THE HIGHWAYS AGENCY BE 7/77

THE SCOTTISH OFFICE DEVELOPMENT DEPARTMENT

THE WELSH OFFICE
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THE DEPARTMENT OF
THE ENVIRONMENT FOR NORTHERN IRELAND

Departmental Standard (Interim) Motorway Sign/Signal Gantries

Technical Memorandum (Bridges)

Summary:

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VOLUME 2	HIGHWAY STRUCTURES: DESIGN (SUBSTRUCTURES AND SPECIAL STRUCTURES), MATERIALS
SECTION 2	SPECIAL STRUCTURES

BE 7/77

DEPARTMENTAL STANDARD (INTERIM) MOTORWAY SIGN/SIGNAL GANTRIES

Contents

1. INTRODUCTION

1.1 This Technical Memorandum promulgates the Departmental Standard (Interim) Sign/Signal Gantries, pending the development in the near future of a more versatile and economical range of gantries to be based on revised Departmental requirements.

1.2 The Standard (Interim) Gantries have been designed primarily for use on motorways and fully meet the requirements of Traffic Engineering and Traffic Control and Communication Divisions of Department of Transport.

1.3 The use of the Standard (Interim) Gantries is not mandatory but is commended at all suitable locations in England and Wales.

1.4 The sets of drawings for the Departmental Standard (Interim) Sign/Signal Gantries are listed in Appendix 1 and these supersede all the previous versions, listed in Appendix 2 issued by Bridges Engineering (Design Standards) Division.

1.5 The standard drawings in Appendix 1, also supersede drawings MR 32 and MR 33 mentioned in clause 13.4 of Traffic Signs Manual.

2. SCOPE

2.1 The Standard (Interim) Gantries are designed in accordance with the criteria listed in Clause 3 and are suitable for erection in any location in England and Wales, except as stated in clause 3.1.4.

2.2 The Standard (Interim) Gantry designs are available in the 2 basic types: namely:

2.2.1 Universal beam type catering for span ranges:

17m to 19m inclusive
Over 19m to 21m inclusive.

2.2.2 Lattice plate girder type for span ranges:

Over 21m to 23m inclusive
Over 23m to 27m inclusive
Over 27m to 29m inclusive
Over 29m to 31m inclusive
Over 31m to 33m inclusive
Over 33m to 35m inclusive.

2.3 Where spans below 17m are required standard 17/19 m universal beam type gantry may be adapted as specified and within the limits stated on the drawings to suit the necessary span requirements.

2.4 A range of Standard (Interim) Signal only Gantries is under preparation and will be available shortly. An addendum to this Technical Memorandum promulgating the signal only gantries will be issued in due course.

3. DESIGN CRITERIA

3.1 Gantry Superstructure

The Standard (Interim) Gantries are designed in accordance with the following criteria:

3.1.1 Variable spans within the standard ranges as stated in clause 2.2.

3.1.2 Variable positions of signal units to suit carriageway lane arrangements.

3.1.3 Variable sizes and positions of signs within an envelope 3m high over the clear gantry span.

3.1.4 Wind loading to permit the use of gantries in any area of England and Wales.

Reference should be made to Bridges Engineering (Design Standards) Division before using the gantries in the following locations:

a. on hill slopes and crests where acceleration of the wind is known to occur;

b. in valleys shaped to produce severe funnelling of the wind.

3.1.5 Differential settlement between the ends of the gantry span up to the following limits:

a. Below 21m inclusive - Universal Beam Gantries - 10m

b. Over 21-35m inclusive - Lattice Plate Girder Gantries - 25m.

3.2 Gantry Foundation

The Standard Designs do not include foundation details except for the standard base anchorage. The users are to provide designs in reinforced concrete for their specific gantries conforming to the following:

3.2.1 Design standards

Design standards are to be in accordance with the current schedule TAS in BE 4/73.

3.2.2 Foundation loads.

Design loads are given in Appendix 6.

3.2.3 Load combinations

The following load combinations shall be considered:

1. Worst combination of loading from dead loads, live loads, wind loads and temperature loads;

2. Worst combination of loading from dead loads, impact loads, and 50% of wind loads.

NOTE: Wind loads to be considered are; full transverse wind load in combination with full longitudinal and ±0.5 vertical wind loads.

3.2.4 Permissible stresses

The following permissible stresses shall be used when considering the load combinations in clause 3.2.3:

Combination 1. - The basic elastic permissible stresses as given in the relevant documents in the TAS except that no overstress shall be permitted. Factors of Safety for sliding and overturning shall be 2.0.

Combination 2. - The stresses as for combination 1 increased by 50%. For this combination the Factors of Safety for sliding and overturning may be reduced to 1.4.

3.2.5 Soil survey

Where adequate information is not available a full soil survey shall be carried out.

3.2.6 Allowance for carriageway cross fall

No allowance has been made for a variation of gantry leg height. Variation of ground levels at the ends of a gantry shall be catered for in the foundation design by the use of a reinforced concrete plinth.

3.2.7 Safety fence protection to base

Gantry legs shall be protected from accidental impact by means of safety fences. Details are to be in accordance with the appropriate Technical Memorandum in TAS (BE 4/73).

4. IMPLEMENTATION OF STANDARD DESIGNS

4.1 The standard drawings are intended for use as Contract Documents and as such, should not be modified or altered. See Clause 5.

4.2 The standard drawings should be used in conjunction with the Department's Specification for Road and Bridgeworks.

4.3 Users will require to produce additional working drawing(s) for each gantry conveying the following complementary information:

4.3.1 The reference to the relevant standard drawings that are to be used.

4.3.2 Statement of the exact span length of the gantry.

4.3.3 Positions of carriageway lane centre lines.

4.3.4 Positions of signal units, and associated equipment.

4.3.5 Positions and size of signs (only the necessary sign area should be provided, except where further infilling is required for safety reasons to prevent light spillage).

4.3.6 Location of cable ducts in ground indicating cable entry points to a gantry.

4.3.7 Location of sign lighting equipment and associated cables on the support member and the required length of the support members.

4.3.8 Detail of security device to gantry ladders.

(In urban situations it may be necessary to discourage unauthorised entry to the structure by the provision of a cage and locking arrangement to the access ladder or other effective methods. Details of these proposals shall be submitted to BES for approval, if drilling or welding of any structural member is involved.)

4.3.9 Details of corrosion protection system.

4.3.10 Foundation details.

5. CERTIFICATION IN ACCORDANCE WITH TECHNICAL MEMORANDUM NO BE 4/73

5.1 The Standard (Interim) Gantry designs are certificated in accordance with Technical Memorandum BE 4/73: "Technical Approval of DOE Highway Structures", provided:

a. the gantries are to be used within the criteria listed in clause 3.1;

b. the standard drawings are used without modification or alteration;

c. the fabrication of the gantries are carried out strictly in accordance with the details indicated on the standard drawings.

5.2 Users are only required to provide certificates to cover implementation of standard drawings. The form of the certificate is shown in Appendix 4.

5.3 Approval procedure for foundation design by the user is to be in accordance with BE 4/73.

5.4 BE 4/73 certificates for the Standard (Interim) Gantries are held by all Technical Approval Authorities and need not be submitted with each gantry.

5.5 Modification of any details on the standard drawings, not specifically indicated as variable, shall invalidate the approval certificate and a certificate for the whole structure will be required from the user.

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6. STANDARD DRAWINGS

6.1 Reduced copies of one of each of the 2 basic types of gantries, namely the universal beam type and the lattice plate girder type, are illustrated in Appendix 5 for general information only.

6.2 Negatives of standard drawings are held by Bridges Engineering (Design Standard) Division (Telephone number 01 928 7999 extension 4683). Prints for office use and as Contract Drawings will be issued only for specific gantries and all enquiries should include details of location of gantry and span required.

6.3 When amendments are made to the standard drawings revised copies will not automatically be issued to previous users.

6.4 Users must always check with Bridges Engineering (Design Standards) Division (Telephone number 01 928 7999 extension 2506) before re-using drawings for a subsequent gantry scheme.

7. INSTALLATION OF ELECTRICAL EQUIPMENT

7.1 Traffic Engineering (TE) and Traffic Control and Communication (TCC) Division of the Department have documents relating to electrical equipment, lighting, etc. for gantries. These documents are listed in Appendix 3.

7.2 Welding to and drilling of structural members for the installation of electrical equipment shall be considered as a modification of details and in accordance with paragraph 5.5 of this Memorandum shall invalidate the Standard Certificates.

7.3 Special support members for installation of electrical equipment have been provided in the gantry structures. Drilling and welding to the support members only may be carried out for electrical equipment installation.

7.4 The user shall be responsible for ensuring that the requirements of this clause are adhered to.

8. GANTRIES TO PREVIOUS VERSIONS OF THE CURRENT DRAWINGS

8.1 On gantries not yet completed, consideration should be given to the implementation of all the details shown in the standard drawings listed in Appendix 1.

8.2 For gantries already built or now being built to previous versions of these drawings, Bridges Engineering (Design Standards) Division will be able to furnish certificates for the design of the gantry superstructures on receipt of the following information for the individual gantries:

a. Version of standard drawing used;

b. Gantry span;

c. Arrangement and dimensions of traffic signs;

d. Details of any amendments made to (a) above.

9. ENQUIRIES

All technical enquiries or comments on this technical memorandum must be sent in writing quoting reference given on the cover sheet to:

The Assistant Chief Engineer
Bridges Engineering (Design Standards) Division BES
Department of Transport
St Christopher House
Southwark Street
LONDON
SE1 0TE

Minor technical enquiries may however be made by telephone to Mr RJ Howard 01 928 7999 extension 4683.

Any distribution enquiries should be made to Highways Manual Branch, Room P2/017A, 2 Marsham Street, London, SW1P 3EB. Telephone 01 212 4944.

CURRENT DEPARTMENTAL STANDARD (INTERIM) SIGN/SIGNAL GANTRY DRAWINGS

Span	Type	Title	Drawing No.
17/19m	Universal beam	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/19m/1K 2064/M/GS/19m/2H 2064/M/GS/19m/3A 2064/M/GS/19m/4A
19/21m	Universal beam	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/21m/1A 2064/M/GS/21m/2A 2064/M/GS/21m/3A 2064/M/GS/21m/4A
21/23m	Lattice plate girder	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/23m/1E 2064/M/GS/23m/2G 2064/M/GS/23m/3A 2064/M/GS/23m/4A
23/27m	Lattice plate girder	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/27m/1D 2064/M/GS/27m/2F 2064/M/GS/27m/3A 2064/M/GS/27m/4A
27/29m	Lattice plate girder	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/29m/1E 2064/M/GS/29m/2E 2064/M/GS/29m/3A 2064/M/GS/29m/4A
29/31m	Lattice plate girder	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/31m/1D 2064/M/GS/31m/2E 2064/M/GS/31m/3A 2064/M/GS/31m/4A
31/33m	Lattice plate girder	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/33m/1E 2064/M/GS/33m/2G 2064/M/GS/33m/3A 2064/M/GS/33m/4A
33/35m	Lattice plate girder	General arrangement Leg and ladder assembly Miscellaneous details Electrical equipment mounting details	2064/M/GS/35m/1E 2064/M/GS/35m/2E 2064/M/GS/35m/3A 2064/M/GS/35m/4A

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SUPERSEDED STANDARD DRAWINGS

Span	Type	Title	Drawing No
50' 6" 10 86' 6"	Box girder	Standard Sign Gantry	MR 32C MR 33C
17/19m	Universal beam	Sign/Signal Gantry 19m max span	B140/1E B140/2E B140/3
17/19m	Universal beam	Sign/Signal Gantry 19m Standard details DOE girder	2064/M/GS/19m/1H 2064/M/GS/19m/2F
19/21m	Unversal beam	Sign/Signal gantry 21m max span } } } Sign board post details (preferred alternative for 19m and 21m span sign/signals gantries)	B140/4E B140/5F B140/7 B140/6B
21/23m	Lattice plate girder	Sign/Signal gantry 23m Standard details. Lattice plate girder	2064/M/GS/23m/1C 2064/M/GS/23m/2E
23/27m	Lattice plate girder	Sign/Signal gantry 27m Standard details. Lattice plate girder	2064/M/GS/27m/1B 2064/M/GS27m/2D
27/29m	Lattice plate girder	Sign/Signal gantry 29m Standard details. Lattice plate girder	2064/M/GS/29m/1C 2064/M/GS/29m/2C
29/31m	Lattice plate girder	Sign/Signal gantry 31m Standard details. Lattice plate girder	2064/M/GS/31m/1B 2064/M/GS/31m/2C
31/33m	Lattice plate girder	Sign/Signal gantry 33m Standard details. Lattice plate girder	2064/M/GS/33m/1C 2064/M/GS/33m/2E
33/35m	Lattice plate girder	Sign/Signal gantry 35m Standard details. Lattice plate girder	2064/M/GS/35m/1C 2064/M/GS/35m/2C
	Ancillary drawings	Sign/signal gantry. Details of Signal backing frame for 19m Standard DOE girder Sign/signal gantry. Details of Signal backing frame for lattice plate girder and tubular type	2064/M/GS/19m/3 2064/M/GS/15-35/3

NOTE: All the previous Amendments of the above drawings are also superseded.

TRAFFIC ENGINEERING (TE) AND TRAFFIC CONTROL AND COMMUNICATIONS (TCC) DIVISIONS DOCUMENTS/DETAILS RELATING TO STANDARD (INTERIM) GANTRIES

Traffic Control and Communications Division (TCC) Documents:-

MCC 1440		GA of Signal 112
MCC 1441		Detail drawing of cross frame
MCC 1442		Back mounting frame (Type A)
MCC 1443		" " " (Type B)
MCC 1444		" " " (Type C)
MCC 1445		Lower Pivot stand (" A)
MCC 1446		" " " (" B)
MCC 1447		" " " (" C)
MCC 1448		Pivot washer
MCC 1449		Upper pivot plate
MCC 1450		Pivot catch
MCC 1451		Locking plate
MCC 1452		Tab washer
MCC 1453		Ball and socket joint
MCC 1454		Item list
MCC 1455		" "
MCC 1456		" "
MCC 1457		Wiring diagram of x frame.
MCC 1458		Material list
MCC 1459		" "
MCA 1471		Signal Equipment Installation on Gifford Gantries
MCA 1471	PL Sht 1	" " " " " "
MCA 1471	PL Sht 2	" " " " " " for 3 lane Gantry
MCA 147	PL Sht 3	" " " " " " for 4 lane Gantry
MCA 1471	PL Sht 4	" " " " " " for 5 lane Gantry
MCA 147	PL Sht 5	" " " " " " Cabling Arrangements
MCA 147	DL	" " " " " " Drawing List
MCA 1472		Mounting Plate and Clamp Assembly
MCA 147	PL	" " " " " Parts list
MCA 1473		Mounting Plate
MCA 1474	PL	Mounting Plate Assembly Parts List
MCA 1474		Clamp Pivot Plate
MCA 1476		M8 Tread Bush
MCA 1477		Clamp Plate
MCA 1478	PL	Clamp Plate Parts List
MCA 1478		Eyebolt

NOTE:- (TCC) Documents are included for reference only. The essential details for the installation of signalling equipment on Gantries are incorporated in the standard drawings.

NOTE:- The above documents may be obtained on written application to:-

The Department of Transport
TCC Division
Room 2/71
St Christopher House
Southwark Street
London SE1 0TE

Traffic Engineering Division (TE) Documents:-

Traffic Signs Manual HMSO Publication
BS 873: Specification for the Construction of road traffic signs and internally illuminated bollards;
Part 1: General Traffic Signs

Circular Roads No 16/73; Model Specification for The Supply and Erection of Road Traffic Signs.

The last document may be obtained on written application to:-

Highways Manual Branch
Room P2/017A
2 Marsham Street
London SW1P 3EB

STANDARD GANTRY CERTIFICATE

Form of Certificate to be used by Design Office when using Department of Transport Standard (Interim) Sign Signal Gantries.

1. We certify that reasonable professional skill and care has been used in the preparation of Arrangement Drawings for . . . . . (Identification of Gantry) to be used in conjunction with the Standard Drawings with a view to securing that:

   a. It has been prepared strictly within the limits indicated on the following standard drawings issued by Department of Transport.

      i.
      ii.
      iii.
      iv.

   b. It has been prepared without need to amend the above Standard Drawings.

   c. It complies with the requirements specified in Technical Memorandum BE 7/77.

   d. It has been checked for compliance in all respects.

2. The unique numbers of the Arrangement Drawings are:-

   Signed .....

   TEAM LEADER

   Signed .....
   CHIEF OFFICER or his Nominee
   (Agent Authority or RCU Sub-Unit) or Partner or his Nominee
   (Consulting Engineer)

   Date .....

3. The receipt of this certificate is acknowledged by the TAA.

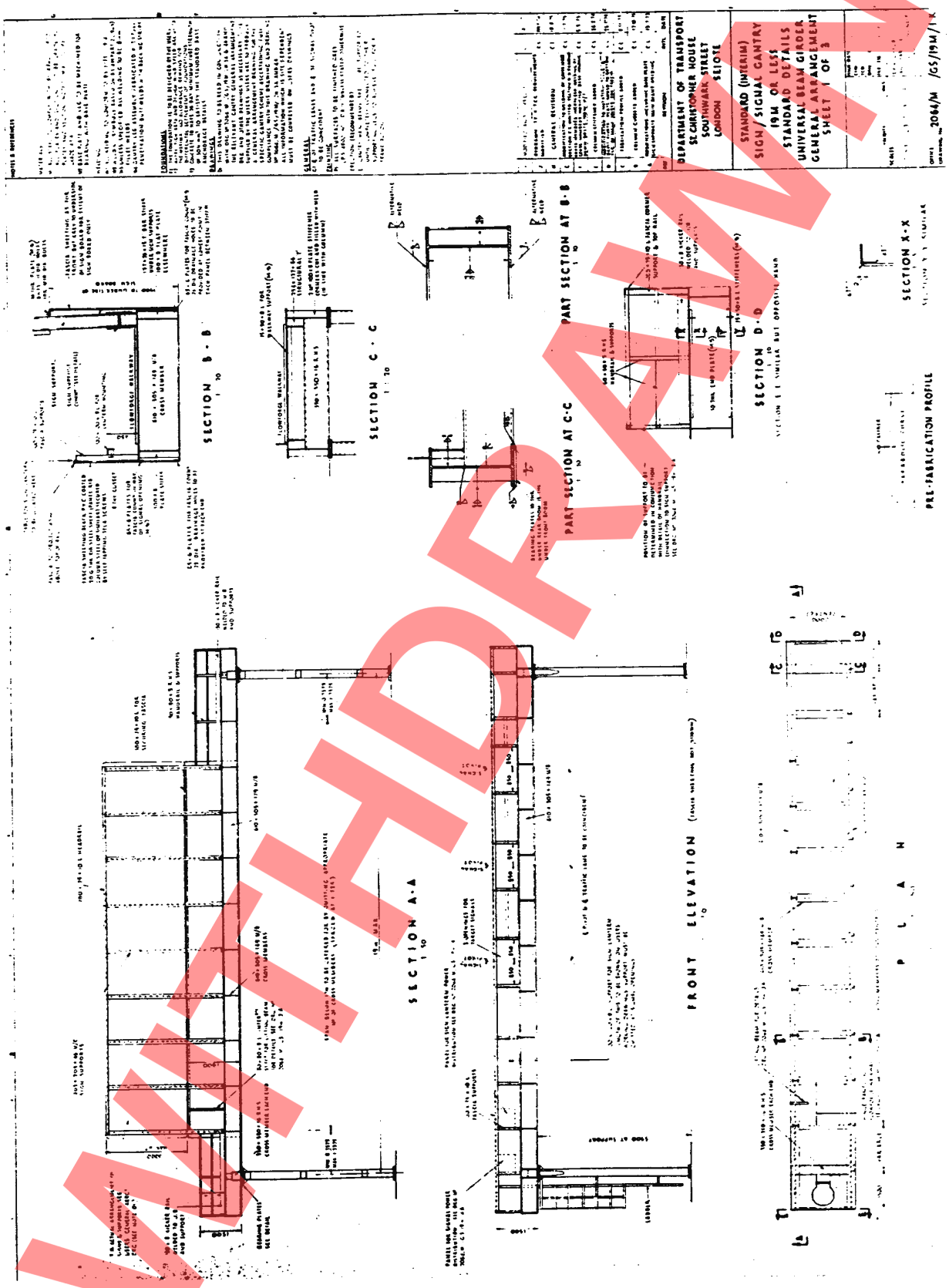
   Signed .....
   BET RCU

   Date .....

NOTE: A separate certificate in accordance with Technical Memorandum BE4/73 is required for the gantry foundations.

TYPICAL STANDARD GANTRY DRAWINGS

PHOTO REDUCED EXAMPLES (NOT TO BE USED FOR CONSTRUCTION)



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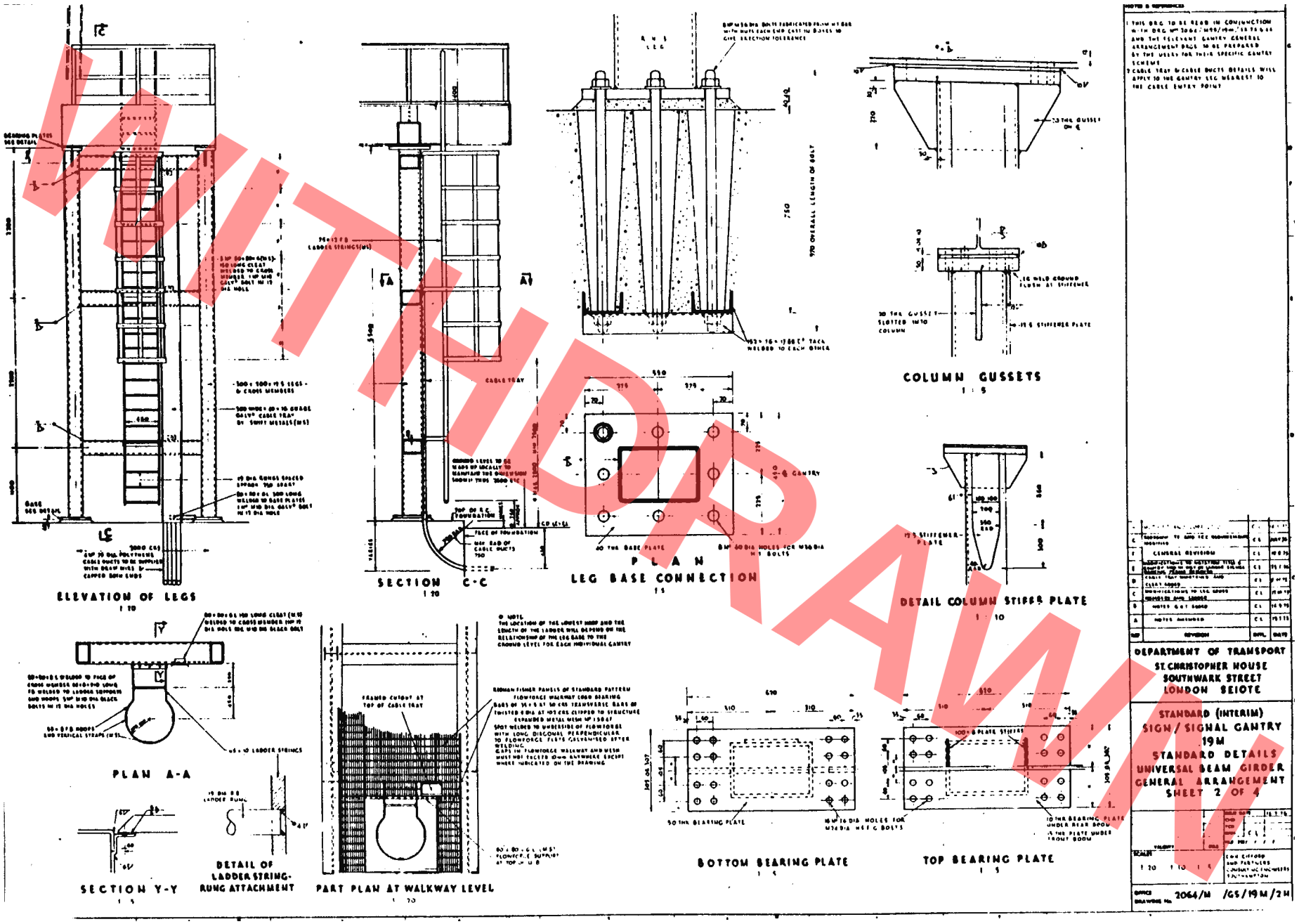

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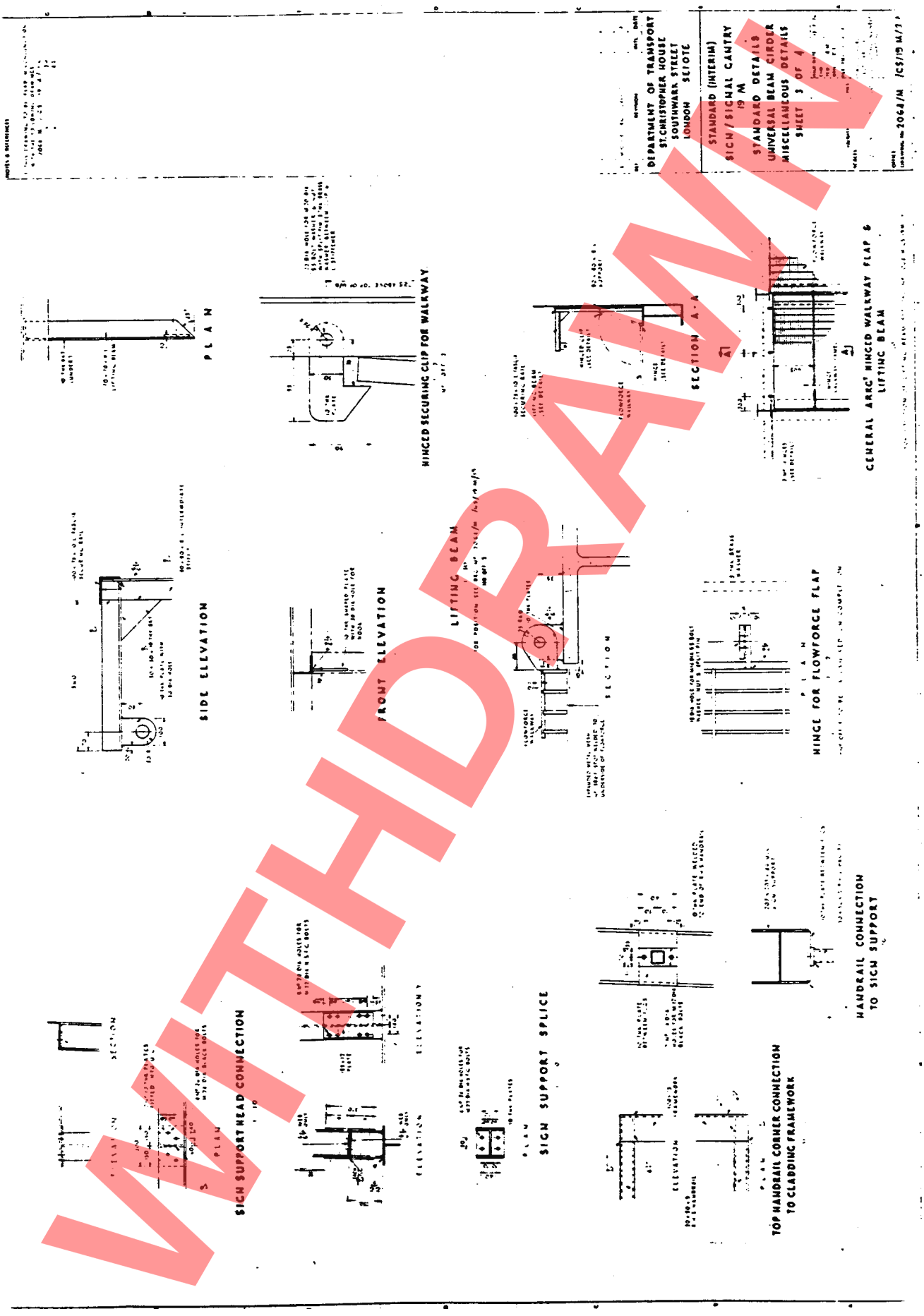

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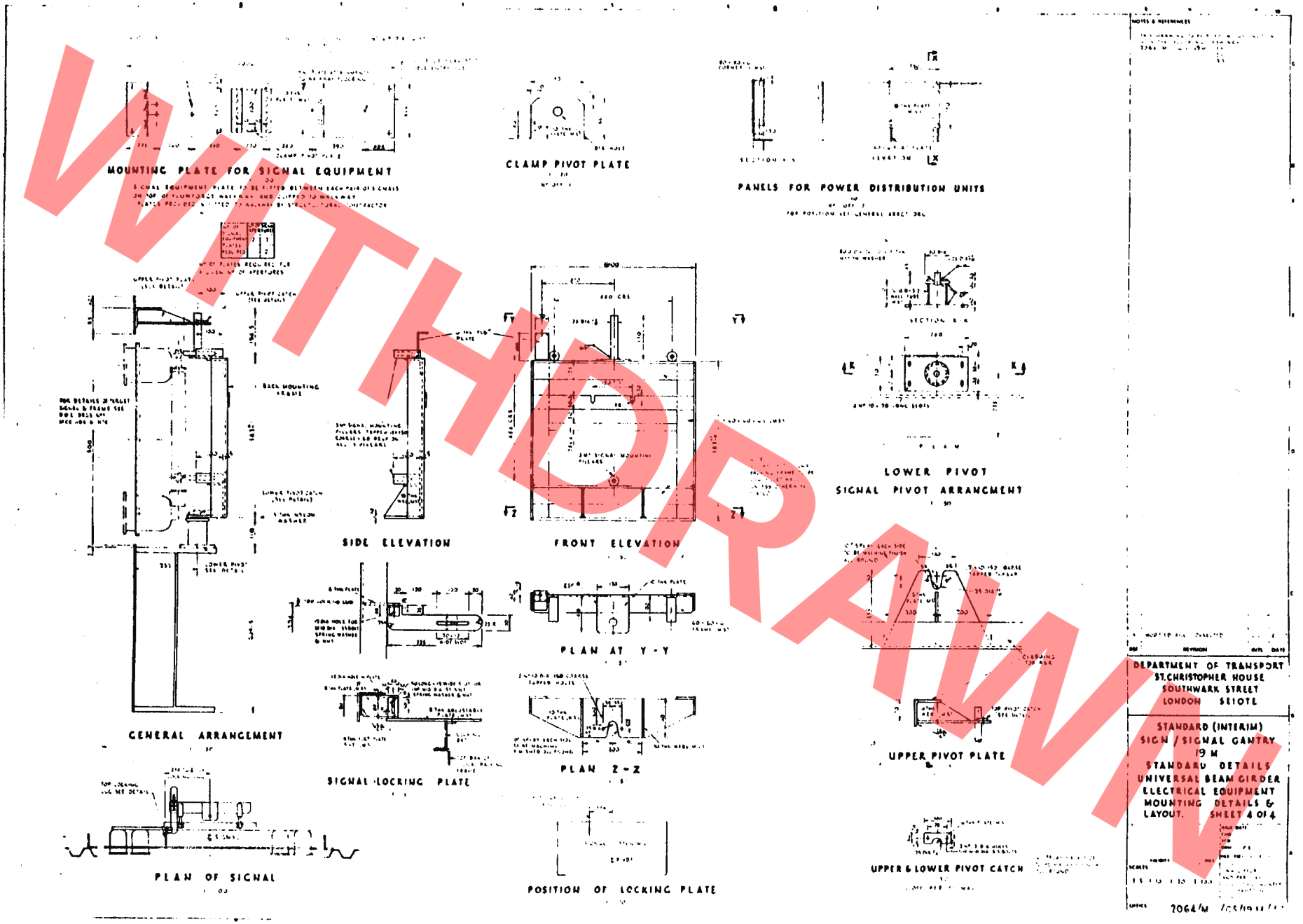

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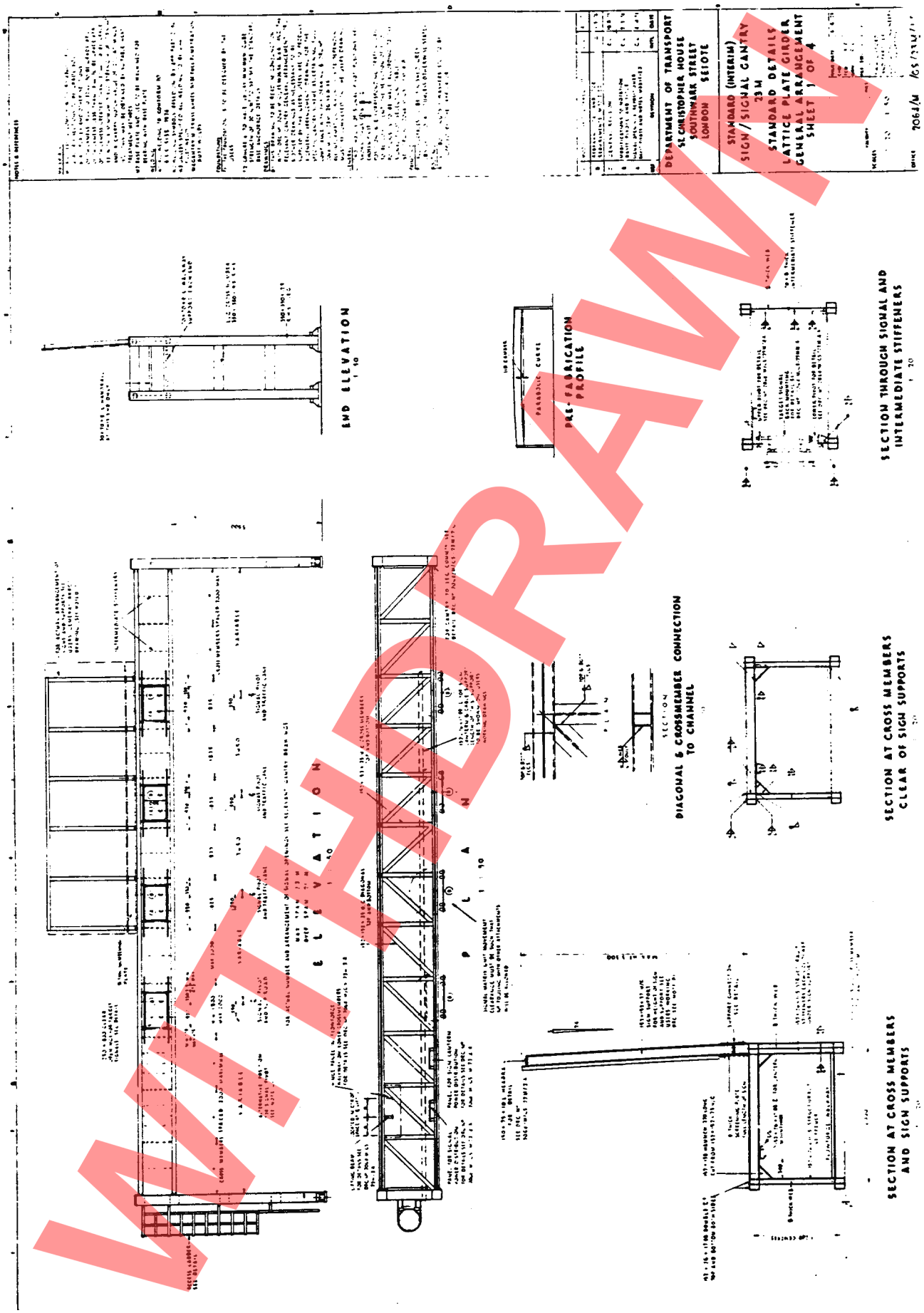

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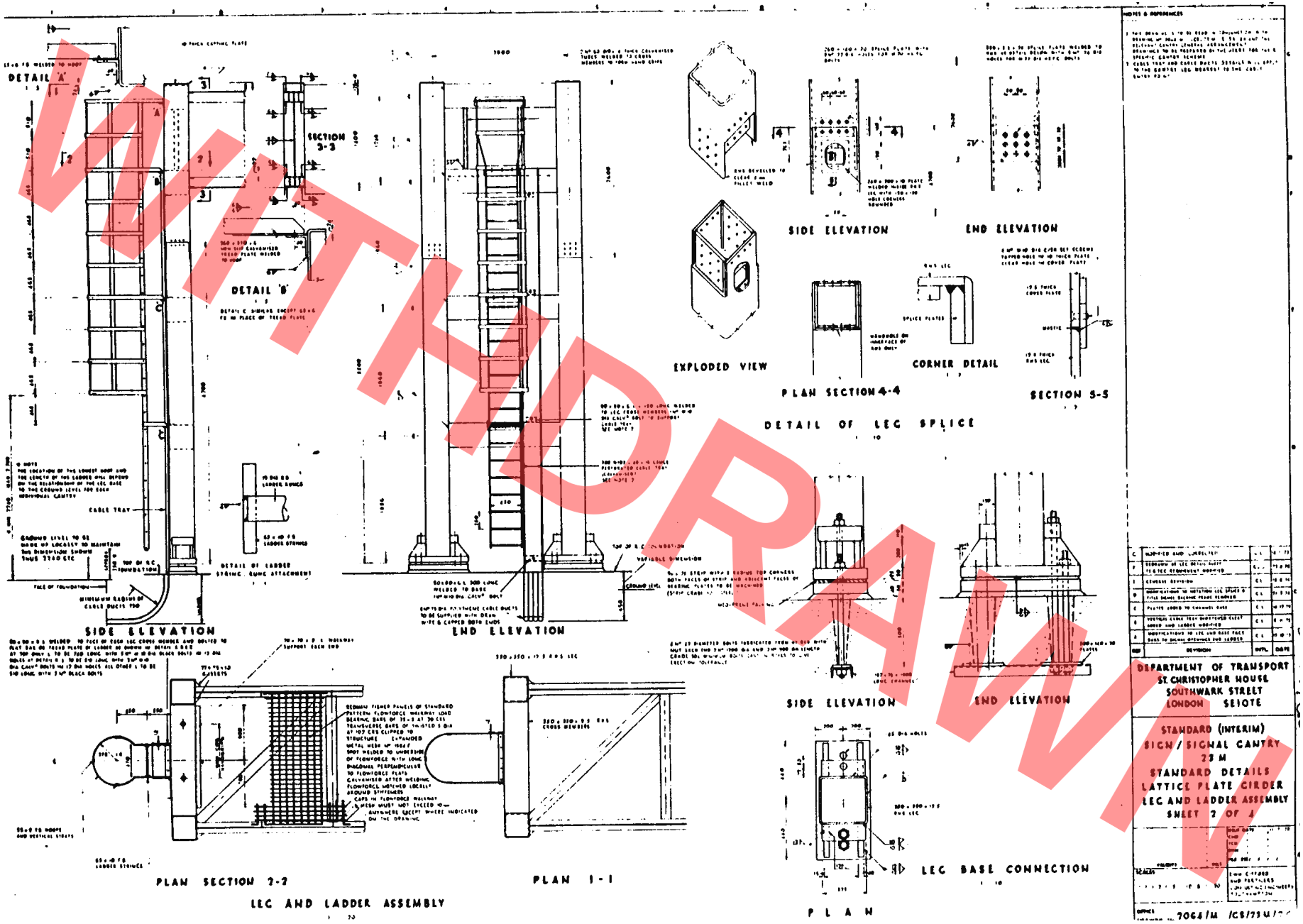

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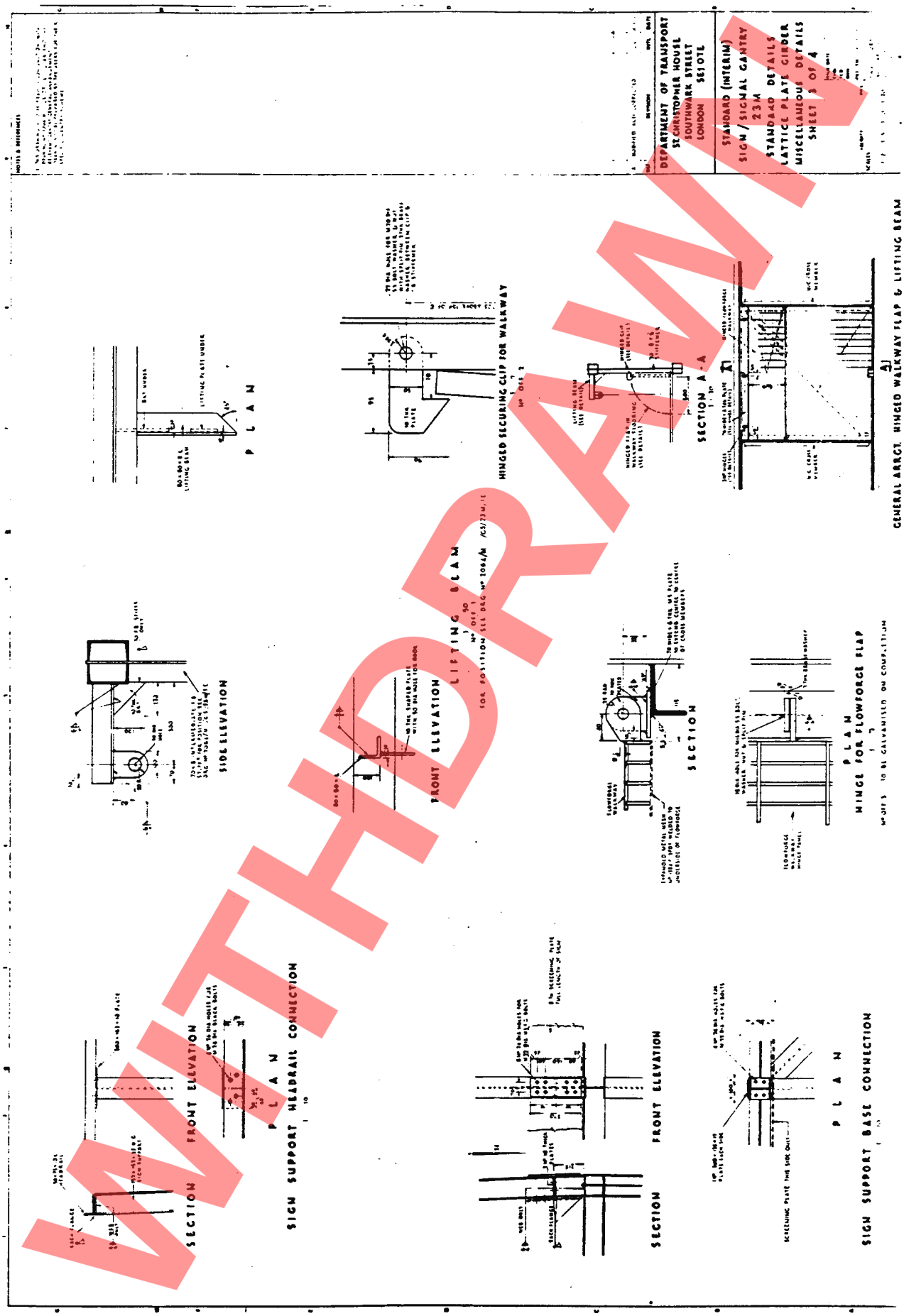

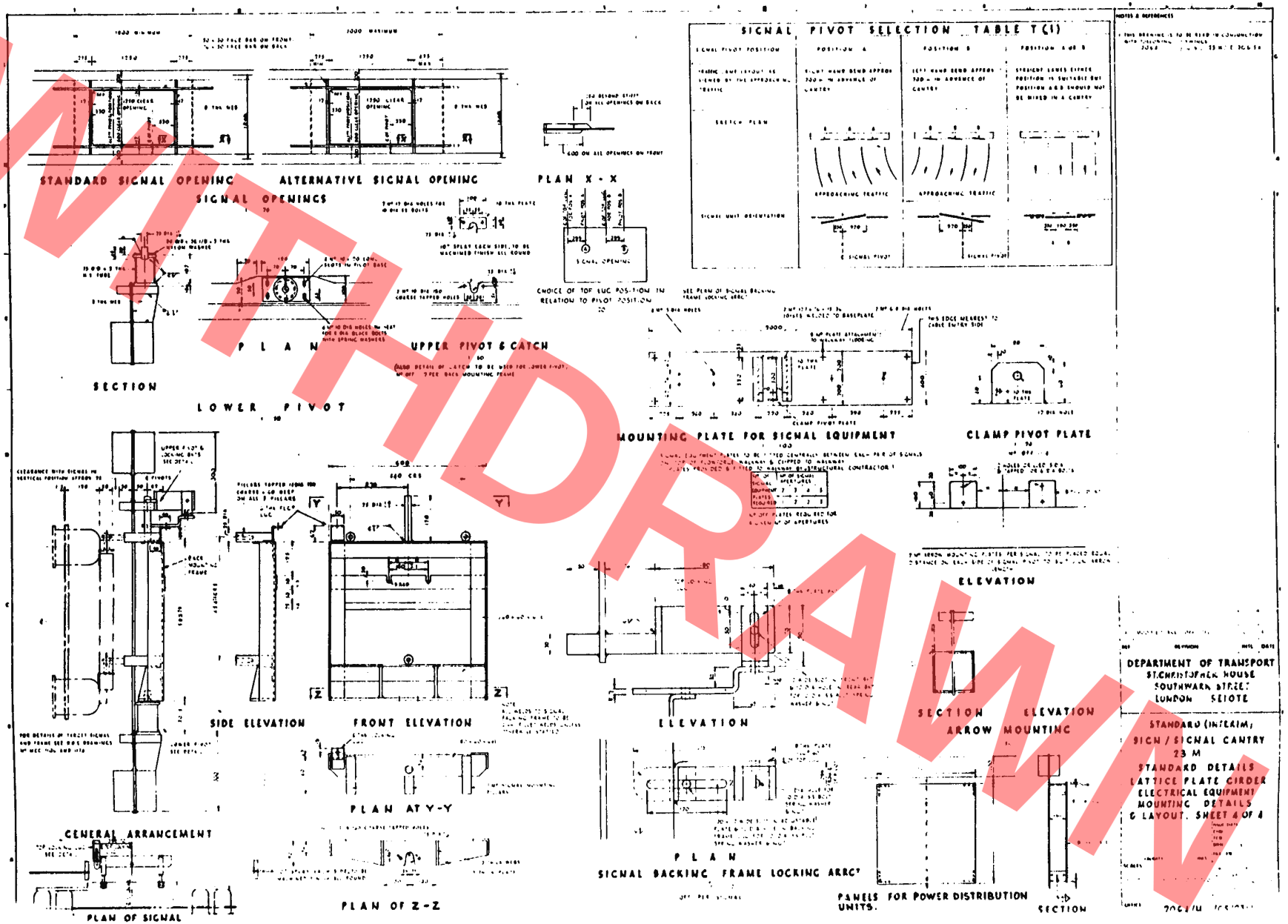

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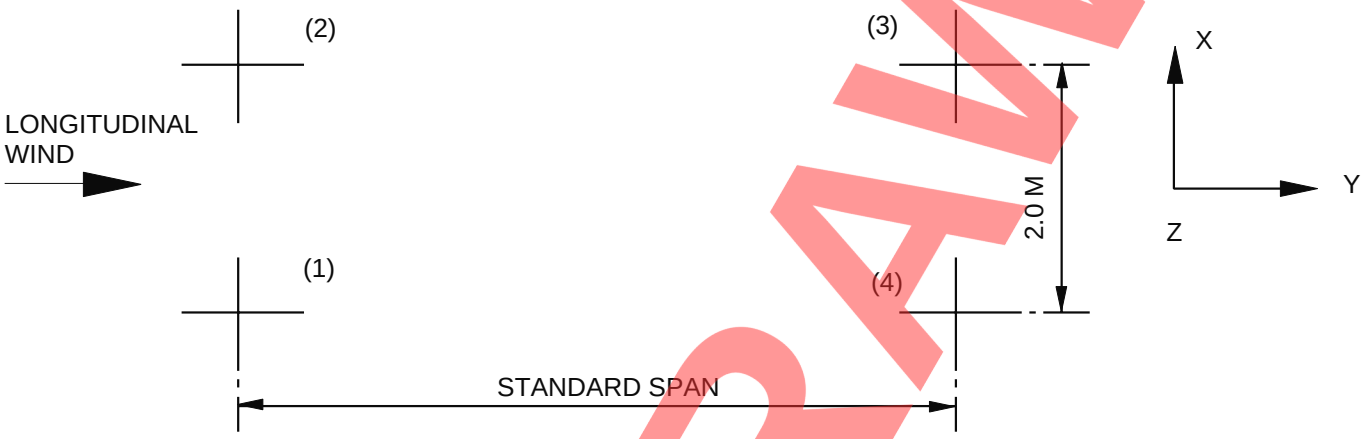
FOUNDATION LOAD TABLES

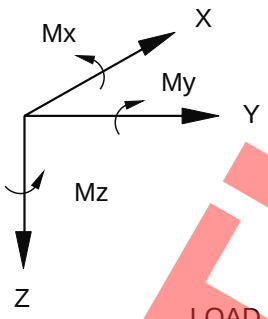
STANDARD (INTERIM) SIGN/SIGNAL GANTRIES

SPANS UP TO 21.00 M . INCLUSIVE

BASE NUMBERING KEY



SIGN CONVENTION



FORCES : + VE. IN DIRECTION OF AXIS

MOMENTS : + VE. ANTICLOCKWISE VIEWED FROM ORIGIN

LOAD CASES

1. DEAD LOAD
2. SUPERIMPOSED LOAD
3.* TEMPERATURE EFFECTS
4.* LATERAL WIND
5.* LONGITUDINAL WIND
6.* UPLIFT DUE TO WIND
7.* IMPACT LOAD ON SUPPORTS

LOAD CASES ASTERISKED * ARE REVERSIBLE

17-19 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

LOAD CASE	BASE	Fx KN	Fy KN	Fz KN	Mx KNm	My KNm	Mz KNm
1	1		-14	+45	+26		
	2		-14	+45	+26		
	3		+14	+45	-26		
	4		+14	+45	-26		
2	1		-3	+7	+5		
	2		-3	+7	+5		
	3		+3	+7	-5		
	4		+3	+7	-5		
3	1		-2		+6		
	2		-2		+6		
	3		+2		-6		
	4		+2		-6		
4	1	+52	+12	-347	-17	+52	-3
	2	+52	-12	+347	+17	+52	-3
	3	+52	+12	+347	-17	+52	+3
	4	+52	-12	-347	+17	+52	+3
5	1		+14	-4	-40		
	2		+14	-4	-40		
	3		+14	+4	-40		
	4		+14	+4	-40		
6	1		-2	+6	+5		
	2		-2	+6	+5		
	3		+2	+6	-5		
	4		+2	+6	-5		
7	1	+25	-50	-150	+80		
	2	+25	-50	+150	+80		
	3	+25	+50	+150	-80		
	4	+25	+50	-150	-80		

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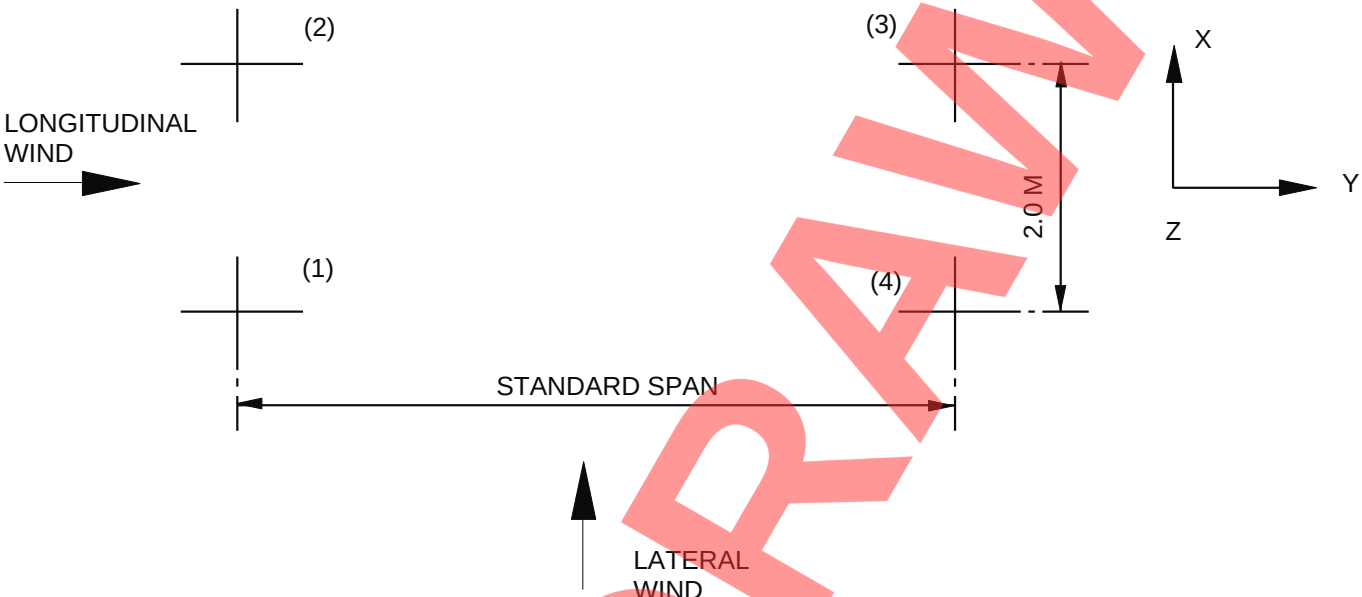
19-21 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

LOAD CASE	BASE	Fx KN	Fy KN	Fz KN	Mx KNm	My KNm	Mz KNm
1	1		-30	+67	+54		
	2		-30	+67	+54		
	3		+30	+67	-54		
	4		+30	+67	-54		
2	1		-5	+8	+9		
	2		-5	+8	+9		
	3		+5	+8	-9		
	4		+5	+8	-9		
3	1		-4		+13		
	2		-4		+13		
	3		+4		-13		
	4		+4		-13		
4	1	+59	+27	-391	-43	+59	-6
	2	+59	-27	+391	+43	+59	-6
	3	+59	+27	+391	-43	+59	+6
	4	+59	-27	-391	+43	+59	+6
5	1		+15	-4	-40		
	2		+15	-4	-40		
	3		+15	+4	-40		
	4		+15	+4	-40		
6	1		-4	+7	+8		
	2		-4	+7	+8		
	3		+4	+7	-8		
	4		+4	+7	-8		
7	1	+25	-50	-150	+80		
	2	+25	-50	+150	+80		
	3	+25	+50	+150	-80		
	4	+25	+50	-150	-80		

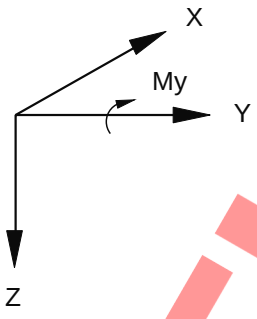
STANDARD (INTERIM) SIGN/SIGNAL GANTRIES

SPANS UP TO 21.00 M . AND UP TO 35.00 INCLUSIVE

BASE NUMBERING KEY



SIGN CONVENTION



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LOAD CASES

1. DEAD LOAD
2. SUPERIMPOSED LOAD
3.* TEMPERATURE EFFECTS
4.* LATERAL WIND
5.* LONGITUDINAL WIND
6.* IMPACT LOAD ON SUPPORTS

LOAD CASES ASTERISKED * ARE REVERSIBLE

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23 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

	CASE	BASE	Fx KN	Fy KN	Fz KN	My KNm
1	DEAD	1		-6	+58	
		2		-6	+58	
		3		+6	+58	
		4		+6	+58	
2	LIVE	1		-1	+7	
		2		-1	+7	
		3		+1	+7	
		4		+1	+7	
3	TEMP	1		-1		
		2		-1		
		3		+1		
		4		+1		
4	LAT.	1	+82	+1	-532	+104
		2	+82	-1	+532	+104
		3	+82	-1	-532	+104
		4	+82	-1	-532	+104
5	LONG.	1		+28	-15	
		2		+28	-15	
		3		+28	+15	
		4		+28	+15	
6	IMPACT	1	+25	-50	-150	
		2	+25	-50	+150	
		3	+25	+50	+150	
		4	+25	+50	-150	

27 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

	CASE	BASE	Fx KN	Fy KN	Fz KN	My KNm
1	DEAD	1		-12	+68	
		2		-12	+68	
		3		+12	+68	
		4		+12	+68	
2	LIVE	1		-2	+10	
		2		-2	+10	
		3		+2	+10	
		4		+2	+10	
3	TEMP	1		-2		
		2		-2		
		3		-2		
		4		+2		
4	LAT.	1	+96	+2	-627	+121
		2	+96	-2	+627	+121
		3	+96	+2	+627	+121
		4	+96	-2	-627	+121
5	LONG. WIND	1		+24	-12	
		2		+24	-12	
		3		+24	+12	
		4		+24	+12	
6	IMPACT	1	+25	-50	-150	
		2	+25	-50	+150	
		3	+25	+50	+150	
		4	+25	+50	-150	

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29 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

	CASE	BASE	Fx KN	Fy KN	Fz KN	My KNm
1	DEAD	1		-16	+76	
		2		-16	+76	
		3		+16	+76	
		4		+16	+76	
2	LIVE	1		-3	+11	
		2		-3	+11	
		3		+3	+11	
		4		+3	+11	
3	TEMP	1		-2		
		2		-2		
		3		+2		
		4		+2		
4	LAT.	1	+102	+2	-664	+139
		2	+102	-2	+664	+139
		3	+102	+2	+664	+139
		4	+102	-2	-664	+139
5	LONG. WIND	1		+26	-15	
		2		+26	-15	
		3		+26	+15	
		4		+26	+15	
6	IMPACT	1	+25	-50	-150	
		2	+25	-50	+150	
		3	+25	+50	+150	
		4	+25	+50	-150	

31 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

	CASE	BASE	Fx KN	Fy KN	Fz KN	My KNm
1	DEAD	1		-16	+87	
		2		-16	+87	
		3		+16	+87	
		4		+16	+87	
2	LIVE	1		-3	+12	
		2		-3	+12	
		3		+3	+12	
		4		+3	+12	
3	TEMP	1		-2		
		2		-2		
		3		+2		
		4		+2		
4	LAT. WIND	1	+120	+3	-770	+161
		2	+120	-3	+770	+161
		3	+120	+2	+770	+161
		4	+120	-3	-770	+161
5	LONG. WIND	1		+30	-16	
		2		+30	-16	
		3		+30	+16	
		4		+30	+16	
6	IMPACT	1	+25	-50	-150	
		2	+25	-50	+150	
		3	+25	+50	+150	
		4	+25	+50	-150	

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33 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

	CASE	BASE	Fx KN	Fy KN	Fz KN	My KNm
1	DEAD	1		-22	+96	
		2		-22	+96	
		3		+22	+96	
		4		+22	+96	
2	LIVE	1		-4	+12	
		2		-4	+12	
		3		+4	+12	
		4		+4	+12	
3	TEMP	1		-3		
		2		-3		
		3		+3		
		4		+3		
4	LAT.	1	+124	+4	-813	+175
		2	+124	-4	+813	+175
		3	+124	+4	+813	+175
		4	+124	-4	-813	+175
5	LONG.	1		+31	-12	
		2		+31	-12	
		3		+31	+12	
		4		+31	+12	
6	IMPACT	1	+25	-50	-150	
		2	+25	-50	+150	
		3	+25	+50	+150	
		4	+25	+50	-150	

35 M STANDARD (INTERIM) GANTRY FOUNDATION LOADING

	CASE	BASE	Fx KN	Fy KN	Fz KN	My KNm
1	DEAD	1		-29	+104	
		2		-29	+104	
		3		+29	+104	
		4		+29	+104	
2	LIVE	1		-5	+13	
		2		-5	+13	
		3		+5	+13	
		4		+5	+13	
3	TEMP	1		-3		
		2		-3		
		3		+3		
		4		+3		
4	LAT. WIND	1	+131	+5	-852	+200
		2	+131	-5	+852	+200
		3	+131	+5	+852	+200
		4	+131	-5	-852	+200
5	LONG.	1		+33	-12	
		2		+33	-12	
		3		+33	+12	
		4		+33	+12	
6	IMPACT	1	+25	-50	-150	
		2	+25	-50	+150	
		3	+25	+50	+150	
		4	+25	+50	-150	

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