SULTANATE OF OMAN
MINISTRY OF COMMUNICATIONS
DIRECTORATE GENERAL OF ROADS

CONSTRUCTION OF FLYOVER
AT
FALAJ AL QABAIL ROUNDABOUT
BATINAH HIGHWAY

TENDER DOCUMENT

DRAWINGS

PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

MARCH, 1997

DRAWING SCHEDULE
(F07-R/A14 FALAJ AL QABAIL)

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W-10	Re-bar Arrangement (8)
W-11	Re-bar Arrangement (9)
W-12	Re-bar Arrangement (10)
W-13	Re-bar Arrangement (11)
W-14	Re-bar Arrangement (12)
W-15	Re-bar Arrangement (13)
W-16	Re-bar Arrangement (14)
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W-24	Re-bar Arrangement (3)
W-25	Re-bar Arrangement (4)
W-26	Re-bar Arrangement (5)
W-27	Re-bar Arrangement (6)
W-28	Re-bar Arrangement (7)
W-29	Re-bar Arrangement (8)
W-30	Re-bar Arrangement (9)
W-31	Re-bar Arrangement (10)
W-32	Re-bar Arrangement (11)
W-33	Re-bar Arrangement (12)
W-34	Re-bar Arrangement (13)
W-35	Re-bar Arrangement (14)
W-36	Re-bar Arrangement (15)
W-37	Re-bar Arrangement (16)
W-38	Re-bar Arrangement (17)
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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)	Characterictic 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 defonned 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:

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 (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

460300E

2702300N

2702100N

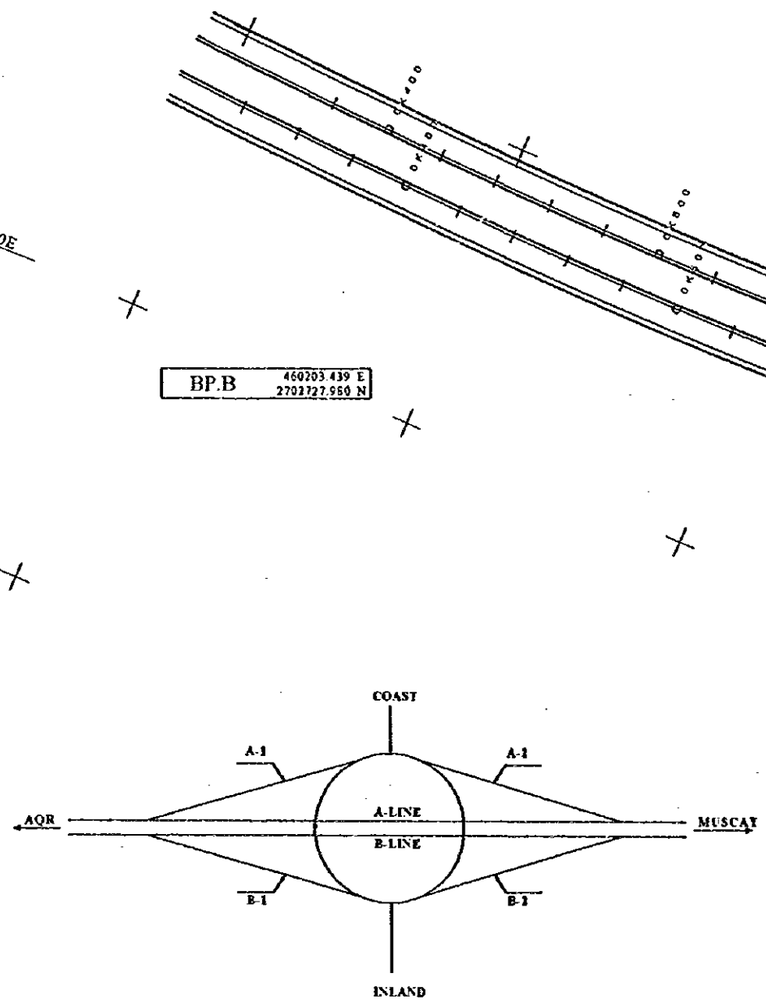
460500E

2701900N

BP.A 460217.780 E 2702726.671 N

460100E

BP.B 460203.439 E 2702727.950 N



2702100N

2701900N

460100E

2701700N

NOTES:

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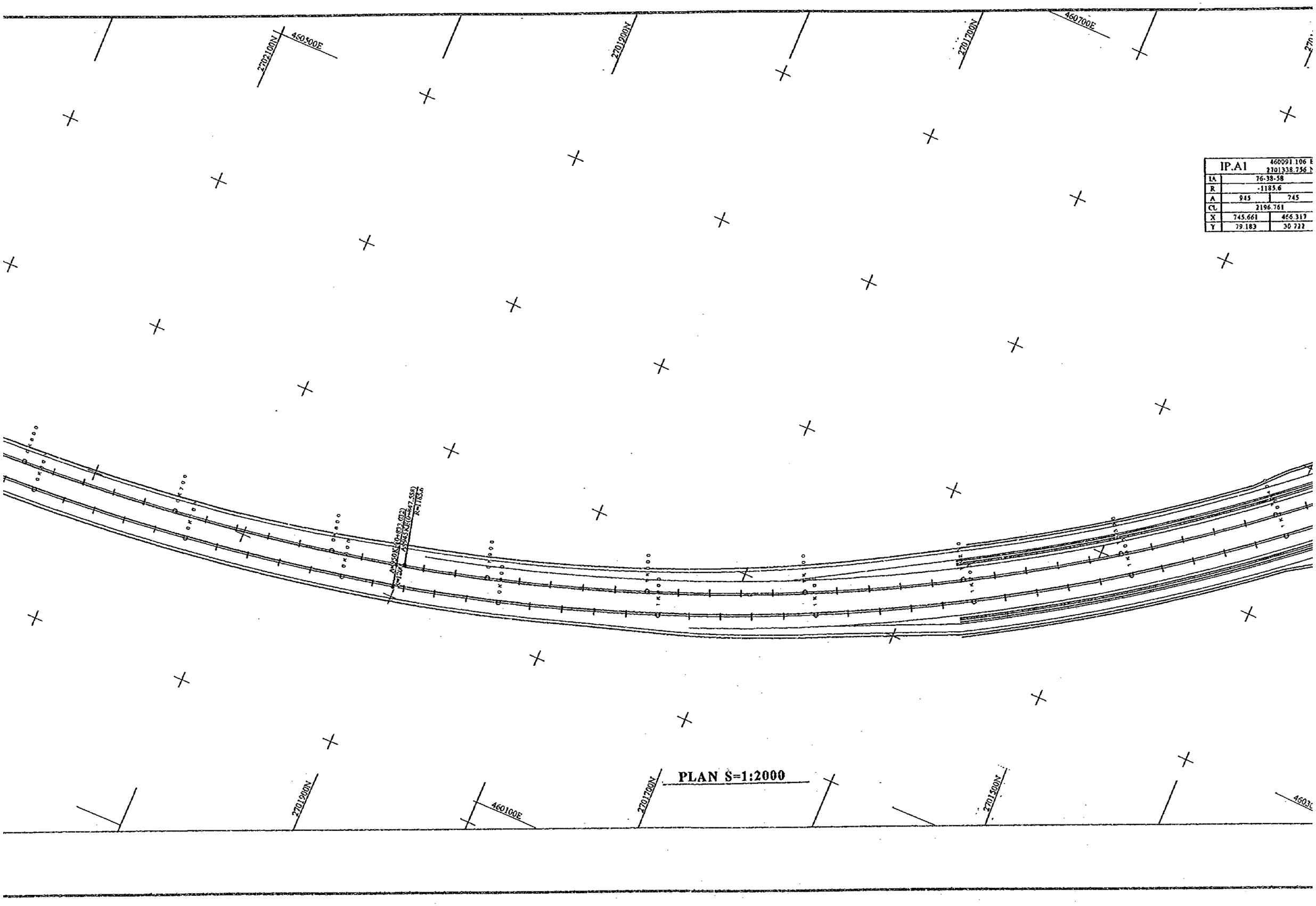
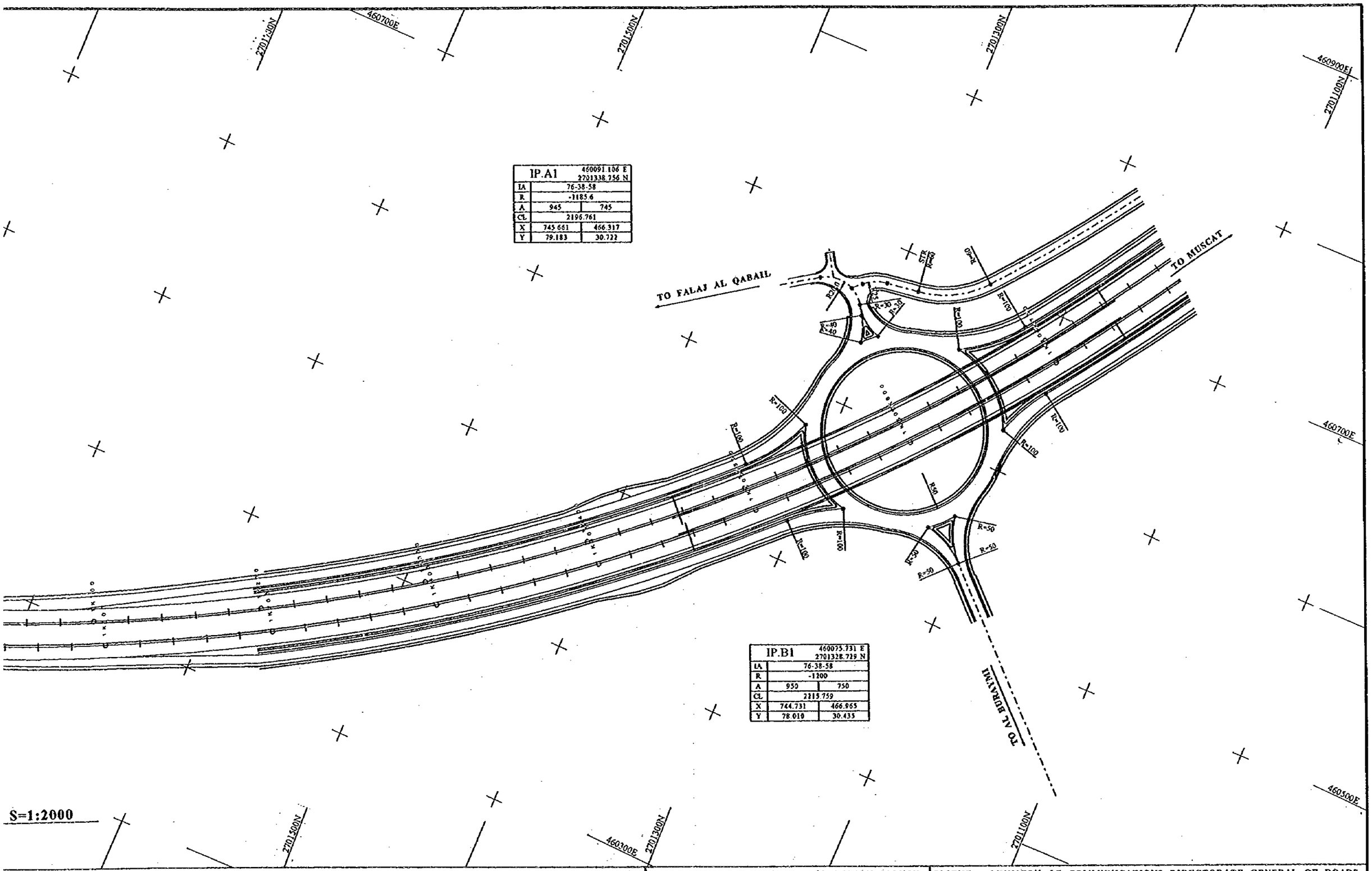

2702100N
460500E
2701900N
2701700N
460700E
IP.A1
460091.106 E
2701338.756 N
LA
76-38-58
R
-1185.6
A
945
745
CL
2196.761
X
745.661
466.317
Y
79.183
30.722
2701900N
460100E
2701700N
2701500N
PLAN S=1:2000



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IA	76-38-58	
R	-1185.6	
A	945	745
CL	2196.761	
X	745.661	466.317
Y	79.183	30.722

IP.B1	460075.731 E 2701328.729 N	
IA	76-38-58	
R	-1200	
A	950	750
CL	2215.759	
X	744.731	466.965
Y	78.010	30.435

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT :	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
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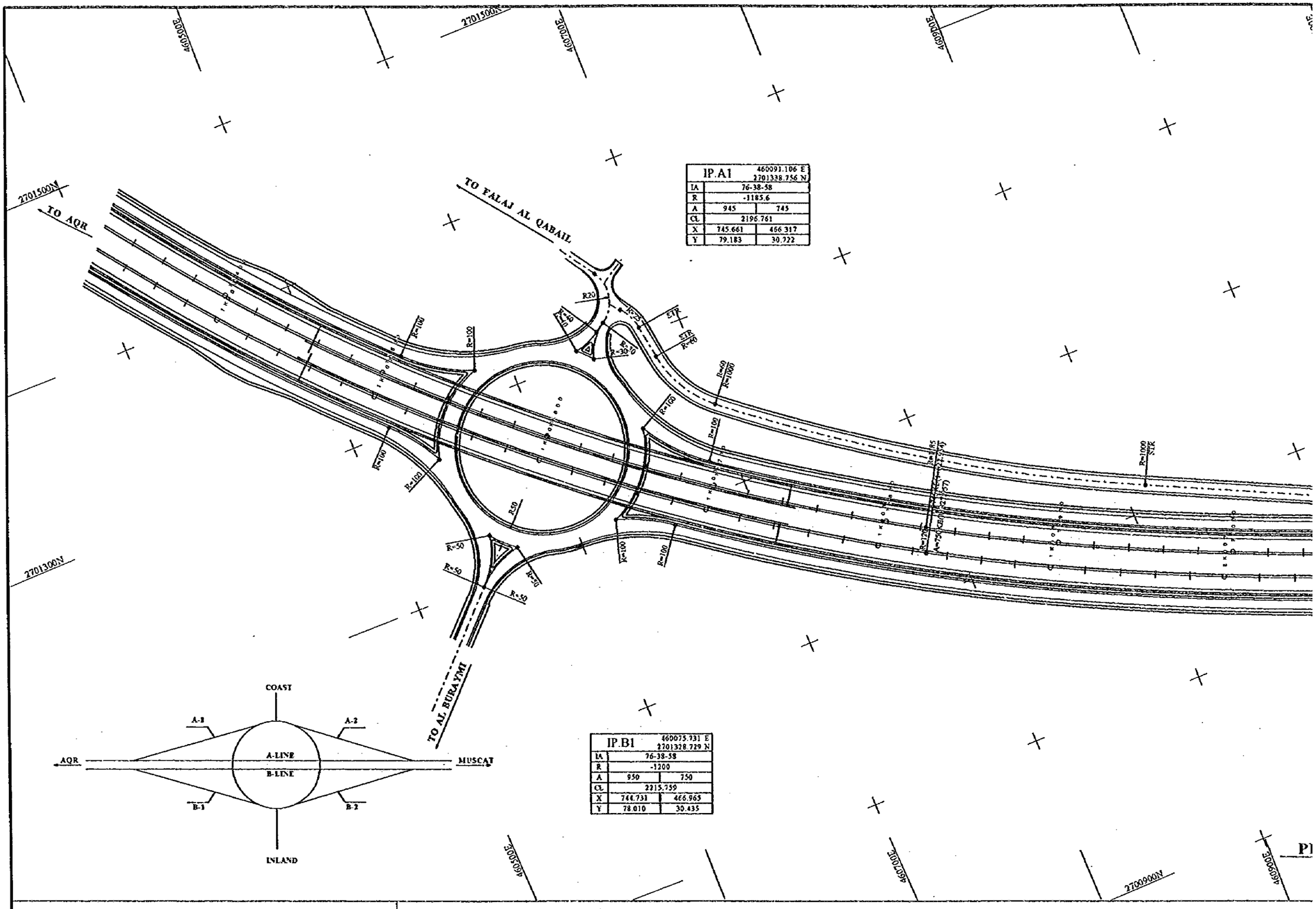
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE:	RA/14 FALAJ AL QABAIL ALIGNMENT LAYOUT (1/2)
	DATE:	DWG NO. R-1



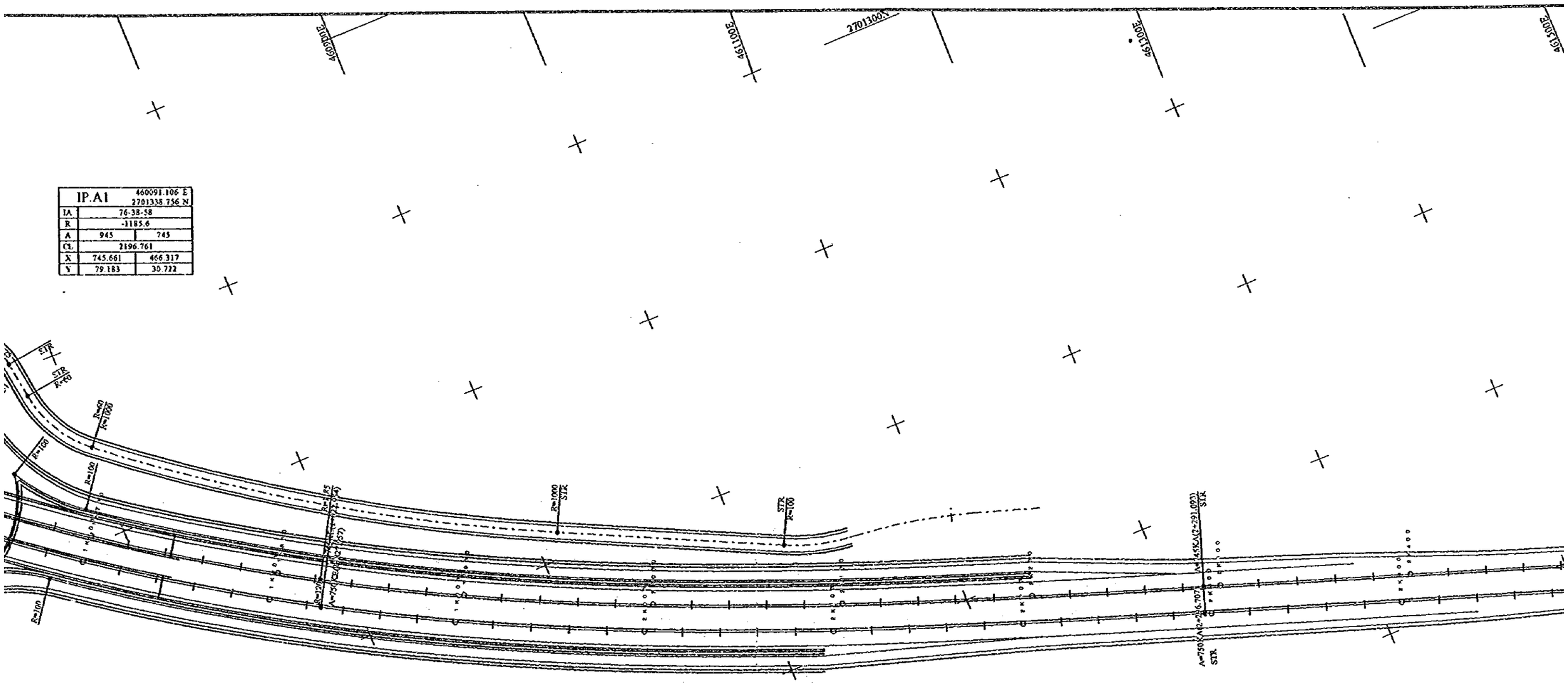
IP.A1	460091.106 E 2701338.756 N	
IA	76-38-58	
R	-1185.6	
A	945	745
CL	2196.761	
X	745.661	466.317
Y	79.183	30.722

IP.B1	460075.731 E 2701328.729 N	
IA	76-38-58	
R	-1200	
A	950	750
CL	2215.759	
X	744.731	466.965
Y	78.010	30.435

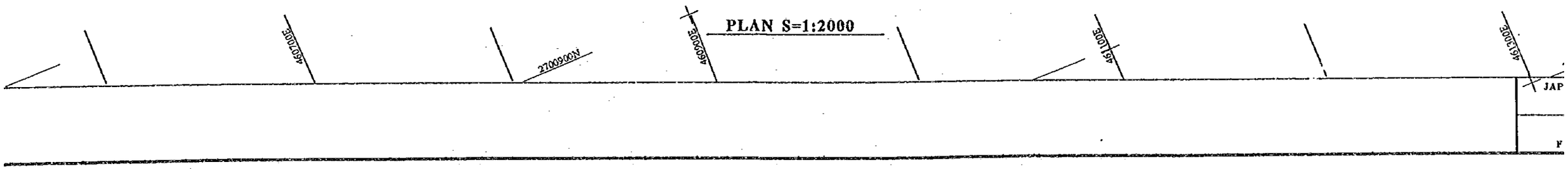
NOTES:

6

IP.A1	460091.106 E 2701338.756 N	
IA	76-38-58	
R	-1185.6	
A	945	745
CL	2196.761	
X	745.661	466.317
Y	79.183	30.722



I	460075.731 E 2701328.729 N	
	76-38-58	
	-1200	
50		750
	2215.759	
L.731		466.965
010		30.435



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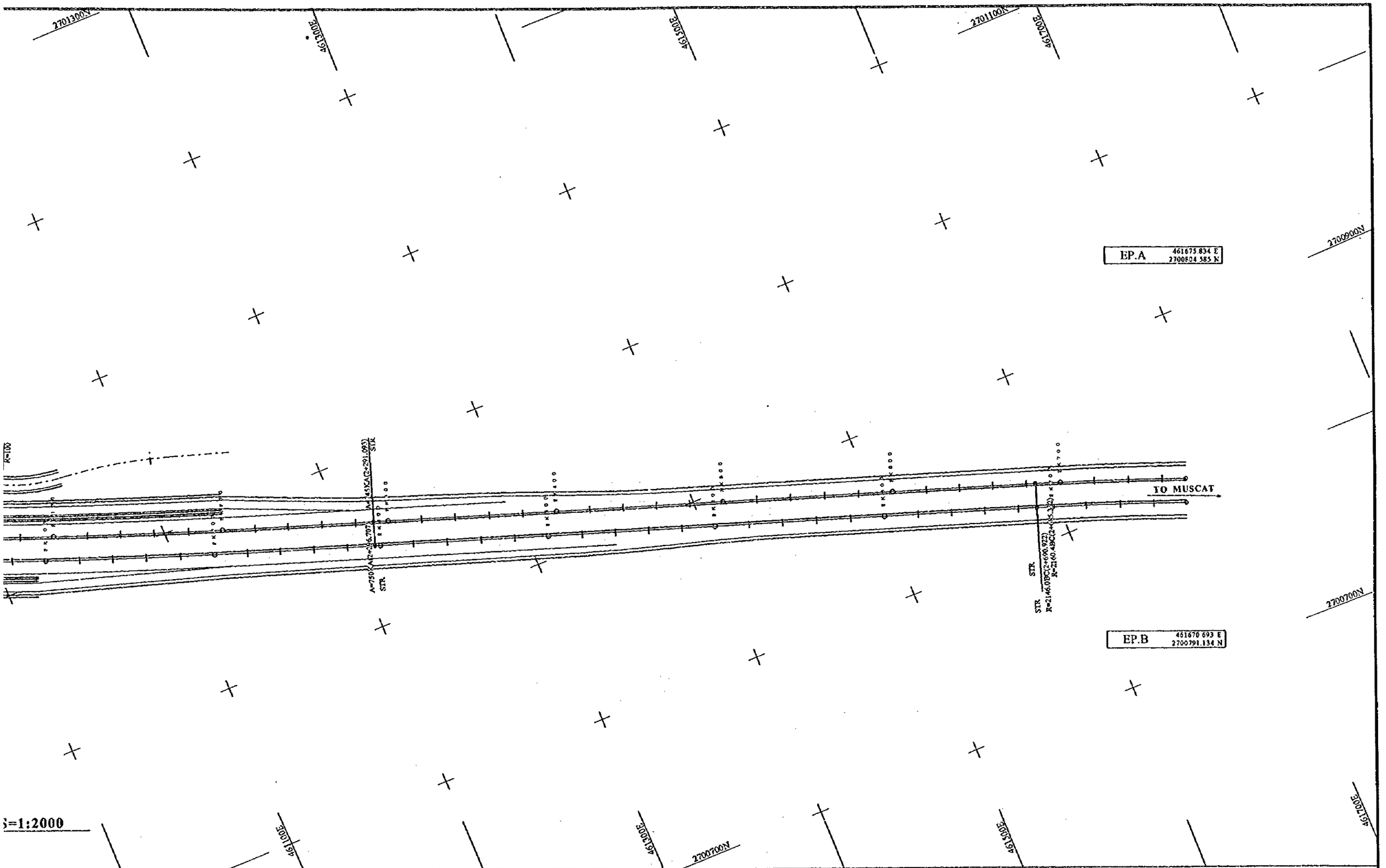
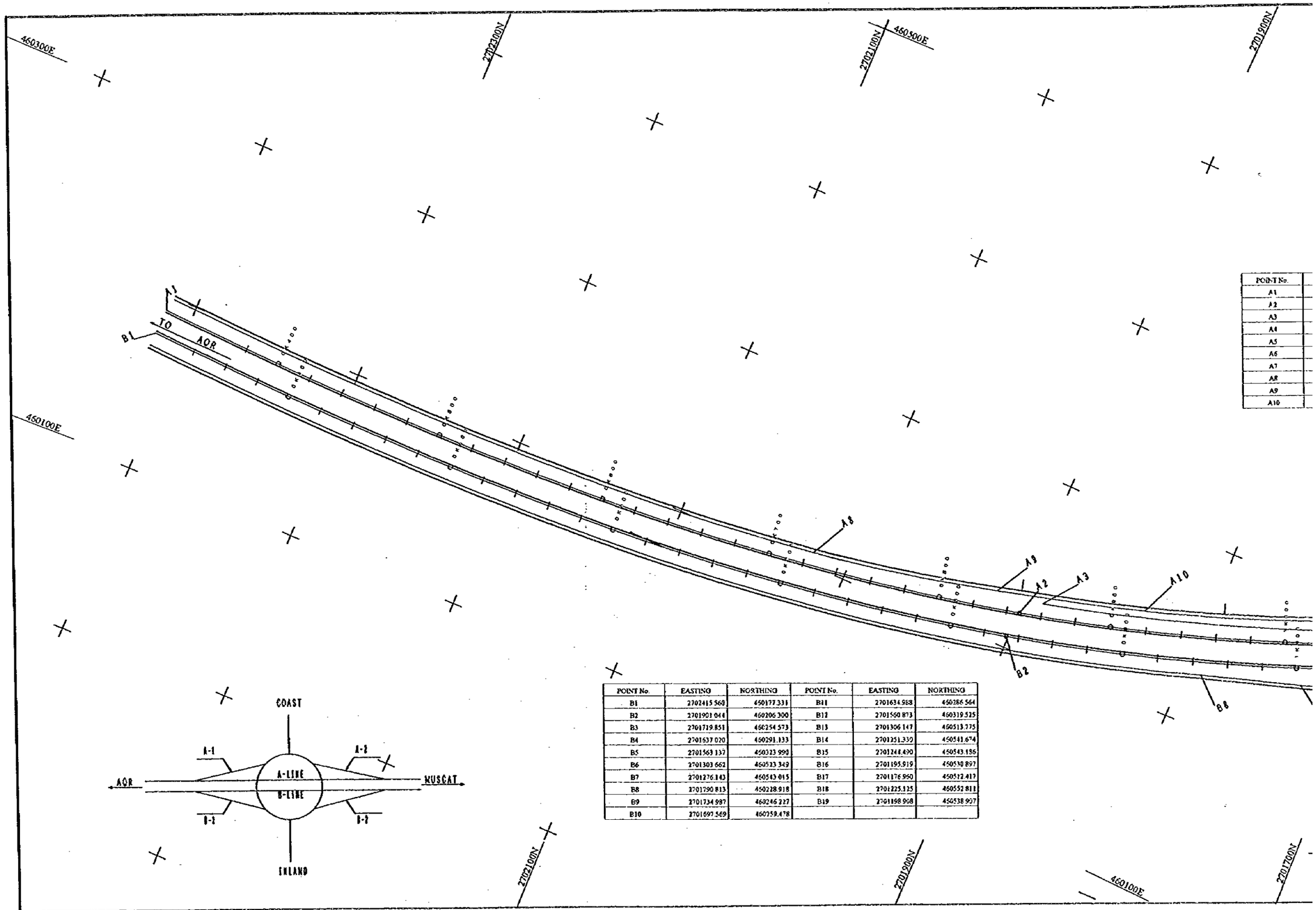
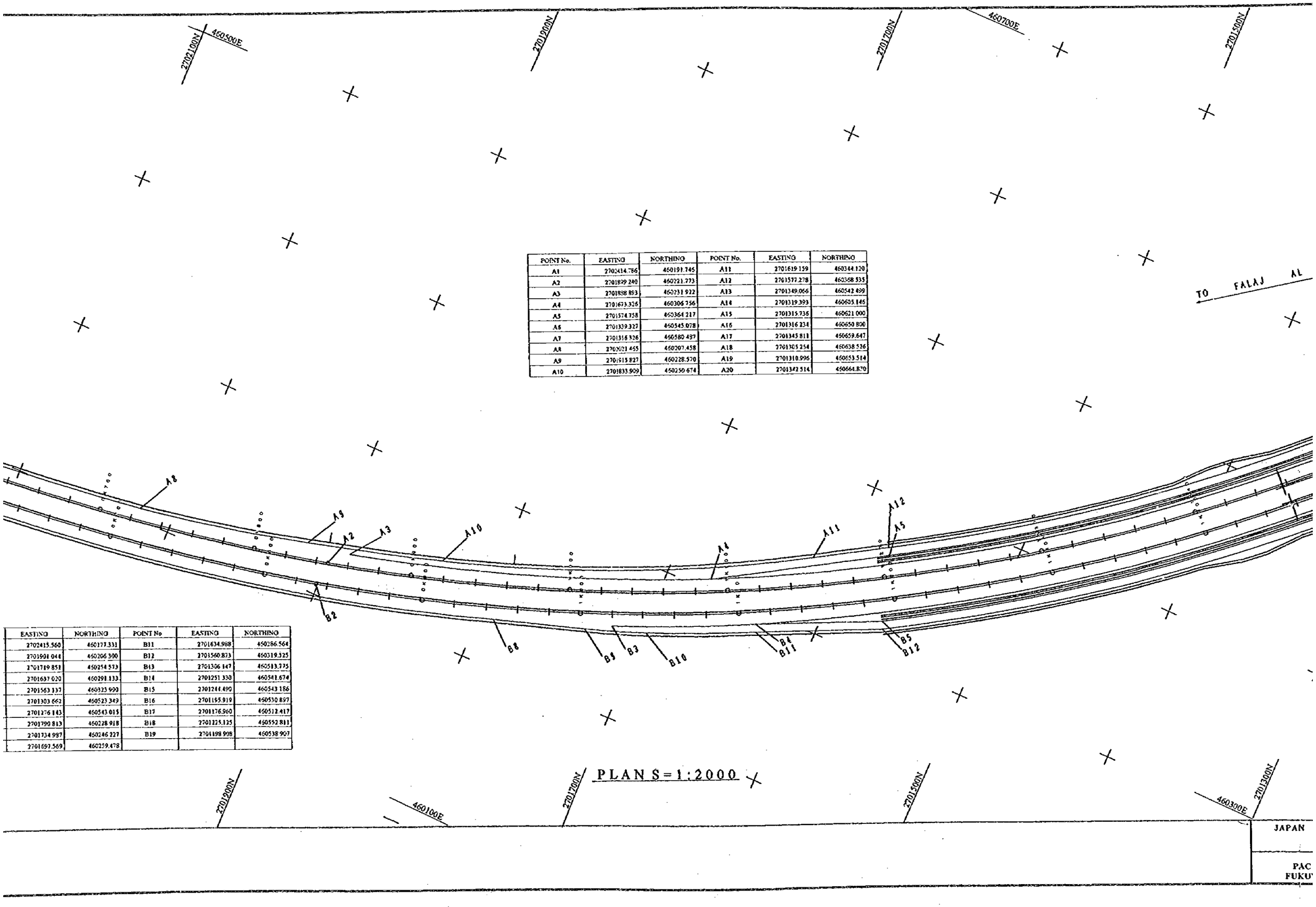


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/14 FALAJ AL QABAIL ALIGNMENT LAYOUT (2/2)	
	DATE:	DWG NO. R-2



POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
B1	2702415.560	460177.331	B11	2701634.988	460286.564
B2	2701903.044	460206.300	B12	2701560.873	460319.525
B3	2701719.851	460254.573	B13	2701306.147	460513.775
B4	2701637.020	460291.133	B14	2701251.330	460541.674
B5	2701563.137	460323.990	B15	2701244.490	460543.156
B6	2701303.662	460523.349	B16	2701195.919	460530.897
B7	2701276.143	460543.015	B17	2701176.950	460512.417
B8	2701290.813	460228.918	B18	2701225.125	460552.811
B9	2701734.987	460246.227	B19	2701198.908	460538.907
B10	2701697.569	460259.478			

NOTES:
(1) FINAL CONTROL COORDINATES, WGS84 DATUM, ZONE 40 UTM, CM 57.



POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
A1	2702414.786	460191.745	A11	2701619.159	460344.120
A2	2701899.240	460221.773	A12	2701577.278	460368.535
A3	2701888.893	460231.922	A13	2701349.066	460542.499
A4	2701673.326	460306.756	A14	2701319.393	460605.146
A5	2701574.758	460364.217	A15	2701315.736	460621.000
A6	2701339.327	460545.078	A16	2701316.234	460650.890
A7	2701316.326	460580.497	A17	2701345.811	460659.647
A8	2702021.455	460207.458	A18	2701305.254	460638.526
A9	2701915.827	460228.570	A19	2701310.996	460653.514
A10	2701833.909	460250.674	A20	2701342.514	460664.870

EASTING	NORTHING	POINT No	EASTING	NORTHING
2702415.560	460177.331	B11	2701634.988	460286.564
2701901.044	460206.300	B12	2701560.873	460319.325
2701719.851	460254.573	B13	2701306.147	460513.775
2701637.020	460291.133	B14	2701251.330	460541.674
2701563.337	460323.990	B15	2701244.490	460543.186
2701303.662	460523.349	B16	2701155.919	460530.897
2701276.143	460543.015	B17	2701176.960	460512.417
2701790.813	460228.918	B18	2701225.125	460552.813
2701734.987	460246.227	B19	2701198.908	460538.907
2701697.569	460259.478			

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NORTHING	POINT No.	EASTING	NORTHING
460191.746	A11	2701619.359	460344.120
460221.773	A12	2701577.278	460368.535
460331.923	A13	2701349.066	460542.459
460306.756	A14	2701319.393	460605.845
460364.217	A15	2701335.736	460621.000
460545.028	A16	2701316.234	460650.800
460580.487	A17	2701345.811	460659.647
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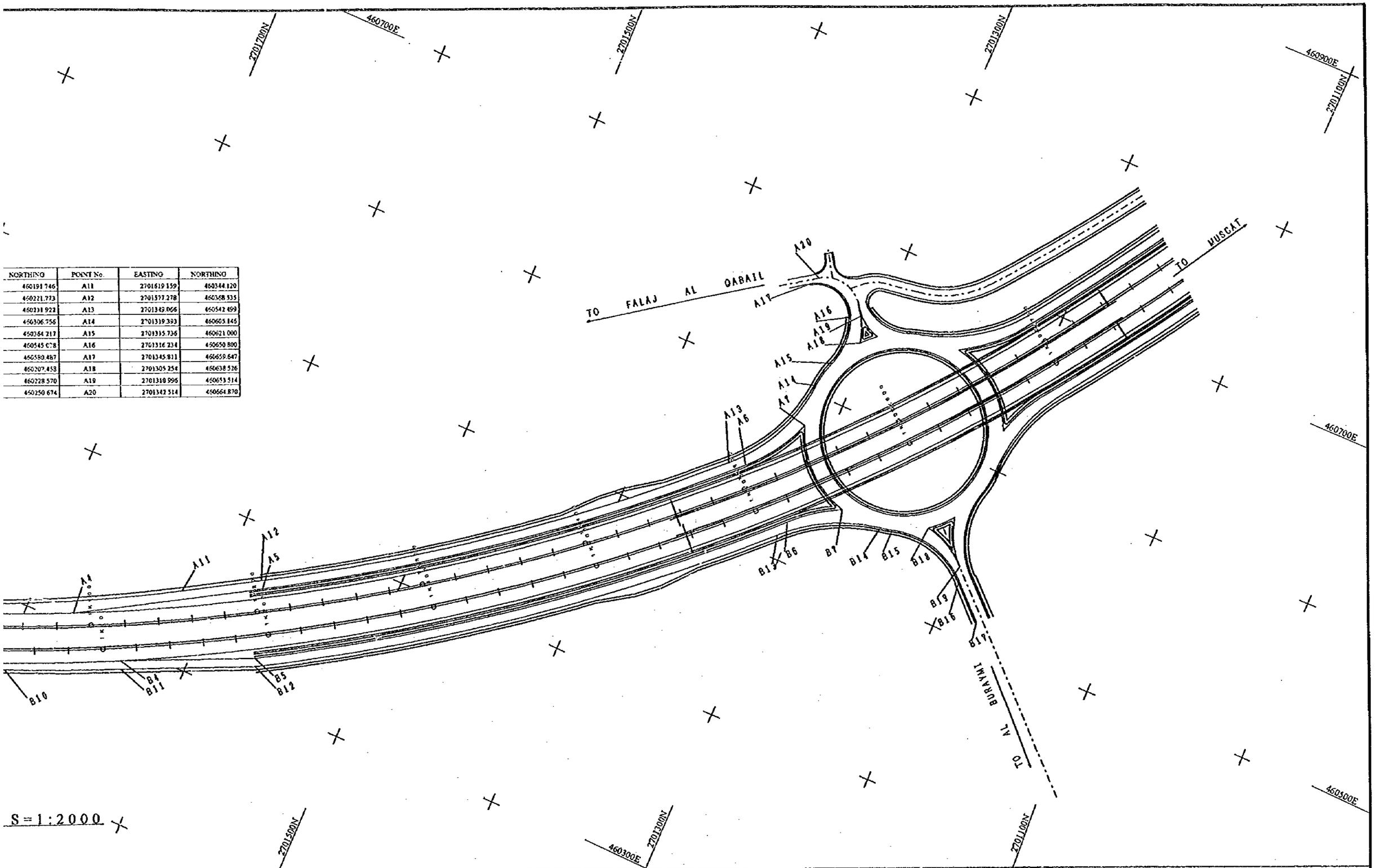
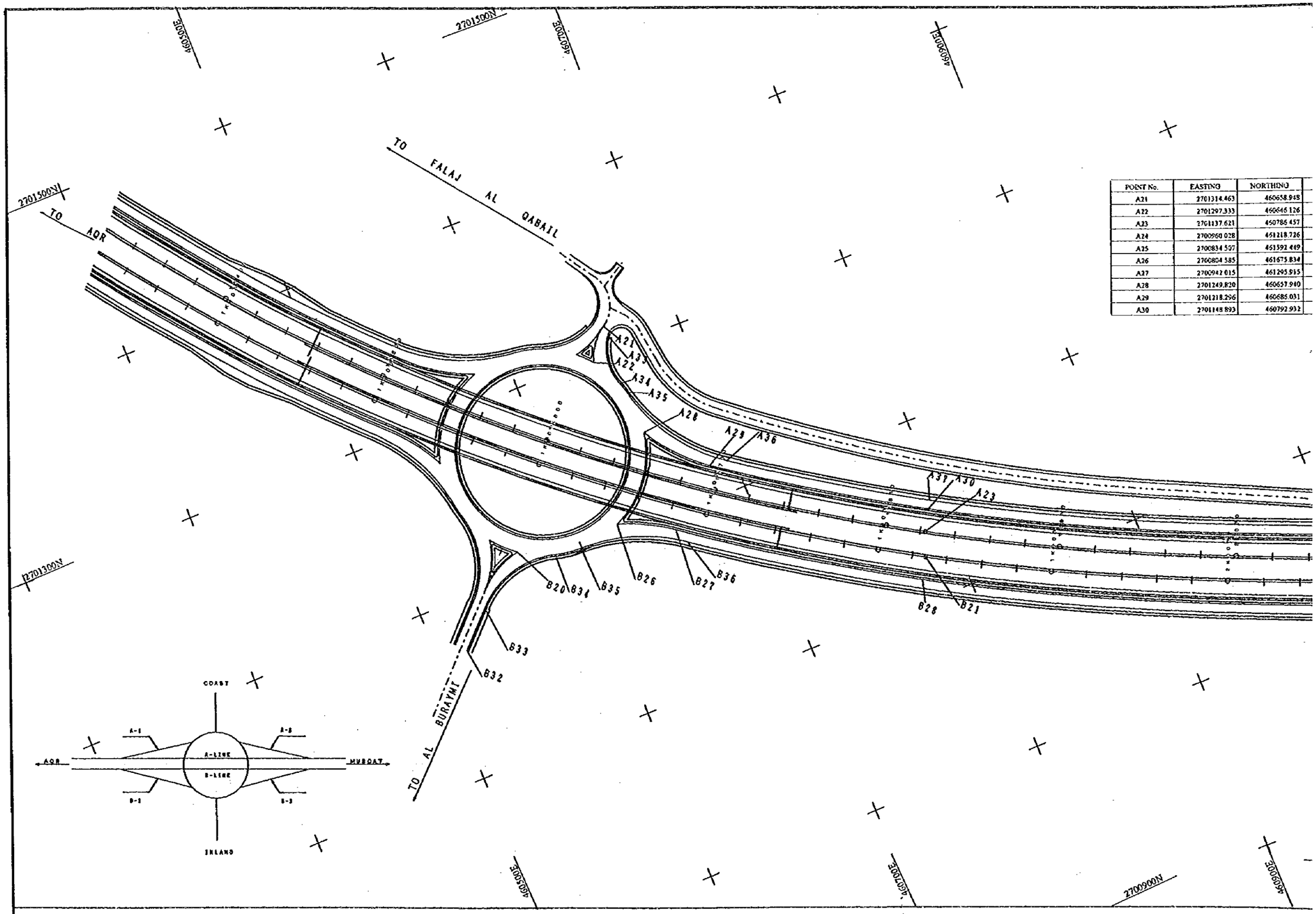


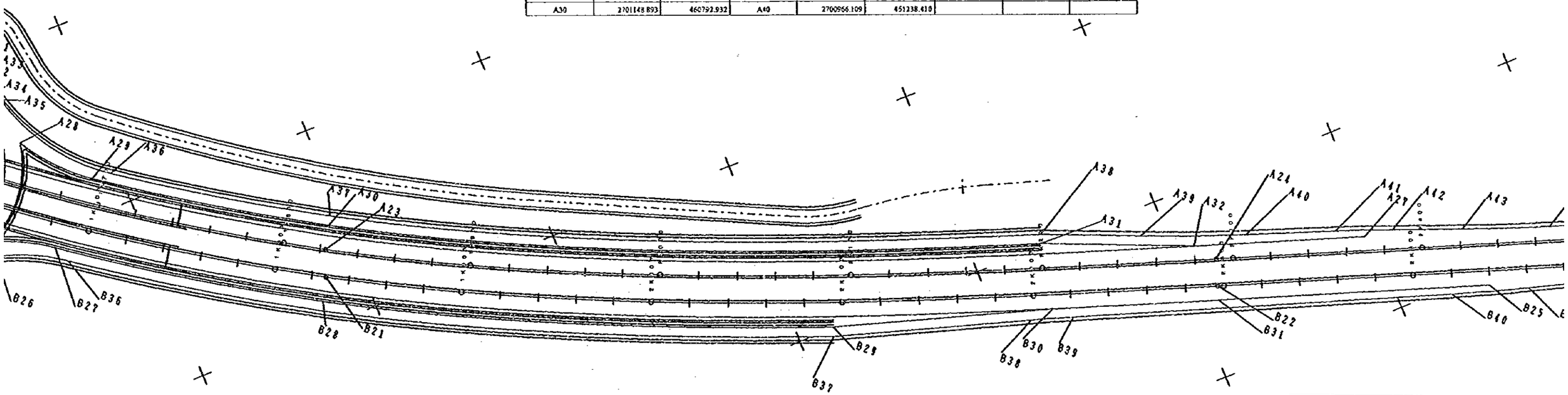
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/14 FALAJ AL QABAIL SETTING OUT DETAILS(1/2)	
	DATE:	DWGNO. R-3



POINT No.	EASTING	NORTHING
A21	2701314.463	460658.948
A22	2701297.333	460646.126
A23	2701137.621	460786.457
A24	2700960.028	461218.726
A25	2700834.597	461592.449
A26	2700804.585	461675.834
A27	2700942.015	461295.515
A28	2701249.820	460657.940
A29	2701218.296	460685.031
A30	2701148.893	460792.932

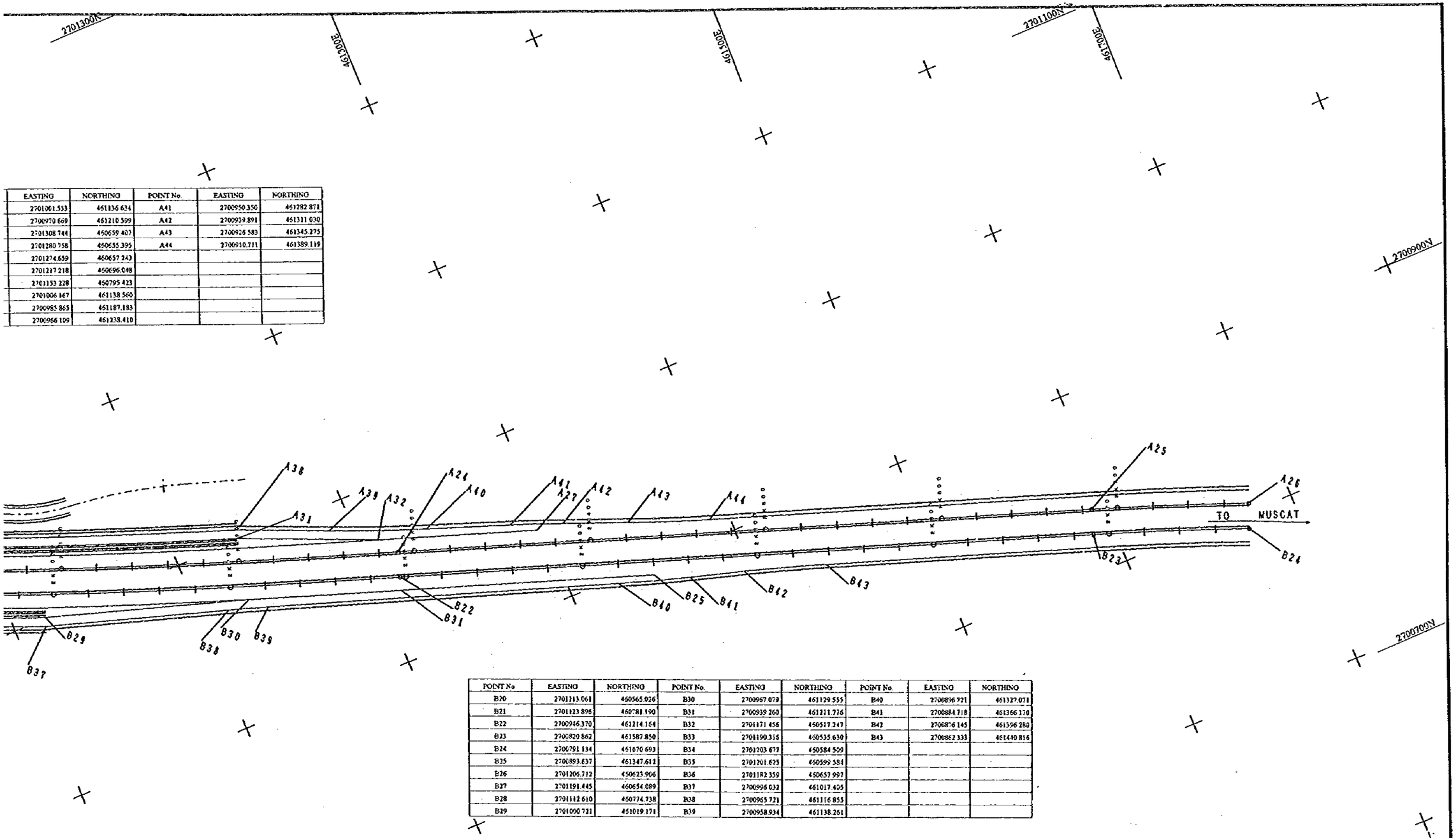
NOTES:
(1) FINAL CONTROL COORDINATES, WGS 84 DATUM, ZONE 40 UTM, CM 57.

POINT No.	EASTING	NORTHING	POINT No	EASTING	NORTHING	POINT No.	EASTING	NORTHING
A21	2701314.463	450658.948	A31	2701001.553	461136.634	A41	2700950.350	461282.871
A22	2701297.333	450646.125	A32	2700970.669	461210.539	A42	2700939.891	461311.030
A23	2701137.621	450786.457	A33	2701308.744	460659.497	A43	2700926.583	461345.275
A24	2700960.028	451218.726	A34	2701280.758	460655.395	A44	2700910.711	461389.119
A25	2700834.507	461592.449	A35	2701274.659	460657.243			
A26	2700804.585	461675.834	A36	2701217.218	460695.048			
A27	2700942.015	461295.935	A37	2701153.228	460795.423			
A28	2701249.820	460657.940	A38	2701006.167	461138.560			
A29	2701218.296	460685.031	A39	2700985.863	461187.183			
A30	2701148.893	460792.932	A40	2700956.109	451238.410			



POINT No	EASTING	NORTHING	POINT No
B20	2701213.061	450565.026	B30
B21	2701323.895	450781.190	B31
B22	2700945.370	451234.164	B32
B23	2700820.852	451587.850	B33
B24	2700791.134	451670.693	B34
B25	2700893.637	451387.612	B35
B26	2701206.712	450623.956	B36
B27	2701191.445	450651.089	B37
B28	2701112.610	460774.738	B38
B29	2701000.721	461019.171	B39

PLAN S=1:2000

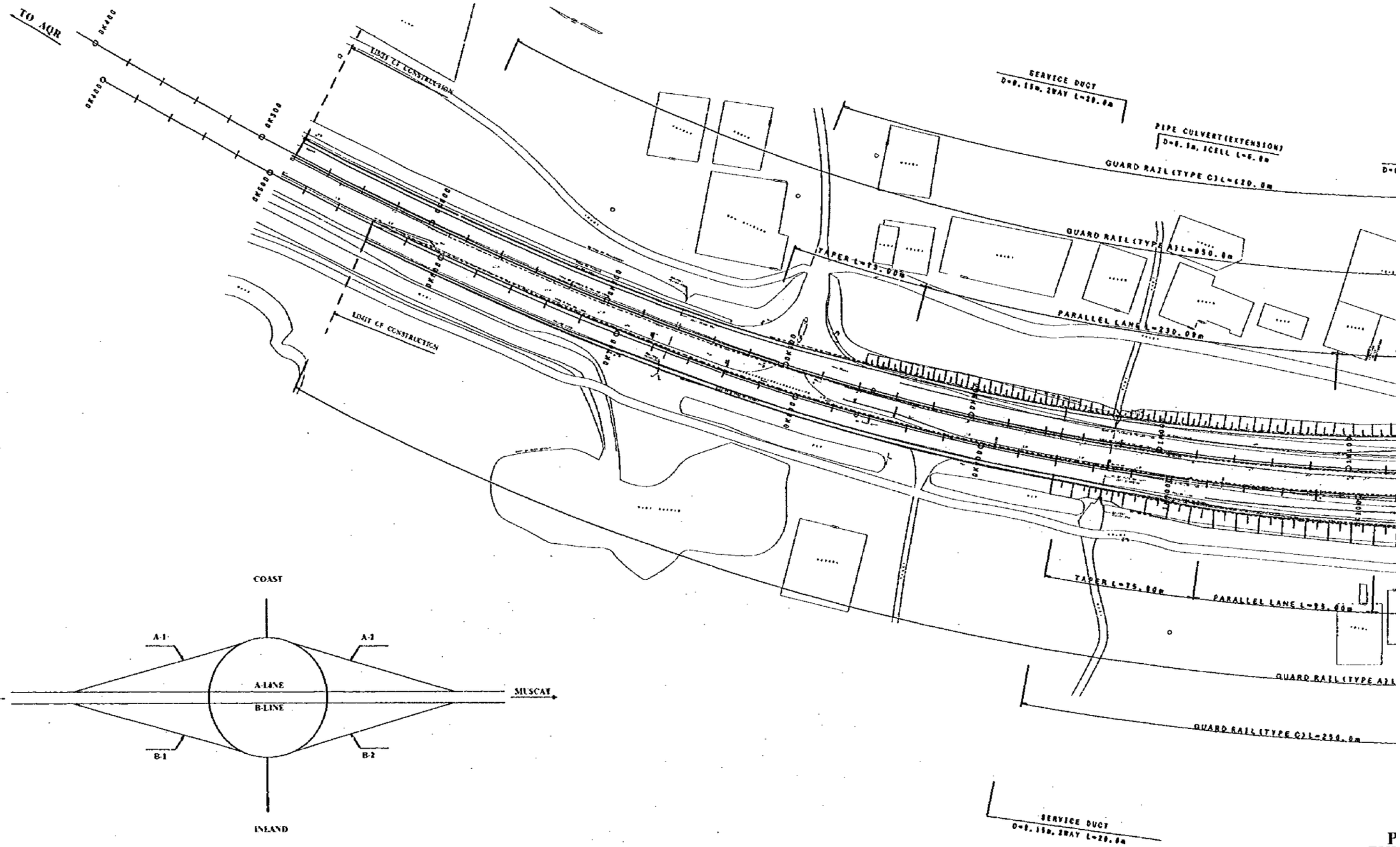


EASTING	NORTHING	POINT No.	EASTING	NORTHING
2701001.553	461136.634	A41	2700950.350	461282.871
2700970.669	461210.599	A42	2700939.891	461311.030
2701308.744	460659.407	A43	2700926.583	461345.275
2701280.758	460655.395	A44	2700910.711	461389.119
2701274.659	460657.243			
2701217.218	460696.048			
2701153.228	460795.423			
2701006.167	461138.560			
2700985.865	461187.183			
2700966.109	461238.410			

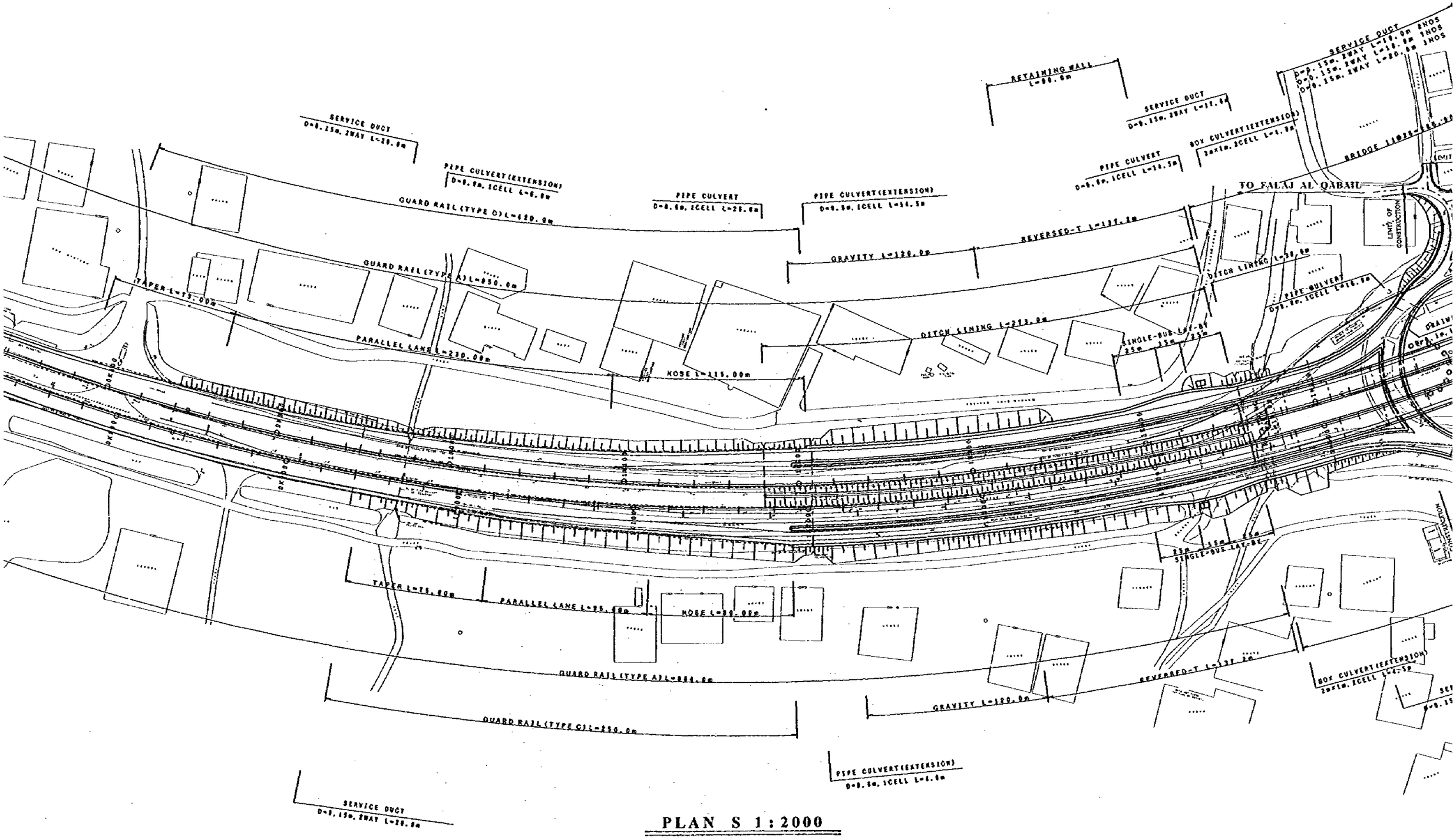
POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
B20	2701213.061	460565.026	B30	2700967.079	461129.555	B40	2700896.721	461327.071
B21	2701123.896	460781.190	B31	2700939.260	461211.776	B41	2700884.718	461366.170
B22	2700946.370	461214.164	B32	2701171.456	460517.247	B42	2700876.145	461396.280
B23	2700820.862	461587.850	B33	2701190.315	460535.630	B43	2700862.333	461440.816
B24	2700791.134	461670.693	B34	2701203.673	460584.509			
B25	2700893.637	461347.612	B35	2701201.625	460599.584			
B26	2701206.712	460623.906	B36	2701182.359	460657.997			
B27	2701191.445	460654.089	B37	2700996.032	461017.405			
B28	2701112.610	460774.738	B38	2700965.721	461116.855			
B29	2701090.721	461019.171	B39	2700958.934	461138.261			

N S=1:2000

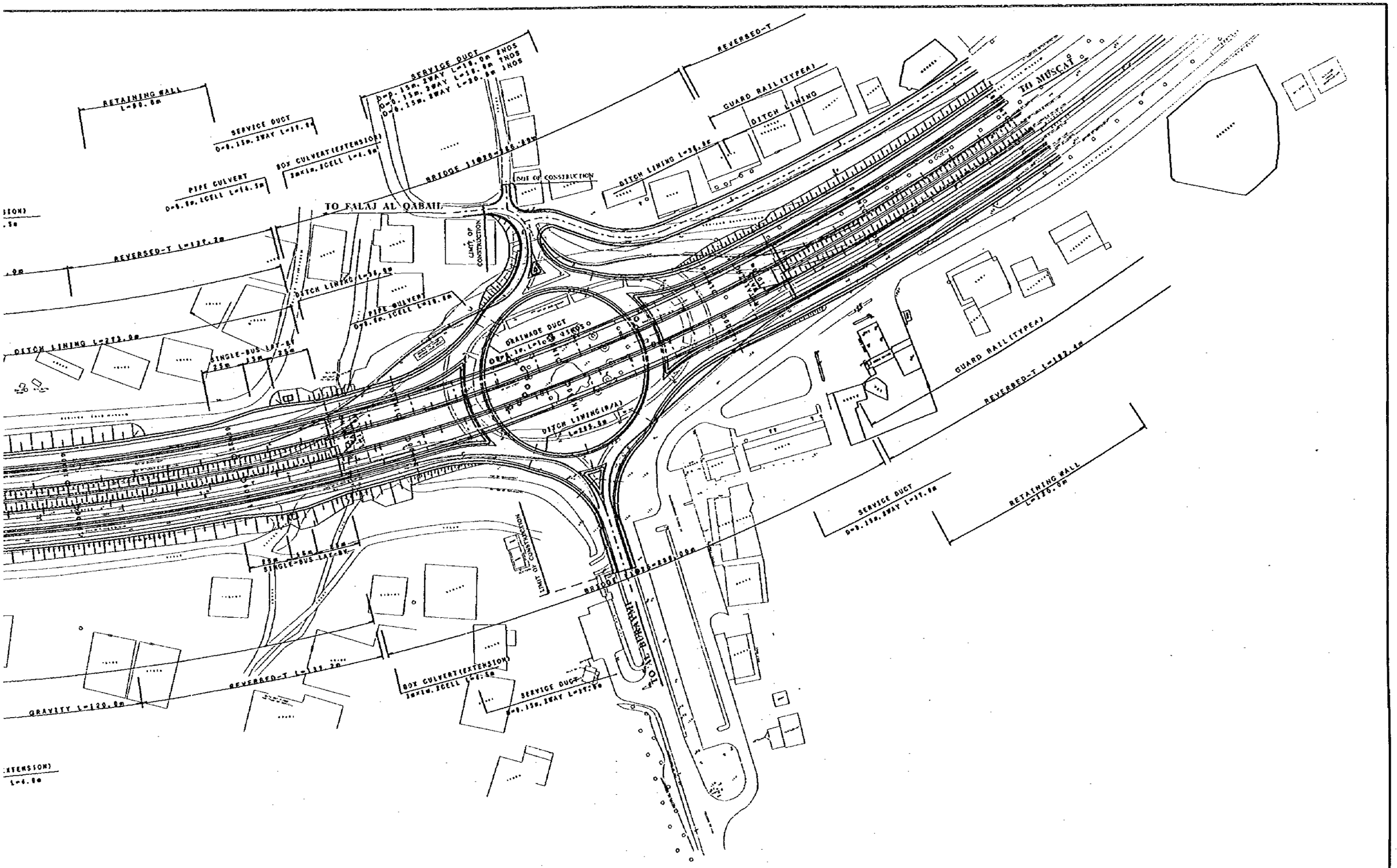
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/14 FALAJ AL QABAIL SETTING OUT DETAILS(2/2)	
	DATE:	DWG NO. R-4


TO AQR
0K400
0K500
0K600
0K700
0K800
0K900
0K1000
0K1100
0K1200
LIMIT OF CONSTRUCTION
LIMIT OF CONSTRUCTION
SERVICE DUCT
D=0.15m, 2WAY L=20.0m
PIPE CULVERT(EXTENSION)
D=0.5m, 3CELL L=6.0m
GUARD RAIL(TYPE C)L=620.0m
GUARD RAIL(TYPE A)L=850.0m
TAPER L=75.00m
PARALLEL LANE L=230.00m
TAPER L=75.00m
PARALLEL LANE L=95.00m
GUARD RAIL(TYPE A)L
GUARD RAIL(TYPE C)L=250.0m
SERVICE DUCT
D=0.15m, 2WAY L=20.0m
COAST
A-1
A-2
AQR
A-LINE
B-LINE
MUSCAT
B-1
B-2
INLAND

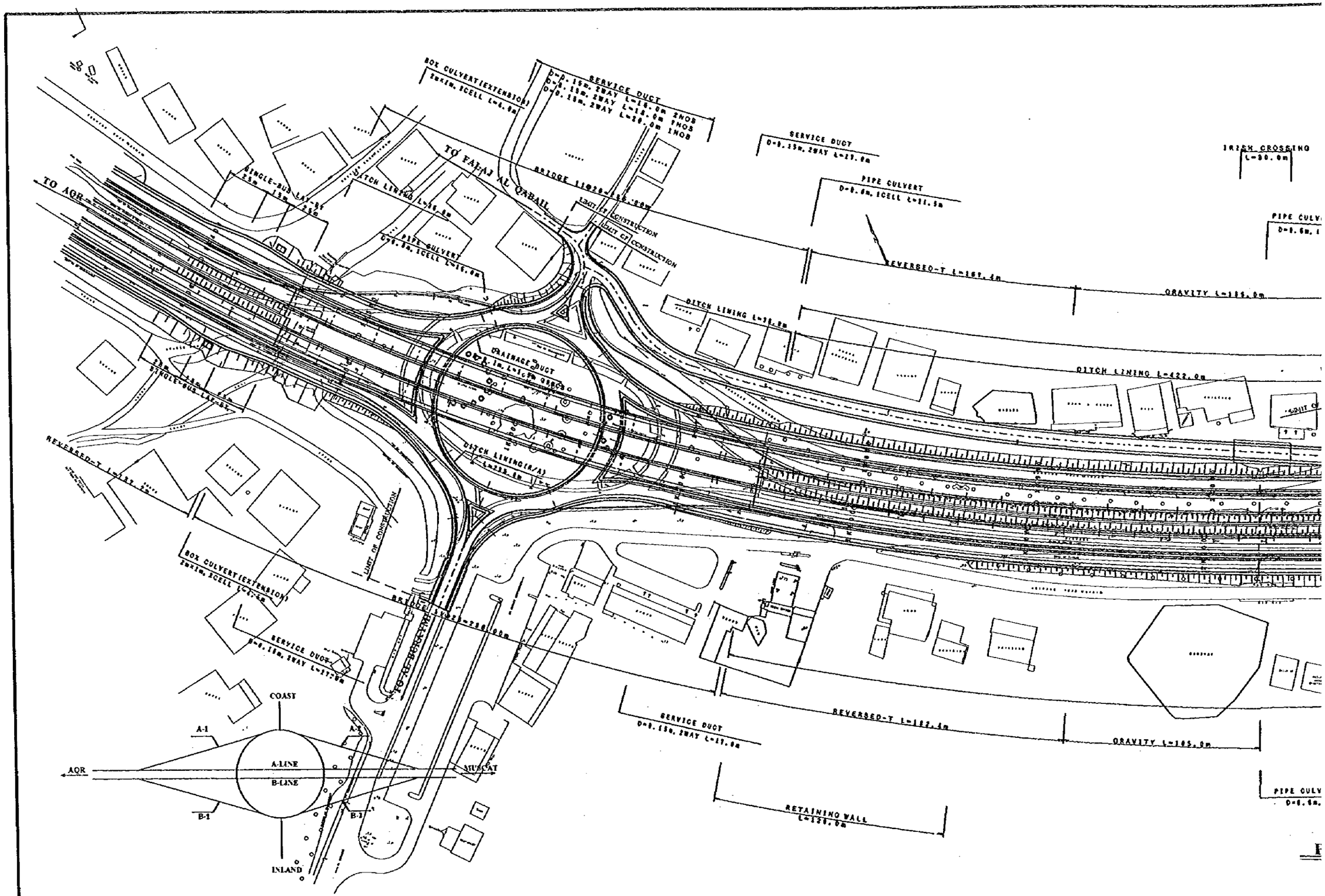
NOTES:


SERVICE DUCT
D=0.15m, 2WAY L=28.0m
PIPE CULVERT(EXTENSION)
D=0.5m, 1CELL L=6.0m
GUARD RAIL (TYPE D) L=620.0m
PIPE CULVERT
D=0.5m, 1CELL L=28.0m
PIPE CULVERT(EXTENSION)
D=0.5m, 1CELL L=14.5m
RETAINING WALL
L=80.0m
SERVICE DUCT
D=0.15m, 2WAY L=12.0m
BOX CULVERT(EXTENSION)
2mx1m, 2CELL L=4.0m
PIPE CULVERT
D=0.5m, 1CELL L=14.5m
SERVICE DUCT
D=0.15m, 2WAY L=18.0m 2NOS
D=0.15m, 2WAY L=18.0m 3NOS
D=0.15m, 2WAY L=20.0m 3NOS
BRIDGE
TO FALAJ AL QABAIL
LIMIT OF CONSTRUCTION
REVERSED-T L=132.0m
GRAVITY L=120.0m
GUARD RAIL (TYPE A) L=850.0m
TAPER L=75.00m
PARALLEL LANE L=230.00m
NOSE L=115.00m
DITCH LINING L=293.0m
DITCH LINING L=50.00
PIPE CULVERT
D=0.5m, 1CELL L=16.5m
SINGLE-BUS LAY-BY
25m 15m 25m
SINGLE-BUS LAY-BY
25m 15m 25m
TAPER L=75.00m
PARALLEL LANE L=95.00m
NOSE L=80.00m
GUARD RAIL (TYPE A) L=864.0m
REVERSED-T L=132.0m
BOX CULVERT(EXTENSION)
2mx1m, 2CELL L=4.5m
GRAVITY L=120.0m
GUARD RAIL (TYPE C) L=250.0m
PIPE CULVERT(EXTENSION)
D=0.5m, 1CELL L=6.0m
SERVICE DUCT
D=0.15m, 2WAY L=28.0m

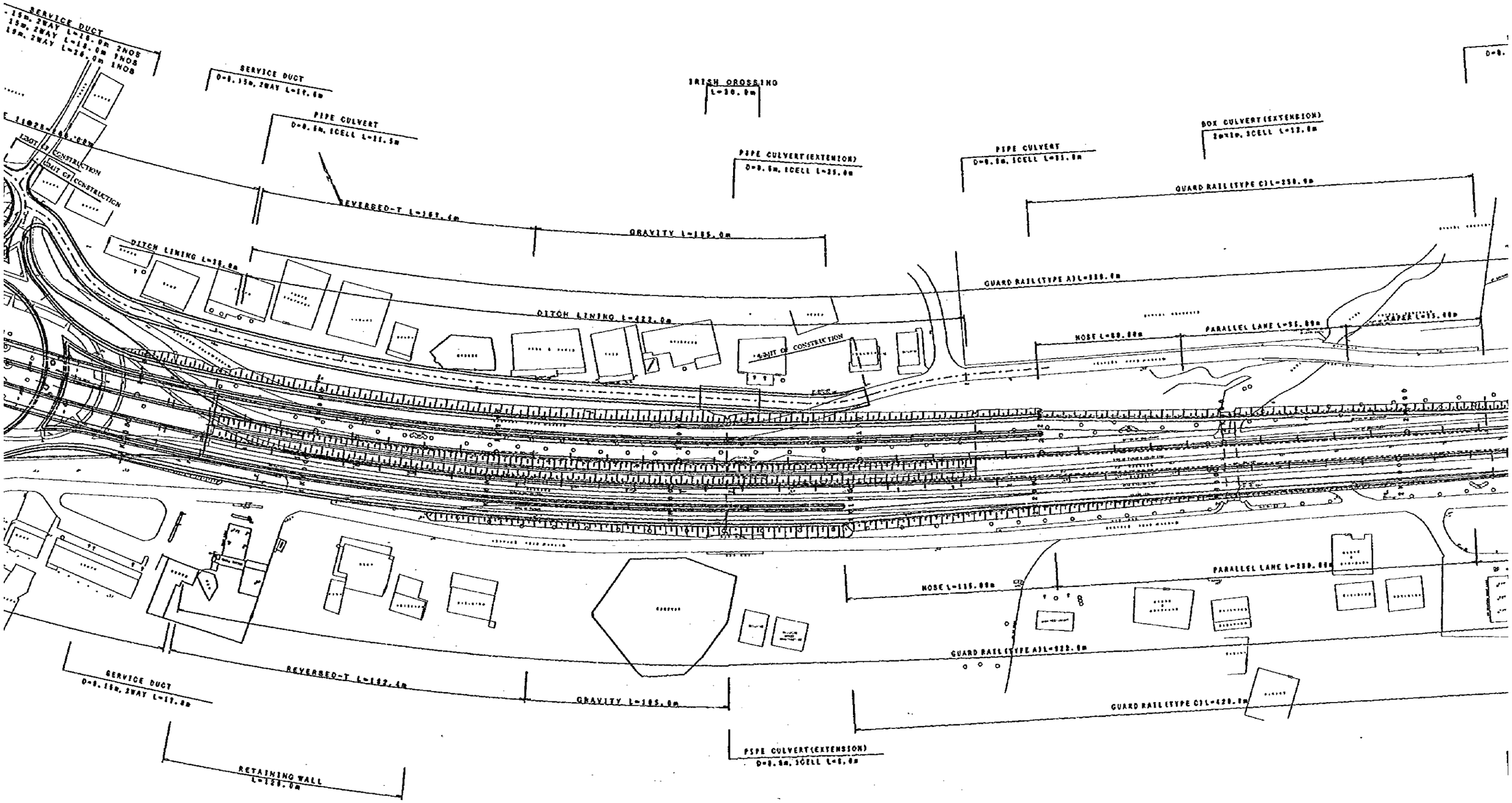
PLAN S 1:2000



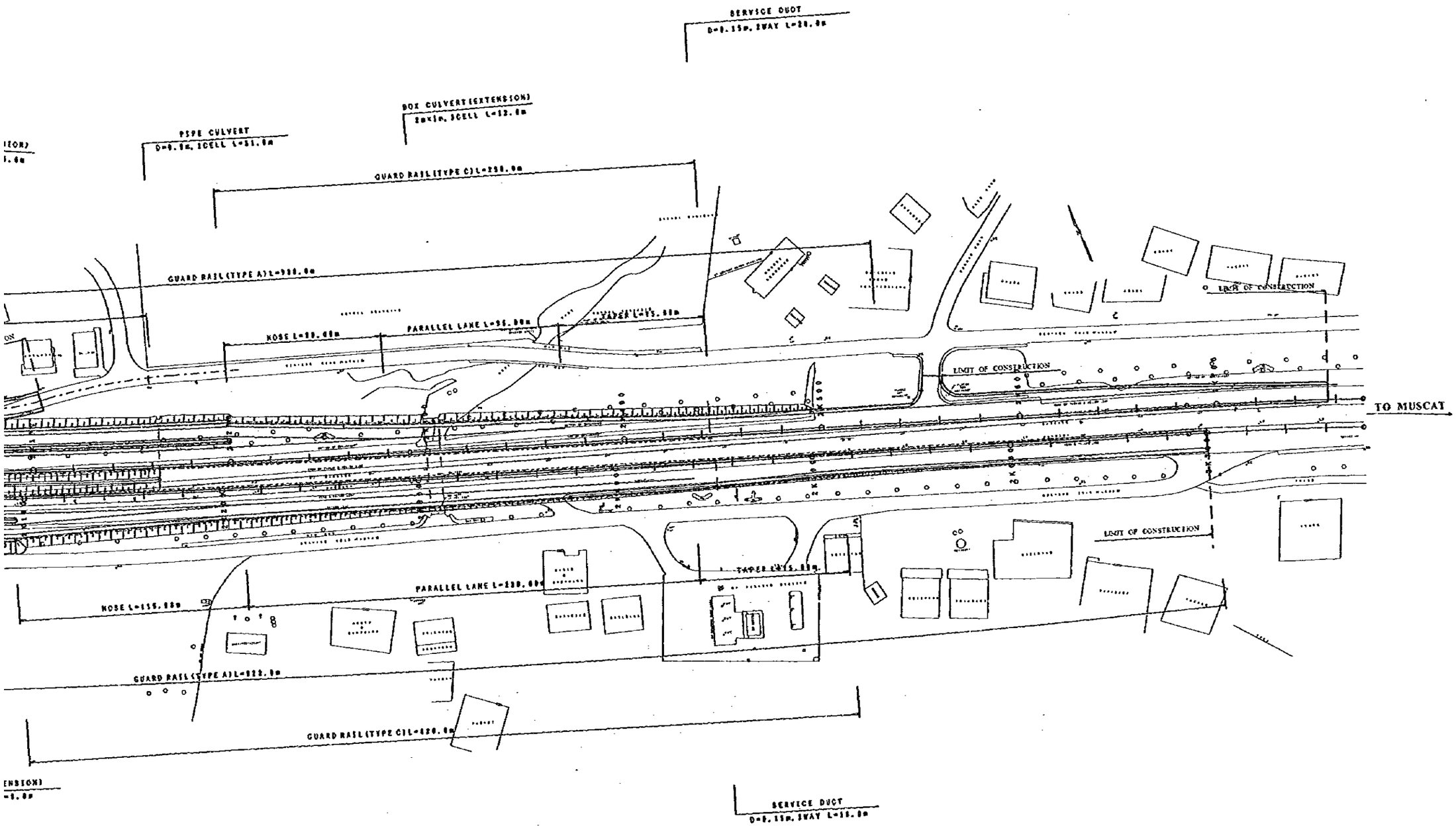
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT :	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE	RA/14 FALAJ AL QABAIL PLAN(1/2)	
	DATE		DWG NO. R-5


TO AQR
TO FALAJ AL QABAIL
BRIDGE
SERVICE DUCT
BOX CULVERT(EXTENSION)
PIPE CULVERT
REVERSED-T
GRAVITY
DITCH LINING
DRAINAGE DUCT
IRIGH CROSSING
RETAINING WALL
COAST
INLAND
A-1
B-1
A-LINE
B-LINE
AQR
MUSCAT

NOTES:

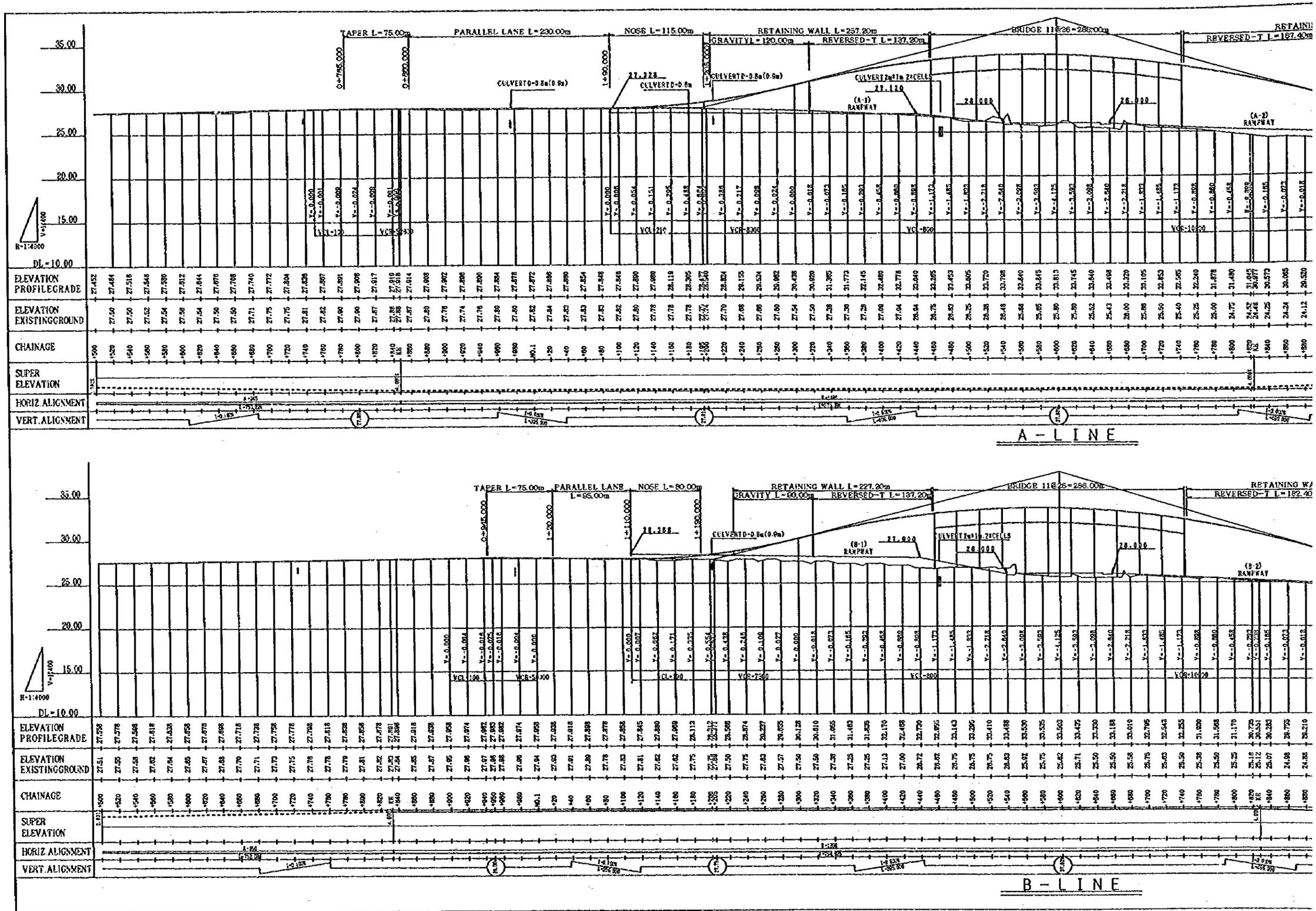

SERVICE DUCT
SERVICE DUCT
IRISH CROSSING
L=30.0m
PIPE CULVERT
PIPE CULVERT(EXTENSION)
PIPE CULVERT
BOX CULVERT(EXTENSION)
GUARD RAIL(TYPE C)
REVERSED-T
GRAVITY
DITCH LINING
GUARD RAIL(TYPE A)
DITCH LINING
NOSE
PARALLEL LANE
LIMIT OF CONSTRUCTION
NOSE
PARALLEL LANE
GUARD RAIL(TYPE A)
GUARD RAIL(TYPE C)
SERVICE DUCT
REVERSED-T
GRAVITY
PIPE CULVERT(EXTENSION)
RETAINING WALL

PLAN S 1:2000



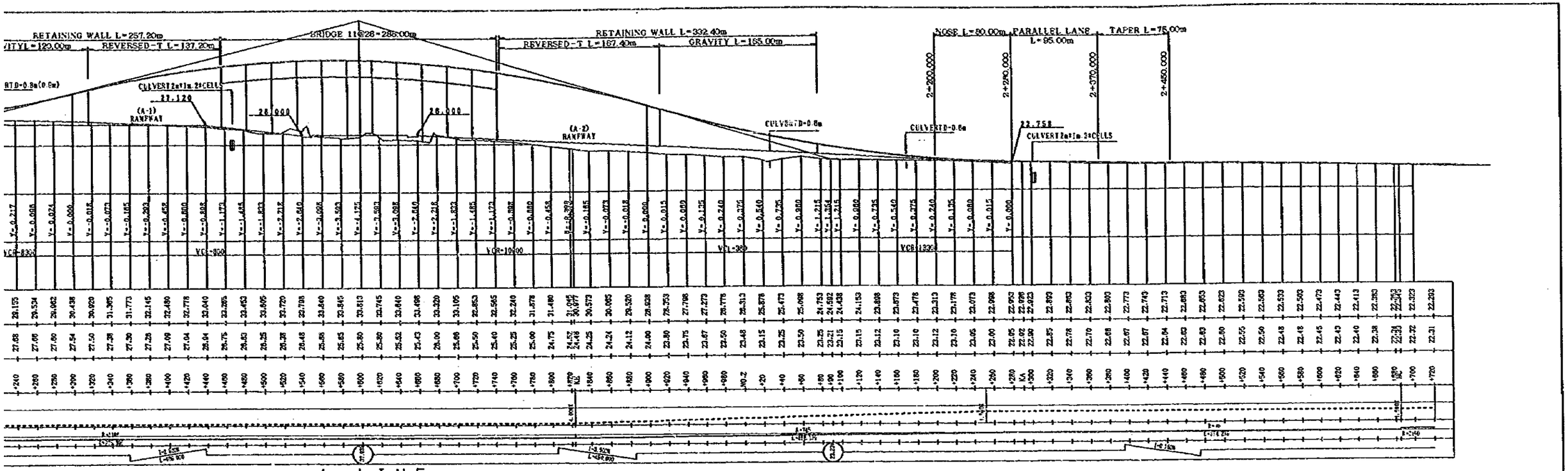
N S 1:2000

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/14 FALAJ AL QABAIL PLAN(2/2)	
	DATE	DWGNO. R-6

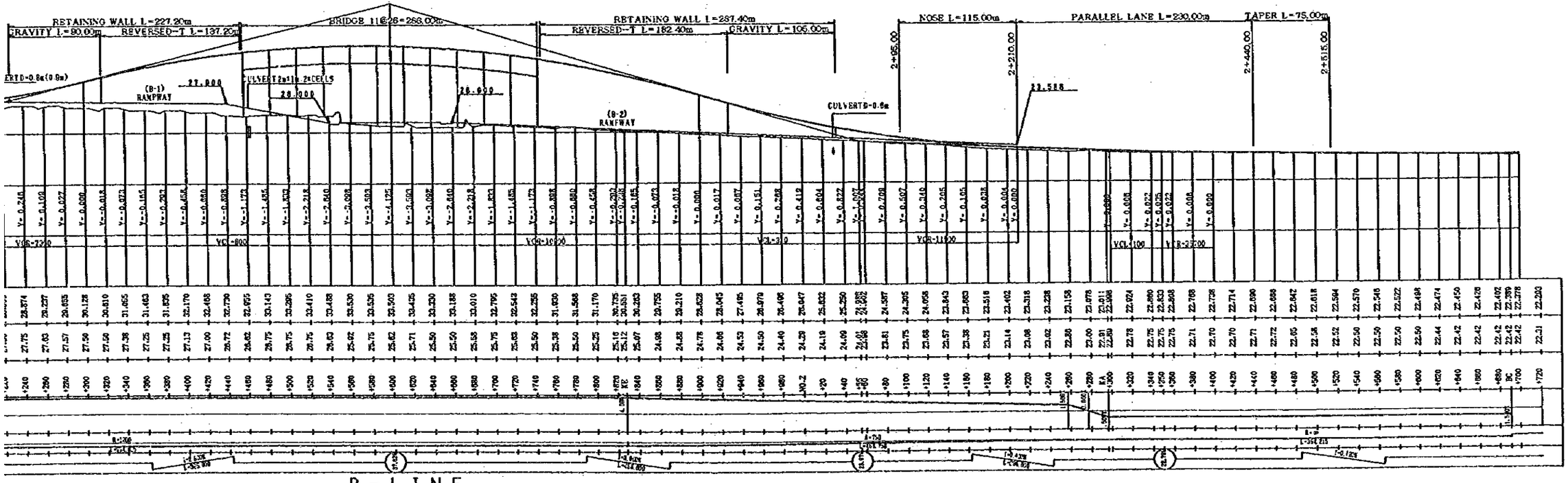

TAPER L=75.00m
PARALLEL LANE L=230.00m
NOSE L=115.00m
RETAINING WALL L=257.20m
GRAVITY L=120.00m
REVERSED-T L=137.20m
BRIDGE 11@26=286.00m
REVERSED-T L=167.40m
CULVERT0-0.8m(0.9m)
CULVERT0-0.6m
CULVERT2m*1m 2*CELLS
(A-1) RAMPWAY
(A-2) RAMPWAY
DL=10.00
ELEVATION PROFILEGRADE
ELEVATION EXISTINGGROUND
CHAINAGE
SUPER ELEVATION
HORIZ.ALIGNMENT
VERT.ALIGNMENT
A-LINE
TAPER L=75.00m
PARALLEL LANE L=85.00m
NOSE L=80.00m
RETAINING WALL L=227.20m
GRAVITY L=90.00m
REVERSED-T L=137.20m
BRIDGE 11@26=286.00m
REVERSED-T L=182.40
CULVERT0-0.8m(0.9m)
(B-1) RAMPWAY
(B-2) RAMPWAY
DL=10.00
ELEVATION PROFILEGRADE
ELEVATION EXISTINGGROUND
CHAINAGE
SUPER ELEVATION
HORIZ.ALIGNMENT
VERT.ALIGNMENT
B-LINE

NOTES:

11

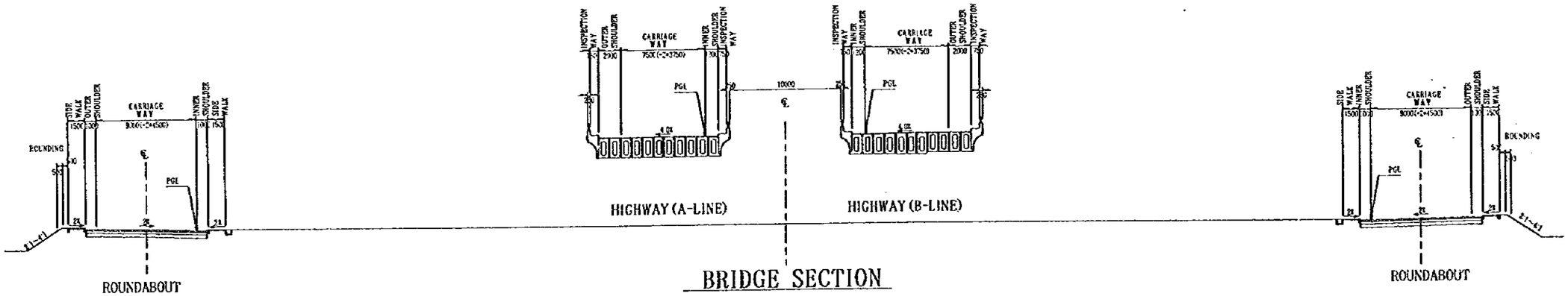


A - LINE

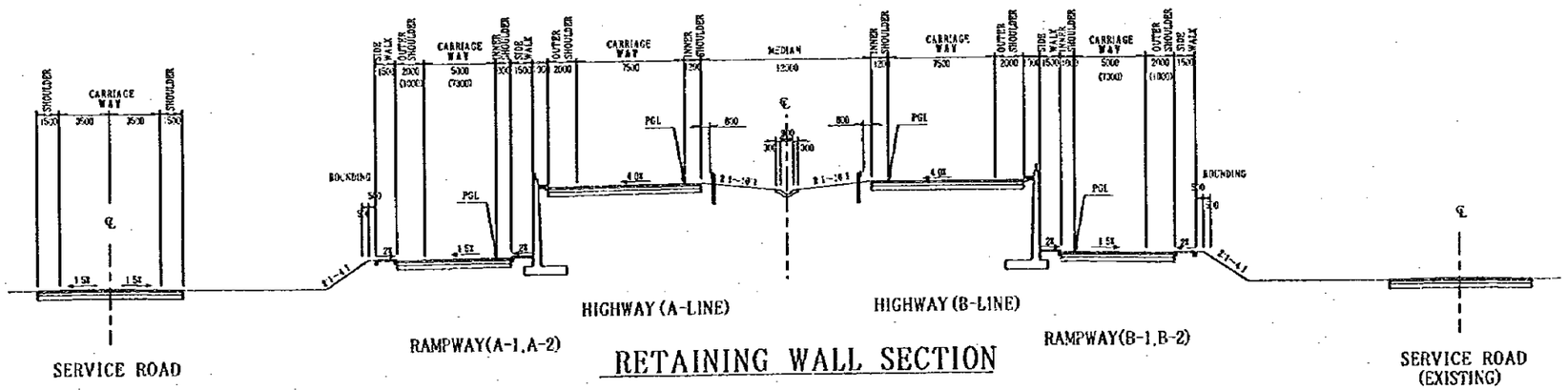


B - LINE

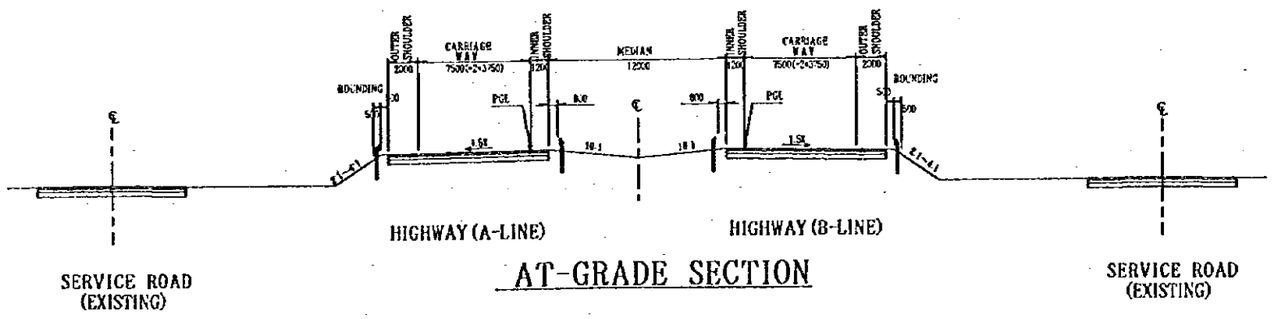
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT :	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE	RA/14 FALAJ AL QABAIL PROFILE-HIGHWAY
	DATE	DWG NO. R-7



BRIDGE SECTION



RETAINING WALL SECTION



AT-GRADE SECTION

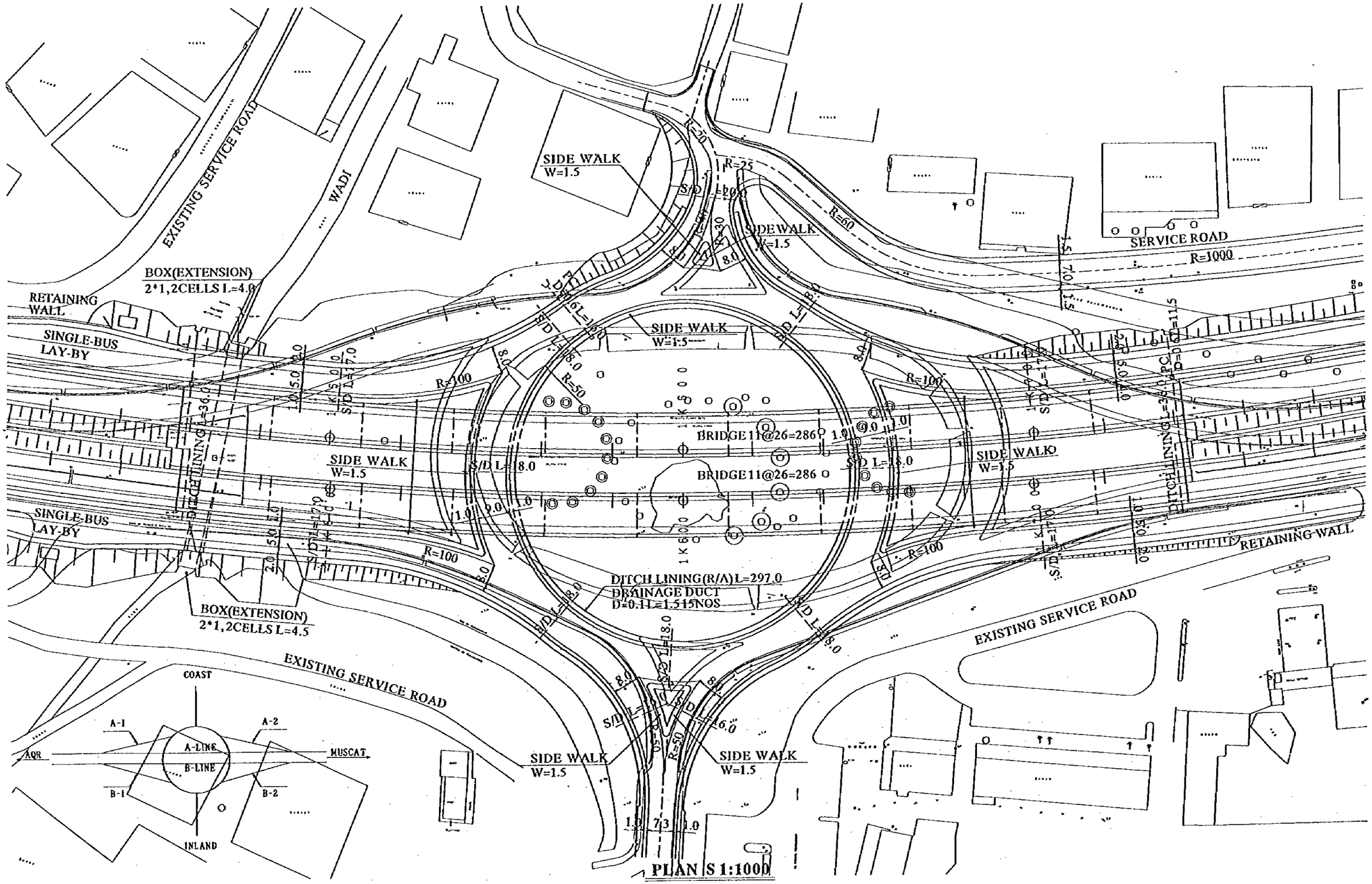
NOTES:

(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
(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/14 FALAJ AL QABAIL TYPICAL CROSS SECTION
DATE:	DWG NO. : R-8

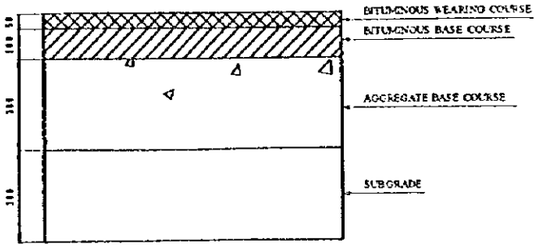


NOTES:

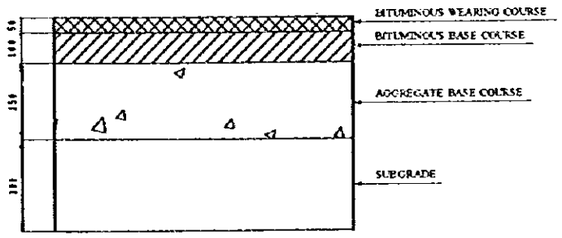
(1) ALL DIMENSIONS ARE IN METER.
(2) S/D INDICATES SERVICE DUCT (D=0.15m, 2WAY)
(3) PC AND BC REPRESENTS PIPE CULVERT AND BOX CULVERT RESPECTIVELY.

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/14 FALAJ AL QABAIL DETAILED PLAN
	DATE: DWG NO.: R-9

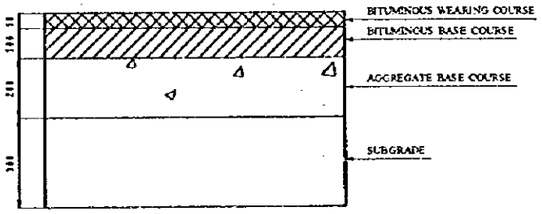
TYPE'A'



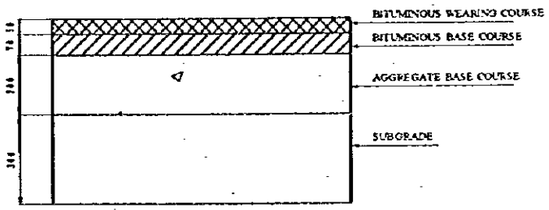
TYPE'B'

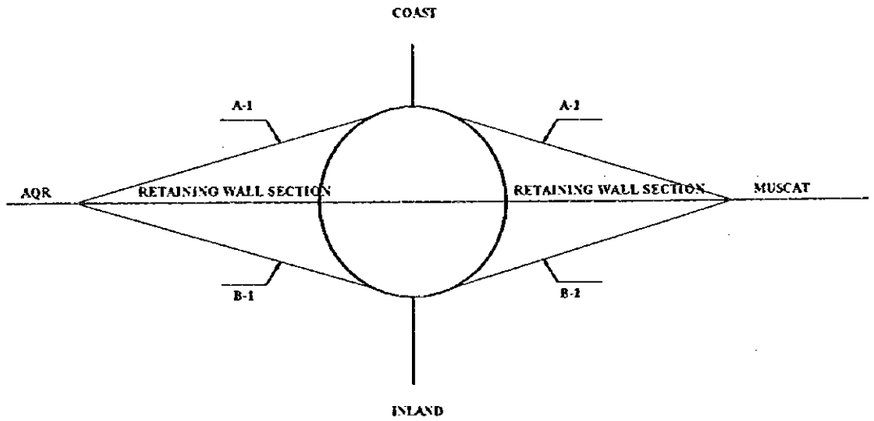


TYPE'C'



TYPE'D'

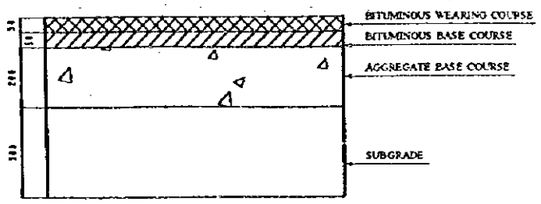




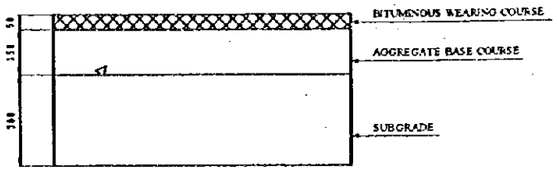
CLASSIFICATION OF PAVEMENT STRUCTURE

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

TYPE'E'



TYPE FOR SERVICE ROADS



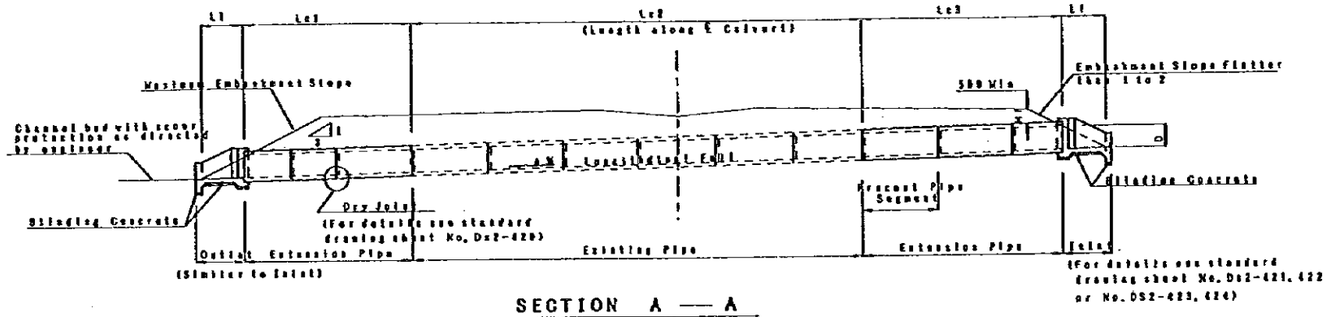
NOTES:

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

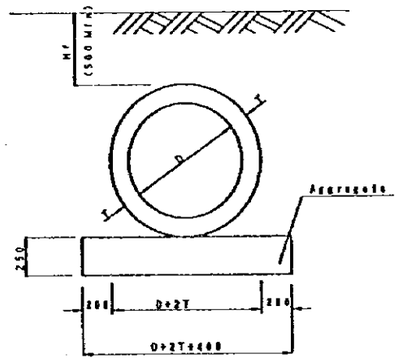
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)
JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/14 FALAJ AL QABAIL PAVEMENT DETAILS
DATE:
DWG NO.: R-10

4



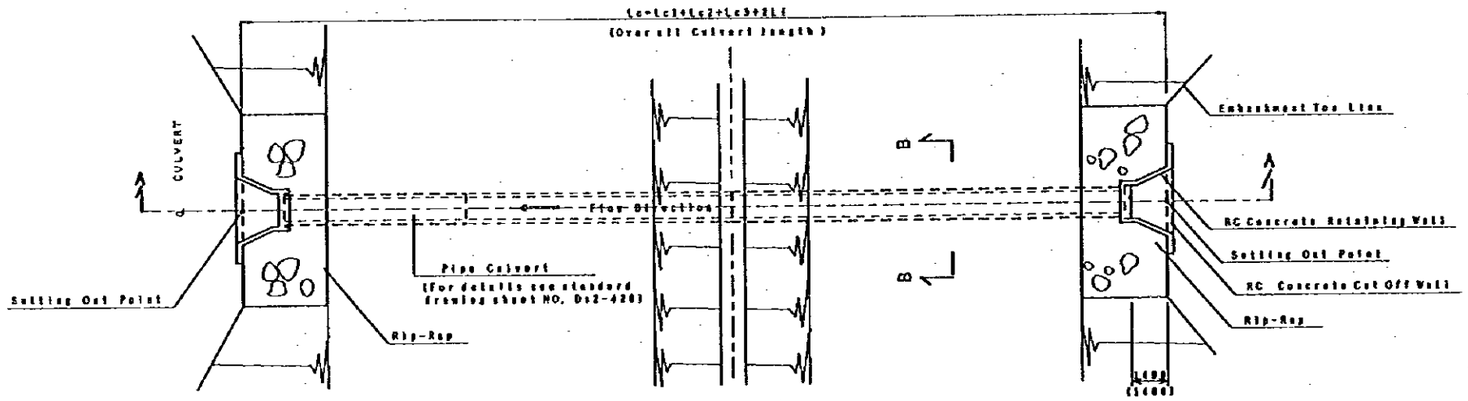
SECTION A — A



SECTION B — B

LIST OF PIPE CULVERT

STA	A or B LINE	DIMENSION(m)	PIPE CLASS	LONGITUDINAL FALL : n	LENGTH (m)	REMARK
0K976.5	A	φ0.90x1CELL	M	0.53%	6.0	Extension
1K207.5	A.B	φ0.90x1CELL	M	0.52%	(14.5+4.0) 18.5	Extension
2K 028.0	A.B	φ0.60x1CELL	M	0.94%	(25.0+8.0) 33.0	Extension



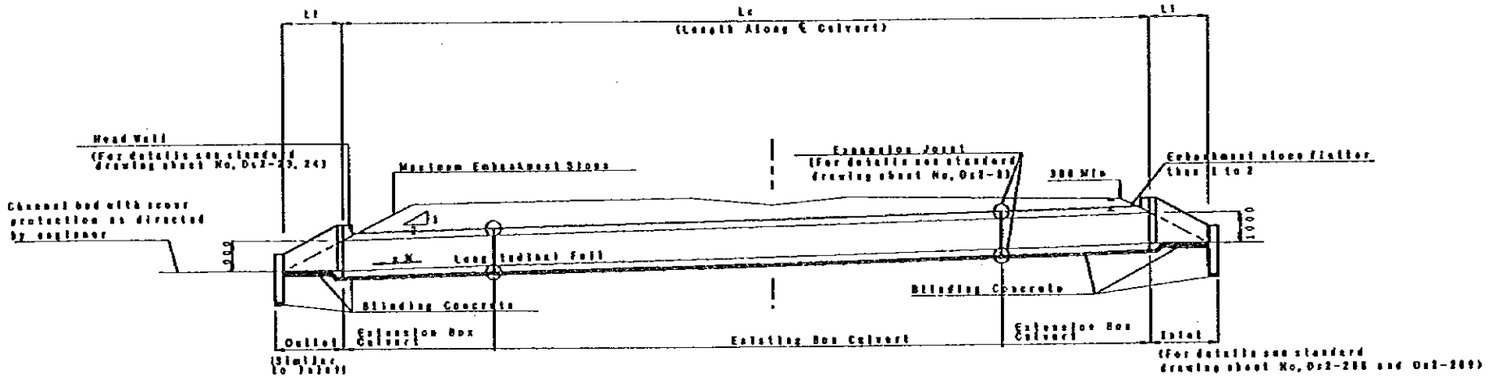
PLAN

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.
(4) FIGURES INSIDE BRACKETS DENOTE INLET-OUTLET DIMENSION FOR PIPE CILVERT D=0.90

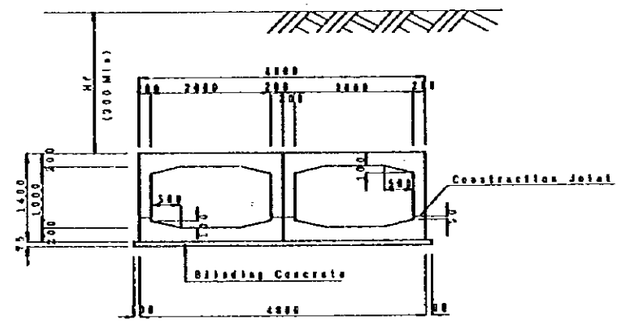
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

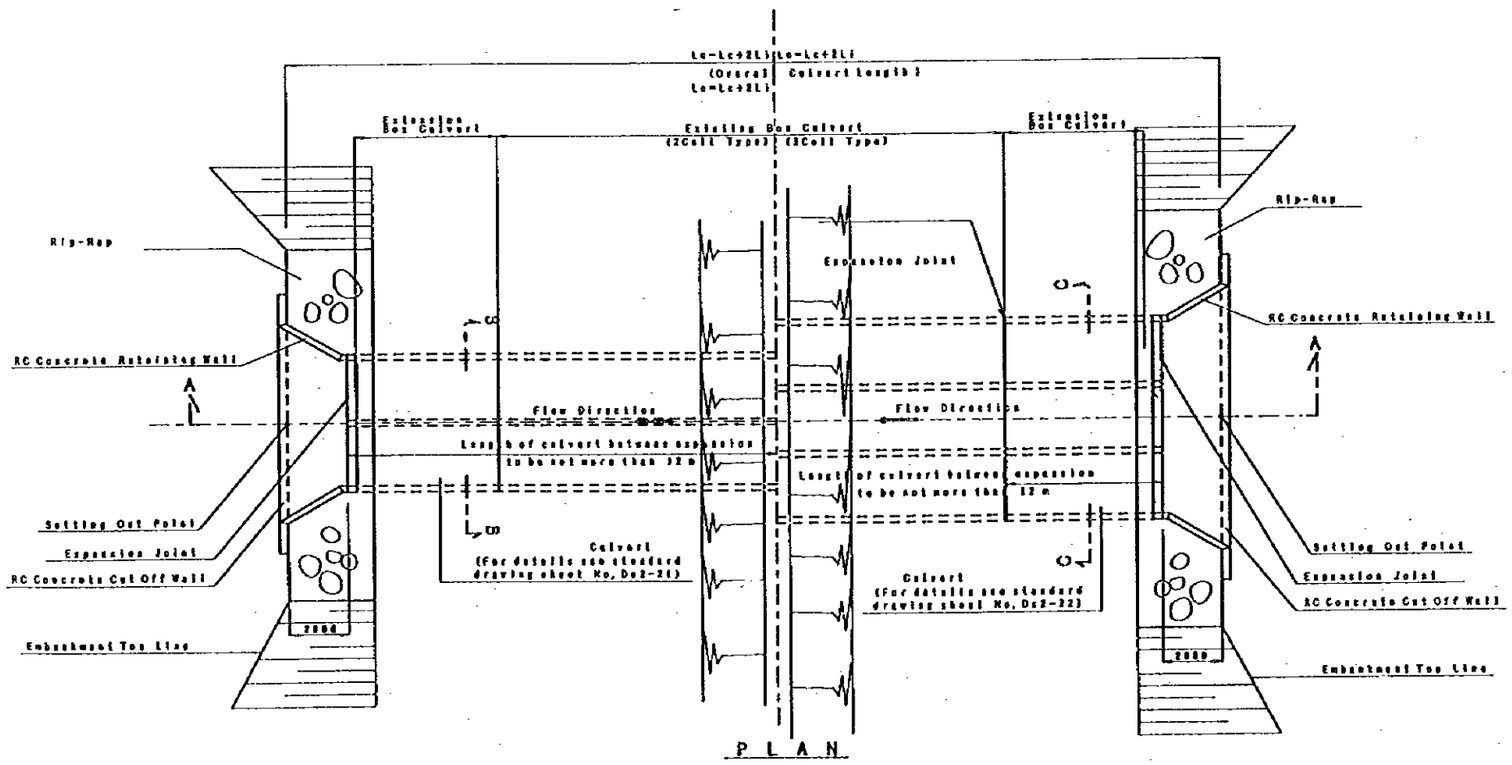
CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/14 FALAJ AL QABAIL DRAINAGE STRUCTURE (1/4)
DATE:
DWG NO. : R-11



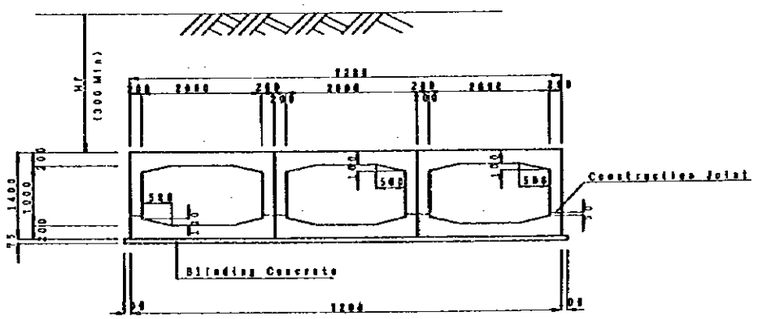
SECTION A — A



SECTION B — B



PLAN



SECTION C — C

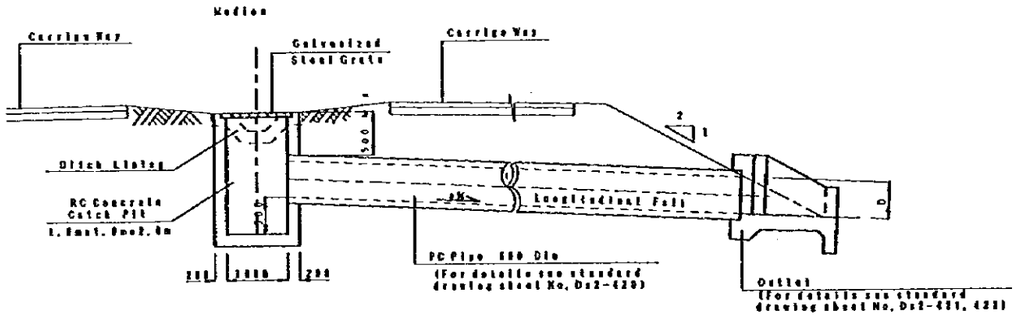
LIST OF BOX CULVERT

STA	A or B LINE	DIMENSION (m)	LONGITUDINAL FALL : %	LENGTH (m)	REMARK
1K468.0	A.B	2.0x1.0x2CELL	0.43%	(4.0+4.5) 8.5	Extension
2K302.5	A	2.0x1.0x3CELL	0.57%	12.0	Extension

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

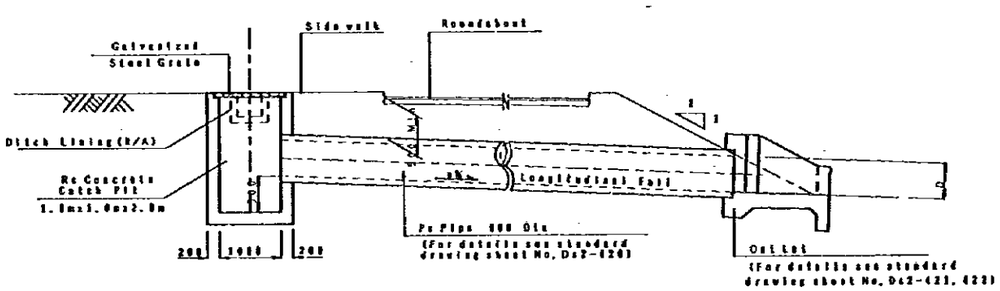
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)
JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/14 FALAJ AL QABAIL DRAINAGE STRUCTURE (2/4)
DATE:
DWG NO. : R-12



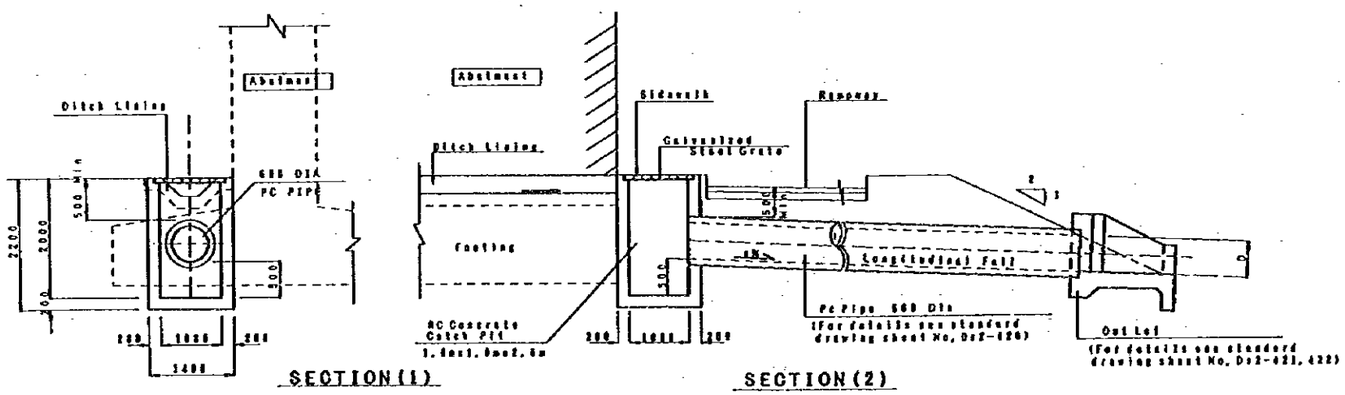
SECTION

DRAIN SYSTEM OF MEDIAN



SECTION

DRAIN SYSTEM OF ROUNDABOUT



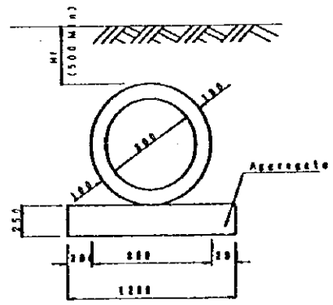
SECTION(1)

SECTION(2)

DRAIN SYSTEM IN FRONT OF ABUTMENT

LIST OF DRAIN SYSTEM AT MEDIAN

STA	AccB LINE	DIMENSION(m)	PIPE CLASS	LONGITUDINAL FALL:n	LENGTH (m)	REMARK
1K150	A	φ0.60x1CELL	M	0.3%	29.0	
2K170	A	φ0.60x1CELL	M	0.3%	31.0	



TYPICAL CROSS SECTION

LIST OF DRAIN SYSTEM AT ROUNDABOUT

STA	AccB LINE	DIMENSION(m)	PIPE CLASS	LONGITUDINAL FALL:n	LENGTH (m)	REMARK
1K628	A	φ0.60x1CELL	M	0.3%	16.0	

LIST OF DRAIN SYSTEM IN FRONT OF ABUTMENT

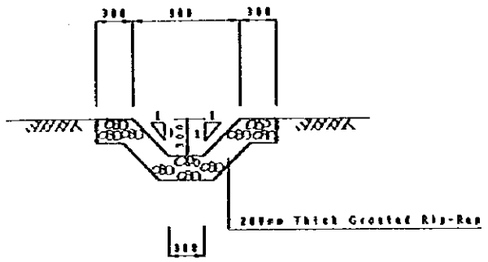
STA	AccB LINE	DIMENSION(m)	PIPE CLASS	LONGITUDINAL FALL:n	LENGTH (m)	REMARK
1K458(A1)	A	φ0.60x1CELL	M	0.3%	14.5	
1K742(A2)	A	φ0.60x1CELL	M	0.3%	11.5	

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

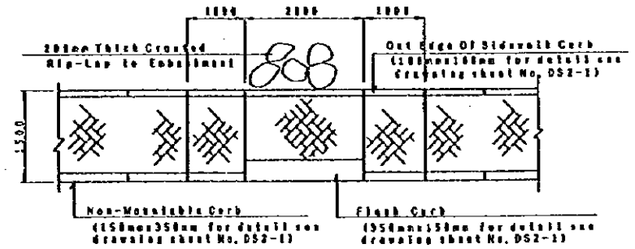
JAPAN INTERNATIONAL COOPERATION AGENCY
(JICA)

JICA STUDY TEAM
PACIFIC CONSULTANTS INTERNATIONAL
FUKUYAMA CONSULTANTS INTERNATIONAL

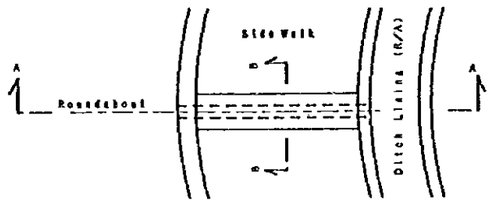
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
TITLE: RA/14 FALAJ AL QABAIL DRAINAGE STRUCTURE (3/4)
DATE:
DWG NO. : R-13



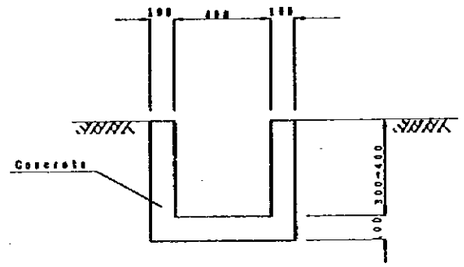
DITCH LINING



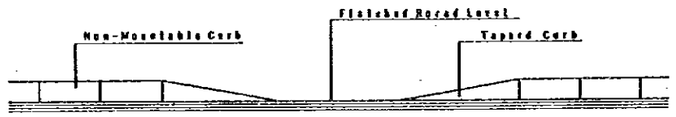
P L A N



P L A N

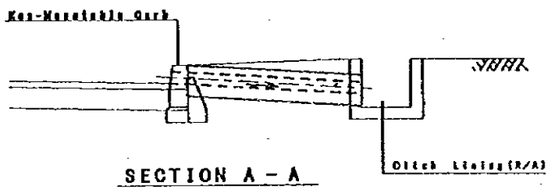


DITCH LINING (R/A)

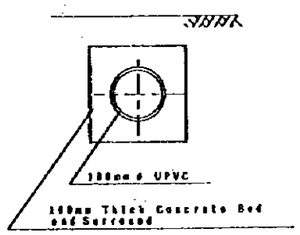


Elevation

DROPPED SIDEWALK

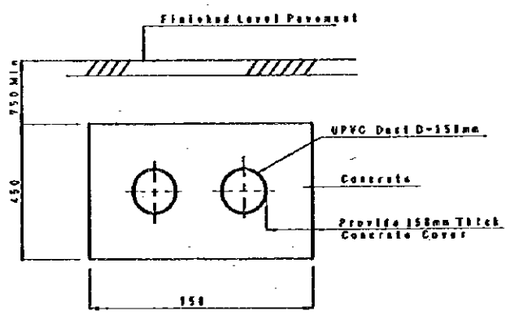


SECTION A - A



SECTION B - B

DRAIN SYSTEM AROUND ROUNDABOUT



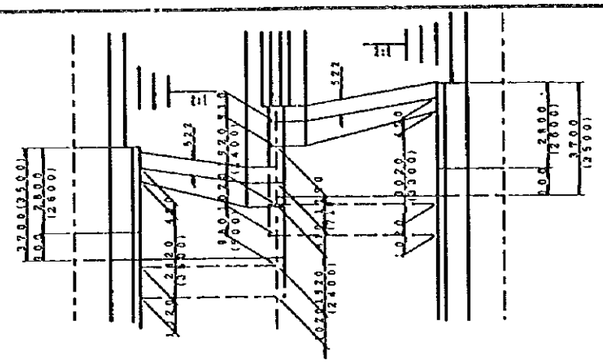
SECTION

SERVICE DUCTS

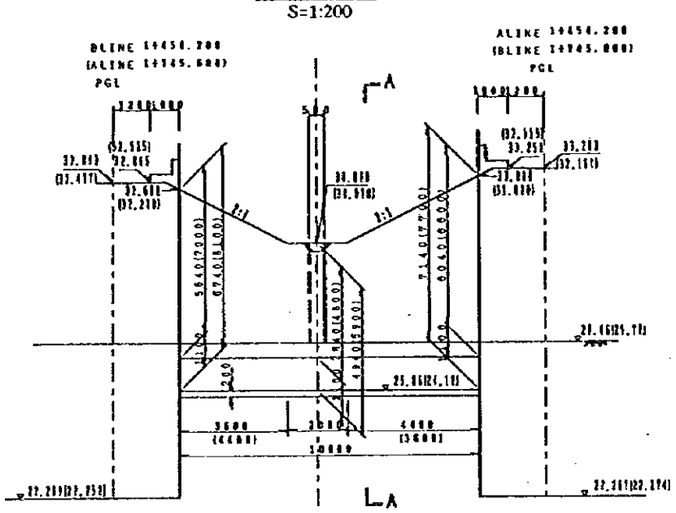
NOTES:

(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.

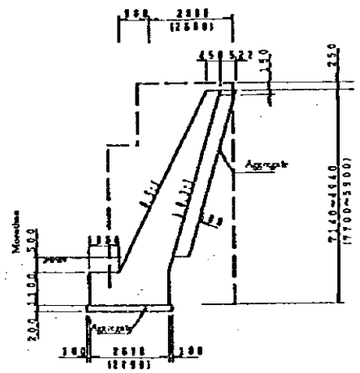
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT:	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE:	RA14 FALAJ AL QABAIL DRAINAGE (4/4)AND SERVICE DUCTS
	DATE:	DWG NO.: R-14



PLAN
S=1:200

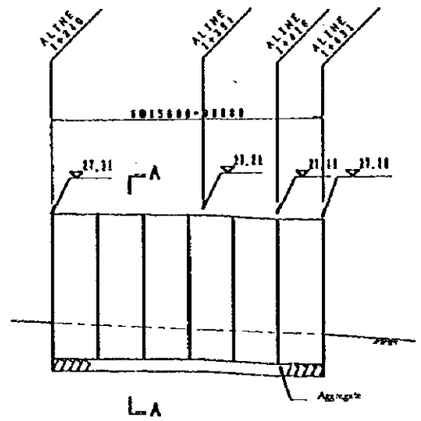


FRONT VIEW
S=1:200

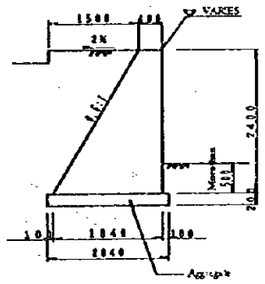


SECTION A-A
S=1:200

RETAINING WALL BETWEEN ABUTMENTS

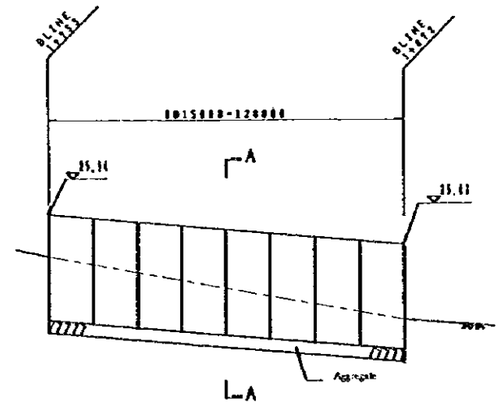


FRONT VIEW
H=1:2000
V=1:100

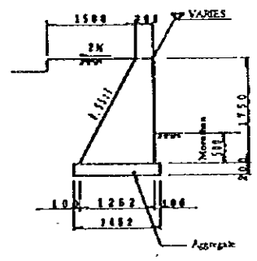


SECTIONA-A
S=1:100

RETAINING WALL ALONG RAMPWAY (A-1)



FRONT VIEW
H=1:2000
V=1:100



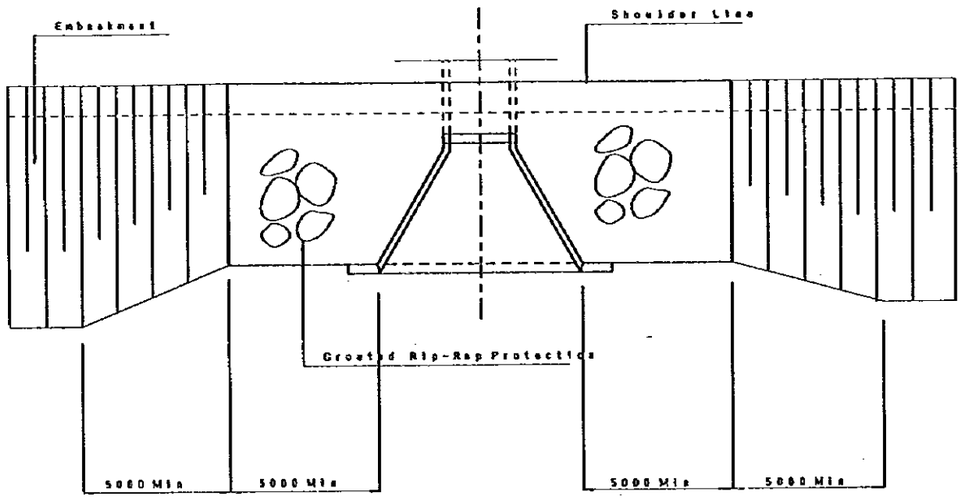
SECTIONA-A
S=1:100

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/14 FALAJ AL QABAIL RETAINING WALL
DATE:	DWG NO. : R-15



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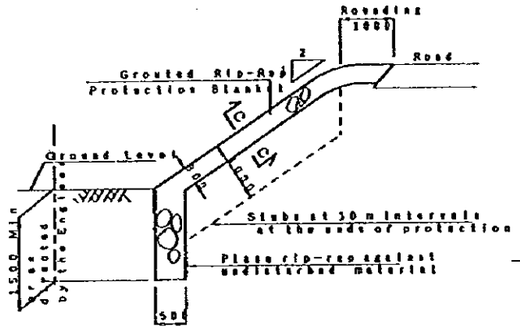
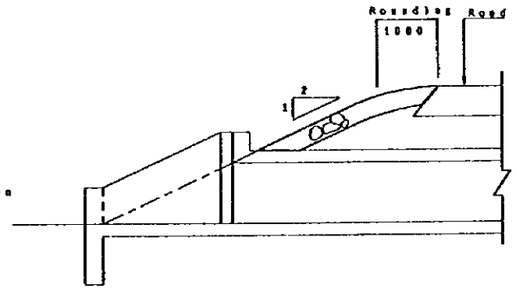
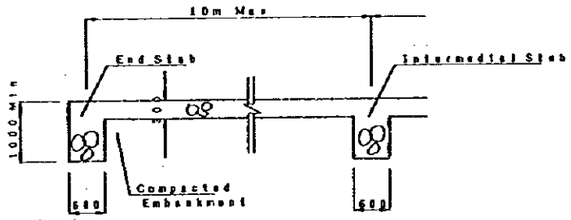


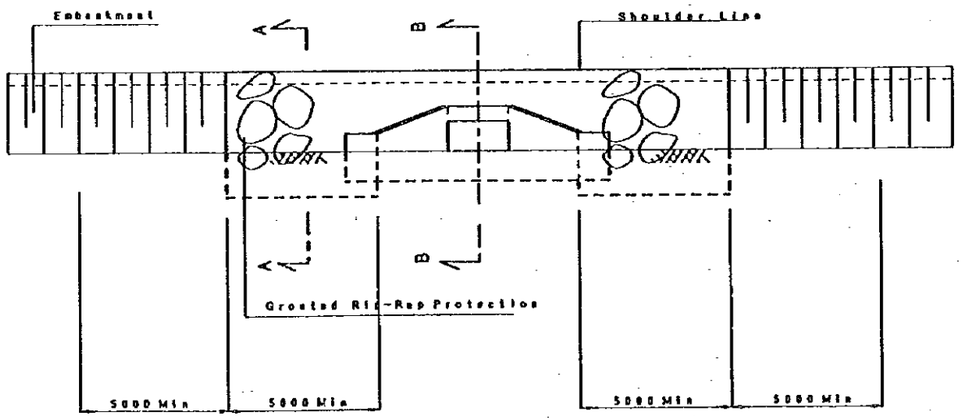
SECTION A — A



SECTION B — B



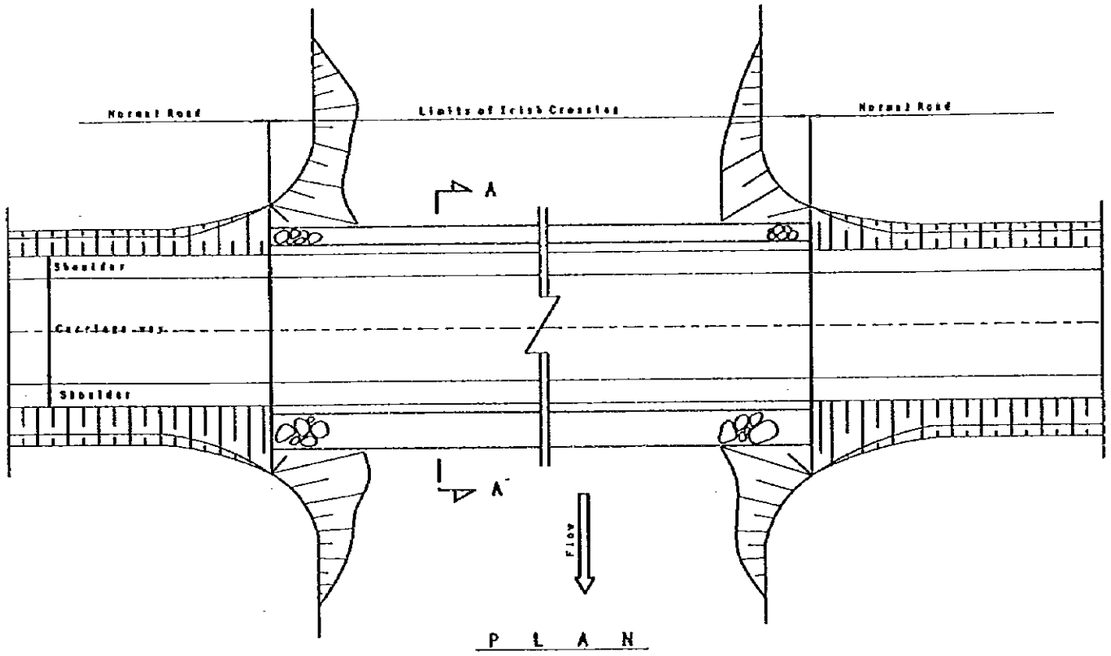
SECTION C — C



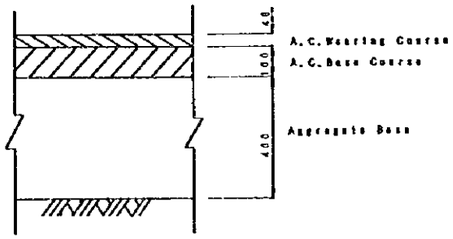
FRONT VIEW

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

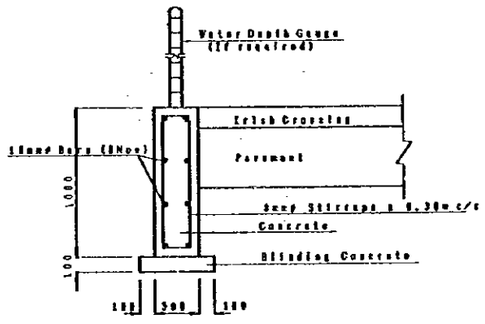
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/14 FALAJ AL QABAIL SLOPE PROTECTION
	DATE: DWG NO.: R-16



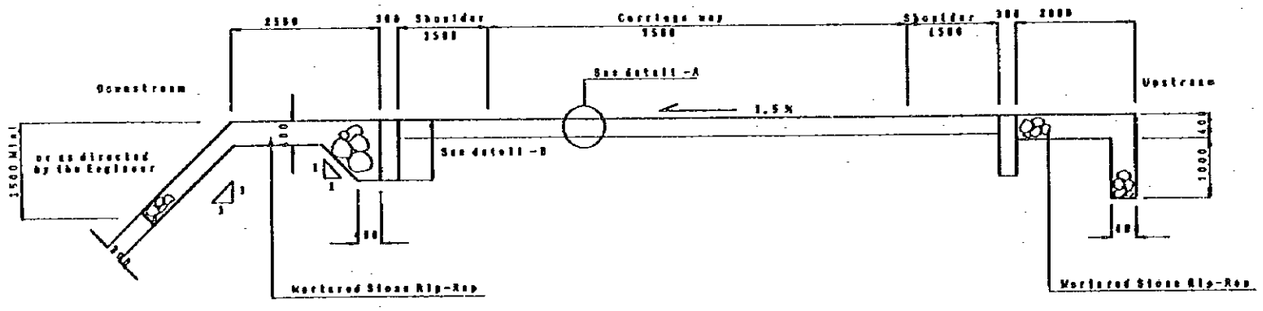
P L A N



PAVEMENT
(Detail-A)



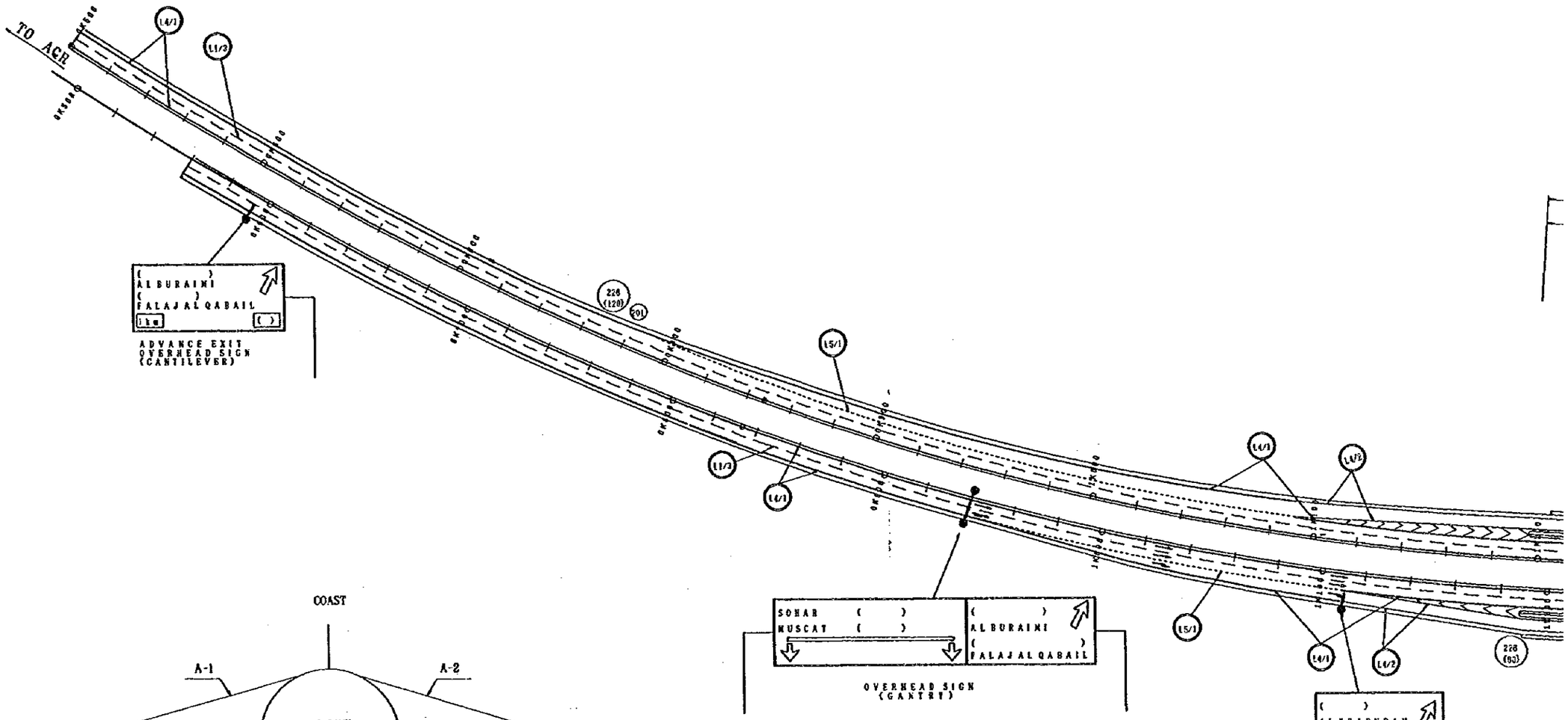
DETAIL OF CUT OFF WALL
(Detail-B)

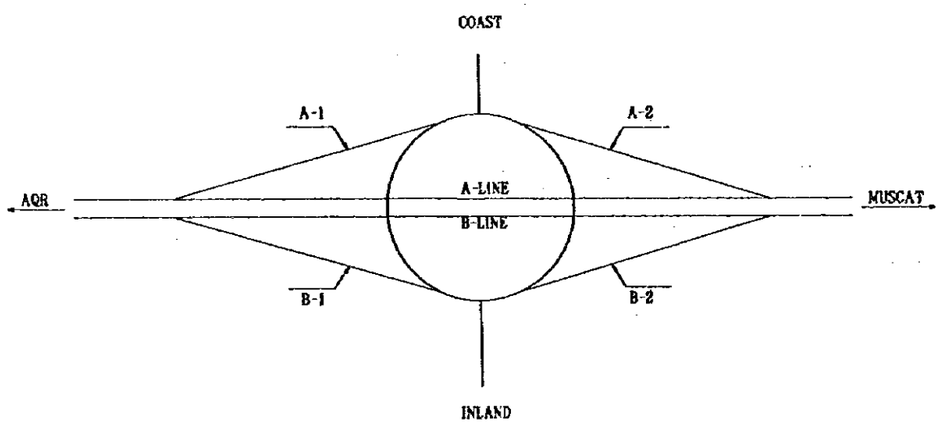


SECTION A — A

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

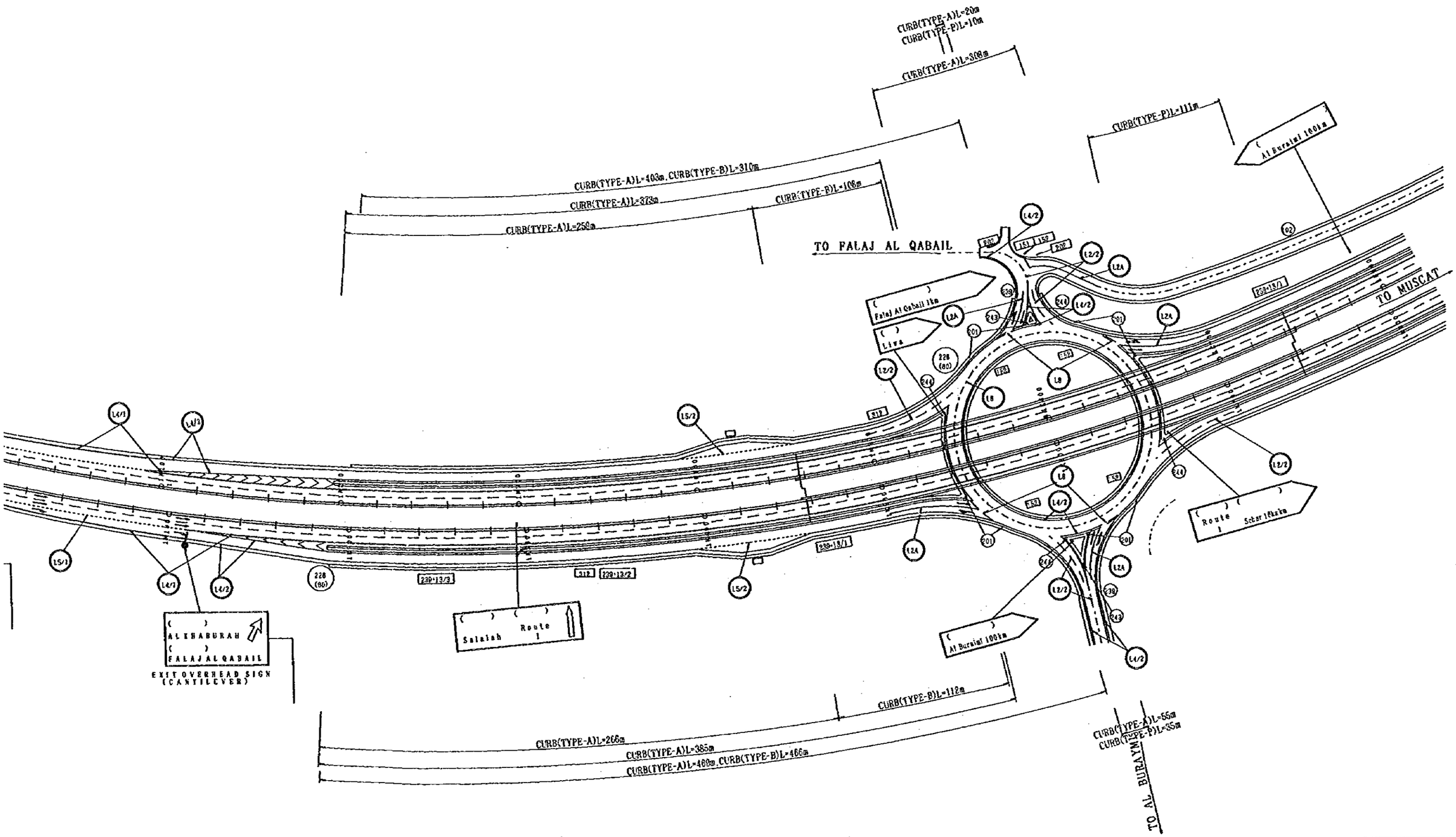
JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE: RA/14 FALAJ AL QABAIL IRISH CROSSING	
	DATE:	DWG NO.: R-17





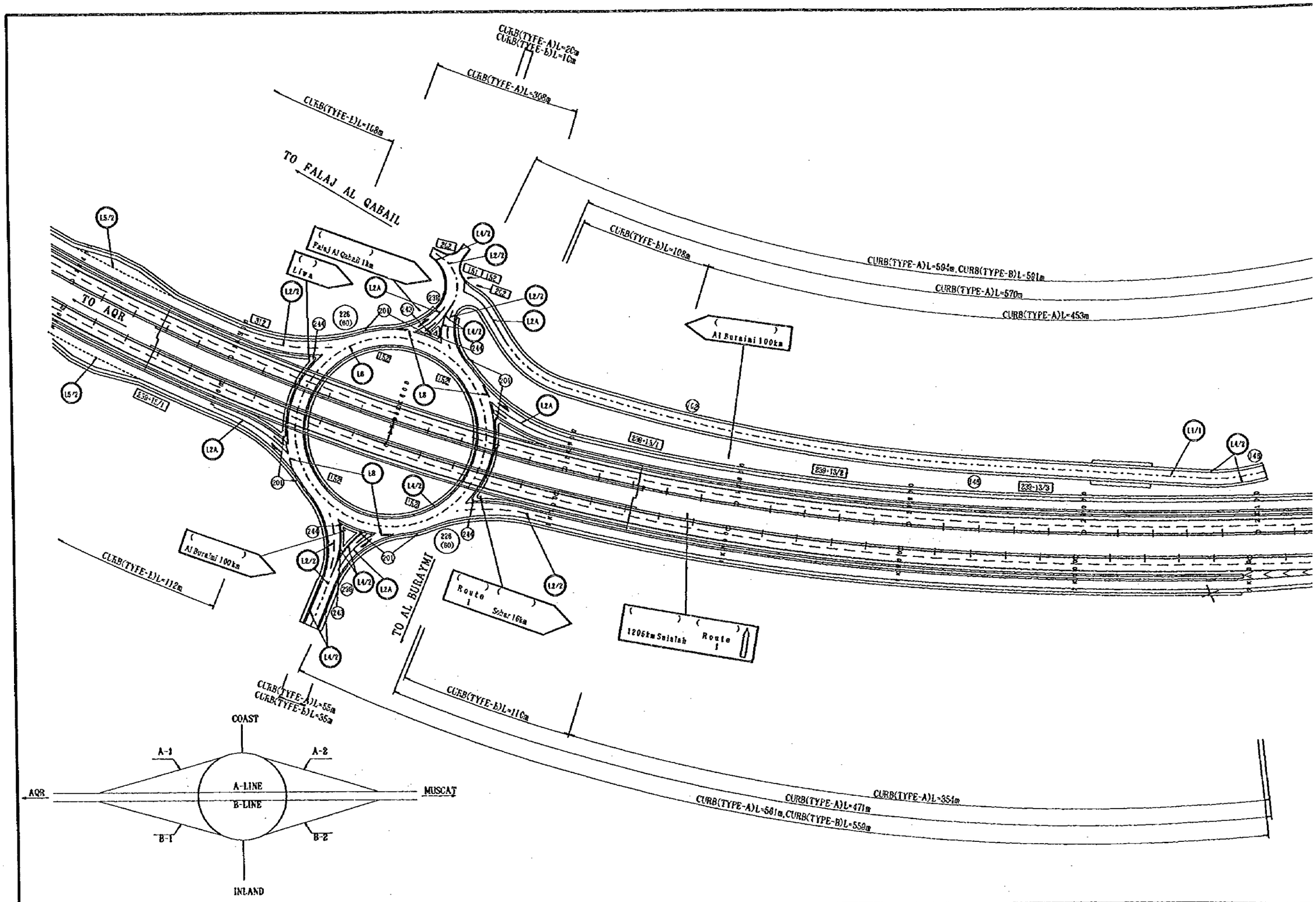
NOTES:

(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.



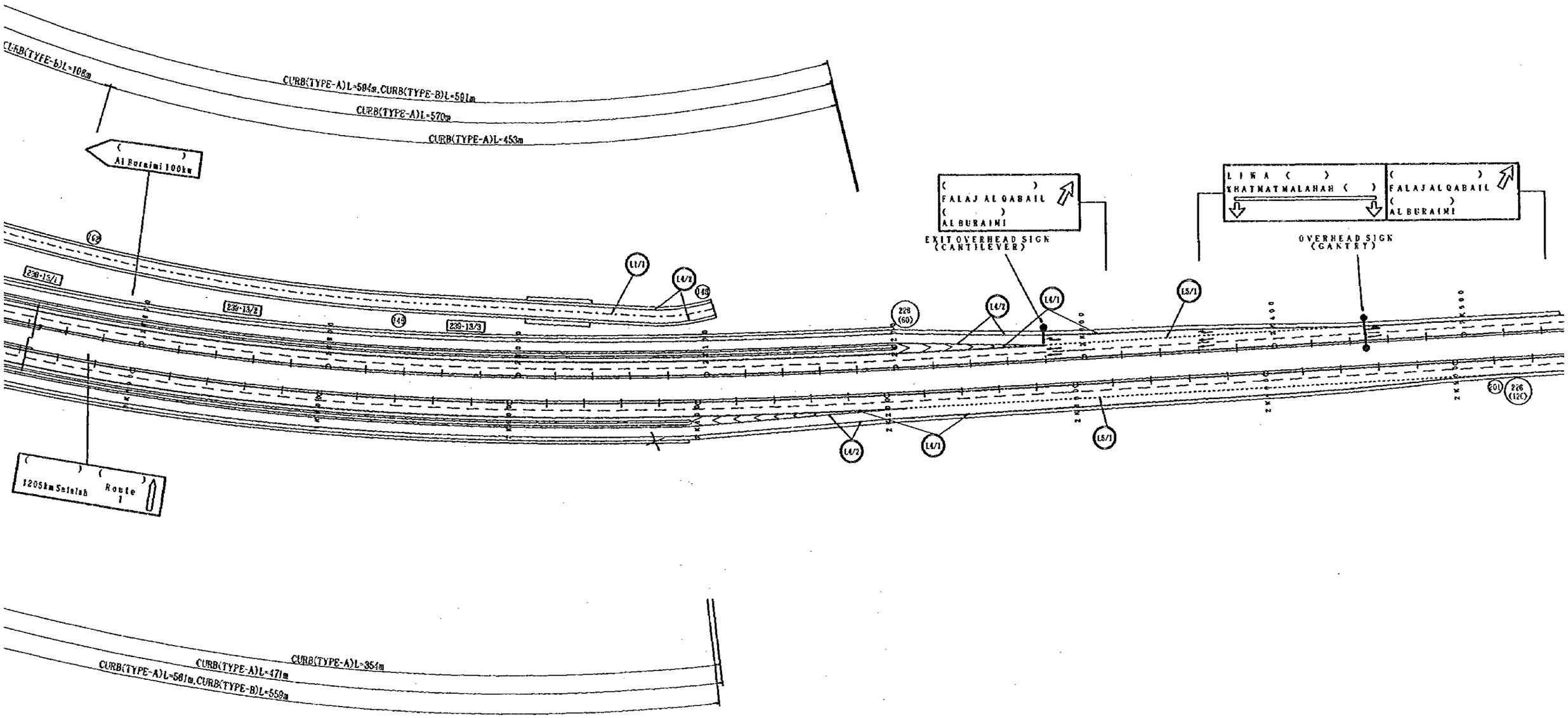
E FINALIZED DURING CONSTRUCTION.
IE LOCATION 300-1000m AHEAD FROM OVERHEAD SIGN.

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/14 FALAJ AL QABAIL ROAD MARKING AND TRAFFIC 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 DGR OR THE RELEVANT AUTHORITIES.
(5) FINAL LOCATION OF ROAD SIGNS AND ARABIC NAMES ARE TO BE FINALIZED DURING CONSTRUCTION.



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

JAPAN INTERNATIONAL
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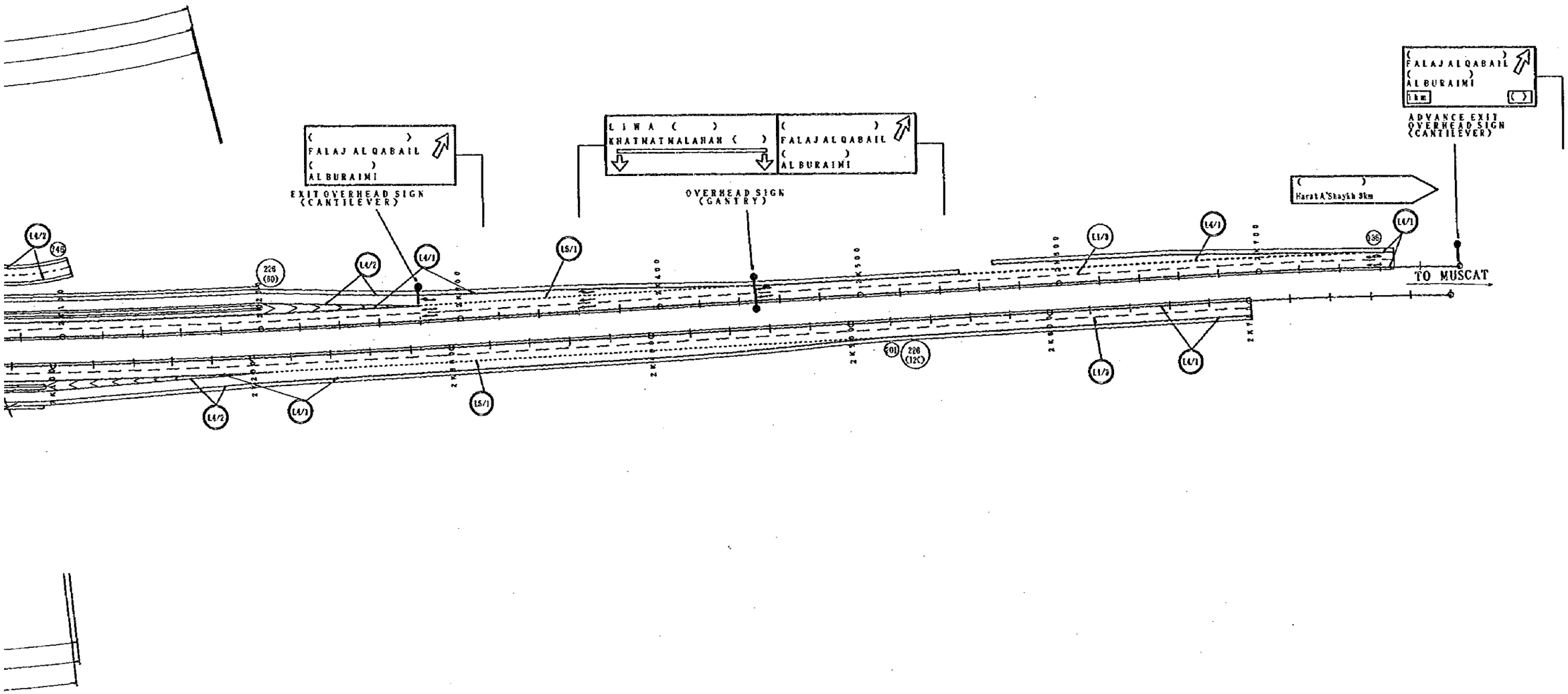
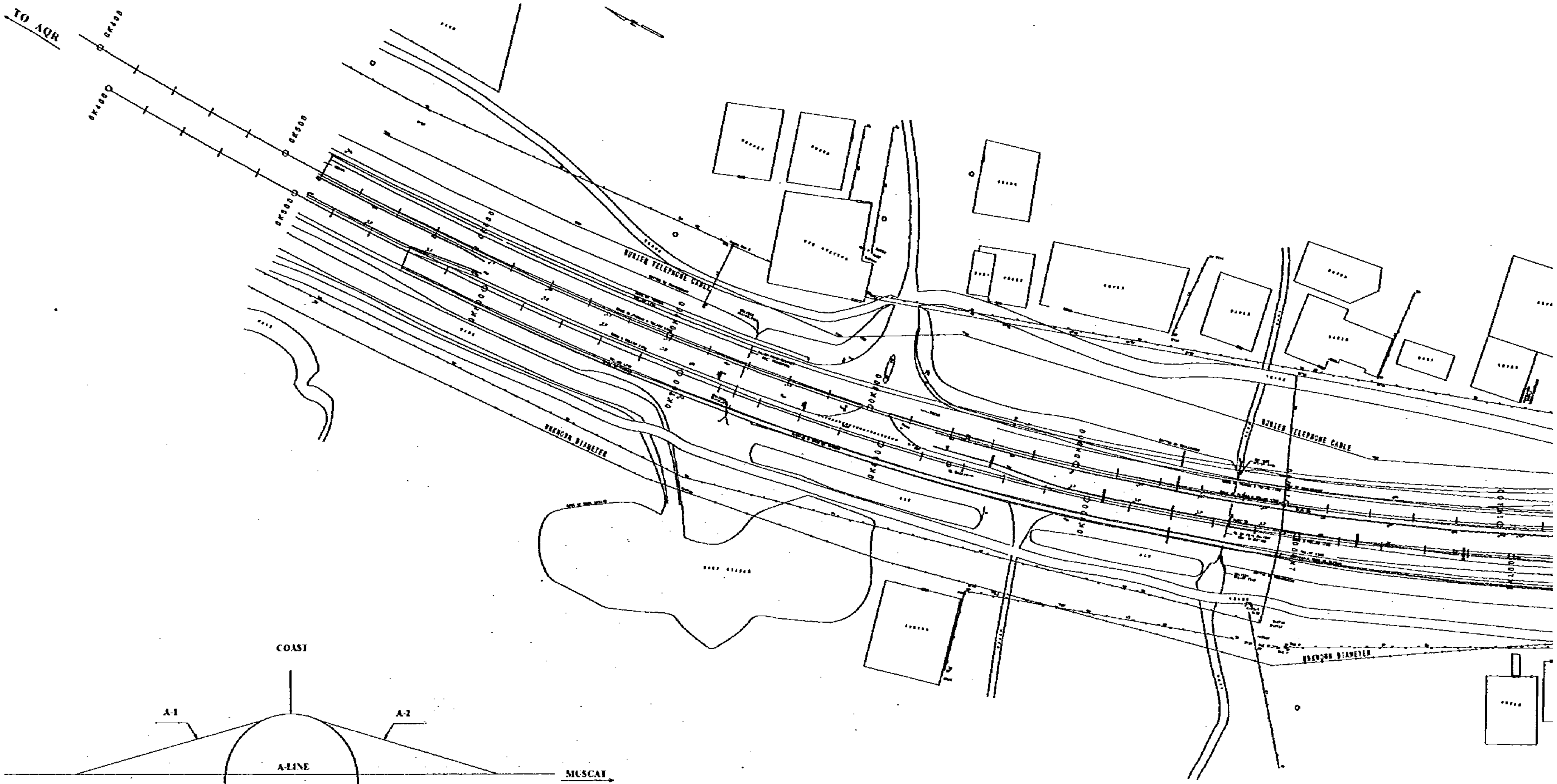
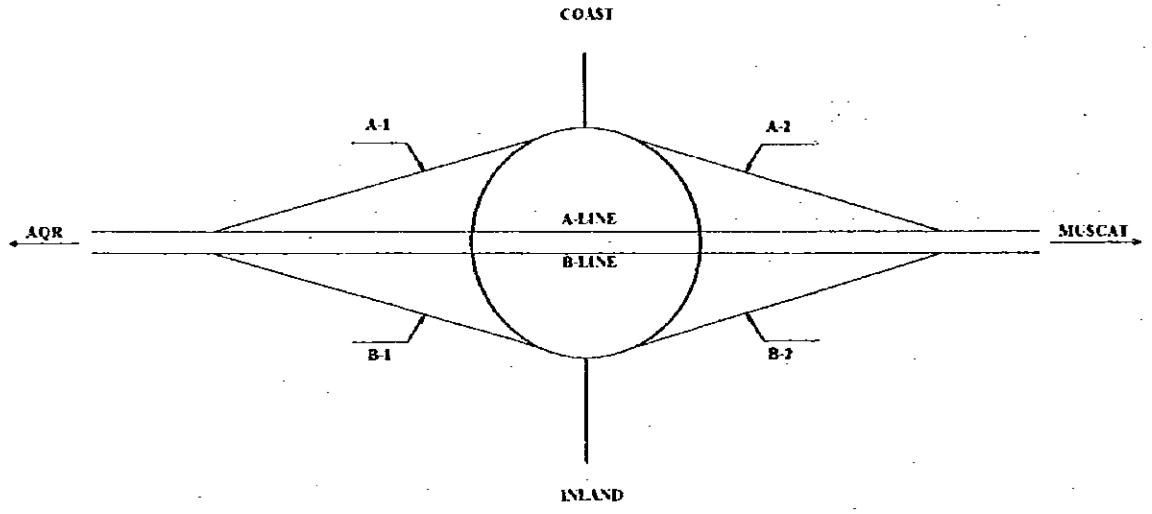
PACIFIC CONSULTA
FUKUYAMA CONSULT



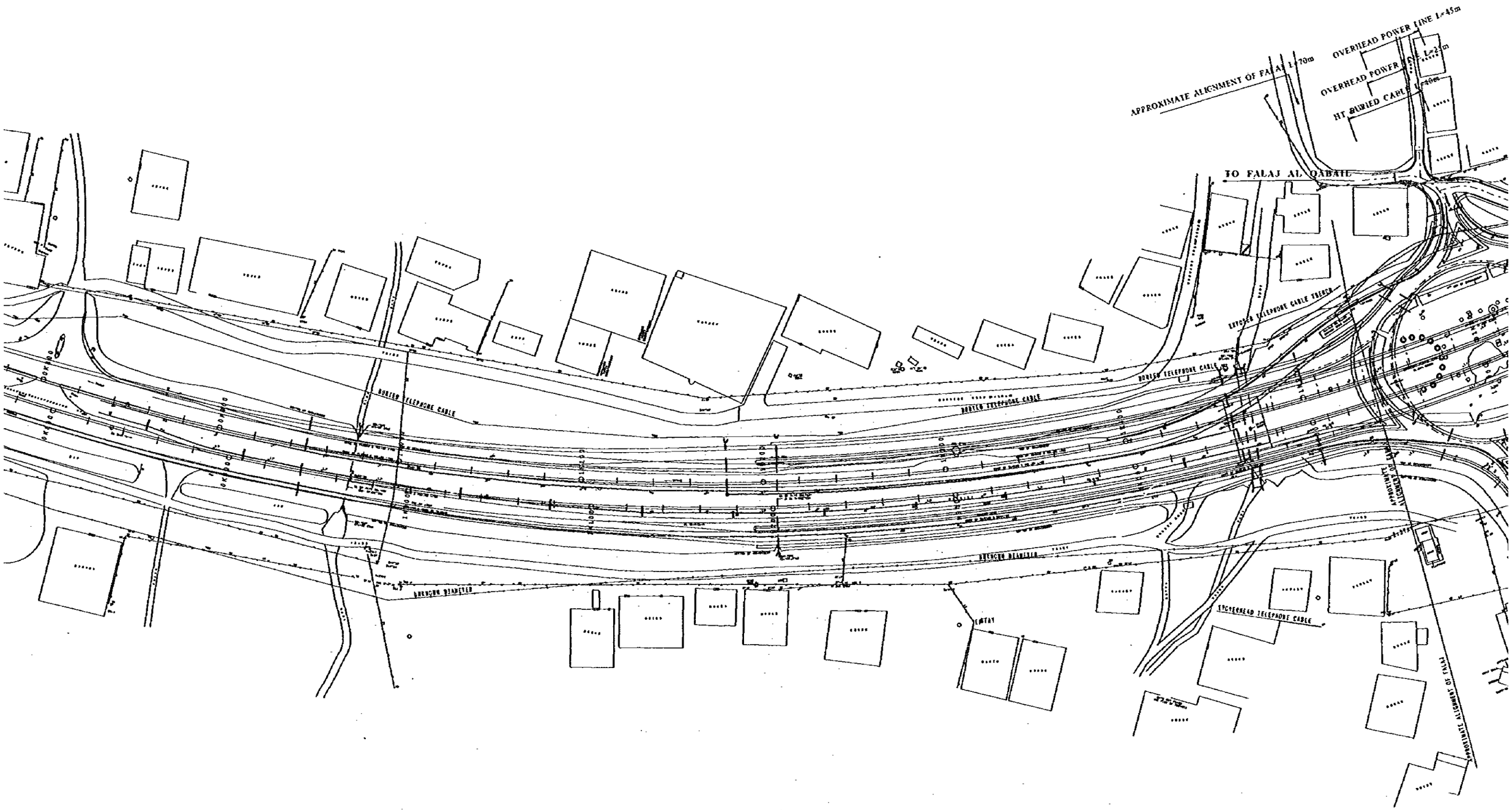
	JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT:	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
		PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
	JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE	RA/14 FALAJ AL QABAIL ROAD MARKING AND TRAFFIC SIGN(2/2)
		DATE	DWGNO. R-19


TO AQR
BURIED TELEPHONE CABLE
UNKNOWN DIAMETER

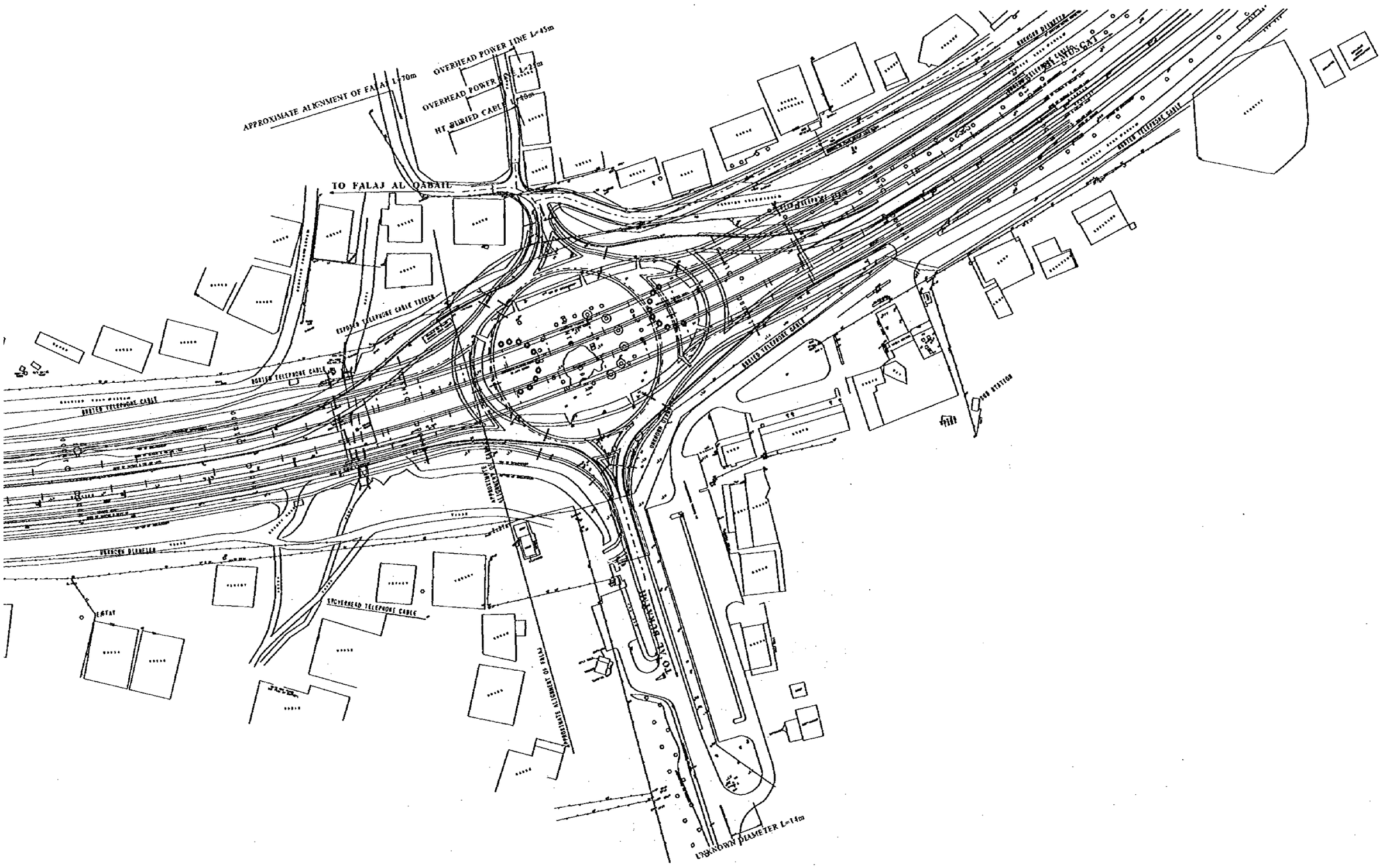

COAST
A-1
A-2
AQR
A-LINE
B-LINE
MUSCAT
B-1
B-2
INLAND

PLA

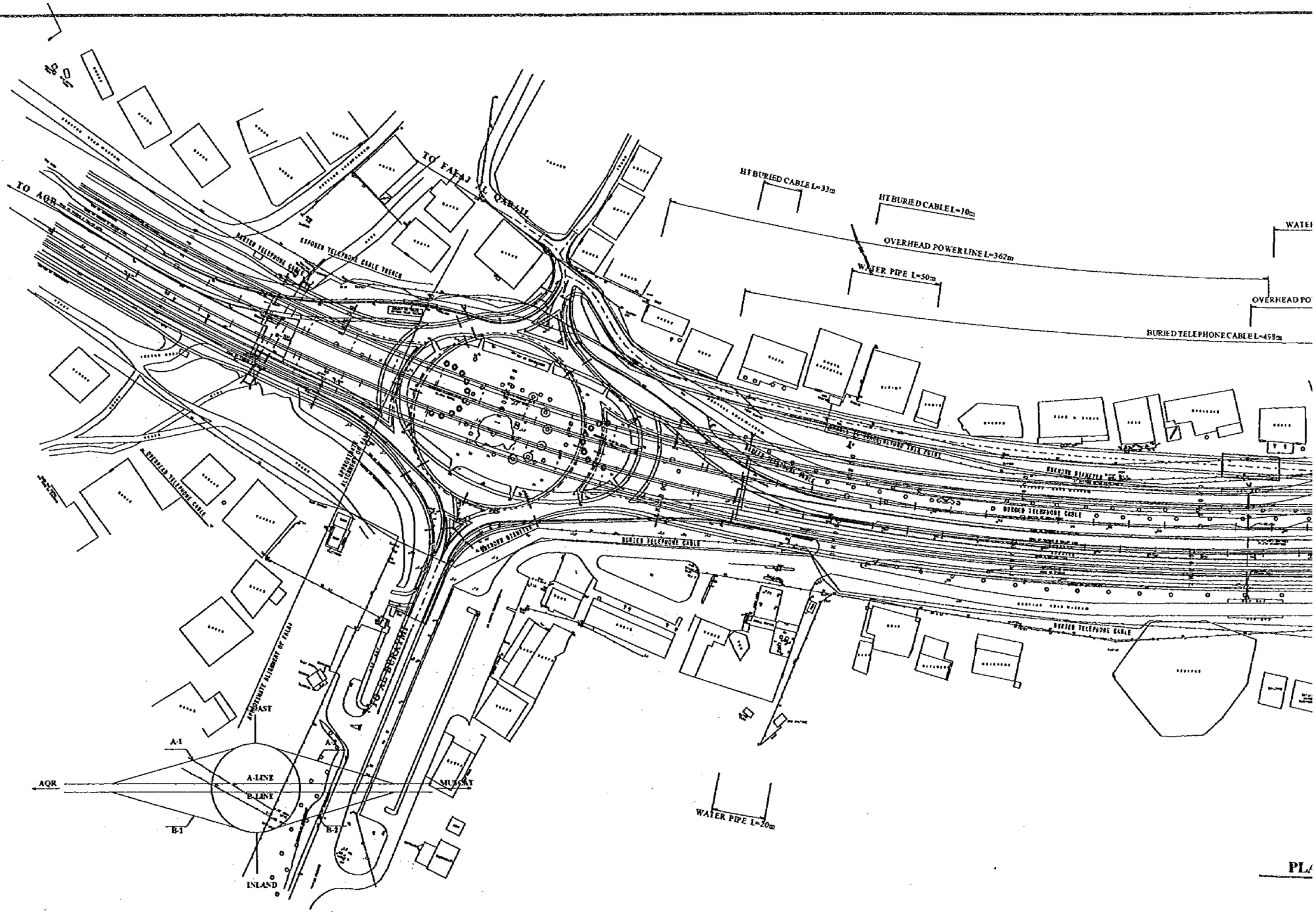
NOTES:


APPROXIMATE ALIGNMENT OF FALAJ L=70m
OVERHEAD POWER LINE L=45m
OVERHEAD POWER LINE L=25m
HT BURIED CABLE L=40m
TO FALAJ AL QABAIL
BURIED TELEPHONE CABLE
BURIED TELEPHONE CABLE
BURIED TELEPHONE CABLE
BURIED TELEPHONE CABLE TRENCH
BURIED TELEPHONE CABLE
BURIED TELEPHONE CABLE
OVERHEAD TELEPHONE CABLE
APPROXIMATE ALIGNMENT OF FALAJ

PLAN S 1 : 2000

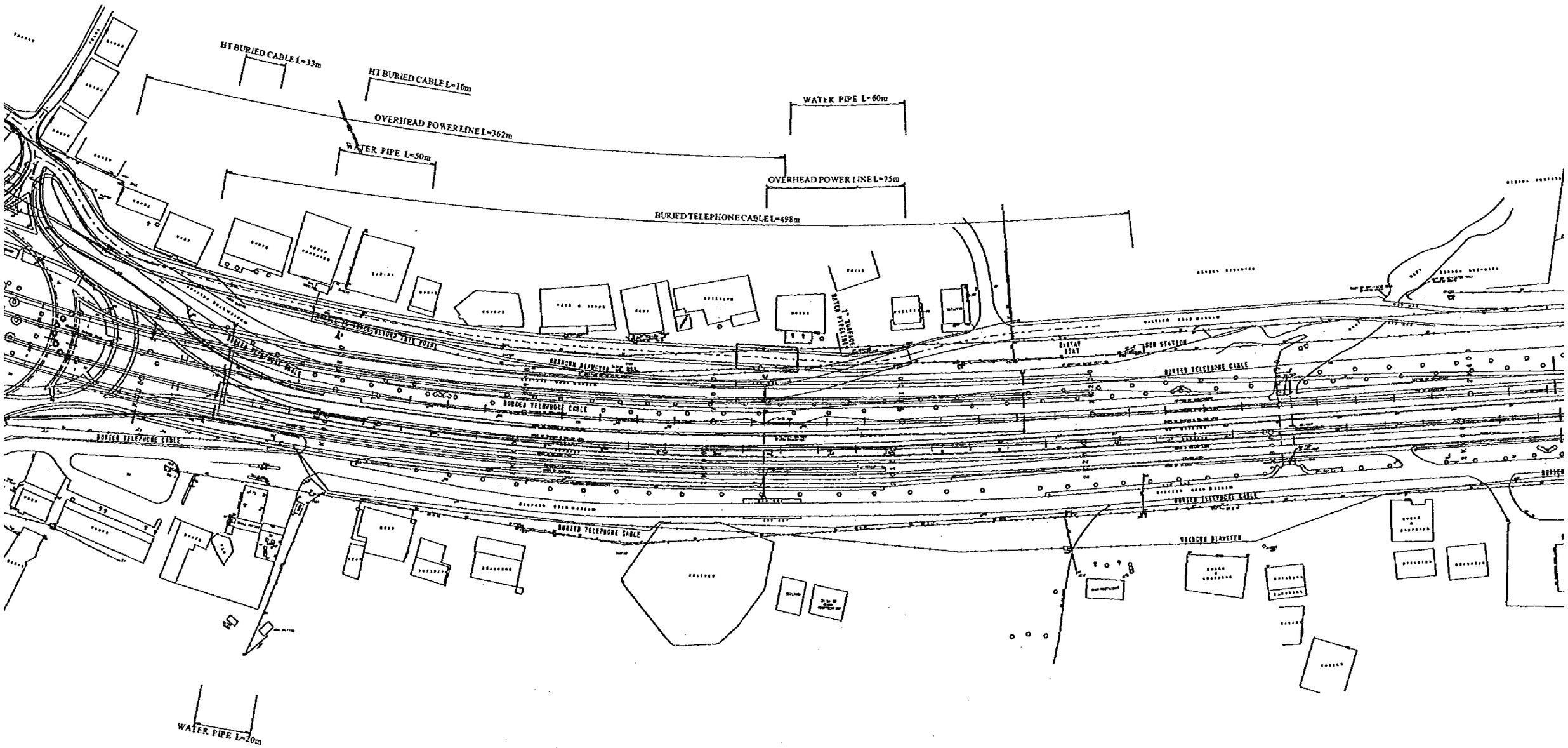


JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)	CLIENT :	MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS
	PROJECT:	D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY
JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL	TITLE	RA/14 FALAJ AL QABAIL REMOVAL & RELOCATION OF UTILITIES(1/2)
	DATE	DWG NO. R-10

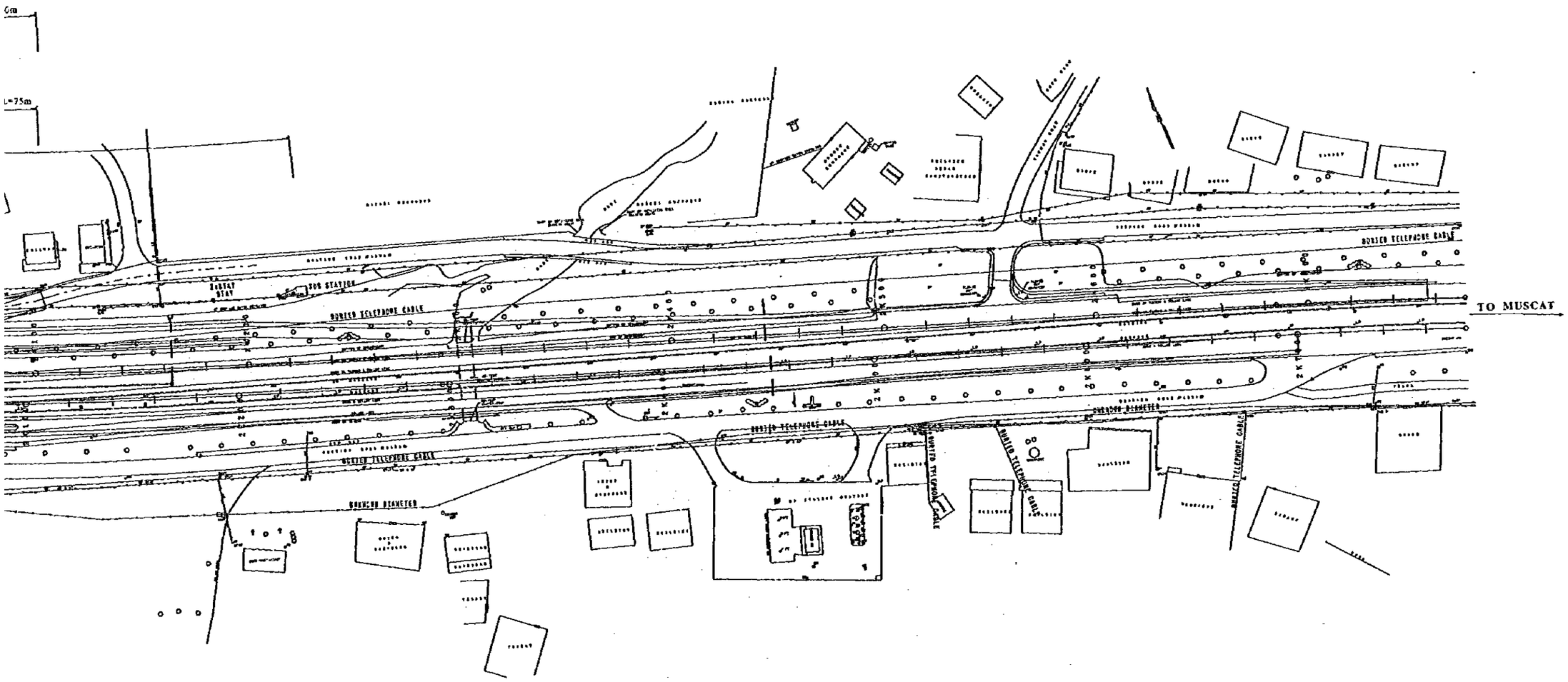

TO AGR
TO FALAJ AL QABAIL
HT BURIED CABLE L=33m
HT BURIED CABLE L=10m
OVERHEAD POWER LINE L=362m
WATER PIPE L=50m
BURIED TELEPHONE CABLE L=498m
EXPOSED TELEPHONE CABLE TRENCH
BURIED TELEPHONE LINE
OVERHEAD TELEPHONE CABLE
APPROXIMATE ALIGNMENT OF FALAJ
BURIED TELEPHONE CABLE
TO AL BUSAITIN
EAST
A-1
A-2
AQR
A-LINE
B-LINE
MUSCAT
B-1
B-1
INLAND
WATER PIPE L=20m

NOTES:

25


HT BURIED CABLE L=33m
HT BURIED CABLE L=10m
OVERHEAD POWER LINE L=362m
WATER PIPE L=50m
WATER PIPE L=60m
OVERHEAD POWER LINE L=75m
BURIED TELEPHONE CABLE L=498m
BURIED TELEPHONE CABLE
WATER PIPE L=20m

PLAN S 1:2000



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/14 FALAJ AL QABAIL REMOVAL & RELOCATION OF UTILITIES (2/2)
	DATE	DWG NO. R-21