18
C19
C20
C21
C22
C23
C24
C25
C26
C27
S1
GE1
P2
GE2
S2
S1
GE1
P3
GE2
S2

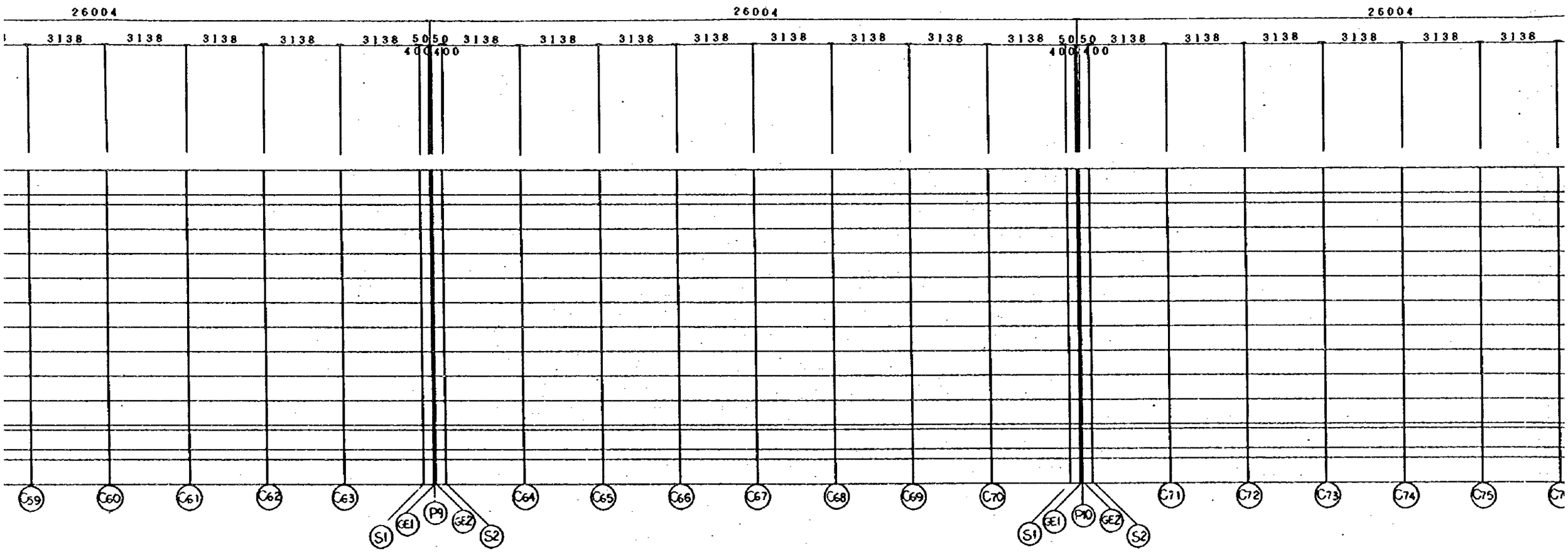

26004
26004
260
3138
5050
400
C22
C23
C24
C25
C26
C27
C28
C29
C30
C31
C32
C33
C34
C35
C36
C37
C38
S1
GE1
P4
GE2
S2
P5

R/A-3 BARKA

A-LINE




26004
26004
3138
3088
50
400
C48
C49
C50
C51
C52
C53
C54
C55
C56
C57
C58
C59
C60
C61
C62
C63
S1
GE1
P7
GE2
S2
P8
P9


26004
26004
26004
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400400
C59
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C64
C65
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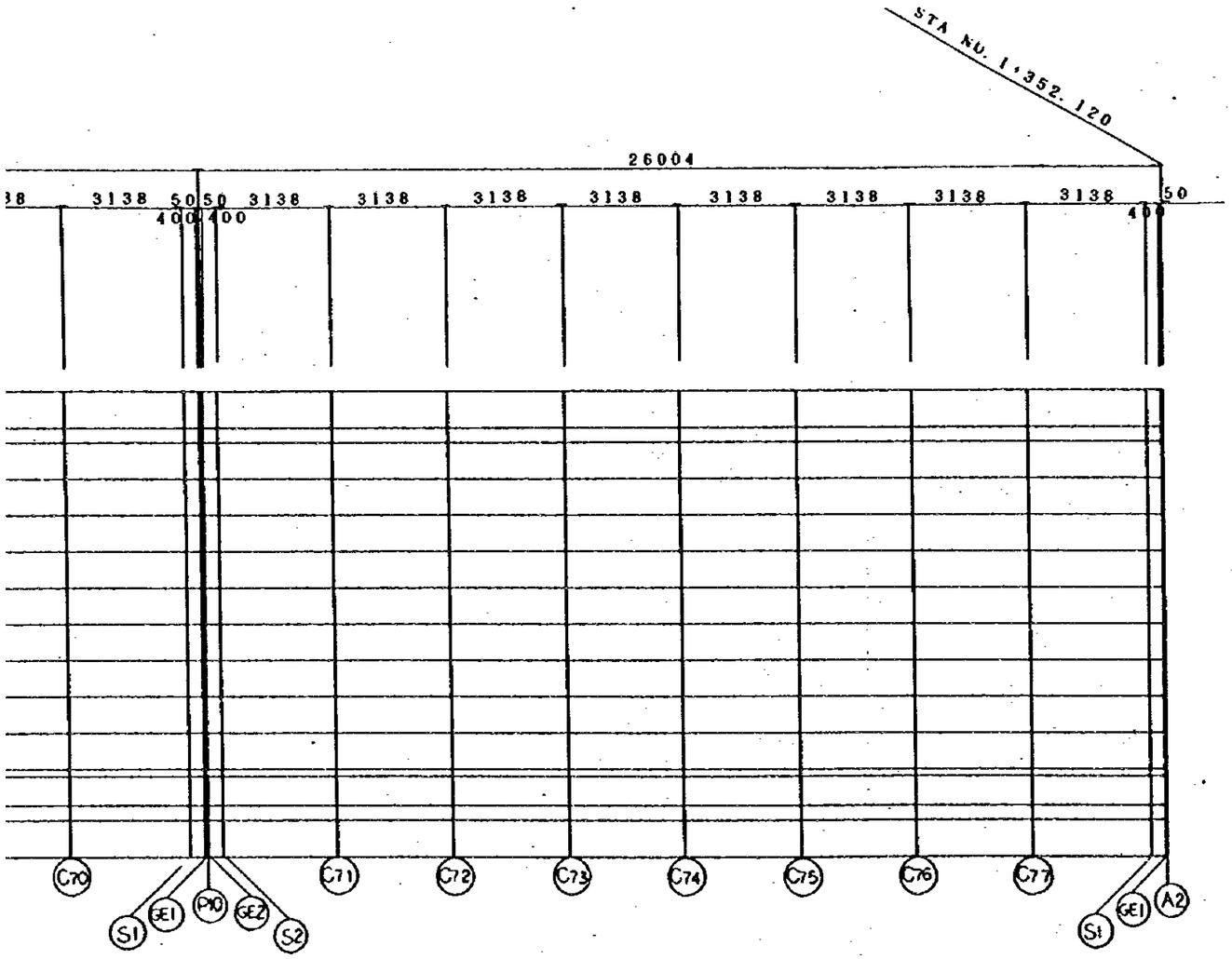
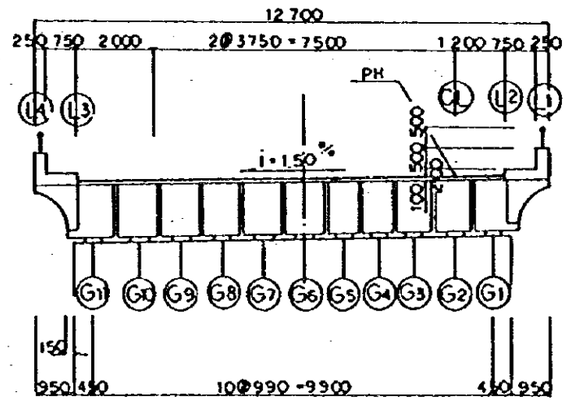
C68
C69
C70
C71
C72
C73
C74
C75
S1
GE1
P9
GE2
S2
P10



A-LINE



	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: FRAMING PLAN RA/03 AT A-LINE
		DATE: DWG NO. B-3

BARKA(A)

SECTION		A1	A1-GE1	A1-S1	C4	P1-S1	P1-GE1	P1	P1-GE2	P1-S2	C11	P2-S1	P2-GE1	P2	P2-GE2
STATION		1 + 66.1200	1 + 66.1700	1 + 66.5700	1 + 79.1200	1 + 91.6700	1 + 92.0700	1 + 92.1200	1 + 92.1700	1 + 92.5700	1 + 105.1200	1 + 117.6700	1 + 118.0700	1 + 118.1200	1 + 118.170
L4	X	0	0.05	0.45	13	25.55	25.95	26	26.05	26.45	39	51.55	51.95	52	52.05
	Y	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
	Z	21.1891	21.1898	21.1955	21.3665	21.5218	21.5265	21.5271	21.5276	21.5323	21.6707	21.7933	21.797	21.7975	21.7979
L3	X	0	0.05	0.45	13	25.55	25.95	26	26.05	26.45	39	51.55	51.95	52	52.05
	Y	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
	Z	21.3041	21.3048	21.3105	21.4815	21.6368	21.6415	21.6421	21.6426	21.6473	21.7857	21.9083	21.912	21.9125	21.9129
G6(PIER CENTER)	X	0	0.05	0.45	13	25.55	25.95	26	26.05	26.45	39	51.55	51.95	52	52.05
	Y	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Z	21.3843	21.385	21.3907	21.5617	21.717	21.7217	21.7223	21.7229	21.7276	21.8659	21.9886	21.9922	21.9927	21.9932
CL	X	0	0.05	0.45	13	25.55	25.95	26	26.05	26.45	39	51.55	51.95	52	52.05
	Y	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15
	Z	21.4465	21.4473	21.453	21.624	21.7793	21.784	21.7845	21.7851	21.7898	21.9282	22.0508	22.0545	22.055	22.0554
L2	X	0	0.05	0.45	13	25.55	25.95	26	26.05	26.45	39	51.55	51.95	52	52.05
	Y	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35
	Z	21.4646	21.4653	21.471	21.642	21.7973	21.802	21.8026	21.8031	21.8078	21.9462	22.0688	22.0725	22.073	22.0734
L1	X	0	0.05	0.45	13	25.55	25.95	26	26.05	26.45	39	51.55	51.95	52	52.05
	Y	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35
	Z	21.3795	21.3803	21.386	21.557	21.7123	21.717	21.7175	21.7181	21.7228	21.8612	21.9838	21.9875	21.9879	21.9884

NOTES:

	C11	P2-S1	P2-GE1	P2	P2-GE2	P2-S2	C18	P3-S1	P3-GE1	P3	P3-GE2	P3-S2	C25	P4-S1	P4-GE1	P4	P4-GE2	P4-S2	C32	P5-S1
700	1 + 105.1200	1 + 117.6700	1 + 118.0700	1 + 118.1200	1 + 118.1700	1 + 118.5700	1 + 131.1200	1 + 143.6700	1 + 144.0700	1 + 144.1200	1 + 144.1700	1 + 144.5700	1 + 157.1200	1 + 169.6700	1 + 170.0700	1 + 170.1200	1 + 170.1700	1 + 170.5700	1 + 183.1200	1 + 195.6
.45	39	51.55	51.95	52	52.05	52.45	65	77.55	77.95	78	78.05	78.45	91	103.55	103.95	104	104.05	104.45	117	129
.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6
23	21.6707	21.7933	21.797	21.7975	21.7979	21.8015	21.9073	21.9973	21.9999	22.0003	22.0006	22.0032	22.0763	22.1337	22.1353	22.1355	22.1356	22.1372	22.1777	22.2
.45	39	51.55	51.95	52	52.05	52.45	65	77.55	77.95	78	78.05	78.45	91	103.55	103.95	104	104.05	104.45	117	129
.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5
173	21.7857	21.9083	21.912	21.9125	21.9129	21.9165	22.0223	22.1123	22.1149	22.1153	22.1156	22.1182	22.1913	22.2487	22.2503	22.2505	22.2506	22.2522	22.2927	22.3
.45	39	51.55	51.95	52	52.05	52.45	65	77.55	77.95	78	78.05	78.45	91	103.55	103.95	104	104.05	104.45	117	129
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
276	21.8659	21.9886	21.9922	21.9927	21.9932	21.9968	22.1025	22.1926	22.1952	22.1955	22.1958	22.1984	22.2715	22.3289	22.3305	22.3307	22.3309	22.3324	22.3729	22.3
.45	39	51.55	51.95	52	52.05	52.45	65	77.55	77.95	78	78.05	78.45	91	103.55	103.95	104	104.05	104.45	117	129
.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4
898	21.9282	22.0508	22.0545	22.055	22.0554	22.059	22.1648	22.2548	22.2574	22.2578	22.2581	22.2607	22.3338	22.3912	22.3928	22.3929	22.3931	22.3947	22.4352	22
.45	39	51.55	51.95	52	52.05	52.45	65	77.55	77.95	78	78.05	78.45	91	103.55	103.95	104	104.05	104.45	117	129
.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5
078	21.9462	22.0688	22.0725	22.073	22.0734	22.077	22.1828	22.2728	22.2754	22.2758	22.2761	22.2787	22.3518	22.4092	22.4108	22.411	22.4111	22.4127	22.4532	22.
.45	39	51.55	51.95	52	52.05	52.45	65	77.55	77.95	78	78.05	78.45	91	103.55	103.95	104	104.05	104.45	117	129
.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6
228	21.8612	21.9838	21.9875	21.9879	21.9884	21.992	22.0978	22.1878	22.1904	22.1907	22.1911	22.1937	22.2668	22.3242	22.3258	22.3259	22.3261	22.3277	22.3682	22.

FRAMING PLAN AT RA/03 BARKA (A-LINE)

GE1	P4	P4-GE2	P4-S2	C32	P5-S1	P5-GE1	P5	P5-GE2	P5-S2	C39	P6-S1	P6-GE1	P6	P6-GE2	P6-S2	C46	P7-S1	P7-GE1	P7	P7-
0.0700	1 + 170.1200	1 + 170.1700	1 + 170.5700	1 + 183.1200	1 + 195.6700	1 + 196.0700	1 + 196.1200	1 + 196.1700	1 + 196.5700	1 + 209.1200	1 + 221.6700	1 + 222.0700	1 + 222.1200	1 + 222.1700	1 + 222.5700	1 + 235.1200	1 + 247.6200	1 + 248.0700	1 + 248.1200	1 + 24
03.95	104	104.05	104.45	117	129.55	129.95	130	130.05	130.45	143	155.55	155.95	156	156.05	156.45	169	181.5	181.95	182	
6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	
.1353	22.1355	22.1356	22.1372	22.1777	22.2025	22.203	22.2031	22.2031	22.2036	22.2115	22.2036	22.2031	22.2031	22.203	22.2025	22.1777	22.1374	22.1356	22.1355	2
03.95	104	104.05	104.45	117	129.55	129.95	130	130.05	130.45	143	155.55	155.95	156	156.05	156.45	169	181.5	181.95	182	
5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	
.2503	22.2505	22.2506	22.2522	22.2927	22.3175	22.318	22.3181	22.3181	22.3186	22.3265	22.3186	22.3181	22.3181	22.318	22.3175	22.2927	22.2524	22.2506	22.2505	2
03.95	104	104.05	104.45	117	129.55	129.95	130	130.05	130.45	143	155.55	155.95	156	156.05	156.45	169	181.5	181.95	182	
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
.3305	22.3307	22.3309	22.3324	22.3729	22.3977	22.3982	22.3983	22.3984	22.3989	22.4067	22.3989	22.3984	22.3983	22.3982	22.3977	22.3729	22.3326	22.3309	22.3307	2
03.95	104	104.05	104.45	117	129.55	129.95	130	130.05	130.45	143	155.55	155.95	156	156.05	156.45	169	181.5	181.95	182	
-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	
2.3928	22.3929	22.3931	22.3947	22.4352	22.46	22.4605	22.4605	22.4606	22.4611	22.469	22.4611	22.4606	22.4606	22.4605	22.46	22.4352	22.3949	22.3931	22.393	2
103.95	104	104.05	104.45	117	129.55	129.95	130	130.05	130.45	143	155.55	155.95	156	156.05	156.45	169	181.5	181.95	182	
-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	
2.4108	22.411	22.4111	22.4127	22.4532	22.478	22.4785	22.4786	22.4786	22.4791	22.487	22.4791	22.4786	22.4786	22.4785	22.478	22.4532	22.4129	22.4111	22.411	2
103.95	104	104.05	104.45	117	129.55	129.95	130	130.05	130.45	143	155.55	155.95	156	156.05	156.45	169	181.5	181.95	182	
-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	
2.3258	22.3259	22.3261	22.3277	22.3682	22.393	22.3935	22.3935	22.3936	22.3941	22.402	22.3941	22.3936	22.3935	22.3935	22.393	22.3682	22.3279	22.3261	22.326	2

	P6-GE2	P6-S2	C46	P7-S1	P7-GE1	P7	P7-GE2	P7-S2	C53	P8-S1	P8-GE1	P8	P8-GE2	P8-S2	C60	P9-S1	P9-GE1	P9	P9-GE2	P9-S2
01	1 + 222.1700	1 + 222.5700	1 + 235.1200	1 + 247.6200	1 + 248.0700	1 + 248.1200	1 + 248.1700	1 + 248.5700	1 + 261.1200	1 + 273.6700	1 + 274.0700	1 + 274.1200	1 + 274.1700	1 + 274.5700	1 + 287.1200	1 + 299.6700	1 + 300.0700	1 + 300.1200	1 + 300.1700	1 + 300.570
6	156.05	156.45	169	181.5	181.95	182	182.05	182.45	195	207.55	207.95	208	208.05	208.45	221	233.55	233.95	234	234.05	234.4
5	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.3
1	22.203	22.2025	22.1777	22.1374	22.1356	22.1355	22.1353	22.1337	22.0763	22.0032	22.0006	22.0003	21.9999	21.9973	21.9073	21.8015	21.7979	21.7975	21.797	21.793
6	156.05	156.45	169	181.5	181.95	182	182.05	182.45	195	207.55	207.95	208	208.05	208.45	221	233.55	233.95	234	234.05	234.4
5	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.3
1	22.318	22.3175	22.2927	22.2524	22.2506	22.2505	22.2503	22.2487	22.1913	22.1182	22.1156	22.1153	22.1149	22.1123	22.0223	21.9165	21.9129	21.9125	21.912	21.908
6	156.05	156.45	169	181.5	181.95	182	182.05	182.45	195	207.55	207.95	208	208.05	208.45	221	233.55	233.95	234	234.05	234.4
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
3	22.3982	22.3977	22.3729	22.3326	22.3309	22.3307	22.3305	22.3289	22.2715	22.1984	22.1958	22.1955	22.1952	22.1926	22.1025	21.9968	21.9932	21.9927	21.9922	21.988
6	156.05	156.45	169	181.5	181.95	182	182.05	182.45	195	207.55	207.95	208	208.05	208.45	221	233.55	233.95	234	234.05	234.4
5	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.1
6	22.4605	22.46	22.4352	22.3949	22.3931	22.393	22.3928	22.3912	22.3338	22.2607	22.2581	22.2577	22.2574	22.2548	22.1648	22.059	22.0554	22.0549	22.0545	22.050
6	156.05	156.45	169	181.5	181.95	182	182.05	182.45	195	207.55	207.95	208	208.05	208.45	221	233.55	233.95	234	234.05	234.4
5	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.3
6	22.4785	22.478	22.4532	22.4129	22.4111	22.411	22.4108	22.4092	22.3518	22.2787	22.2761	22.2758	22.2754	22.2728	22.1828	22.077	22.0734	22.073	22.0725	22.068
6	156.05	156.45	169	181.5	181.95	182	182.05	182.45	195	207.55	207.95	208	208.05	208.45	221	233.55	233.95	234	234.05	234.4
5	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.3
5	22.3935	22.393	22.3682	22.3279	22.3261	22.326	22.3258	22.3242	22.2668	22.1937	22.1911	22.1907	22.1904	22.1878	22.0978	21.992	21.9884	21.9879	21.9875	21.983

C60	P9-S1	P9-GE1	P9	P9-GE2	P9-S2	C67	P10-S1	P10-GE1	P10	P10-GE2	P10-S2	C74	A2-S1	A2-GE1	A2
287.1200	1 + 299.6700	1 + 300.0700	1 + 300.1200	1 + 300.1700	1 + 300.5700	1 + 313.1200	1 + 325.6700	1 + 326.0700	1 + 326.1200	1 + 326.1700	1 + 326.5700	1 + 339.1200	1 + 351.6700	1 + 352.0700	1 + 352.1200
221	233.55	233.95	234	234.05	234.45	247	259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
21.9073	21.8015	21.7979	21.7975	21.797	21.7933	21.6707	21.5323	21.5276	21.5271	21.5265	21.5218	21.3665	21.1955	21.1898	21.1891
221	233.55	233.95	234	234.05	234.45	247	259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
22.0223	21.9165	21.9129	21.9125	21.912	21.9083	21.7857	21.6473	21.6426	21.6421	21.6415	21.6368	21.4815	21.3105	21.3048	21.3041
221	233.55	233.95	234	234.05	234.45	247	259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22.1025	21.9968	21.9932	21.9927	21.9922	21.9886	21.8659	21.7276	21.7229	21.7223	21.7217	21.717	21.5617	21.3907	21.385	21.3843
221	233.55	233.95	234	234.05	234.45	247	259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15
22.1648	22.059	22.0554	22.0549	22.0545	22.0508	21.9282	21.7898	21.7851	21.7845	21.784	21.7793	21.624	21.453	21.4473	21.4465
221	233.55	233.95	234	234.05	234.45	247	259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35
22.1828	22.077	22.0734	22.073	22.0725	22.0688	21.9462	21.8078	21.8031	21.8026	21.802	21.7973	21.642	21.471	21.4653	21.4646
221	233.55	233.95	234	234.05	234.45	247	259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35
22.0978	21.992	21.9884	21.9879	21.9875	21.9838	21.8612	21.7228	21.7181	21.7175	21.717	21.7123	21.557	21.386	21.3803	21.3795

)-S1	P10-GE1	P10	P10-GE2	P10-S2	C74	A2-S1	A2-GE1	A2
25.6700	1 + 326.0700	1 + 326.1200	1 + 326.1700	1 + 326.5700	1 + 339.1200	1 + 351.6700	1 + 352.0700	1 + 352.1200
259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35	6.35
21.5323	21.5276	21.5271	21.5265	21.5218	21.3665	21.1955	21.1898	21.1891
259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35	5.35
21.6473	21.6426	21.6421	21.6415	21.6368	21.4815	21.3105	21.3048	21.3041
259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
0	0	0	0	0	0	0	0	0
21.7276	21.7229	21.7223	21.7217	21.717	21.5617	21.3907	21.385	21.3843
259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15	-4.15
21.7898	21.7851	21.7845	21.784	21.7793	21.624	21.453	21.4473	21.4465
259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35	-5.35
21.8078	21.8031	21.8026	21.802	21.7973	21.642	21.471	21.4653	21.4646
259.55	259.95	260	260.05	260.45	273	285.55	285.95	286
-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35	-6.35
21.7228	21.7181	21.7175	21.717	21.7123	21.557	21.386	21.3803	21.3795

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: B/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE CO-ORDINATE LIST RA/03 AT A-LINE
	DATE DWG NO. B-4