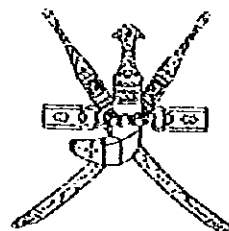


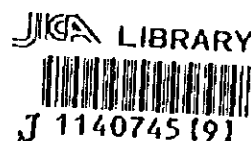
SULTANATE OF OMAN
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF ROADS



CONSTRUCTION OF FLYOVER
AT
AQR ROUNDABOUT
BATINAH HIGHWAY

TENDER DOCUMENT

DRAWINGS



PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

MARCH, 1997

SSF
CR(5)
97-015

DRAWING SCHEDULE (1)
(FO12-R/A18 AQR)

SHEET NO.	TITLE	SHEET NO.	TITLE	SHEET NO.	TITLE
A	GENERAL	B-16	Bar Schedules of Main Girder (A-Line)	B-65	Re-bar Arrangement of P5,P7(A-Line) P8(B-Line) (1/3)
G-1	Drawing Schedule (1)	B-17	Bar Schedules of Main Girder (B-Line)	B-66	Re-bar Arrangement of P5,P7(A-Line) P8(B-Line) (2/3)
G-2	Drawing Schedule (2)	B-18	Railing and Cantilever Slab (A-Line)	B-67	Re-bar Arrangement of P5,P7(A-Line) P8(B-Line) (3/3)
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R-9	Profile (2/3)	B-29	Bar Schedule of Main Girder (1)	B-78	Bar Bending Diagram
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B-11	Re-bar Arrangement (A-Line) (2/6)	B-54	Re-bar Arrangement of A2 (A-Line) (2/3)	W-24	Re-bar Arrangement (6)
B-12	Re-bar Arrangement (A-Line) (3/6)	B-55	Re-bar Arrangement of A2 (A-Line) (3/3)	W-25	Re-bar Arrangement (7)
B-13	Re-bar Arrangement (A-Line) (4/6)	B-56	Re-bar Arrangement of A1 (B-Line) (1/3)	W-26	Re-bar Arrangement (8)
B-14	Re-bar Arrangement (A-Line) (5/6)	B-57	Re-bar Arrangement of A1 (B-Line) (2/3)	W-27	Re-bar Arrangement (9)
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		B-61	Re-bar Arrangement of A2 (B-Line) (3/3)	W-31	Re-bar Arrangement (13)
		B-62	Re-bar Arrangement of P6 (B-Line) (1/3)		
		B-63	Re-bar Arrangement of P6 (B-Line) (2/3)		
		B-64	Re-bar Arrangement of P6 (B-Line) (3/3)		

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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 : DRAWING SCHEDULE

DATE

DWG NO. G - 1



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DRAWING SCHEDULE (2)
(FO12-R/A18 AQR)

SHEET NO.	TITLE
W-32	General View (2)-1
W-33	General View (2)-2
W-34	Re-bar Arrangement (1)
W-35	Re-bar Arrangement (2)
W-36	Re-bar Arrangement (3)
W-37	Re-bar Arrangement (4)
W-38	Re-bar Arrangement (5)
W-39	Re-bar Arrangement (6)
W-40	Re-bar Arrangement (7)
W-41	Re-bar Arrangement (8)
W-42	Re-bar Arrangement (9)
W-43	Re-bar Arrangement (10)
W-44	Re-bar Arrangement (1)
W-45	Re-bar Arrangement (2)
W-46	Re-bar Arrangement (3)
W-47	Re-bar Arrangement (4)
W-48	Re-bar Arrangement (5)
W-49	Re-bar Arrangement (6)
W-50	Re-bar Arrangement (7)
W-51	Re-bar Arrangement (8)
W-52	Re-bar Arrangement (9)
W-53	Re-bar Arrangement (10)
W-54	Re-bar Arrangement (11)
W-55	Re-bar Arrangement (12)
W-56	Re-bar Arrangement (13)
W-57	Re-bar Arrangement (14)
W-58	Re-bar Arrangement (15)
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C-1	General View of Box Culvert
C-2	Re-bar Arrangement (1)
C-3	Re-bar Arrangement (2)
C-4	Re-bar Arrangement (3)
C-5	Re-bar Arrangement (4)
C-6	Re-bar Arrangement (5)
C-7	Re-bar Arrangement (6)
T	TEMPORARY WORKS
T-1	Construction Sequence
T-2	Detour Layout

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TITLE : DRAWING SCHEDULE

DATE

DWG NO. G - 2

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 - Masonnet'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	
	(kgf/cm ²)	(N/mm ²)	(kgf/cm ²)	(N/mm ²)		
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, Felloc 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/cm ²)	Yield strength, min (kgf/cm ²)
Grade40	4921	2812
Grade60	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 ²)	Designation	Ultimate strength (kgf/mm ²)	Yield strength (kgf/mm ²)
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 ²)	Class32	Class40
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/cm²)

	Class20	Class24	Class28	Class32
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 class32, but its allowable stresses are for concrete class24.

(4) Reinforcing Bar

Allowable stresses(kgf/cm²) for each grade of reinforcing 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, stations and coordinates are shown in meters.
- Other dimensions are shown in millimeters

NOTES:

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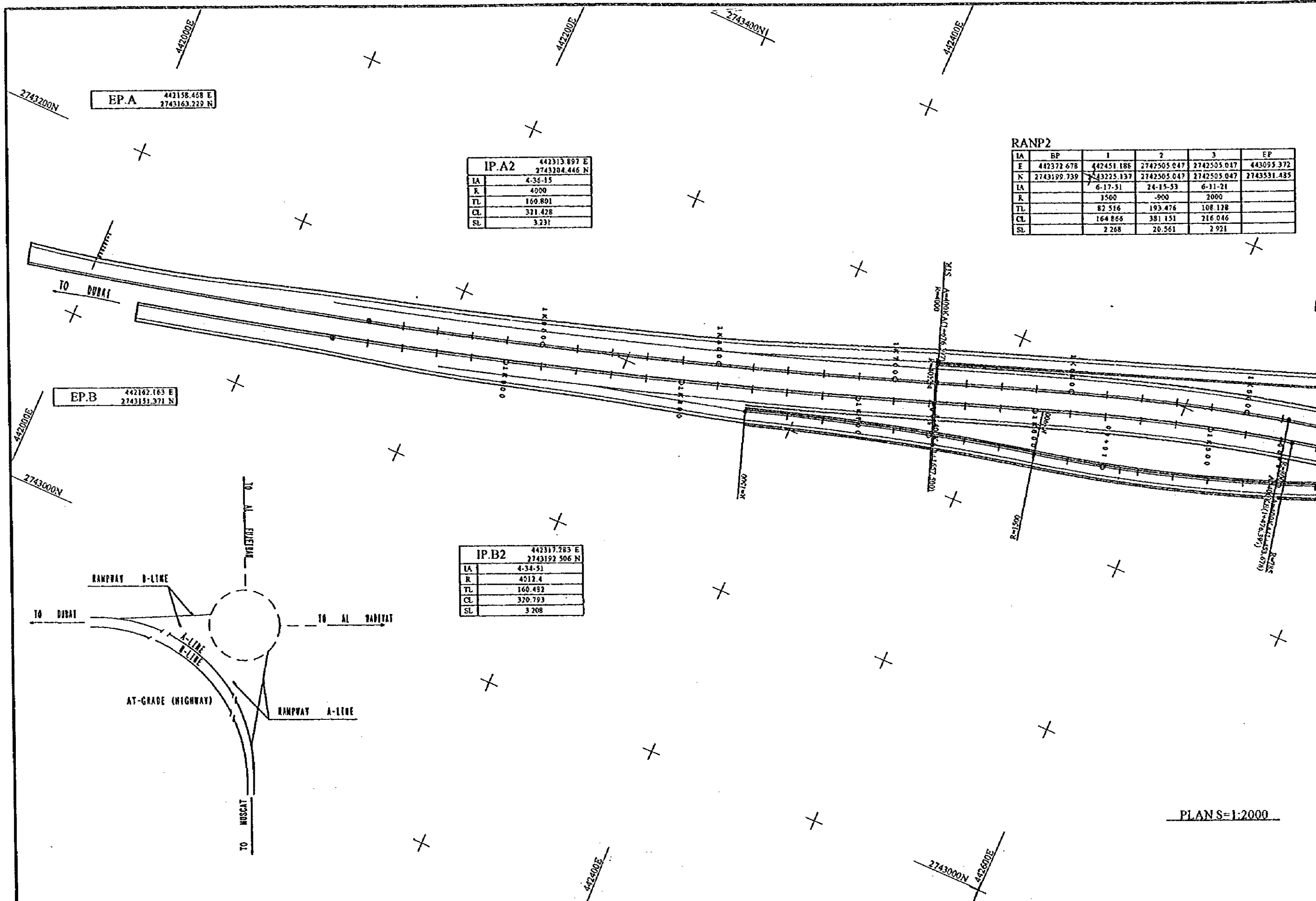
TITLE : GENERAL NOTES

DATE

DWG NO.

G - 3

ROAD



EP.A 442158.468 E
2743163.229 N

IP.A2		442313.897 E	2743204.446 N
LA	4-36-15		
R	4000		
TL	160.891		
CL	321.428		
SL	3.231		

RANP2

LA	BP	1	2	3	EP
E	442372.678	442451.186	2742505.047	2742505.047	443095.372
N	2743199.739	2743225.137	2742505.047	2742505.047	2743531.489
LA	6-17-51		24-15-53	6-11-21	
R	1500		-900	2000	
TL	82.516		193.476	108.128	
CL	164.866		381.151	216.046	
SL	2.268		20.561	2.921	

EP.B 442162.163 E
2743151.371 N

IP.B2		442317.283 E	2743192.506 N
LA	4-34-51		
R	4512.4		
TL	160.482		
CL	320.793		
SL	3.208		

PLANS=1:2000

NOTES: (1) SHADED REGION REPRESENTS FILLING AT WADI SPREAD AREA EXCEPTING RIGHT-OF-WAY IS OUT OF SCOPE UNDER THIS PROJECT.

897 E
446 N

RANP2

IA	EP	1	2	3	EP
E	442372.678	442451.188	2742505.047	2742505.047	443095.372
N	2743199.739	443225.137	2742505.047	2742505.047	2743531.485
IA		6-12-51	24-15-53	6-11-21	
R		1500	-900	2090	
TL		82.516	193.476	108.128	
CL		164.866	381.151	216.046	
SL		2.268	20.561	2.921	

13 E
16 N

IP.A1		443289.066	2743548.930
IA		87-55-12	
R		-800	
A		400	
CL		1427.593	
X		199.688	
Y		8.324	

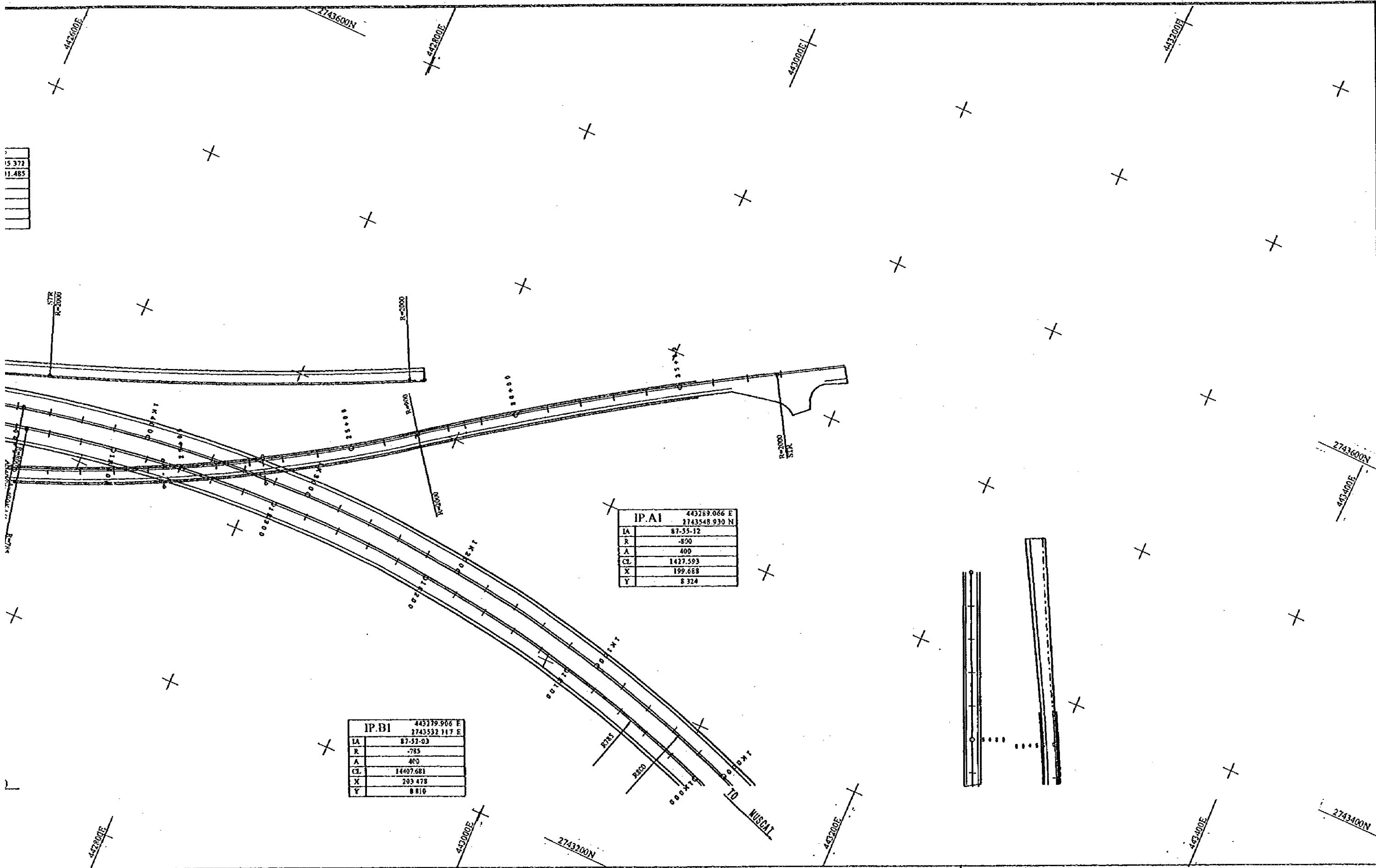
IP.B1		443179.906 E	2743532.117 E
IA		87-52-03	
R		-785	
A		400	
CL		14497.681	
X		203.478	
Y		8.810	

PLANS=1:2000

IT OF SCOPE UNDER THIS PROJECT.

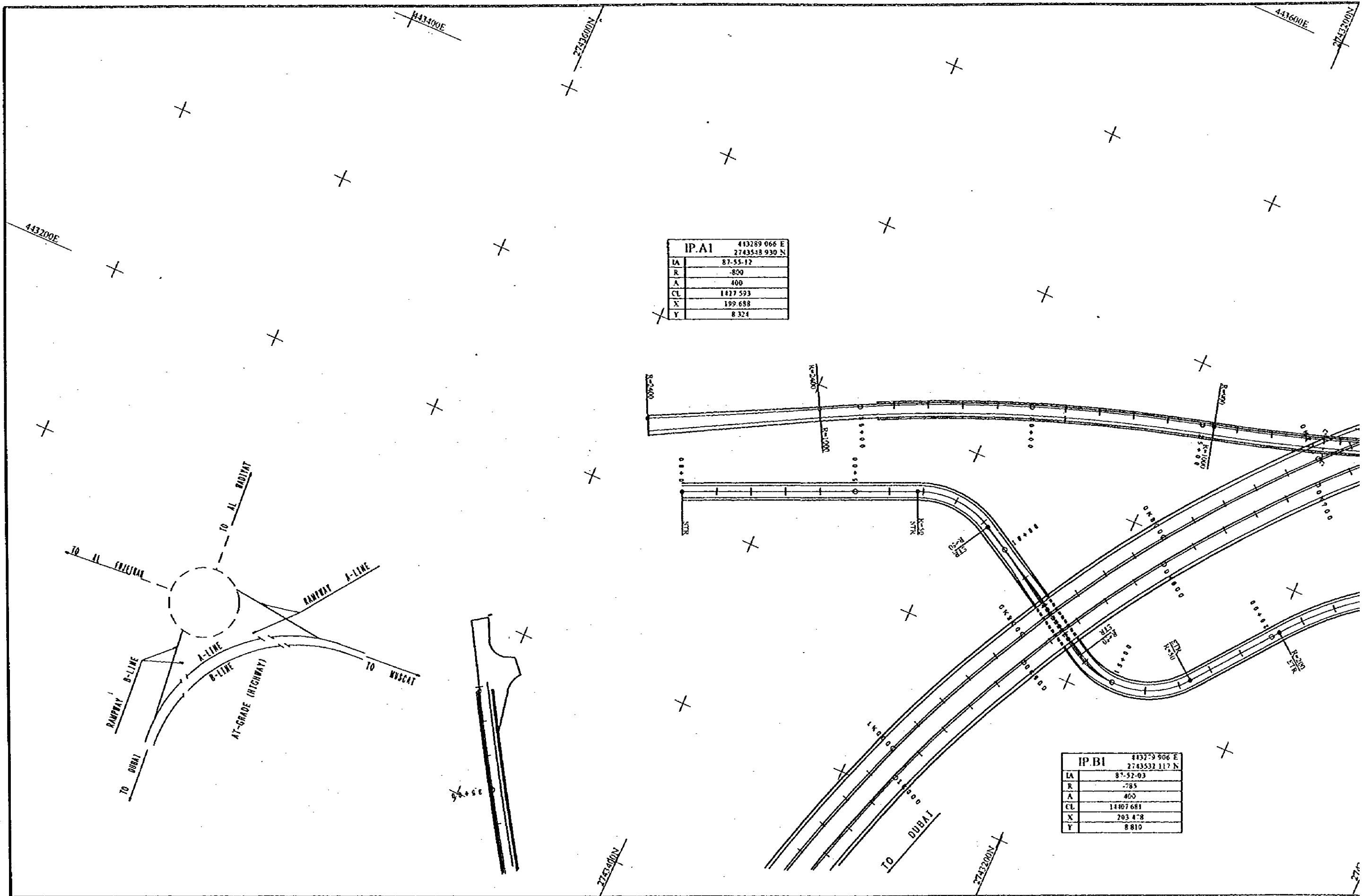
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PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/18 AQR ALIGNMENT LAYOUT (1/2)
DATE : _____ DWGNO. _____ R-1



IP.A1		443289 066 E
		2743513 930 N
LA	87-55-12	
R	-800	
A	400	
CL	1427 593	
X	199 688	
Y	8 324	

IP.B1		443279 906 E
		2743532 117 N
LA	87-52-03	
R	-785	
A	400	
CL	14407 681	
X	203 478	
Y	8 810	

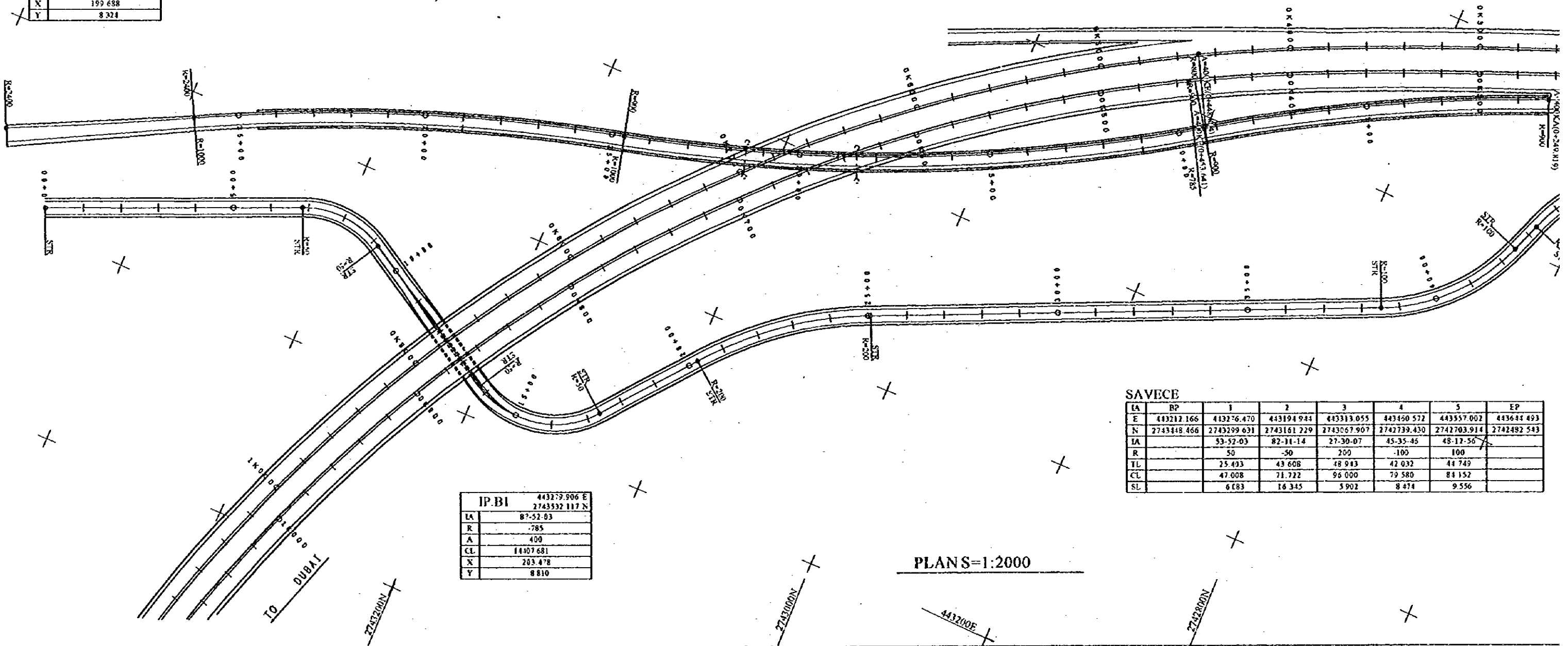
NOTES:

(1) SHADED REGION REPRESENTS FILLING AT WADI SPREAD AREA EXCEPTING RIGHT-OF-WAY IS OUT OF SCOPE UNDER THIS PROJECT.

IP.A1		443289 056 E
		2743548 930 N
LA	87-55-12	
R	-800	
A	400	
CL	1427 593	
X	199 688	
Y	8 324	

RANPI

LA	BP	1	2	3	4	EP
E	443579 274	443544 647	443407 419	443340 652	443764 505	443243 483
N	2742739 923	2742824 820	2743029 635	2743291 622	2743438 053	2743487 908
IA		11-38-02	19-31-30	13-10-41	2-21-54	
R		-900	900	-1000	2400	
TL		91 687	154 851	115 510	49 537	
CL		182 744	306 699	230 001	93 059	
SL		4 658	13 224	6 649	0 511	



IP.B1		443279 906 E
		2743532 117 N
LA	87-52-03	
R	-785	
A	400	
CL	14107 681	
X	203 478	
Y	8 810	

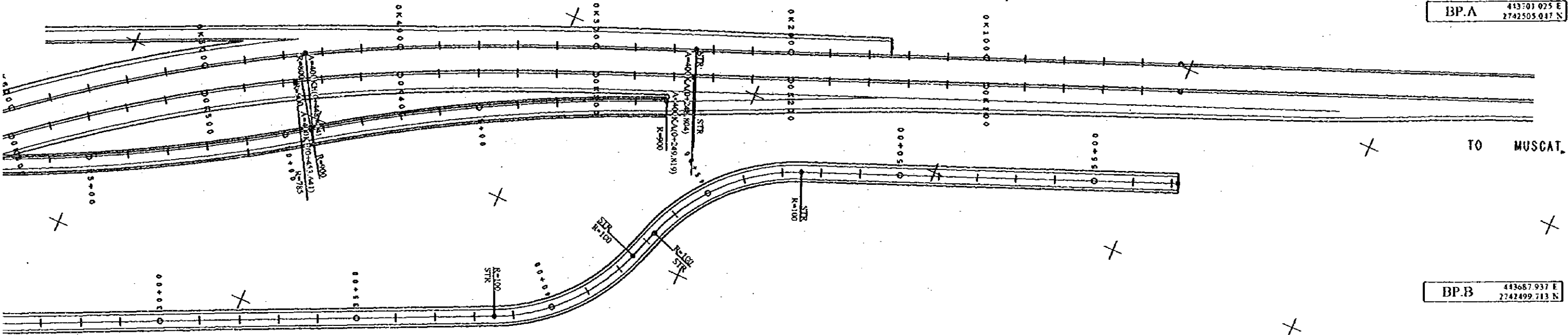
SAVECE

LA	BP	1	2	3	4	5	EP
E	443212 166	443276 470	443194 944	443313 055	443460 572	443557 002	443644 493
N	2743448 466	2743299 631	2743161 229	2743067 907	2742739 430	2742703 914	2742482 543
IA		53-52-03	82-11-14	27-30-07	45-35-45	48-17-56	
R		50	-50	200	-100	100	
TL		25 493	43 608	48 943	42 032	44 749	
CL		47 008	71 722	96 000	79 580	84 152	
SL		6 683	16 345	5 902	8 474	9 556	

PLANS=1:2000

RANPI

LA	BP	1	2	3	4	EP
E	443579.274	443544.647	443407.419	443330.652	443264.505	443243.483
N	2742739.923	2742824.820	2743027.635	2743291.622	2743438.053	2743482.908
LA	11-38-02	19-31-30	13-10-41	2-21-54		
R	-900	900	-1000	2430		
TL	91.687	154.851	115.510	49.537		
CL	182.744	306.699	239.001	99.059		
SL	4.658	13.224	6.649	0.511		



BP.A 443701.025 E
2742505.017 N

BP.B 443687.937 E
2742499.713 N

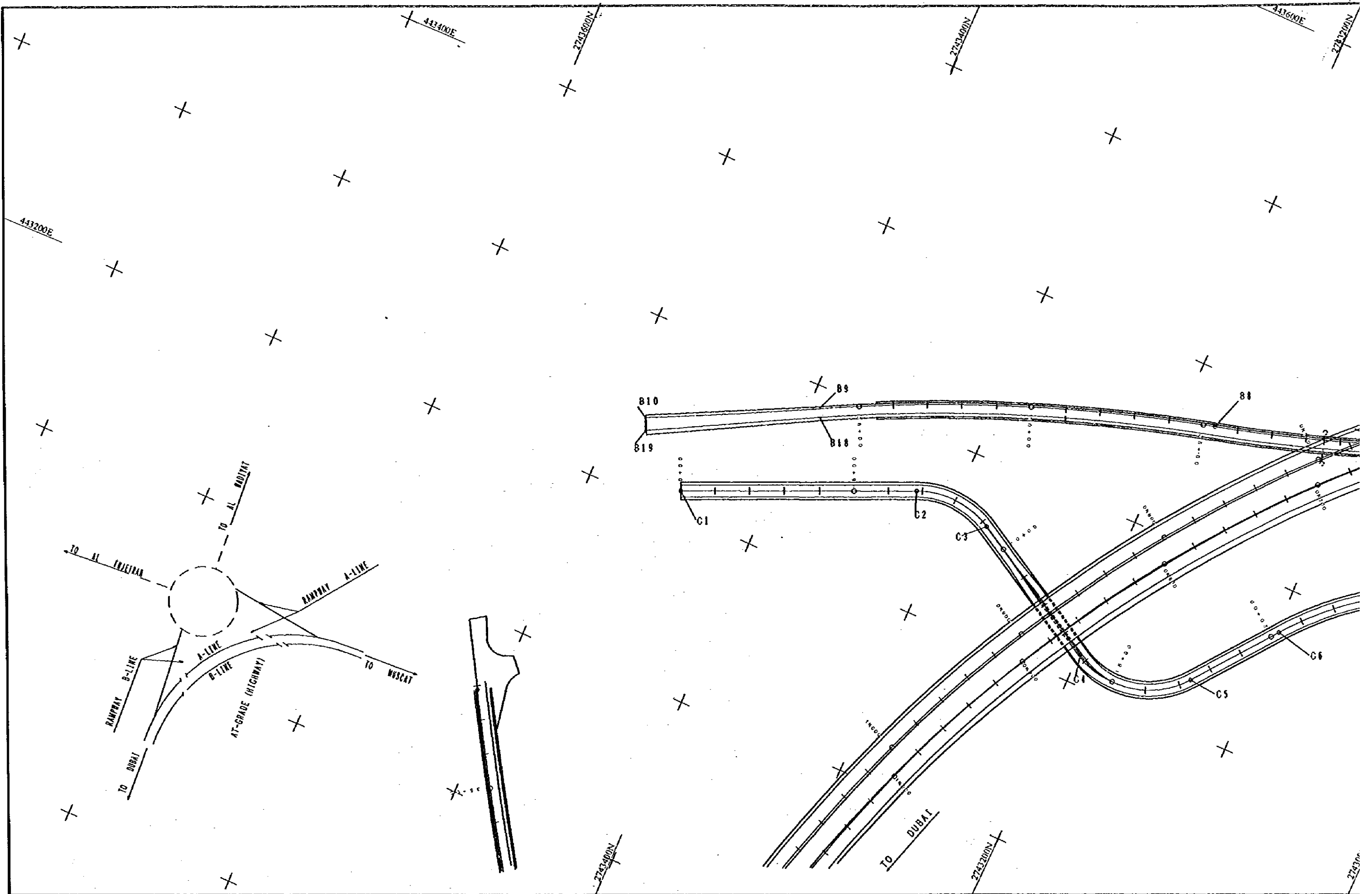
SAVECE

LA	BP	1	2	3	4	5	EP
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N	2743418.466	2743259.631	2743161.229	2743067.907	2742739.430	2742703.914	2742482.543
LA		53-52-03	82-11-14	27-30-07	45-35-46	48-12-56	
R		50	-50	200	-100	100	
TL		25.403	43.608	48.943	42.032	44.749	
CL		47.008	71.722	96.000	79.580	84.152	
SL		6.083	16.345	5.902	8.474	9.556	

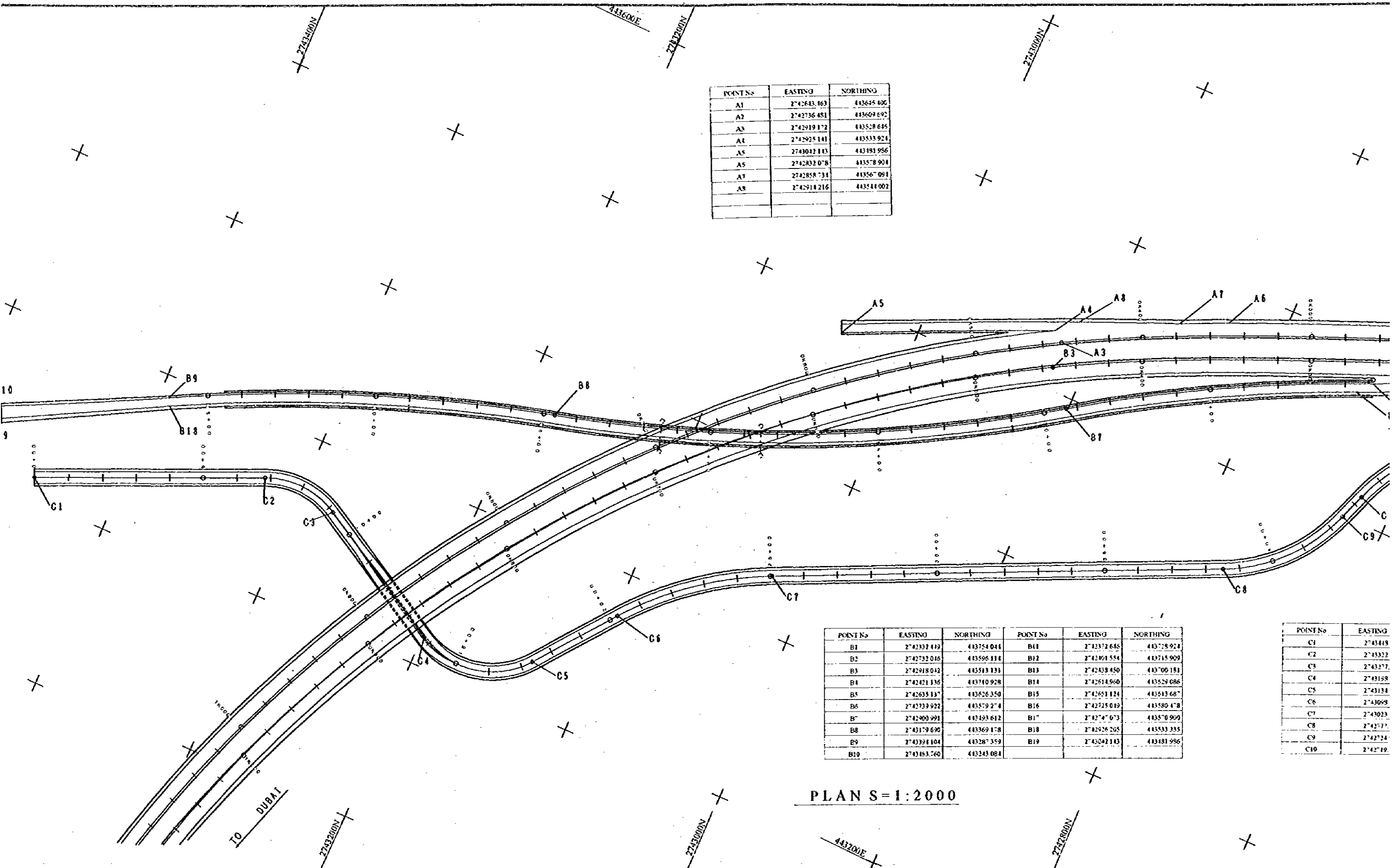
PLANS=1:2000

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PROJECT : D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE : RA/18 AQR ALIGNMENT LAYOUT (1/2)
DATE : _____ DWGNO. R-1



NOTES:
 (1) FINAL CONTROL COORDINATES, WGS84 DATUM, ZONE 40 UTM, CM57.



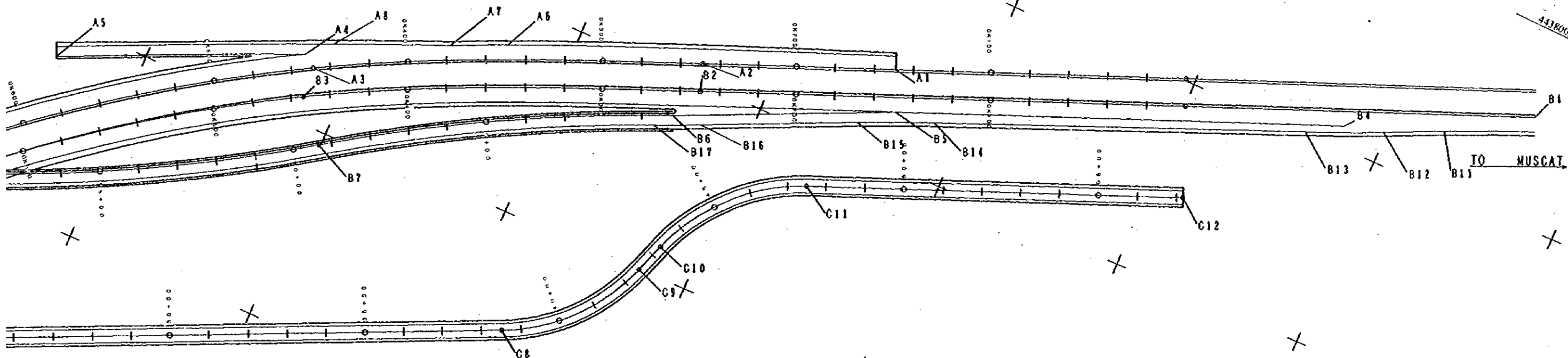
POINTS	EASTING	NORTHING
A1	2742643.463	443645.406
A2	2742736.481	443609.693
A3	2742919.172	443528.645
A4	2742925.141	443533.924
A5	2743042.143	443481.956
A5	2742832.078	443578.904
A7	2742858.734	443567.091
A8	2742914.216	443544.002

POINT No	EASTING	NORTHING	POINT No	EASTING	NORTHING
B1	2742332.419	443754.044	B11	2742372.646	443758.924
B2	2742732.016	443596.114	B12	2742461.554	443715.909
B3	2742918.042	443513.131	B13	2742439.450	443700.151
B4	2742421.136	443710.928	B14	2742614.560	443529.086
B5	2742635.137	443626.350	B15	2742651.124	443613.687
B6	2742739.922	443579.274	B16	2742725.019	443580.478
B7	2742900.991	443493.612	B17	2742747.073	443578.909
B8	2743179.690	443369.178	B18	2742926.205	443533.335
B9	2743394.104	443287.359	B19	2743042.143	443481.956
B10	2743483.760	443243.084			

POINT No	EASTING
C1	2743449
C2	2743322
C3	2743277
C4	2743158
C5	2743134
C6	2743098
C7	2743023
C8	2742777
C9	2742724
C10	2742719

PLANS = 1:2000

ING	NORTHING
2643.453	443546.400
2736.481	443609.692
2919.172	443528.646
2925.141	443533.924
3042.143	443451.956
2832.078	443578.904
42858.734	443567.094
42914.216	443544.002

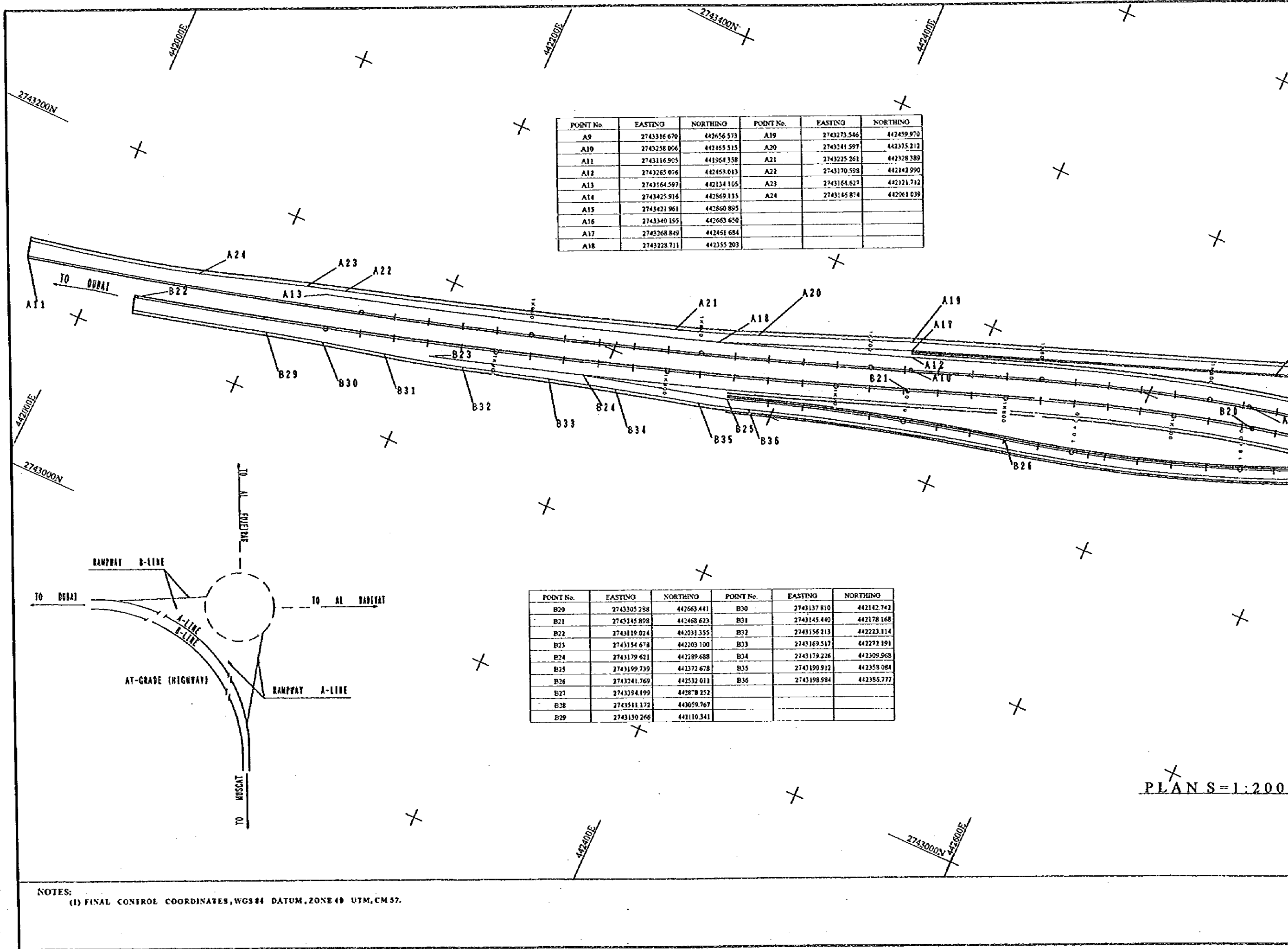


POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
B1	2742332.443	443754.044	B11	2742372.645	443728.924
B2	274232.046	443596.144	B12	2742494.554	443715.909
B3	2742918.042	443513.131	B13	2742438.450	443700.181
B4	2742121.135	443710.928	B14	2742614.960	443659.086
B5	2742635.137	443626.350	B15	2742651.124	443613.687
B6	2742739.922	443579.274	B16	2742725.049	443580.478
B7	2742900.991	443493.612	B17	2742747.073	443570.900
B8	2743179.690	443369.178	B18	2742926.205	443533.335
B9	2743394.104	443297.359	B19	2743042.143	443481.956
B10	2743483.760	443243.081			

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
C1	2743448.456	443212.166	C11	2742662.298	443573.450
C2	2743321.551	443266.395	C12	2742482.543	443544.493
C3	2743277.743	443263.577			
C4	2743198.803	443217.077			
C5	2743134.194	443229.161			
C6	2743098.250	443174.652			
C7	2743023.259	443333.106			
C8	2742777.773	443443.353			
C9	2742724.903	443500.014			
C10	2742719.380	443515.011			

PLANS = 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/18 AQR SETTING OUT DETAILS (1/2)
	DATE: _____ DWGNO. R-3



POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
A9	2743316.670	442656.573	A19	2743273.546	442459.970
A10	2743258.006	442455.515	A20	2743241.597	442375.212
A11	2743116.905	441964.358	A21	2743225.261	442328.589
A12	2743265.076	442453.013	A22	2743170.598	442142.990
A13	2743164.597	442134.105	A23	2743164.627	442121.712
A14	2743425.916	442569.135	A24	2743145.874	442061.039
A15	2743421.961	442860.895			
A16	2743340.195	442663.650			
A17	2743268.849	442461.684			
A18	2743228.711	442355.203			

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
B20	2743305.288	442663.441	B30	2743137.810	442142.742
B21	2743245.898	442468.623	B31	2743145.440	442178.168
B22	2743119.024	442031.355	B32	2743156.213	442223.114
B23	2743154.678	442203.100	B33	2743169.517	442272.191
B24	2743179.621	442289.688	B34	2743179.226	442309.968
B25	2743199.739	442372.678	B35	2743190.912	442359.084
B26	2743241.769	442532.011	B36	2743198.984	442385.777
B27	2743394.199	442878.252			
B28	2743511.172	443059.767			
B29	2743130.266	442110.341			

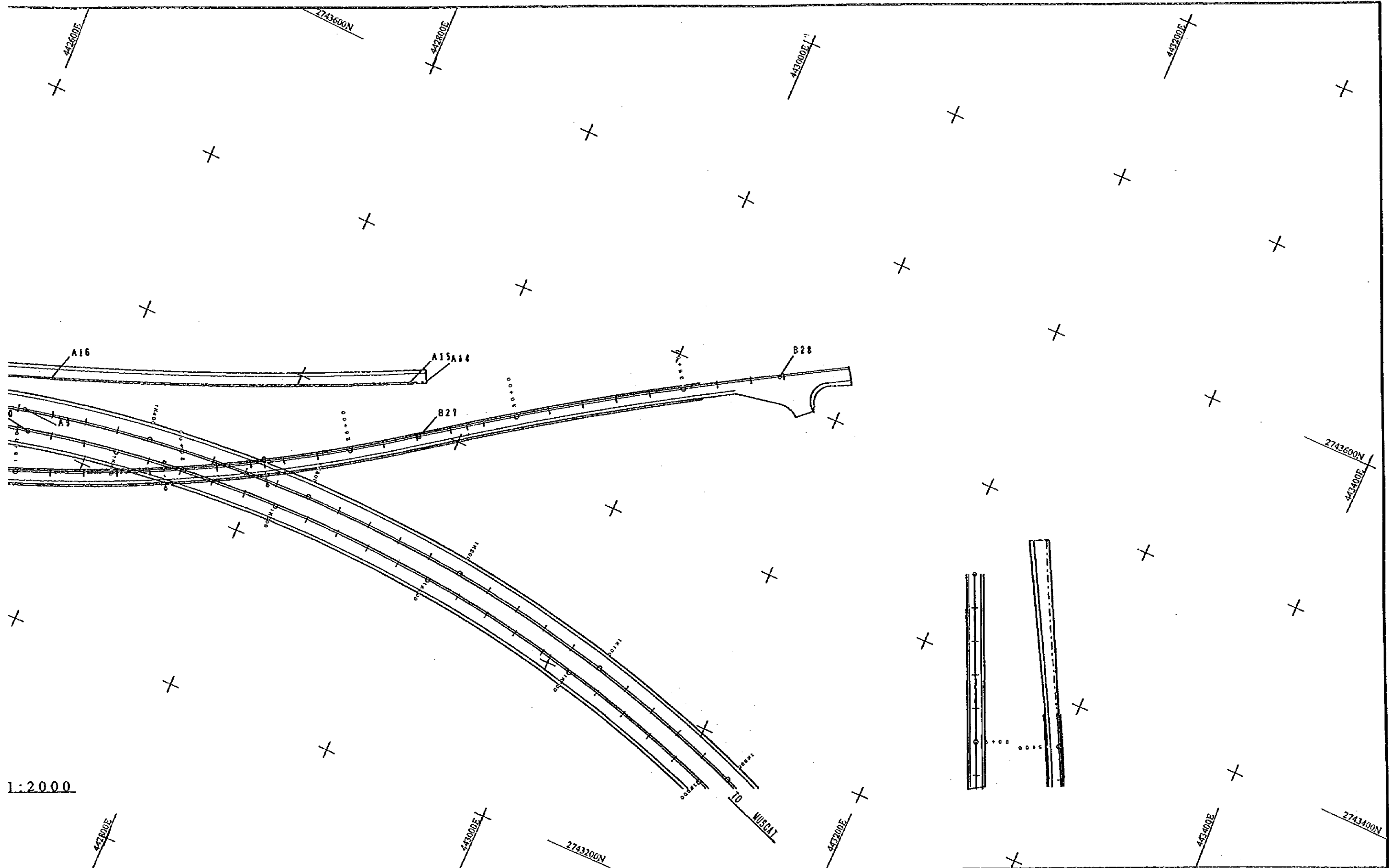
NOTES:
 (1) FINAL CONTROL COORDINATES, WGS 84 DATUM, ZONE 49 UTM, CM 57.

PLANS=1:200

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
A9	2743316.670	442656.573	A19	2743273.546	442459.970
A10	2743258.006	442465.513	A20	2743241.597	442375.212
A11	2743116.905	441964.358	A21	2743225.261	442328.389
A12	2743265.076	442463.013	A22	2743170.529	442142.990
A13	2743164.597	442134.105	A23	2743164.627	442121.712
A14	2743425.916	442569.135	A24	2743146.874	442061.039
A15	2743421.951	442860.895			
A16	2743340.195	442663.650			
A17	2743268.849	442461.684			
A18	2743228.711	442355.203			

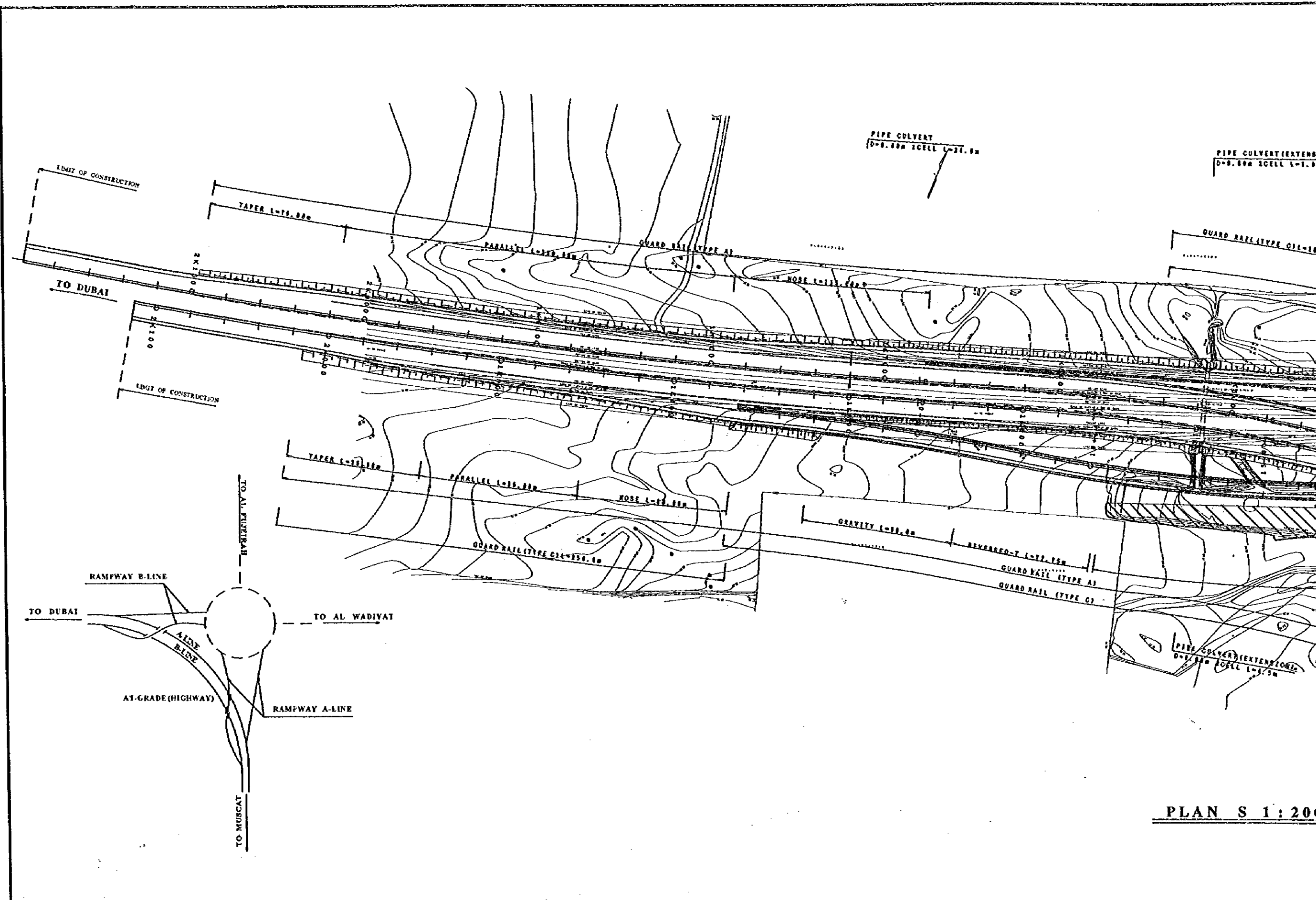
P.No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
0	2743305.288	442663.441	B30	2743137.810	442142.742
1	2743245.899	442458.633	B31	2743145.410	442178.168
2	2743119.024	442031.355	B32	2743156.313	442223.114
3	2743154.678	442203.100	B33	2743169.517	442272.191
4	2743179.621	442289.688	B34	2743179.326	442309.968
5	2743199.739	442372.678	B35	2743190.912	442358.084
6	2743241.769	442532.011	B36	2743198.984	442386.717
7	2743394.199	442878.252			
8	2743511.172	443059.767			
29	2743130.266	442110.341			

PLANS = 1:2000



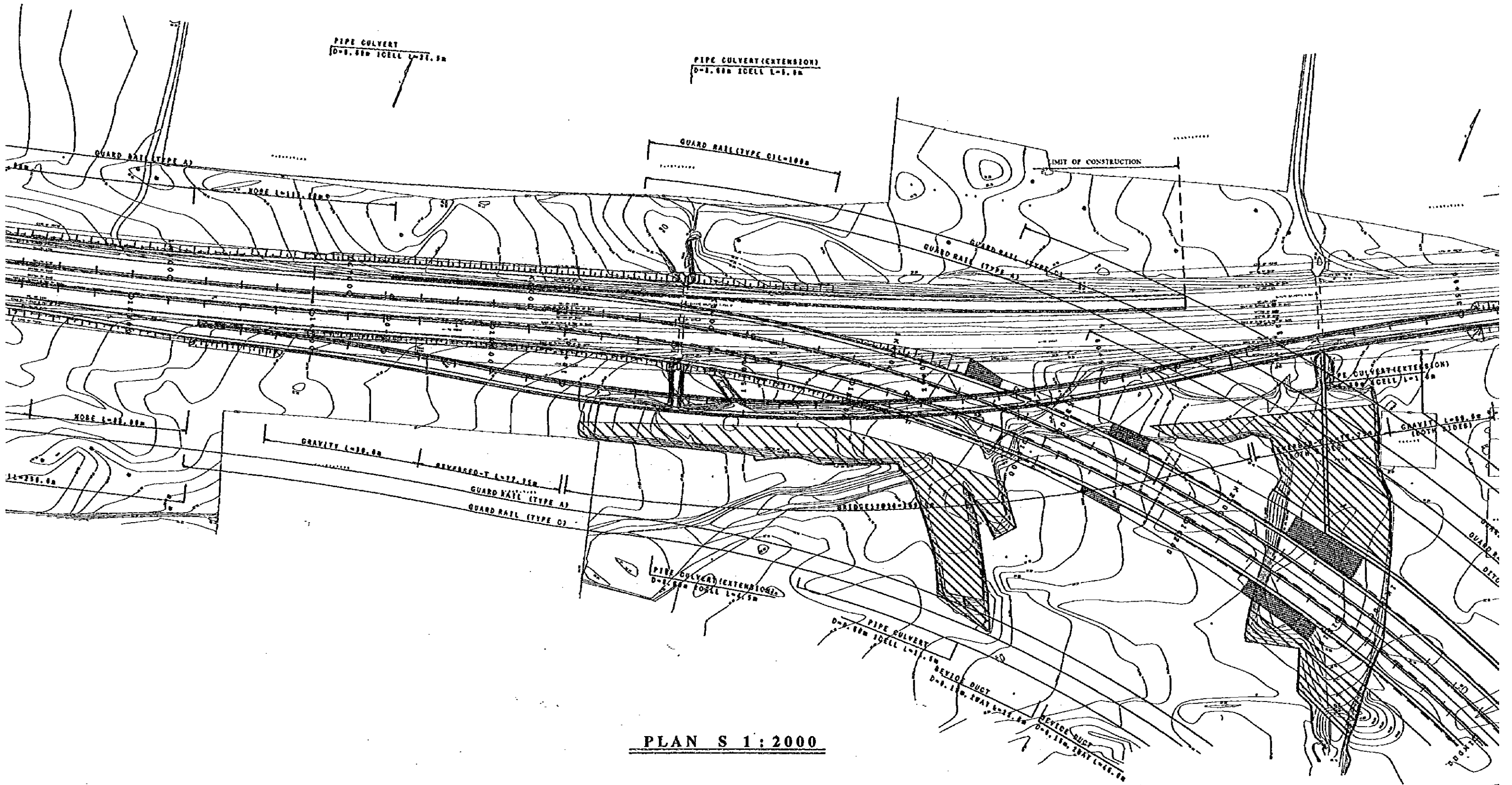
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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/18 AQR SETTING OUT DETAILS (2/2)	
	DATE:	DWGNO. R-4



PLAN S 1:200

NOTES: (1) SHADED REGION REPRESENTS FILLING AT WADI SPREAD AREA EXCEPTING RIGHT-OF-WAY WHICH IS OUT OF SCOPE UNDER THIS PROJECT.



PLAN S 1:2000

HIGH IS OUT OF SCOPE UNDER THIS PROJECT.

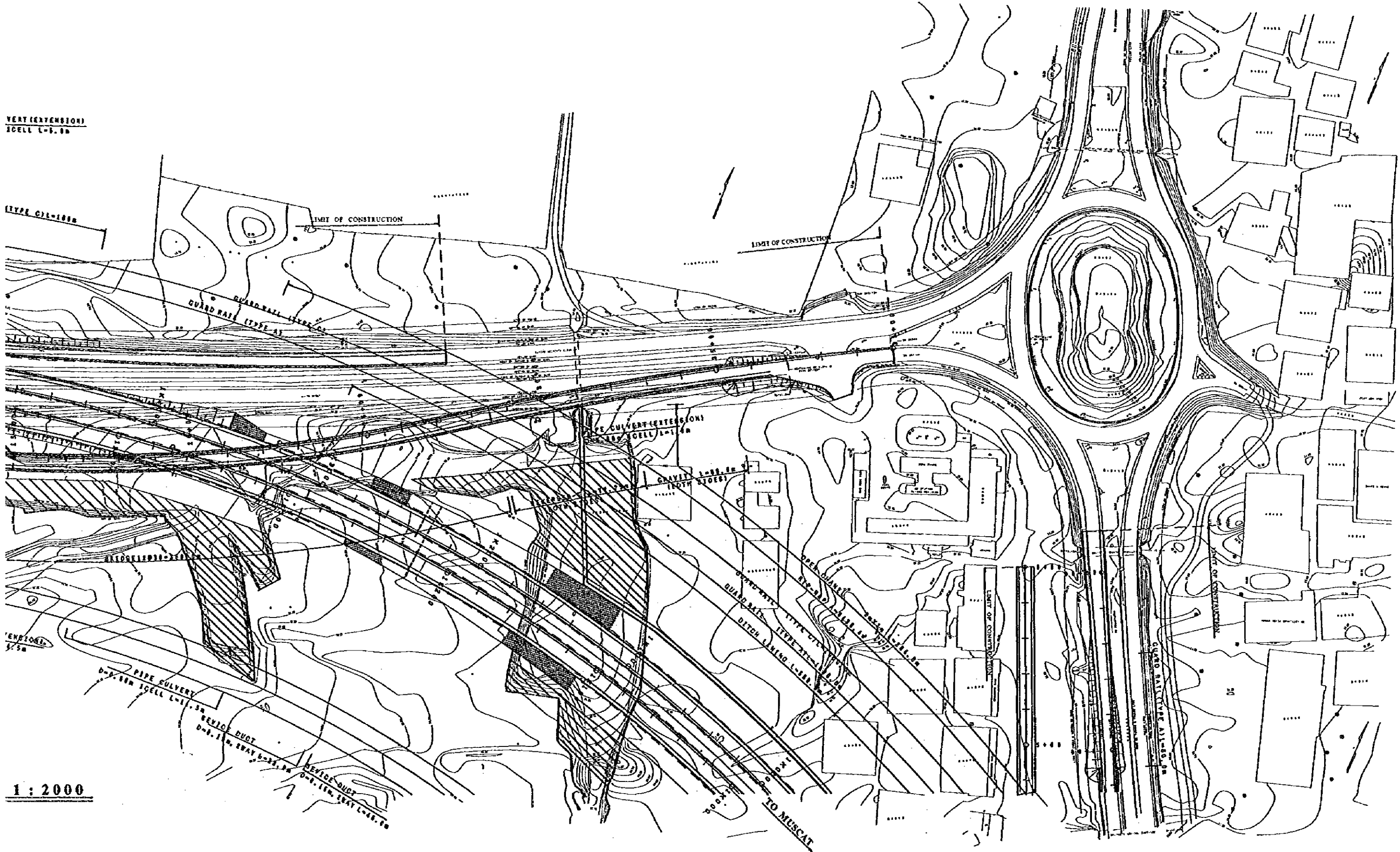
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CELL L-1. 00

TYPE CIL-1800

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JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

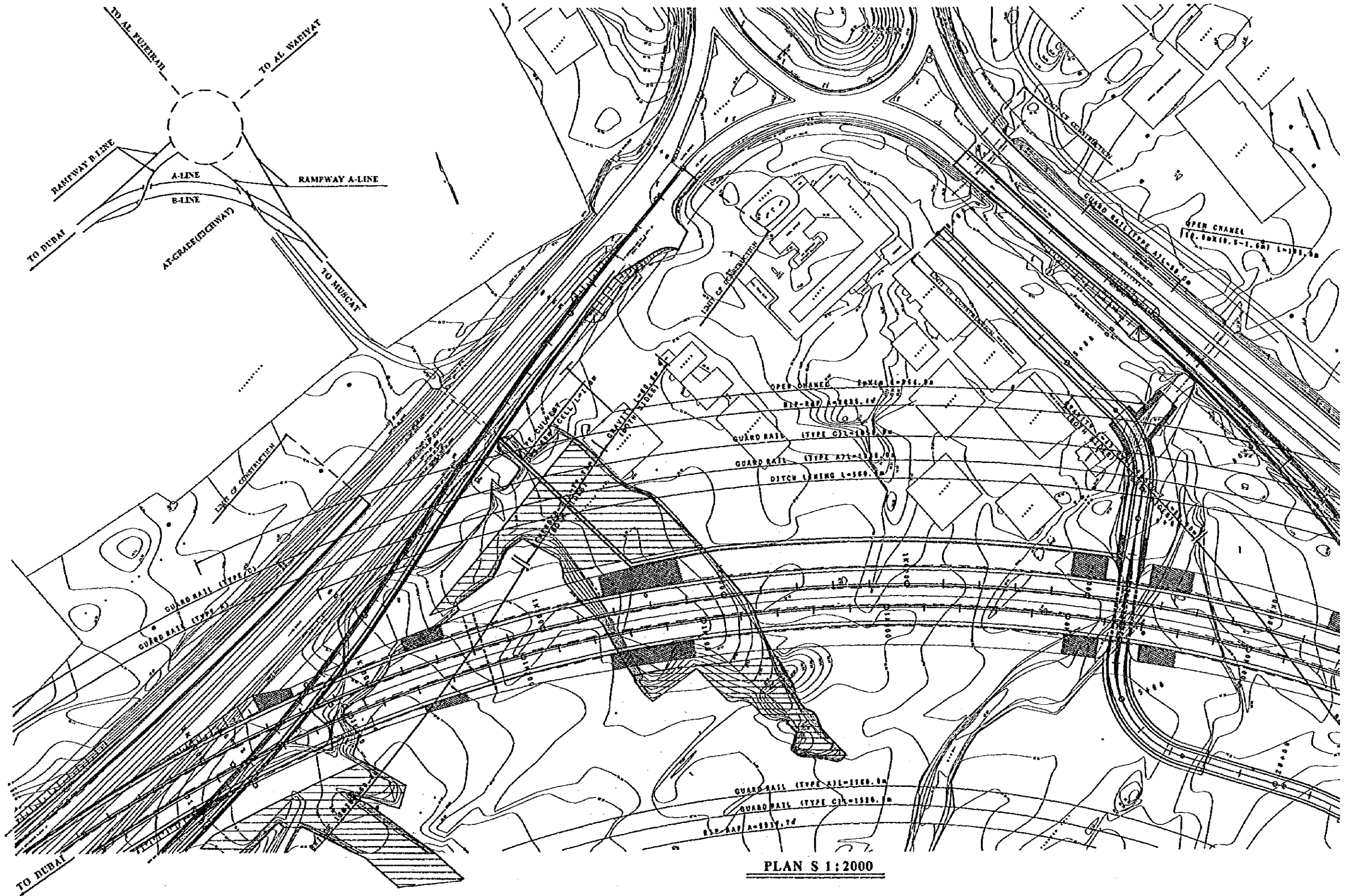
JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

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

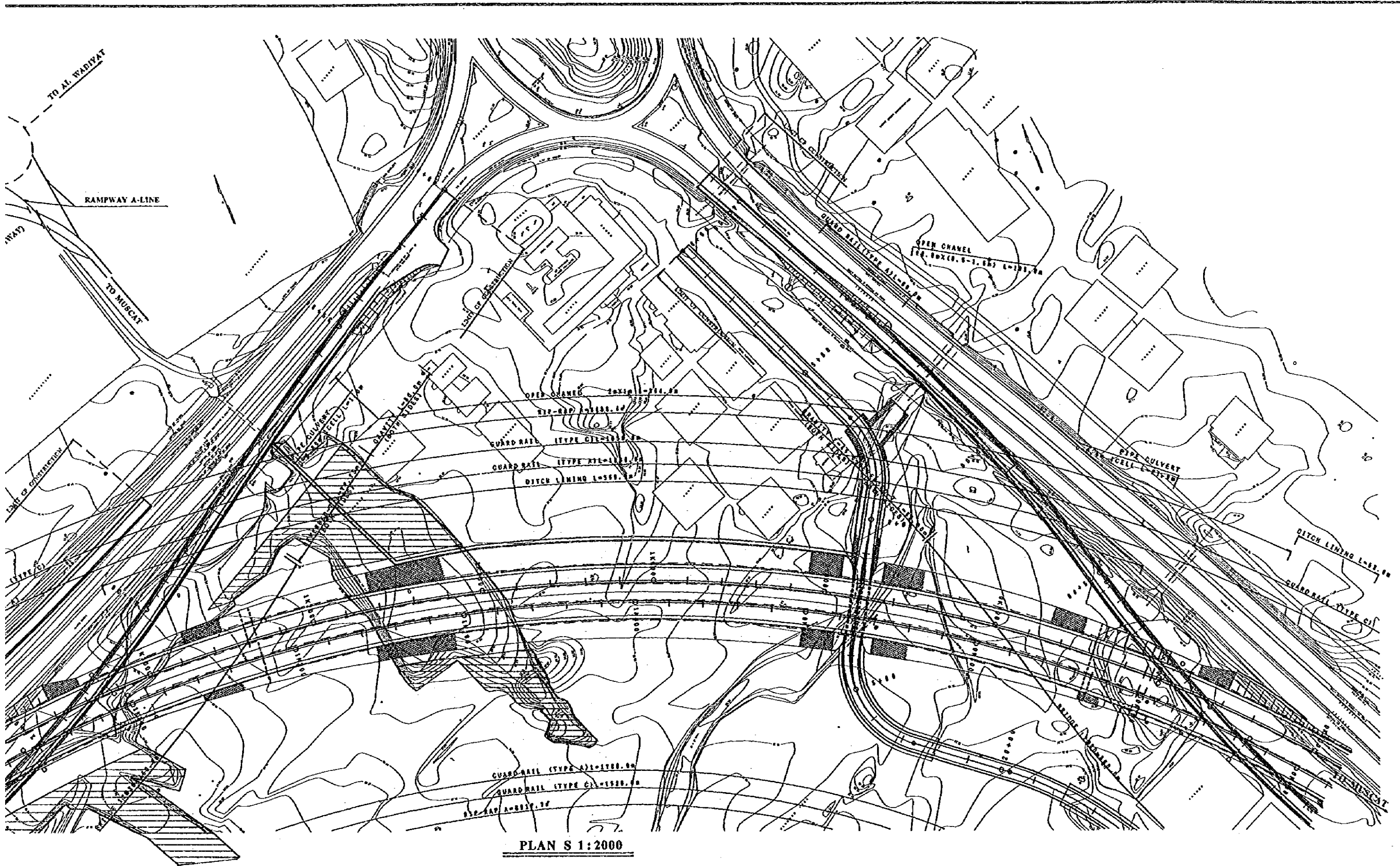
TITLE RA/18 AQR PLAN (1/3)

DATE _____ DWGNO. R-5



NOTES: (1) SHADED REGION REPRESENTS FILLING AT WADI SPREAD AREA EXCEPTING RIGHT-OF-WAY WHICH IS OUT OF SCOPE UNDER THIS PROJECT.

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MIN
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	PROJECT: D/D
	TITLE RA/ DATE

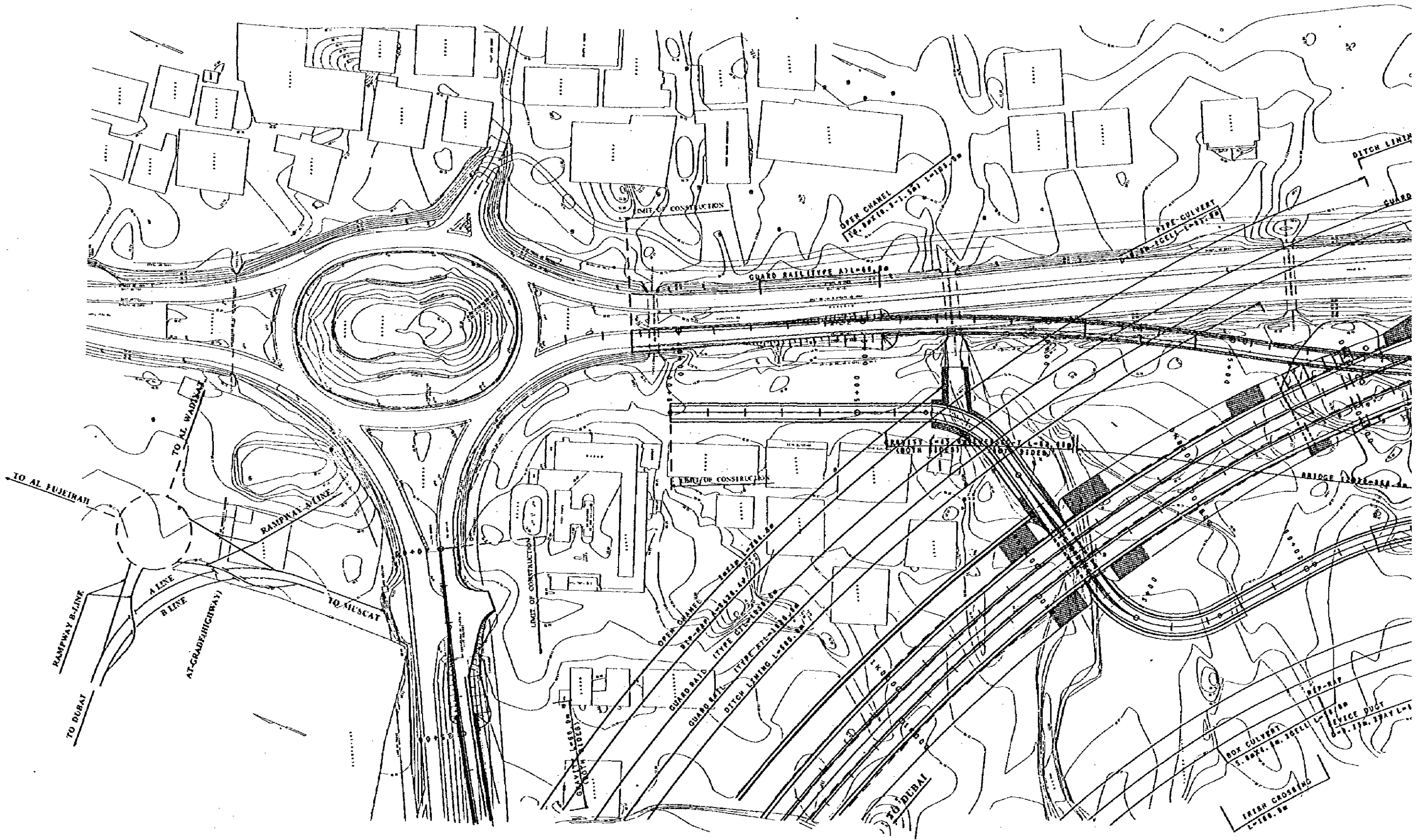


PLAN S 1:2000

INO AT WADI SPREAD AREA EXCEPTING RIGHT-OF-WAY THIS PROJECT.

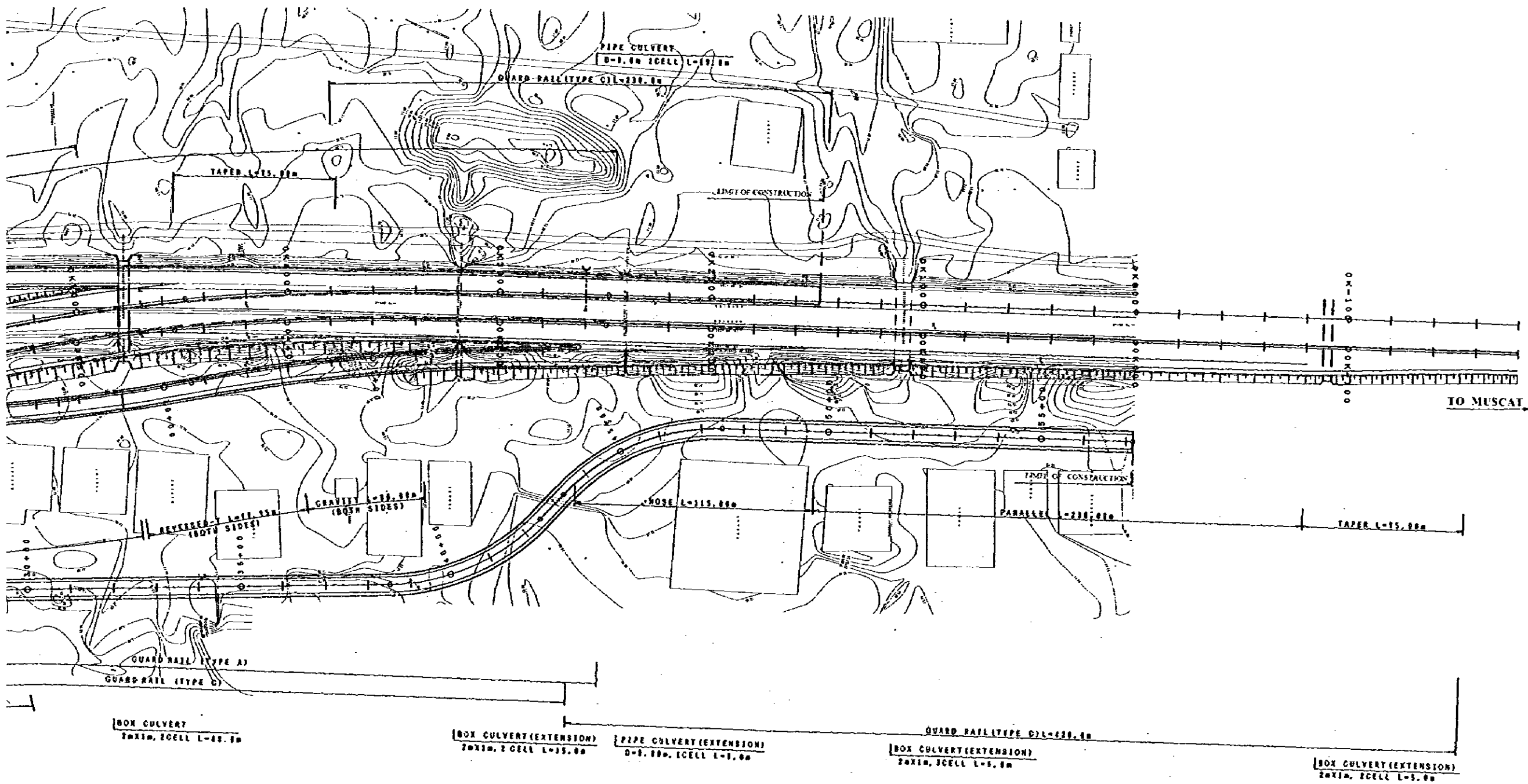
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)
JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT:	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE:	RA/18 AQR PLAN (2/3)
DATE:	DWGNO. R-6



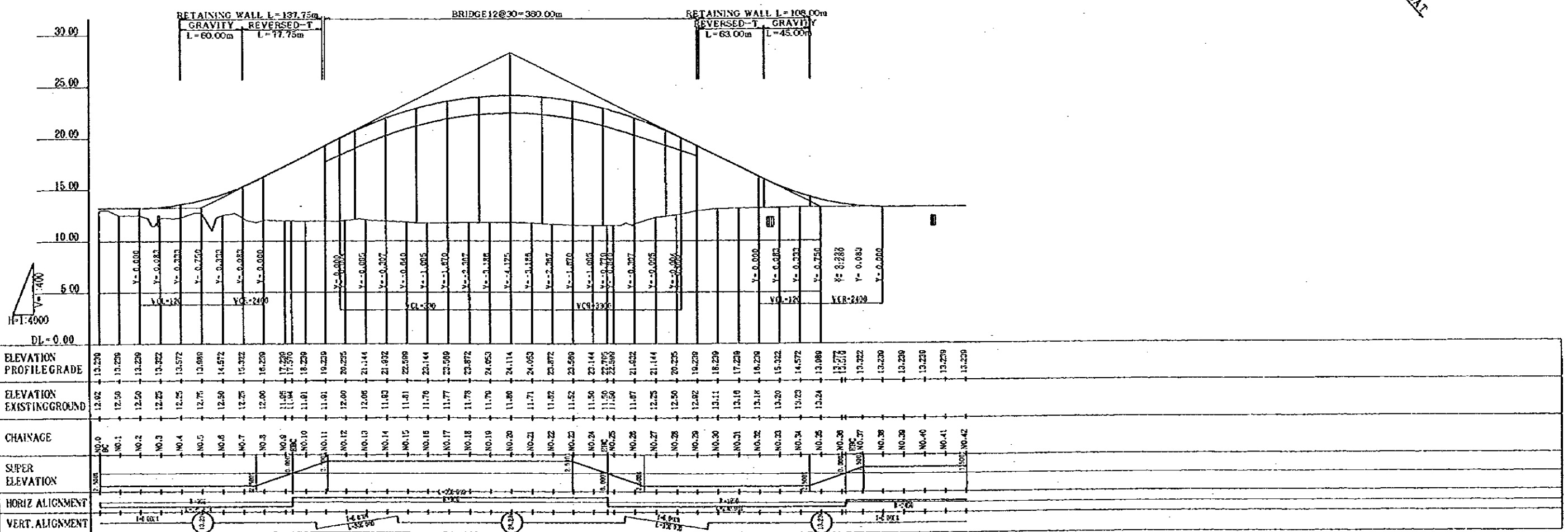
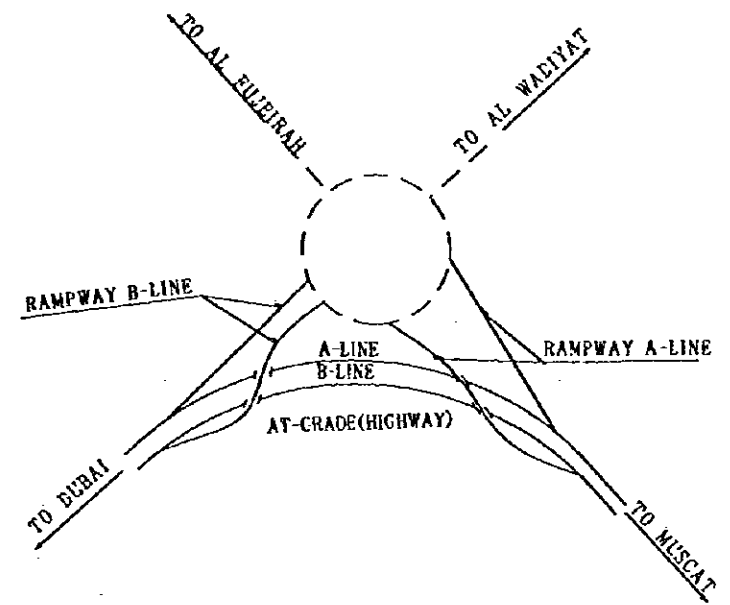
NOTES:

(1) SHADED REGION REPRESENTS FILLING AT WADI SPREAD AREA EXCEPTING RIGHT-OF-WAY WHICH IS OUT OF SCOPE UNDER THIS PROJECT.



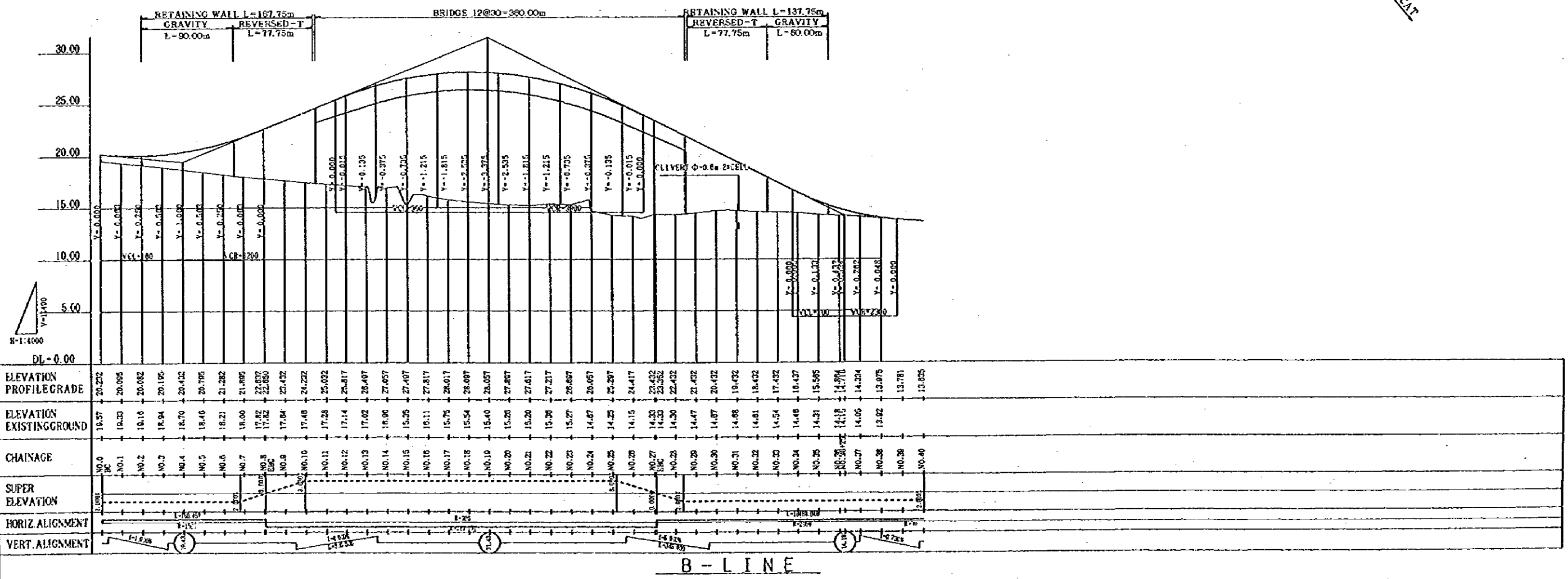
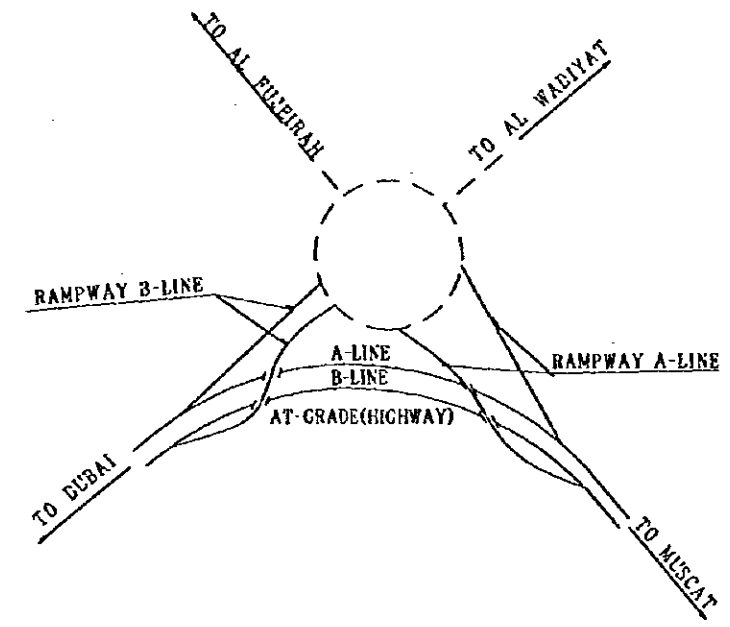
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JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE RA/18 AQR PLAN (3/3)	
	DATE	DWGNO. R-7

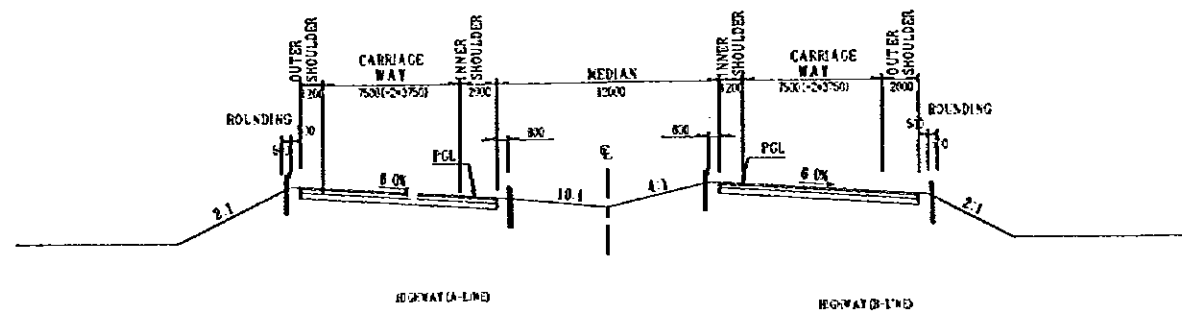


A - LINE

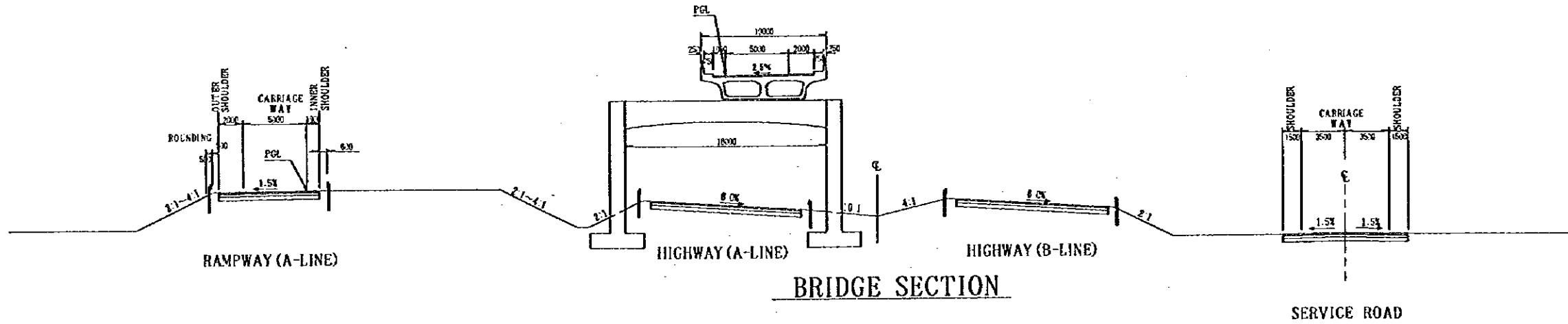
NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
			TITLE RA/18 AQR PROFILE-RAMPWAY (A:MUSCAT-AQR)	
			DATE	DWGNO. R-9



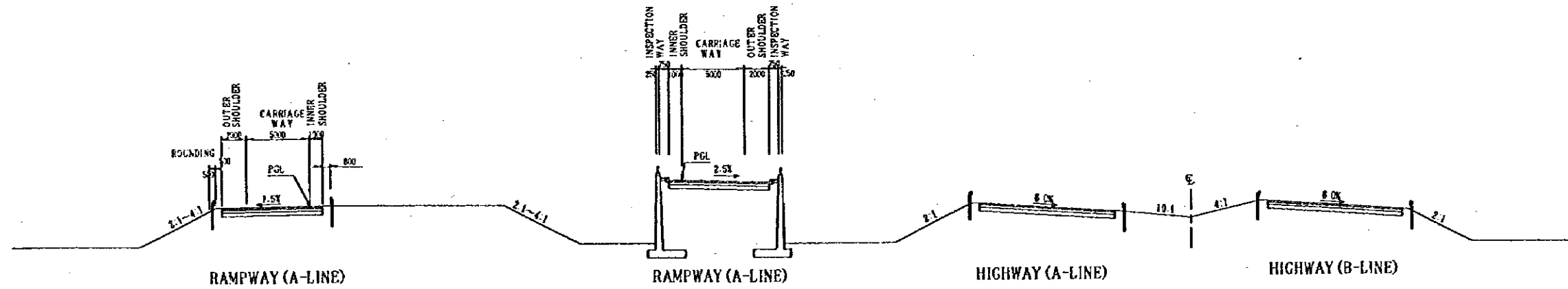
NOTES:	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	JICA STUDY TEAM		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	PACIFIC CONSULTANTS INTERNATIONAL		TITLE: RA/18 AQR PROFILE-RAMPWAY (B:DUBAI-AQR)
	FUKUYAMA CONSULTANTS INTERNATIONAL		DATE: _____ DWGNO. R-10



AT-GRADE SECTION



BRIDGE SECTION

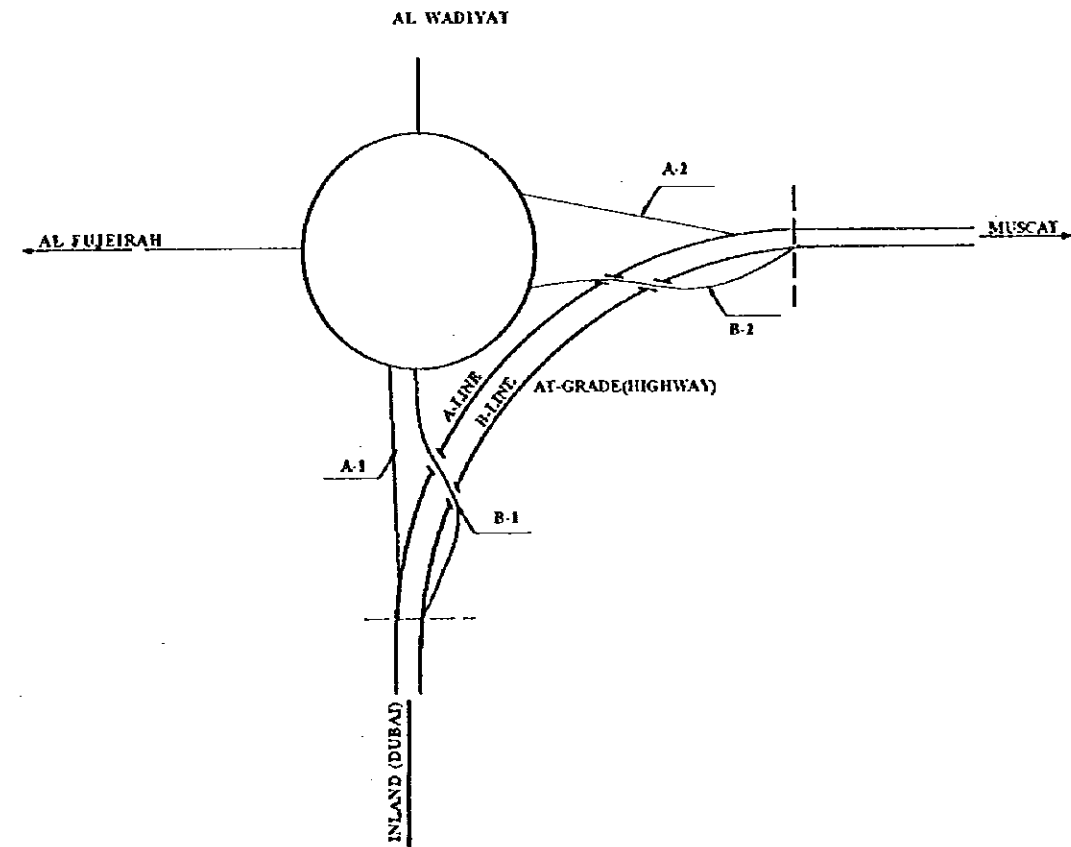
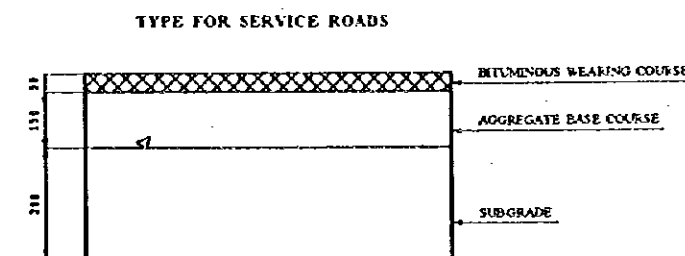
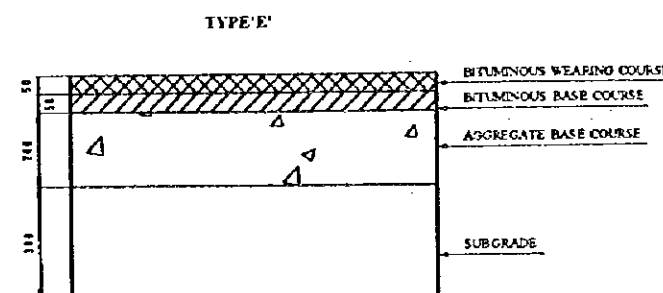
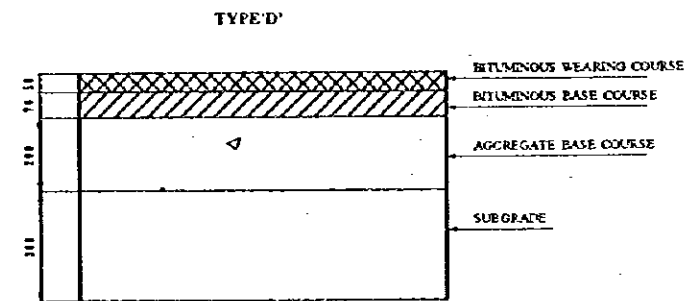
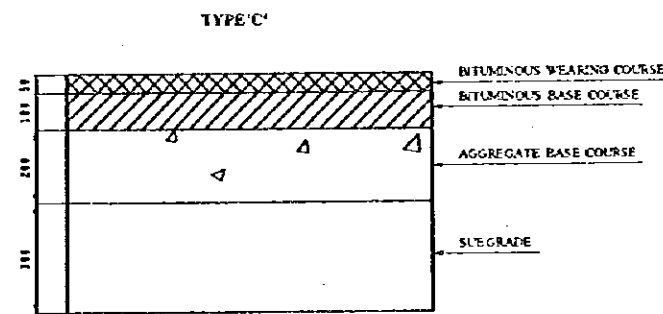
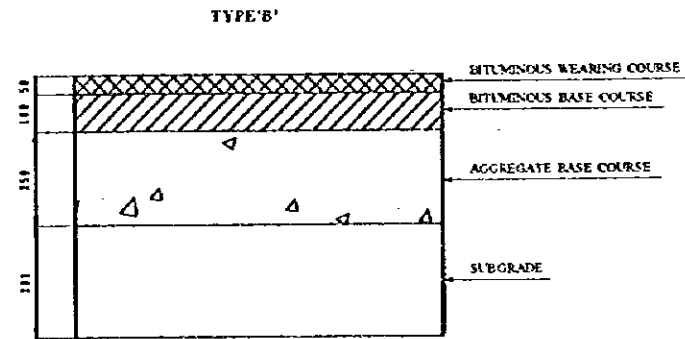
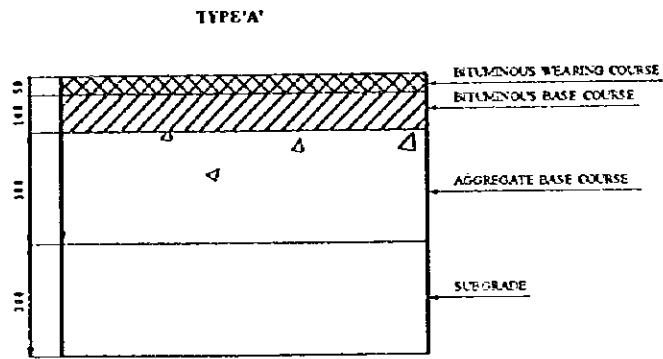


RETAINING WALL SECTION

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

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/18 AQR TYPICAL CROSS SECTION
 DATE :
 DWG NO. : R-11



CLASSIFICATION OF PAVEMENT STRUCTURE

HIGHWAY			ROUNDBOUT	RAMPWAY				CROSSROAD	
DUBAI	MUSCAT	AT-GRADE		A-1	B-1	A-2	B-2	INLAND	COAST
D	C	D	--	E	E	D	D	--	--

NOTES:

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

JAPAN INTERNATIONAL COOPERATION AGENCY

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FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

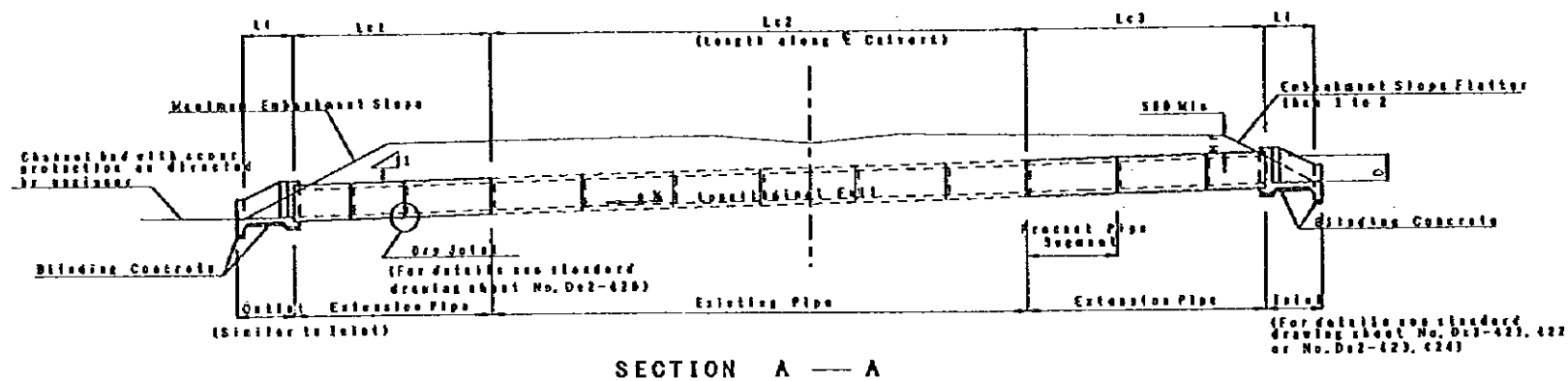
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY

TITLE: RA/18 AQR PAVEMENT DETAILS

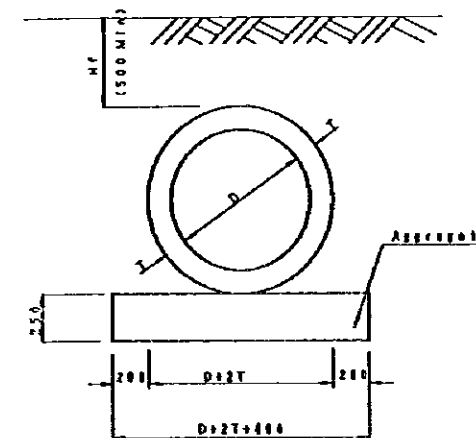
DATE:

DWG NO.:

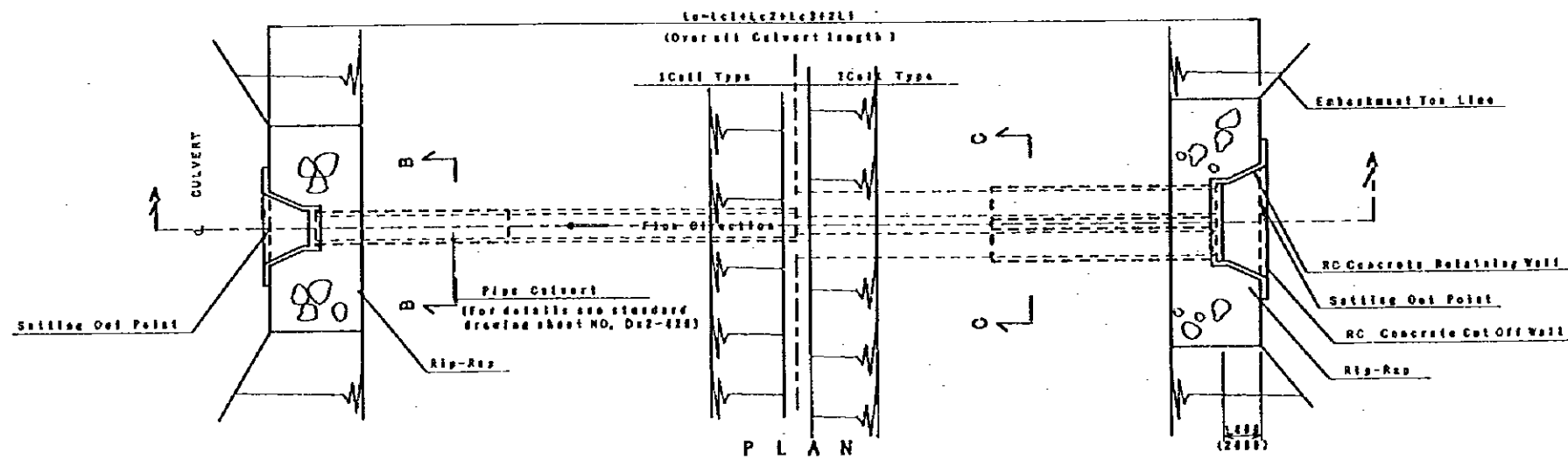
R-12



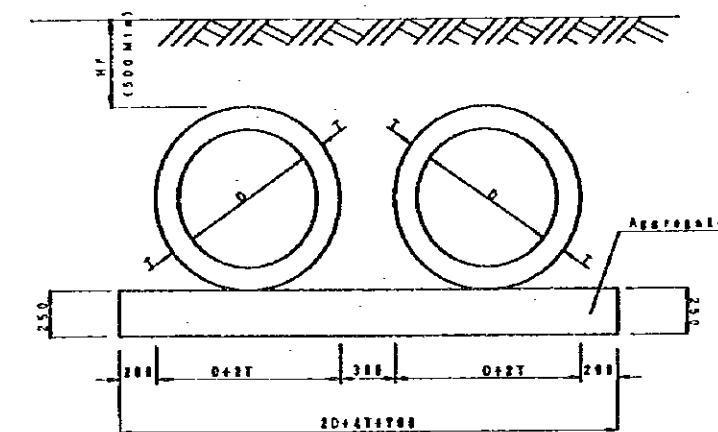
SECTION A — A



SECTION B — B



P L A N



SECTION C — C

LIST OF PIPE CULVERT

STA	APR LINE	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL: m	LENGTH (m)	REMARK
0K240.0	B	φ0.90x1CELL	M	0.19%	9.0	Extension
1K516.5	A.B	φ0.60x2CELL	M	1.03%	5.0+4.5 9.5	Extension
31+2.0	B RAMP	φ0.60x2CELL	M	1.30%	1.0	Extension

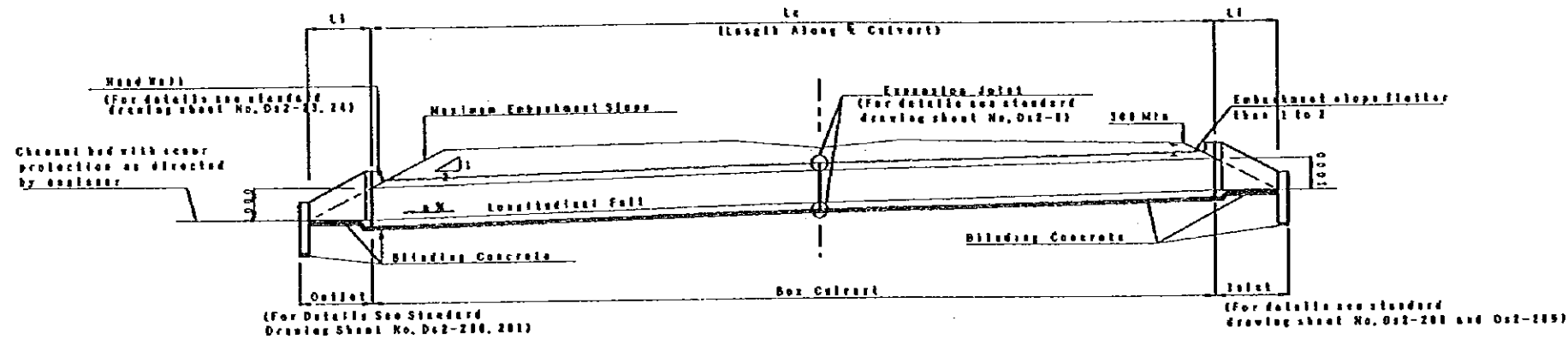
NOTES:

- (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.

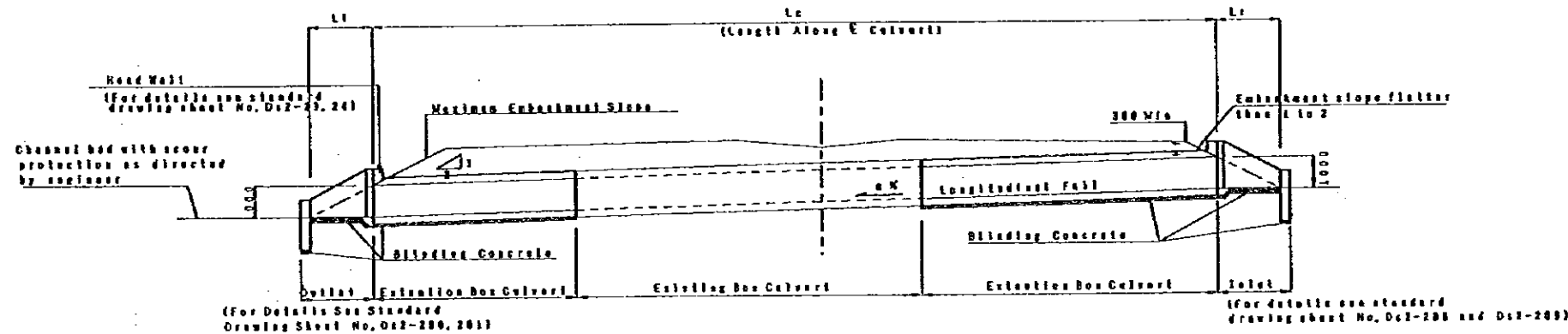
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

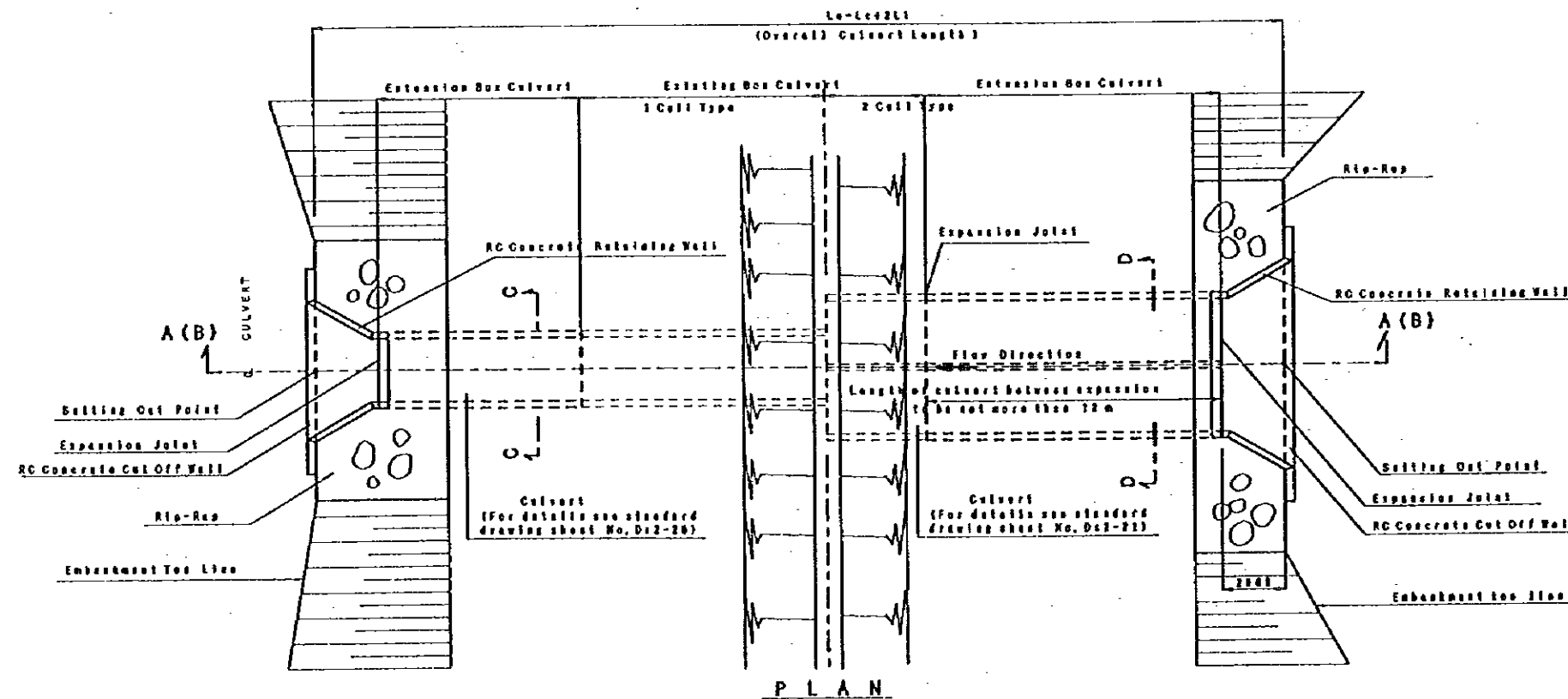
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/18 AQR DRAINAGE STRUCTURE (1/4)
DATE: _____ DWG NO.: R-13



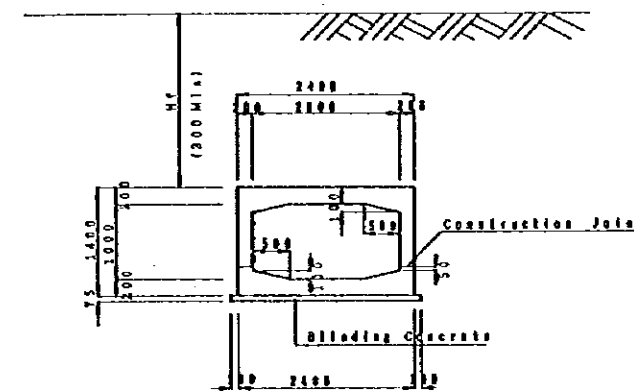
SECTION A - A



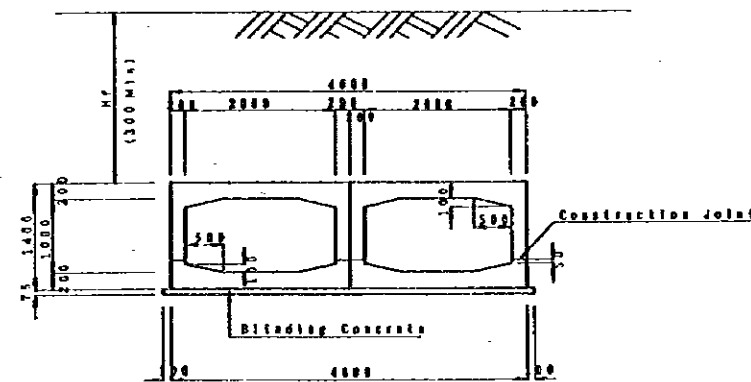
SECTION B - B



PLAN



SECTION C - C



SECTION D - D

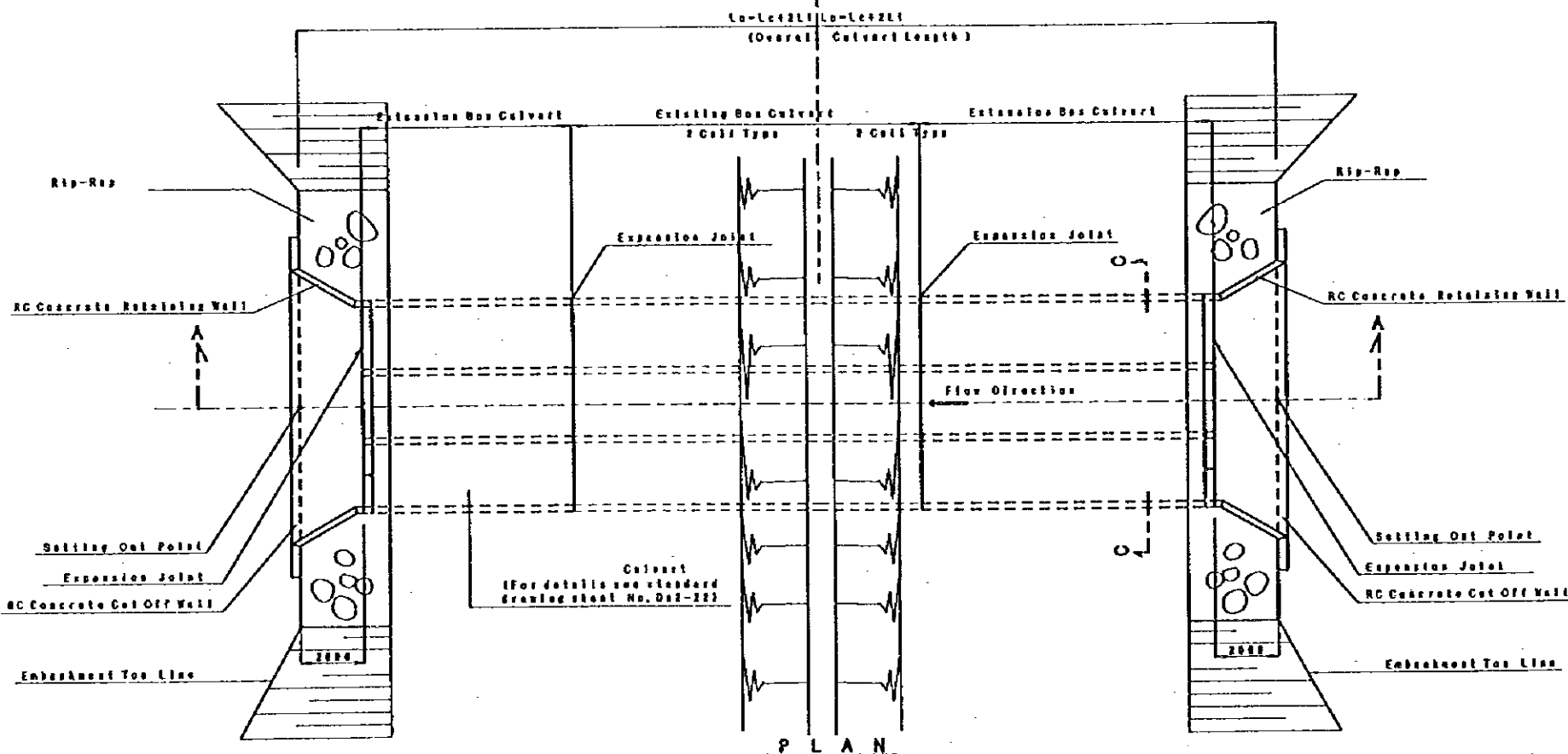
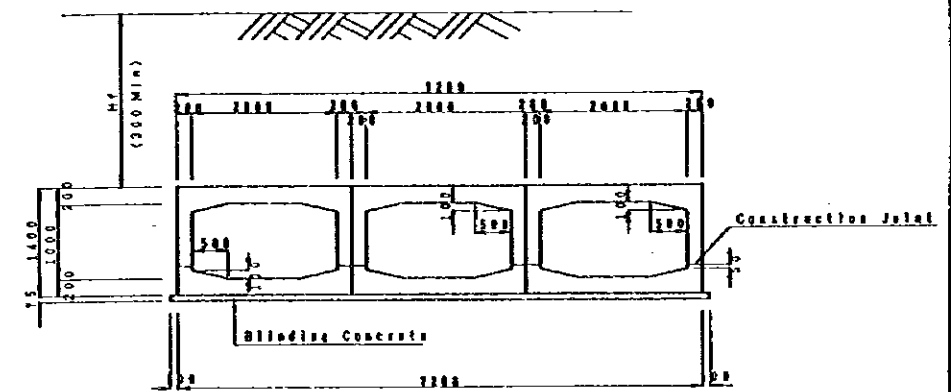
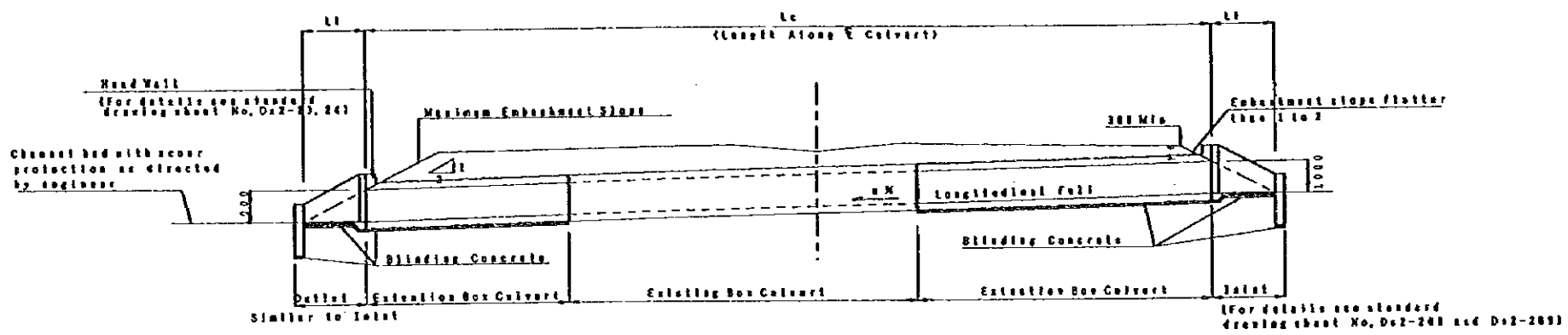
LIST OF BOX CULVERT

STA	NO. OF LANE	DIMENSION (m)	LONGITUDINAL FALL (%)	LENGTH (m)	REMARK
OK-90.0	B	2.0x1.0x2CELL	0.66%	5.0	Extension
OK319.0	B	2.0x1.0x1CELL	0.69%	15.0	Extension
OK476.5	A,B	2.0x1.0x2CELL	1.05%	48.0	New Construction
OK709.0	A,B	2.0x1.0x2CELL	1.04%	41.0	New Construction

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

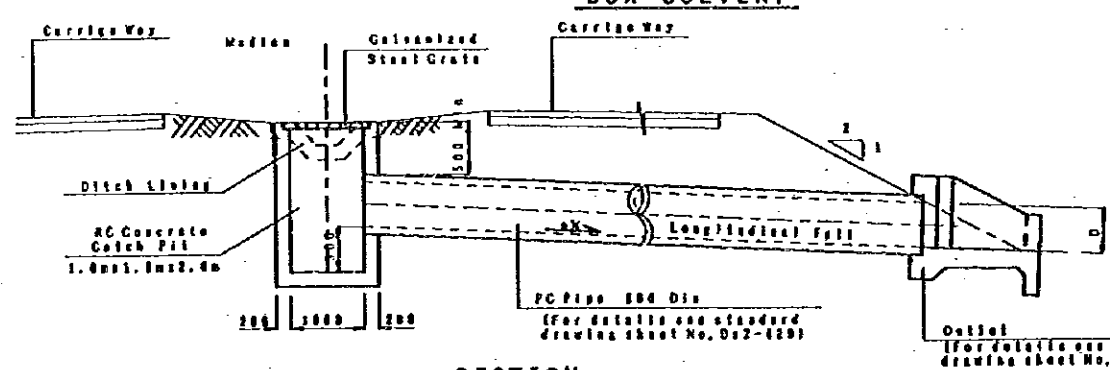
JAPAN INTERNATIONAL COOPERATION AGENCY
 (JICA)
 JICA STUDY TEAM
 PACIFIC CONSULTANTS INTERNATIONAL
 FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
 PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
 TITLE: RA/18 AQR DRAINAGE STRUCTURE (2/4)
 DATE: DWG NO.: R-14



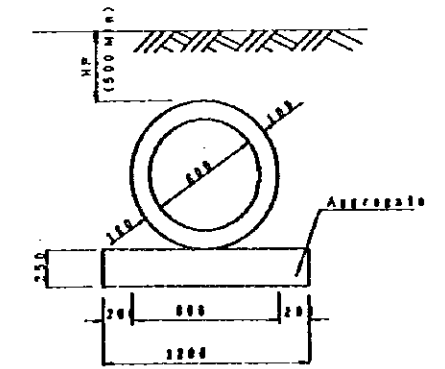
LIST OF BOX CULVERT

STA	A or B LINE	DIMENSION (m)	LONGITUDINAL FALL: %	LENGTH (m)	REMARK
OK110.0	B	2.0x1.0x3CELL	0.66%	5.0	Extension



LIST OF DRAIN SYSTEM AT MEDIAN

STA	A or B LINE	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL: %	LENGTH (m)	REMARK
OK290	A	φ0.60x1CELL	M	0.3%	19.0	
OK730	A	φ0.60x1CELL	M	0.3%	23.0	
IK290	B	φ0.60x1CELL	M	0.3%	17.0	
IK720	A	φ0.60x1CELL	M	0.3%	24.5	

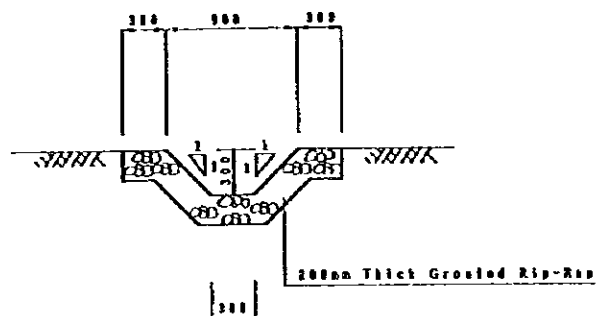


NOTES:

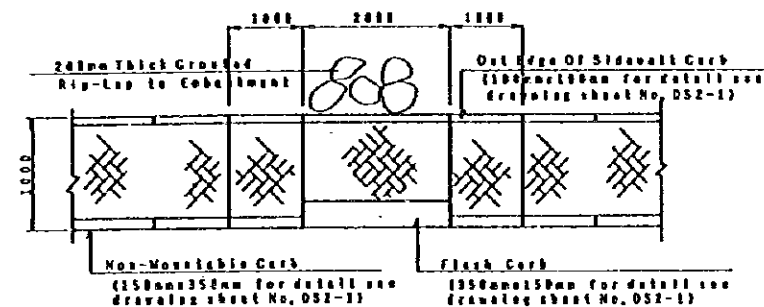
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.

(2) H_f: HEIGHT FROM ABOVE THE CULVERT ROOF TO THE TOP OF PAVEMENT.

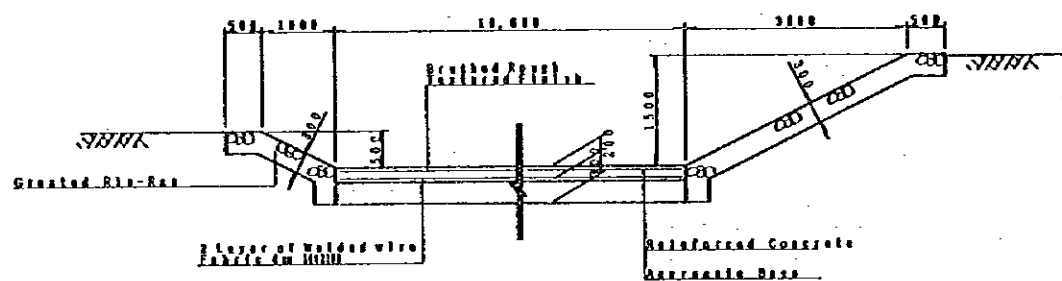
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	TITLE: RA/18 AQR DRAINAGE STRUCTURE (3/4)
	DATE: _____ DWG NO.: R-15



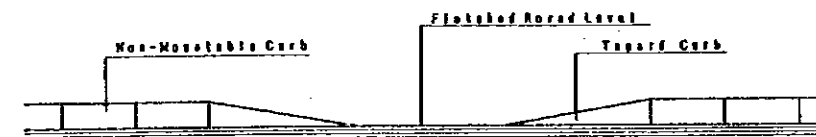
DITCH LINING



P L A N

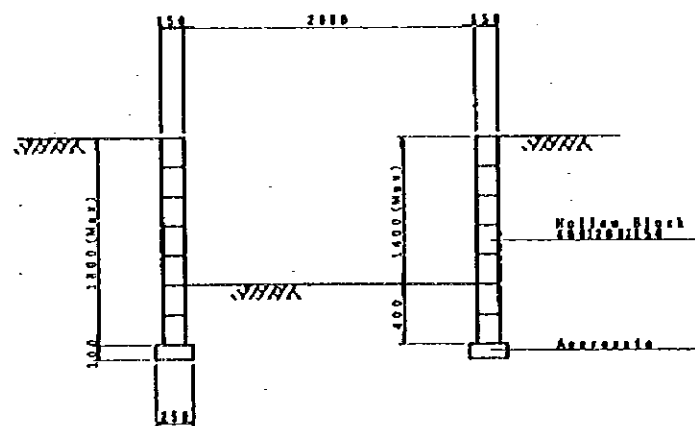


OPEN CHANNEL 1

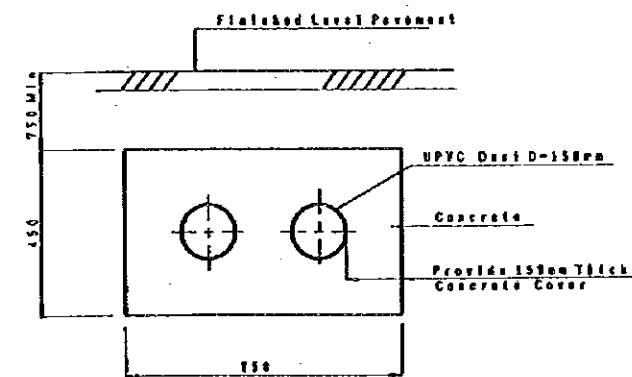


Elevation

DROPPED SIDEWALK



OPEN CHANNEL 2



SECTION

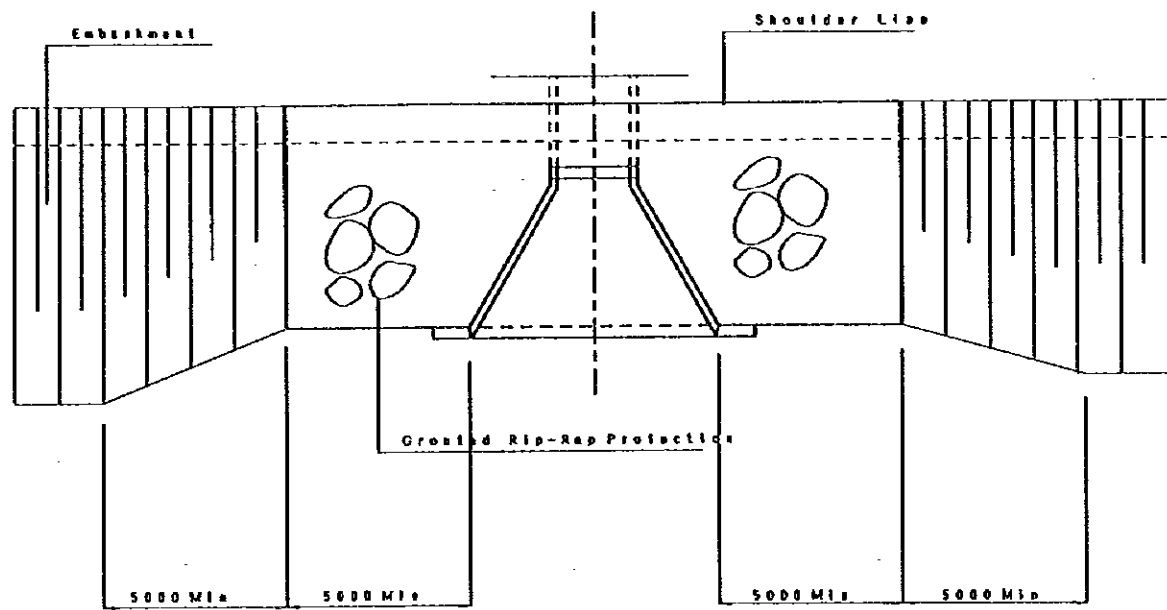
SERVICE DUCTS

NOTES:

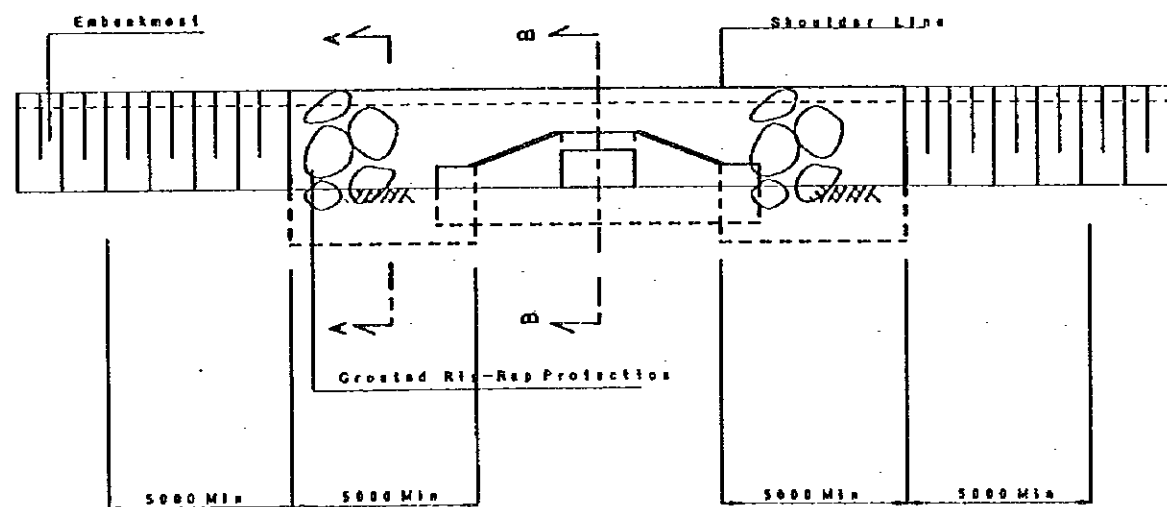
- (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
- (2) THE LONGITUDINAL FALL OF OPEN CHANNEL 1 AND 2 IS 0.5% AND 0.1% RESPECTIVELY.
- (3) THE DROPPED SIDEWALK IS INSTALLED ALONG RAMPWAYS AT AN INTERVAL OF 20m.

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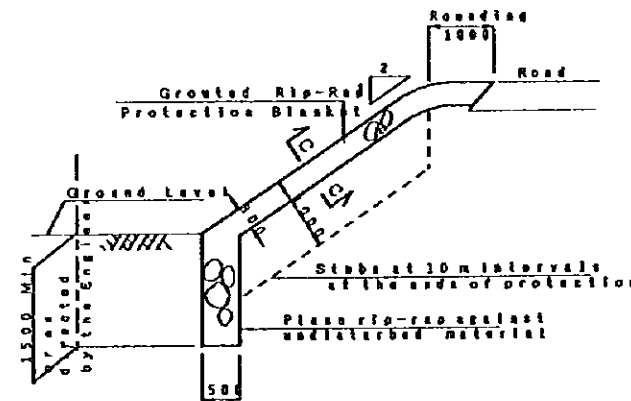
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA18 AQL DRAINAGE STRUCTURE(4/4)SERVICE AND DUCTS
DATE: DWG NO.: R-16



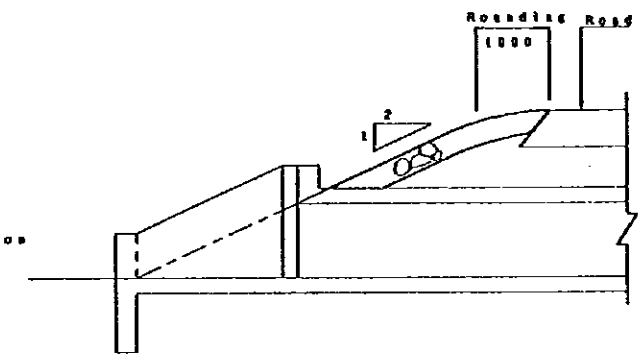
PLAN



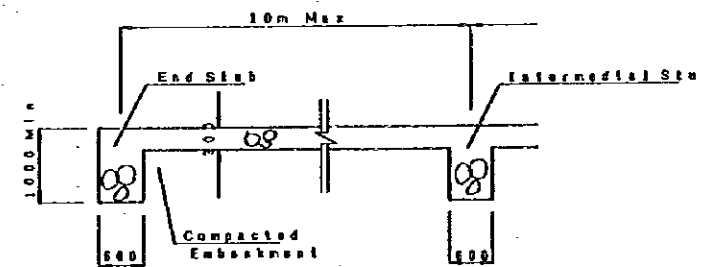
FRONT VIEW



SECTION A - A



SECTION B - B



SECTION C - C

NOTES:

- (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
- (2) CONCRETE LAYER OF THICKNESS 150mm IS PROVIDED UNDER THE RIP-RAP WITH SHARP GRADE (1:2 TO 1:1) AT THE GATEWAYS OF CROSSING BOX CULVERT FOR SERVICE ROADS.

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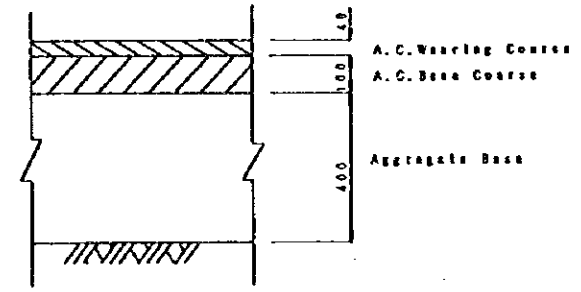
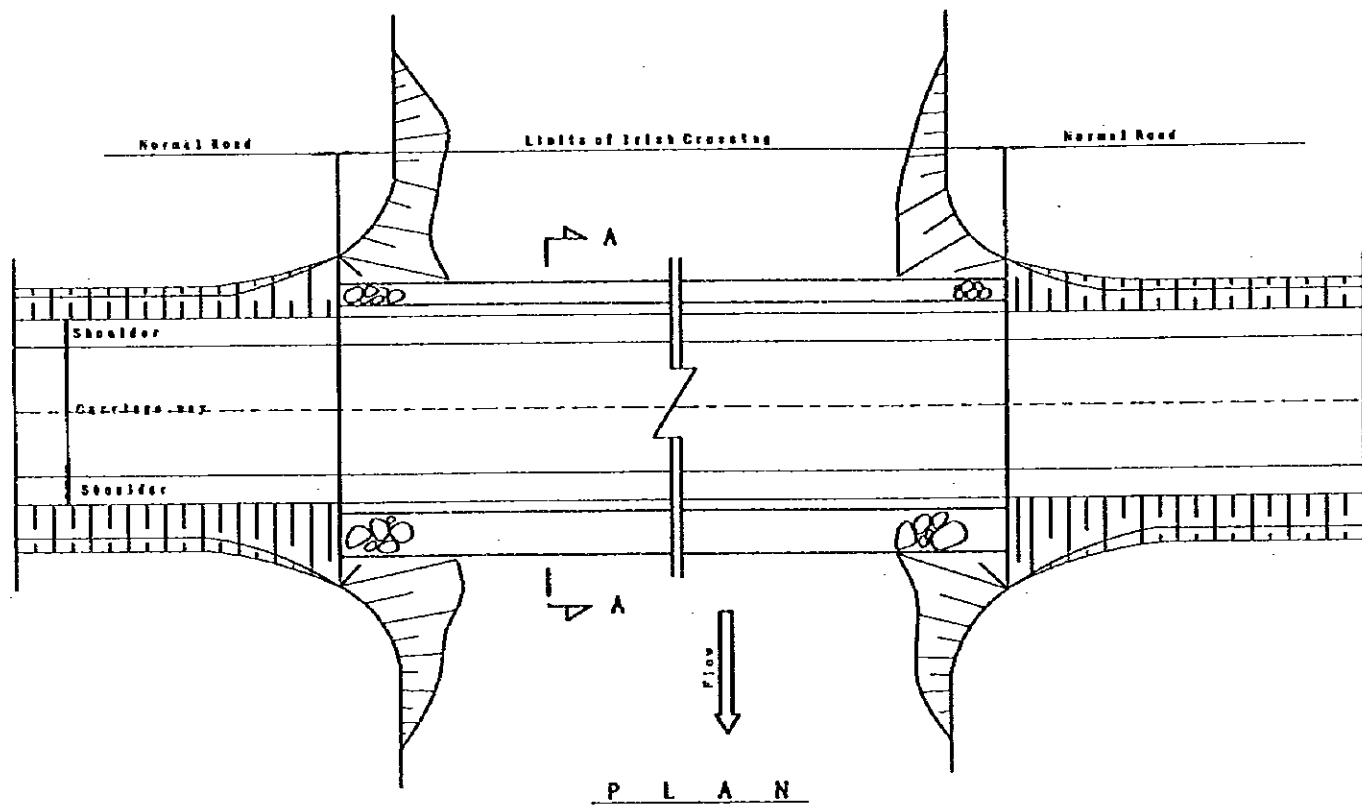
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

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

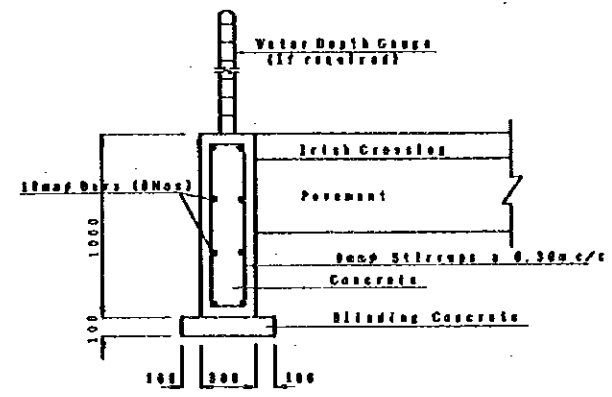
TITLE: RA18 AQR SLOPE PROTECTION

DATE:

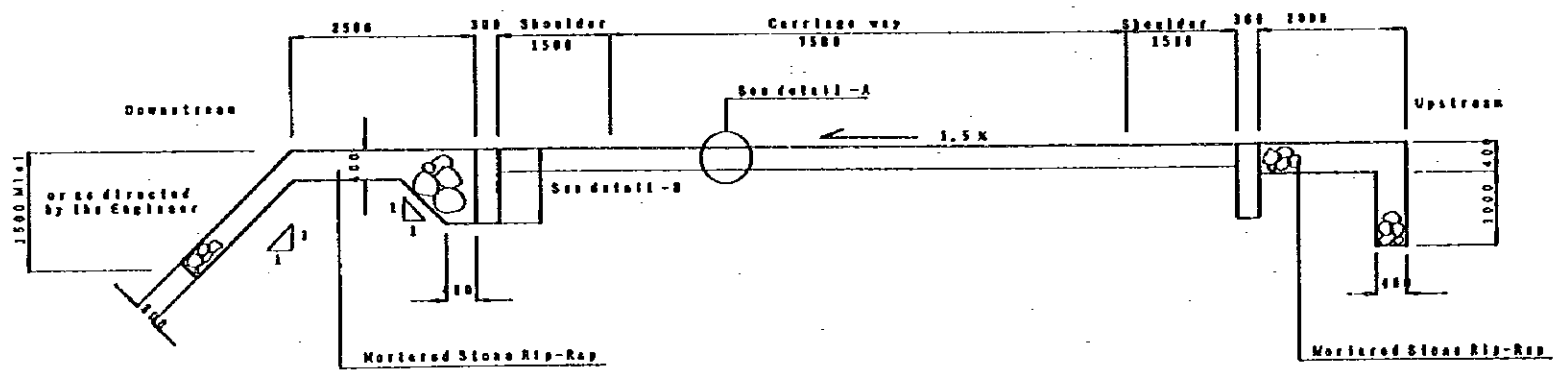
DWG NO.: R-17



PAVEMENT
(Detail-A)



DETAIL OF CUT OFF WALL
(Detail-B)

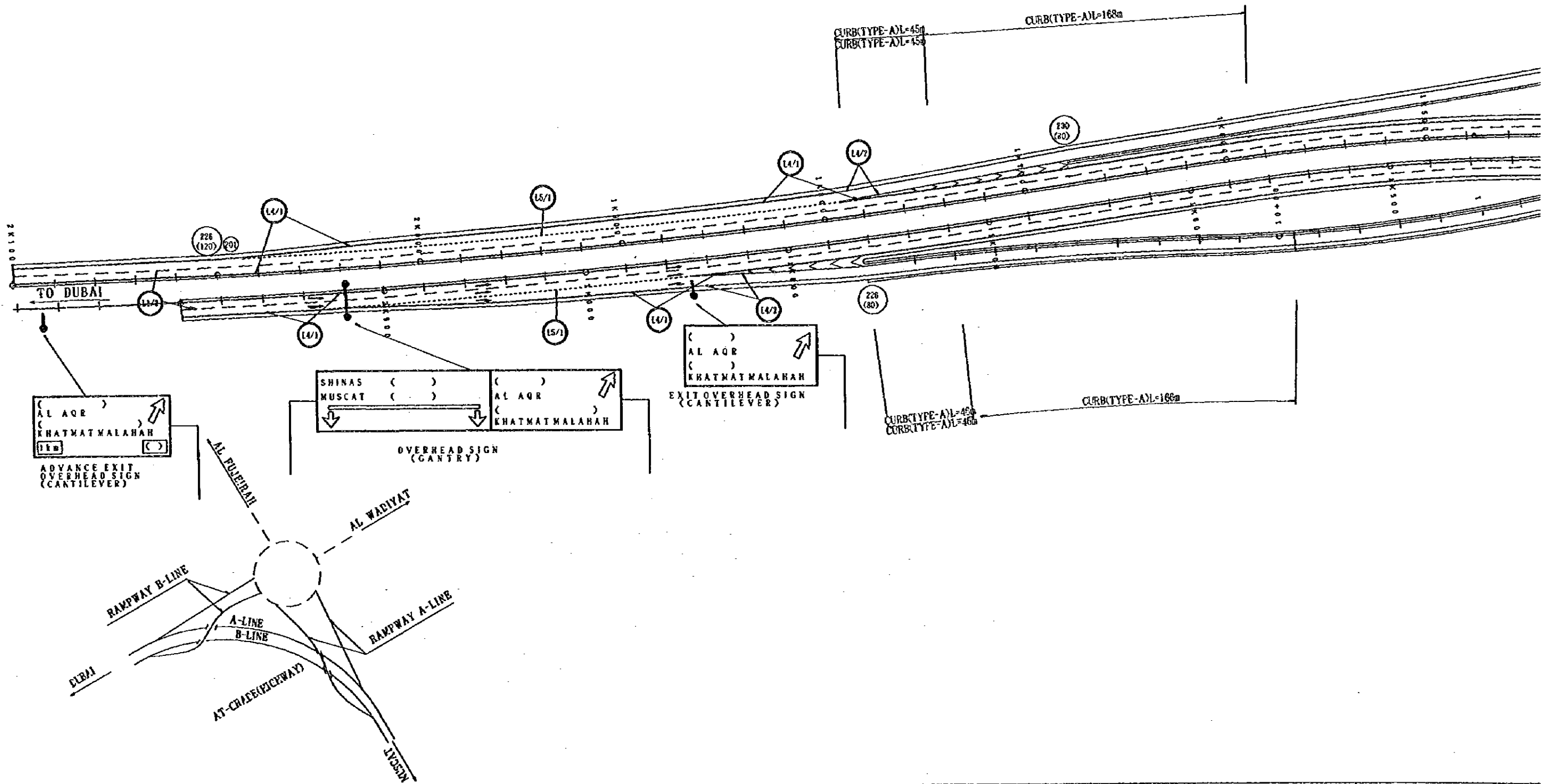


SECTION A - A

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

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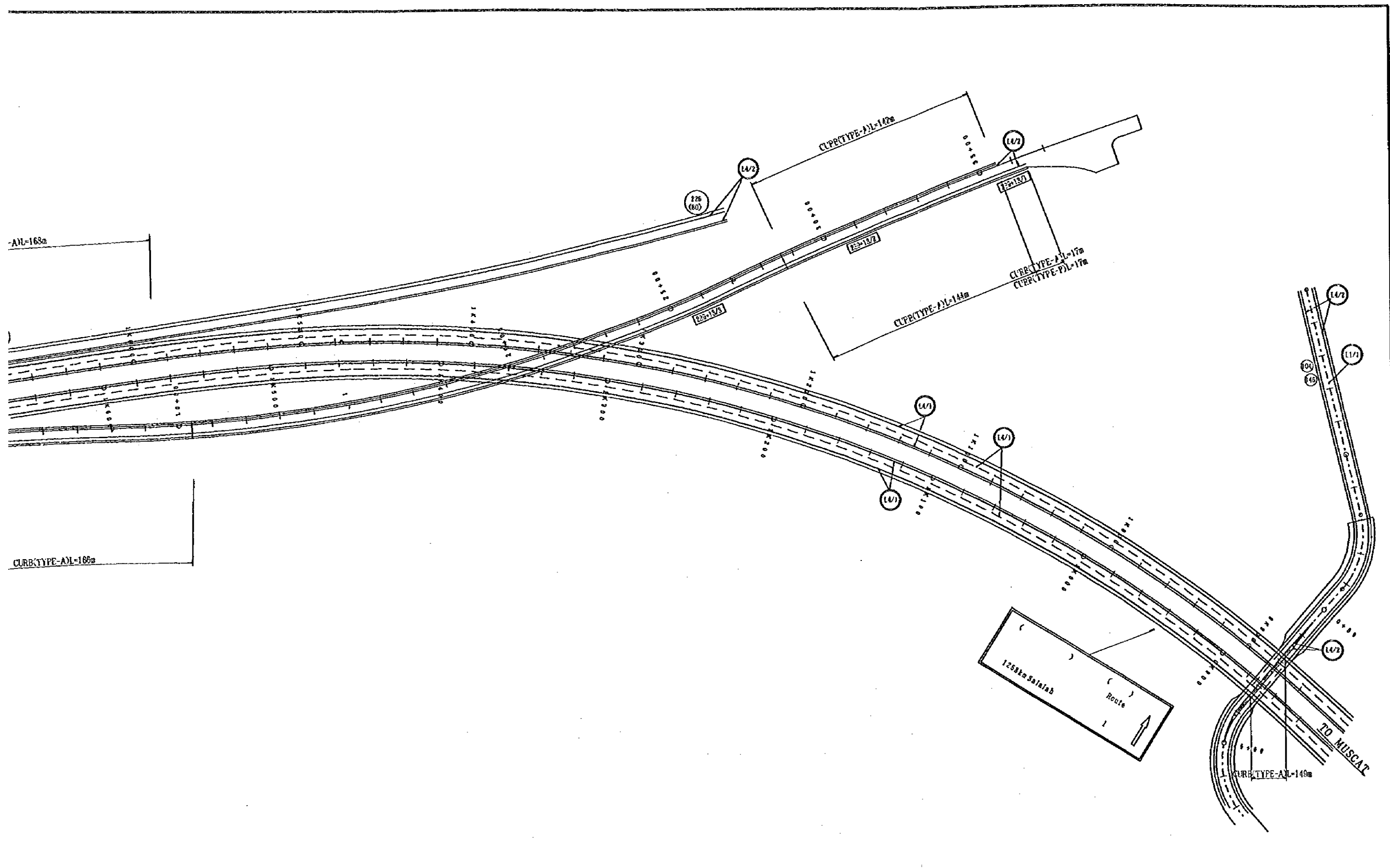
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/18 AQR IRISH CROSSING
DATE: _____ DWG NO.: R-18



NOTES:

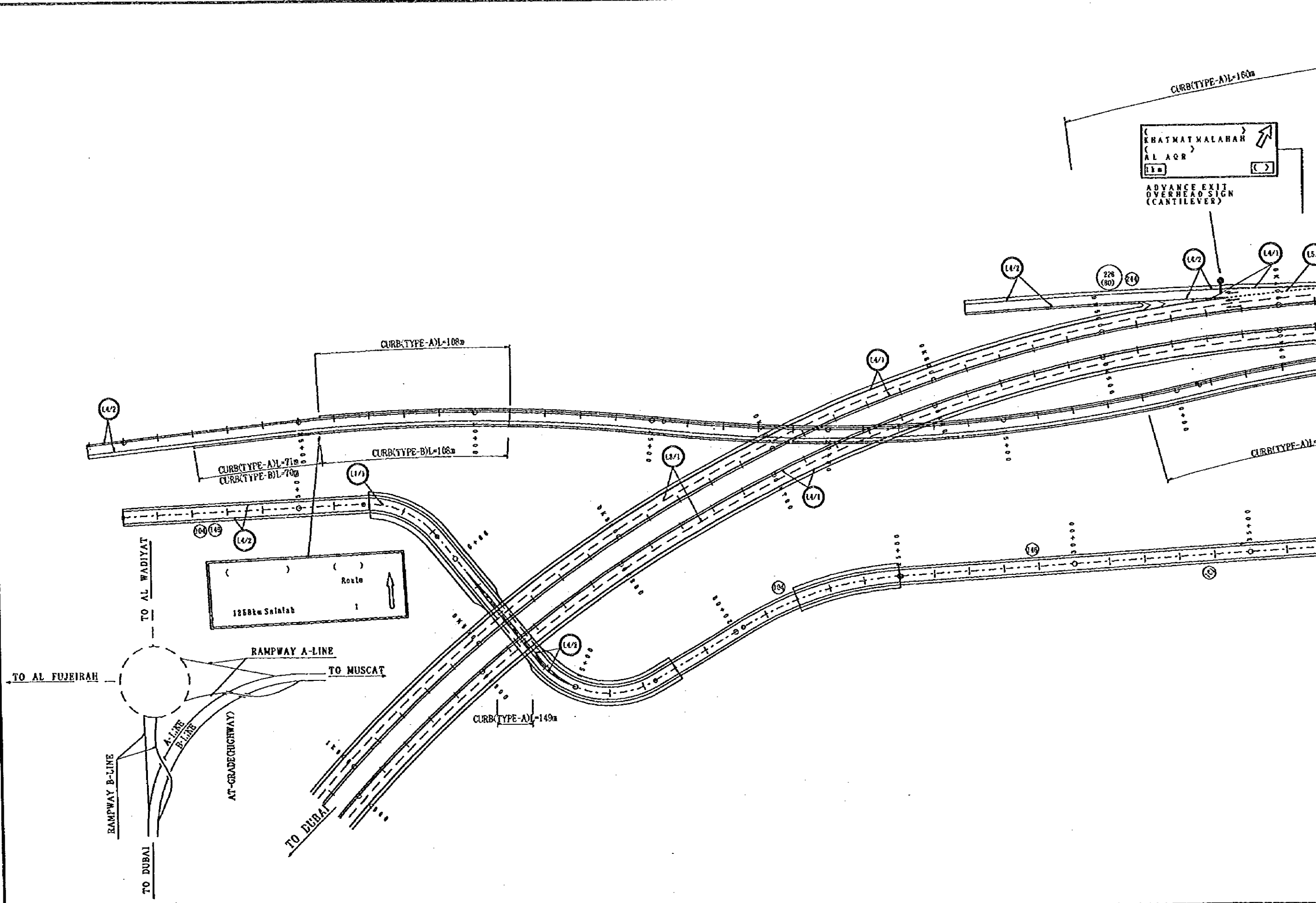
- (1) FOR DETAILS OF ROAD SIGNS, ROAD MARKINGS REFER TO THE HIGHWAY DESIGN MANUAL.
- (2) DIMENSIONS OF CURB TYPE-A AND TYPE-B ARE 150mm x 350mm AND 100mm x 200mm RESPECTIVELY. FOR DETAILS REFER STANDARD DRAWING SHEET NO. SCD2.1
- (3) PAINTING (YELLOW AND BLACK) IS APPLIED TO CURB TYPE-A.
- (4) FOR DETAILS OF INFORMATION SIGNBOARDS CONFIRM WITH 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.



FINALIZED DURING CONSTRUCTION.
 LOCATION 300-1000m AHEAD FROM OVERHEAD SIGN.

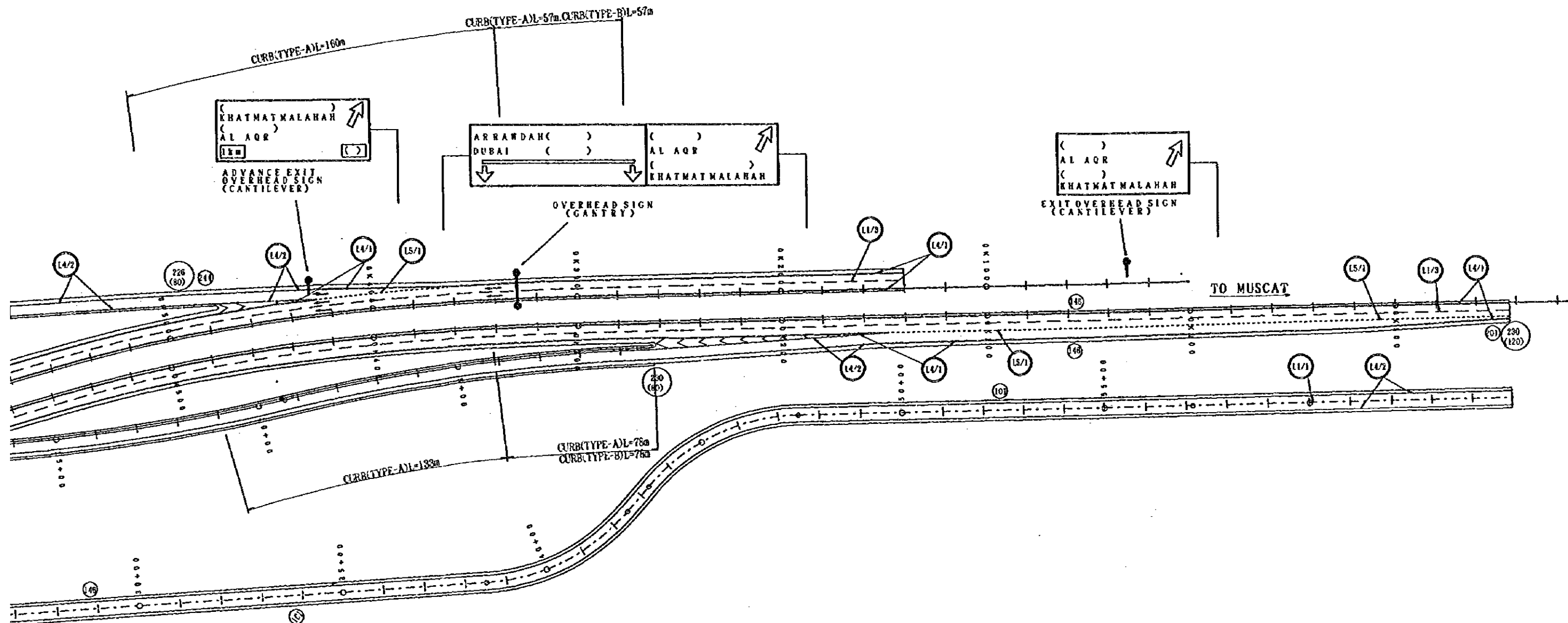
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
	TITLE	RA/18 AQR ROAD MARKING AND TRAFFIC SIGN(1/2)
	DATE	DWGNO. R-19



NOTES:

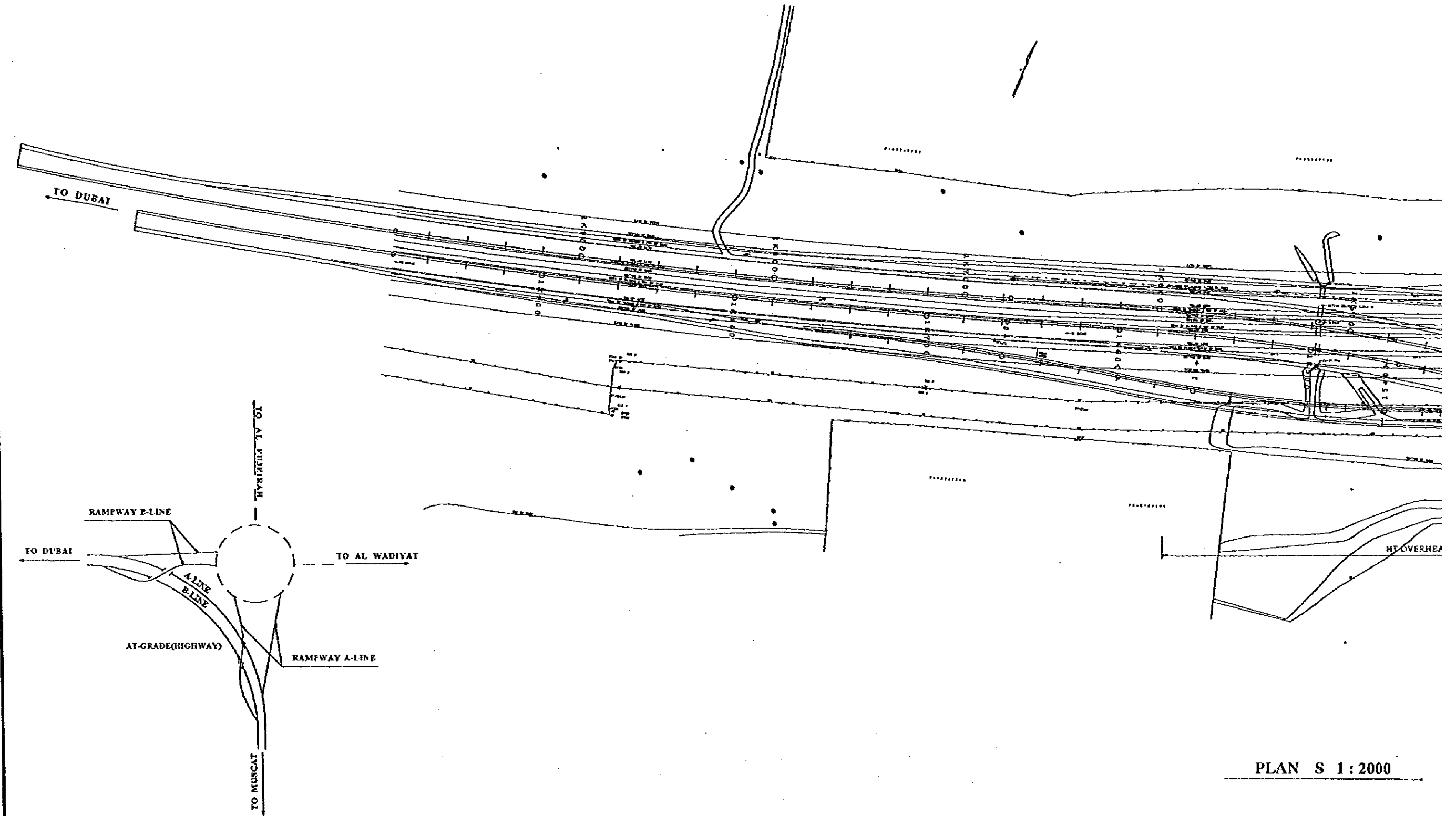
- (1) FOR DETAILS OF ROAD SIGNS, ROAD MARKINGS REFER TO THE HIGHWAY DESIGN MANUAL.
- (2) DIMENSIONS OF CURB TYPE-A AND TYPE-B ARE 150mm x 350mm AND 100mm x 200mm RESPECTIVELY. FOR DETAILS REFER STANDARD DRAWING SHEET NO. SCD 2 I
- (3) PAINTING (YELLOW AND BLACK) IS APPLIED TO CURB TYPE-A.
- (4) FOR DETAILS 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.



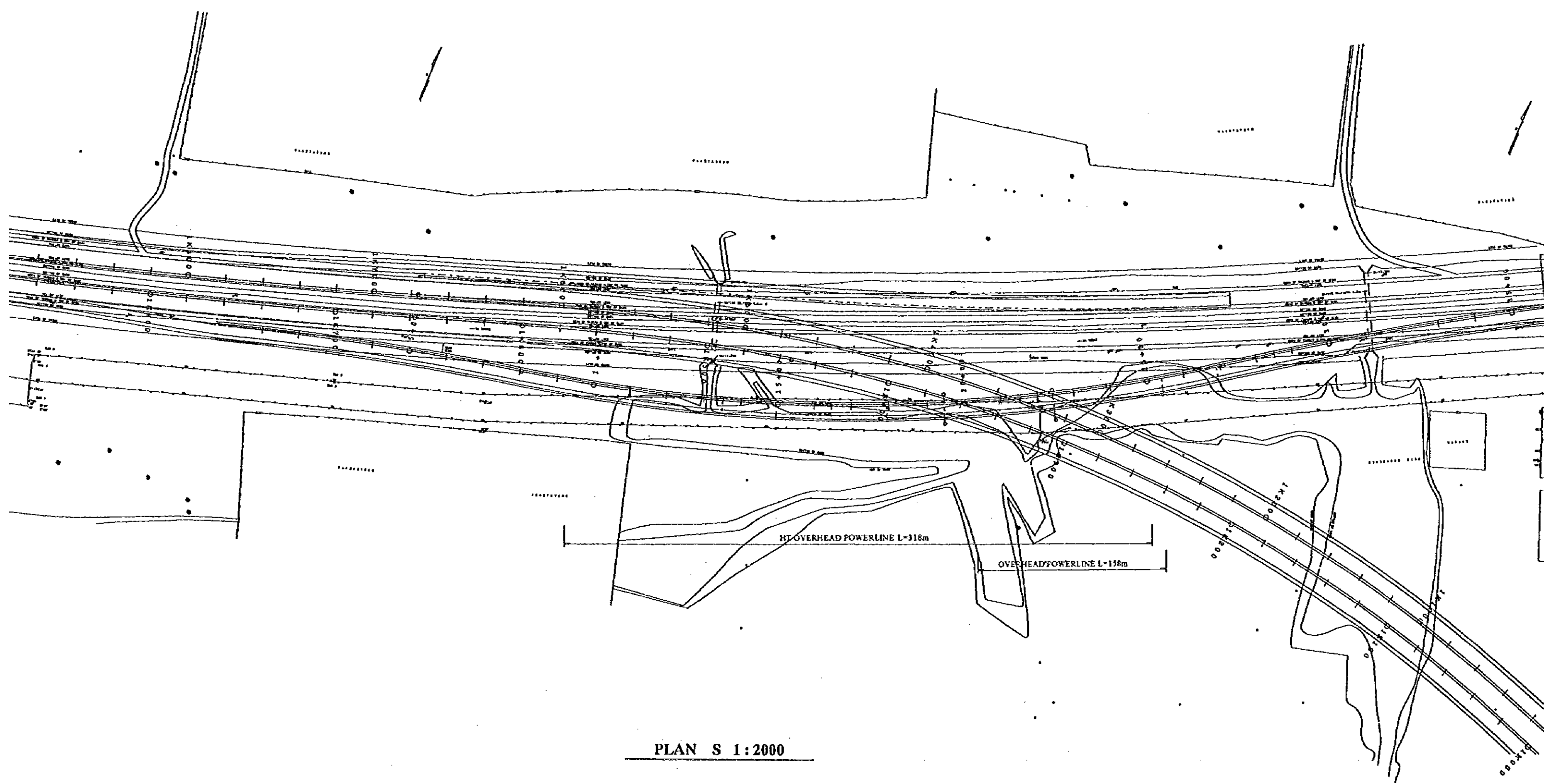
FINALIZED DURING CONSTRUCTION.
LOCATION 300-1000m AHEAD FROM OVERHEAD SIGN.

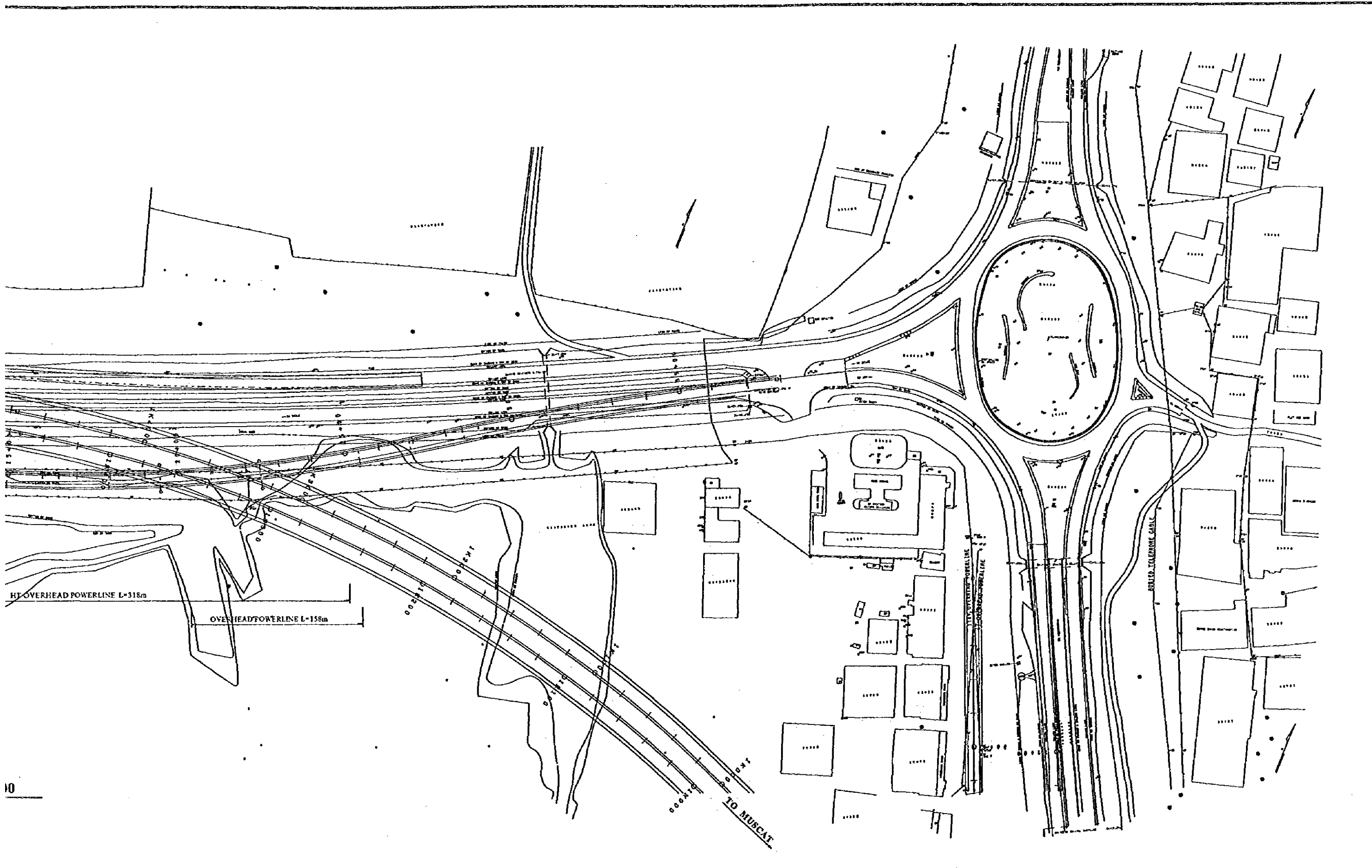
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)		CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL		PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
		TITLE RA/18 AQR ROAD MARKING AND TRAFFIC SIGN (2/2)	
		DATE	DWGNO. R-20



PLAN S 1:2000

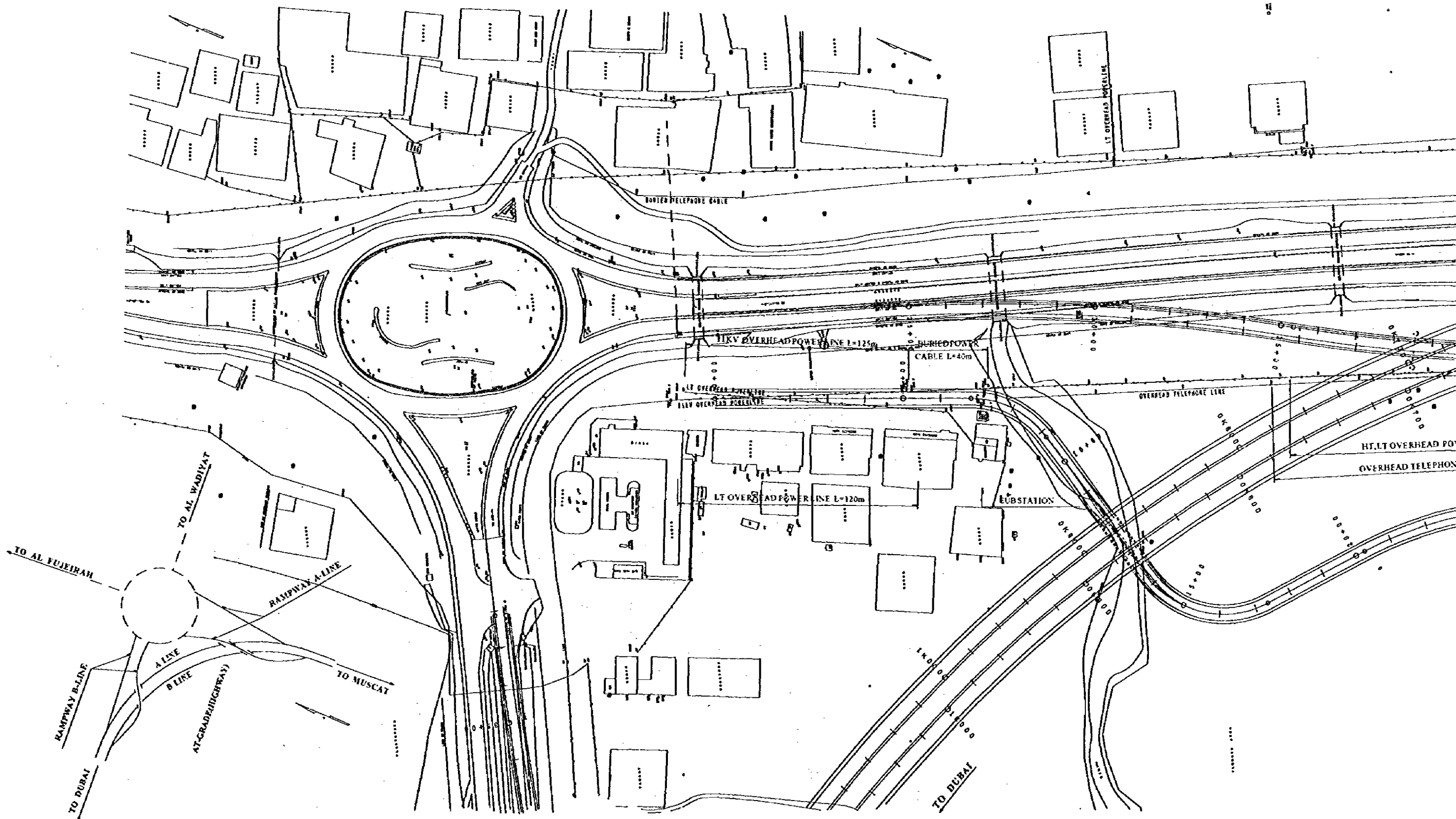
NOTES: (1) SHADED REGION REPRESENTS FILLING AT WADI SPREAD AREA EXCEPTING RIGHT-OF-WAY IS OUT OF SCOPE UNDER THIS PROJECT.



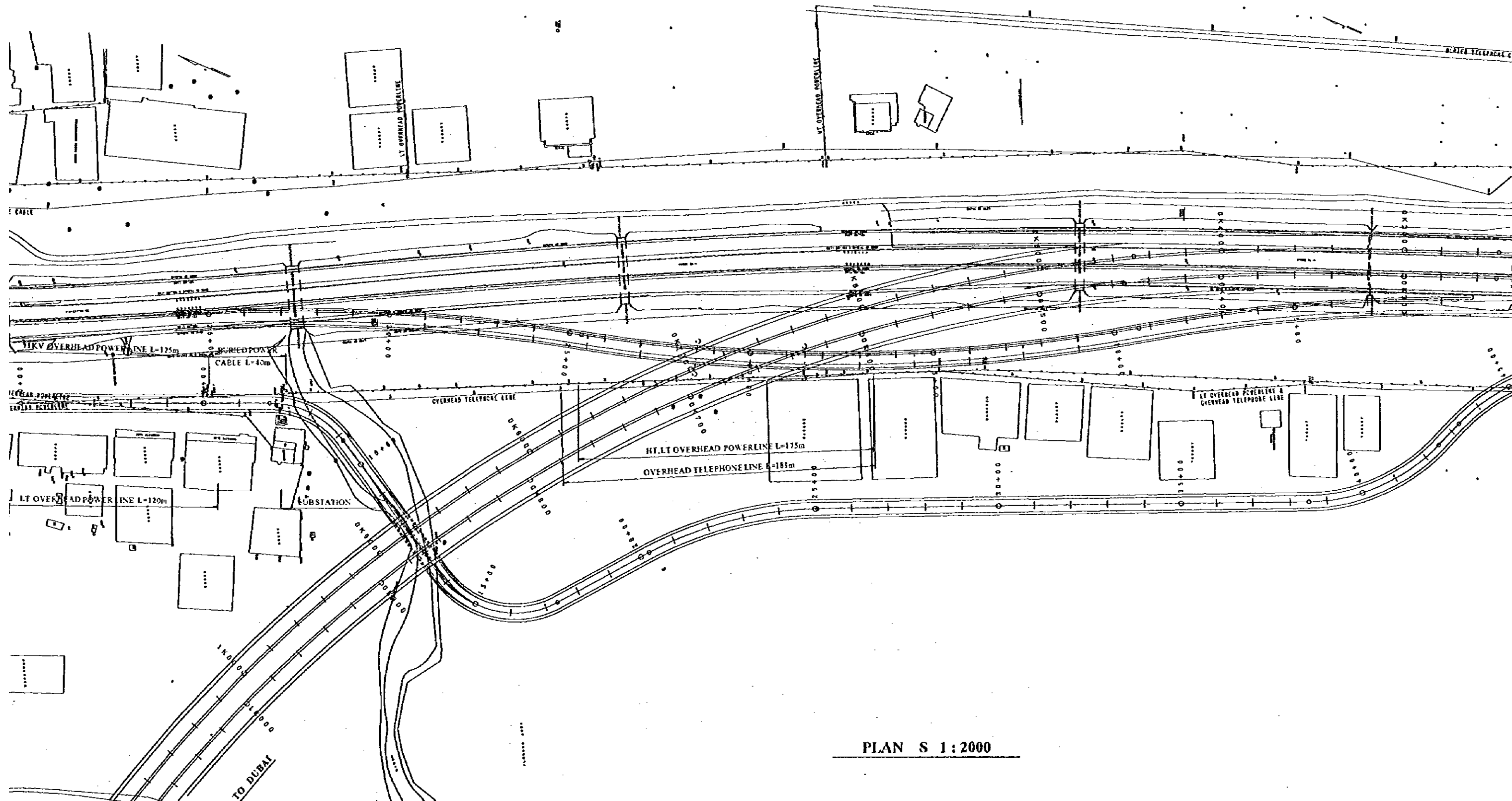


10

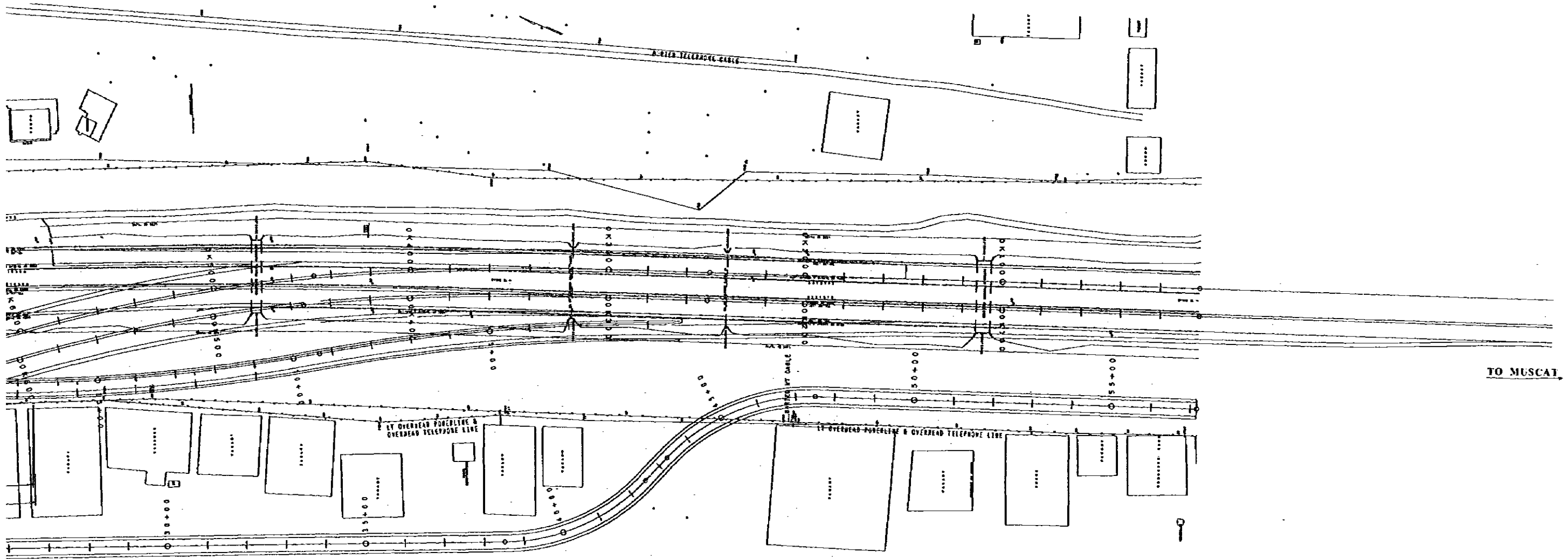
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA) JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
	TITLE: RA/18 AQR REMOVAL & RELOCATION OF UTILITIES (1/2)	
	DATE	DWGNO. R-21



NOTES:



PLAN S 1:2000



PLAN S 1:2000

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CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
TITLE: RA/18 AQR REMOVAL & RELOCATION OF UTILITIES (2/2)	
DATE	DWG. NO. R-22