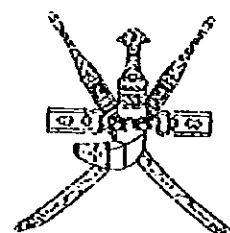


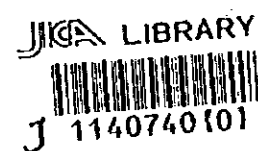
**SULTANATE OF OMAN**  
**MINISTRY OF COMMUNICATIONS**  
**DIRECTORATE GENERAL OF ROADS**



**CONSTRUCTION OF FLYOVER**  
**AT**  
**AL KHABURAH ROUNDABOUT**  
**BATINAH HIGHWAY**

**TENDER DOCUMENT**

**DRAWINGS**



PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

MARCH, 1997

SSF
CR(5)
97-015

# DRAWING SCHEDULE (FO4-R/A8 AL KHABURAH)

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	B-4	Co-ordinate List (A-Line)	W-4	Re-bar Arrangement (2)
R-2	Setting Out Details	B-5	Framing Plan (B-Line)	W-5	Re-bar Arrangement (3)
R-3	Plan	B-6	Co-ordinate List (B-Line)	W-6	Re-bar Arrangement (4)
R-4	Profile-Highway	B-7	General View of Bridge (A-Line)	W-7	Re-bar Arrangement (5)
R-5	Typical Cross Section	B-8	Structural Detail of Main Girder (A-Line)	W-8	Re-bar Arrangement (6)
R-6	Detailed Plan	B-9	Detail of Tendons (A-Line)	W-9	Re-bar Arrangement (7)
R-7	Pavement Details	B-10	Re-bar Arrangement (A-Line) (1/2)	W-10	Re-bar Arrangement (8)
R-8	Drainage Structure (1/4)	B-11	Re-bar Arrangement (A-Line) (2/2)	W-11	Re-bar Arrangement (9)
R-9	Drainage Structure (2/4)	B-12	Bar Schedule of Main Girder (A-Line)	W-12	Re-bar Arrangement (10)
R-10	Drainage Structure (3/4)	B-13	Railing and Cantilever Slab (A-Line)	W-13	Re-bar Arrangement (11)
R-11	Drainage Structure (4/4) and Service Ducts	B-14	Detail of Shoe and Anchor Bar (A-Line)	W-14	Re-bar Arrangement (12)
R-12	Retaining Wall	B-15	General View of Bridge (B-Line)	W-15	Re-bar Arrangement (13)
R-13	Slope Protection	B-16	Structural Detail of Main Girder (B-Line)	W-16	Re-bar Arrangement (14)
R-14	Irish Crossing	B-17	Detail of Tendons (B-Line)	W-17	Re-bar Arrangement (15)
R-15	Road Marking and Traffic Sign	B-18	Re-bar Arrangement (B-Line) (1/2)	W-18	Re-bar Arrangement (16)
R-16	Removal and Relocation of Utilities	B-19	Re-bar Arrangement (B-Line) (2/2)	W-19	Re-bar Arrangement (17)
		B-20	Bar Schedule of Main Girder (B-Line)	W-20	General View (2)-1
		B-21	Railing and Cantilever Slab (B-Line)	W-21	General View (2)-2
		B-22	Detail of Shoe and Anchor Bar (B-Line)	W-22	Re-bar Arrangement (1)
		B-23	Expansion Joint	W-23	Re-bar Arrangement (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,B-Line)	W-26	Re-bar Arrangement (5)
		B-27	Structural Detail of A2 Abutment (A,B-Line)	W-27	Re-bar Arrangement (6)
		B-28	Structural Details of P4~P7 (A,B-Line) (1/2)	W-28	Re-bar Arrangement (7)
		B-29	Structural Details of P4~P7 (A,B-Line) (2/2)	W-29	Re-bar Arrangement (8)
		B-30	Structural Details of P1~P3 and P8~P10 (A,B-Line) (1/2)	W-30	Re-bar Arrangement (9)
		B-31	Structural Details of P1~P3 and P8~P10 (A,B-Line) (1/2)	W-31	Re-bar Arrangement (10)
		B-32	Re-bar Arrangement of A1 (A,B-Line) (1/3)	W-32	Re-bar Arrangement (11)
		B-33	Re-bar Arrangement of A1 (A,B-Line) (2/3)	W-33	Re-bar Arrangement (12)
		B-34	Re-bar Arrangement of A1 (A,B-Line) (3/3)	W-34	Re-bar Arrangement (13)
		B-35	Re-bar Arrangement of A2 (A,B-Line) (1/2)	W-35	Re-bar Arrangement (14)
		B-36	Re-bar Arrangement of A2 (A,B-Line) (2/2)	W-36	Re-bar Arrangement (15)
		B-37	Re-bar Arrangements of P4~P7 (A,B-Line) (1/2)	W-37	Re-bar Arrangement (16)
		B-38	Re-bar Arrangements of P4~P7 (A,B-Line) (2/2)	W-38	Re-bar Arrangement (17)
		B-39	Re-bar Arrangements of P1~P3 and P8~P10 (A,B-Line) (1/2)		
		B-40	Re-bar Arrangements of P1~P3 and P8~P10 (A,B-Line) (2/2)	<b>T</b>	<b>TEMPORARY WORKS</b>
		B-41	Re-bar Arrangements of Pile Foundation	T-1	Construction Sequence
		B-42	Re-bar Arrangement of Approach Slab	T-2	Detour Layout (1/2)
		B-43	Bar Bending Diagram	T-3	Detour Layout (2/2)

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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 : DRAWING SCHEDULE

DATE DWG NO. G - 1



1140740 (0)

## 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	Specified	Characteristic strength at 28 days				Application
	compressive strength (28days)	Cylinders		Cubes		
	(kgf/cm <sup>2</sup> )	(N/mm <sup>2</sup> )	(kgf/cm <sup>2</sup> )	(N/mm <sup>2</sup> )	(kgf/cm <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> )	Yield 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> )	Yield 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:

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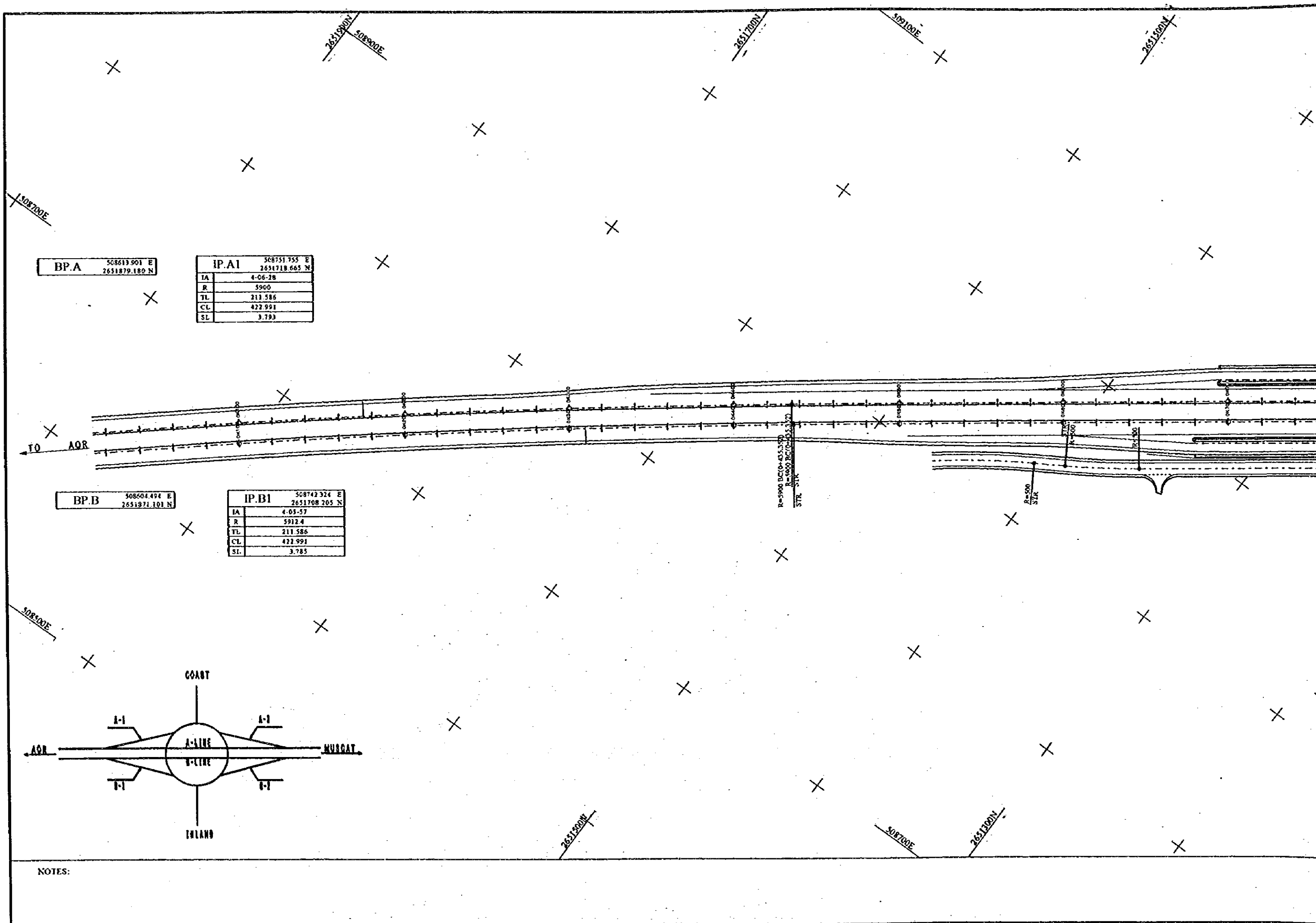
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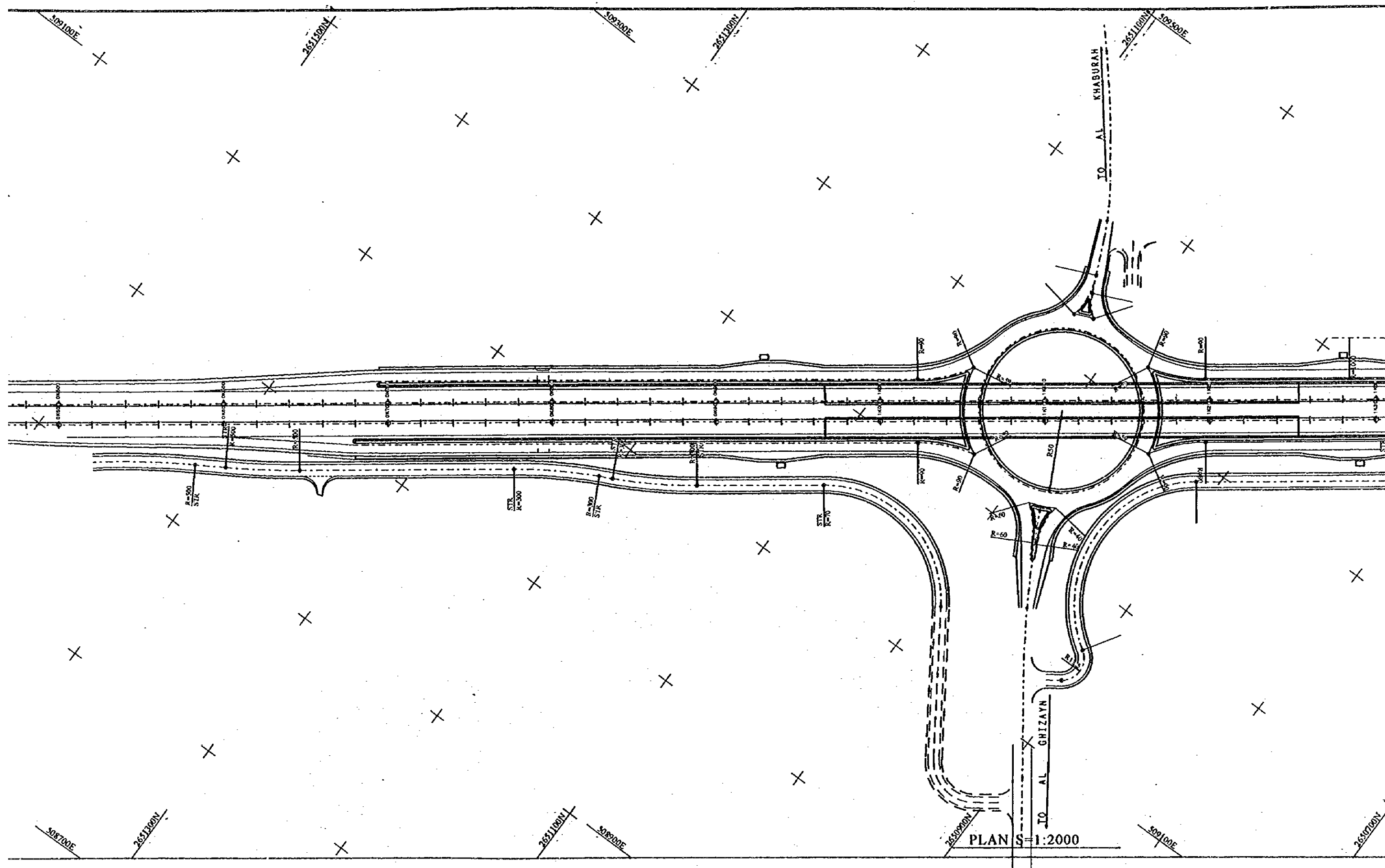
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON DATINAH HIGHWAY

TITLE GENERAL NOTES

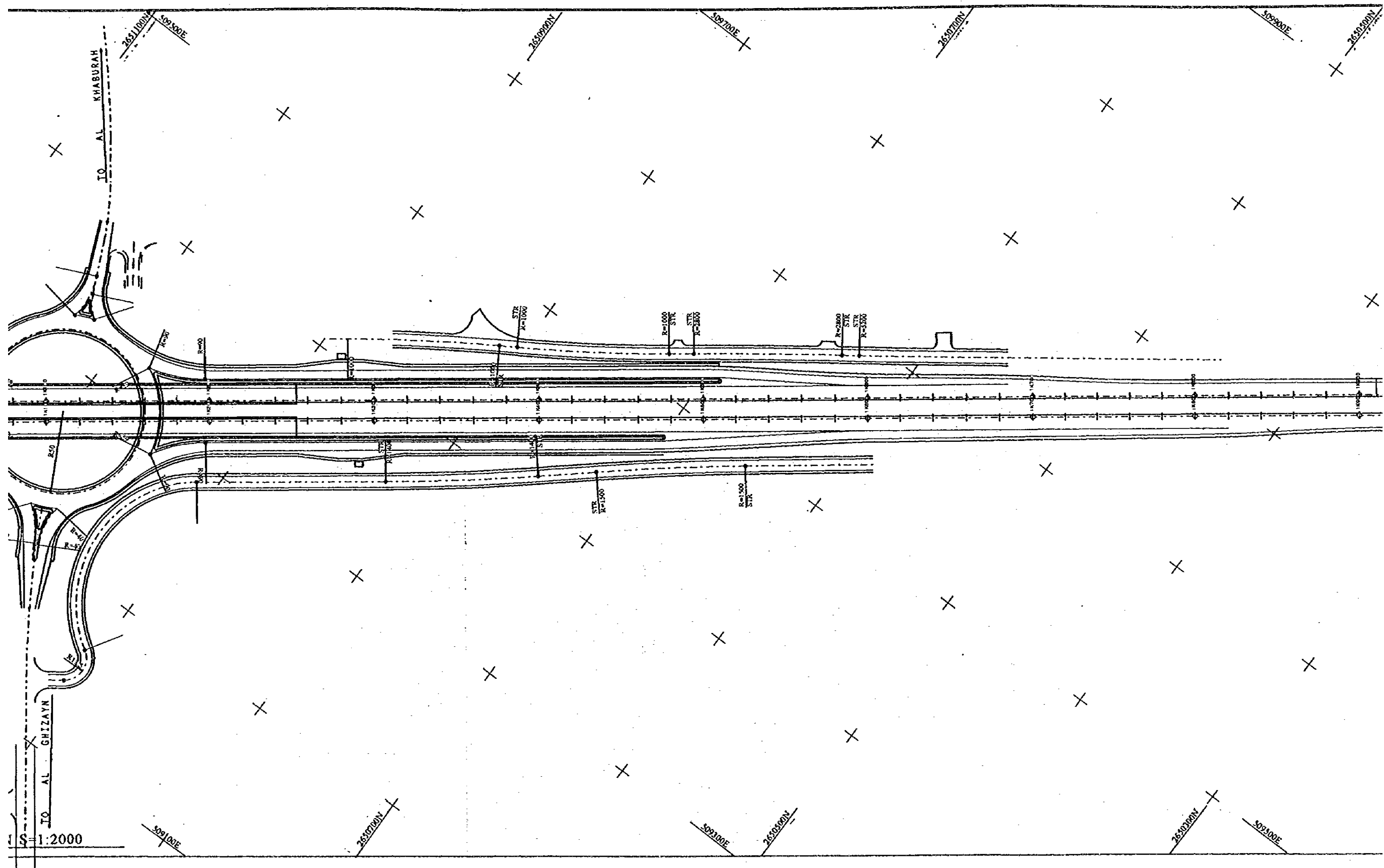
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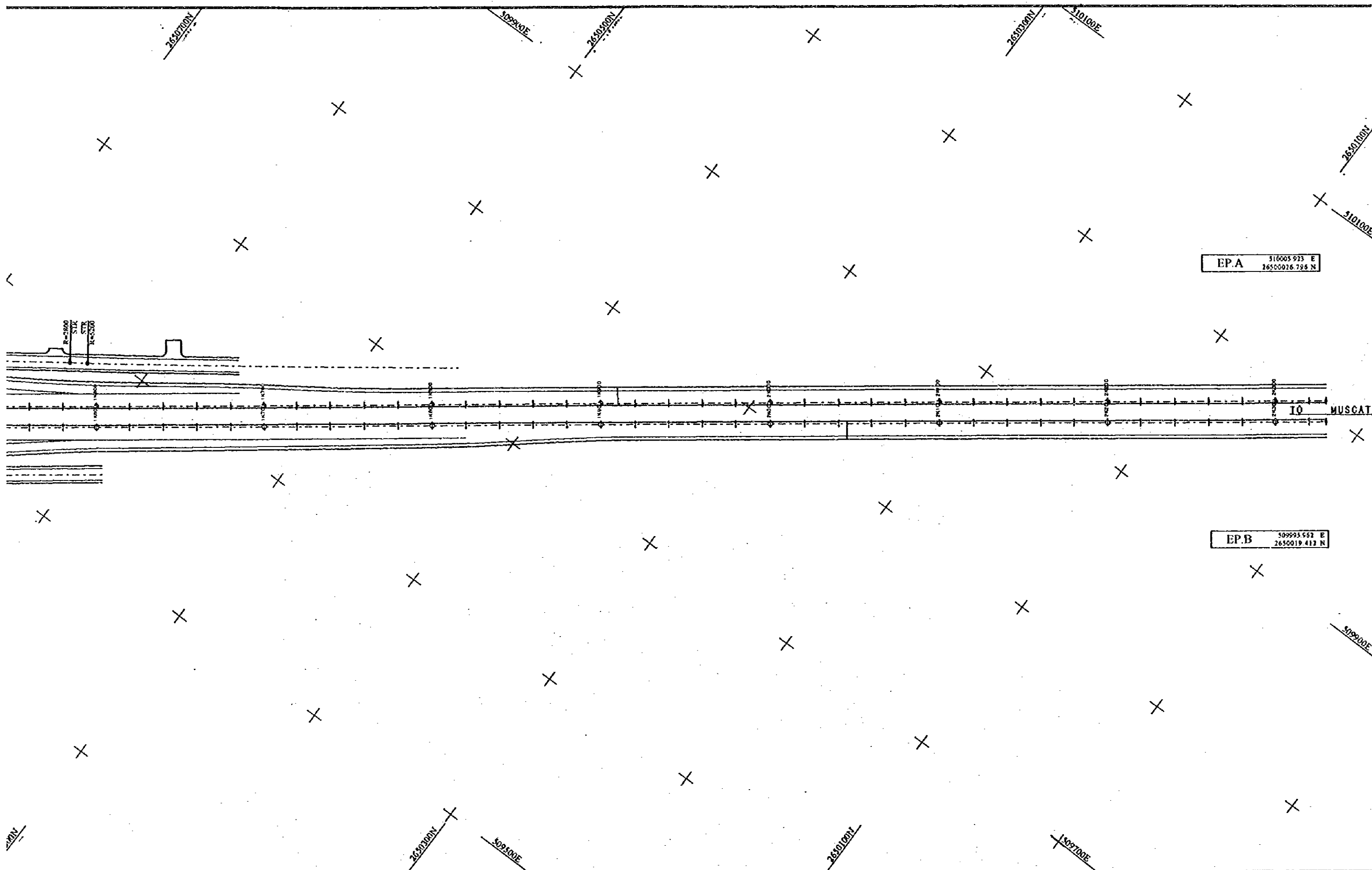
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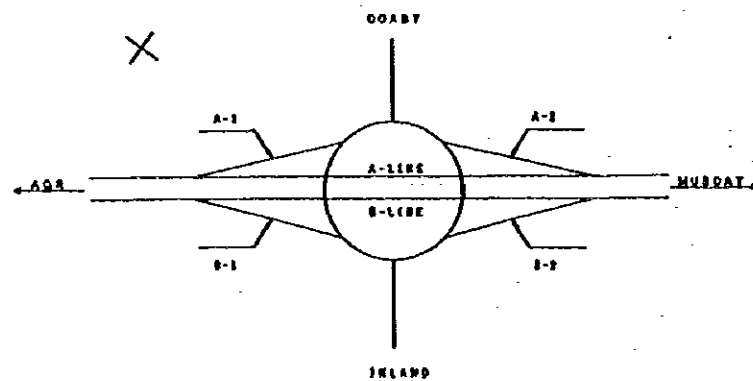




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			PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
			TITLE: RA/8 AL KHABURAH ALIGNMENT LAYOUT	
			DATE :	DWGNO. R-1

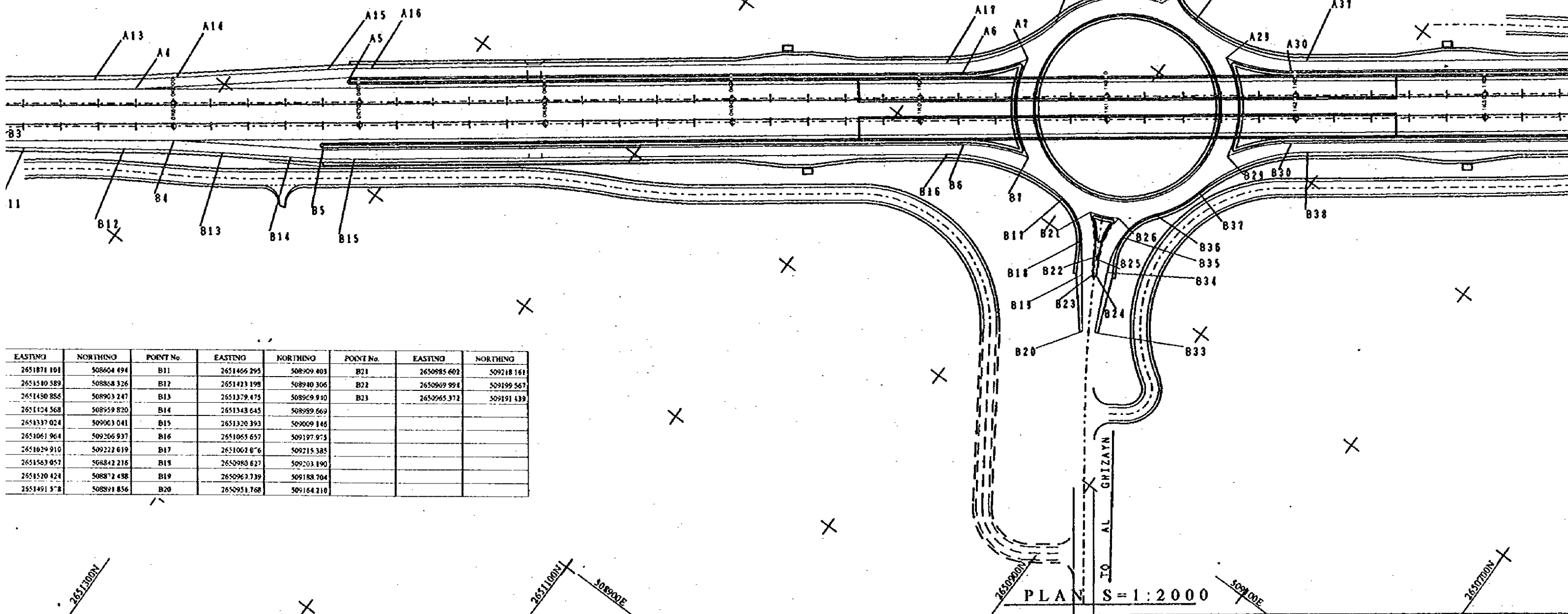
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A1	2651879.180	508613.901	A11	2651603.630	508850.362	A21	2651040.893
A2	2651549.688	508877.758	A12	2651555.745	508837.393	A22	2651052.177
A3	2651621.439	508932.395	A13	2651457.624	508960.715	A23	2651031.730
A4	2651436.951	508969.921	A14	2651423.020	508987.779	A24	2651034.855
A5	2651347.811	509042.823	A15	2651360.164	509039.202		
A6	2651084.831	509237.785	A16	2651341.315	509053.884		
A7	2651061.081	509264.069	A17	2651094.312	509236.981		
A8	2651094.864	508775.381	A18	2651060.389	509288.293		
A9	2651666.113	508798.951	A19	2651047.664	509313.101		
A10	2651648.197	508817.610	A20	2651037.908	509342.356		

POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING
B1	2651871.101	508604.494	B11	2651466.295	508909.403	B21	2650985.602
B2	2651540.589	508668.326	B12	2651423.198	508940.306	B22	2650969.991
B3	2651480.856	508703.247	B13	2651379.475	508969.940	B23	2650965.372
B4	2651404.568	508759.820	B14	2651348.645	508989.669		
B5	2651337.024	509003.041	B15	2651320.393	509009.146		
B6	2651061.964	509206.937	B16	2651065.657	509197.975		
B7	2651029.910	509222.019	B17	2651062.076	509215.385		
B8	2651563.057	508842.216	B18	2650989.627	509203.190		
B9	2651520.424	508871.488	B19	2650969.739	509183.704		
B10	2651491.578	508891.856	B20	2650951.768	509164.210		

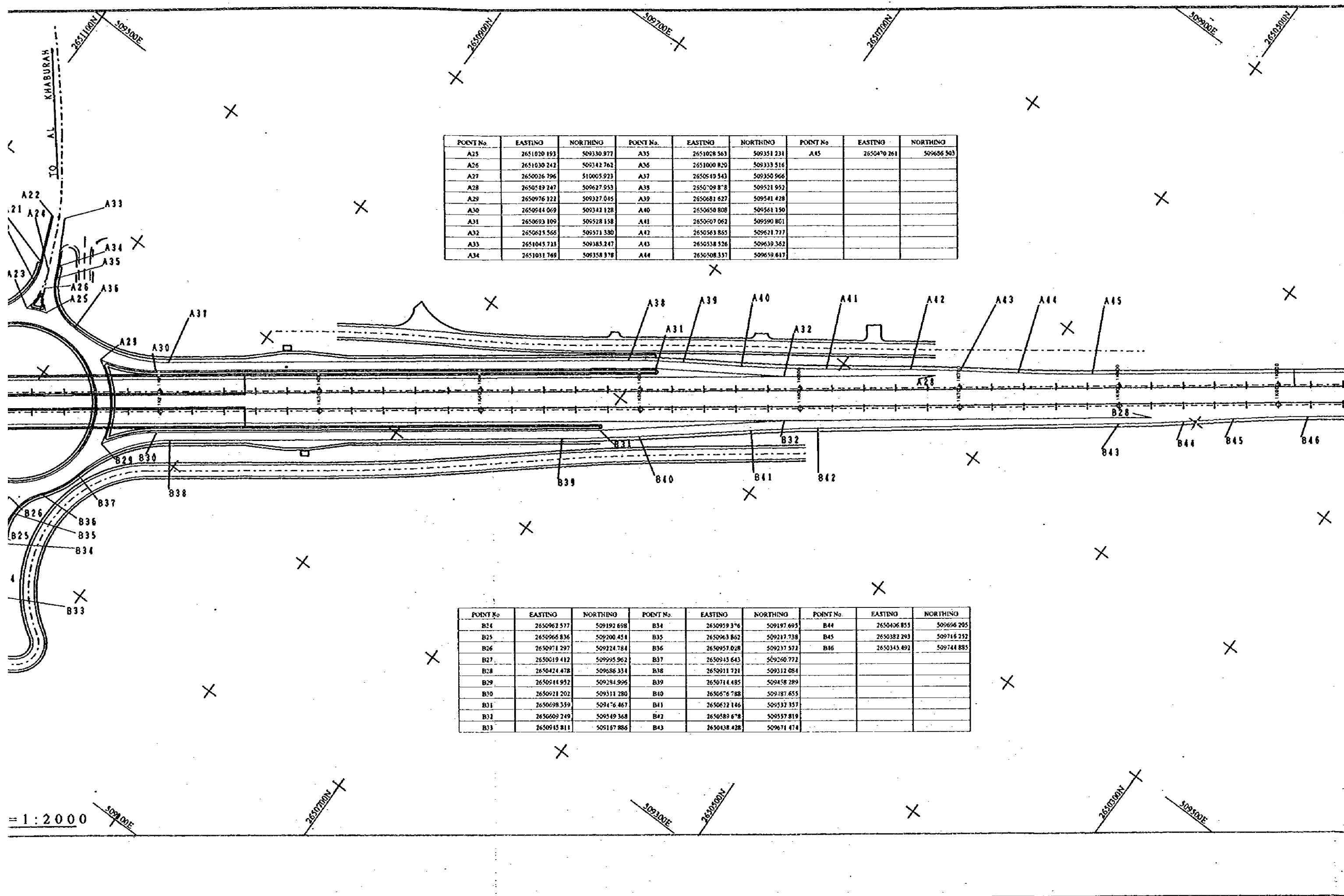


NOTES:  
(1) FINAL CONTROL COORDINATES, WGS84 DATUM, ZONE 40 UTM, CM 57.

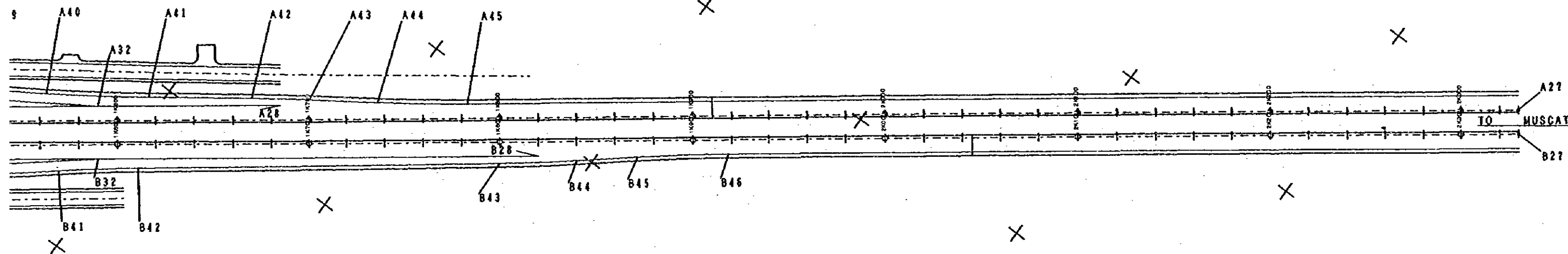
EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
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2651349.688	508877.758	A12	2651555.745	508897.393	A22	2651052.177	509381.833
2651621.439	508832.395	A13	2651457.624	508960.715	A23	2651031.730	509316.074
2651436.951	508969.921	A14	2651423.020	508987.779	A24	2651034.855	509353.042
2651347.841	509042.823	A15	2651360.154	509039.202			
2651084.831	509237.785	A16	2651341.315	509053.884			
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2651694.864	508773.351	A18	2651060.389	509288.293			
2651664.113	508798.951	A19	2651047.664	509313.101			
2651644.197	508817.610	A20	2651037.908	509342.356			



EASTING	NORTHING	POINT No.	EASTING	NORTHING	POINT No.	EASTING	NORTHING
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2651580.589	508868.326	B12	2651423.198	508940.306	B22	2650969.994	509199.567
2651450.856	508903.247	B13	2651379.475	508969.940	B23	2650965.372	509191.439
2651124.568	508959.820	B14	2651343.645	508989.669			
2651337.024	509063.041	B15	2651320.393	509009.146			
2651061.964	509206.937	B16	2651065.657	509197.973			
2651029.910	509222.019	B17	2651062.076	509215.385			
2651563.057	508842.216	B18	2650980.627	509203.190			
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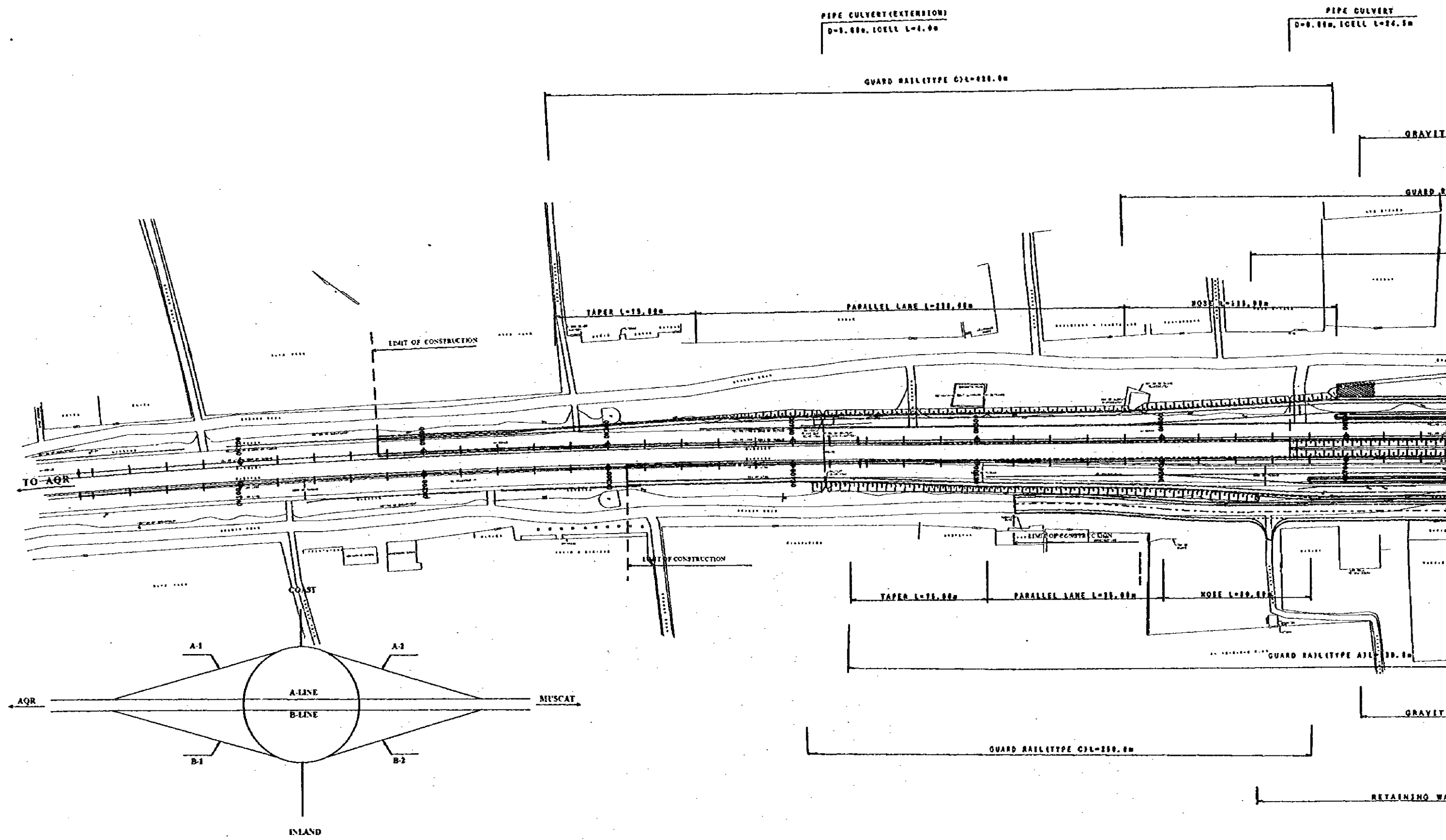
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0 543	509350 866			
9 878	509321 952			
11 627	509341 428			
10 808	509561 150			
17 062	509590 801			
13 865	509621 777			
18 526	509639 362			
28 337	509659 617			



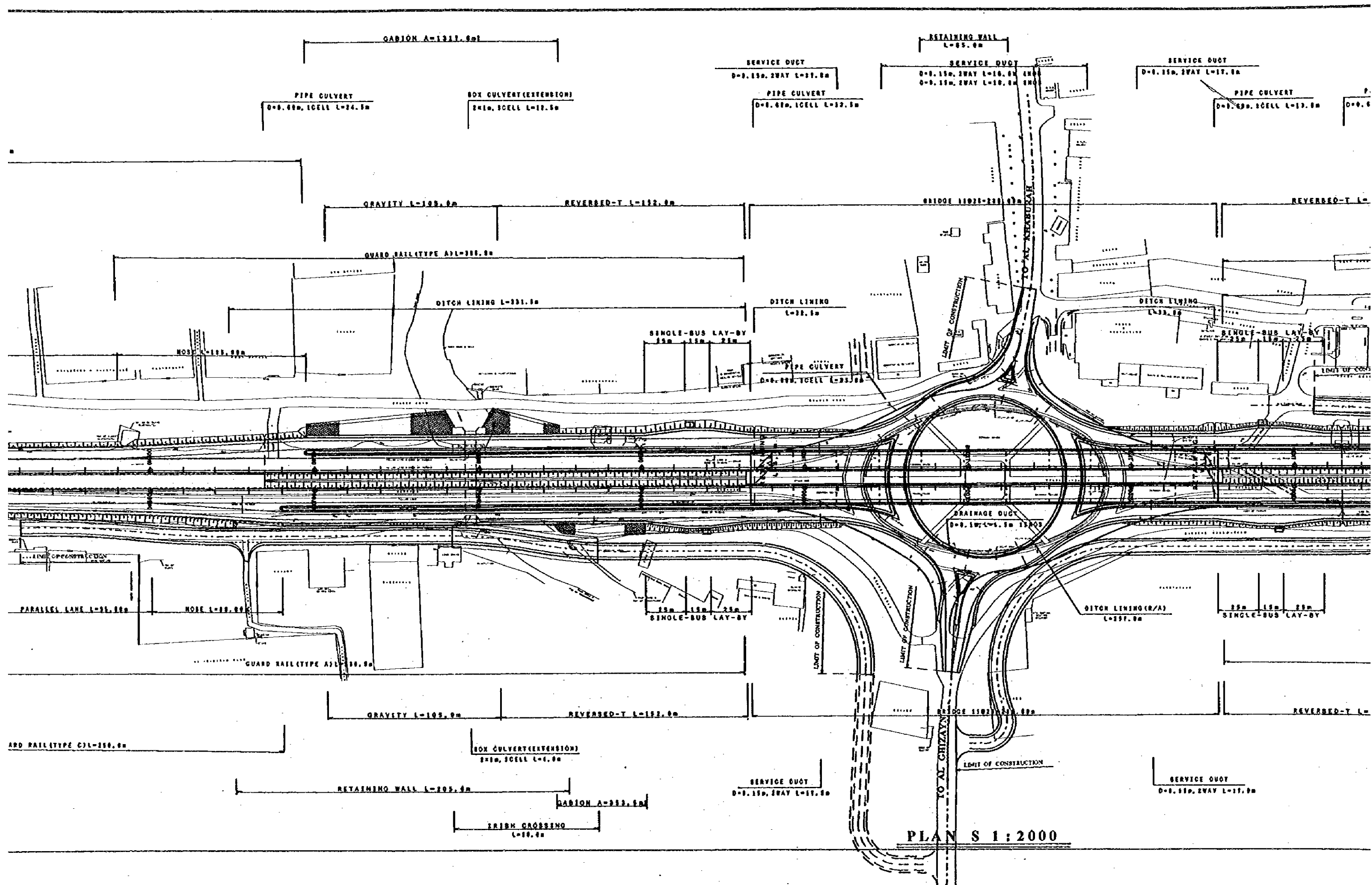
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650957 028	509237 572	B46	2650345 492	509741 885
650945 643	509260 772			
650911 721	509312 084			
650714 485	509458 289			
650676 788	509487 655			
650672 146	509532 357			
650589 678	509557 819			
650438 428	509671 474			

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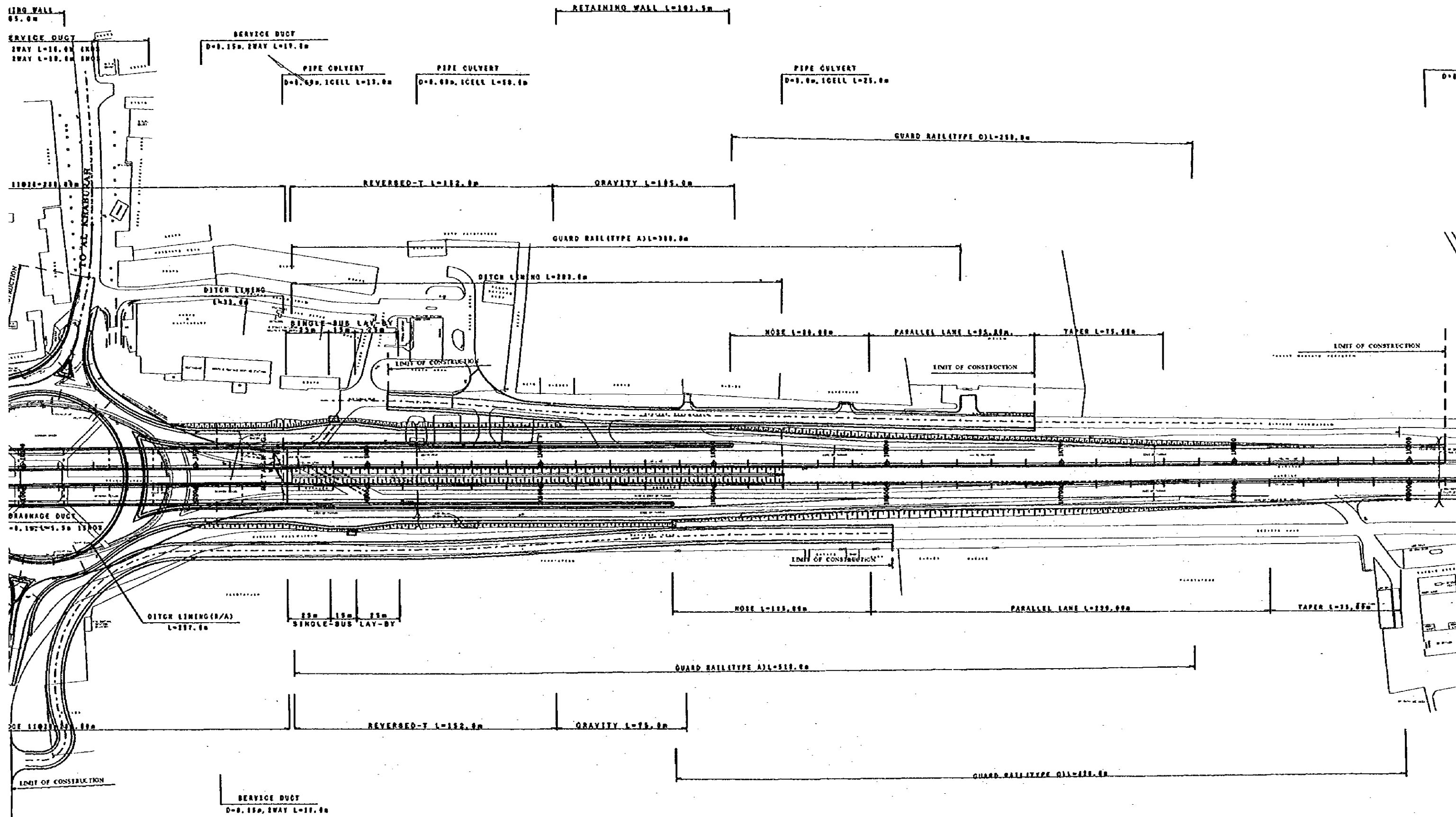
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PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/8 AL KABURAH SETTING OUT DETAILS  
DATE: DWG NO. R-2



NOTES:





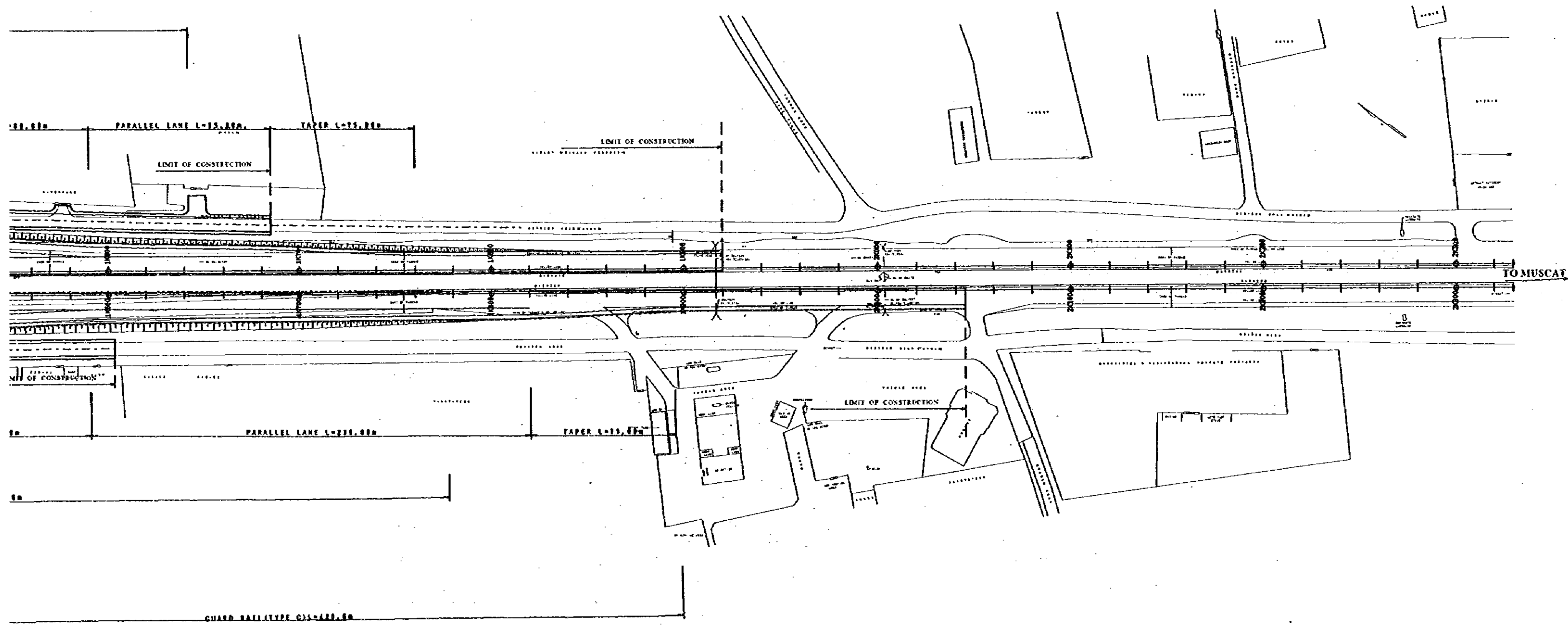


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PIPE CULVERT  
Ø 90.0 CM, 1 CELL L=25.00

PIPE CULVERT  
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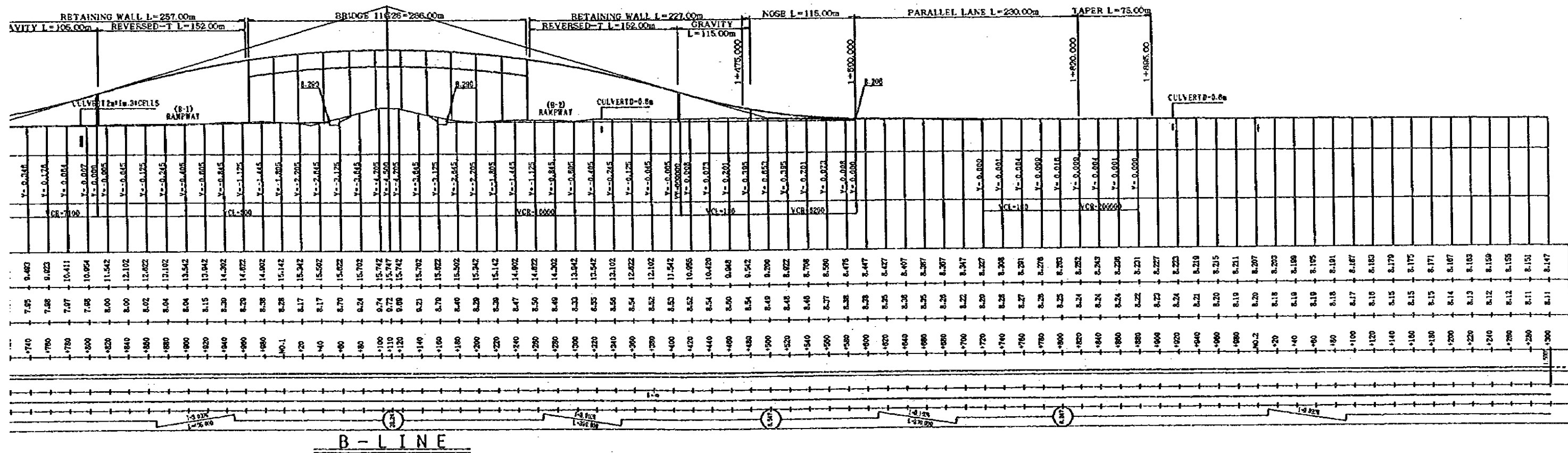
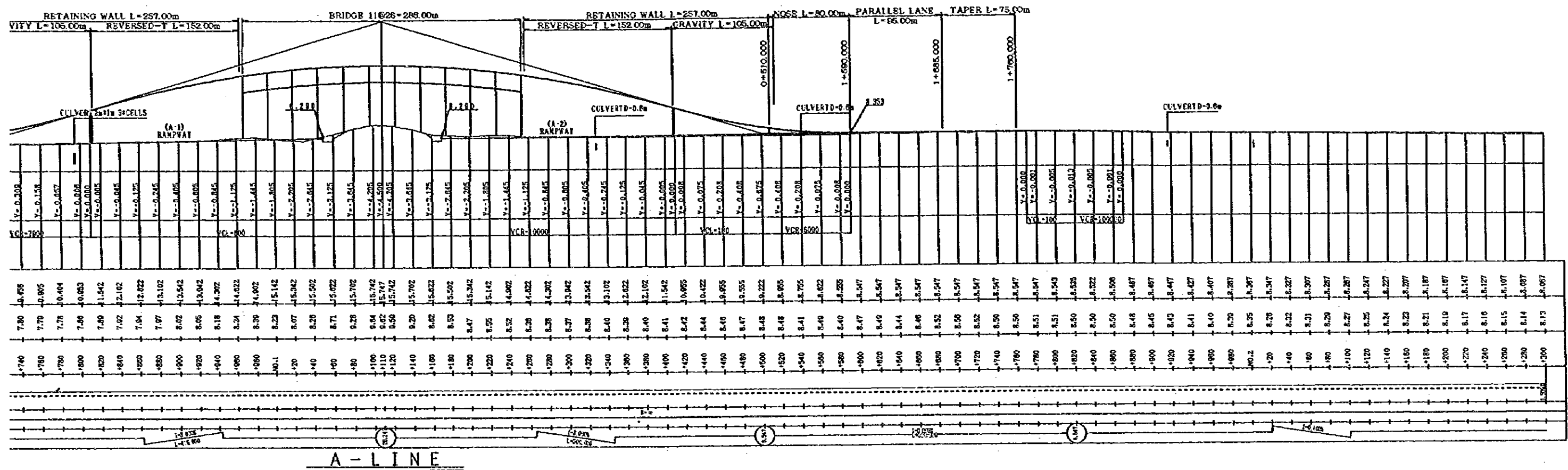
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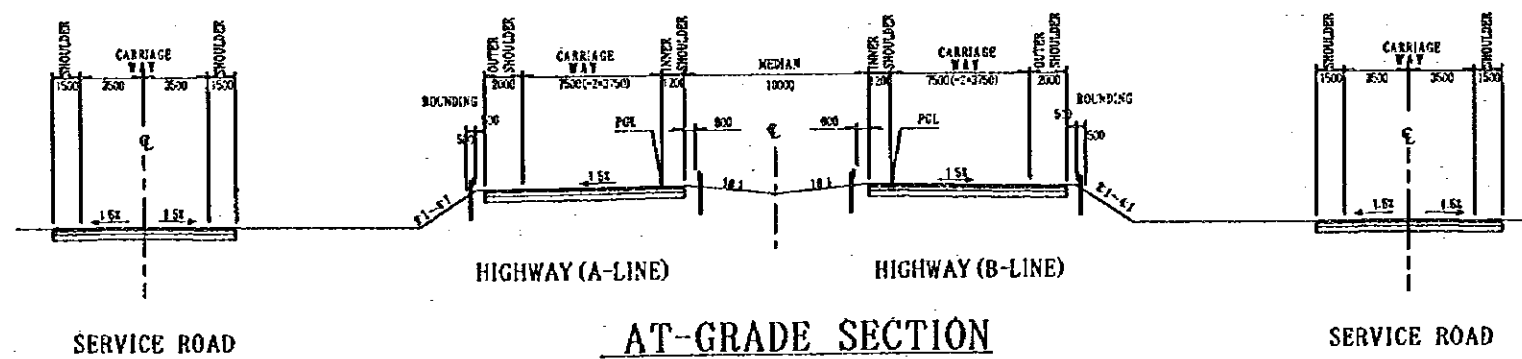
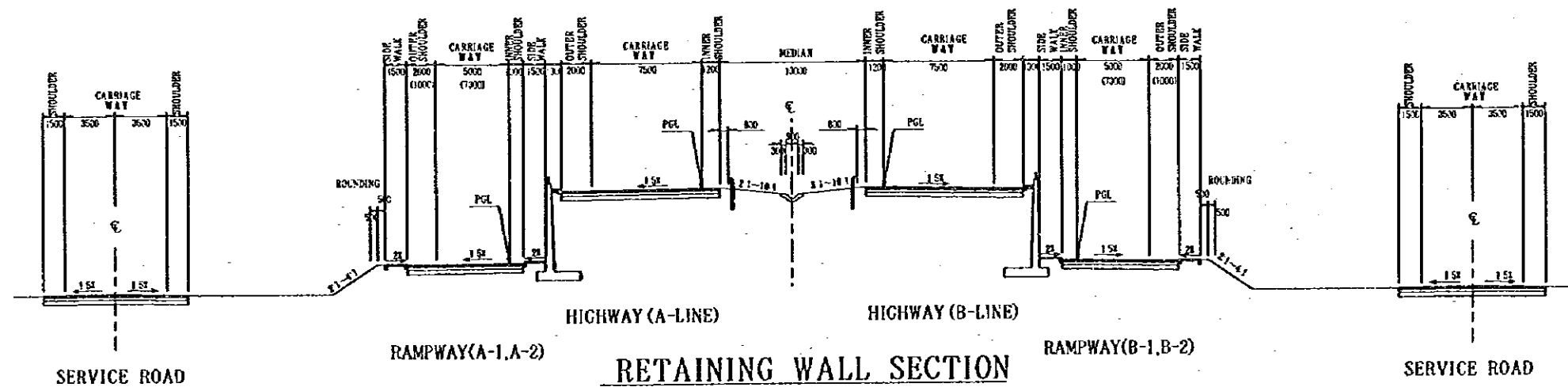
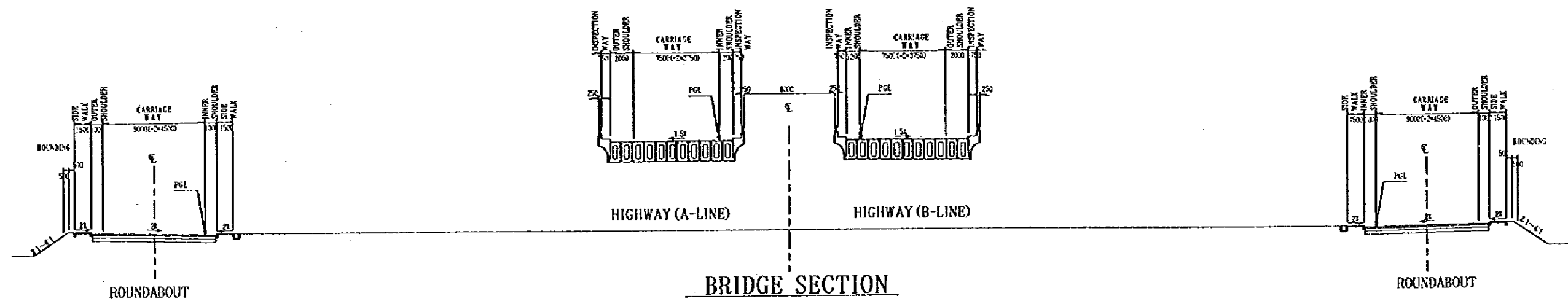
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JICA STUDY TEAM  
PACIFIC CONSULTANTS INTERNATIONAL  
FUKUYAMA CONSULTANTS INTERNATIONAL

CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/8 AL KHABURAH PLAN  
DATE: \_\_\_\_\_ DWGNO. R-3





<p>JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)</p> <p>JICA STUDY TEAM PACIFIC CONSULTANTS INTERNATIONAL FUKUYAMA CONSULTANTS INTERNATIONAL</p>	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS	
	PROJECT : D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY	
	TITLE RA/8 AL KHABURAH PROFILE-HIGHWAY	
	DATE	DWGNO. R-4



#### 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 BEGINING AND THE END.

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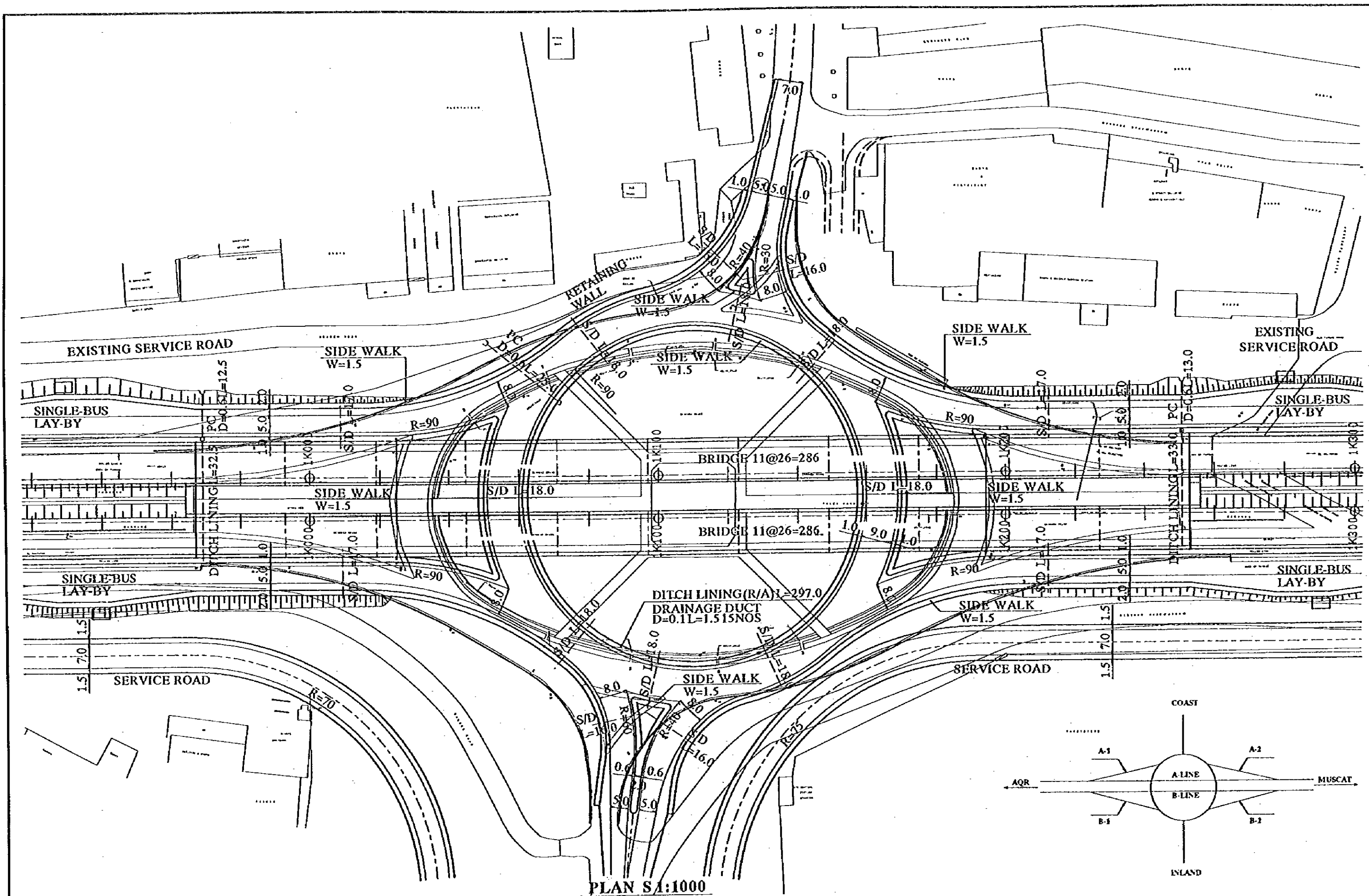
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

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

TITLE: RA/8 AL KHABURAH TYPICAL CROSS SECTION

DATE:

DWG NO.: R-5



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)

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

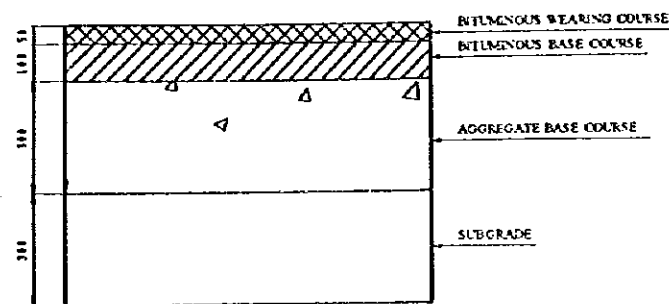
TITLE: RA/8 AL KABURAH DETAILED PLAN

DATE:

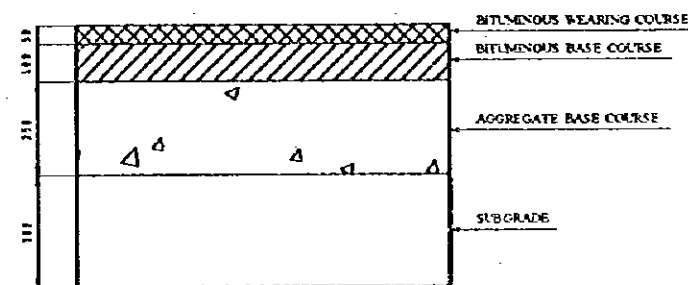
DWG NO.:

R-6

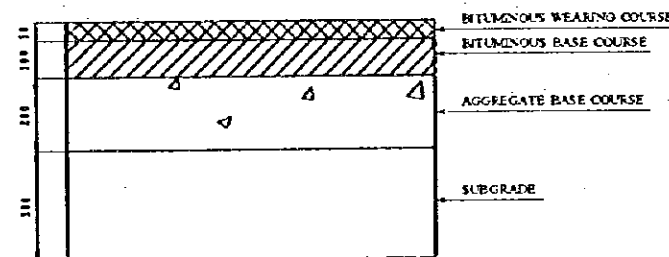
TYPE 'A'



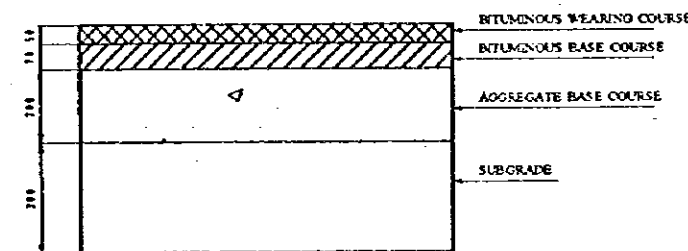
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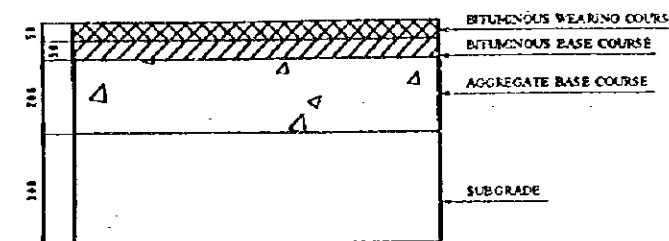
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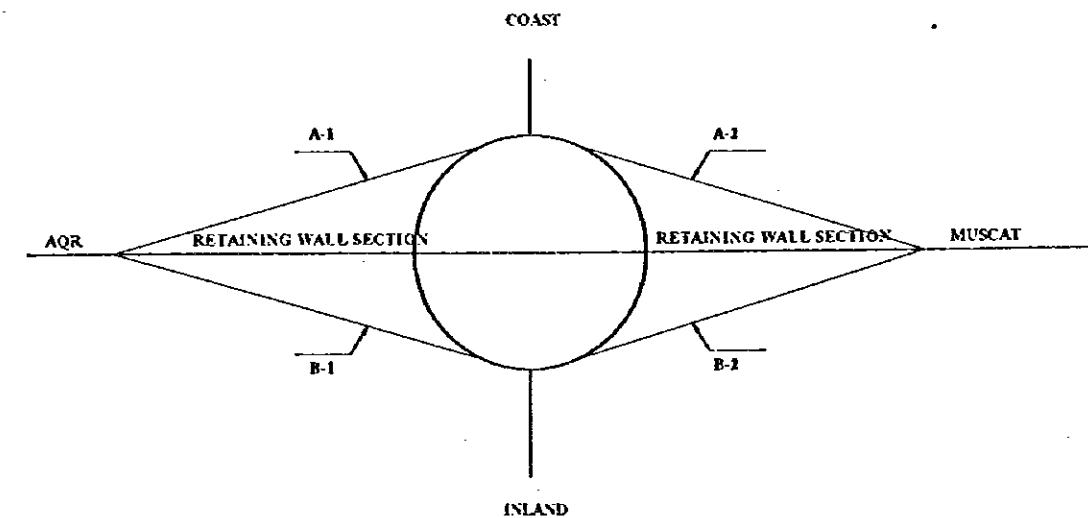
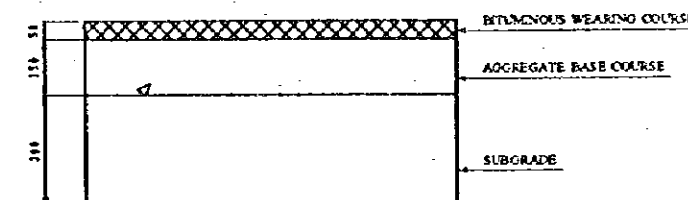
TYPE 'D'



TYPE 'E'



TYPE FOR SERVICE ROADS



CLASSIFICATION OF PAVEMENT STRUCTURE

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

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

TITLE: RA/8 AL KHABURAH PAVEMENT DETAILS

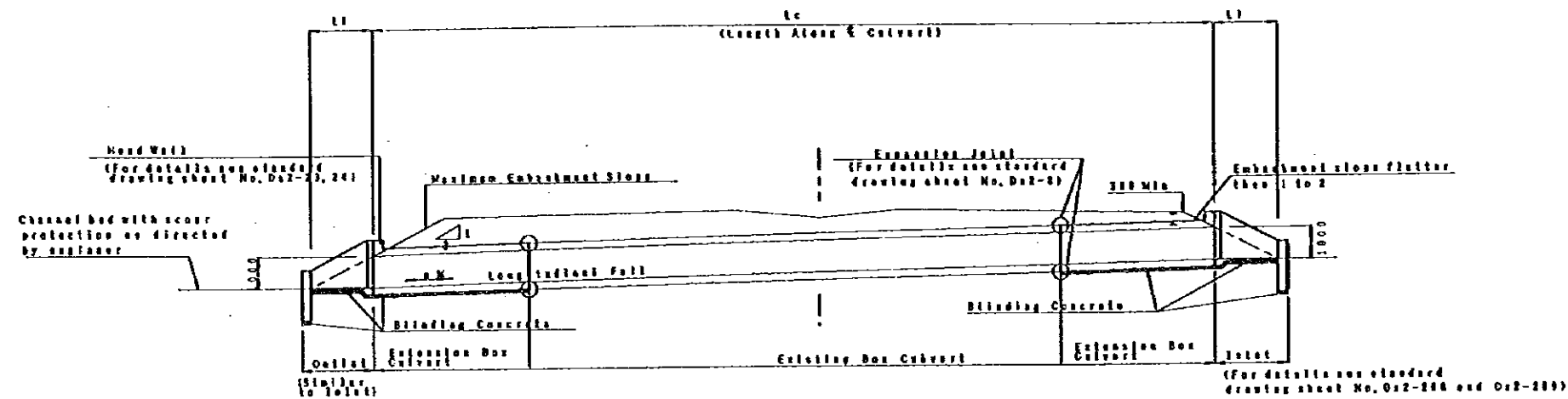
DATE:

DWG NO.:

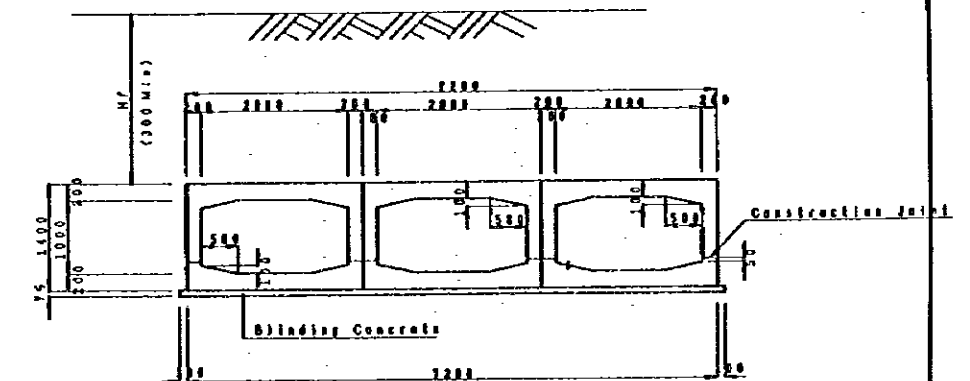
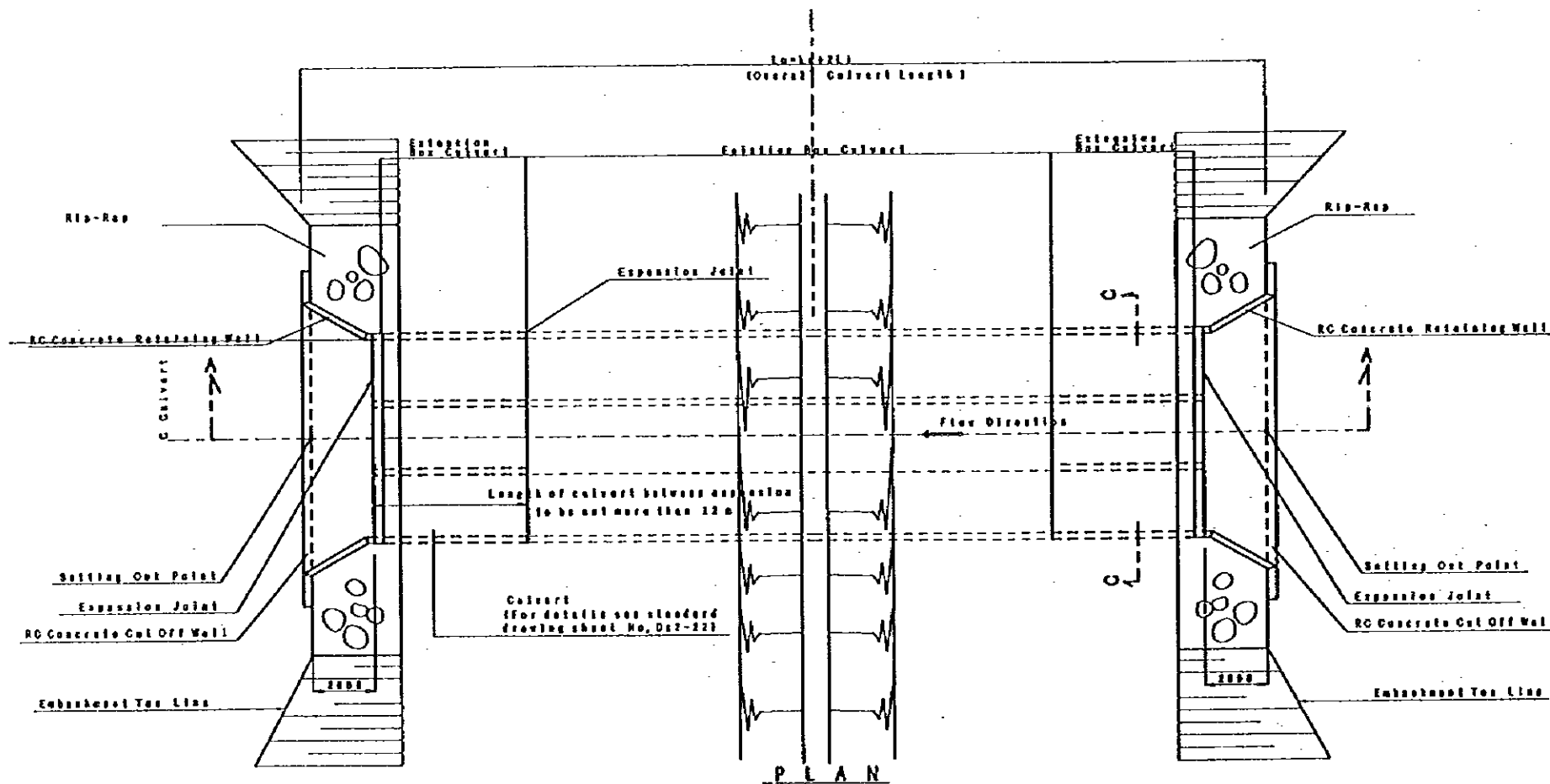
R-7







SECTION A - A



SECTION C - C

LIST OF BOX CULVERT

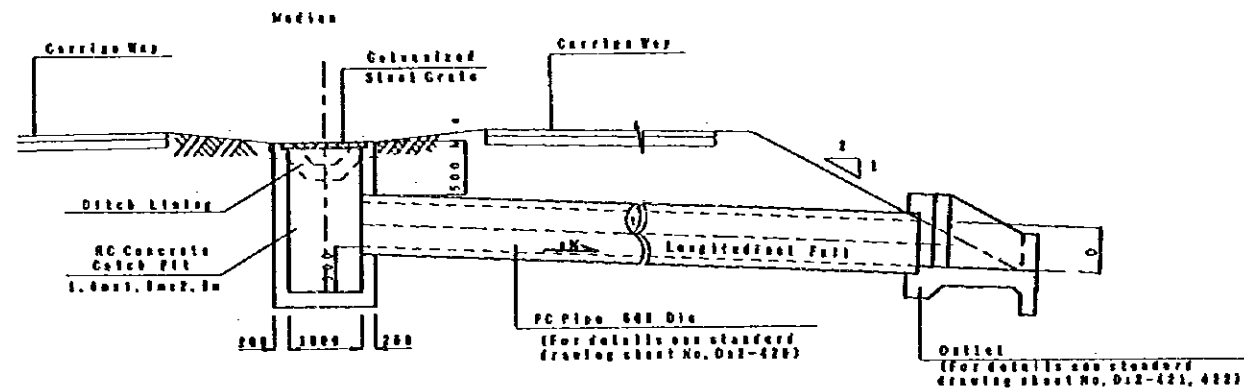
STA	Ac/B LINE	DIMENSION(m)	LONGITUDINAL FALL:m	LENGTH (m)	REMARK
OK794.5	A.B	2.0x1.0x3CELL	0.82%	(12.5+4.0) 16.5	Extension

NOTES:

- (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.
- (2) H<sub>T</sub>: HEIGHT FROM ABOVE THE CULVERT ROOF TO THE TOP OF PAVEMENT.

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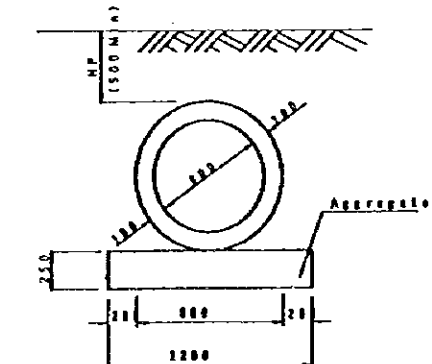
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/8 AL KHABURAH DRAINAGE STRUCTURE (1/4)  
DATE: DWG NO.: R-9



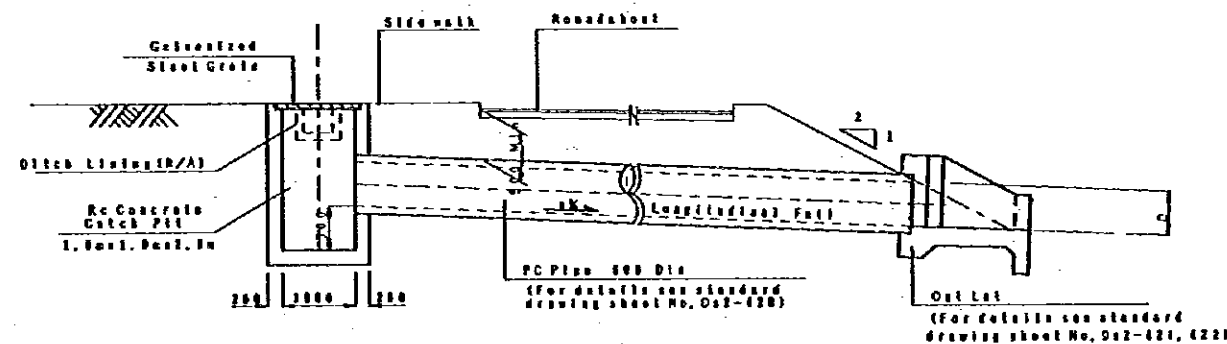
SECTION

DRAIN SYSTEM OF MEDIAN

LIST OF DRAIN SYSTEM AT MEDIAN						
STA	ABUTMENT	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL: 1:n	LENGTH (m)	REMARK
OK670	A	φ0.60x1CELL	M	0.3%	25.0	
1K540	A	φ0.60x1CELL	M	0.3%	25.0	



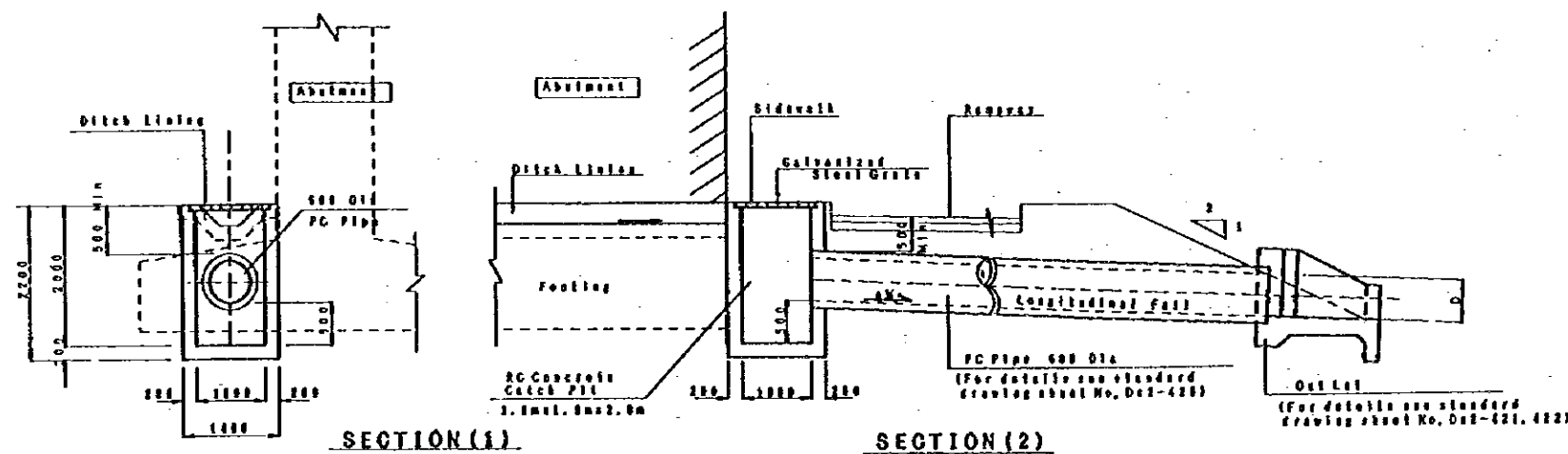
TYPICAL CROSS SECTION



SECTION

DRAIN SYSTEM OF ROUNDABOUT

LIST OF DRAIN SYSTEM AT ROUNDABOUT						
STA	ABUTMENT	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL: 1:n	LENGTH (m)	REMARK
1K000	A	φ0.60x1CELL	M	0.3%	25.0	



SECTION (1)

SECTION (2)

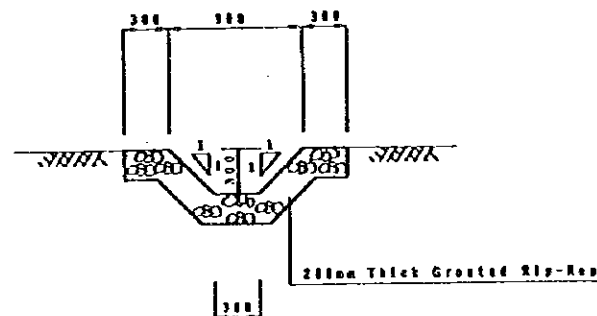
DRAIN SYSTEM IN FRONT OF ABUTMENT

LIST OF DRAIN SYSTEM IN FRONT OF ABUTMENT						
STA	ABUTMENT	DIMENSION (m)	PIPE CLASS	LONGITUDINAL FALL: 1:n	LENGTH (m)	REMARK
OK068(A1)	A	φ0.60x1CELL	M	0.3%	12.5	
1K252(A2)	A	φ0.60x1CELL	M	0.3%	13.0	

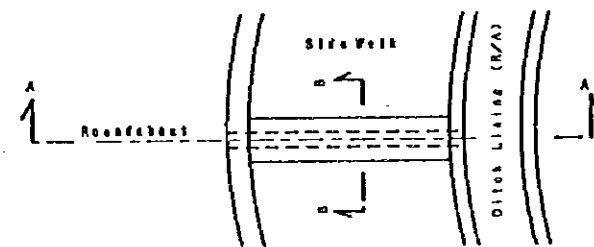
NOTES:  
 (1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.  
 (2) D: INTERNAL DIAMETER OF THE PIPE.  
 (3) H: HEIGHT OF FILL FROM ABOVE THE PIPE TO THE TOP OF PAVEMENT.

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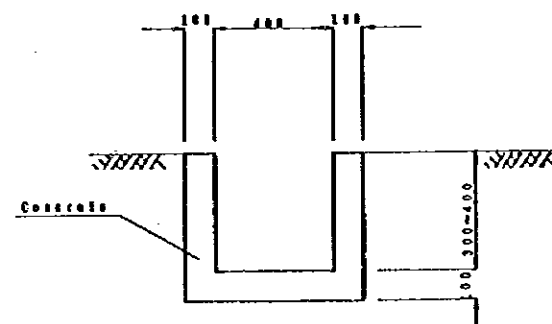
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
 PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
 TITLE: RA/8 AL KHABURAH DRAINAGE STRUCTURE (3/4)  
 DATE: DWG NO.: R-10



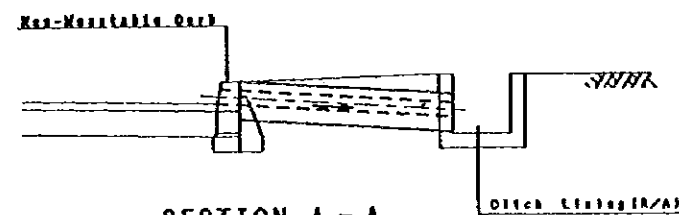
DITCH LINING



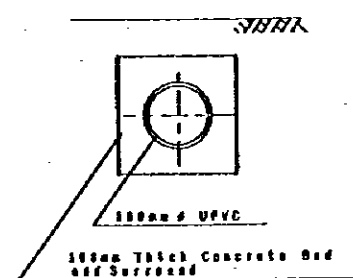
P L A N



DITCH LINING (R/A)

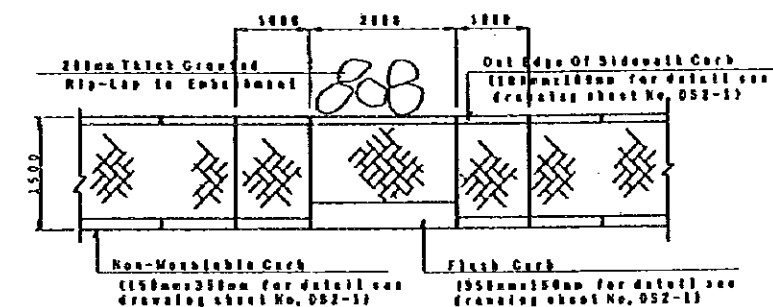


SECTION A - A



SECTION B - B

DRAIN SYSTEM AROUND ROUNDABOUT

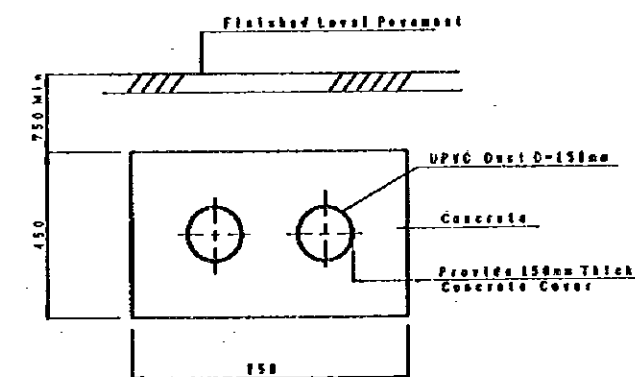


P L A N



Elevation

DROPPED SIDEWALK



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.

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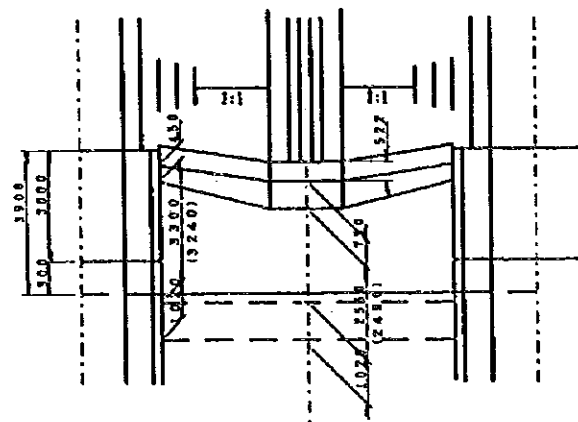
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

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

TITLE: RA/8 AL KHABURAH DRAINAGE STRUCTURE(4/4)SERVICE AND DUCTS

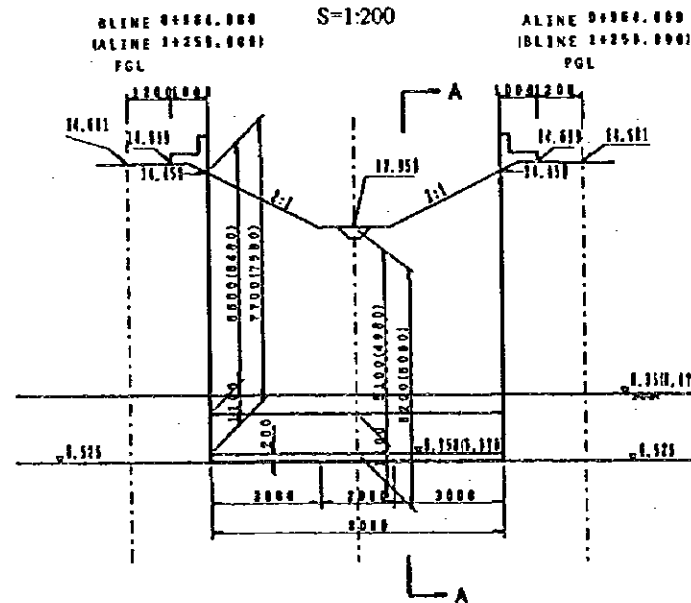
DATE:

DWG NO.: R-11



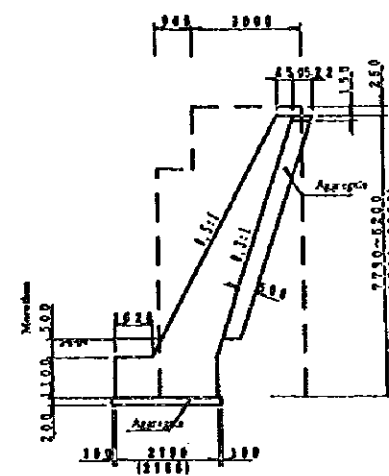
PLAN

S=1:200



FRONT VIEW

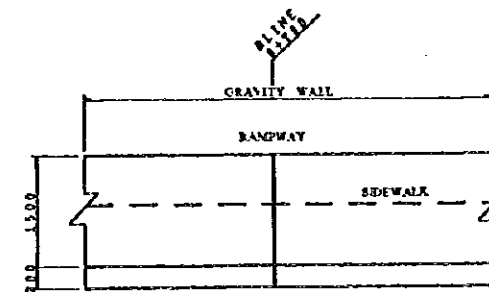
S=1:200



SECTION A-A

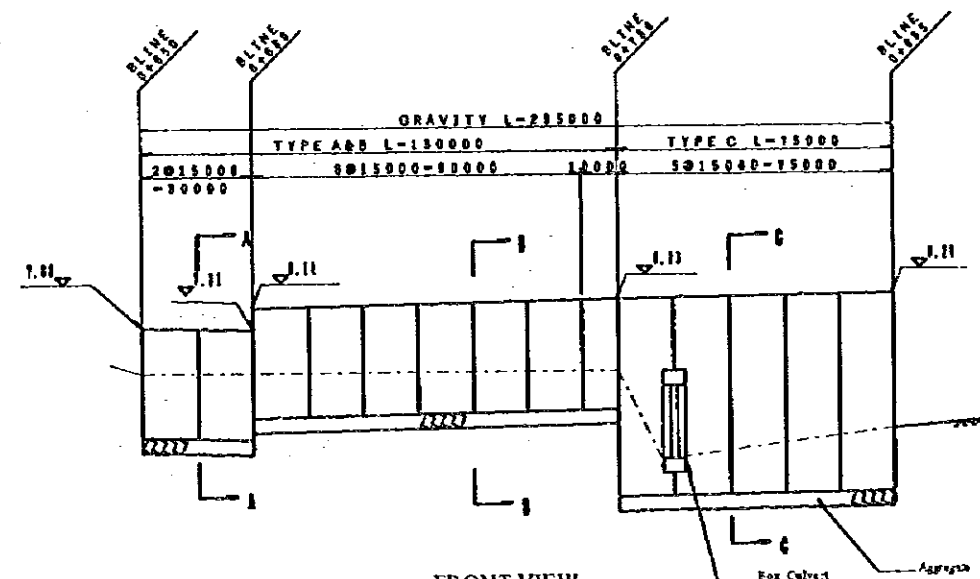
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RETAINING WALL BETWEEN ABUTMENTS



PLAN

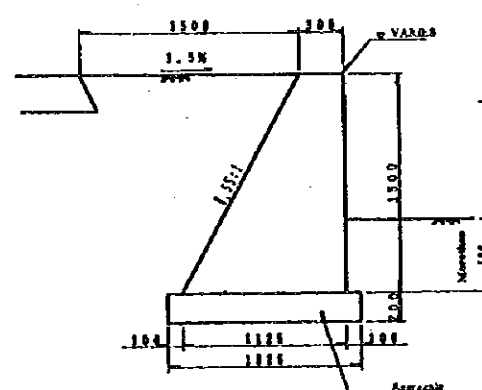
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FRONT VIEW

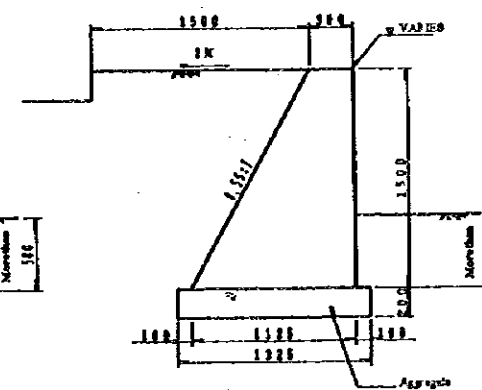
H=1:2000

V=1:100



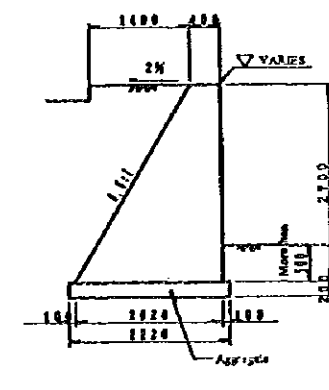
SECTION A-A

S=1:50



SECTION B-B

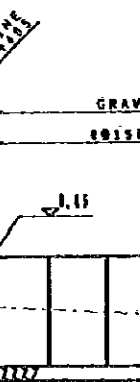
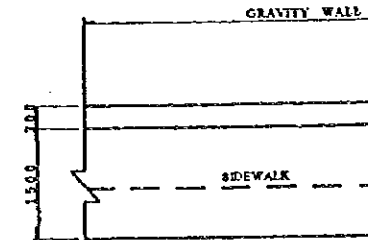
S=1:50



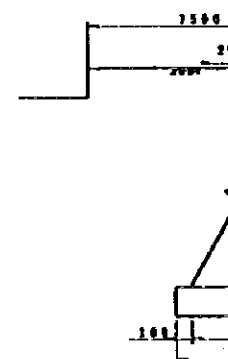
SECTION C-C

S=1:100

RETAINING WALL ALONG RAMPWAY (B-1)



F



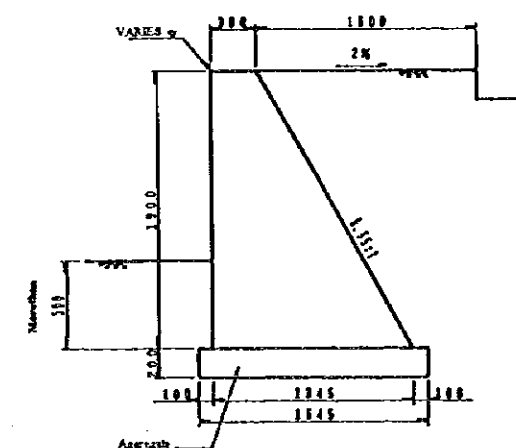
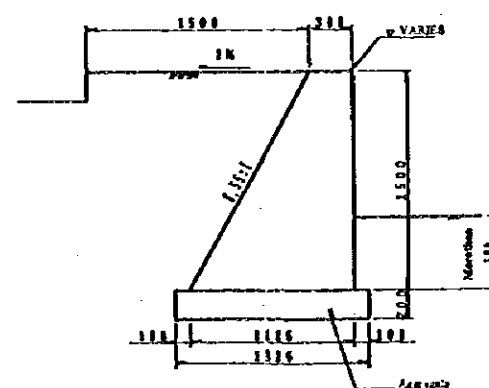
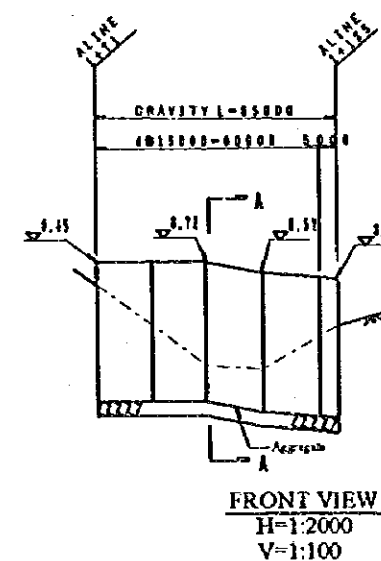
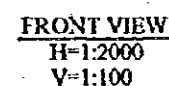
RETAINING

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 CO



**SECTION A-A**  
**S=1:50**

**SECTION B-B**  
**S=1:50**

SECTION C-C  
S=1:100

**SECTION A-A**  
**S=1:50**

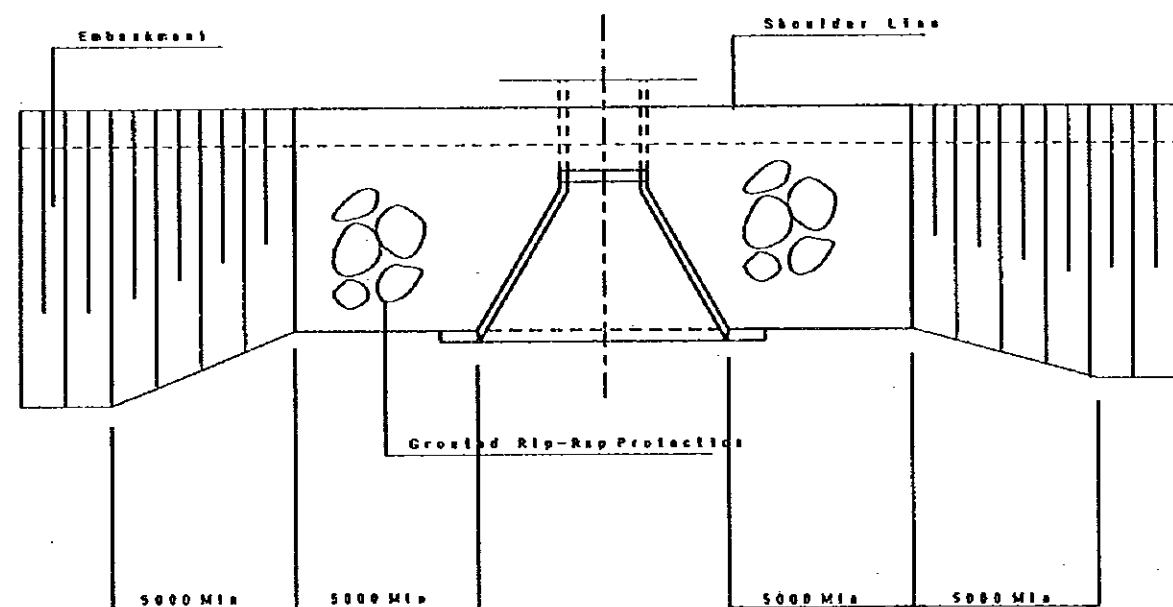
**SECTION A-A**  
**S=1:50**

### RETAINING WALL ALONG RAMPWAY (B-1)

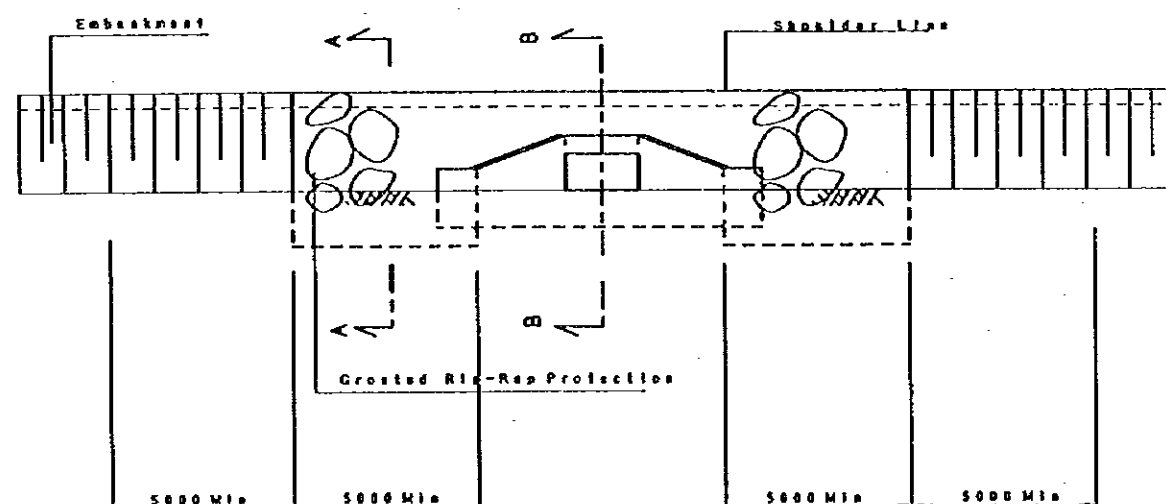
### RETAINING WALL ALONG RAMPWAY (A-2)

### RETAINING WALL ALONG COASTAL SIDE CROSSROAD

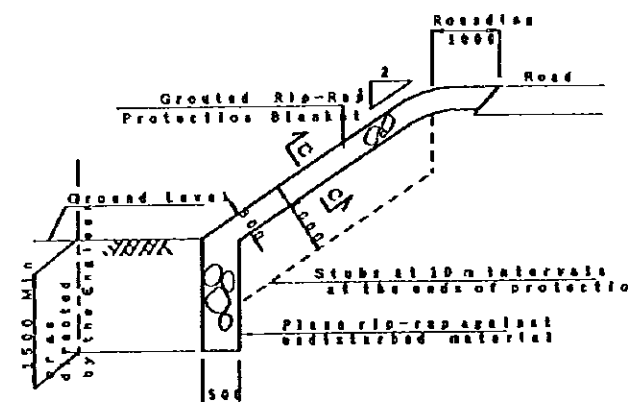
JAPAN INTERNATIONAL COOPERATION AGENCY	CLIENT : MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS		
(JICA)	PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY		
JICA STUDY TEAM	TITLE: RA/8 AL KHA BURAH RETAINING WALL		
PACIFIC CONSULTANTS INTERNATIONAL	DATE :		DWG NO. : R-12
FUKUYAMA CONSULTANTS INTERNATIONAL			



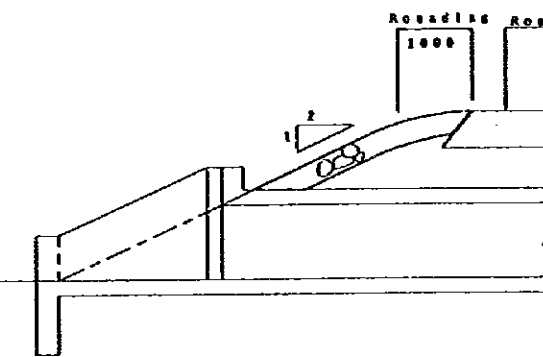
PLAN



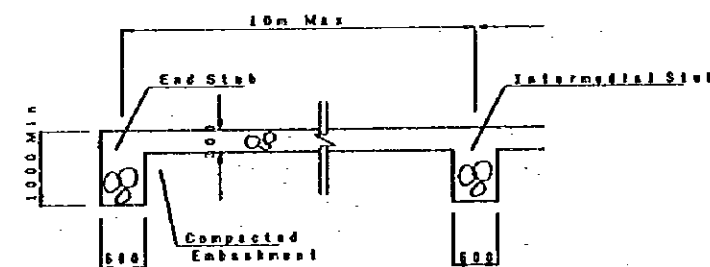
FRONT VIEW



SECTION A - A



SECTION B - B

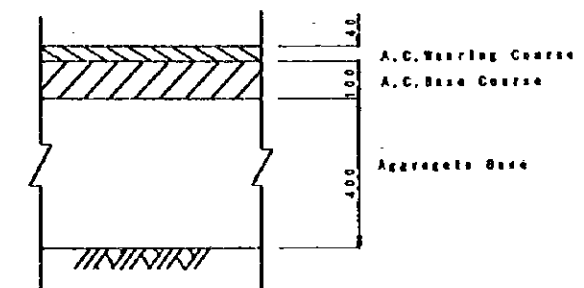
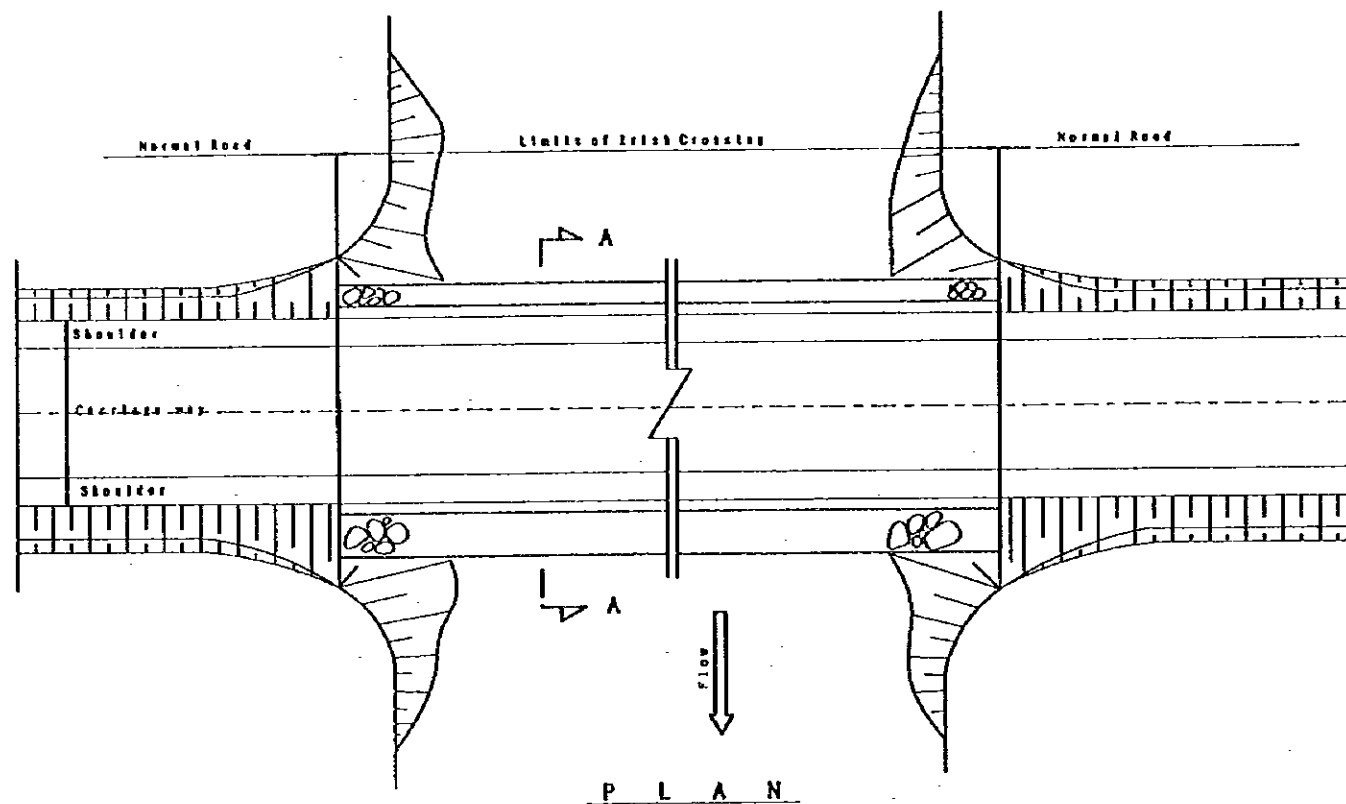


SECTION C - C

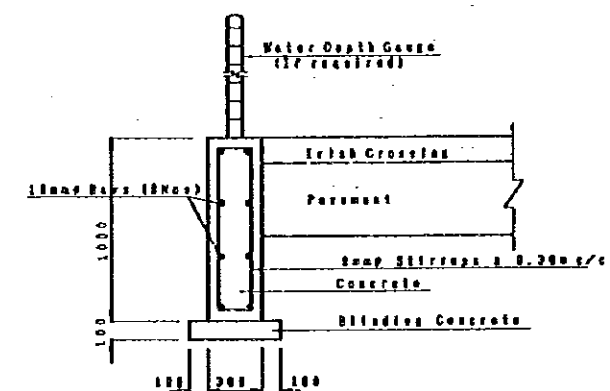
NOTES:  
(1) DIMENSIONS IN MILLIMETER UNLESS OTHERWISE INDICATED.

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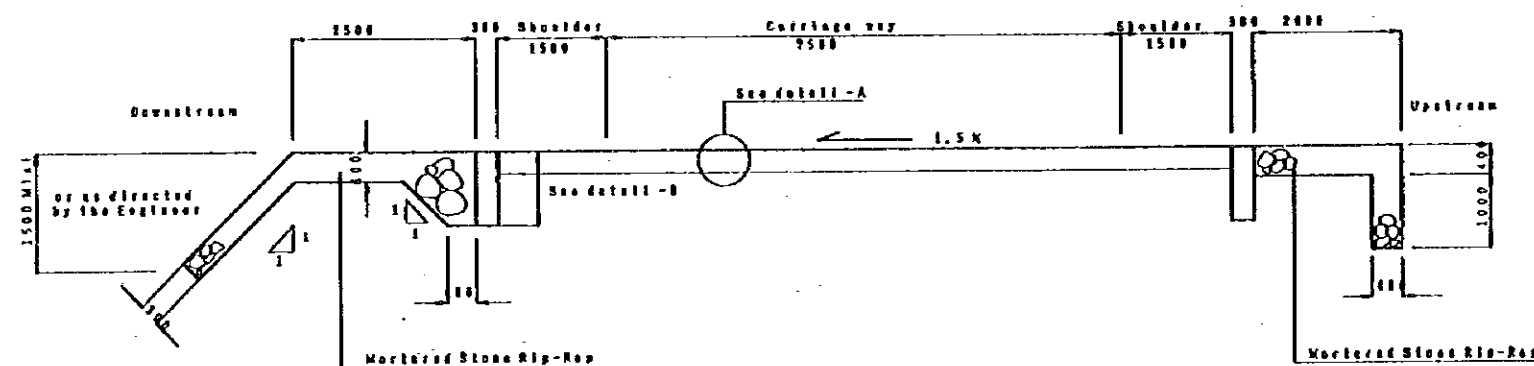
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE: RA/8 AL KHABURAH SLOPE PROTECTION  
DATE: DWO NO.: R-13



**PAVEMENT**  
(Detail-A)



**DETAIL OF CUT OFF WALL**  
(Detail-B)

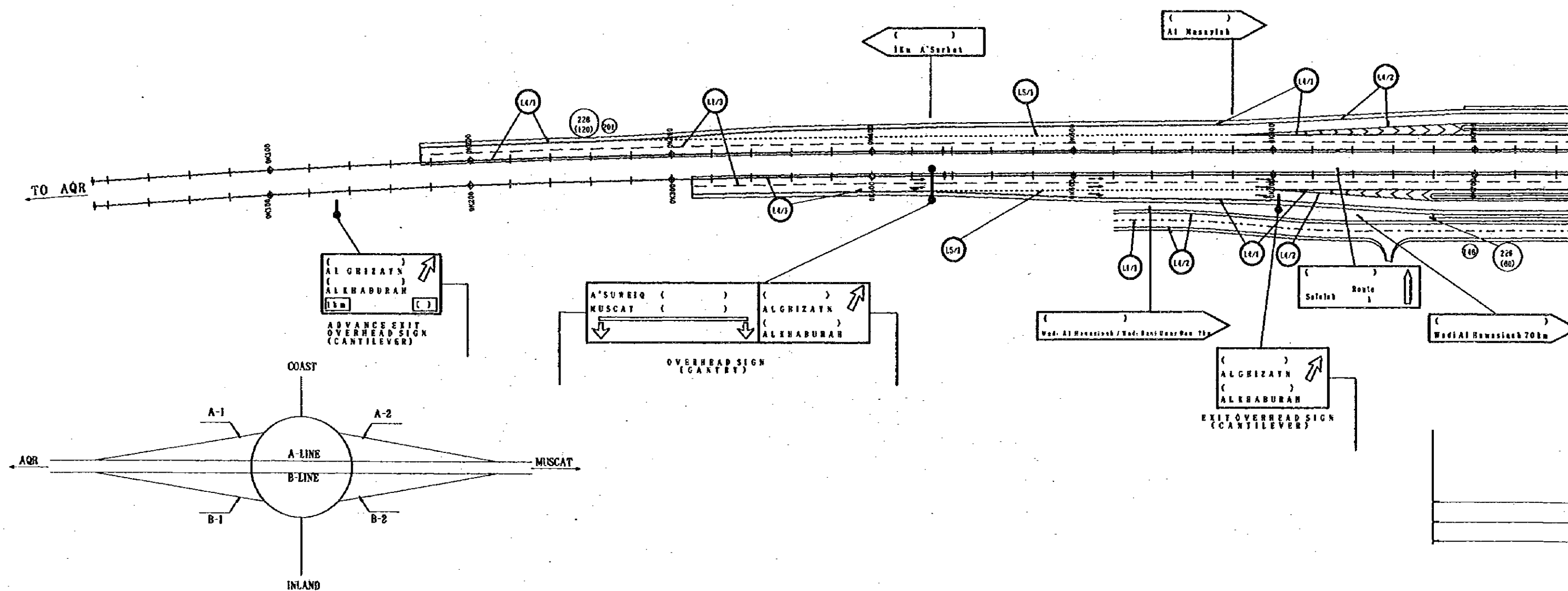


**SECTION A - A**

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/8 AL KHABURAH GARDEN IRISH CROSSING  
DATE: DWG NO.: R-14



**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.

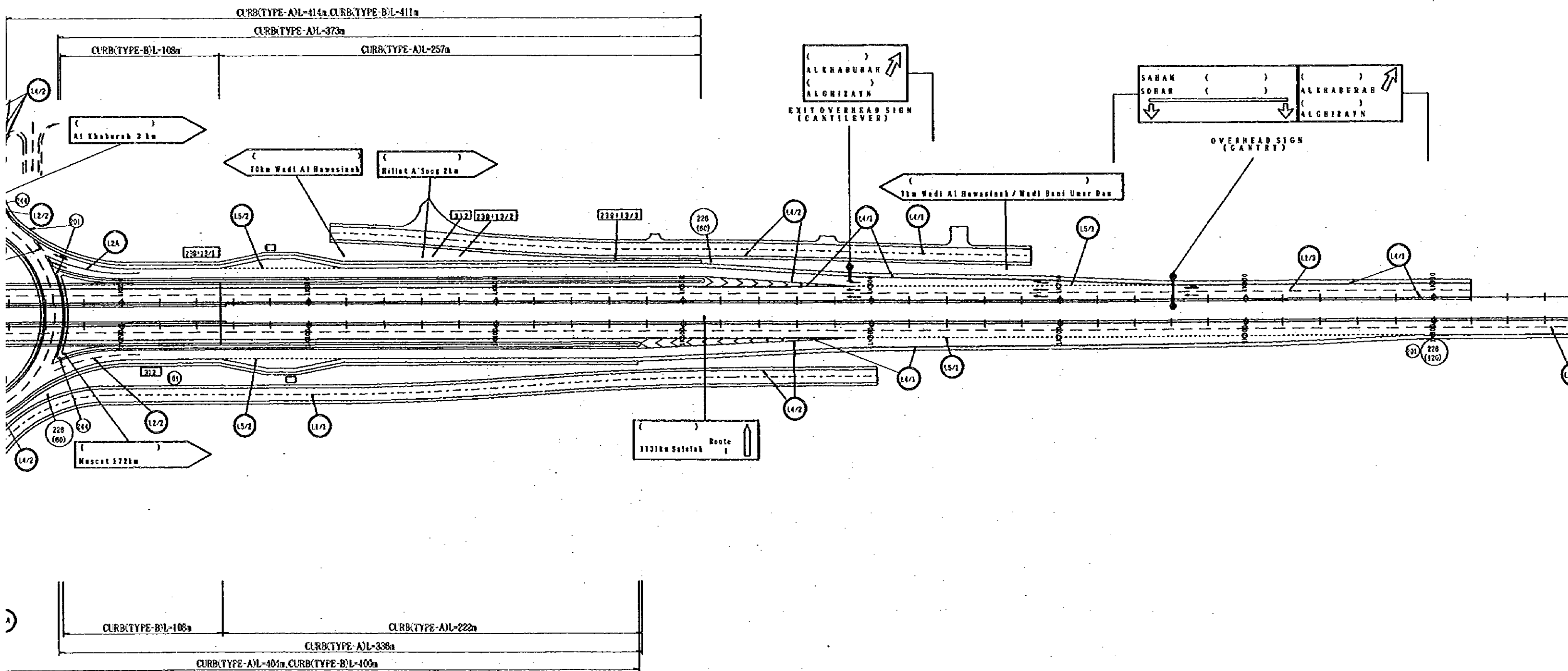
- (5) FINAL LOCATION OF ROAD SIGNS AND ARABIC NAMES ARE TO BE FINALIZED DURING CONSTRUCTION.
- (6) ADVANCE EXIT OVERHEAD SIGN SHALL BE PROVIDED AT APPROPRIATE LOCATION 300-1000m AHEAD FROM OVERHEAD SIGN.





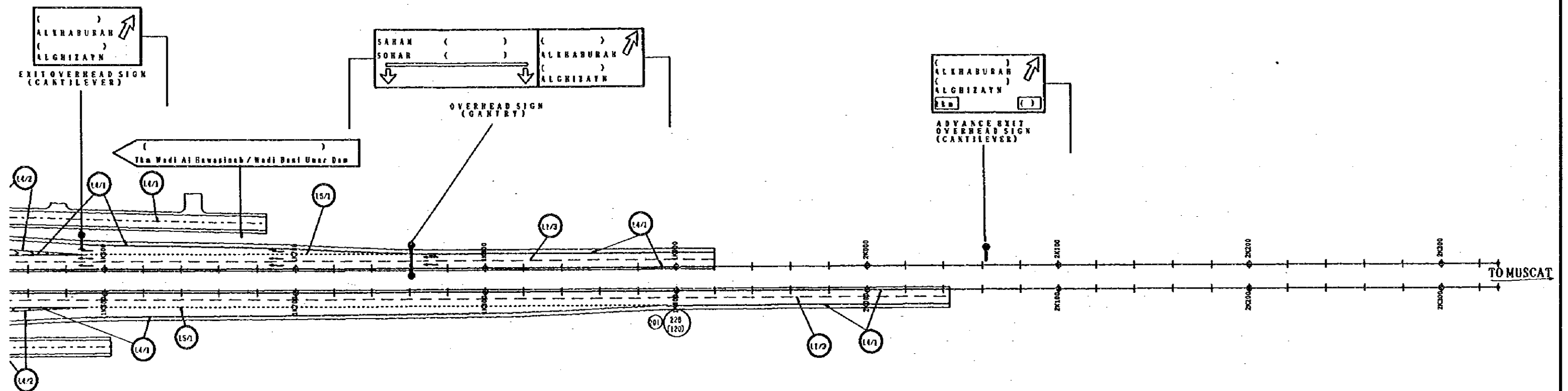
28m  
25m

DL-306a



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FUKUYAMA CONSULTANTS INTERNATIONAL

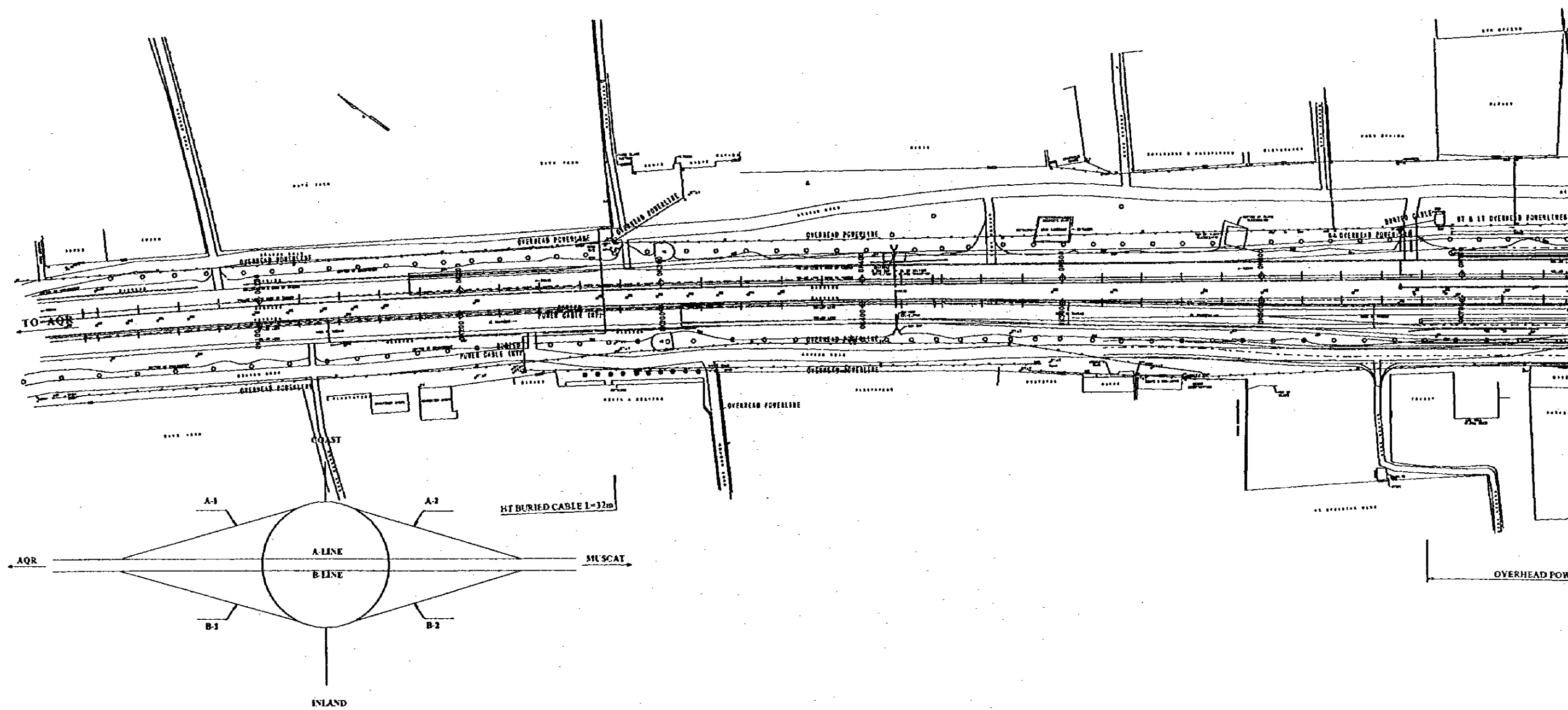
CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS

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

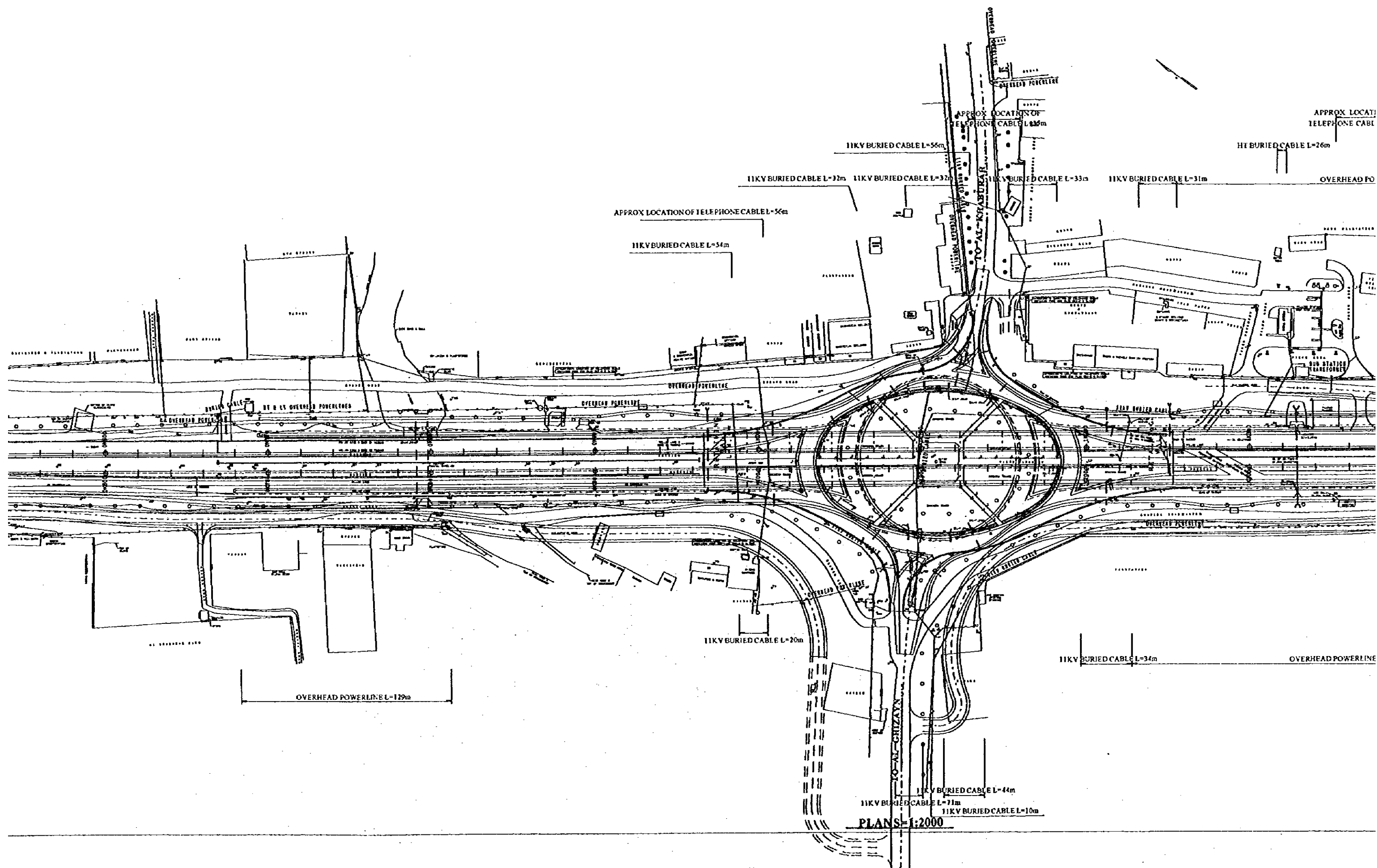
TITLE: RA/8 AL KHABURAH ROAD MARKING AND TRAFFIC SIGN

DATE

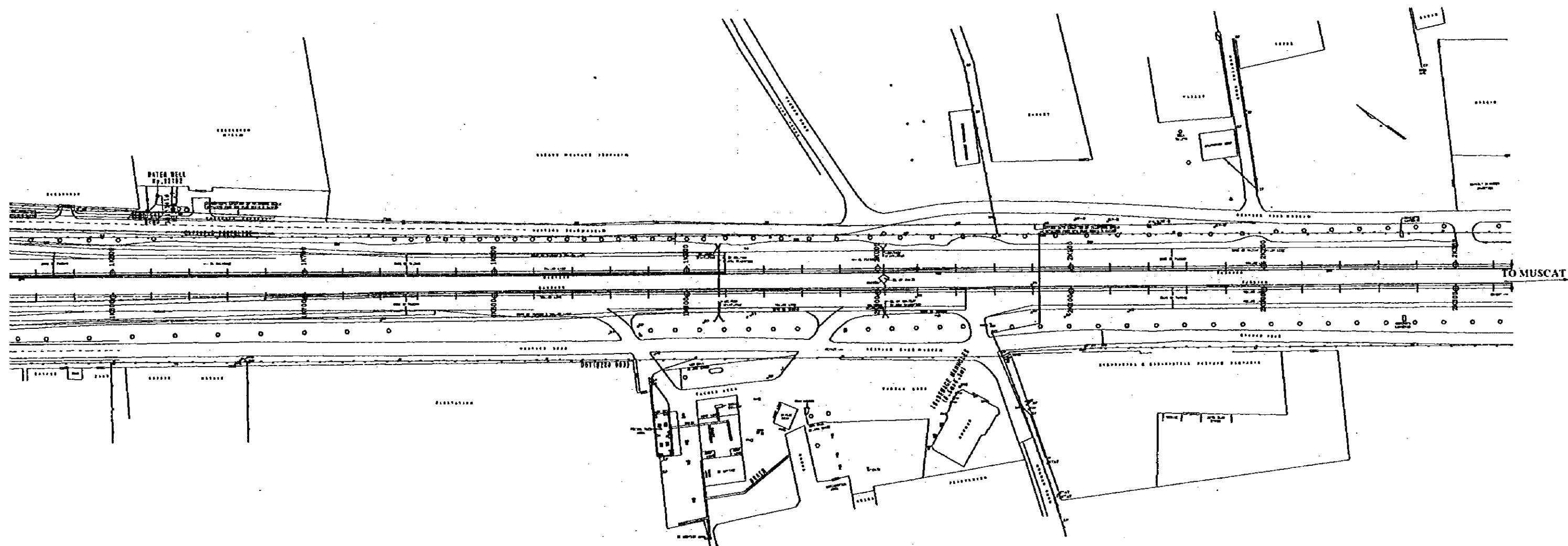
DWGNO. R-15



NOTES:







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CLIENT: MINISTRY OF COMMUNICATIONS, DIRECTORATE GENERAL OF ROADS  
PROJECT: D/D ON ROAD DEVELOPMENT PROJECT ON BATINAH HIGHWAY  
TITLE RA/8 AL KHABURAH REMOVAL & RELOCATION OF UTILITIES  
DATE DWGNO. R-16