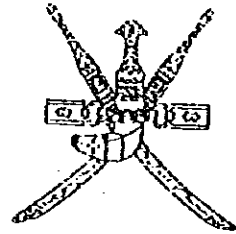


**SULTANATE OF OMAN**  
**MINISTRY OF COMMUNICATIONS**  
**DIRECTORATE GENERAL OF ROADS**



**CONSTRUCTION OF FLYOVER**  
**AT**  
**SOHAR ROUNDABOUT**  
**BATINAH HIGHWAY**

**TENDER DOCUMENT**

**DRAWINGS**

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PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

MARCH, 1997

SSF
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97-015

**DRAWING SCHEDULE**  
**(FO6-R/A12 SOHAR)**

SHEET NO.	TITLE	SHEET NO.	TITLE	SHEET NO.	TITLE
<b>A</b>	<b>GENERAL</b>	<b>B</b>	<b>STRUCTURE - BRIDGE</b>	<b>W</b>	<b>STRUCTURE - RETAINING WALL</b>
G-1	Drawing Schedule	B-1	General View (A-Line)	W-1	General View (1)-1
G-2	General Note	B-2	General View (B-Line)	W-2	General View (1)-2
<b>R</b>	<b>ROAD</b>	B-3	Framing Plan (A-Line)	W-3	Re-bar Arrangement (1)
R-1	Alignment Layout (1/2)	B-4	Co-ordinate List (A-Line)	W-4	Re-bar Arrangement (2)
R-2	Alignment Layout (2/2)	B-5	Framing Plan (B-Line)	W-5	Re-bar Arrangement (3)
R-3	Setting Out Details (1/2)	B-6	Co-ordinate List (B-Line)	W-6	Re-bar Arrangement (4)
R-4	Setting Out Details (2/2)	B-7	General View of Bridge (A-Line)	W-7	Re-bar Arrangement (5)
R-5	Plan (1/2)	B-8	Structural Detail of Main Girder (A-Line)	W-8	Re-bar Arrangement (6)
R-6	Plan (2/2)	B-9	Detail of Tendons (A-Line)	W-9	Re-bar Arrangement (7)
R-7	Profile-Highway	B-10	Re-bar Arrangement (A-Line) (1/2)	W-10	Re-bar Arrangement (8)
R-8	Typical Cross Section	B-11	Re-bar Arrangement (A-Line) (2/2)	W-11	Re-bar Arrangement (9)
R-9	Pavement Details	B-12	Bar Schedule of Main Girder (A-Line)	W-12	Re-bar Arrangement (10)
R-10	Detailed Plan	B-13	Railing and Cantilever Slab (A-Line)	W-13	Re-bar Arrangement (11)
R-11	Drainage Structure (1/3)	B-14	Detail of Shoe and Anchor Bar (A-Line)	W-14	Re-bar Arrangement (12)
R-12	Drainage Structure (2/3)	B-15	General View of Bridge (B-Line)	W-15	Re-bar Arrangement (13)
R-13	Drainage Structure (3/3) and Service Ducts	B-16	Structural Detail of Main Girder (B-Line)	W-16	Re-bar Arrangement (14)
R-14	Retaining Wall (1/2)	B-17	Detail of Tendons (B-Line)	W-17	Re-bar Arrangement (15)
R-15	Retaining Wall (2/2)	B-18	Re-bar Arrangement (B-Line) (1/2)	W-18	Re-bar Arrangement (16)
R-16	Slope Protection	B-19	Re-bar Arrangement (B-Line) (2/2)	W-19	Re-bar Arrangement (17)
R-17	Irish Crossing	B-20	Bar Schedule of Main Girder (B-Line)	W-20	General View (2)-1
R-18	Road Marking and Traffic Sign (1/2)	B-21	Railing and Cantilever Slab (B-Line)	W-21	General View (2)-2
R-19	Road Marking and Traffic Sign (2/2)	B-22	Detail of Shoe and Anchor Bar (B-Line)	W-22	Re-bar Arrangement (1)
R-20	Removal and Relocation of Utilities (1/2)	B-23	Expansion Joint	W-23	Re-bar Arrangement (2)
R-21	Removal and Relocation of Utilities (2/2)	B-24	Handrail	W-24	Re-bar Arrangement (3)
		B-25	Drainage Details	W-25	Re-bar Arrangement (4)
		B-26	Structural Detail of A1 Abutment (A-Line)	W-26	Re-bar Arrangement (5)
		B-27	Structural Detail of A2 Abutment (A-Line)	W-27	Re-bar Arrangement (6)
		B-28	Structural Detail of A1 Abutment (B-Line)	W-28	Re-bar Arrangement (7)
		B-29	Structural Detail of A2 Abutment (B-Line)	W-29	Re-bar Arrangement (8)
		B-30	Structural Details of P1~P8 (A-Line) (1/2)	W-30	Re-bar Arrangement (9)
		B-31	Structural Details of P1~P8 (A-Line) (2/2)	W-31	Re-bar Arrangement (10)
		B-32	Structural Details of P1~P8 (B-Line) (1/2)	W-32	Re-bar Arrangement (11)
		B-33	Structural Details of P1~P8 (B-Line) (2/2)	W-33	Re-bar Arrangement (12)
		B-34	Re-bar Arrangement of A1 (A-Line) (1/3)	W-34	Re-bar Arrangement (13)
		B-35	Re-bar Arrangement of A1 (A-Line) (2/3)	W-35	Re-bar Arrangement (14)
		B-36	Re-bar Arrangement of A1 (A-Line) (3/3)	W-36	Re-bar Arrangement (15)
		B-37	Re-bar Arrangement of A2 (A-Line) (1/3)	W-37	Re-bar Arrangement (16)
		B-38	Re-bar Arrangement of A2 (A-Line) (2/3)	W-38	Re-bar Arrangement (17)
		B-39	Re-bar Arrangement of A2 (A-Line) (3/3)		
		B-40	Re-bar Arrangement of A1 (B-Line) (1/2)	<b>T</b>	<b>TEMPORARY WORKS</b>
		B-41	Re-bar Arrangement of A1 (B-Line) (2/2)	T-1	Construction Sequence
		B-42	Re-bar Arrangement of A2 (B-Line) (1/2)	T-2	Detour Layout (1/2)
		B-43	Re-bar Arrangement of A2 (B-Line) (2/2)	T-3	Detour Layout (2/2)
		B-44	Re-bar Arrangements of P1~P8 (A-Line) (1/2)		
		B-45	Re-bar Arrangements of P1~P8 (A-Line) (2/2)		
		B-46	Re-bar Arrangements of P1~P8 (B-Line) (1/2)		
		B-47	Re-bar Arrangements of P1~P8 (B-Line) (2/2)		
		B-48	Re-bar Arrangements of Pile Foundation		
		B-49	Re-bar Arrangement of Approach Slab		
		B-50	Bar Bending Diagram		

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 BATNAH HIGHWAY

TITLE : DRAWING SCHEDULE


DATE

DWG NO. G - 1

UNITED STATES DEPARTMENT OF JUSTICE  
FEDERAL BUREAU OF INVESTIGATION

MEMORANDUM FOR THE DIRECTOR

RE: [Illegible]

  
1140569(3)

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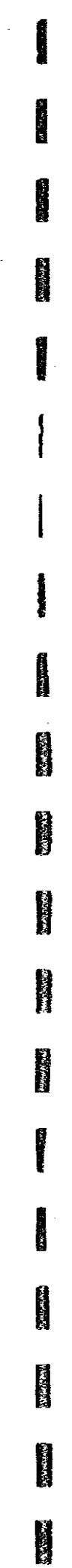
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## GENERAL NOTES

### 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, American Association of State Highway and Transportation Officials
- SPECIFICATIONS FOR HIGHWAY BRIDGES, February 1994, Japan Road Association

According 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 - Masoñnet's method based on orthotropic plate theory.

### MATERIALS FOR STRUCTURES

#### 1. CONCRETE

Design strength of concrete is specified as follows:

Class of concrete (28 days)	Cylinders		Cubes		Application	
	compressive strength (kg/cm <sup>2</sup> )	Characteristic strength (N/mm <sup>2</sup> )	compressive strength (kg/cm <sup>2</sup> )	Characteristic strength (N/mm <sup>2</sup> )		
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 <sup>A</sup>	400	40	408	50	510	Prestressed concrete girder

<sup>A</sup> 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/cm <sup>2</sup> )	Yielded strength, min (kgf/cm <sup>2</sup> )
Grade 40	4921	2812
Grade 60	6327	4218

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

AASHTO No.	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 (mm <sup>2</sup> )	Designation	Ultimate strength (kgf/mm <sup>2</sup> )	Yielded strength (kgf/mm <sup>2</sup> )
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/cm <sup>2</sup> )	Class 32	Class 40
Allowable compressive stress		
- Temporary stress before losses due to creep and shrinkage	140	180
- Stress at service load after losses have occurred	110	140
Allowable tensile stress		
- Temporary stress before losses due to creep and shrinkage	-12	-15
- Stress at service load after losses have occurred at dead load	0	0
- Stress at service load after losses have occurred at service load	-12	-15
Allowable shearing stress		
- Stress at service load after losses have occurred at service load		5.5
- Stress at service load after losses have occurred at ultimate load		53
Allowable diagonal stress		
- Stress at service load after losses have occurred at service load		-10

#### (2) Reinforced concrete structures (kgf/cm<sup>2</sup>)

	Class 20	Class 24	Class 28	Class 32
Allowable compressive stress				
- Flexural compressive 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 diagonal reinforcement	15	17	18	19
- Punching 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-place concrete pile

Cast-in-concrete piles are constructed by concrete class 32, but its allowable stresses are for concrete class 24.

#### (4) Reinforcing Bar

Allowable stresses (kgf/cm<sup>2</sup>) for each grade of reinforcing bar are as follows:

	Grade 40	Grade 60
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, stations and coordinates 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

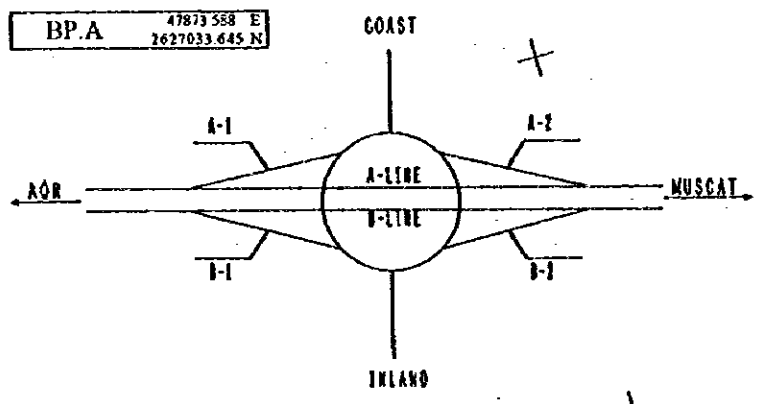
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2692500N  
BP.A 471325.586 E  
2692650.534 N

IP.A1	471559.525 E
	2692333.248 N
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R	-900
A	400
CL	826.638
X	177.604
Y	5.849

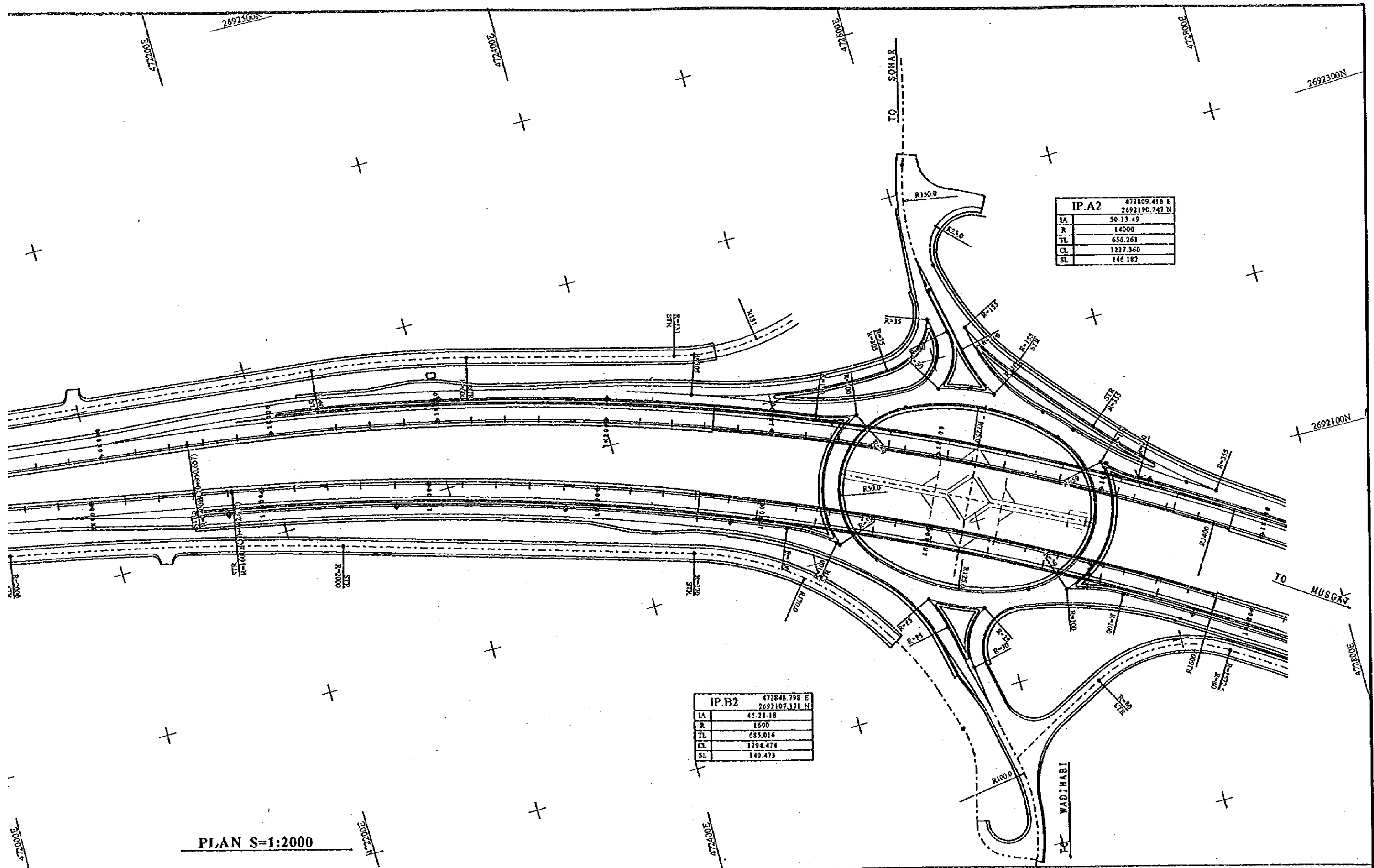
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BP.A 47873.588 E  
2627033.645 N

IP.B1	471333.086 E
	2692348.523 N
IA	43-10-30
R	-915
A	450
CL	800.465
X	220.892
Y	8.900



PLAN S=1:2000

NOTES:



<b>IP.A2</b>		472809.416 E
		2692190.747 N
LA	50-13-49	
R	14000	
TL	655.261	
CL	1227.360	
SL	146.182	

<b>IP.B2</b>		472848.798 E
		2692107.171 N
LA	45-21-18	
R	1650	
TL	685.016	
CL	1294.474	
SL	140.473	

PLAN S=1:2000

472000E

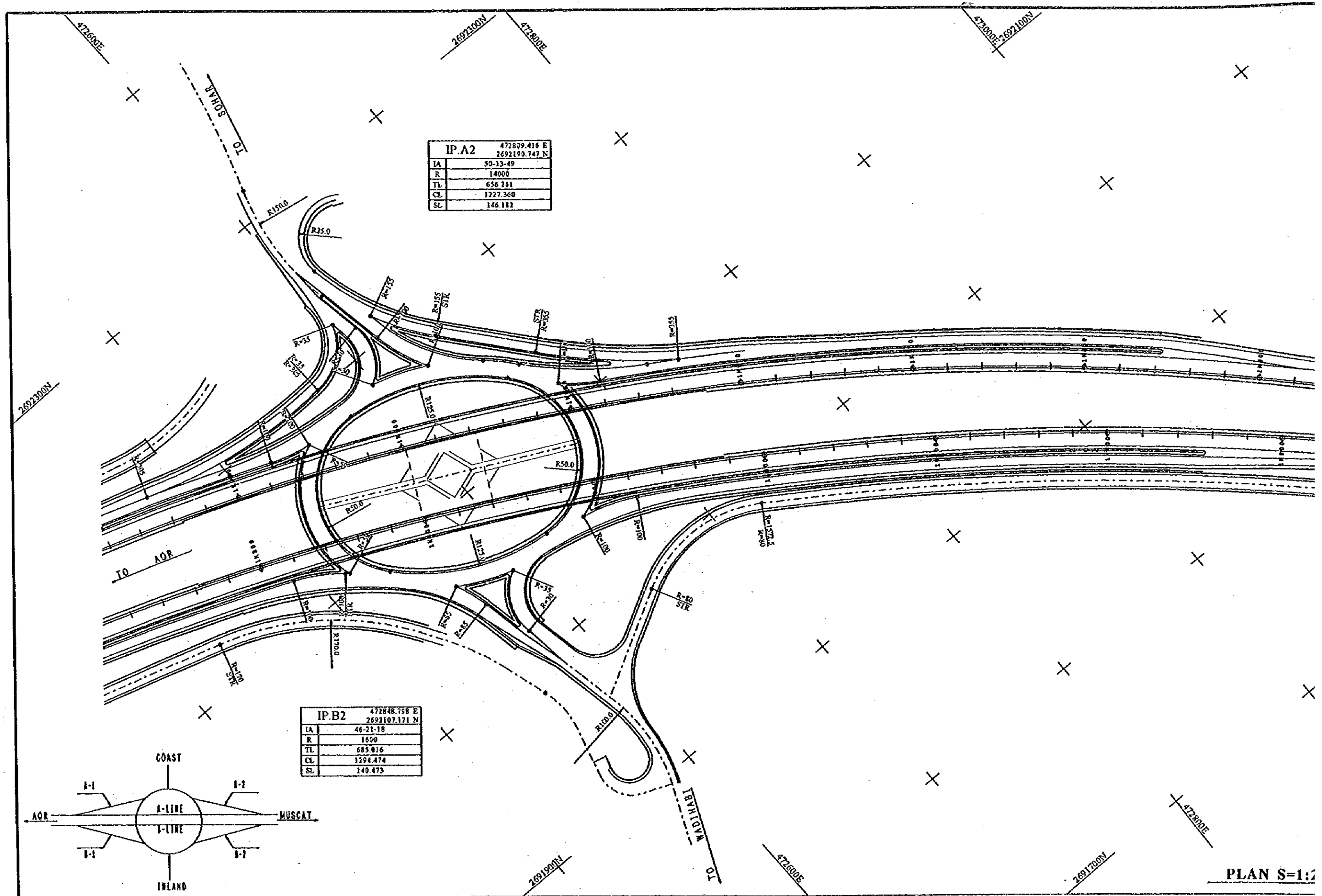
472200E

472400E

472800E

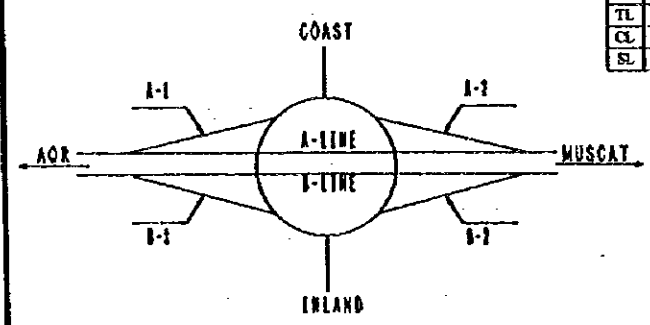
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	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT : D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
		TITLE : RA/11 SOHAR SETTING OUT DETAILS (1/2)
		DATE : DWONO. R-1





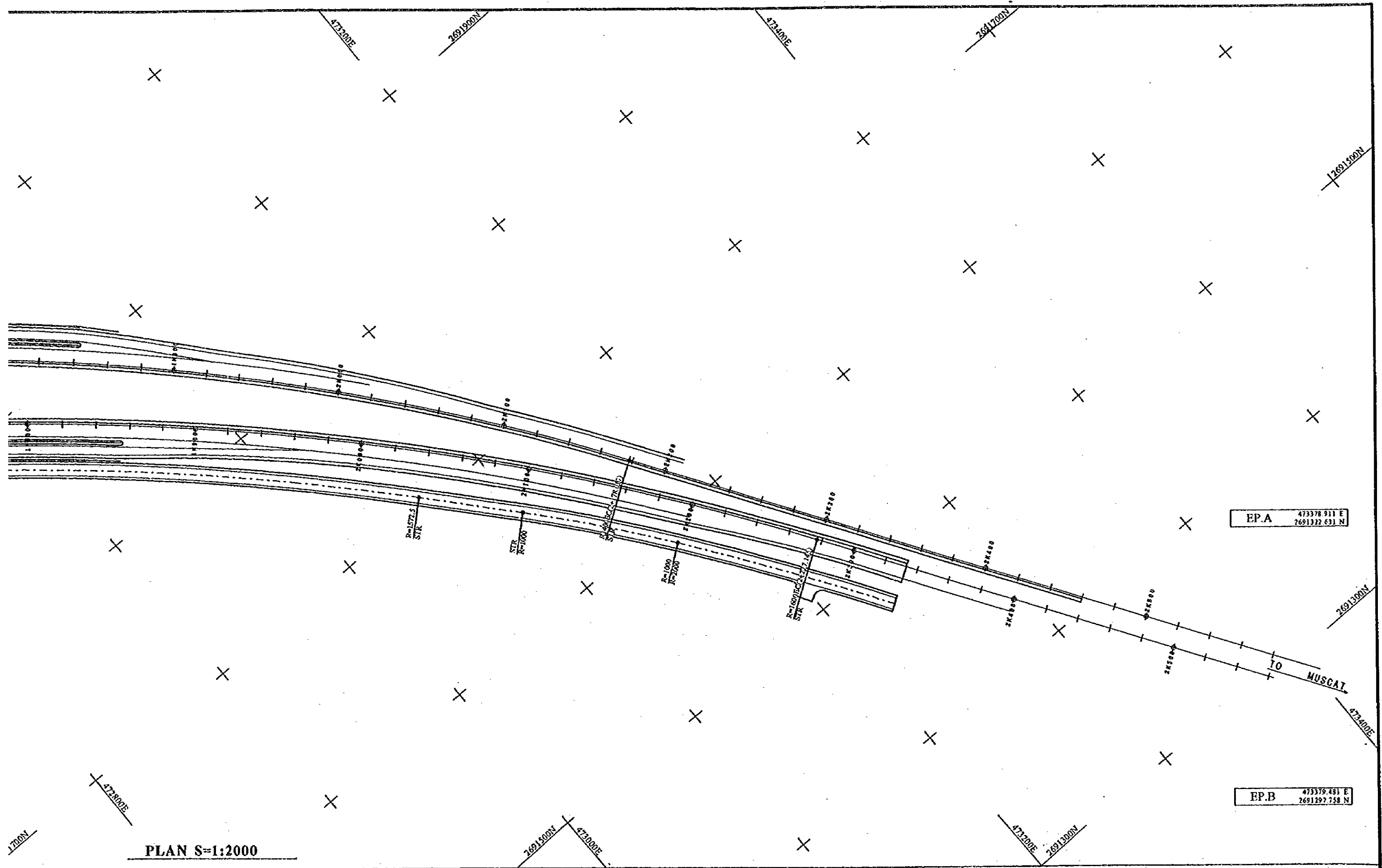
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R	50-13-49
TL	14000
CL	656.261
SL	1227.360
	146.182

IP.B2	
LA	472848.758 E
	2692107.171 N
R	46-21-18
TL	1600
CL	683.016
SL	1294.474
	140.473



NOTES:  
 (1) FINAL CONTROL COORDINATES, WGS 84 DATUM, ZONE 40 UTM, CM 47.

PLAN S=1:1

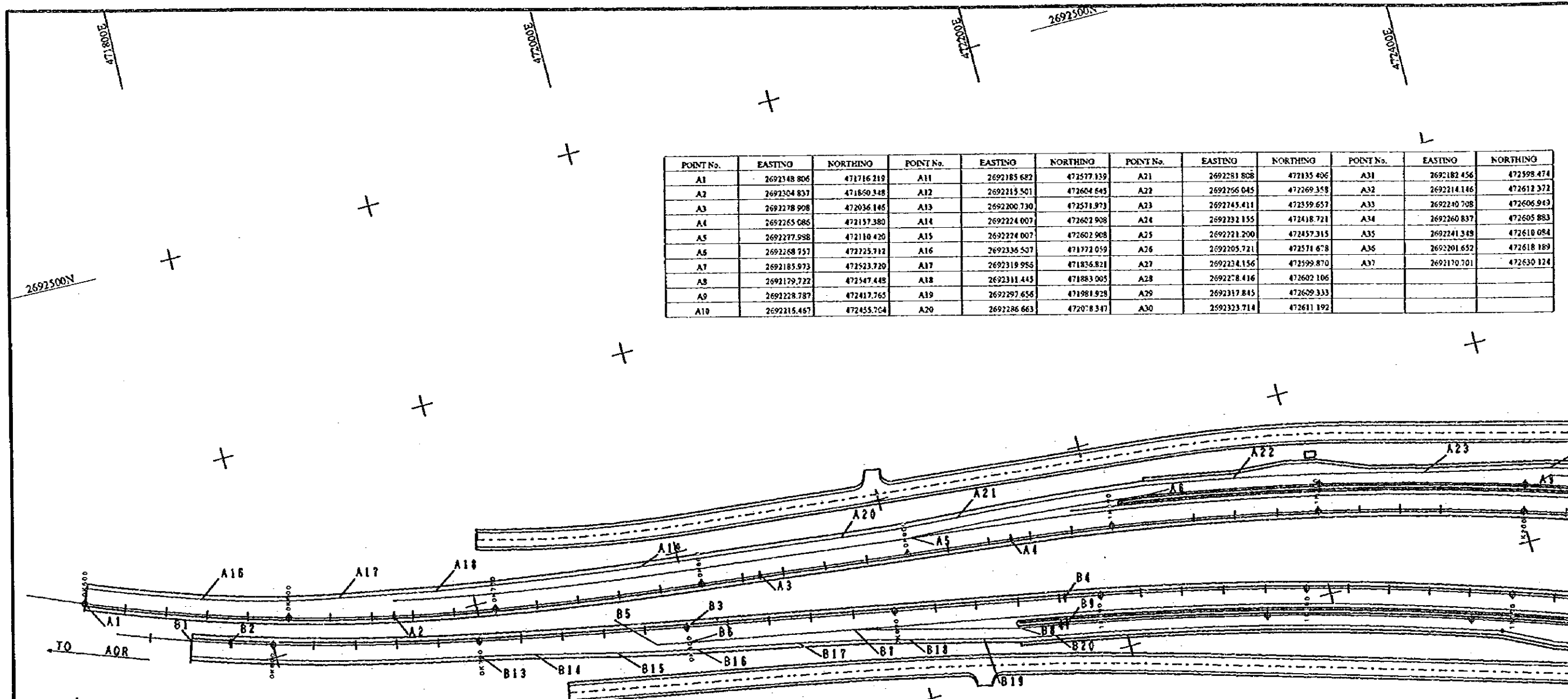


EPA 473378.911 E  
2691322.631 N

EP.B 473379.491 E  
2691297.758 N

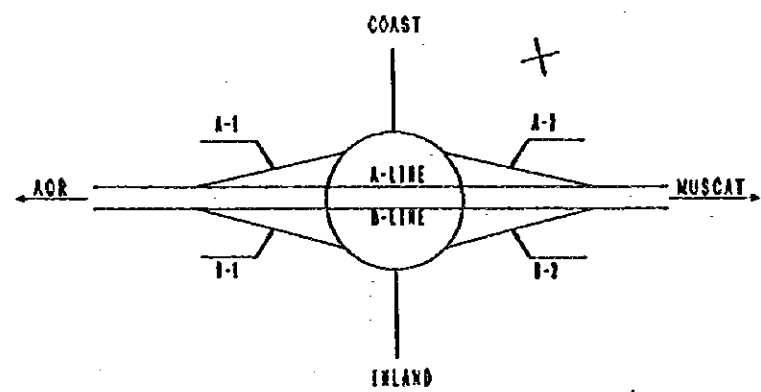
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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
	TITLE: RA/11 SOHAR ALIGNMENT LAYOUT (1/2)	
	DATE:	DWGNO. R-2



POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
A1	2692348.806	471716.219	A11	2692185.682	472577.139	A21	2692281.808	472135.606	A31	2692182.456	472598.474
A2	2692304.837	471860.348	A12	2692215.501	472604.645	A22	2692256.045	472269.358	A32	2692214.146	472612.372
A3	2692278.998	472036.146	A13	2692200.730	472571.973	A23	2692245.411	472559.657	A33	2692240.708	472606.949
A4	2692265.086	472157.380	A14	2692224.007	472602.908	A24	2692232.155	472418.721	A34	2692260.837	472605.883
A5	2692277.598	472110.420	A15	2692224.007	472602.908	A25	2692221.200	472457.315	A35	2692241.349	472610.084
A6	2692268.757	472225.712	A16	2692336.507	471772.059	A26	2692205.721	472571.678	A36	2692201.652	472618.189
A7	2692185.973	472523.720	A17	2692319.955	471836.821	A27	2692234.156	472599.870	A37	2692170.701	472630.124
A8	2692179.722	472547.448	A18	2692311.445	471883.005	A28	2692278.416	472602.106			
A9	2692228.787	472417.765	A19	2692297.655	471981.928	A29	2692317.845	472609.333			
A10	2692215.467	472455.704	A20	2692286.663	472078.547	A30	2692323.714	472611.192			

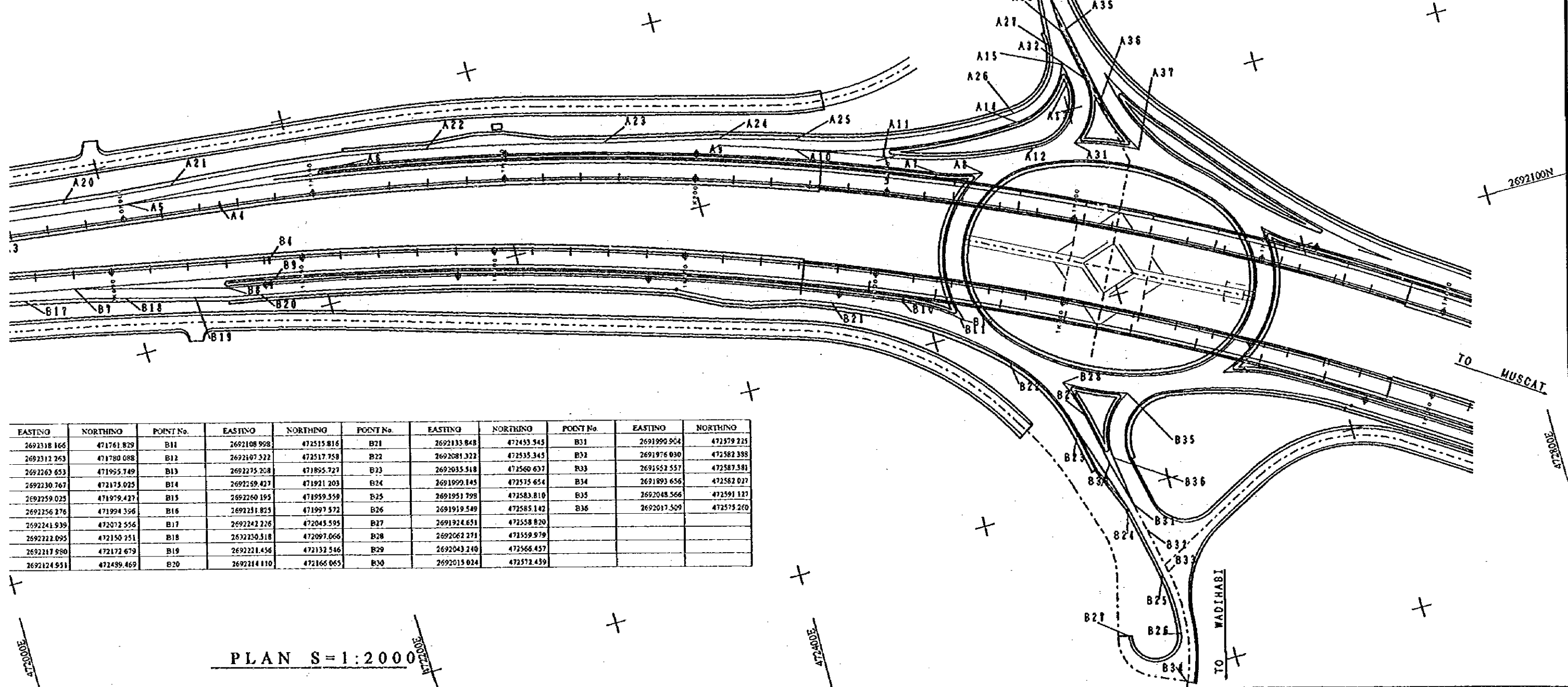
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B2	2692312.263	471780.088	B12	2692107.322	472517.758	B22	2692081.322	472535.345	B32	2691976.030	472582
B3	2692263.653	471895.749	B13	2692275.208	471895.727	B23	2692035.518	472560.637	B33	2691952.557	472587
B4	2692230.767	472175.025	B14	2692269.427	471921.203	B24	2691990.145	472575.654	B34	2691891.656	472582
B5	2692259.025	471979.427	B15	2692260.193	471939.559	B25	2691951.798	472583.810	B35	2692045.566	472591
B6	2692256.276	471994.356	B16	2692251.825	471997.572	B26	2691919.549	472585.142	B36	2692017.509	472575
B7	2692241.939	472072.556	B17	2692242.226	472045.595	B27	2691924.651	472558.820			
B8	2692222.095	472130.251	B18	2692230.518	472097.066	B28	2692062.271	472559.579			
B9	2692217.580	472172.679	B19	2692221.456	472132.546	B29	2692043.240	472566.437			
B10	2692124.951	472489.469	B20	2692214.110	472156.665	B30	2692015.024	472572.459			



PLAN S=1:2000

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

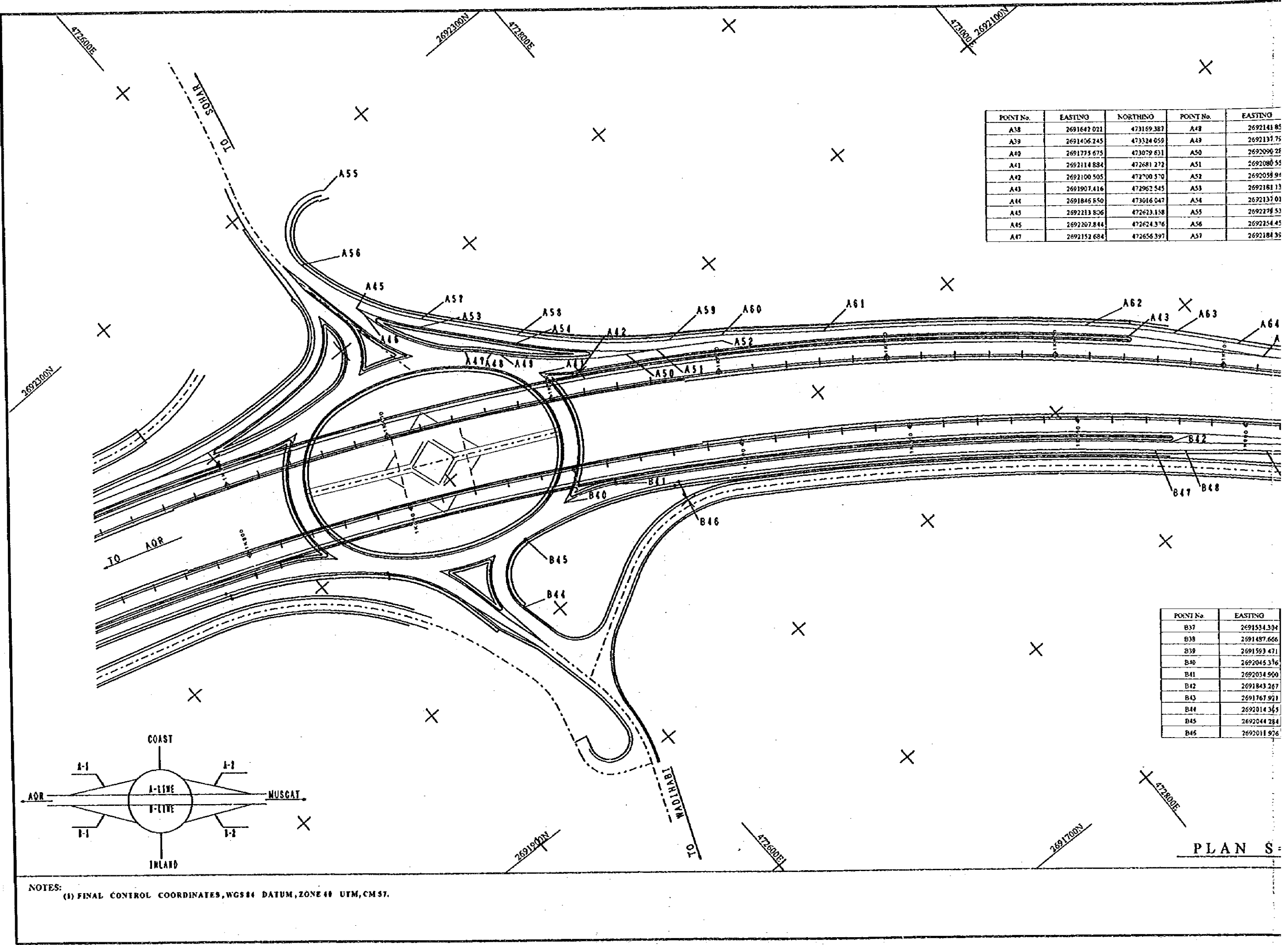
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278.908	472036.146	A13	2692200.730	472571.973	A23	2692245.411	472359.657	A33	2692240.708	472606.949
255.056	472157.380	A14	2692224.067	472602.908	A24	2692232.155	472418.721	A34	2692260.837	472505.883
277.588	472110.420	A15	2692224.007	472602.908	A25	2692271.200	472457.315	A35	2692241.349	472610.084
268.757	472225.712	A16	2692335.507	471772.059	A26	2692205.721	472571.678	A36	2692201.652	472618.189
185.973	472523.720	A17	2692319.586	471836.821	A27	2692234.156	472599.870	A37	2692170.701	472630.124
173.722	472547.448	A18	2692311.445	471883.065	A28	2692278.416	472502.106			
278.787	472417.765	A19	2692297.656	471981.928	A29	2692317.845	472569.333			
216.467	472455.704	A20	2692285.663	472078.347	A30	2692323.714	472611.192			



EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
2692318.166	471761.829	B11	2692108.998	472515.816	B21	2692133.848	472453.545	B31	2691999.904	472579.225
2692312.263	471780.088	B12	2692197.322	472517.758	B22	2692081.322	472535.345	B32	2691976.030	472582.388
2692263.653	471955.749	B13	2692275.208	471855.727	B23	2692035.518	472560.637	B33	2691552.557	472587.381
2692230.767	472173.025	B14	2692289.427	471921.203	B24	2691999.145	472575.654	B34	2691893.656	472582.027
2692259.025	471979.427	B15	2692260.195	471959.359	B25	2691951.798	472583.810	B35	2692048.566	472591.127
2692256.276	471994.396	B16	2692231.823	471997.572	B26	2691919.549	472585.142	B36	2692017.509	472575.260
2692241.939	472072.556	B17	2692242.226	472045.595	B27	2691924.651	472558.820			
2692222.095	472150.251	B18	2692230.518	472097.066	B28	2692062.271	472559.979			
2692217.980	472172.679	B19	2692221.456	472132.546	B29	2692043.240	472566.457			
2692124.951	472489.469	B20	2692214.110	472166.065	B30	2692015.024	472572.459			

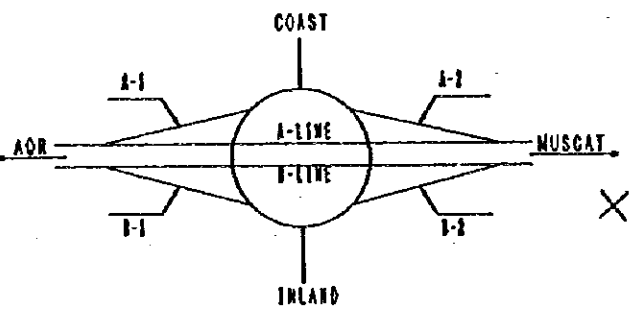
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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	TITLE: RA/11 SOHAR SETTING OUT DETAILS (1/2)
DATE:	DWONO. R-3



POINT No.	EASTING	NORTHING	POINT No.	EASTING
A38	2691642.021	473169.387	A48	2692141.85
A39	2691406.245	473324.659	A49	2692137.75
A40	2691775.675	473079.631	A50	2692090.28
A41	2692114.834	472681.272	A51	2692080.55
A42	2692100.505	472700.370	A52	2692059.94
A43	2691907.416	472962.545	A53	2692181.13
A44	2691846.850	473016.047	A54	2692137.01
A45	2692213.806	472623.158	A55	2692278.53
A46	2692207.844	472624.376	A56	2692254.45
A47	2692152.684	472656.397	A57	2692184.35

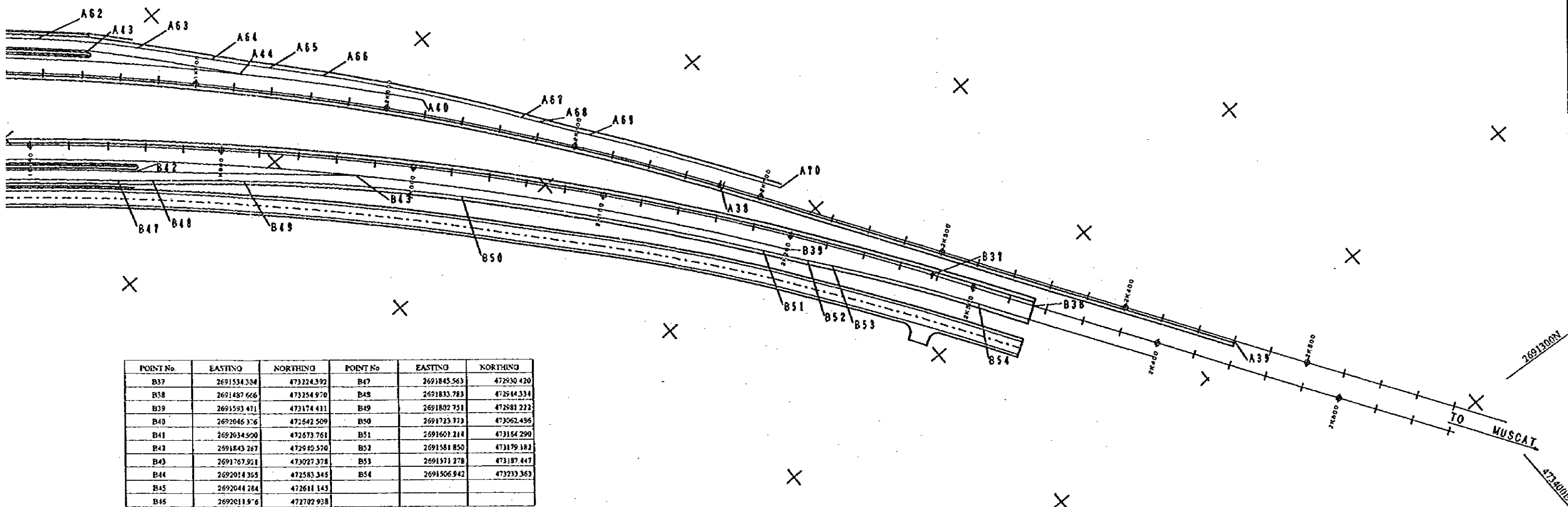
POINT No.	EASTING
B37	2691534.304
B38	2691487.666
B39	2691593.471
B40	2692045.376
B41	2692034.500
B42	2691843.267
B43	2691767.921
B44	2692014.345
B45	2692044.284
B45	2692011.926



NOTES:  
 (1) FINAL CONTROL COORDINATES, WGS84 DATUM, ZONE 48 UTM, CM57.

PLAN S

EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
2691642.021	473169.387	A48	2692141.855	472667.390	A58	2692140.268	472685.344	A58	2691727.714	473118.690
2691406.245	473324.059	A49	2692137.791	472670.958	A59	2692080.027	472753.313	A59	2691705.579	473134.439
2691775.675	473079.631	A50	2692090.281	472727.915	A60	2692062.869	472778.204	A70	2691620.453	473192.499
2692114.884	472681.272	A51	2692082.555	472743.898	A51	2692025.660	472826.214			
2692100.505	472700.570	A52	2692075.942	472716.285	A62	2691928.711	472946.680			
2691907.416	472952.545	A53	2692181.135	472644.687	A53	2691891.765	472983.704			
2691846.650	473016.047	A54	2692137.012	472682.550	A54	2691862.143	473009.681			
2692213.806	472623.158	A55	2692279.532	472654.039	A55	2691838.970	473030.056			
2692207.844	472624.176	A56	2692254.459	472614.878	A56	2691818.384	473048.362			
2692152.684	472656.397	A57	2692184.391	472649.491	A57	2691735.239	473113.432			

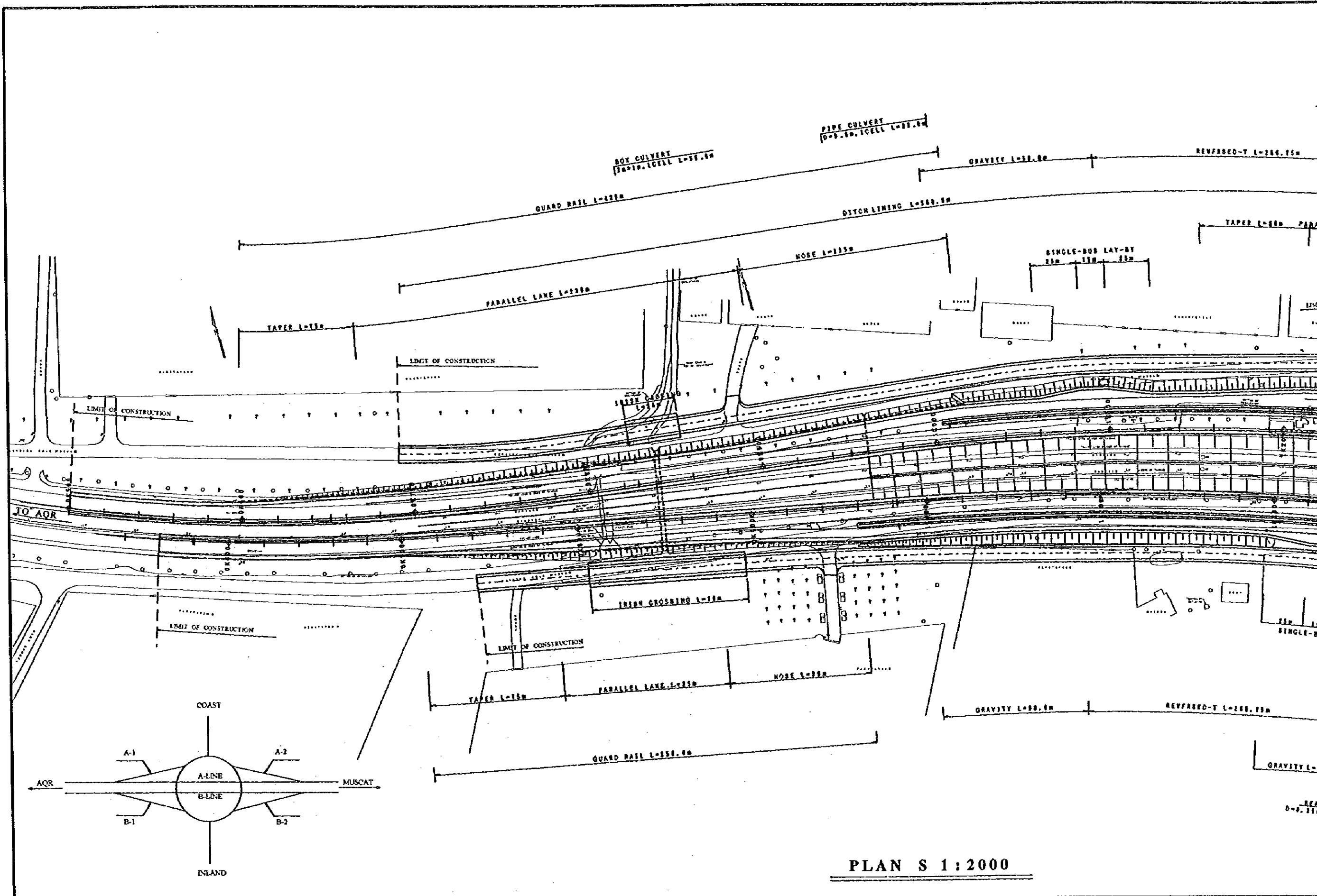


POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
B37	2691534.304	473224.392	B47	2691845.563	472930.420
B38	2691487.666	473254.970	B48	2691833.783	472944.334
B39	2691593.411	473174.411	B49	2691802.751	472981.222
B40	2692046.376	472642.509	B50	2691723.713	473062.496
B41	2692034.900	472673.761	B51	2691601.214	473154.290
B42	2691843.267	472940.570	B52	2691581.850	473179.182
B43	2691767.921	473027.378	B53	2691571.278	473187.447
B44	2692014.365	472583.345	B54	2691506.942	473233.363
B45	2692044.284	472611.143			
B46	2692011.976	472702.938			

PLAN S=1:2000

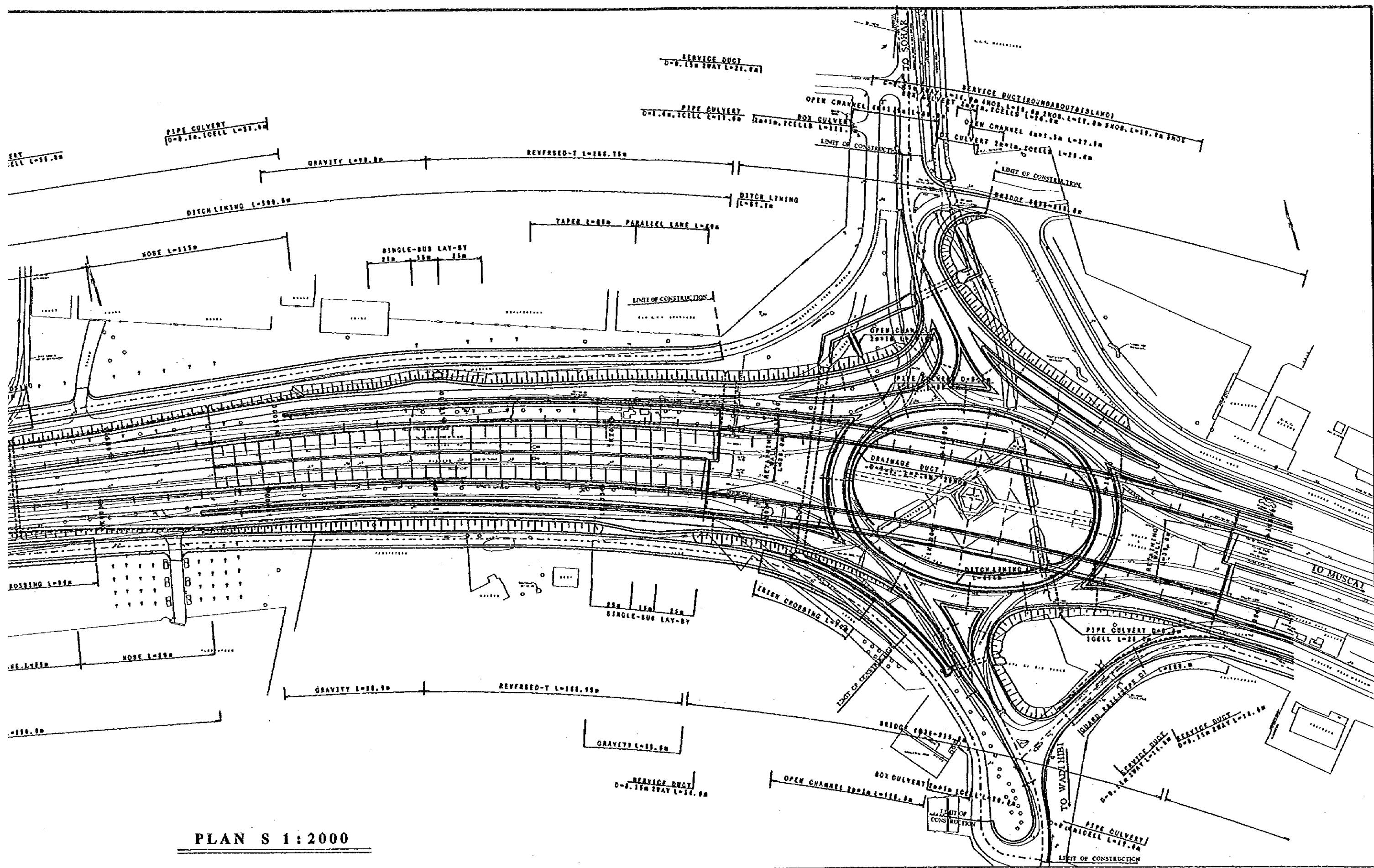
JAPAN INTERNATIONAL COOPERATION AGENCY  
(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/12 SOHAR SETTING OUT DETAILS (1/2)  
DATE: \_\_\_\_\_ DWGNO. R-4



PLAN S 1:2000

NOTES:

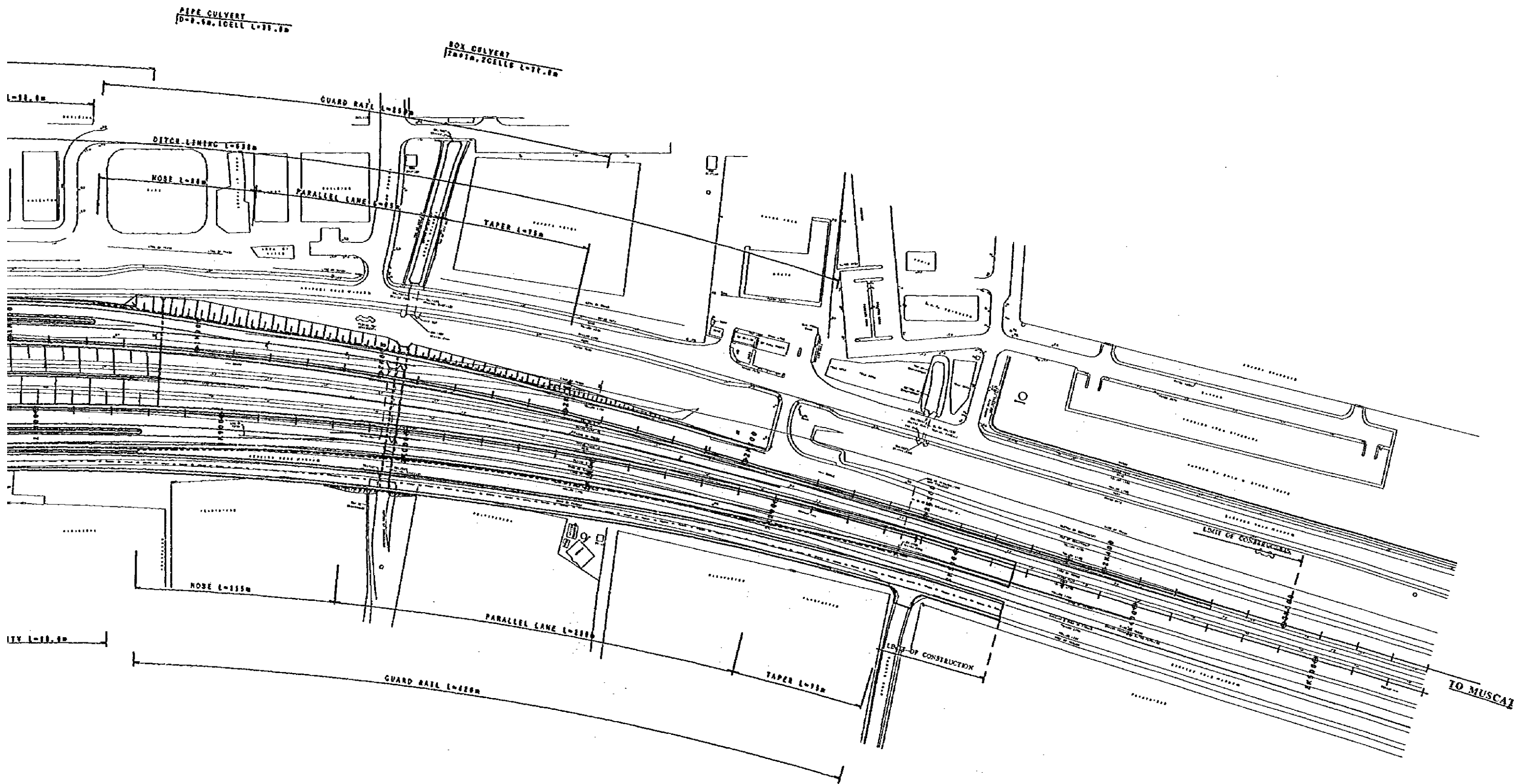


PLAN S 1:2000

	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
		TITLE RA/12 SOHAR PLAN(1/2)	DATE

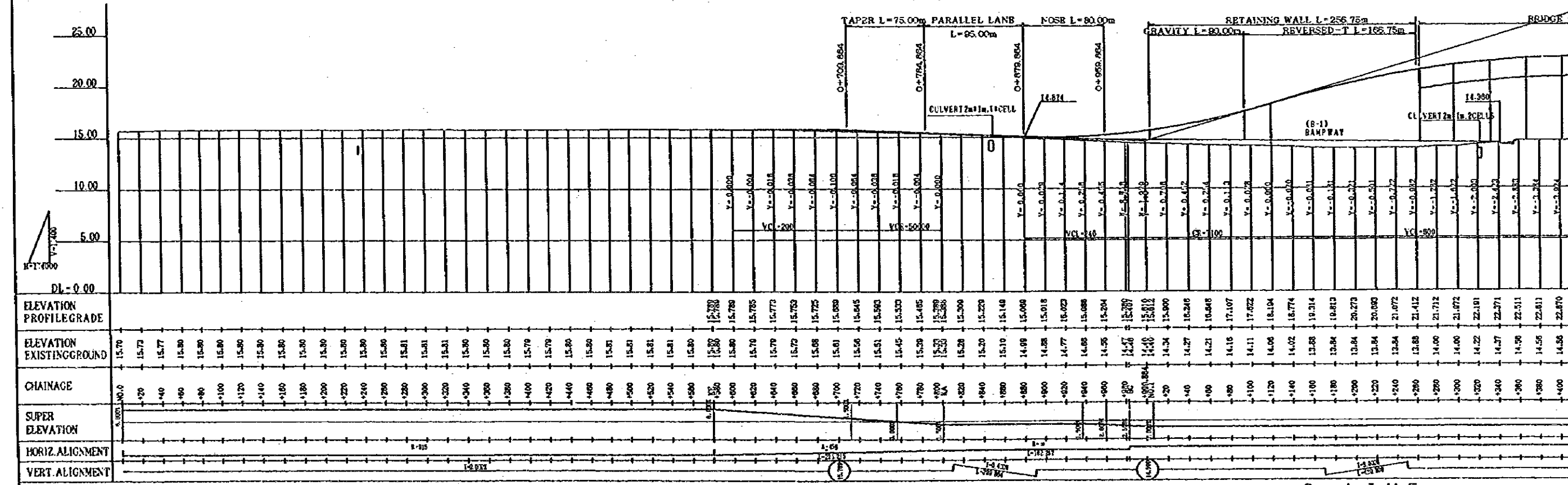
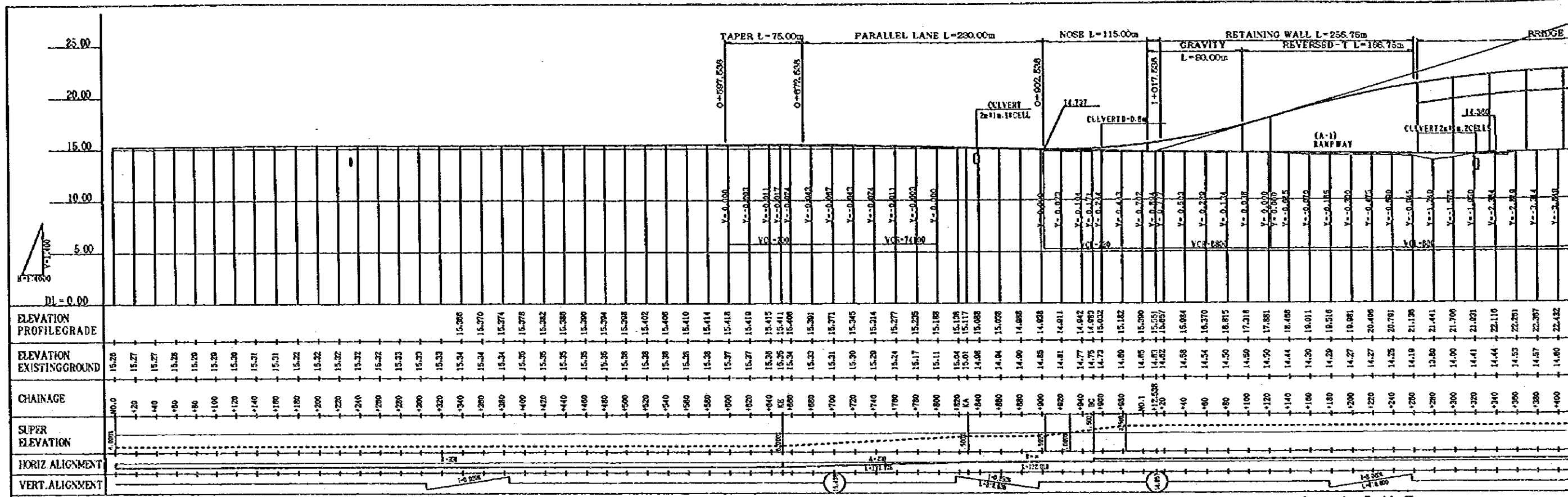




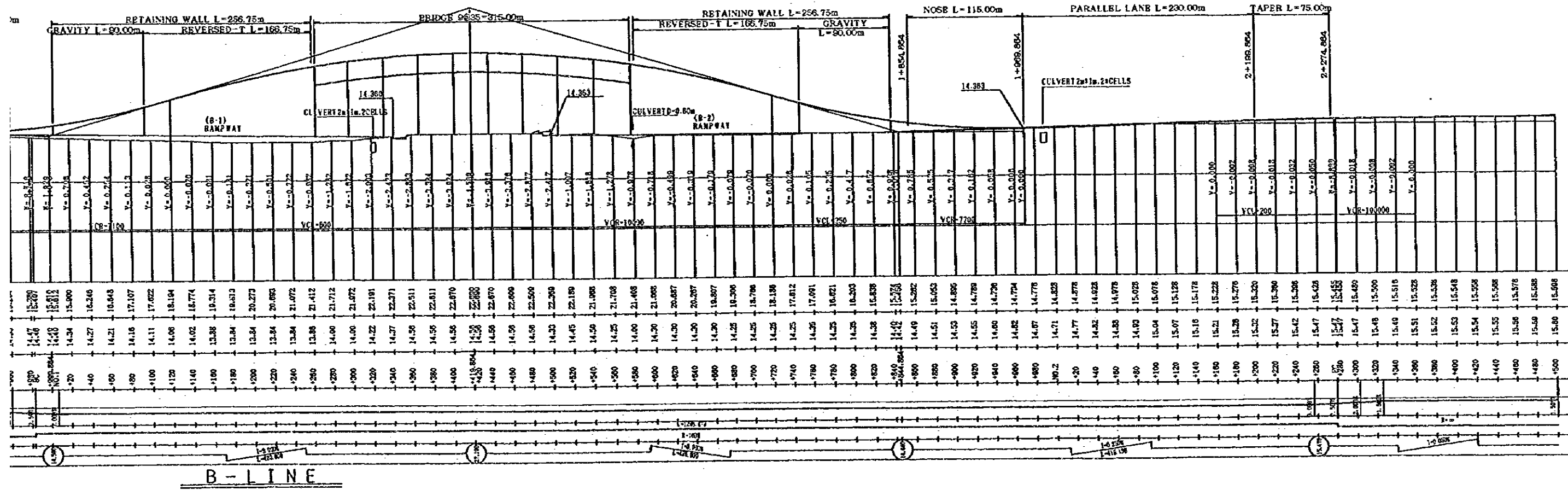
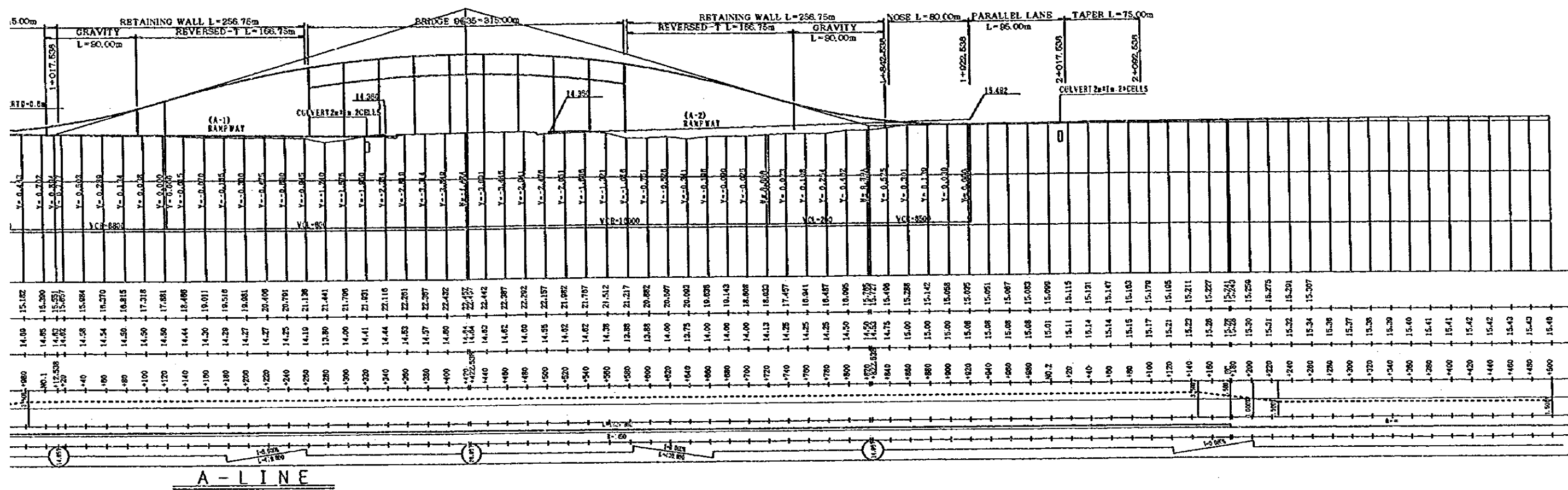


**PLAN S 1:2000**

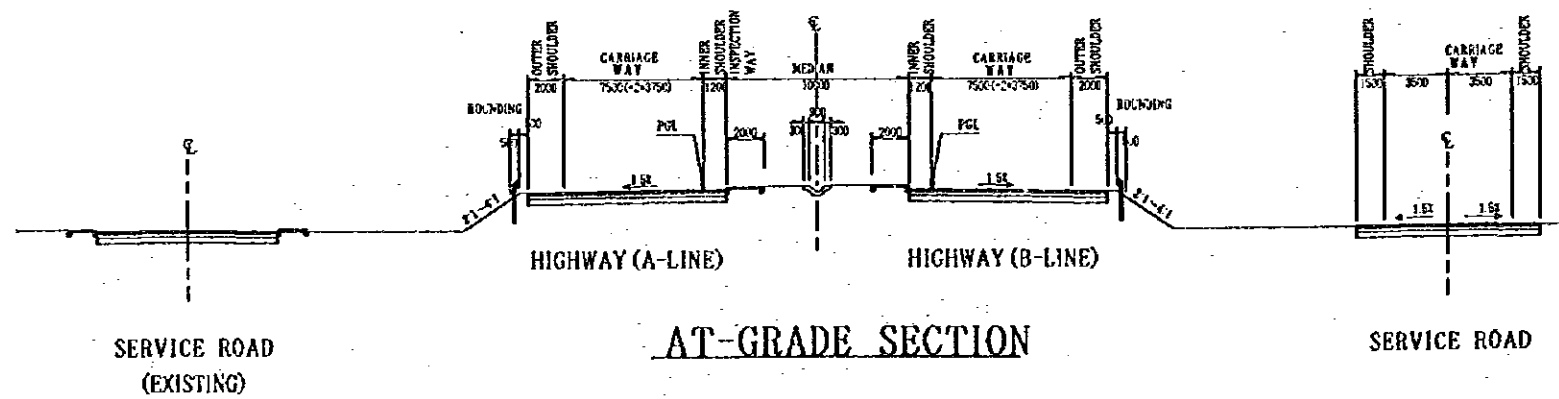
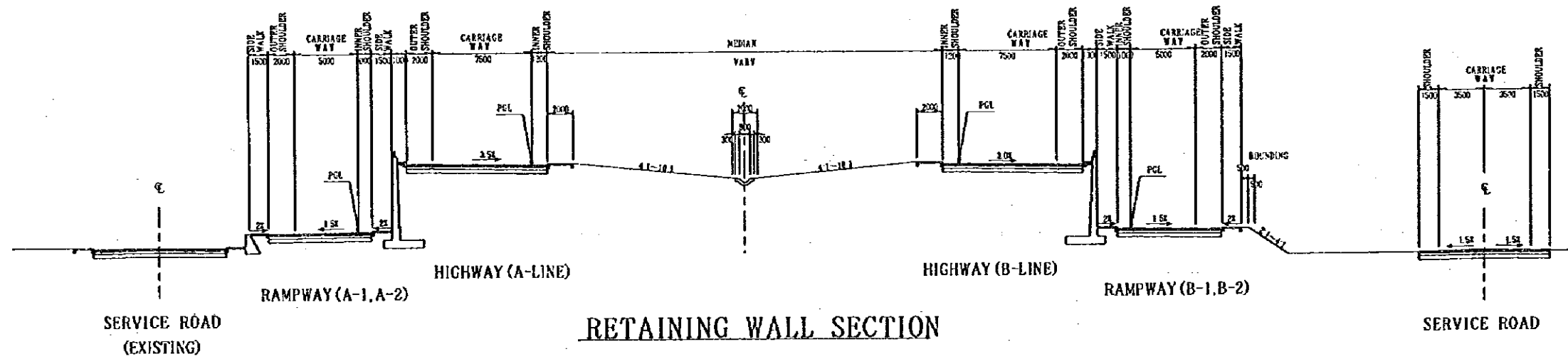
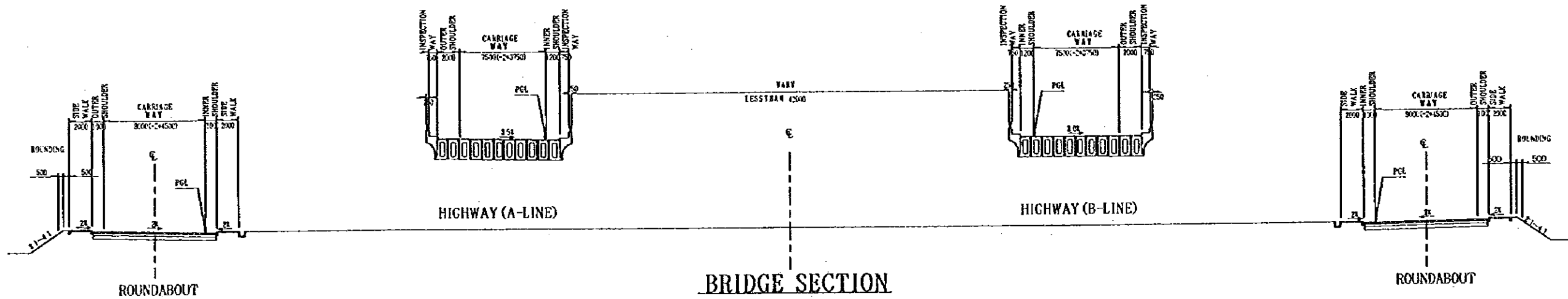
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/12 SOHAR PLAN (1/2)	DATE:
DWGNO. R-6	



NOTES:



JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
		TITLE: RA/12 SOHAR PROFILE-HIGHWAY	
		DATE	DWGNO. R-7

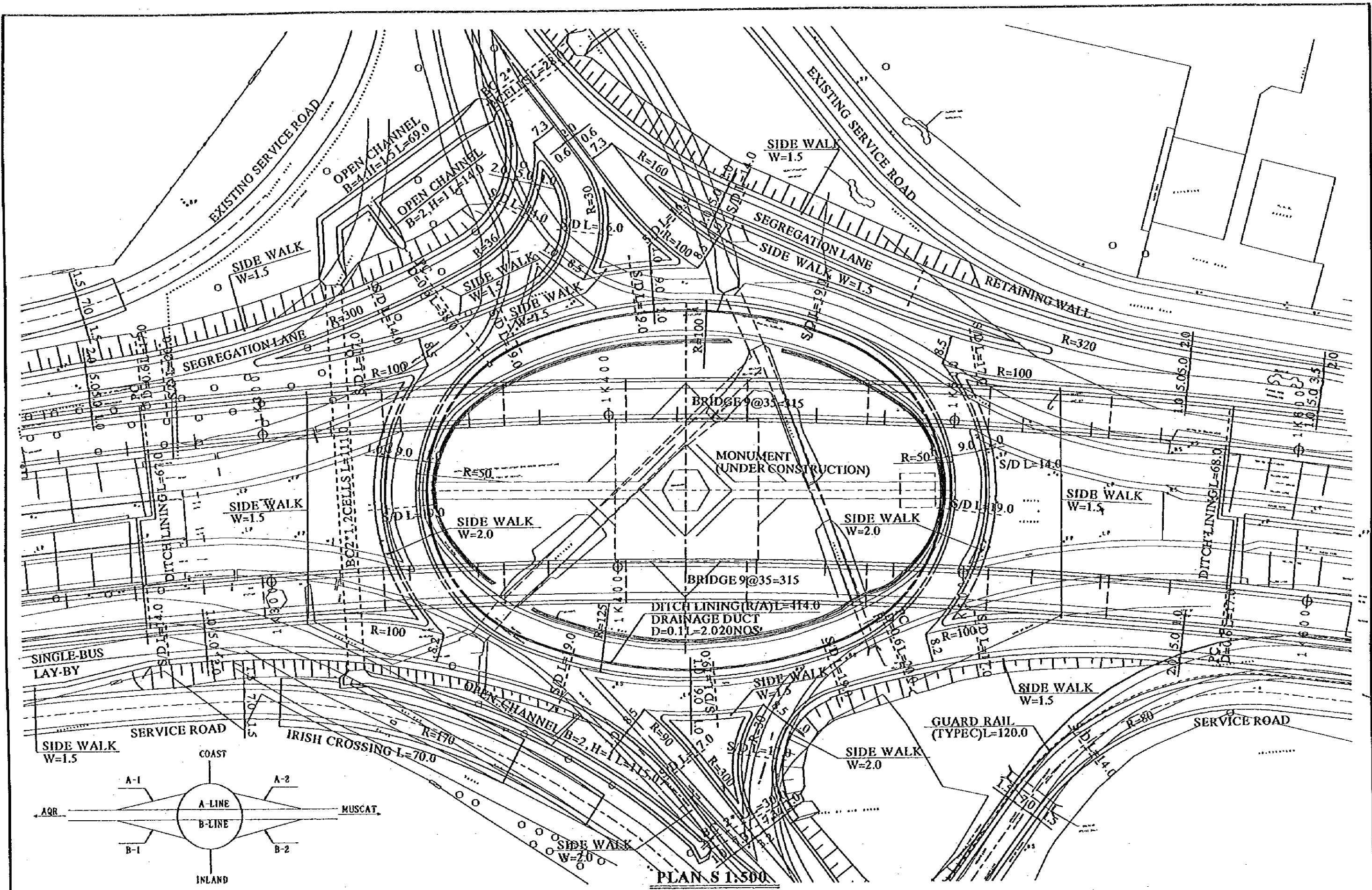


NOTES:

- (1) SCALE 1:400
- (2) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
- (3) THE TRANSITIONAL STRETCH FOR WIDTH AND CROSS FALL ADJUSTMENT SHOULD BE PROVIDED AT THE BEGINING AND THE END.

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PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

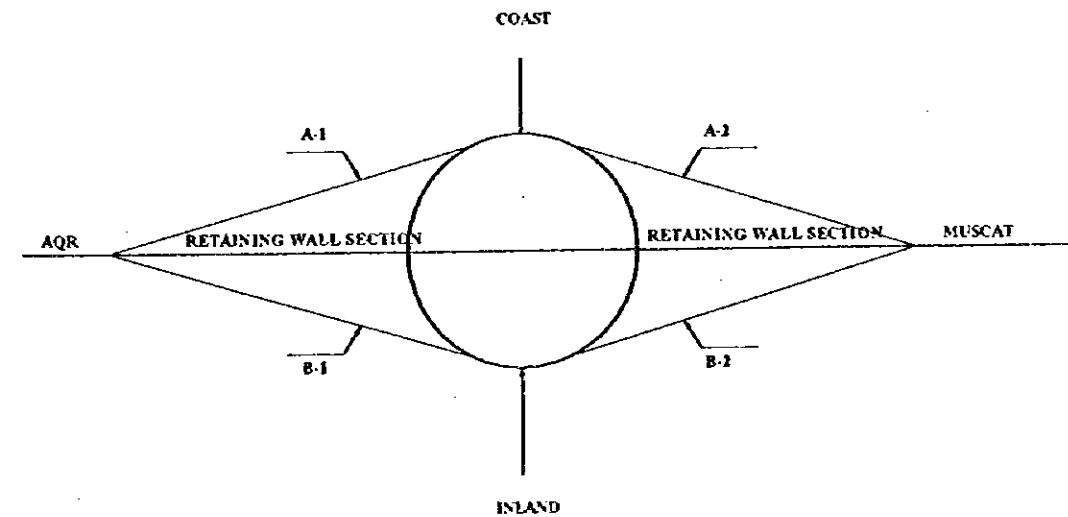
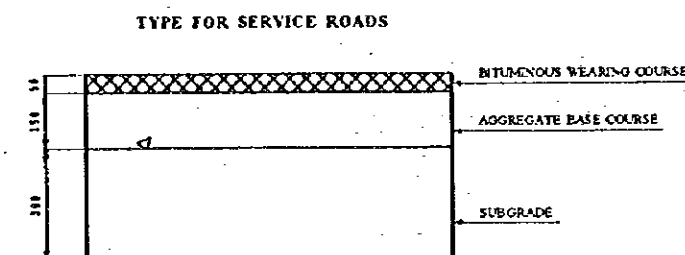
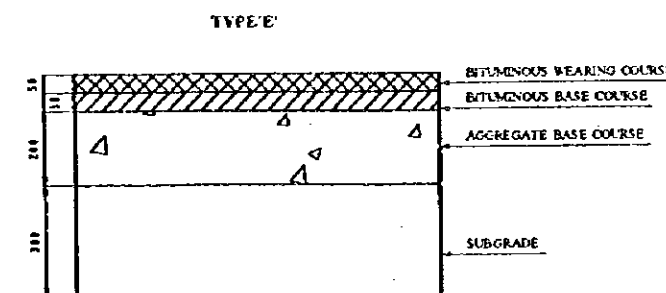
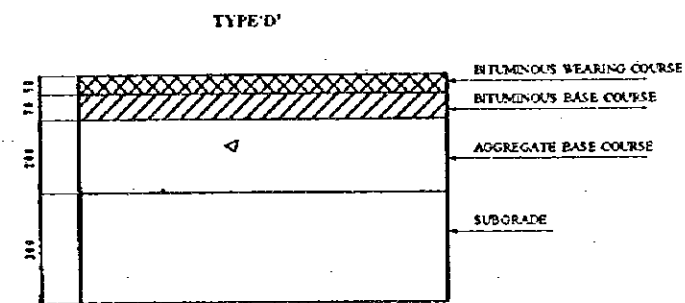
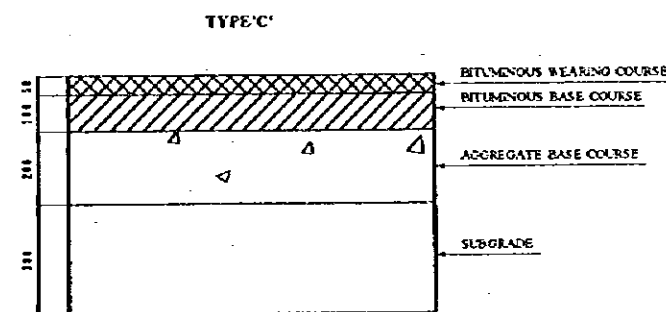
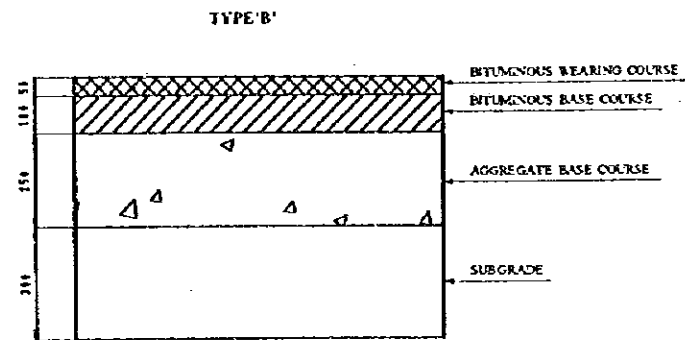
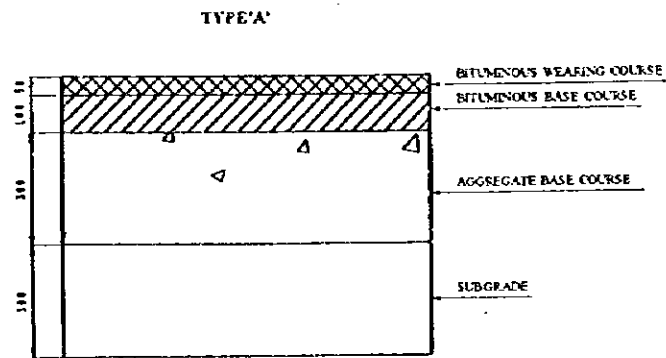
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/12 SOHAR TYPICAL CROSS SECTION  
DATE: DWG NO.: R-8



PLAN S 1:500

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
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	TITLE: RA/12 SOHAR DETAILED PLAN
	DATE: _____ DWG NO.: R-9



**CLASSIFICATION OF PAVEMENT STRUCTURE**

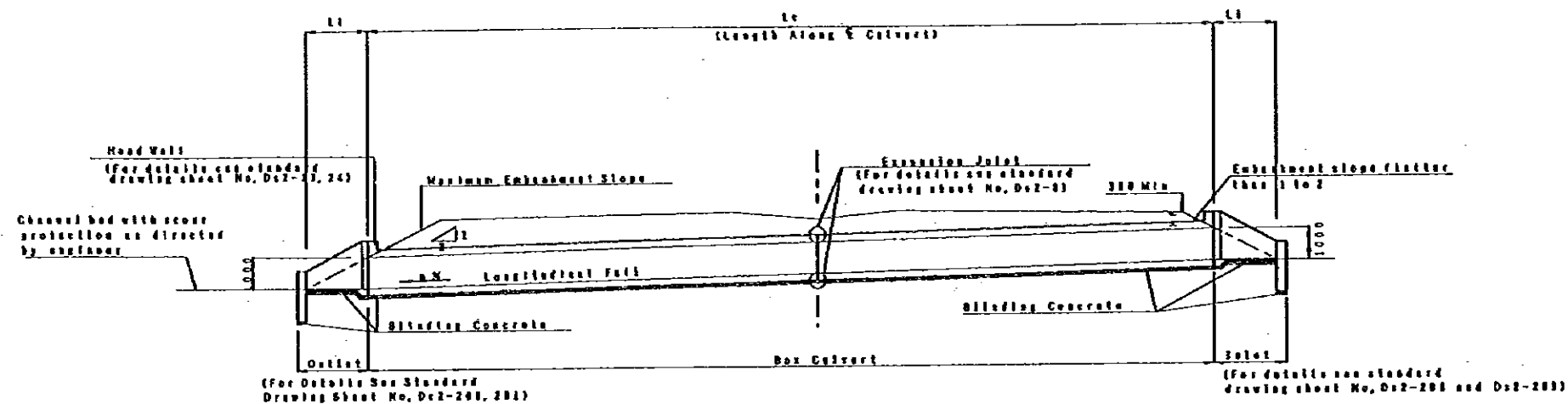
HIGHWAY		RETAINING WALL	ROUNDABOUT	RAMPWAY				CROSSROAD	
AT-GRADE	MUSCAT			A-1	B-1	A-2	B-2	INLAND	COAST
B	B	C	A	B	B	B	B	B	A

**NOTES:**

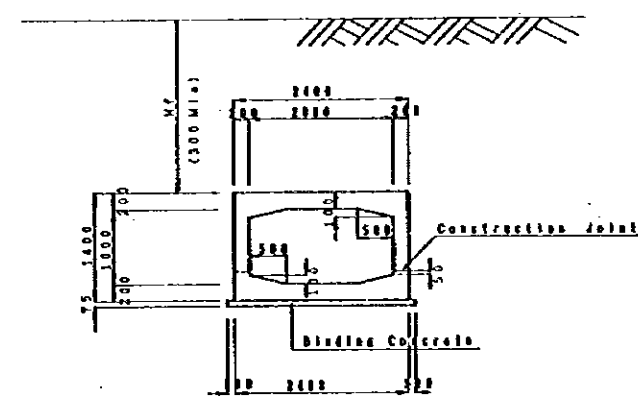
- (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
- (2) PRIME COATING PRECEDES BITUMINOUS WEARING COURSE AND TACK COATING PRECEDES BITUMINOUS BASE COURSE.

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FUKUYAMA CONSULTANTS INTERNATIONAL

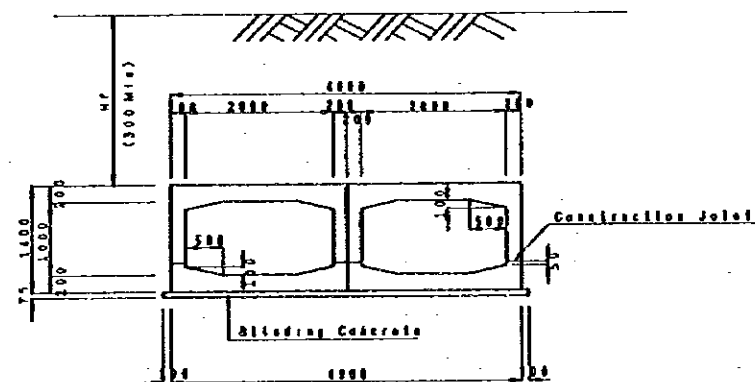
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/12 SOHAR PAVEMENT DETAILS  
DATE: \_\_\_\_\_ DWG NO.: R-10



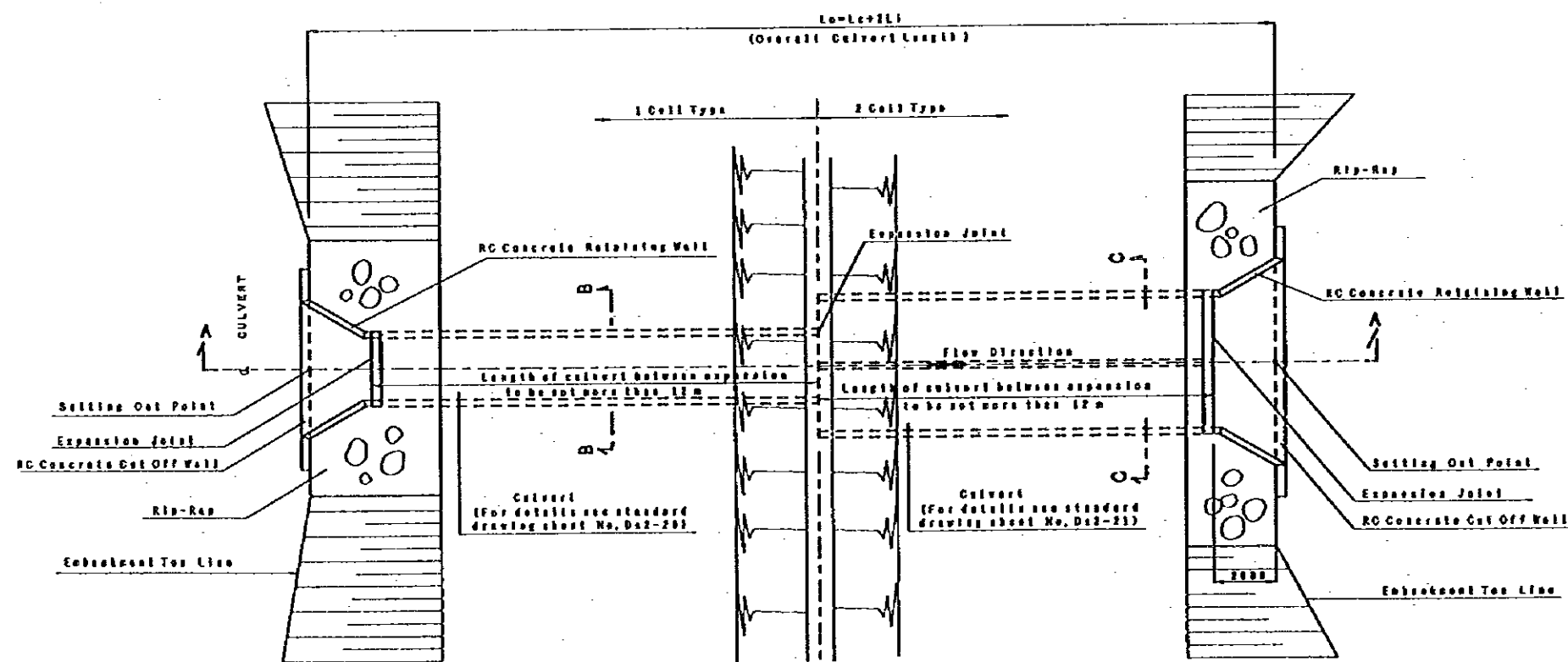
SECTION A - A



SECTION B - B



SECTION C - C



PLAN

LIST OF BOX CULVERT

STA	A or B LINE	DIMENSION (m)	LONGITUDINAL FALL: %	LENGTH (m)	REMARK
OK847	A	2.0x1.0x1CELL	0.30%	56.0	New Construction
OK849	B	2.0x1.0x1CELL	0.30%	56.0	New Construction
1K323	A,B	2.0x1.0x2CELL	0.35%	110.0	New Construction
SEASIDE CROSSROAD	RA	2.0x1.0x2CELL	0.35%	28.0	New Construction
SEASIDE SERVICEROAD	RA	2.0x1.0x2CELL	0.35%	26.0	New Construction
INLAND CROSSROAD	RA	2.0x1.0x1CELL	0.35%	30.0	New Construction
2K010	A	2.0x1.0x1CELL	0.35%	30.0	New Construction
1K992	B	2.0x1.0x2CELL	0.70%	77.0	New Construction

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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CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

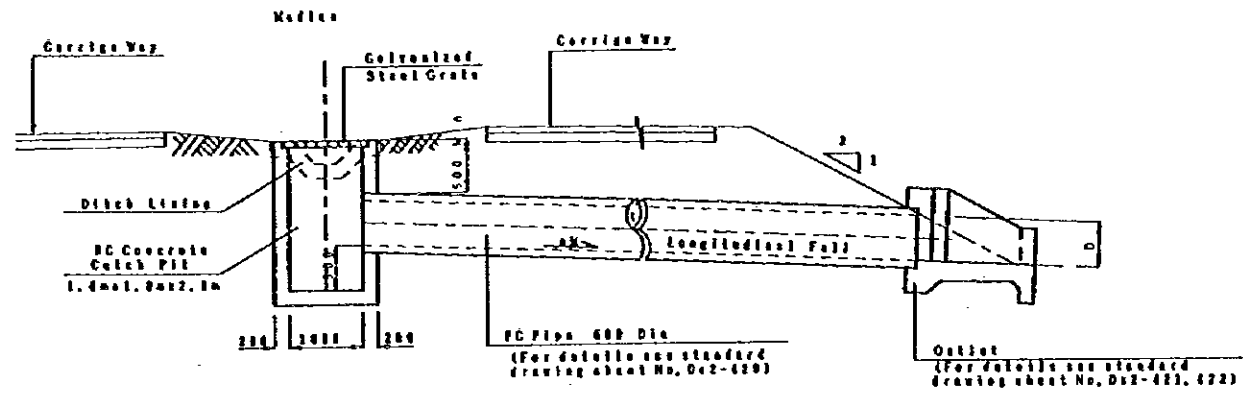
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

TITLE: RA/12 SOHAR DRAINAGE STRUCTURE (1/3)

DATE:

DWG NO.: R-11

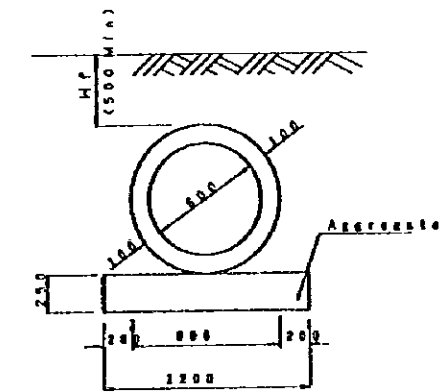




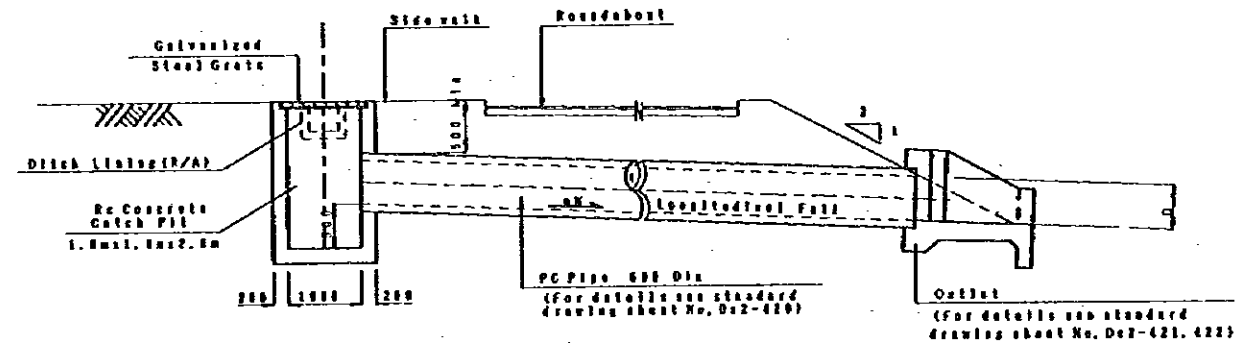
SECTION  
DRAIN SYSTEM OF MEDIAN

**LIST OF DRAIN SYSTEM AT MEDIAN**

STA	LINE	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL (%)	LENGTH (m)	REMARK
0K960	A	φ0.60x1CELL	M	0.3%	33.0	
1K550	A	φ0.60x1CELL	M	0.3%	35.0	



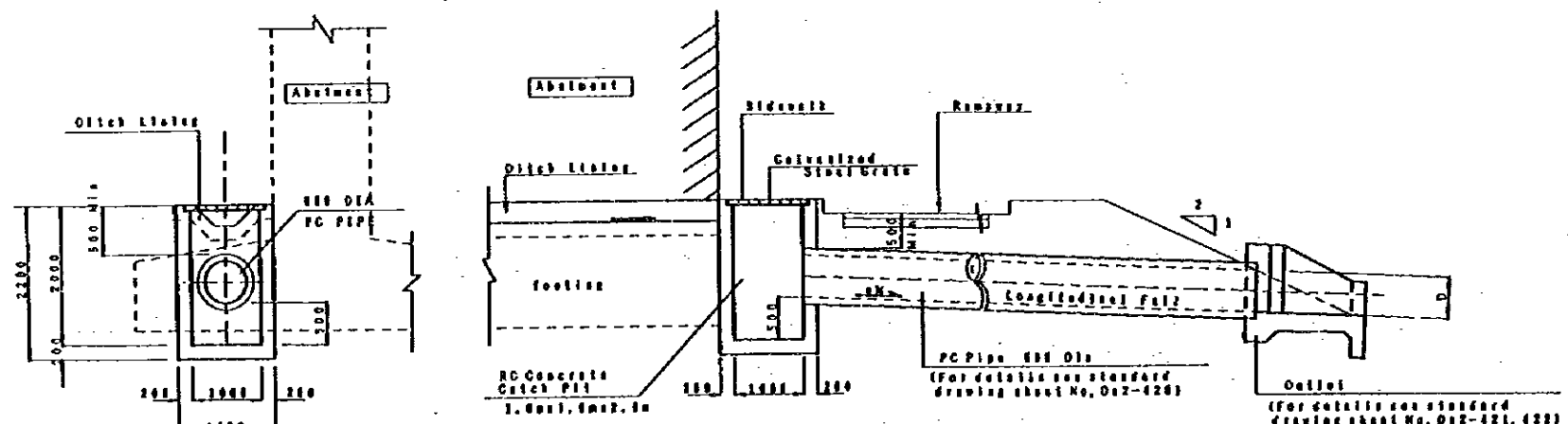
TYPICAL CROSS SECTION



SECTION  
DRAIN SYSTEM OF ROUNDABOUT

**LIST OF DRAIN SYSTEM AT ROUNDABOUT**

STA	LINE	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL (%)	LENGTH (m)	REMARK
1K370	A	φ0.60x1CELL	M	0.3%	38.0	
1K475	A	φ0.60x1CELL	M	0.3%	20.0	



SECTION (1)  
SECTION (2)  
DRAIN SYSTEM IN FRONT OF ABUTMENT

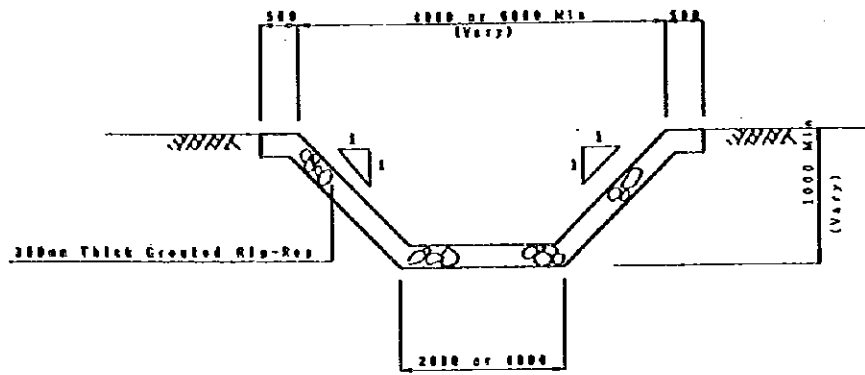
**LIST OF DRAIN SYSTEM IN FRONT OF ABUTMENT**

STA	LINE	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL (%)	LENGTH (m)	REMARK
1K268(A1)	A	φ0.60x1CELL	M	0.3%	17.0	
1K576(A2)	B	φ0.60x1CELL	M	0.3%	11.0	

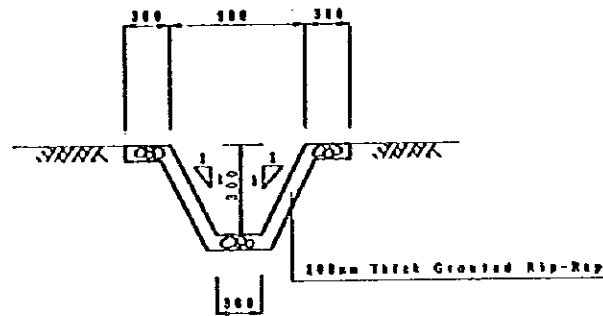
NOTES:  
 (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.  
 (2) D; INTERNAL DIAMETER OF THE PIPE.  
 (3) H; HEIGHT OF FILL FROM ABOVE THE PIPE TO THE TOP OF PAVEMENT.

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 PACIFIC CONSULTANTS INTERNATIONAL  
 FUKUYAMA CONSULTANTS INTERNATIONAL

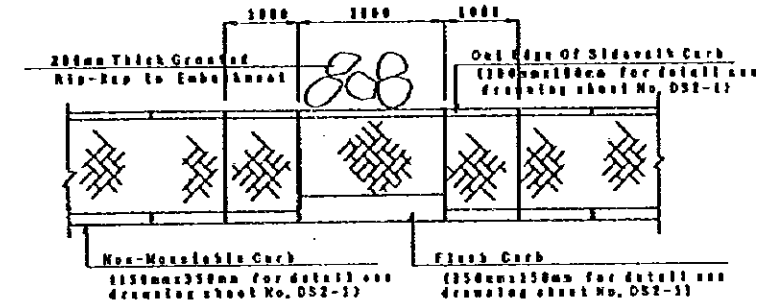
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
 PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
 TITLE: RA/12 SOHAR DRAINAGE STRUCTURE (2/3)  
 DATE: \_\_\_\_\_ DWG NO.: R-12



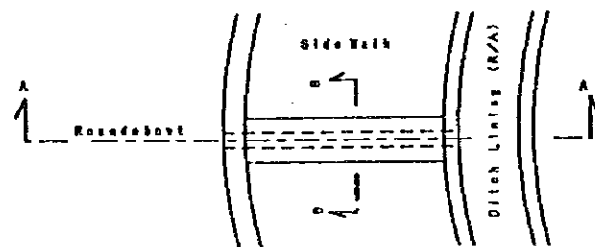
OPEN CHANNEL



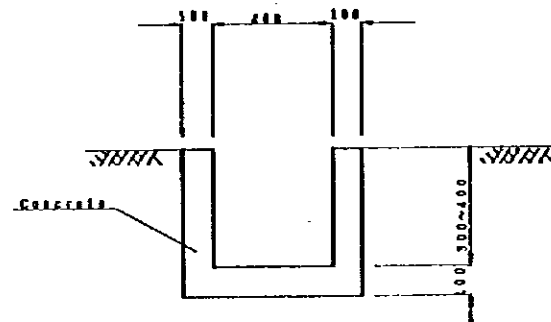
DITCH LINING



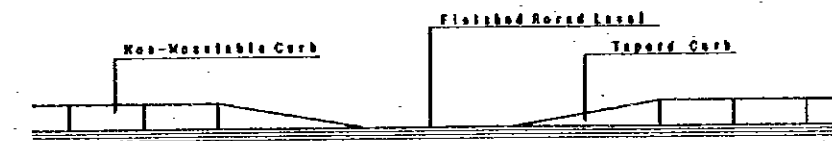
P L A N



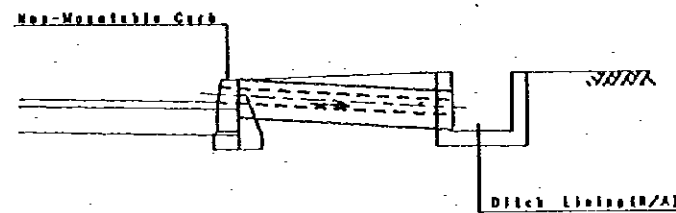
P L A N



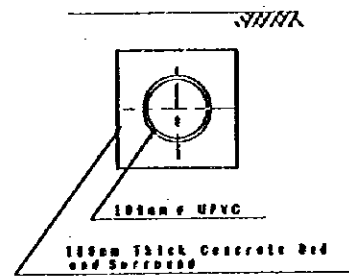
DITCH LINING (R/A)



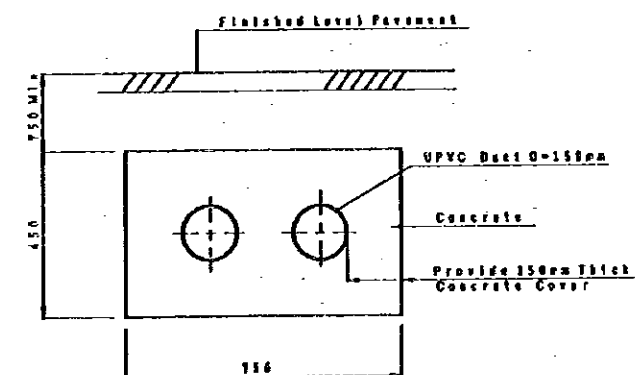
Elevation  
DROPPED SIDEWALK



SECTION A - A



SECTION B - B



SECTION  
SERVICE DUCTS

DRAIN SYSTEM AROUND ROUNDABOUT

NOTES:

- (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
- (2) THE LONGITUDINAL FALL OF OPEN CHANNEL IS 0.35% AND ITS WIDTH DEPENDS ON THE WIDTH OF THE ADJACENT BOX CULVERT.
- (3) THE DEPTH OF DITCH LINING BECOMES 400mm AT CATCH PIT.
- (4) THE UPVC OF 100mm IN DIAMETER IS INSTALLED AT AN INTERVAL OF ABOUT 20m.
- (5) THE DROPPED SIDEWALK IS INSTALLED ALONG RAMPWAYS, A LINE HIGHWAY AND THE BEGINNING SECTION OF BLINE AT AN INTERVAL OF 50m.

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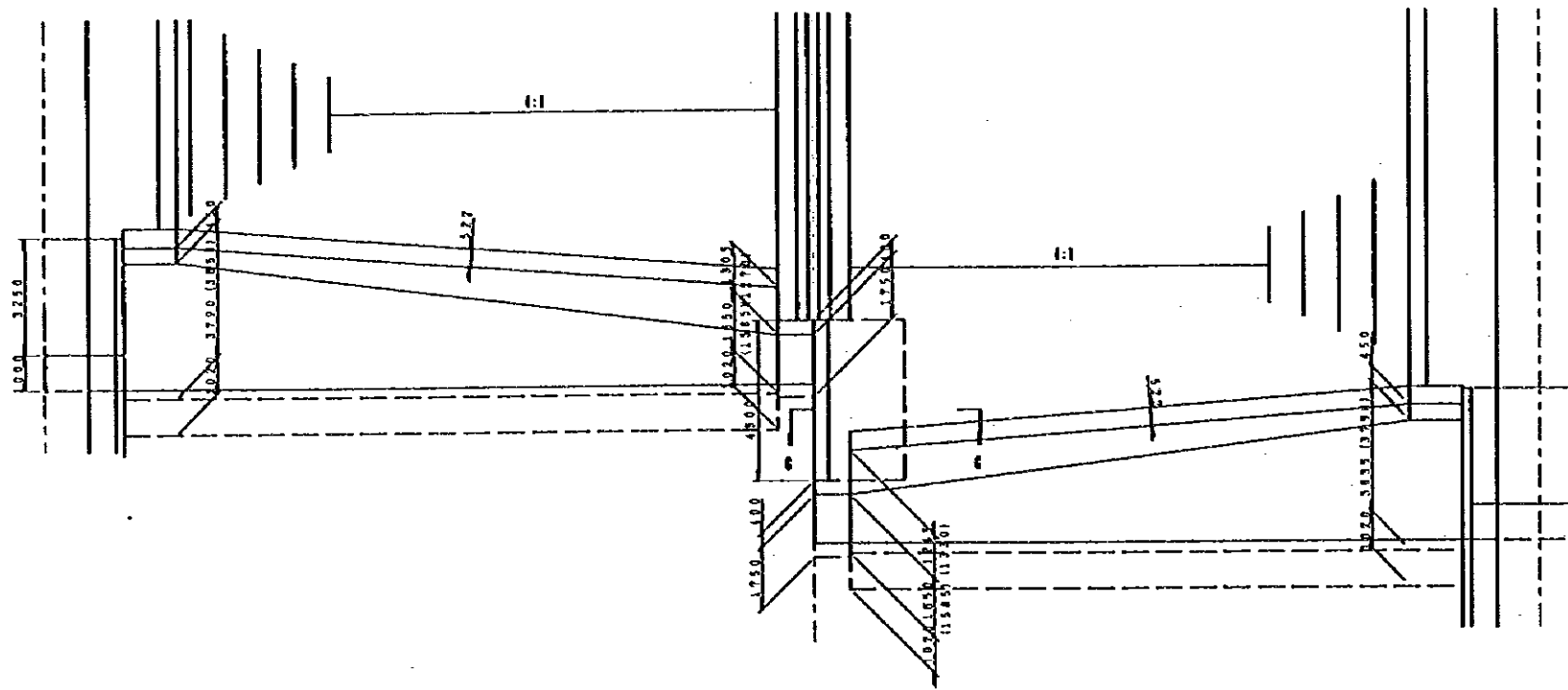
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

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

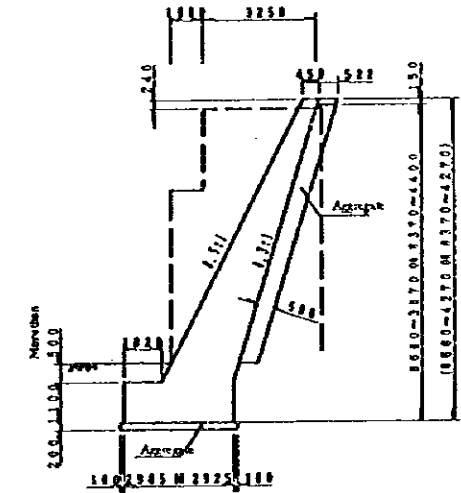
TITLE: RA/12 SOHAR DRAINAGE STRUCTURE (3/3) AND SERVICE DUCTS

DATE:

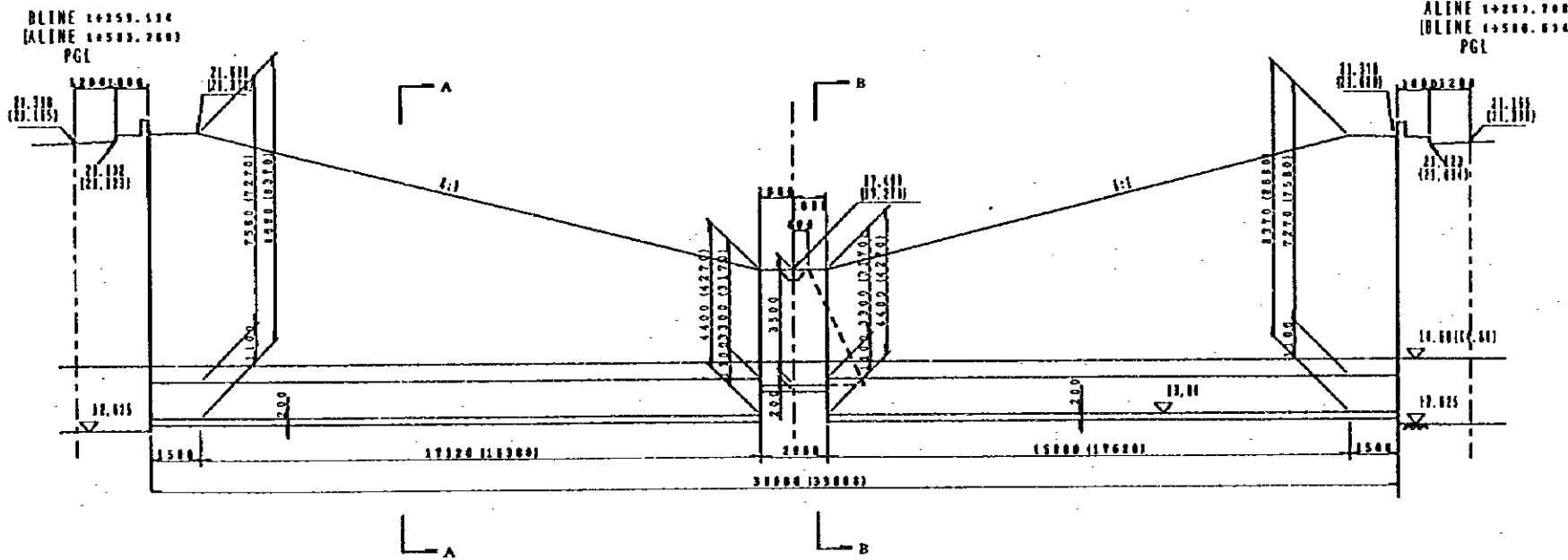
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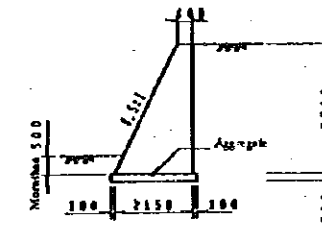
PLAN  
S=1:200



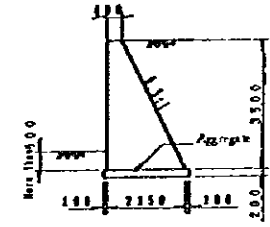
SECTION A-A  
S=1:200



FRONT VIEW  
S=1:200



SECTION B-B  
S=1:200



SECTION C-C  
S=1:200

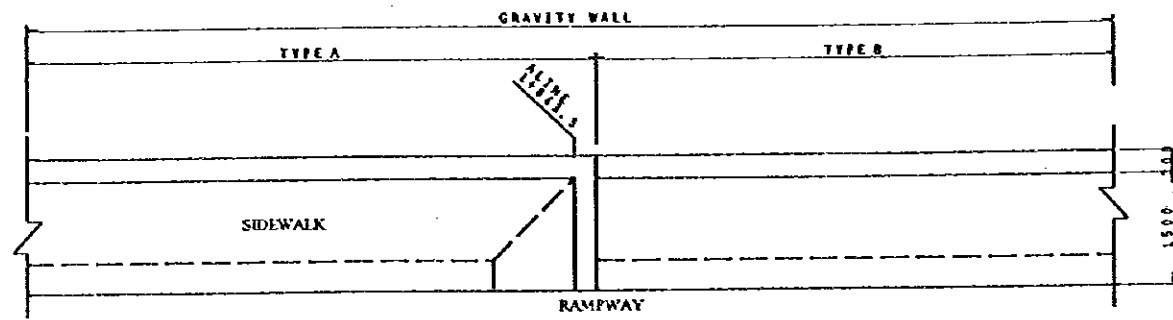
RETAINING WALL BETWEEN ABUTMENTS

NOTES:

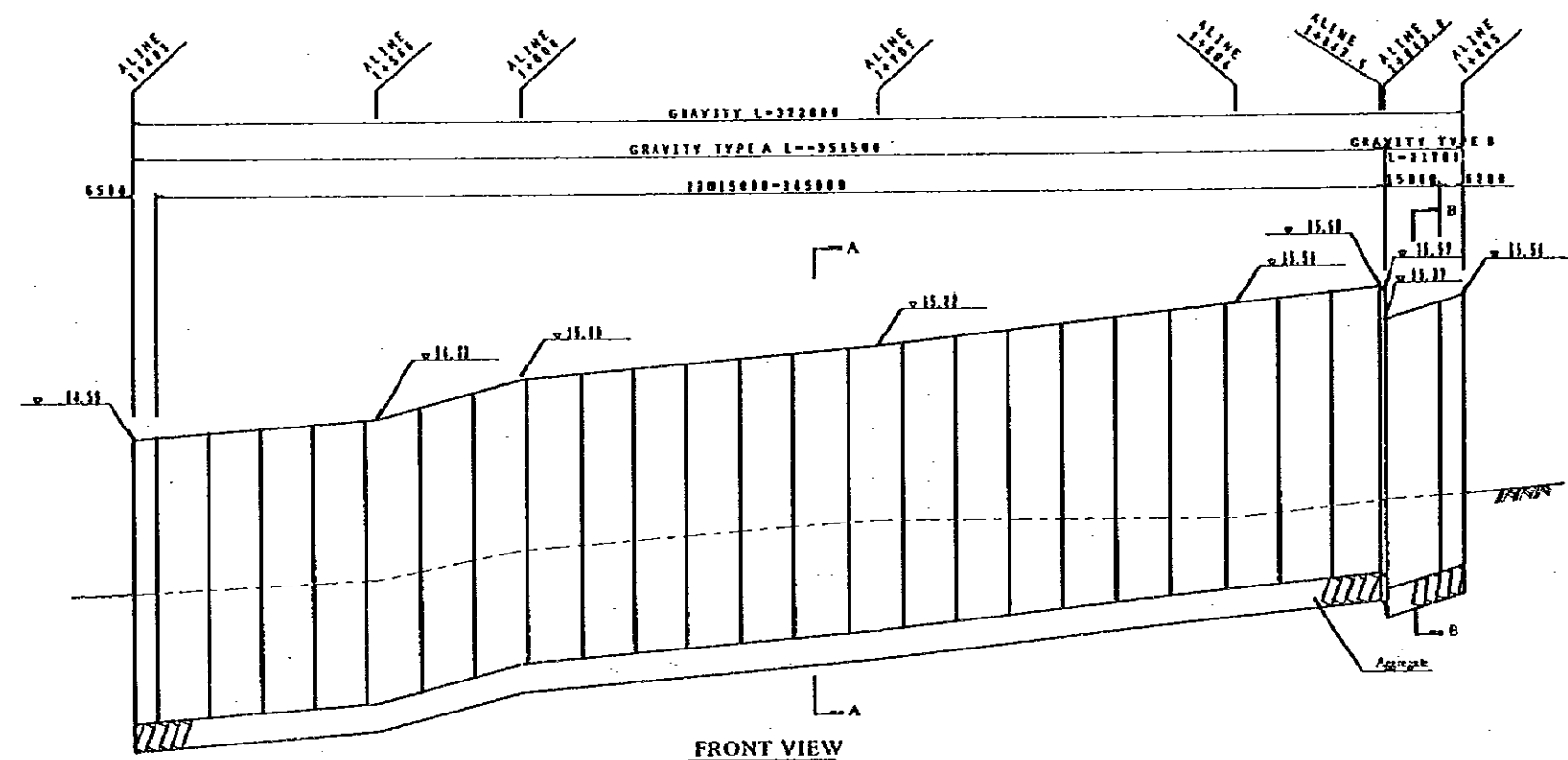
- (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
- (2) NUMBERS IN BRACKETS INDICATE DIMENSION OF RETAINING WALL AT MUSCAT SIDE.
- (3) JOINTS SHOULD BE PROVIDED AT AN INTERVALS OF 15m.

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(JICA)  
JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

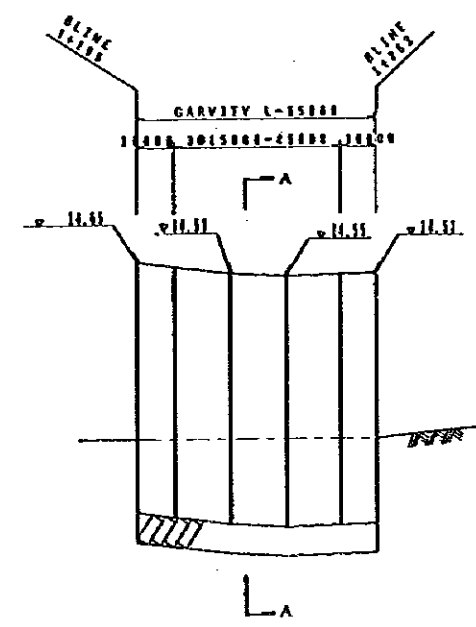
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/12 SOHAR RETAINING WALL (1/2)  
DATE: \_\_\_\_\_ DWG NO.: R-14



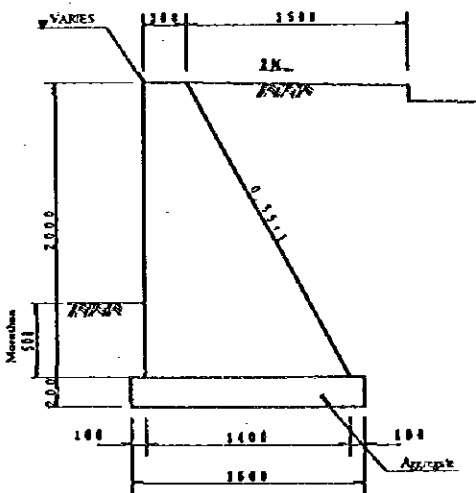
PLAN  
S=1:200



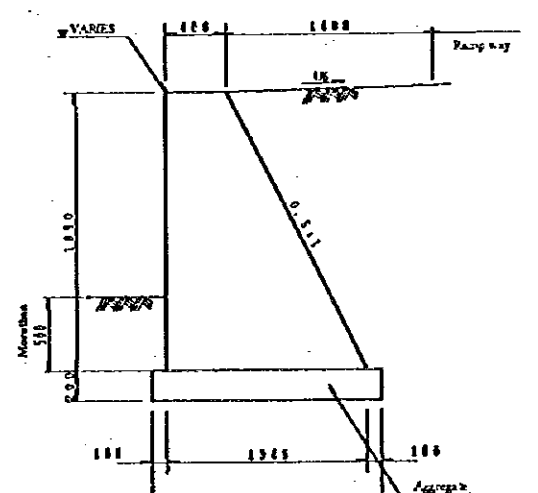
FRONT VIEW  
H=1:2000  
V=1:50



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

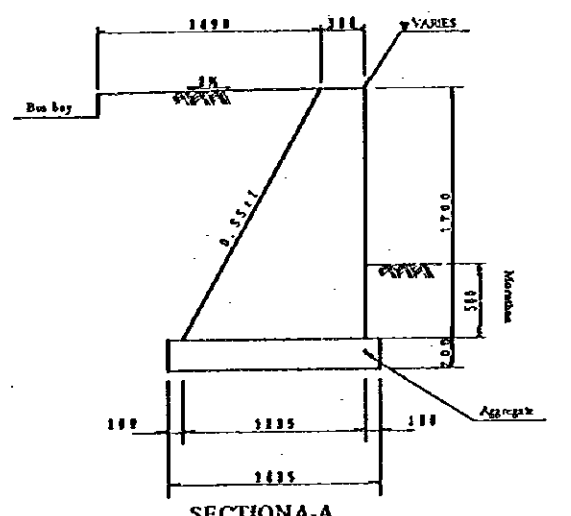


SECTION A-A  
S=1:50



SECTION B-B  
S=1:50

RETAINING WALL ALONG RAMPWAY (A-2)



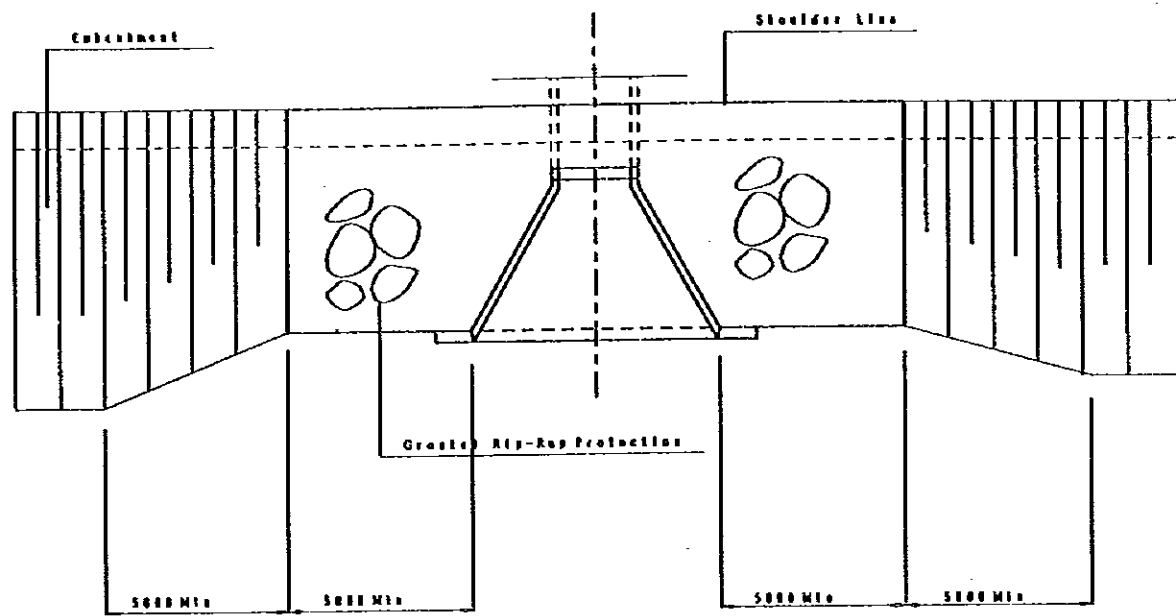
SECTION A-A  
S=1:50

RETAINING WALL ALONG RAMPWAY (B-1)

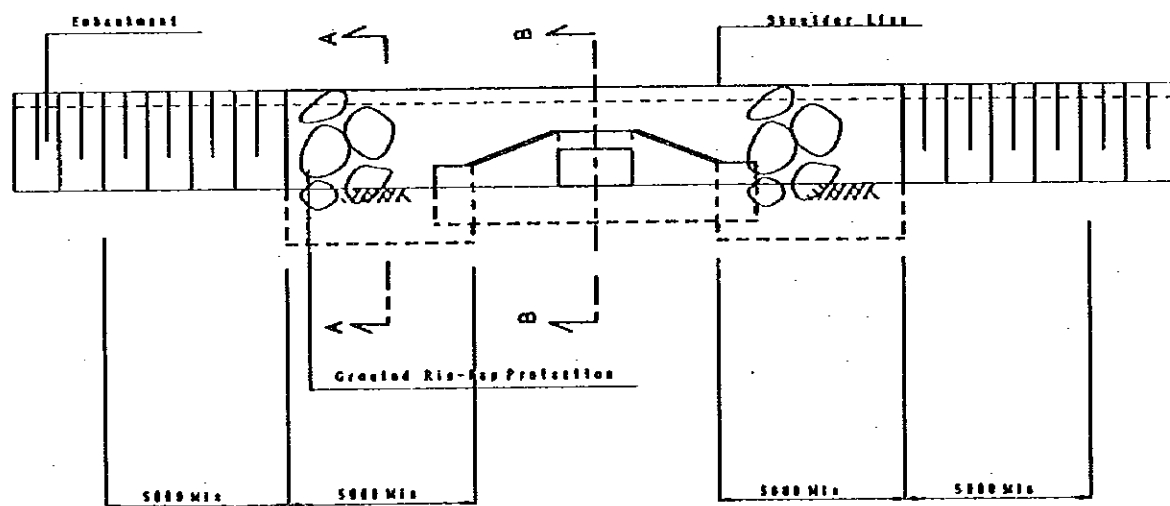
NOTES:  
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.  
(2) NUMBERS IN BRACKETS INDICATE DIMENSION OF RETAINING WALL AT MUSCAT SIDE.  
(3) JOINTS SHOULD BE PROVIDED AT AN INTERVALS OF 15m.

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FUKUYAMA CONSULTANTS INTERNATIONAL

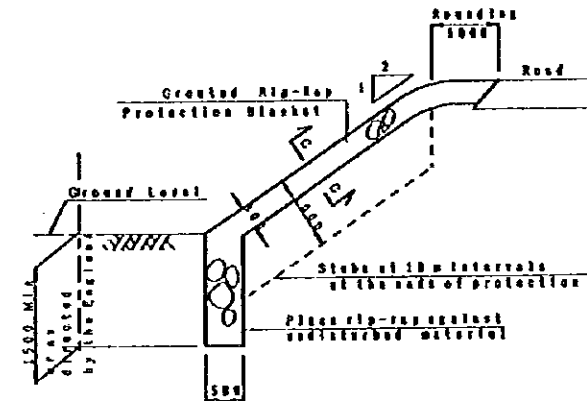
CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/12 SOHAR RETAINING WALL (2/2)  
DATE: \_\_\_\_\_ DWG NO. : R-15



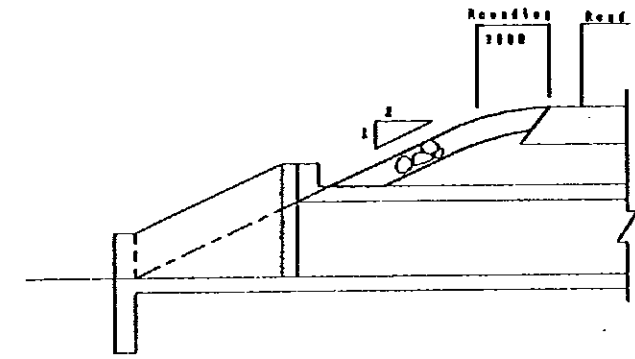
PLAN



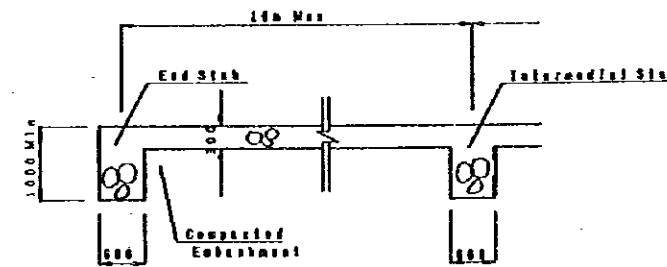
FRONT VIEW



SECTION A - A



SECTION B - B

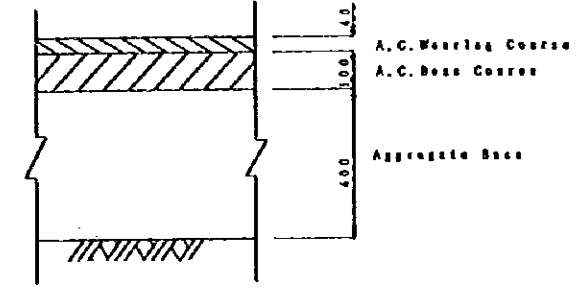
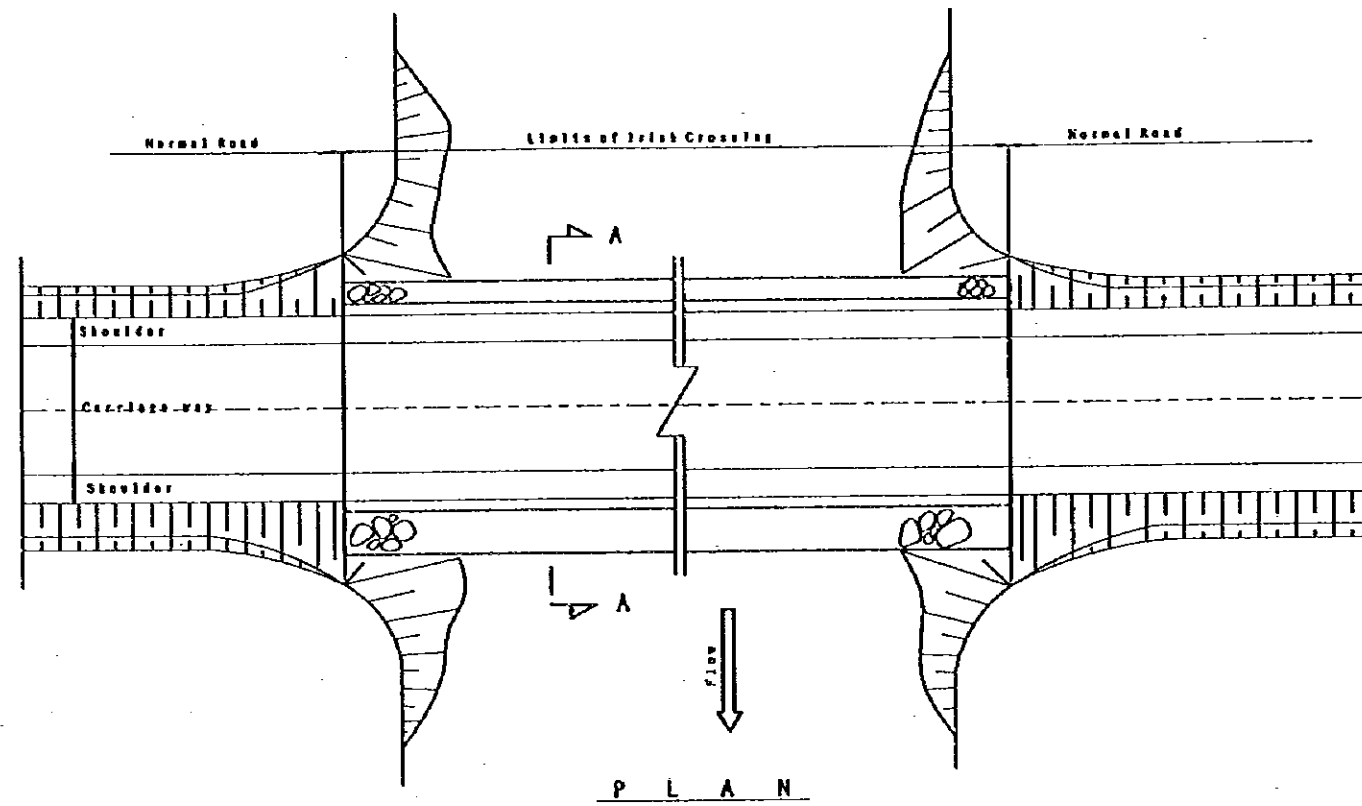


SECTION C - C

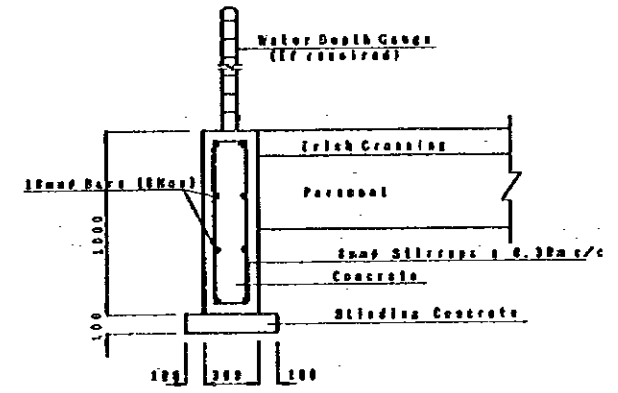
NOTES:  
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.

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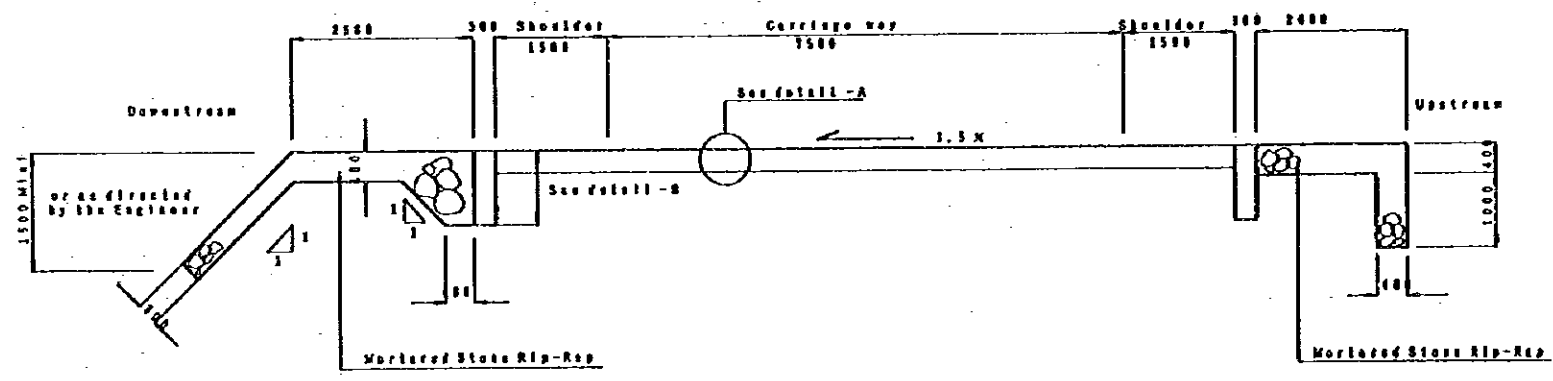
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/12 SOHAR SLOPE PROTECTION  
DATE: \_\_\_\_\_ DWG NO.: R-16



PAVEMENT  
(Detail-A)



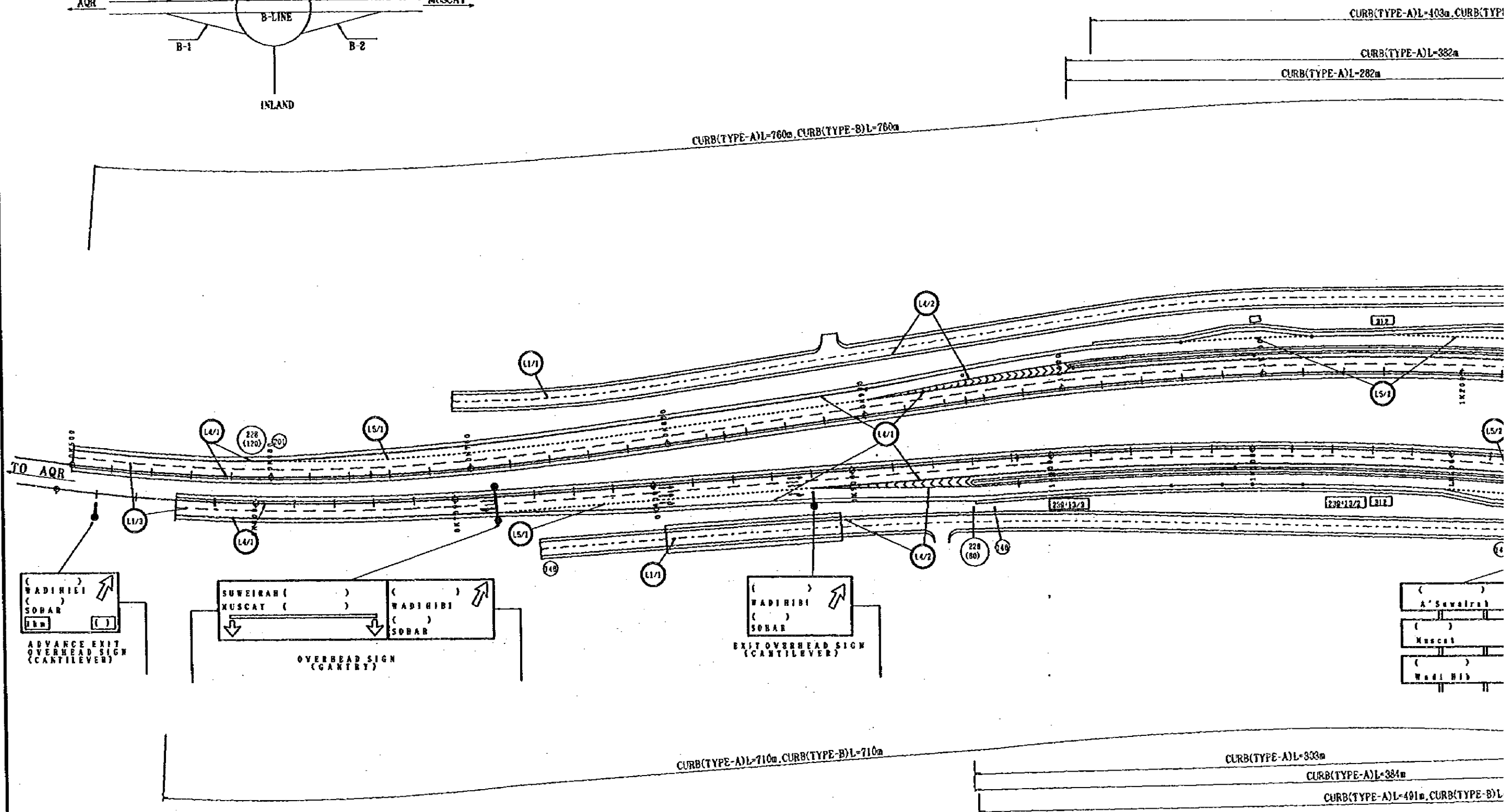
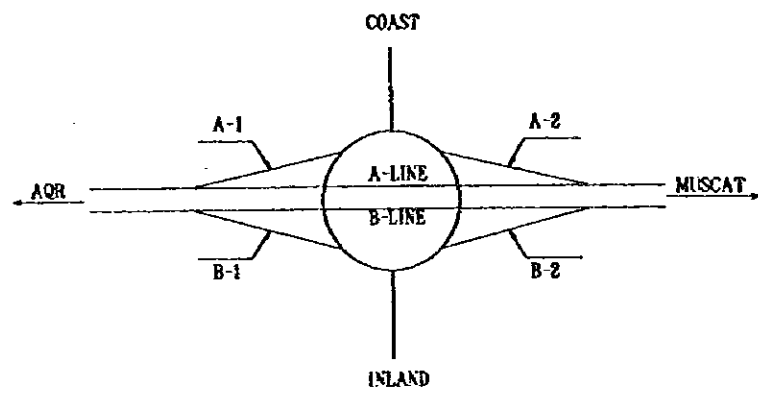
DETAIL OF GUT OFF WALL  
(Detail-B)



SECTION A - A

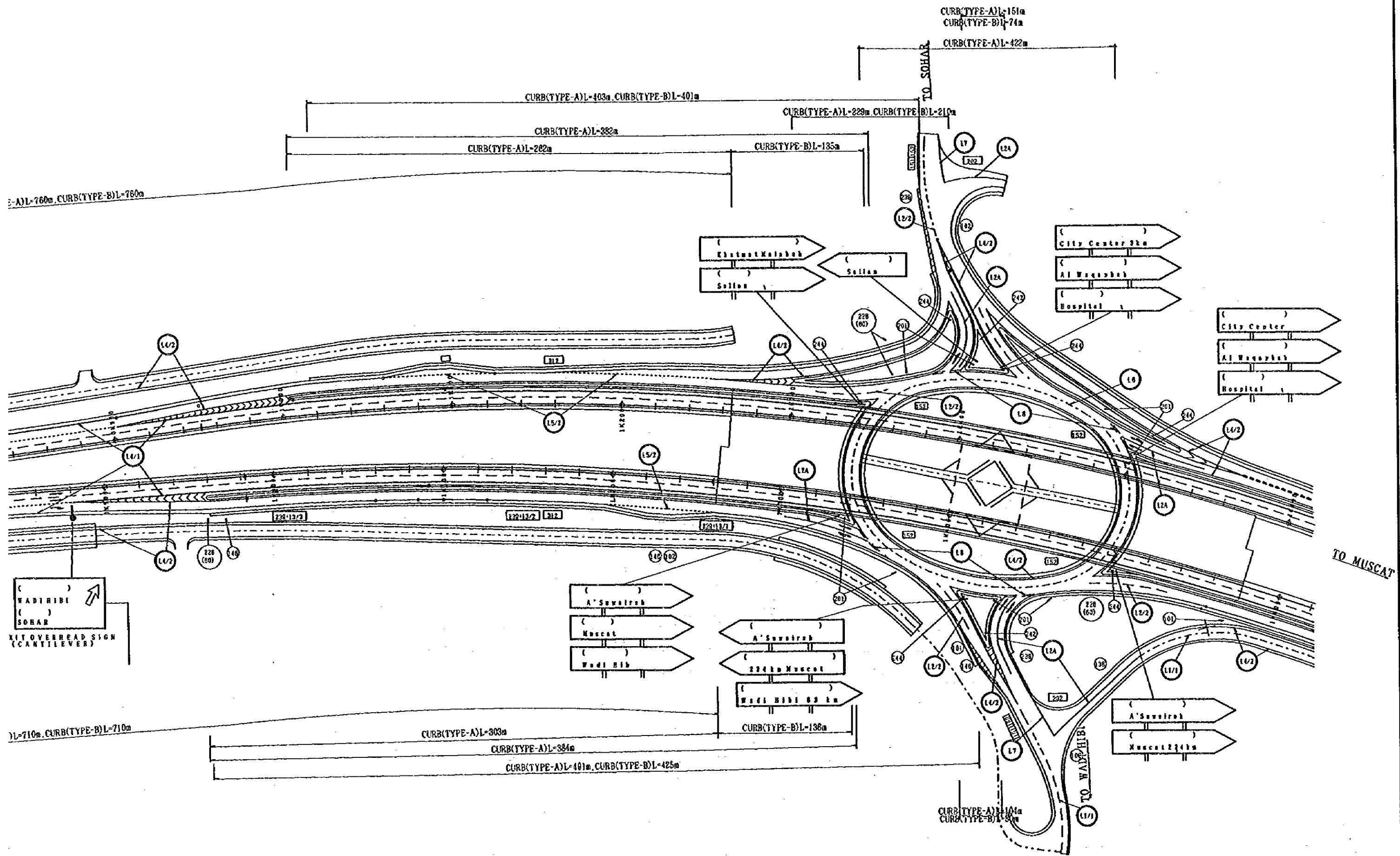
NOTES:  
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
		TITLE: RA/12 SOHAR	IRISH CROSSING
		DATE:	DWG NO.: R-17



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 DGR OR THE RELEVANT AUTHORITIES.

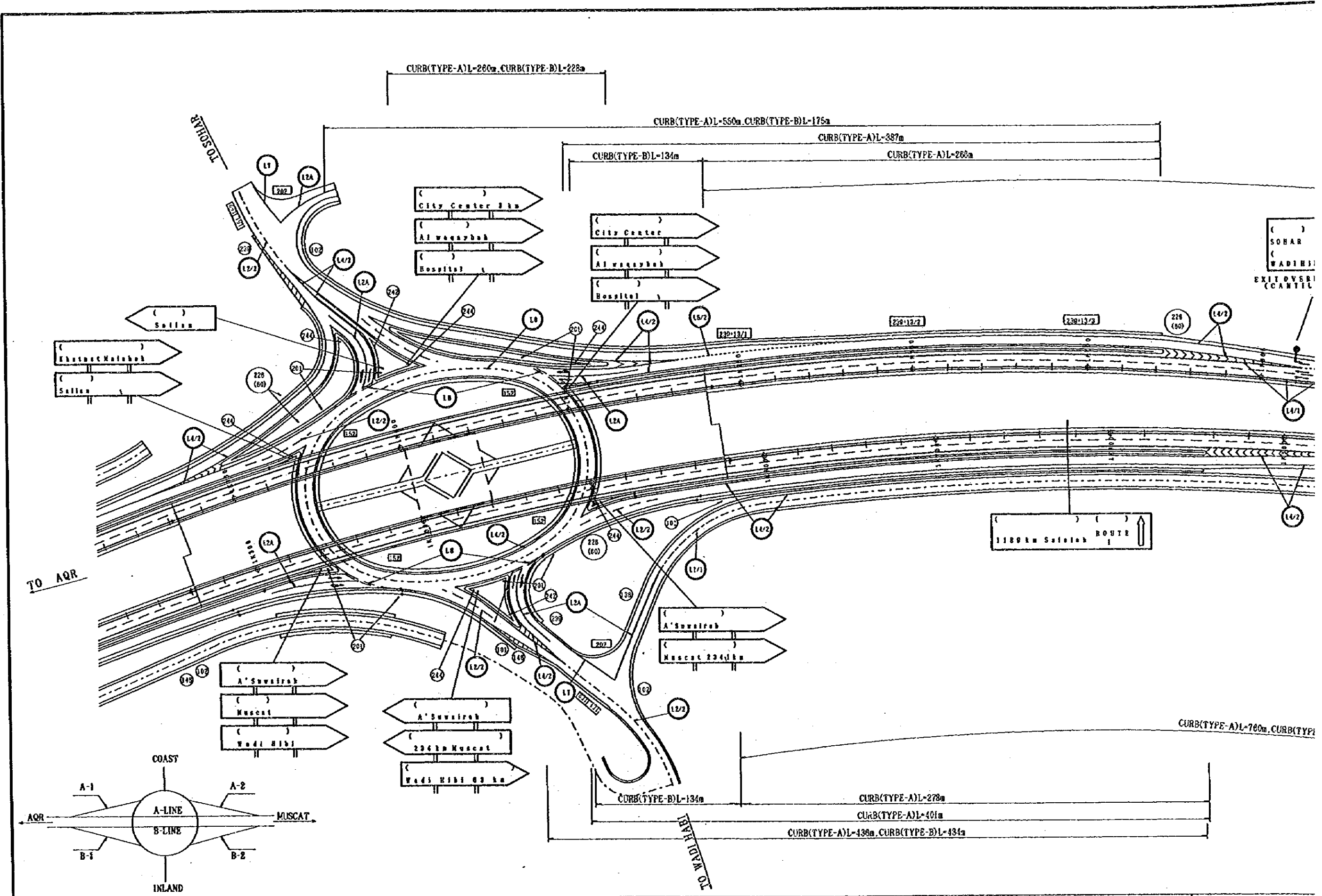
(5) FINAL LOCATION OF ROAD SIGNS AND ARABIC NAMES ARE TO BE FINALIZED DURING CONSTRUCTION.  
 (6) ADVANCE EXIT OVERHEAD SIGN SHALL BE PROVIDED AT APPROPRIATE LOCATION 300-1000m AHEAD FROM OVERHEAD SIGN.



(3) 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.

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/12 SOHAR: ROAD MARKING & ROAD SIGN (1/2)	DATE
	DWGNO. R-18

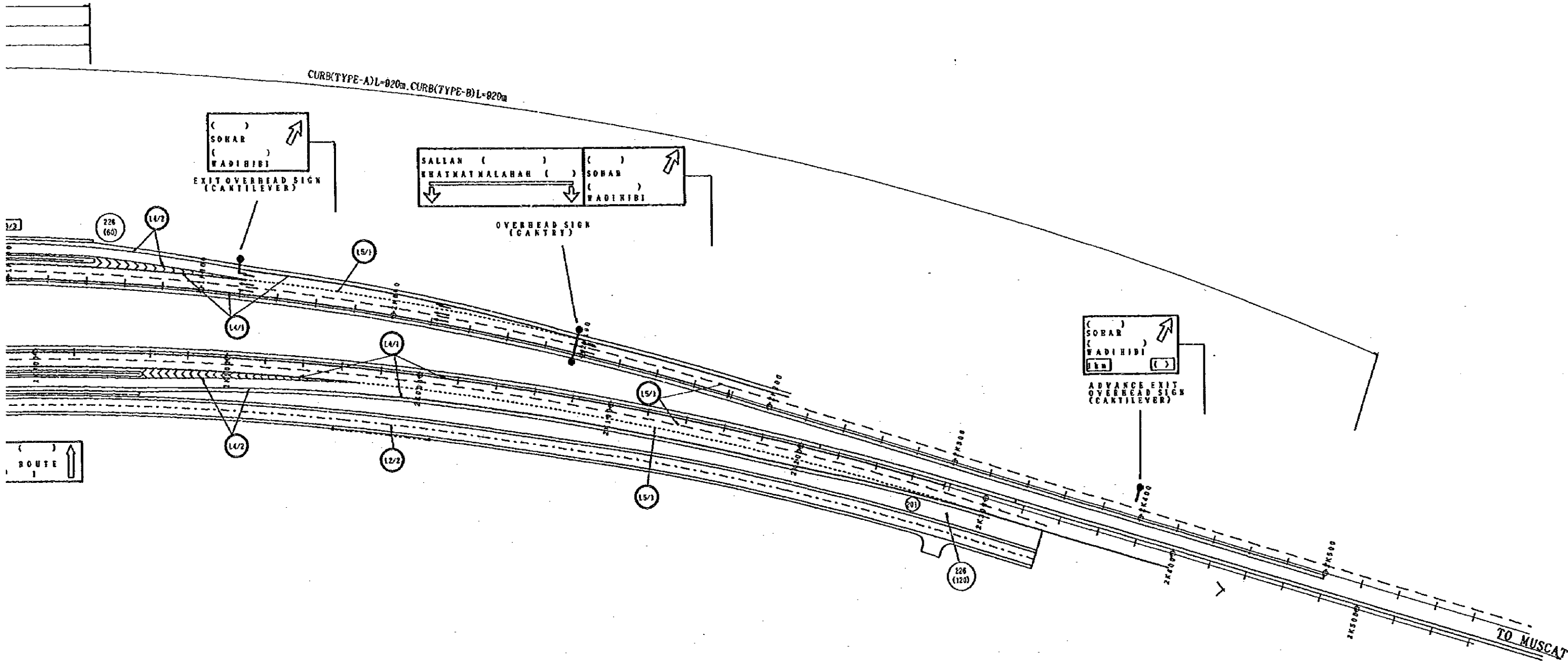




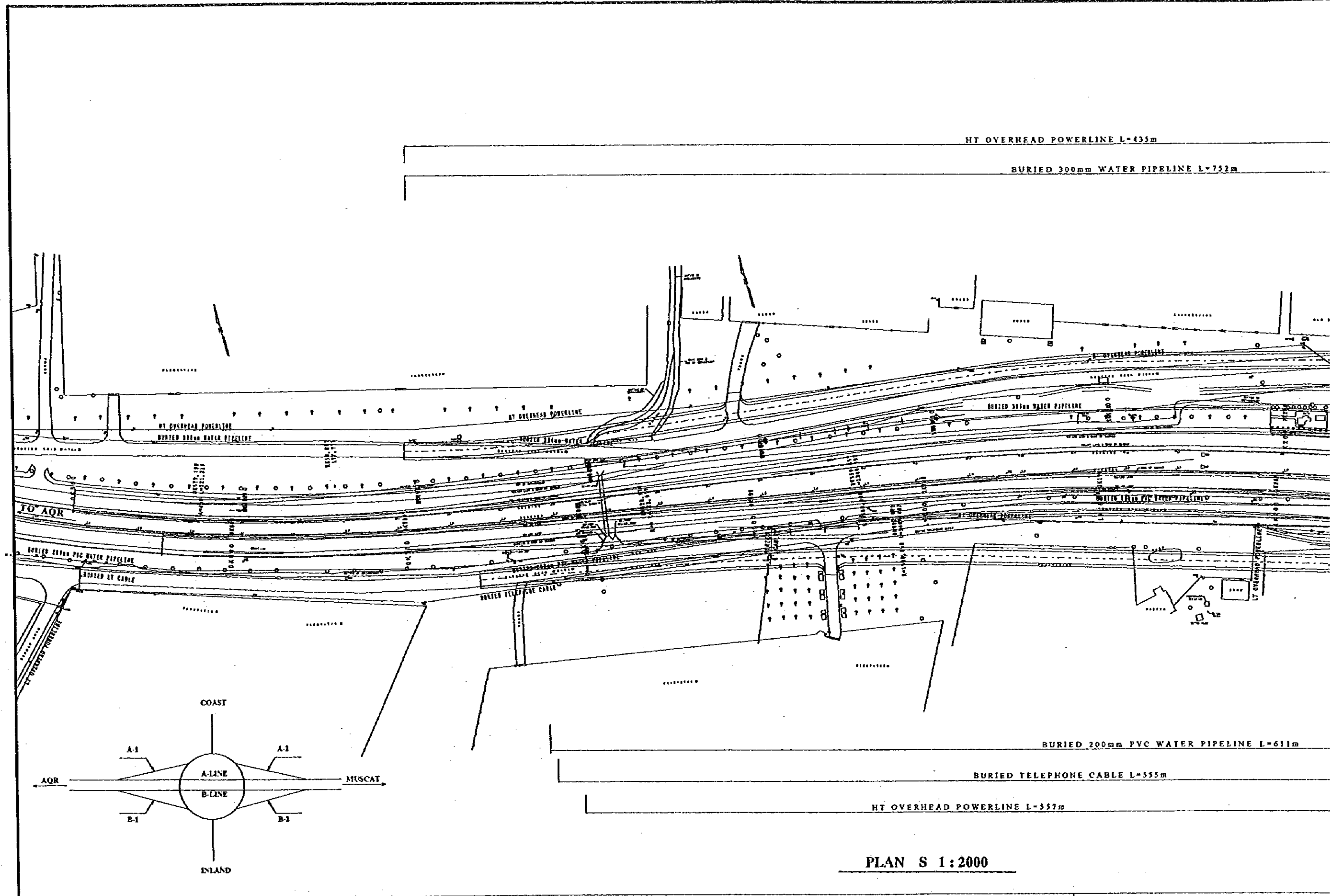
NOTES:

- (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.

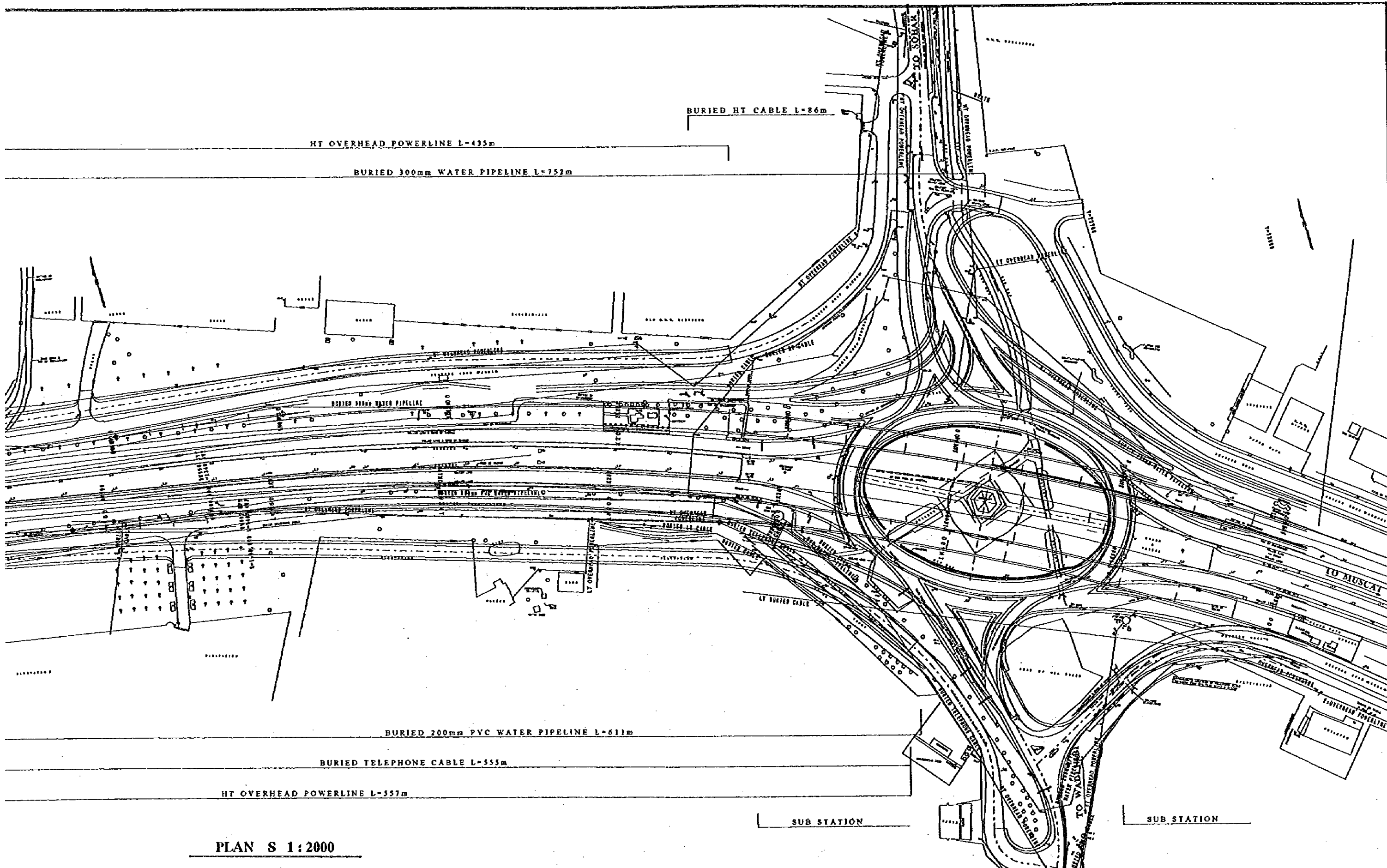
(5) FINAL LOCATION OF ROAD SIGNS AND ARABIC NAMES ARE TO BE FINALIZED DURING CONSTRUCTION.



TION.		JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
		JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
			TITLE RA/12 SOHAR ROAD MARKING & ROAD SIGN (2/2)
			DATE
			DWGNO. R-19



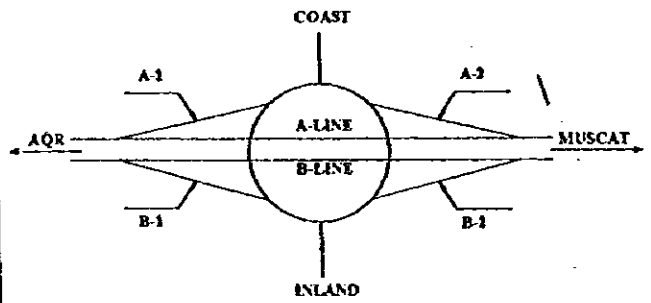
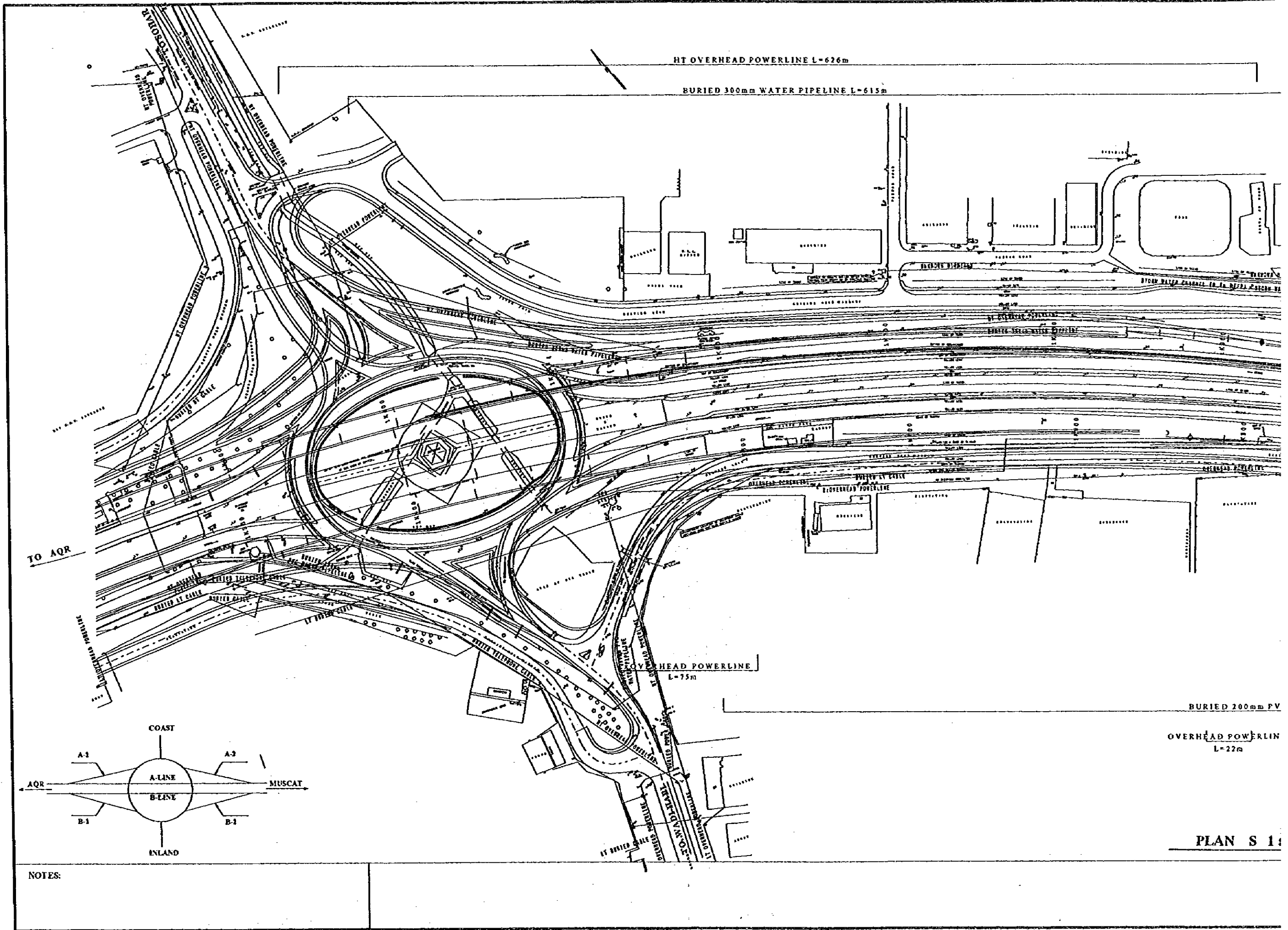
NOTES:



PLAN S 1:2000

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

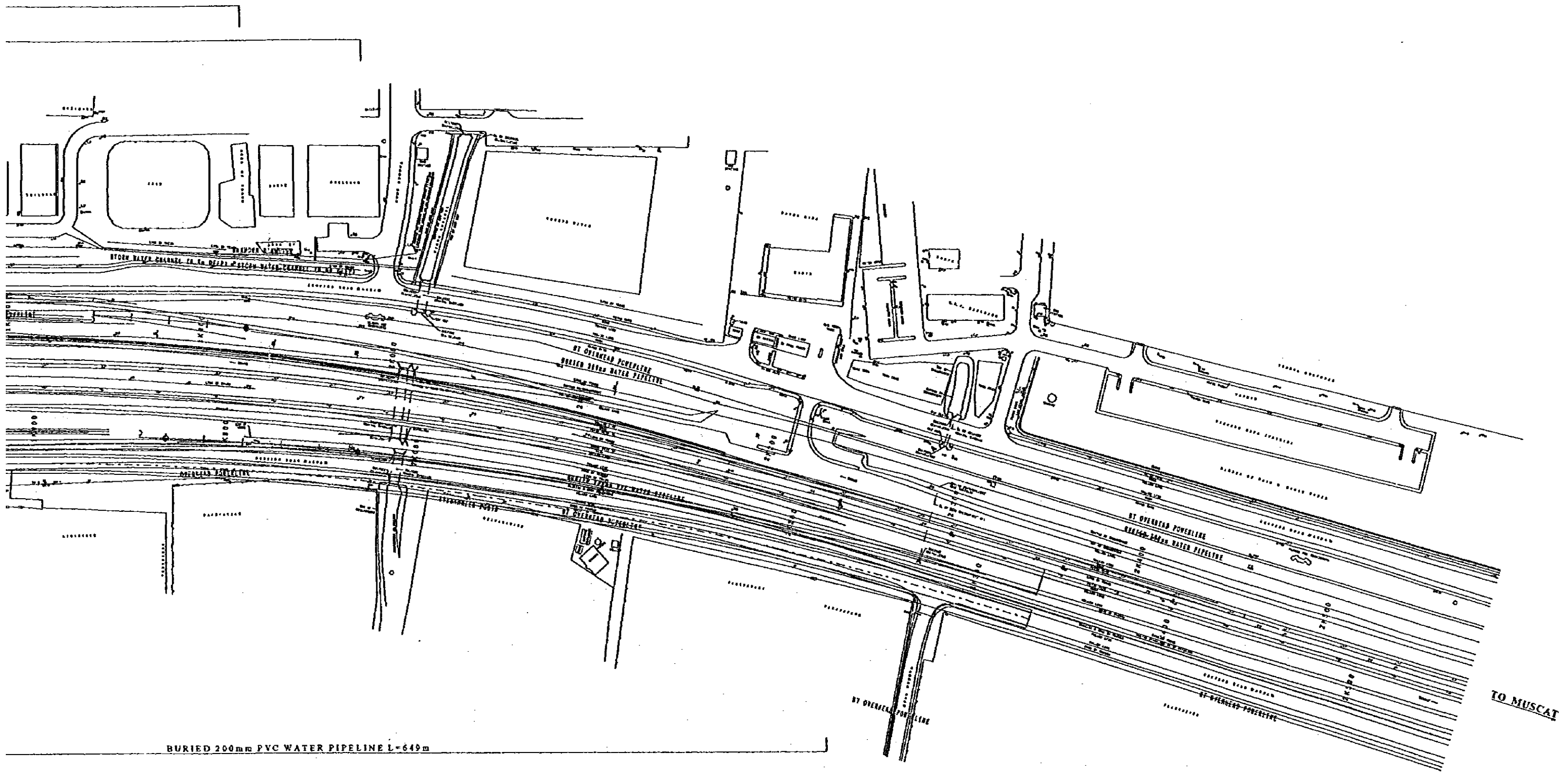
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/13 SOHAR REMOVL & RELOCATION OF UTILITIES(1/2)  
DATE: \_\_\_\_\_ DWGNO. R-20



NOTES:

BURIED 200mm PV  
OVERHEAD POWERLINE  
L=22m

PLAN S 11



OVERHEAD POWERLINE  
L=22m

HT OVERHEAD POWERLINE L=1333m

PLAN S 1:2000

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/12 SOHAR REMOVAL & RELOCATION OF UTILITIES (1/2)	DATE: DWONO. R-21