VOLUME 3 HIGHWAY STRUCTURES: INSPECTION AND MAINTENANCE

SECTION 2 MAINTENANCE

PART 1

BD 62/94

AS BUILT, OPERATIONAL AND MAINTENANCE RECORDS FOR HIGHWAY STRUCTURES

SUMMARY

This Standard together with Standard and Advice Note BD 63 (DRMB 3.1.4) and BA 63 (DMRB 3.1.5) - Inspection of Highway Strucures, supersede TRMM 2/98 in England and WOTRMM 2/98 in Wales. For Northern Ireland the Bridge Management and Maintenance Information Transfer System applies.

INSTRUCTIONS FOR USE

This is a new document to be incorporated into the Manual.

1. Insert BD 62/94 into Volume 3 Section 2.

2. Archive this sheet as appropriate.

Note: A new contents page for Volume 3 dated December 1994 is available with BD 63/94.

THE HIGHWAYS AGENCY

THE SCOTTISH OFFICE INDUSTRY DEPARTMENT

THE WELSH OFFICE
Y SWYDDFA GYMREIG

THE DEPARTMENT OF THE ENVIRONMENT FOR NORTHERN IRELAND

BD 62/94

As Built, Operational and Maintenance Records for Highway Structures

Summary: This Standard sets out the Overseeing Organisations requirements for the provision of As Built, Operational and Maintenance Records for Highway Structures.

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REGISTRATION OF AMENDMENTS

Amend No	Page No	Signature & Date of incorporation of amendments	Amend No	Page No	Signature & Date of incorporation of amendments

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SECTION 2 MAINTENANCE

PART 1

BD 62/94

AS BUILT, OPERATIONAL AND MAINTENANCE RECORDS FOR HIGHWAY STRUCTURES

Contents

Chapter

1. INTRODUCTION

1.1 This Standard together with BD 63 (DMRB 3.1.4) and BA 63 (DMRB 3.1.5) - Inspection of Highway Structures, supersede TRMM 2/88 in England and WOTRMM 2/88 in Wales. For Scotland this Standard supersedes the contents of SDD Circular 27/1989 which deal with As Built Records for trunk road structures. For Northern Ireland the Bridge Management and Maintenance Information Technology System applies.

1.2 This Standard describes the requirements for the provision of As Built, Inspection, Maintenance records, associated manuals and other documents by the Designer/Engineer or Maintaining Agent (MA) for the Overseeing Organisations highway structures, and sets out the way in which these records are to be kept, updated and distributed.

1.3 Detailed requirements for the preparation of inspection reports and inspection records are given in BD 63 (DMRB 3.1.4) and BA 63 (DMRB 3.1.5).

1.4 For use of this Standard in Wales the term Regional Office (RO) should be replaced with Welsh Office Highways Directorate.

1.5 For use of this standard in Northern Ireland the terms Regional Office (RO) and MA should be replaced by Roads Service Headquarters and Roads Services Divisional Offices respectively.

Scope

1.6 This Standard applies to the following Structures over, under or alongside the Overseeing Organisations road's:

a. Greater than 3 metres span.

b. Culverts 1.8 to 3 metres span, or multi-cell culverts where the cumulative span is greater than or equal to 5 metres, if their cover to road surface is less than 1 metre. In Scotland the minimum culvert size is 2 metres.

c. Corrugated metal culverts 0.9 metres or more in span.

d. Pedestrian subways.

e. Retaining walls where the level of the fill at the back of the wall is greater than 1.5 metres above the finished ground level in front of the wall.

f. High masts (>=20m) for lighting, masts for television cameras, catenary lighting systems and supporting structures for electrical equipment.

g. Structural aspects of sign/signal gantries.

Note: Structures which are marginally outside these dimensions and especially those which are subject to hydraulic action may be included within the scope of this document by agreement between the MA and Overseeing Organisation.

Implementation

1.7 This Standard shall be used forthwith to provide and keep records of Highway Structures.

2. AS BUILT, OPERATIONAL AND MAINTENANCE RECORDS

General

2.1 The As Built Records which are required for each Overseeing Organisation are given in Appendices A to D.

2.2 Records relating to new construction, including the Maintenance Manual shall be prepared and supplied by the Engineer/Designer for the works. The Engineer shall provide appropriate copies of As Built records for the Overseeing Organisation.

2.3 Records in respect of existing structures where possible shall be obtained from the former maintaining authority. The MA, however, shall make good as far as possible any deficiencies in such documentation and provide appropriate copies of records for the Overseeing Organisation.

Health and Safety Information

Drawings

2.4 General Arrangement drawings showing plan, elevation and cross-sectional details of each structure, and marked to show details of any proprietry components and protection systems.

The drawings are to show the following information:

a. Details of any built-in features

b. Details of any service ducts and drainage systems

c. Details of reinforcement, post-tensioning etc

d. Details of demountable structures such as gantries including designated lifting positions, safe working loads etc

e. Strip plan showing number/location of all structures

Design Information

2.5 The following information shall be provided in accordance with the Overseeing Organisations requirements, eg for England Forms ROADS 277, BE 13/94, Bridges Data Base input sheet, final Approval in Principle form TA1 and Design criteria schedule; statutory undertakers agreements; (the stated form and data sheets may not be applicable to every Overseeing Organisation and the appropriate equivalent should be substituted.)

Construction Methods

2.6 Provide information on any special feature or precautions which may be necessary if a structure has to be demolished or extensively modified, eg sequence of demolition to avoid progressive collapse.

Provide information on methods of construction where special techniques were necessary, eg dewatering or ground freezing.

Describe any significant problems not anticipated that arose during construction and the steps taken to overcome them.

Materials

2.7 Provide details of materials and products used in the project. This should list all suppliers by name, address and material/product supplied. Where products or materials are covered by the COSHH Regulations full details of the product or material specification should be given. Where sub-contractors were responsible for operations involving the installation or application of products or materials, names and addressess should be given.

Maintenance Facilities/Procedure

2.8 For each structure or group of structures a Manual of Information from the design and construction phases should be prepared covering areas which could have possible implications for future maintenance. Any special maintenance/inspection requirements which have been assumed in the conception, design and construction of a structure shall be recorded in the manual including specific maintenance facilities.

Demolition

2.9 Precise details of any major hazards with Health and Safety implications known at the time of construction eg external stressing, strutting, hingeing, arching etc., which may be important in planning demolition methods.

3. REFERENCES

1. TRMM 2/88 Records and Inspection

2. WOTRMM 2/88 Records and Inspection

3. Tunk Road Maintenance Manual : Volume 2 :Part 2 - Routine Maintenance of Highway Structures

4. SDD Circular 27/1989 "As Built" Records and Defect Reporting

5. Design Manual for Roads and Bridges
Volume 3 Part 1 - Inspection and Maintenance

   BD 63 - Inspection of Highway Structures (DMRB 3.1.4)

   BA 63 - Inspection of Highway Structures (DMRB 3.1.5)

   Volume 8: Section 3: Traffic Signs and Lighting

   TD 23 - Inspection and Maintenance of Road Lighting
   (DMRB 8.3)

   Volume 6: Section 1: Road Geometry

   TD 27 - Cross Sections and Headroom
   (DMRB 6.1) (In Scotland SH2/92)

4. ENQUIRIES

All technical enquiries or comments on this Standard should be sent in writing as appropriate to:

The Chief Highway Engineer
The Highways Agency
St Christopher House
Southwark Street
London SE1 0TE

T A ROCHESTER
Chief Highway Engineer

The Deputy Chief Engineer
The Scottish Office Industry Department
Roads Directorate
New St Andrew's House
Edinburgh EH1 3TG

J INNES
Deputy Chief Engineer

The Director of Highways
Welsh Office
Y Swyddfa Gymreig
Government Buildings
Ty Glas Road
Llanishen
Cardiff CF4 5PL

K J THOMAS
Director of Highways

Chief Engineer - Roads Service
Department of the Environment for
Northern Ireland
Roads Service Headquarters
Clarence Court
10-18 Adelaide Street
Belfast BT2 8GB

W J McCOUBREY
Chief Engineer - Roads Service

SPECIAL REQUIREMENTS : ENGLAND AS BUILT RECORDS, FORMS AND DATABASE

A1 Introduction

A1.1 The records which are to be supplied by the Engineer/ Designer for new construction or by the MA when they are not available for existing structures are as follows:-

Structure Register

Structure File

Original design documents
(AIP, Certificates)

Maintenance Manual

Operating Manual, Log Book
(where applicable)

As Built Drawings, including
details of modifications and
renewals

Administrative and legal documents

Routine Maintenance Schedule

Notes : All correspondence or copies of forms should be sent to Bridges Engineering (BE) through the Regional Office (RO).

A2 Maintenance Manual - Recommended Contents

A2.1 For each structure or for a group of minor structures of similar design (eg culverts, sign gantries), the Engineer/Designer shall prepare a Maintenance Manual containing information from the design and construction phases which could have possible implications for the future maintenance. The manual will be complementary to the As Built Drawings and the Form ROADS 277.

A2.2 Any special maintenance/inspection needs which have been assumed in the conception and design of a structure must be recorded in the Maintenance Manual with full information on the actions required and the frequency of these actions eg a Method Statement for inspection and maintenance work on structural significant details with difficult access.

A2.3 **Contents**

i. **Strip Map**

An outline description of the works, with a strip map showing the location of the various highway structures covered by the Maintenance Manual.

ii. **Special Features**

Any special features or precautions are to be itemised. This shall include advice on any special procedures that may need to be adopted on demolition, modification, or jacking of the structure, or when extensive modifications are envisaged.

iii. **Materials**

The following items shall be considered for inclusion as appropriate. The lists are not exhaustive, and the Engineer shall consider adding other items which could be of value. The list should give the name and address of the supplier, sub-contractors, and where appropriate, the source and location within the structure.

a. For concrete, the list should include: Cement; GGBFS; PFA; aggregates; ready mixed concrete; admixtures; mix proportions; reinforcing bars; prestressing wire; strand or bar. Where a number of concrete mixes are supplied, their destinations shall be recorded within each element, and histograms of concrete cube test results for each structural element. Areas where silane has been applied shall be shown on the As Built Drawings.

b. For steel, the list shall include: plate; rolled sections; prefabricated steelwork, etc. weathering steel, type of fixings and torque settings for bolts.

c. Sources of imported fill shall be included and their location within the structure.

d. Compliance test certificates, for mechanical/electrical/hydraulic aspects shall be included.

iv. **Components**

This list shall give the name of the manufacturer/supplier/sub-contractor; the part number and manufacturer's drawing number if not given on the As Built Drawings.

Items shall include: Expansion joints; drainage systems; bearings; parapets; waterproofing systems; precast units; reinforced earth components; brick, precast or masonry facings; lighting systems; and moving bridge equipment,together with any test results.

v. **Certification and Test Records**

These shall be grouped in Appendices or Folders, and shall include mill certificates, cement analyses, cube test results, equivalent sodium oxide and chloride content in the mix. Concrete fresh analysis, air entrainment, Silane, Load tests on Components and elements where appropriate including mechanical and electrical records. Also test results on fill adjacent to structure.

vi. **Paint**

A copy of contract specification Appendices 19/1 to 19/4 for new works or Clause 5009 for maintenance painting, and a copy of all BE Forms BE/P2 should be included, especially particulars of site trials.

vii. **Problems During Construction**

A short report, supplemented with instrument readings, sketches or photographs as appropriate, of problems encountered and solutions adopted during construction or application which could have

repercussions on future maintenance (eg materials out of specification) shall be included.

viii. **Access and Security**

Details, including drawings of access to the site, walkways, ladders, manholes etc and of security to prevent unauthorised access, should be included.

ix. **Future Assessment**
Adequate records shall be provided of the construction sequence and the construction joint positions where these may influence future assessment.

A3 Structure Register

A Structure Register of Form ROADS 277 (Rev 4/94) and BE 13/94 is required for each structure. For structures which consist of two or more sections due to widening or for long viaducts which have been subdivided into smaller elements, each element is regarded as being a separate structure and shall be treated accordingly.

A4 Structure File

A Structure File is required for each structure or for a group of minor structures of similar design (eg small culverts and sign gantries). The list of items for inclusion in the Structure File given at A9 of this document is not exhaustive and the MA shall include any items which it considers appropriate for the maintenance of the structure. Particular care must be taken to ensure that all aspects which relate to health and safety are catalogued.

A5 Routine Maintenance Schedule

A schedule of routine maintenance which is considered appropriate for the structure. Refer to Trunk Road Maintenance Manual:Volume 2: Part 2 - Routine Maintenance of Highway Structures.

A6 Forms BE 11/94 and BE 13/94

Information from Forms BE 11/94 and BE 13/94 is managed by BE and is held in a computerised database, the National Structures Database (NATS). NATS can be accessed by the MA using the terminal provided for Network Information System (NIS) purposes and by the RO.

A7 Monitoring Records

Record monitoring inspections and/or measurements on structures arising from eg a bridge assessment or Special Inspection of a post tensioned bridge.

A8 Non-DoT Structures

For existing structures not in the ownership of the Department of Transport, Forms ROADS 277 and BE 13/94 shall be completed. The only details required are the location, a brief description and in the case of structures over the road, the headroom. Where there are difficulties in obtaining these from the owner, the forms may be supplied by the MA by special arrangement with the RO.

For new non-DoT structures constructed as part of DoT schemes, full records shall be completed for passing to the owner of the structure.

A9 Records and Forms - Summary and Distribution

	MA	RO	BE
1. **STRUCTURE REGISTER:**			
Form ROADS 277	Yes	Yes	Yes
Form BE 13	Yes	Yes	Yes
2. **STRUCTURE FILE**			
Original design documents (AIP, Certificates)	Yes	Yes	No
Maintenance Manual	Yes	Yes	See Note 1
Operating Manual, Log Book (where applicable)	Yes	Yes	No
As Built Drawings, including details of modifications and renewals	See Note 2	See Note 2	See Note 3
Administrative and legal documents	Yes	Yes	No
Inspection Reports (Diving form, half cell potential etc)	Yes	Yes	No
Form BE 11	Yes	Yes	No
Monitoring Records	Yes	Yes	No
Routine Maintenance Schedule	Yes	Yes	No
Health and Safety Information	Yes	Yes	No

Notes : All correspondence or copies of forms should be sent to BE through the RO.

1 Strip map only

2 Microfilm, unless otherwise requested.

3 General layout only (elevations, sections and dimensions), in the form of 35mm unperforated microfilm negative mounted in standard aperture cards complying with BS 4210:1977. Label aperture cards with Structure Key, name and structure number.

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A10. FORM ROADS 277 - EXPLANATORY NOTES

General

All entries should be completed without ambiguity. In particular, dashes shall be avoided unless the meaning is quite clear. The forms ROADS 277 and BE 13/94 must be fully consistent. Completed examples can be found at the end of A10 and A11 respectively. If any item is unknown, a note shall be made to that effect at that point in the form. A blank is not helpful.

The design loading should specify which version of the standard has been used.

The Form ROADS 277 must contain the details to enable the codes to be derived for Form BE 13/94. In many cases this will mean a special simplified sketch which will show the positions and types of bearings and joints for example. A reduced photocopy of an original GA will not suffice when this does not contain the level of detail required or where original components such as waterproofing and parapets have been replaced.

At interchanges where both roads are motorway or trunk roads, the bridges are assigned to the road which carries the traffic, even if the bridge was built as an overbridge. For example, where the A5 crosses the M1, the bridge shall be treated as an underbridge assigned to the A5, not an overbridge on the M1, even though it may have been originally constructed as part of the M1.

Widened Structures

For widened structures each part is regarded as being a separate structure and a Form ROADS 277 and BE 13/94 should be produced for each. For inspection and maintenance and assessment work each structure must be treated separately. In order to differentiate between bridges which have been widened the original part retains its number and new parts given a suffix of 'A', 'B' etc, providing that the widened parts are continuous with the original to make what is in effect a single bridge. If the widening has been carried out by building a completely separate bridge which is discontinuous with the existing structure, the original bridge carries a suffix 'A' and the new bridge a suffix 'B'. For structures other than bridges, the widened parts are given a suffix '1', '2' etc.

Twin Deck Bridges

Bridges which have been constructed with twin decks which are regarded as being two structures, even if the abutments are common to both.

Split Bridges

Long structures such as large viaducts or sections of elevated road may have been split into smaller sections for historical reasons or for convenience. In this case, each section is regarded as being a separate structure and inspection reports, maintenance bids etc must be produced for each section. Each section is differentiated from the previous by use of a suffix '1', '2' etc or by the kilometerage.

Headroom

It is important that the headroom is measured in strict accordance with TD 27 (DMRB 6.1) to take into account the effect of crossfall and camber and that the headroom over the hard shoulder should also be recorded in the maintenance manual in case it is necessary to use the hard shoulders during road works. This is particularly relevant in the case of framed or arched bridges where the headroom reduces towards the end supports.

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HIGHWAYS AGENCY

Structure Name DOGS LANE

ROADS 277 (Rev 4/94)

HA Structure No	A.5053 / 187.6
National Grid Ref	9,9,7,3,2 / 0,0,4,2,2
County/Borough	BARSETSHIRE
Maintaining Region	YHRO
Maintaining Agent: For Structure	ESSEX C.C.
For Road Surface	ESSEX C.C.
Maintaining Agent Structure Ref	M 999/1
HA ST key	95000
RO File Reference	1/3/A1
Date of issue of form	
Date of Last Principal Inspection	14-SEP-1990
Structure Owner (If not HA)	

Year Structure Commissioned	1984
Design Office	DVH & PARTNERS
Does the road go *over/~~under~~ *Railway, Canal, ~~River~~, Road?	M.999
Railway Bridge Number	
Is the ~~River~~ Canal tidal?	yes ☐ no ☑
Is the ~~River~~ Canal navigable?	yes ☑ no ☐
Name of Navigation/Drainage Authority	BRITISH WATERWAYS

Is the structure susceptible to scour?	yes ☐ no ☑
Is the Structure on the High Load Route?	yes ☐ no ☑
Is the Structure on the Heavy Load Route?	yes ☑ no ☐
Is the structure scheduled as an Ancient Monument?	yes ☐ no ☑
Name of Statutory undertakers having services on bridge	B.T. N.W.E.B.

*Please delete as necessary

Min Headroom Clearance* under/over *Motorway/Trunk Road carriageways

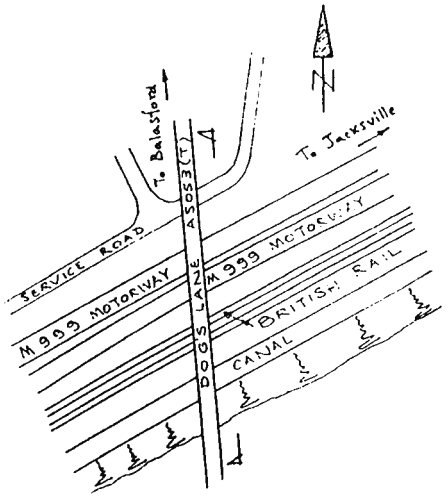
*N. Bound / ~~W. Bound~~	5.27
S. Bound / ~~E. Bound~~	5.30

*Please delete as necessary

Design load	HA + 45 HB
Design standard version	
Special loading/restriction	

Construction Details

Materials Deck / Wall / Mast etc (eg In situ PSC)	SPANS 1, 2, 3, 4 & 6 – R.C. SPAN 2 (PART) PRECAST R.C. SPAN 5 PRETENSIONED, PRESTRESSED 'M' BEAMS WITH INSITU R.C.
Type of Construction (eg Solid Slab)	SPANS 1, 3, 4 & 6 VOIDED SLAB, SPAN 2 SOLID SLAB SPAN 5 BEAM & SLAB
Form of Deck (eg Propped Cantilever)	SPANS 1, 3 & 4 CONTINUOUS, SPAN 2 CANTILEVER & SUSPENDED SPANS 5 & 6 SIMPLY SUPPORTED
End Supports (eg Skeleton Abutment)	SOUTH END R.C. BANK SEAT NORTH END R.C. CANTILEVER ABUTMENT
Intermediate Supports (eg Slab Wall)	SPAN 2: CONCRETE COLUMN / SLAB WALL, SPAN 3: SLAB WALL SPAN 4: SLAB WALL / TEE HEAD COLUMN, SPAN 5: TEE HEAD COLUMNS
Nature of Foundations (eg Caissons)	600 DIA. CAST IN PLACE PILES EXCEPT NTH. ABUTMENT WHICH IS SPREAD FOOTING



Site Plan (1:2500)

Photograph(s)

PTO

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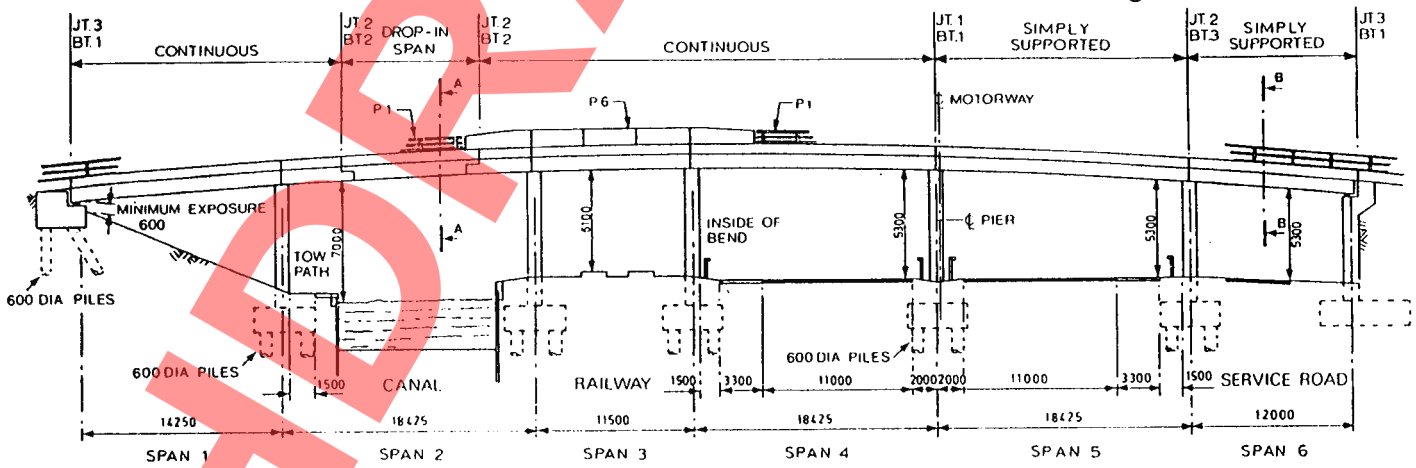
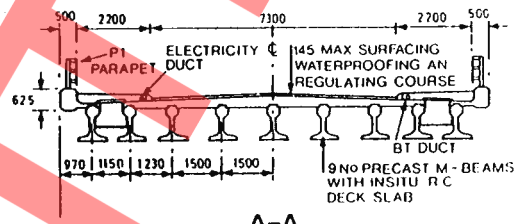
Dimensional Elevation, Cross Section and Components of Structure.
Indicate all materials of construction, eg steel wrought iron, cast iron, concrete, brick, stone, etc.
Indicate roadway and pavement widths of the reference road and also of the crossing road where appropriate (include spans).
Indicate type and position of bearings and joints.

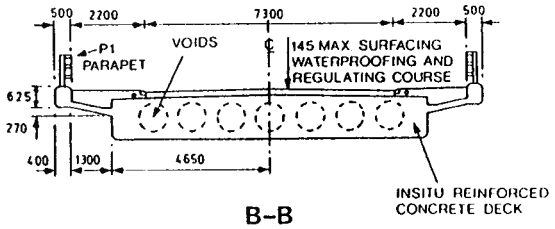
Dimensional Elevation and Cross Section of Bridge



ELEVATION



A–A



B–B

		Manufacturer	Type
Prestressing System		DOWMAC	M. BEAMS
Paint System:	Parapet	CROWN	P.78 GALVANISED COATED WITH ACRYLIC RUBBER
	Internal	N/A	N/A
	External	N/A	N/A

	Manufacturer	Type	Position
Bearings*	ANDRE RUBBER	PTFE SLIDING	BT. 1
		ELASTOMERIC PLAIN	BT. 2
		ELASTOMERIC MONOPLATE	BT. 3
Joints*	MAURER (UK)	D 80 B SINGLE ELEMENT	JT. 1
	PRISMO	THERMAJOINT	JT. 2
	USL	TRANSFLEX	JT. 3
Parapets	BRITISH STEEL	P. 1	—
	UNKNOWN	P. 6 CONCRETE	—
Waterproofing	EXPANDITE	FAMGUARD	—
			—

* Indicate on sketch above.

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HIGHWAYS AGENCY

Structure Name PROVOIR CANTENARIES - SECTION 1

ROADS 277 (Rev 4/94)

HA Structure No	M7/273.0/L1
National Grid Ref	314510 617810
County/Borough	BARSETSHIRE C.C.
Maintaining Region	EASTERN
Maintaining Agent:	
For Structure	BARSETSHIRE C.C.
For Road Surface	BARSETSHIRE C.C.
Maintaining Agent Structure Ref	

HA ST key	67899
RO File Reference	
Date of issue of form	
Date of Last Principal Inspection	15 JUN 1990
Structure Owner (If not HA)	N/A

Year Structure Commissioned	1984
Design Office	J.M. FARNSBARNS
Does the road go *over/under *Railway, Canal, River, Road?	N/A
Railway Bridge Number	N/A
Is the River tidal?	yes ☐ no ☐ N/A
Is the River navigable?	yes ☐ no ☐ N/A
Name of Navigation/Drainage Authority	

~~Is the structure susceptible to scour?~~	~~yes ☐ no ☐~~
Is the Structure on the High Load Route?	yes ☐ no ☑
Is the Structure on the Heavy Load Route?	yes ☐ no ☑
Is the structure scheduled as an Ancient Monument?	yes ☐ no ☑
Name of Statutory undertakers having services on bridge	N/A

*Please delete as necessary

Min Headroom Clearance* under/over *Motorway/Trunk Road carriageways

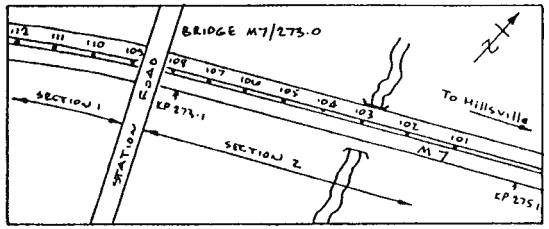
*N. Bound / W. Bound	N/A
S. Bound / E. Bound	N/A

*Please delete as necessary

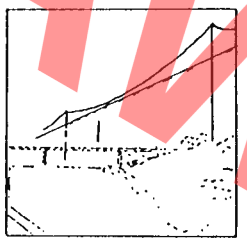
Design load	
Design standard version	
Special loading/restriction	N/A

Construction Details

Materials: Deck / Wall / Mast etc (eg In situ PSC)	STEEL COLUMNS
Type of Construction (eg Solid Slab)	N/A
Form of Deck (eg Propped Cantilever)	N/A
End Supports (eg Skeleton Abutment)	N/A
Intermediate Supports (eg Slab Wall)	N/A
Nature of Foundations (eg Caissons)	MASS CONCRETE



Site Plan (1:2500)



VIEW FROM SOUTH EAST

Photograph(s)

PTO

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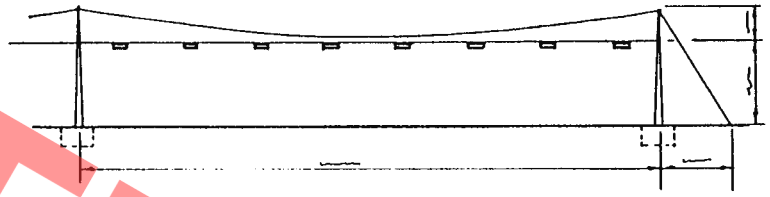
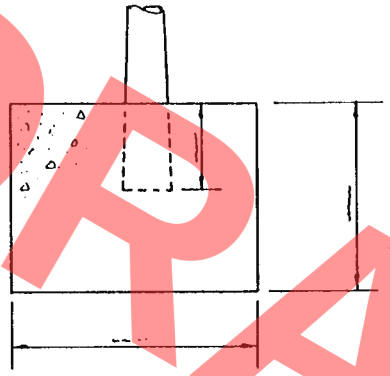
Dimensional Elevation, Cross Section and Components of Structure.
Indicate all materials of construction, eg steel wrought iron, cast iron, concrete, brick, stone, etc.
Indicate roadway and pavement widths of the reference road and also of the crossing road where appropriate (include spans).
Indicate type and position of bearings and joints.

ROADS 277 (Rev 4/94)



MAST NR:	101	102	103	104	105	106
HEIGHT :	16·0	16·0	15·8	15·8	16·0	
DISTANCE:		45·0	45·0	45·0	45·0	



DETAIL OF BASE

		Manufacturer	Type
Prestressing System			
Paint System:	*Parapet*		
	Internal		
	External		

	Manufacturer	Type	Position
*Bearings**			
*Joints**			
Parapets			
Waterproofing			

** Indicate on sketch above.*

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HIGHWAYS AGENCY

Structure Name GRACE I/C HIGH MASTS

ROADS 277 (Rev 4/94)

HA Structure No	M99/123.4/L
National Grid Ref	918721 615434
County/Borough	WARNERSHIRE C.C.
Maintaining Region	WESTERN
Maintaining Agent:	
For Structure	WARNERSHIRE C.C.
For Road Surface	DUCKSFORTH
Maintaining Agent Structure Ref	GRACE MASTS
HA ST key	123456
RO File Reference	
Date of issue of form	
Date of Last Principal Inspection	25 JUN 1989
Structure Owner (If not HA)	N/A

Year Structure Commissioned	1983
Design Office	A.N. OTHER & PARTNERS
Does the road go *over/under *Railway, Canal, River, Road?	N/A
Railway Bridge Number	N/A
Is the River tidal?	yes ☐ no ☐ N/A
Is the River navigable?	yes ☐ no ☐ N/A
Name of Navigation/Drainage Authority	N/A
~~Is the structure susceptible to scour?~~	yes ☐ ~~no~~ ☐
Is the Structure on the High Load Route?	yes ☐ no ☑
Is the Structure on the Heavy Load Route?	yes ☐ no ☑
Is the structure scheduled as an Ancient Monument?	yes ☐ no ☑
Name of Statutory undertakers having services on bridge	

*Please delete as necessary

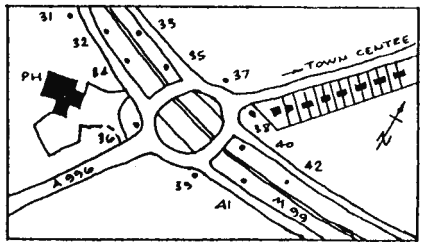
Min Headroom Clearance* under/over *Motorway/Trunk Road carriageways

*N. Bound / W. Bound	N/A
S. Bound / E. Bound	N/A
Design load	
Design standard version	
Special loading/restriction	N/A

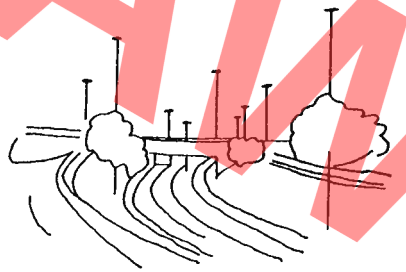
*Please delete as necessary

Construction Details

Materials: Deck / Wall / Mast etc (eg In situ PSC)	STEEL
Type of Construction (eg Solid Slab)	N/A
Form of Deck (eg Propped Cantilever)	N/A
End Supports (eg Skeleton Abutment)	N/A
Intermediate Supports (eg Slab Wall)	N/A
Nature of Foundations (eg Caissons)	MASS CONCRETE



Site Plan (1:2500)



VIEW FROM SOUTH EAST

Photograph(s)

PTO

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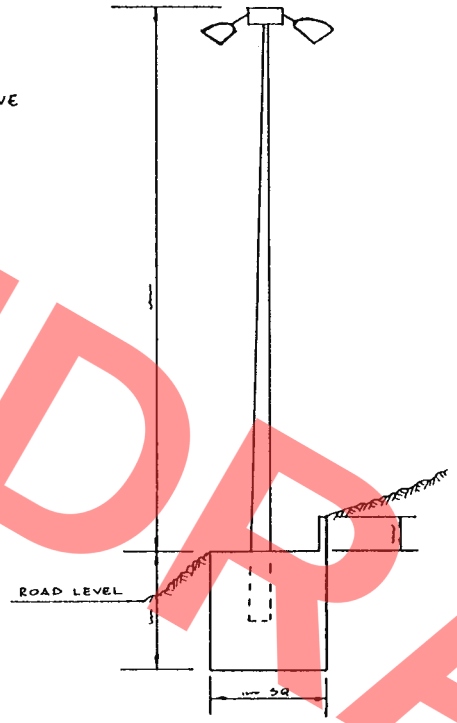
Dimensional Elevation, Cross Section and Components of Structure.
Indicate all materials of construction, eg steel wrought iron, cast iron, concrete, brick, stone, etc.
Indicate roadway and pavement widths of the reference road and also of the crossing road where appropriate (include spans).
Indicate type and position of bearings and joints.

ROADS 277 (Rev 4/94)

NOTE : MAST NOS 35, 37, 38 & 39 HAVE LENGTH REDUCED TO GIVE UNIFORM LANTERN HEIGHT.

MAST NO	HEIGHT
31	20.0
32	20.0
33	20.0
34	20.0
35	20.0
36	18.0
37	18.0
38	16.0
39	16.0
40	20.0
41	20.0
—	—
—	—



		Manufacturer	Type
Prestressing System			
Paint System:	Parapet		
	Internal		
	External		

	Manufacturer	Type	Position
Bearings*			
Joints*			
Parapets			
Waterproofing			

* Indicate on sketch above.

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HIGHWAYS AGENCY

Structure Name GOLDWATER RETAINING WALL (W)

ROADS 277 (Rev 4/94)

HA Structure No	A.1024/10.7/R1
National Grid Ref	412140 456071
County/Borough	WESSEX
Maintaining Region	WESTERN
Maintaining Agent:	
For Structure	WESSEX C.C.
For Road Surface	WESSEX C.C.
Maintaining Agent Structure Ref	25/16/47

HA ST key	78432
RO File Reference	
Date of issue of form	
Date of Last Principal Inspection	12 SEPT. 1988
Structure Owner (If not HA)	N/A

Year Structure Commissioned	1982
Design Office	J. SOAP ASSOCIATES (FOR WESSEX CC)
Does the road go *over/under *Railway, Canal, River, Road?	N/A
Railway Bridge Number	N/A
Is the River tidal?	yes ☐ no ☐ N/A
Is the River navigable?	yes ☐ no ☐ N/A
Name of Navigation/Drainage Authority	N/A

*Please delete as necessary

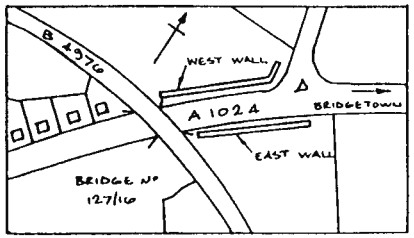
~~Is the structure susceptible to scour?~~	yes ☐ no ☐
Is the Structure on the High Load Route?	yes ☐ no ☑
Is the Structure on the Heavy Load Route?	yes ☐ no ☑
Is the structure scheduled as an Ancient Monument?	yes ☐ no ☑
Name of Statutory undertakers having services on bridge	

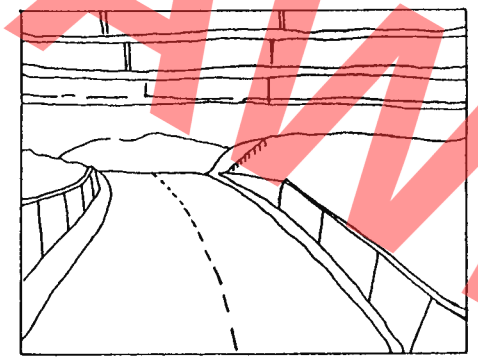
Min Headroom Clearance* under/over *Motorway/Trunk Road carriageways

*N. Bound / W. Bound	N/A
S. Bound / E. Bound	N/A
*Please delete as necessary	
Design load	
Design standard version	
*Special loading/restriction	N/A

Construction Details

Materials: Deck / Wall / Mast etc (eg In situ PSC)	IN SITU
Type of Construction (eg Solid Slab)	MASS CONCRETE
Form of Deck (eg Propped Cantilever)	SOLID MASS CONCRETE
End Supports (eg Skeleton Abutment)	N/A
Intermediate Supports (eg Slab Wall)	N/A
Nature of Foundations (eg Caissons)	CONTINUOUS STRIP





VIEW FROM SOUTH END

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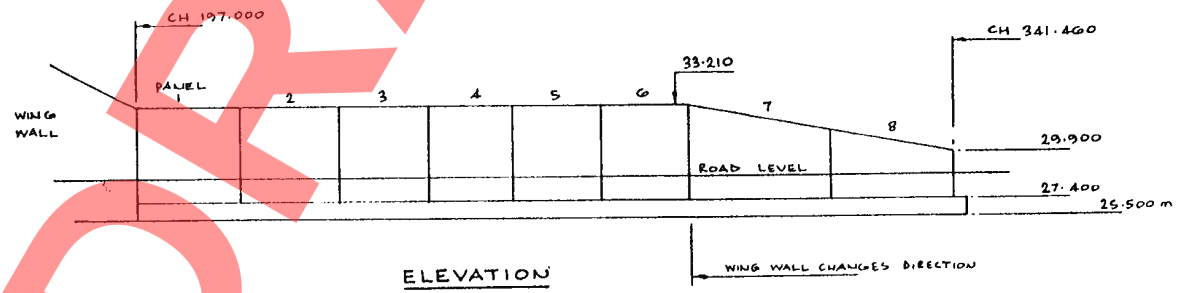
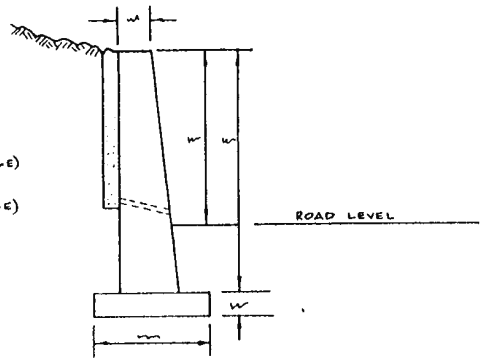
Dimensional Elevation, Cross Section and Components of Structure.
Indicate all materials of construction, eg steel wrought iron, cast iron, concrete, brick, stone, etc.
Indicate roadway and pavement widths of the reference road and also of the crossing road where appropriate (include spans).
Indicate type and position of bearings and joints.



ELEVATION

PANEL NO	LENGTH	HEIGHT
1 - 6	18.00	5 81
7	18.23	5·26 (AVERAGE)
8	18 23	3·00 (AVERAGE)



CROSS SECTION

		Manufacturer	Type
Prestressing System			
Paint System:	Parapet		
	Internal		
	External		

	Manufacturer	Type	Position
Bearings*			
Joints*			
Parapets			
Waterproofing			

* Indicate on sketch above.

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EXPLANATORY NOTES

General

This form should be completed using information derived from only the Form ROADS 277 and can be regarded as a Form ROADS 277 in a coded form which is suitable for input to the computer. If an appropriate code is not present in the look-up tables, an asterisk should be put in the box with a request in the comments box for a new code, or the RO contacted with a request for a new code. Up-to date lists of look-up codes are available via NATS. A completed example of Form BE 13/94 together with examples of look-up codes is included at the end of this Appendix.

Completion of Location File

This file is completed for all structures and contains geographical and location details.

i. St Key :This is simply a number unique to the structure used for quick reference purposes by the computer and is not necessarily related to any neighbouring structures.

If this is not known leave blank.

ii. Name : The DoT structure name should be agreed by the RO Engineer/Designer and the MA and should be the only one used in any correspondence. The use of local names should be avoided as this could cause confusion. Do not use the word 'bridge' and abbreviate as necessary so as to avoid the name exceeding 24 characters in length. Use abbreviations such as 'Rly' for railway, 'F/B' for Footbridge, 'R/W' for retaining wall etc.

iii. St No : The DoT structure number is made up of the following elements comprised as illustrated and should be agreed by the RO Engineer/Designer, MA and BE, in advance of preparation of the forms.

|a| | |/|b| | | | | | | |/|c| |/|d| | |.| | |/|e|/|f| |

DOT Structure Number Skeleton

a. Junction number : Motorway junction number if appropriate eg 19.

b. Road : road title - this should be in the form as known by the normal road user eg M55,A1(M),A38 and not A43(T).

c. Slip Road (Designator) : for structures at interchanges of DoT roads which are not situated on either interchange road.

d. Kilometerage : preceding kilometerage (0.1Km) marker post for motorways with marker posts or the DoT equivalent for other motorways and trunk roads.

e. Type Tag : eg 'Q' for culverts, 'R' for retaining walls, or 'A', 'B' etc for widened bridges.

f.	Individual Structure Type	:	To distinguish between structures within the same marker posts or within 0.1 kilometre of each other or for widened structures other than bridges which have been split into smaller sections.
iv.	Class	:	Enter 'A' for motorway with suffix M eg A1(M). Enter 'M' for motorway with prefix M eg M56. Enter 'T' for trunk road eg A43.
v.	Grid Easting	:	Enter the five figure grid easting.
vi.	Grid Northing	:	Enter the five figure grid northing.
vii.	Region	:	This is the geographical region code (codes 9901-9909 inclusive) from look-up Table II. In most cases, this will be the same as the maintaining region.
viii.	County	:	This is the geographical county or metropolitan county code from look-up Table I and in many cases will be the same as the MA.
ix.	High Load	:	Enter 'Y' if the structure is on a high load route and the headroom is of significance as in the case of overbridges, foot bridges and sign gantries, otherwise enter 'N'. Do not leave blank.
x.	Heavy Load	:	Enter 'Y' if the structure is on a heavy load route and is affected by traffic loading otherwise enter 'N'. Do not leave blank. Buried structures on heavy load routes which are not influenced by highway loading, enter N.

Completion of Header File

This file is completed for all structures irrespective of type and contains basic information.

i.	Structure Type	:	Enter the Code from look-up Table I. Note that all bridges listed in look-up table III. are structure type 2. Road Tunnels and permanent access gantries are to be treated as structure type 1.
ii.	Designer	:	Enter the code for the Engineer/Designer from look-up Table I.
iii.	Owner	:	In most cases this will be DoT and can be left blank. As this field is limited to eight characters, abbreviations should be used, eg 'BR' British Rail Board, 'LUL' for London Underground Ltd, 'BW' for British Waterways Board etc.
iv.	Agent Ref	:	This is the identifier used by the MA for its own purposes. This must not exceed 12 characters in length.
v.	Year	:	Enter the year in which the structure was brought into use (commissioned).

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vi.	Maint Region	:	In most cases this will be the same as the geographical region, except in the case of a small number of structures adjacent to boundaries between adjacent regions. Enter the code from look-up Table I.
vii.	No Maint	:	This will normally be one, as the Department usually has a single agency agreement. In some instances, however, it is possible to have separate MA's responsible for different parts of the structure and the number ie 2, 3, etc should be entered if this is the case.
viii.	Detrunked	:	Enter 'T' to indicate that the structure is present on a Motorway or Other Trunk Road.

Completion of Agent File

Enter the MA codes(s) from look-up Table II. If there is only one MA for the structure, strike out the second box which should not be left blank.

This should be the body with whom the Department has an agency agreement.

Completion of Bridge File

i.	No span	:	Enter the number of spans.
ii.	Bridge Type	:	Enter the code from the look-up Table III Note that the bridge type is determined from the reference road in the case of interchanges.
iii.	Load 1	:	Load one is the design code from look-up Table IV. In order to correctly assign the design load, the version of the design standard must be selected.
iv.	Load 2	:	This is reserved for structures for which there is either a weight or an abnormal load restriction and for assessed loadings.
v.	Services	:	This field is restricted to 5 characters only and therefore abbreviations 'T' for telephone, 'W' for water, ,'E' for electricity and 'G' for gas should be used.
vi.	Microfilm	:	Enter 1 if microfilm of the structure is available, otherwise leave blank.

Completion of Span File

This section is only completed for bridges and large culverts. If there are more than eight spans, the details should be entered on additional forms. In the case of viaducts where the details are the same for a number of spans, they may be grouped together in one box. Each span should be treated as if it were a bridge, hence there will always be two support and foundation codes entered, even if these are the same in the case of intermediate spans.

i.	Span No.	:	This should be numbered commencing with the first span to be encountered, proceeding along the highway in the direction of ascending kilometerage/bridge number. For bridges over the reference road span number one will be the first span of the bridge on the left hand side of the road viewed in the direction of ascending kilometerage/bridge number.

ii.	Span Length	:	This is the skew distance (rounded up to 0.1m) between centre of the bearings at the abutments, piers or columns (not the length of a drop-in span for example). For relatively short spans, eg small box culverts, the square span shall be entered.
iii.	Headroom	:	Enter the minimum headroom, accurate to a 0.01m, only if the structure is over a road, rail or navigable waterway (above mean water level), otherwise enter 99.99. For arch bridges or other structures with limited clearance, enter the actual restricted headroom, ie at the signed arrow markers on the bridge.
iv.	Width	:	Enter the distance between the traffic faces of the parapets, or the soffit length of the structure if it carries the road, accurate to 0.1m.
v.	Material 1/2	:	Enter the appropriate code(s) from look-up Table X. If the form of construction is beam and slab, the beam material is to be assigned to Material 1. If there is only one deck material, enter 0 in the Material 2 box.
vi.	Obstacle 1/ Obstacle 2	:	Enter the appropriate code(s) from look-up Table VIII. If there is only one obstacle enter 0 in the Obstacle 2 box. The major obstacle should be entered against Obstacle 1 in the case of multiple obstacles.
vii.	Const	:	Enter the appropriate code from look-up Type Table IX.
viii.	Form of	:	Enter the appropriate code from look-up Deck Deck Table XII. For bridges where the form of construction involves suspended spans, the adjacent spans are to be treated as 'continuous' (code 3).
ix.	Support 1/ Support 2	:	Enter the appropriate code(s) from look-up Table XI. Both these boxes shall be completed even when the supports are the same, as in the case of intermediate spans.
x.	Foundations 1/2	:	Enter the code from look-up Table XIII for the corresponding support. Both these boxes shall be completed even if they are the same.
xi.	Skew	:	Enter the angle in degrees from square, otherwise enter 0. Do not leave blank. This should be the maximum skew angle if the skew angle is subject to variation as in the case of bridges which are curved in plan.
xii.	Cross Ref	:	Enter the motorway or trunk number which the span crosses only if it is another motorway or trunk road. This should be in the form as recognised by the ordinary road user eg M62, A43, A1(M) and not A43(T).

Completion of Component Files (Joints, Bearings, Parapets, Waterproofing)

It may be helpful to regard each span as an individual bridge. With the exception of waterproofing, there should be at least two entries for each component type, even if the non-applicable codes are appropriate (as for joints on intermediate spans where the form of construction is continuous, for example.) In the case of multiple entries for a span, these should be numbered in the sequence that they would be encountered if proceeding along the span. Parapet codes should be entered as parapet numbers 1 and 2, even if they are the same for both sides of the bridge. If due to widening there is only one actual parapet present, the non-applicable code should be used for parapet 2. The codes can be found in look-up Table XVII.

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Completion of Prestressing File

Enter the details from look-up Table XIV.

Note that the look-up codes have been grouped in sections corresponding to the type of system ie pretensioned, post-tensioned etc.

Completion of Lighting File

i.	Types of Lighting	:	Enter 2 for Catenary lighting, 3 for High Mast lighting, 4 for Closed Circuit Television Mast and 1 for any other kind of lighting type.
ii.	Length of Scheme	:	Enter the length of the scheme accurate to a tenth of a metre.
iii.	No of Masts	:	Enter the number of masts in the lighting scheme/structure.
iv.	Material	:	Enter the appropriate code from look-up table X.
v.	Foundations	:	Enter the appropriate code from look-up Table XIII.
vi.	Manufacturer	:	Enter the appropriate code from look-up Table XIX.
vii.	Cross Ref	:	Enter the motorway or trunk road number which the scheme/structure crosses or is crossed but only if it is another DoT motorway or trunk road.

Details of the individual masts shall be entered in the Panels/Independent Lighting section. The details required are the mast number, mast height and the distance from the preceding mast - in the case of Catenary lighting (recorded in the mast length field).

Completion of Other/Services File

Structures which do not fall into any other category and Road Tunnels are assigned to this section (including permanent access gantries). The details required are the minimum headroom, accurate to a hundredth of a metre for structures above the ground or 99.99 if not applicable, and a brief description of the structure in the comment boxes.

Completion of Retaining Wall File

i.	No of Panels	:	Enter the number of panels.
ii.	Material	:	Enter the appropriate code from look-up Table X.
iii.	Structural Form	:	Enter the appropriate code from look-up Table XII.
iv.	Construction Type	:	Enter the appropriate code from look-up IX.
v.	Load	:	Enter the appropriate code from look-up Table III.

vi.	Cross Ref	:	Enter the motorway or trunk road number which the retaining wall forms part of only if it is another motorway or trunk road.
vii.	Parapet	:	Enter 'Y' if the retaining wall has a parapet and enter the details in the parapet section of the components file, otherwise enter 'N'.

Completion of Panels/Independent Lighting File

Details of retaining wall panels should be entered in this section, which should be completed for all retaining walls. Foundation codes can be found in look-up Table XIII.

Completion of Small Culverts File

i.	No of Spans	:	Enter the number of spans.
ii.	Length	:	Enter the total length of the culvert accurate to 0.1m.
iii.	Width	:	Enter the diameter or clear square span accurate to a 0.1m.
iv.	Skew	:	Enter the skew from square otherwise enter 0.
v.	Construction	:	Enter the appropriate code from look-up Table IX.
vi.	Material	:	Enter the appropriate code from look-up Table X.
vii.	Load	:	Enter the load from look-up Table III.

Completion of Sign Gantry File

i.	No of Spans	:	Enter the number of spans.
ii.	Length	:	Enter the total span length accurate to 0.1m.
iii.	Headroom	:	Enter the minimum headroom accurate to 0.1m.
iv.	Material	:	Enter the appropriate code from look-up Table X.
v.	Foundations	:	Enter the appropriate code from look-up Table XIII.
vi.	Manufacturer	:	Enter the appropriate code from look-up Table XIX.

Completion of Element File

Enter the element code from look-up Table XV. This file is to enable the elements which comprise the structure to be identified (for inspection purposes).

Completion of Paint File

Enter the element code(s) from look-up Table XV and the paint detail codes from look-up Table VI.

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Completion of Variation File

The details required are largely self-explanatory and the element codes can be found in look-up Table XV. If the whole bridge has been altered, enter O in the Span No box or if the structure is other than a bridge.

Completion of Defects File

i. Span No. : Enter O if the defect affects the structure as a whole, otherwise enter the number of the span in which the defect is present.

ii. Date : Enter the date, in the form of 15-JUN-1987, on which the defect was found.

iii. The details of Defect Code, Status, Severity and Extent can be found by reference to look-up Table VII. Defects which are not specified in look-up Table VII are not intended for input but shall be notified in the space for comments.

iv. Defect Cost : Enter the estimated cost in pounds required to rectify the defect, or the actual cost if rectification has already taken place.

v. In addition, certain defects may be notifiable, in accordance with the procedures of the Quality Control Reporting System (QCRS).

HIGHWAYS AGENCY

Structures Database Input Sheet

BE 13/94

Location File

St Key 9|5|0|0|0

Name D|O|G|'|S| |L|A|N|E

St No A|5|0|5|3| / 1|8|7|·|6| /

Class T Grid (E) 9|9|7|3|2 Grid (N) 0|0|4|2|2

Region 9|9|0|9 County 9|9|9|0

Scour N High Load N Heavy Load Y

Header File

St Type 2| Designer 1|2|0|

Owner

Agent Ref M|9|9|9|/|5|6|

Cert Ref Year 1|9|8|4

Maint Region 9|9|0|9 No Maint Agent 1

Detrunked T

Agent File

Maint Agent 1|5|0|0

Retaining Wall File

No of Panels Parapet Yes No

Material

Structural Form Construction Type

Load Cross Ref

Bridge File

No of Spans 6|

Bridge Type 2|

Load 1 9| Load 2

Services T|E|

Microfilm

Sign Gantry File

No of Spans

Length

Headroom

Material

Foundations

Manufacturer

Small Culvert File

No of Spans

Length

Width

Skew Construction Type

Material Load

Tunnel File

Tunnel Type

Length

Width

Lane Width

Headroom

Max Gradient

Hilliness

Bendiness

Design Speed

Obstacle 1

Obstacle 2

Structural Form

Construction Type

Material 1

Material 2

Light

Vent

Pump

Emergency Services

Obstacle

Int Pavement

Lining/Finish

Carriage Way

Lighting File

Type of Lighting

Length of Scheme

No of Masts Material

Foundations

Manufacturer

Cross Ref

Other Services File

Headroom

Comments

Panels / Independent Lighting File

Panel/Mast No

Panel/Mast Length

Panel/Mast Height

Foundations

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Span File

Span No	1	2	3	4	5	6		
Span Length	14.3	18.4	11.5	18.4	18.4	12.0		
Headroom	99.9	5.3	99.9	5.3	7.0	6.0		
Width	11.7	11.7	11.7	11.7	11.7	11.7		
Material 1	3	3	3	3	3	3		
Material 2	-	3	-	-	-	-		
Obstacle 1	3	4	5	4	6	9		
Obstacle 2	-	-	-	-	7	-		
Const Type	2	3	2	2	7	2		
Form of Deck	3	2	3	3	4	2		
Support 1	6	13	10	10	11	13		
Support 2	11	13	10	13	10	7		
Foundation 1	6	6	6	6	6	6		
Foundation 2	6	6	6	6	6	9		
Skew	22	22	22	22	22	22		
Cross Ref				M999	M999			

Component File

Bearings

Type No	1	2	3					
Bearing No								
Year	1984	1984	1984					
Manufacturer	56	56	56					
Bearing Code	5	3	2					

Joints

Type No	1	2	3					
Joint No								
Year	1984	1984	1984					
Manufacturer	657	1004	109					
Joint Code	2	1	4					

Parapets

Type No	1	2						
Parap No								
Year	1984	1984						
Manufacturer	103	2						
Parap Code	1	39						

Waterproof

Type No								
Year	1984							
Manufacturer	253							
W/P Code	1							

Prestress Deck File

BE 13/94

Span No	5		
Long Stress	1 1		
Trans Stress			

Element File

Element	Prestressing System	Element	Prestressing System	Element	Prestressing System
01		08		21	
02		09		22	
03		10		23	
04		12		24	
05		13			
06		19			
07		20			

Paint File

Element	24		
Year	1984		
Metal	2		
Paint Code	15		
Manufacturer	158		

Variation File

Span No	6		
Variation No	1		
Variation Date	07 - 11 - 90		
1 Element Chg	23		
2 Element Chg	-		
Description	Asphaltic plug installed.		

Defect File

Span No	4		
Date	29 - 2 - 89		
Defect Code	6		
Status	2		
Extent	8		
Severity	3		
Defect Cost	20,000		

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DATABASE LOOK - UP CODES

NB: ADDITIONAL DATABASE CODES WILL BE ISSUED AS AND WHEN REQUIRED, FOR ITEMS NOT COVERED

LOOK-UP TABLE I - STRUCTURE TYPE

STRUCTURE TYPE CODE	STRUCTURE DESCRIPTION
1	OTHER/SERVICE : ROAD TUNNELS, NON-ROAD TUNNELS, OVERHEAD CONVEYORS OR GAS PIPES OR ANY STRUCTURES NOT INCLUDED IN THE CATEGORIES BELOW. PERMANENT ACCESS GANTRIES.
2	BRIDGE/LARGE : A LARGE CULVERT IS DEFINED AS CULVERT A CULVERT WHICH HAS A SINGLE SPAN GREATER THAN OR EQUAL TO 3 METRES OR HAS MULTI-CELLS OF CUMULATIVE SPAN GREATER THAN OR EQUAL TO 5 METRES.
3	
4	SMALL CULVERT : A CULVERT WHICH DOES NOT CONFORM TO THE MINIMUM SIZE CRITERIA OF STRUCTURE TYPE 2.
5	SIGN/SIGNAL : INCLUDES CANTILEVER MAST GANTRY ARMS.
6	RETAINING WALL : RETAINING WALL WHERE THE LEVEL OF THE FILL AT THE BACK OF THE WALL IS GREATER THAN 1.5 METRES ABOVE THE FINISHED GROUND LEVEL IN FRONT OF THE WALL.
7	LIGHTING : HIGH MASTS (≤ 20M) AND CATENARY LIGHTING. INCLUDES MASTS FOR CLOSED CIRCUIT TELEVISION.

LOOK-UP TABLE II - COUNTY, DISTRICT, CONSULTANTS, OTHER AUTHORITIES AND REGIONS

1. THIS LOOK-UP TABLE CONSISTS OF FOUR DIGITS GROUPED AS FOLLOWS:-

0100-3900	ARE USED FOR ENGLISH NON METROPOLITAN COUNTIES
4200-4725	ARE USED FOR ENGLISH METROPOLITAN COUNTIES AND DISTRICTS
5000-5990	ARE USED FOR GLC AND LONDON BOROUGHS
7000-7990	ARE USED FOR CONSULTANTS
9005-9095	ARE USED FOR OTHER AUTHORITES (EG BR, GAS, RCU)
9901-9983	ARE USED FOR REGIONAL OFFICES AND HQ DIVISIONS

2. WITHIN EACH GROUP, THE NAMES ARE LISTED IN ALPHABETIC ORDER. IN THE CASE OF COUNTIES, IT IS USUAL FOR THE LAST TWO DIGITS TO BE 00, THE FIRST TWO DIGITS INDICATES THE COUNTY CODE.

LOOK-UP TABLE II

ENGLISH NON-METROPOLITAN COUNTIES

CODE	NAME
100	AVON
200	BEDFORDSHIRE
300	BERKSHIRE
400	BUCKINGHAMSHIRE
500	CAMBRIDGESHIRE
600	CHESHIRE
700	CLEVELAND
800	CORNWALL
900	CUMBRIA
1000	DERBYSHIRE
1100	DEVON
1200	DORSET
1300	DURHAM
1400	EAST SUSSEX
1500	ESSEX
1600	GLOUCESTERSHIRE
1700	HAMPSHIRE
1800	HEREFORD AND WORCESTER
1900	HERTFORDSHIRE
2000	HUMBERSIDE
2100	ISLE OF WIGHT
2200	KENT
2300	LANCASHIRE
2400	LEICESTERSHIRE
2500	LINCOLNSHIRE
2600	NORFOLK
2700	NORTH YORKSHIRE
2800	NORTHAMPTONSHIRE
2900	NORTHUMBERLAND
3000	NOTTINGHAMSHIRE
3100	OXFORDSHIRE
3200	SHROPSHIRE
3300	SOMERSET
3400	STAFFORDSHIRE
3500	SUFFOLK
3600	SURREY
3700	WARWICKSHIRE
3800	WEST SUSSEX
3900	WILTSHIRE

LOOK-UP TABLE II
ENGLISH METROPOLITAN COUNTIES / DISTRICTS

CODE	NAME
4200	**GREATER MANCHESTER**
4205	BOLTON
4210	BURY
4215	MANCHESTER
4220	OLDHAM
4225	ROCHDALE
4230	SALFORD
4235	STOCKPORT
4240	TAMESIDE
4245	TRAFFORD
4250	WIGAN
4300	MERSEYSIDE
4305	KNOWSLEY
4310	LIVERPOOL
4315	ST HELENS
4320	SEFTON
4325	WIRRAL
4400	**SOUTH YORKSHIRE**
4405	BARNSLEY
4410	DONCASTER
4415	ROTHERHAM
4420	SHEFFIELD
4500	**TYNE AND WEAR**
4505	GATESHEAD
4510	NEWCASTLE UPON TYNE
4515	NORTH TYNESIDE
4520	SOUTH TYNESIDE
4525	SUNDERLAND
4600	**WEST MIDLANDS**
4605	BIRMINGHAM
4610	COVENTRY
4615	DUDLEY
4620	SANDWELL
4625	SOLIHULL
4630	WALSALL
4635	WOLVERHAMPTON
4700	**WEST YORKSHIRE**
4705	BRADFORD
4710	CALDERDALE
4715	KIRKLEES
4720	LEEDS
4725	WAKEFIELD

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LOOK-UP TABLE II

GLC/LONDON BOROUGHS

CODE	NAME
5000	**LONDON (GLC)**
5030	CITY OF LONDON
5060	BARKING & DAGENHAM
5090	BARNET
5120	BEXLEY
5150	BRENT
5180	BROMLEY
5210	CAMDEN
5240	CROYDON
5270	EALING
5300	ENFIELD
5330	GREENWICH
5360	HACKNEY
5390	HAMMERSMITH & FULHAM
5420	HARINGEY
5450	HARROW
5480	HAVERING
5510	HILLINGDON
5540	HOUNSLOW
5570	ISLINGTON
5600	KENSINGTON & CHELSEA
5630	KINGSTON
5660	LAMBETH
5690	LEWISHAM
5720	MERTON
5750	NEWHAM
5780	REDBRIDGE
5810	RICHMOND
5840	SOUTHWARK
5870	SUTTON
5900	TOWER HAMLETS
5930	WALTHAM FOREST
5960	WANDSWORTH
5990	WESTMINSTER

LOOK - UP TABLE II

CONSULTANTS

CODE	NAME
7000	UNKNOWN CONSULTANT
7001	ALISTAIR DICK & ASSOCIATES
7005	ALAN MARSHALL AND PARTNER
7010	C & S ALLOT
7015	ALLOT AND LOMAX
7020	THE GEOFFERY ALSO PRACTICE
7025	W S ATKINS AND PARTNERS
7026	W S ATKINS & MAUNSELL CONSORTIUM
7051	BICC LTD
7054	BABTIE SHAW AND MORTON
7055	M BARCKAY & PARTNERS
7056	SIF BACHY (FRANCE)
7057	J BOBROWSKI AND PARTNERS
7061	BOLTON HENNESSY AND PARTNERS
7062	PETER BRETT & ASSOCIATES
7063	BAILEY BRIDGE STANDARD DESIGN
7064	H BROMPTON AND PARTNERS
7067	BRUCE WHITE WOLFE BARRY
7071	N BRUSETT (NORTHALLERTON)
7074	BULLEN AND PARTNERS
7077	J BURROW AND PARTNERS
7081	H BUSBY
7084	BUTTERLEY ENGINEERING CO LTD
7101	CAIRNES AND BYLES LTD
7104	CARTER HORSLEY
7107	CEGB
7108	FRANK CHURCH & PARTNERS
7109	S P COLLINS & ASSOCIATES
7111	B COLQUHOUN AND PARTNERS
7114	CONCRETE UTILITIES LTD
7117	CONSIDERE AND PARTNERS
7121	COODE AND PARTNERS
7124	COOPER / MACDONALD
7127	J H COOMBS AND PARTNERS
7130	T CROCKER
7134	CROUCH AND HOGG
7137	R B CUTHBERTON & PARTNERS
7141	DOBBIE SANDFORD AND FAWCETT & PATNRS
7145	C H DOBBIE AND PARTNERS
7149	DOWTY GROUP
7171	R EARLEY AND PARTNERS
7201	FAIRBANK AND SON

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LOOK-UP TABLE II (Contd)

CONSULTANTS

CODE	NAME
7205	FAIRHURST AND PARTNERS
7210	FELIX SAMUELY AND PARTNERS
7215	FINCH ENGINEERING LTD
7220	FLINT AND NEILL PARTNERS
7225	FRAENKEL AND PARTNERS
7230	FREEMAN FOX AND PARTNERS
7231	FREEMAN FOX/G MAUNSELL CONSORTIUM
7249	GEC
7250	TONY GEE & PARTNERS
7251	SIR ALEXANDER GIBBS AND PARTNERS
7255	GIFFORD GRAHAM AND PARTNERS
7256	EWH GIFFORD & PARTNERS
7258	C W GLOVER & PARTNERS
7260	ALEC GOURICKIE & PARTNERS
7261	F GRAHAM ASSOCIATES
7265	J R GRAVELING ESQ
7270	R W GREGORY & PARTNERS
7301	SIR WILLIAM HALCROW & PARTNERS
7303	CALLENDER HAMILTON BRIDGES
7305	HARRIS & SUTHERLAND
7308	CASS HAYWARD & PARTNERS
7310	HENDERSON BUSBY
7315	HERBERT HUMPHRIES & PARTNERS
7320	HOWARD HUMPHREYS & PARTNERS
7325	HUSBAND & CO
7351	I G ENGINEERING CO LTD
7401	J I GIFFORD & PARTNERS
7421	KENNEDY/HENDERSON LTD
7445	JOHN LAING DESIGN ASSOCIATES
7451	LEE DONAVON H & PARTNERS
7501	MANDER RAIKES & MARSHALL
7502	G C MANDER & PARTNERS
7503	DOW MAC CONCRETE
7505	G MAUNSELL
7510	MASON PITTENDRIGH & PARTNERS
7515	MIAL RHYS-DAVIES
7517	MOSEDALE CONSTRUCTION LTD
7520	L G MOUCHEL & PARTNERS
7525	MOTT HAY & ANDERSON
7526	MHA/GIFFORDS CONSORTIUM
7528	MRM PARTNERSHIP
7555	NORMAN & DAWBARN & PARTNERS
7601	T O O'SULLIVAN & PARTNERS
7605	OVE ARUP & PARTNERS
7651	W PASZKOWSKI & PARTNERS
7655	C J PELL FRISCHMAN & PARTNERS

LOOK-UP TABLE II (Contd)

CONSULTANTS

CODE	NAME
7660	POSFORD PAVEY & PARTNERS
7701	RENDAL PALMER & TRITTON
7702	ROBINSON JONES PARTNERSHIP
7703	ROFE KENNARD & LAPWORTH
7705	ROUGHTON-LEDIERD & PARTNERS
7751	SANDFORD FAWCETT
7752	SANDERS TUBECRAFTS LTD
7754	FELIX SAMUELY & PARTNERS
7757	SCOTT HOUGHTON
7760	SCOTT WILSON & KIRKPATRICK
7764	K SEVERN
7767	SIMPSON COULSON & SON & PARTNERS
7771	SOMERSET & WALSH (SOUTH COAST WELDERS)
7773	MID SOUTHERN WATER CO
7774	SIR FREDERICK SNOW & PARTNERS
7777	STANDARD BRIDGE
7781	STIRLING MAYNARD
7784	STRESSED CONCRETE DESIGN LTD
7800	JOHN TAYLOR & SONS
7801	TAYLOR WHALLEY & SPYRA & PARTNERS
7802	T H ENGINEERING SERVICES
7803	W H THOMAS AND PARTNERS
7804	THORBURN ASSOCIATES
7805	TRAVERS MORGAN & PARTNERS
7806	PETER THOM ASSOCIATES
7811	L TURNER
7815	D TWIGG ASSOCIATES
7851	VERYARD & PARTNERS
7900	ANTHONY WALKER & PARTNERS
7901	WALLACE EVANS & PARTNERS
7905	WARD ASHCROFT & PARTNERS
7911	SIR BRUCE WHYTE WOLFE BARRY & PARTNERS
7915	SIR OWEN WILLIAMS & PARTNERS
7920	JAMES WILLIAMSON & PARTNERS
7925	B WILLIS & PARTNERS
7951	W V ZINN & PARTNERS

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LOOK-UP TABLE II

OTHER AUTHORITIES

AGENT CODE	AGENT NAME
	NA/UNKNOWN/TOO OLD
10	BRITISH RAIL ANGLIA REGION
9001	BRITISH RAIL EASTERN REGION
9005	BRITISH RAIL LONDON MIDLAND REGION
9010	BRITISH RAIL SOUTHERN REGION
9015	BRITISH RAIL WESTERN REGION
9020	BRITISH WATERWAYS BOARD
9025	PRIVATE
9030	LONDON TRANSPORT
9040	THAMES WATER AUTHORITY
9050	ANGLIAN WATER AUTHORITY
9051	NORTHUMBRIAN WATER AUTHORITY
9055	SOUTHERN WATER AUTHORITY
9059	BRITISH GAS
9060	REDDITCH DEVELOPMENT CORPORATION
9075	WASHINGTON DEVELOPMENT CORPORATION
9079	NORTH WESTERN RCU
9090	NORTH EASTERN RCU
9091	MIDLAND RCU
9092	EASTERN RCU
9093	SOUTH WESTERN RCU
9094	IPSWICH PORT AUTHORITY
9739	SOUTH EASTERN RCU
9095	HAVEN COMMISSIONERS - EAST ANGLIA (PORT)
9743	ASSOCIATED BRITISH PORTS
9750	

LOOK-UP TABLE II

REGIONAL OFFICES & HQ DIVISION

AGENT CODE	AGENT NAME
9901	ERO
9902	EMRO
9903	LRO
9904	NRO
9905	NWRO
9906	SERO
9907	SWRO
9908	WMRO
9909	YHRO
9930	APM
9933	ARC
9937	BE
9940	CON/H
9943	HE/REED
9947	HCSL/HC
9950	HLS/HS
9953	NGAM/NGM
9957	ITSP
9960	LR
9963	RPHP/RP
9967	RTOLG
9970	SASC/BE
9973	TCC
9977	TP
9980	TRRL/TRL
9983	TS

LOOK-UP TABLE III - LOAD

LOAD CODE	LOAD DESCRIPTION
1	NOT USED
2	OTHER LOADING
3	FOOTPATH
4	C & U
5	1/2 HA
6	HA
7	HA + 30 HB
8	HA + 37 1/2 HB
9	HA + 45 HB
10	ABNORMAL LOADING
11	CHECKED & TESTED
12	3.0 T GVW
13	7.5 T GVW
14	10.0 T GVW
15	13.0 T GVW
16	17.0 T GVW
17	25.0 T GVW
18	33.0 T GVW
19	38 T GVW
20	HA + 25 HB
21	40 T GVW

LOOK-UP TABLE IV - BRIDGE TYPE

BRIDGE TYPE	BRIDGE DESCRIPTION
1	OVERBRIDGE
2	UNDERBRIDGE
3	ELEVATED ROAD
4	UNDERPASS
5	ACCOMMODATION ACCESS OVERBRIDGE
6	BRIDLEWAY OVERBRIDGE
7	FOOTBRIDGE OVERBRIDGE
8	CATTLE ACCESS OVERBRIDGE
9	LARGE CULVERT
10	RAILWAY OVERBRIDGE
11	OPENING BRIDGE (EG SWING/BASCULE)
12	ACCOMMODATION ACCESS UNDERBRIDGE
13	BRIDLEWAY UNDERBRIDGE
14	PEDESTRIAN SUBWAY
15	CATTLE CREEP UNDERBRIDGE

LOOK-UP TABLE V - ELEMENTS

ELEMENT CODE	ELEMENT NAME
1	FOUNDATIONS
2	INVERT/APRON
3	FENDERS
4	PIERS/COLUMNS
5	ABUTMENTS
6	WING WALLS
7	RETAINING WALL/REVETMENT
8	APPROACH EMBANKMENTS
9	BEARINGS
10	MAIN BEAMS/MAST
11	TRANSVERSE BEAMS/CATENARY
12	DIAPHRAGMS/BRACINGS
13	CONCRETE SLAB
14	METAL DECK PLATES/TUNNEL LININGS
15	JACK ARCHES
16	ARCH RING/CSBS
17	SPANDRELS
18	TIE RODS
19	DRAINAGE SYSTEM
20	WATERPROOFING
21	SURFACING
22	SERVICE DUCTS
23	EXPANSION JOINTS
24	PARAPET/HANDRAIL
25	ACCESS GANTRY/LADDER/WALKWAYS
26	MACHINERY
32	DRY STONE RETAINING
33	TROUGHING

LOOK-UP TABLE VI - PAINTS

PAINT CODE	PAINT TYPE
1	NOT KNOWN
2	OTHER
11	OLEO RESINOUS
12	CHLORINATED RUBBER
13	GREASE PAINT
14	EPOXY (2 PACK)
15	ACRYLATED RUBBER
16	BITUMEN
17	SILICONE ALKYD SEALER

METAL CODE	METAL TYPE
1	OTHER
2	GALVANISING
3	ALUMINIUM METAL SPRAY
4	ZINC METAL SPRAY
5	WEATHERING STEEL
6	STAINLESS STEEL

MANU CODE	MANUFACTURER NAME
2	UNKNOWN
58	ASTOR CHEMICAL LTD
106	HERBERTS (BERGER) LTD
156	CRAIG & ROSE PLC
157	CRODA PAINTS LTD
158	CASCO NOBEL IND COATINGS (CROWN)
203	DESOTO TITANINE PLC
453	INTERNATIONAL PAINT LTD
501	JOBLING PURSER LTD
502	JOTUN-HENRY CLARK LTD
655	MANDER DOMOLAC & CO LTD
659	MEBON LTD
804	PROTAL (UK) LTD
1051	THE UNITED PAINT CO LTD
1101	VALVOLINE OIL CO LTD

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LOOK UP TABLE VII - DEFECTS

DEFECT CODE	DEFECT NAME
1	ALKALI-SILICA REACTION
2	CHLORIDE CONTAMINATION
3	CARBONATION
4	CORROSION OF REINFORCEMENT
5	STRUCTURAL STEEL PAINTWORK
6	ACCIDENTAL DAMAGE
7	SPALLING OF MASONRY/CONCRETE

STATUS CODE	DEFECT STATUS
1	CHECKED AND CLEARED
2	REPAIRED/MONITORED
3	REPAIRED/CLEARED
4	POTENTIAL
5	SUSPECTED/UNDER INVESTIGATION
6	CONFIRMED

EXTENT CODE	EXTENT
A	NO SIGNIFICANT DEFECT
B	SLIGHT, NOT MORE THAN 5% OF LENGTH OR AREA AFFECTED
C	MODERATE, 5%-20% AFFECTED
D	EXTENSIVE, GREATER THAN 20% AFFECTED

SEVERITY CODE	SEVERITY
1	NO SIGNIFICANT DEFECT
2	MINOR DEFECTS OF A NON-URGENT NATURE
3	DEFECTS WHICH SHOULD BE INCLUDED FOR ATTENTION WITHIN THE NEXT ANNUAL MAINTENANCE PERIOD
4	SEVERE DEFECTS WHERE URGENT ACTION IS REQUIRED

LOOK-UP TABLE VIII - OBSTACLE

OBSTACLE CODE	OBSTACLE DESCRIPTION
1	OTHER
2	NOT APPLICABLE (EG LIGHTING)
3	NATURAL GROUND (EG VALLEY)
4	ROAD
5	RAILWAY
6	WATER
7	FOOTWAY
8	CATTLE ACCESS
9	ACCOMMODATION ACCESS
10	BRIDLEWAY
11	SERVICES

LOOK-UP TABLE IX - CONSTRUCTION TYPE

CONSTRUCTION CODE	CONSTRUCTION DESCRIPTION
1	OTHER FORMS
2	VOIDED SLAB
3	BEAM & SLAB
4	BOX BEAM & CANTILEVER WINGS
5	CORRUGATED STEEL (CSBS)
6	ORTHOTROPIC PLATE
7	SOLID SLAB
8	REINFORCED EARTH
9	TUBULAR
10	MASS CONCRETE
11	BRICK/MASONRY/STONE
12	CRIB WALL
13	ANCHORED WALL
14	DIAPHRAGM WALL
15	SHEET PILE
16	BOX
17	PIPE
18	CONTIGUOUS PILED
19	STRUTTED
20	SECANT PILED
21	CFA PILED

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LOOK-UP TABLE X - MATERIALS

MATERIAL CODE	MATERIAL DESCRIPTION
1	OTHER
2	INSITU MASS CONCRETE
3	INSITU RC
4	INSITU PSC
5	PRECAST RC
6	PRECAST PSC
7	FABRICATED STEEL
8	ROLLED STEEL
9	BRICK/MASONRY/STONE
10	TIMBER
11	STEEL/CONCRETE COMPOSITE - (SMALL CULVERTS ONLY)
12	CAST IRON
13	WROUGHT IRON
14	WEATHERING STEEL

LOOK-UP TABLE XI - SUPPORTS

SUPPORT CODE	SUPPORT DESCRIPTION
1	NON APPLICABLE
2	OTHER FORM
3	COUNTERFORT ABUTMENT
4	STRUTTED ABUTMENT
5	SKELETON ABUTMENT
6	BANK SEAT
7	CANTILEVER ABUTMENT
8	MASS ABUTMENT
9	CONCRETE FRAME
10	SLAB WALL
11	CONCRETE COLUMNS
12	STEEL COLUMNS
13	CONCRETE T HEAD COLUMNS
14	STEEL T HEAD COLUMNS
15	VEE COLUMNS CONCRETE
16	VEE COLUMNS STEEL
17	STEEL FRAME
18	BRICK/MASONRY
19	REINFORCED EARTH
20	CONCRETE COLUMN AND CAP BEAM

LOOK-UP TABLE XII - FORM OF DECK

FORM CODE	FORM DESCRIPTION
1	OTHER FORMS
2	SIMPLY SUPPORTED
3	CONTINUOUS
4	CANTILEVER & SUSPENDED SPAN
5	FRAMED
6	ARCHED
7	WALLS/INVERT/ROOF STRUCTURALLY CONTINUOUS
8	PROPPED CANTILEVER
9	THROUGH GIRDER
10	GRAVITY WALLS
11	CANTILEVER WALLS
12	TIED/ANCHORED
13	REINFORCED EARTH
14	CRIB WALL
15	DRY STONE WALL

LOOK-UP TABLE XIII - FOUNDATIONS

FOUNDATION CODE	FOUNDATION DESCRIPTION
1	OTHER FORM
2	PRECAST RC PILES
3	PRECAST PRESTRESSED PILES
4	DRIVEN CAST-IN-PLACE PILES
5	BORED CAST-IN-PLACE PILES <600MM DIA
6	BORED CAST-IN-PLACE PILES >=600MM DIA
7	STEEL PILES
8	CAISSONS
9	SPREAD FOOTINGS
10	BRICK/MASONRY/STONE
11	GRANULAR FILL
12	PILES (UNSPECIFIED)

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LOOK-UP TABLE XIV - PRESTRESSING

PRESTRESS CODE	PRESTRESSING DESCRIPTION
1	NOT KNOWN
2	OTHER
3	OTHER PRETENSIONED BEAMS
4	M-BEAM OTHER
5	U-BEAM OTHER
6	T-BEAM OTHER
7	I-BEAM OTHER
8	BOX BEAM OTHER
11	M-BEAM DEBONDED & STRAIGHT WIRE
12	M-BEAM DEBONDED & STRAIGHT STRAND
13	M-BEAM DEFLECTED & STRAIGHT WIRE
14	M-BEAM DEFLECTED & STRAIGHT STRAND
20	U-BEAM DEBONDED & STRAIGHT WIRE
21	U-BEAM DEBONDED & STRAIGHT STRAND
22	U-BEAM DEFLECTED & STRAIGHT WIRE
23	U-BEAM DEFLECTED & STRAIGHT STRAND
30	T-BEAM DEBONDED & STRAIGHT WIRE
31	T-BEAM DEBONDED & STRAIGHT STRAND
32	T-BEAM DEFLECTED & STRAIGHT WIRE
33	T-BEAM DEFLECTED & STRAIGHT STRAND
40	I-BEAM DEBONDED & STRAIGHT WIRE
41	I-BEAM DEBONDED & STRAIGHT STRAND
42	I-BEAM DEFLECTED & STRAIGHT WIRE
43	I-BEAM DEFLECTED & STRAIGHT STRAND
50	BOX BEAM DEBONDED & STRAIGHT WIRE
51	BOX BEAM DEBONDED & STRAIGHT STRAND
52	BOX BEAM DEFLECTED & STRAIGHT WIRE
53	BOX BEAM DEFLECTED & STRAIGHT STRAND
101	OTHER INTERNAL POST-TENSIONED SYSTEM
111	INTERNAL/CCL (UK)
112	INTERNAL/PSC (UK)
113	INTERNAL/STRONGHOLD (UK)
114	INTERNAL/STRESSBLOCK (UK)
115	INTERNAL/MACALLOY (UK)
116	INTERNAL/FREYSSINET
117	INTERNAL/BBRV (SWITZERLAND)
118	INTERNAL/VSL (SWITZERLAND)
119	INTERNAL/KA (GERMANY)
120	INTERNAL/LEOBA (GERMANY)
121	INTERNAL/PZ (GERMANY)
122	INTERNAL/DYWIDAG (GERMANY)
123	INTERNAL/ANDERSON (USA)
124	INTERNAL/PRESCON (UK)
125	INTERNAL STRESS STEEL (USA) MULTI STRAND
126	INTERNAL/STRESS STEEL (USA) BAR
201	OTHER EXTERNAL POST-TENSIONED SYSTEM
211	EXTERNAL/CCL (UK)
212	EXTERNAL/PSC (UK)
213	EXTERNAL/STRONGHOLD (UK)
214	EXTERNAL/STRESSBLOCK (UK)
215	EXTERNAL/MACALLOY (UK)

LOOK-UP TABLE XIV - PRESTRESSING (Contd)

PRESTRESS CODE	PRESTRESSING DESCRIPTION
216	EXTERNAL/FREYSSINET
217	EXTERNAL/BBRV (SWITZERLAND)
218	EXTERNAL/VSL (SWITZERLAND)
219	EXTERNAL/KA (GERMANY)
220	EXTERNAL/LEOBA (GERMANY)
221	EXTERNAL/PZ (GERMANY)
222	EXTERNAL/DYWIDAG (GERMANY)
223	EXTERNAL/ANDERSON (USA)
224	EXTERNAL/PRESCON (UK)
225	EXTERNAL STRESS STEEL (USA) MULTI STRAND
226	EXTERNAL/STRESS STEEL (USA) BAR

LOOK - UP TABLE XV - JOINTS

MANUFACTURER	MANU CODE	JOINT CODE	JOINT DESCRIPTION
NOT APPLICABLE	1	1	NOT APPLICABLE
NOT APPLICABLE	1	2	NONE PROVIDED
UNKNOWN	2	3	OTHER STEEL
UNKNOWN	2	4	OTHER EPOXY
UNKNOWN	2	5	OTHER ELASTOMERIC
UNKNOWN	2	6	OTHER PTFE
UNKNOWN	2	7	OTHER JOINT
UNKNOWN	2	8	BURIED JOINT
UNKNOWN	2	9	EPOXY NOSED JOINT WITH SEALANT
UNKNOWN	2	10	EPOXY NOSED JOINT WITH COMPRESSION SEAL
UNKNOWN	2	11	CONC NOSED JOINT WITH SEALANT
UNKNOWN	2	12	CONC NOSED JOINT WITH COMPRESSION SEAL
UNKNOWN	2	13	STEEL NOSED JOINT WITH SEALANT
UNKNOWN	2	14	STEEL NOSED JOINT WITH COMPRESSION SEAL
UNKNOWN	2	15	STEEL TOOTH JOINT
UNKNOWN	2	16	STEEL NOSING
UNKNOWN	2	17	EPOXY NOSING
UNKNOWN	2	18	CONCRETE NOSING
UNKNOWN	2	20	PINNED
ACME	51	1	ACMASEAL COMPRESSION SEAL
ACME	51	2	ACMA MODULAR JOINT
ADVANCED SEALANTS	52	1	HOTFALT
ALH SYSTEMS	53	1	INTERJOINT
ANDRE	56	1	STEEL/RUBBER
ASSOC ASPHALT	57	1	ASPHAPOL
AVON IND POLY	59	1	AVON BURIED
BAKELITE & XYLONITE	105	1	BAKELITE XYLONITE
BOSTIK LTD	107	1	STEEL PLATE
BOSTIK LTD	107	2	NOEPRENE PAD
WILLIAM BRIGGS	108	1	TENASTICK N

LOOK-UP TABLE XV - JOINTS (Contd)

MANUFACTURER	MANU CODE	JOINT CODE	JOINT DESCRIPTION
BRITFLEX RESINS	109	1	BRITFLEX BEJ3
BRITFLEX RESINS	109	2	BRITFLEX BEJ5
BRITFLEX RESINS	109	3	BRITFLEX BEJ8
BRITFLEX RESINS	109	4	BRITFLEX BEJ10
BRITFLEX RESINS	109	5	BRITJOINT
BRITFLEX RESINS	109	6	ZEBRA JOINT
DS BROWN (ARMCO)	110	1	DL-300
DS BROWN (ARMCO)	110	2	DL-450
DS BROWN (ARMCO)	110	3	DL-600
DS BROWN (ARMCO)	110	4	DL-750
DS BROWN (ARMCO)	110	5	SL-300
DS BROWN (ARMCO)	110	6	SL-450
DS BROWN (ARMCO)	110	7	SL-600
DS BROWN (ARMCO)	110	8	SL-750
DS BROWN (ARMCO)	110	9	CP-100
DS BROWN (ARMCO)	110	10	CP-200
DS BROWN (ARMCO)	110	11	CP-300
DS BROWN (ARMCO)	110	12	MT-100
DS BROWN (ARMCO)	110	13	MT-200
DS BROWN (ARMCO)	110	14	MT-300
CCL SYSTEMS LTD	151	1	CIPEC WO
CCL SYSTEMS LTD	151	2	CIPEC W25
CCL SYSTEMS LTD	151	3	CIPEC W50
CCL SYSTEMS LTD	151	4	CIPEC W80
CCL SYSTEMS LTD	151	5	CIPEC W110
CCL SYSTEMS LTD	151	6	CIPEC W160
CCL SYSTEMS LTD	151	7	CIPEC W05
CCL SYSTEMS LTD	151	8	CIPEC WP
CCL SYSTEMS LTD	151	9	CIPEC TA-25
CCL SYSTEMS LTD	151	10	CIPEC TA-50
CCL SYSTEMS LTD	151	11	SLIDING PLATE TYPE
COLAS PRODUCTS LTD	154	1	DUPOXY CONC M10
COLAS PRODUCTS LTD	154	2	DUPOXY CONC WITH SEALANT
COLAS PRODUCTS LTD	154	3	DUPOXY CONC M10 WITH COMP SEAL
COLEBRAND LTD	155	1	NEOFERMA
COLEBRAND LTD	155	2	ACME STRIP
DEMAG	201	1	DEMAG
DU PONT NEOPRENE	202	1	TRANSFLEX 200
EPC SYSTEMS LTD	251	1	HAC CN-1
EPC SYSTEMS LTD	251	2	HAC CN-2
EPC SYSTEMS LTD	251	3	HAC CN-1 WITH SEALANT
EPC SYSTEMS LTD	251	4	HAC CN-1 WITH COMP SEAL
EPC SYSTEMS LTD	251	50	OPC CN-2 WITH SEALANT
EPC SYSTEMS LTD	251	60	OPC CIN-2 WITH COMP SEAL

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LOOK-UP TABLE XV - JOINTS (Contd)

MANUFACTURER	MANU CODE	JOINT CODE	JOINT DESCRIPTION
EVANS H R LTD	252	1	EVANS S J S
EXPANDITE	253	1	B7MX11
EXPANDITE	253	2	TRANSFLEX 200A
EXPANDITE	253	3	TRANSFLEX 250
EXPANDITE	253	4	TRANSFLEX 400A
EXPANDITE	253	5	TRANSFLEX 650
EXPANDITE	253	6	TRANSFLEX 900
EXPANDITE	253	7	TRANSFLEX 1300
EXPANDITE	253	8	DF5 DECK FLASHING
EXPANDITE	253	9	DF6 DECK FLASHING
EXPANDITE	253	10	DF1 DECK FLASHING
EXPANDITE	253	11	DF2 DECK FLASHING
EXPANDITE	253	12	S-502 COMPRESSION SEAL
EXPANDITE	253	13	S-497 COMPRESSION SEAL
EXPANDITE	253	14	S-496 COMPRESSION SEAL
EXPANDITE	253	15	B-610 COMPRESSION SEAL
EXPANDITE	253	16	EXPOFORM NOSING
EXPANDITE	253	17	FLEXCELL
EXPANDITE	253	18	RB 200
EXPANDITE	253	19	FOOTWAY UNIT
EXPANDITE	253	20	RIGIFLEX
EXPANDITE	253	21	EXPOBANK DECK FLASHING
EXPANDITE	253	22	EXPOFORM NOSING WITH SEALANT
EXPANDITE	253	23	EXPOFORM NOSING WITH COMP SEALANT
EXPANDITE	253	24	BURIED
EXPANDITE	253	25	MECHANICAL JOINT B45
EXPANDITE	253	26	EVAZOTE
ESS/CRISPTREND LTD	254	1	CRISPTREND (ASPHALTIC PLUG)
FEB LTD	301	1	FEBPLATE SLS WITH SEALANT
FEB LTD	301	2	FEBPLATE SLS WITH COMP SEAL
FEB LTD	301	3	FEBPLATE SLS
FEB LTD	301	4	FEBPLATE SLS ELEC
FEB LTD	301	5	FEBPLATE SLS ELEC WITH SEALANT
FEB LTD	301	6	FEBPLATE SLS ELEC WITH COMP SEAL
GLACIER	351	1	WSF 80
GLACIER	351	2	WSF 160
GLACIER	351	3	WSF 240
GLACIER	351	4	WSF 320
GLACIER	351	5	WSF 400
GLACIER	351	6	WSF 480
GLACIER	351	7	WSF 560
GLACIER	351	8	WSF 640
GLACIER	351	9	WSF 720
GLACIER	351	10	WSF 800
GLACIER	351	11	WSF 880
GLACIER	351	12	WSF 960
GLACIER	351	13	WSF 1040
GLACIER	351	14	T-MAT

LOOK-UP TABLE XV - JOINTS (Contd)

MANUFACTURER	MANU CODE	JOINT CODE	JOINT DESCRIPTION
GLACIER-HONEL	352	1	131 FS (GS/TB)
GLACIER-HONEL	352	2	141 FS (GS/TB)
GLACIER-HONEL	352	3	151 FS (GS)
GLACIER-HONEL	352	4	161 FS (GS)
GLACIER-HONEL	352	5	162 FS (GS)
GLACIER-HONEL	352	6	163 FS (GS)
GLACIER-HONEL	352	7	164 FS (GS)
GLACIER-HONEL	352	8	165 FS
GLACIER-HONEL	352	9	166 FS
GLACIER-HONEL	352	10	167 FS
GLACIER-HONEL	352	11	168 FS
GLACIER-HONEL	352	12	169 FS
GLACIER-HONEL	352	13	170
GLACIER-HONEL	352	14	WSF 80
ICI LTD	451	1	STRELAX RN POLYURETHANE NOSING
ICI LTD	451	2	STRELAX RN POLY NOSING + SEALANT
ICI LTD	451	3	STRELAX RN POLY NOSING + COMP SEAL
INDUSTRIAL FLOORING	454	1	HAC (MONOJOINT)
INDUSTRIAL FLOORING	454	2	OPC (FERROCRETE)
INDUSTRIAL FLOORING	454	3	HAC MONOJOINT WITH SEALANT
INDUSTRIAL FLOORING	454	4	HAC MONOJOINT WITH COMP SEAL
INDUSTRIAL FLOORING	454	5	OPC (FERROCRETE) WITH SEALANT
INDUSTRIAL FLOORING	454	6	HAC (FERROCRETE) WITH COMP SEALANT
INDUSTRIAL LININGS	455	1	LK 66/P
INDUSTRIAL LININGS	455	2	LK 80
INDUSTRIAL LININGS	455	3	LK66/P WITH SEALANT
INDUSTRIAL LININGS	455	4	LK66/P WITH COMP SEAL
LION EMULSIONS LTD	601	1	DUPOXY 1679
LION EMULSIONS LTD	601	2	DUPOXY CONCRETE

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LOOK-UP TABLE XV - JOINTS (Contd)

MANUFACTURER	MANU CODE	JOINT CODE	JOINT DESCRIPTION
MACLENNAN RUBBER	651	1	LK 25
MACLENNAN RUBBER	651	2	LK 50
MACLENNAN RUBBER	651	3	LK 80
MACLENNAN RUBBER	651	4	LK120
MACLENNAN RUBBER	651	5	LK150
MACLENNAN RUBBER	651	6	LK200
MACLENNAN RUBBER	651	7	MAC SPANSION S2
MACLENNAN RUBBER	651	8	MAC SPANSION MK.III
MACLENNAN RUBBER	651	9	SL STRIP
MACLENNAN RUBBER	651	10	MAC SPANSION S1.5
MACLENNAN RUBBER	651	11	MAC SPANSION S1
MACLENNAN RUBBER	651	12	ER1 HELKA
MACLENNAN RUBBER	651	13	MAC SPANSION MK.IV
MAGEBA LTD	653	1	ROBEK LR1
MAGEBA LTD	653	2	ROBEK LR2
MAGEBA LTD	653	3	ROBEK LR3
MAGEBA LTD	653	4	ROBEK LR4
MAGEBA LTD	653	5	ROBEK LR5
MAGEBA LTD	653	6	ROBEK LR6
MAGEBA LTD	653	7	ROBEK LR7
MAGEBA LTD	653	8	ROBEK LR8
MAGEBA LTD	653	9	ROBEK LR9
MAGEBA LTD	653	10	ROBEK LR10
MAGEBA LTD	653	11	ROBEL LR11
MAGEBA LTD	653	12	ROBEK LR12
MAGEBA LTD	653	13	ROBEK LK2
MAGEBA LTD	653	14	ROBEK LK3
MAGEBA LTD	653	15	ROBEK LK4
MAGEBA LTD	653	16	ROBEK LK5
MAGEBA LTD	653	17	ROBEK LK6
MAGEBA LTD	653	18	ROBEK LK7
MAGEBA LTD	653	19	ROBEK LK8
MAGEBA LTD	653	20	ROBEK LK9
MAGEBA LTD	653	21	ROBEK LK10
MAGEBA LTD	653	22	ROBEK LK11
MAGEBA LTD	653	23	ROBEK LK12
MAGEBA LTD	653	24	ROBEK RSA
MAGEBA LTD	653	25	D75
MAN GHH SEKRADE	654	1	TRANSFLEX T50/4
MAN GHH SEKRADE	654	2	TRANSFLEX T70/2
MAN GHH SEKRADE	654	3	TRANSFLEX T100/5
MAN GHH SEKRADE	654	4	TRANSFLEX T160/2
MAN GHH SEKRADE	654	5	TRANSFLEX T230/2
MAN GHH SEKRADE	654	6	TRANSFLEX T330/1
MAN GHH SEKRADE	654	7	GHH 3W FORMERLY RHEINSTAHL
MAURER (UK) LTD	657	1	D 80B
MAURER (UK) LTD	657	2	D 160B
MAURER (UK) LTD	657	3	D 240B
MAURER (UK) LTD	657	4	D 320B
MAURER (UK) LTD	657	5	D 400B
MAURER (UK) LTD	657	6	D 480B
MAURER (UK) LTD	657	7	D 560B
MAURER (UK) LTD	657	8	D 640B
MAURER (UK) LTD	657	9	D 720B
MAURER (UK) LTD	657	10	D 800B
MAURER (UK) LTD	657	11	D 880B
MAURER (UK) LTD	657	12	D 960B
MAURER (UK) LTD	657	13	D 1040B
MAURER (UK) LTD	657	14	D 120

LOOK-UP TABLE XV - JOINTS (Contd)

MANUFACTURER	MANU CODE	JOINT CODE	JOINT DESCRIPTION
MAURER (SUPP BY LOSS) LTD	658	1	D 75
MAURER (SUPP BY LOSS) LTD	658	2	D 60
MAURER (SUPP BY LOSS) LTD	658	3	D 120
MAURER (SUPP BY LOSS) LTD	658	4	D 180
MAURER (SUPP BY LOSS) LTD	658	5	G 1 NEOPRENE SHEET
MAURER (SUPP BY LOSS) LTD	658	6	G 2
MAURER (SUPP BY LOSS) LTD	658	7	G 3
MAURER (SUPP BY LOSS) LTD	658	8	D 50 NEOPRENE PROFIL
MAURER (SUPP BY LOSS) LTD	658	9	D 150 NEOPRENE PROFIL
MAURER (SUPP BY LOSS) LTD	658	10	D 250 NEOPRENE PROFIL
MAURER (SUPP BY LOSS) LTD	658	11	GROSLA MELLOR
MAURER (SUPP BY LOSS) LTD	658	12	F1 FINGER TYPE
MAURER (SUPP BY LOSS) LTD	658	13	F2 FINGER TYPE
MAURER (SUPP BY LOSS) LTD	658	14	F3 FINGER TYPE
MAURER (SUPP BY LOSS) LTD	658	15	S1 SLIDING PLATE
MAURER (SUPP BY LOSS) LTD	658	16	S2 SLIDING PLATE
MAURER (SUPP BY LOSS) LTD	658	17	1 PLATE EXPANSION
MAURER (SUPP BY LOSS) LTD	658	18	K2 PLATE EXPANSION
MAURER (SUPP BY LOSS) LTD	658	19	M5 MULTI PLATE
MAURER (SUPP BY LOSS) LTD	658	20	M12.5 MULTI PLATE
MAURER (SUPP BY LOSS) LTD	658	21	M15
MAURER (SUPP BY LOSS) LTD	658	22	M25
MAURER (SUPP BY LOSS) LTD	658	23	D81
MAURER (SUPP BY LOSS) LTD	658	24	D161
MAURER (SUPP BY LOSS) LTD	658	25	D241
MAURER (SUPP BY LOSS) LTD	658	26	D321
MAURER (SUPP BY LOSS) LTD	658	27	D100
MAURER (SUPP BY LOSS) LTD	658	28	TYPE N
PSC EQUIPMENT LTD	801	1	FT 50
PSC EQUIPMENT LTD	801	2	FT 75
PSC EQUIPMENT LTD	801	3	FT 100
PSC EQUIPMENT LTD	801	4	FT 150
PSC EQUIPMENT LTD	801	5	FT 175
PSC EQUIPMENT LTD	801	6	FTS 50
PSC EQUIPMENT LTD	801	7	FTS 75
PSC EQUIPMENT LTD	801	8	FTS 100
PSC EQUIPMENT LTD	801	9	TS 150
PSC EQUIPMENT LTD	801	10	FTS 200
PSC EQUIPMENT LTD	801	11	FELSPAN
PSC EQUIPMENT LTD	801	12	FREYSSI JOINT
PSC EQUIPMENT LTD	801	13	VIAJOINT (ASPHALTIC PLUG)
RADMAT	901	1	RADFLEX 125
RADMAT	901	2	RADFLEX S100
RADMAT	901	3	RADFLEX S200
RHEINSTAHL	902	1	RHEINSTAHL
SEALOCRETE LTD	952	1	SEALOCRETE EPOXY NOSINGS
SEALOCRETE LTD	952	2	SEALOCRETE EPOXY NOSING WITH SEALANT
SEALOCRETE LTD	952	3	SEALOCRETE EPOXY NOSING WITH COMP SEAL
SERVICED (W G GRACE)	953	1	SERVISEAL TYPE A
SERVICED (W G GRACE)	953	2	SERVISEAL TYPE B
SERVICED (W G GRACE)	953	3	SERVISEAL TYPE C
SERVICED (W G GRACE)	953	4	WABOFLEX SR2A
SERVICED (W G GRACE)	953	5	WABOFLEX SR2.5A
SERVICED (W G GRACE)	953	6	WABOFLEX SR4A
SERVICED (W G GRACE)	953	7	WABOFLEX SR6.5A
SERVICED (W G GRACE)	953	8	WABOFLEX SR9
SERVICED (W G GRACE)	953	9	WABOFLEX SR13
SERVICED (W G GRACE)	953	10	LM 50

LOOK-UP TABLE XV - JOINTS (Contd)

MANUFACTURER	MANU CODE	JOINT CODE	JOINT DESCRIPTION
SOLARBRIDGE	956	1	4"
THYSSEN RHEINSTAHL	1003	1	120S
THYSSEN RHEINSTAHL	1003	2	180S
THYSSEN RHEINSTAHL	1003	3	240S
THYSSEN RHEINSTAHL	1003	4	300S
THYSSEN RHEINSTAHL	1003	5	360S
THYSSEN RHEINSTAHL	1003	6	420S
THYSSEN RHEINSTAHL	1003	7	480S
THYSSEN RHEINSTAHL	1003	8	120B
THYSSEN RHEINSTAHL	1003	9	180B
THYSSEN RHEINSTAHL	1003	10	240B
THYSSEN RHEINSTAHL	1003	11	300B
THYSSEN RHEINSTAHL	1003	12	360B
THYSSEN RHEINSTAHL	1003	13	420B
THYSSEN RHEINSTAHL	1003	14	480B
THYSSEN RHEINSTAHL	1003	15	540B
THYSSEN RHEINSTAHL	1003	16	7S
THORMACK LTD (NOW PRISMO LTD)	1004	1	THORMAJOINT (ASPHALTIC PLUG)
THORMACK LTD (NOW PRISMO LTD)	1004	2	THORMAJOINT A.P. WITH STEEL PLATE
ZEBRAFLEX	1301	1	ZEBRAJOINT (ASPHALTIC PLUG)

LOOK-UP TABLE XVI - BEARINGS

MANUFACTURER	MANU CODE	BEAR CODE	BEARING DESCRIPTION
NOT APPLICABLE	1	1	NOT APPLICABLE
NOT APPLICABLE	2	2	NONE PROVIDED
UNKNOWN	2	0	OTHER
UNKNOWN	2	1	CONCRETE HINGE
UNKNOWN	2	2	STEEL ROCKER
UNKNOWN	2	3	STEEL ROLLER
UNKNOWN	2	4	STEEL SLIDING
UNKNOWN	2	5	STEEL ROCKER & SLIDING
UNKNOWN	2	6	STEEL POT
UNKNOWN	2	7	ELASTOMERIC
UNKNOWN	2	8	RUBBER STRIP
UNKNOWN	2	9	RUBBER PAD
UNKNOWN	2	10	RUBBER LAMINATED
UNKNOWN	2	11	PTFE
UNKNOWN	2	12	CONCRETE ROCKER
UNKNOWN	2	13	LEAD
UNKNOWN	2	14	BITUMEN SHEET
UNKNOWN	2	15	CEMENT MORTAR
UNKNOWN	2	16	COPPER SHEET
UNKNOWN	2	17	ASBESTOS SHEET
UNKNOWN	2	18	DISC BEARINGS
UNKNOWN	2	19	NEOPRENE
UNKNOWN	2	20	CORK
UNKNOWN	2	21	EVAZOTE
UNKNOWN	2	22	STEEL PIN
UNKNOWN	2	23	STEEL HINGE
ANDRE	56	1	ELASTOMERIC LAMINATED-MULTIPLATE
ANDRE	56	2	ELASTOMERIC LAMINATED-MONOPLATE
ANDRE	56	3	ELASTOMERIC PLAIN RUBBER PADS
ANDRE	56	4	PTFE/ELASTOMERIC PTFE ON CONFINED RUBBER
ANDRE	56	5	PTFE SLIDING
ANDRE	56	6	ROTOFLON
ANDRE	56	7	RUBBER STRIP
ANDRE	56	8	SHEAR KEY
ANDRE	56	9	ARF 150
AVON RUBBER	60	1	
CCL SYSTEMS LTD	151	1	SERIES N
CCL SYSTEMS LTD	151	2	SERIES NGe or NGa
CCL SYSTEMS LTD	151	3	SERIES R10
CCL SYSTEMS LTD	151	4	SERIES R15.7 OR R21.4
CCL SYSTEMS LTD	151	5	SERIES CRV9, CRV13 OR CRV17
CCL SYSTEMS LTD	151	6	ROCKER FIXED
CCL SYSTEMS LTD	151	7	BRIDGEMASTER FABREEKA
CCL SYSTEMS LTD	151	8	TYPE 4320/04/3E NR (ELASTOMERIC)
CCL SYSTEMS LTD	151	9	ELASTOMERIC LAMINATED
CCL SYSTEMS LTD	151	10	LAMINATED RUBBER
CCL SYSTEMS LTD	151	11	FP50 UNIGUIDE
CCL SYSTEMS LTD	151	12	BRIDGEMASTER MECHANICAL
DEMAG	201	1	SERIES GTa-GPA AND DPI-FPH
FLEXCELL	303	1	

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LOOK-UP TABLE XVI - BEARINGS (Contd)

MANUFACTURER	MANU CODE	BEAR CODE	BEARING DESCRIPTION
GLACIER	351	1	SERIES A PTFE
GLACIER	351	2	SERIES B RUBBER PTFE OR COMBINATION
GLACIER	351	3	SERIES C RUBBER
GLACIER	351	4	SERIES D PTFE
GLACIER	351	5	SERIES E PTFE AND ROCKERS
GLACIER	351	6	SERIES F PTFE
GLACIER	351	7	SERIES G PTFE
GLACIER	351	8	SERIES J ROLLER + RACK & PINION & ENDS
GLACIER	351	9	SERIES K
GLACIER	351	10	ELASTOMERIC
GLACIER	351	11	ELASTOMERIC/MECH PIN
GLACIER	351	12	ELASTOMERIC/MECH GUIDE
GLACIER	351	13	PAD 738/740/940 (LAMINATED ELASTOMERIC)
GLACIER	351	14	PAD 592 (LAMINATED ELASTOMERIC)
GLACIER	351	15	GPN
GLACIER	351	16	ANTICLASTIC
GLACIER	351	17	SA 379
GLACIER	351	18	SPECIAL GUIDES AND DOWEL
ICI FLUON LTD	452	1	PLANAR PTFE
ICI FLUON LTD	452	2	LAMINAR PTFE
ICI FLUON LTD	452	3	LAMINAR POT BEARING
ICI FLUON LTD	452	4	COMPOUND PLANAR/CYLINDRICAL
ICI FLUON LTD	452	5	PLANAR/SPECIAL
ICI FLUON LTD	452	6	CYLINDRICAL
KREUTZ	551	1	
LOSSINGER SYSTEMS	602	1	LOSSINGER SYSTEMS
MACSPANSION	652	1	FREE OR FIXED LAMINATED-ELASTOMERIC
MACSPANSION	652	2	SLIDING PTFE ON NEOPRENE LAYER
MAGEBA LTD	653	1	SERIES TA/TE/TF (POT)
MAGEBA LTD	653	2	ROLLER BEARING RS10000
MAURER (UK) LTD	657	1	D75
MAURER (UK) LTD	657	2	POT
MEEHANITE	661	1	MEEHANITE GA
MEEHANITE	661	2	MEEHANITE CB
MEEHANITE	661	3	ROCKERS
METALISTIK	660	1	15-1619
METALISTIK	660	2	15-1621
METALISTIK	660	3	15-1625
PSC EQUIPMENT	801	1	SERIES S
PSC EQUIPMENT	801	2	SERIES C
PSC EQUIPMENT	801	3	SERIES LMP AND LMF
PSC EQUIPMENT	801	4	SERIES DE DF & DT
PSC EQUIPMENT	801	5	CYLINDRICAL ROCKER LONGITUDINAL MOVEMENT
PSC EQUIPMENT	801	6	CYLINDRICAL ROCKER
PSC EQUIPMENT	801	7	SPHERICAL
PSC EQUIPMENT	801	8	ELASTOMERIC
PSC EQUIPMENT	801	9	SERIES SE
PSC EQUIPMENT	801	10	SERIES CR
PSC EQUIPMENT	801	11	TETRON 50/70/75
PSC EQUIPMENT	801	12	TETRON LE15, 170

LOOK-UP TABLE XVI - BEARINGS (Contd)

MANUFACTURER	MANU CODE	BEAR CODE	BEARING DESCRIPTION
PSC EQUIPMENT	801	13	LAMINATED RUBBER
PSC EQUIPMENT	801	14	SPECIAL-G SERIES (GV,GF)
PSC EQUIPMENT	801	15	RUBBER STRIP
PSC EQUIPMENT	801	16	RUBBER PADS
PSC EQUIPMENT	801	17	TETRON DISK TYPE 3
PSC EQUIPMENT	801	18	TETRON SPHERICAL S 3
PSC EQUIPMENT	801	19	SERIES SF
PSC EQUIPMENT	801	20	SERIES LM
PSC EQUIPMENT	801	21	DOWEL/GUIDE
POLLYMER ENG.	803	1	METALSTICK
RICHARD KLINGER	903	1	
RUBEROID LTD	905	1	HIGH LOAD PITCH POLYMER SHEET
SK	951	1	SKB 2242
SIMON CARVES	955	1	LASTO ELASTOMERIC (BLOCK) BEARINGS
SIMON CARVES	955	2	ELASTOMERIC SPECIALLY DESIGNED
SOLARBRIDGE ENGINEERING	956	1	LAMINATED RUBBER
STRONGHOLD	957	1	SERIES SN
STRONGHOLD	957	2	SERIES SD
STRONGHOLD	957	3	SERIES D OR P
TELLE BORG	1002	1	SERIES R
TELLE BORG	1002	2	SERIES TR
TELLE BORG	1002	3	SERIES BL
WESTWOOD	1151	1	HILOAD-ROCKER
WESTWOOD	1151	2	HILOAD-ROLLER
WESTWOOD	1151	3	HILOAD-SPHERICAL

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LOOK-UP TABLE XVII - PARAPETS

MANUFACTURER	MANU CODE	PARAPET CODE	PARAPET DESCRIPTION
NOT APPLICABLE	1	1	NOT APPLICABLE
NOT APPLICABLE	1	2	NOT APPLICABLE
UNKNOWN	2	1	ALUMINIUM
UNKNOWN	2	2	ALUMINIUM PEDESTRIAN
UNKNOWN	2	3	STEEL
UNKNOWN	2	4	STEEL PEDESTRIAN
UNKNOWN	2	5	BRICK FACED R.C.
UNKNOWN	2	6	R.C.
UNKNOWN	2	7	P1 UNSPECIFIED
UNKNOWN	2	8	P2 UNSPECIFIED
UNKNOWN	2	9	P3 UNSPECIFIED
UNKNOWN	2	10	P4 UNSPECIFIED
UNKNOWN	2	11	P5 UNSPECIFIED
UNKNOWN	2	12	P6 UNSPECIFIED
UNKNOWN	2	13	P1 STEEL
UNKNOWN	2	14	P1 ALUMINIUM
UNKNOWN	2	15	P1 CONCRETE
UNKNOWN	2	16	P2 STEEL
UNKNOWN	2	17	P2 ALUMINIUM
UNKNOWN	2	18	P2 CONCRETE
UNKNOWN	2	19	P2 STEEL WITHOUT MESH INFILL
UNKNOWN	2	20	P2 ALUMINIUM WITHOUR MESH INFILL
UNKNOWN	2	21	P2 STEEL WITH MESH INFILL
UNKNOWN	2	23	P2 ALUMINIUM WITH MESH INFILL
UNKNOWN	2	24	P3 STEEL
UNKNOWN	2	25	P3 ALUMINIUM
UNKNOWN	2	26	P3 CONCRETE
UNKNOWN	2	27	P4 STEEL
UNKNOWN	2	28	P4 ALUMINIUM
UNKNOWN	2	29	P4 CONCRETE
UNKNOWN	2	30	P5 STEEL
UNKNOWN	2	31	P5 ALUMINIUM
UNKNOWN	2	32	P5 CONCRETE
UNKNOWN	2	33	P5 STEEL WITHOUT MESH INFILL
UNKNOWN	2	34	P5 ALUMINIUM WITHOUT MESH INFILL
UNKNOWN	2	35	P5 STEEL WITH MESH INFILL
UNKNOWN	2	36	P5 ALUMINIUM WITH MESH INFILL
UNKNOWN	2	37	P6 STEEL
UNKNOWN	2	38	P6 ALUMINIUM
UNKNOWN	2	39	P6 CONCRETE
HISTORIC	4	1	TIMBER
HISTORIC	4	2	BRICKWORK
HISTORIC	4	3	MASONRY
HISTORIC	4	4	CAST IRON
HISTORIC	4	5	WROUGHT IRON
HISTORIC	4	6	STEEL
HISTORIC	4	8	IN-SITU CONCRETE
HISTORIC	4	9	PRECAST CONCRETE
HISTORIC	4	10	DECORATIVE BRONZE
BACO (ALUMINIUM)	101	1	P1 3 RAIL SLOPING TRAFFIC FACE
BACO (ALUMINIUM)	101	2	P2 3 RAIL SLOPING TRAFFIC FACE
BACO (ALUMINIUM)	101	3	P2 3 RAIL VERTICAL TRAFFIC FACE
BACO (ALUMINIUM)	101	4	P5 4 RAIL SLOPING TRAFFIC FACE
BACO (ALUMINIUM)	101	5	P5 4 RAIL VERTICAL TRAFFIC FACE
BACO (ALUMINIUM)	101	6	P5/P2 4 RAIL VERTICAL TRAFFIC FACE

LOOK-UP TABLE XVII - PARAPETS (Contd)

MANUFACTURER	MANU CODE	PARAPET CODE	PARAPET DESCRIPTION
BACO (ALUMINIUM)	101	7	P4 PEDESTRIAN
BACO (ALUMINIUM)	101	8	5 RAIL
BACO (ALUMINIUM)	101	9	P7 GUARDRAILING
BACO (ALUMINIUM)	101	10	P2-2 RAIL VERTICAL INFILL
BACO (ALUMINIUM)	101	11	P1 3 RAIL VERTICAL TRAFFIC FACE
BACO (ALUMINIUM)	101	12	P1 ALUMINIUM 2 RAIL
BE DIVISION	102	1	P1 CONC WALL & STEEL/ALUM POST & RAIL
B S C STEEL	103	1	P1 POST 3 RAIL VERTICAL TRAFFIC FACE
B S C STEEL	103	2	P2 POST 3 RAIL VERTICAL TRAFFIC FACE
B S C STEEL	103	3	P2 POST 2 RAIL VERTICAL TRAFFIC FACE
B S C STEEL	103	4	P5/P1 POST & 4 RAIL
B S C STEEL	103	5	P2 POST & 3 RAIL
B S C STEEL	103	6	P5/P2 POST & 3 RAIL
B S C STEEL	103	7	P5/P1 POST & 4 RAIL (MESH)
B S C STEEL	103	8	P5/P2 POST & 4 RAIL (SOLID)
B S C STEEL	103	9	P1 STRONGER POST & RAIL
B S C STEEL	103	10	P4 PEDESTRIAN
B S C STEEL	103	11	P4/P5
B S C STEEL	103	12	STEEL P2 WITH MESH INFILL
B S C STEEL	103	13	P2/80 - 5 RAIL WITH MESH
B S C AND T R R L	104	1	P1 POST & 3 RAIL WITH ENERGY BRACKET
CHRISTIANI & NEILSON	153	1	P1 CURVE PROFILE POST & TUBULAR RAIL
CHRISTIANI & NEILSON	153	2	P2 CURVE PROFILE POST 3 RAIL & MESH INFILL
H D A LTD	401	1	P5/P1 POST & 4 RAIL VERTICAL TRAFFIC FACE
H D A LTD	401	2	P5/P2 POST & 4 RAIL VERT TRAF FACE (MESH 1250)
H D A LTD	401	3	P5/P2 POST & 4 RAIL VERT TRAF FACE (MESH 1500)
H D A LTD	401	4	P1 POST & 3 RAIL SLOPING TRAFFIC FACE
H D A LTD	401	5	P2 POST & 3 RAILS (80Km/hr)
H D A LTD	401	6	P5/P2 POST & 4 RAIL (1500 SOLID)
H D A LTD	401	7	P2 POST & 2 RAIL VERTICAL INFILL
H D A LTD	401	8	P4 POST 2 RAIL VERTICAL INFILL
H D A LTD	401	9	P2 POST 3 RAIL (113Km/hr)
H D A LTD	401	10	ALUMINIUM P2 2 RAIL
H D A LTD	401	11	ALUMINIUM P2 1 RAIL
	401	12	P1 POST & 3 RAIL VERTICAL TRAFFIC FACE
H D A LTD	401	13	P2 (80Km) 4 RAIL WITH 1500 MESH
H D A LTD	401	14	P5 2 RAIL WITH MESH INFILL
ROAD RESEARCH LTD	904	1	P1 SHAPED POST 3 RAIL ENERGY ABSORB MIDDLE RAIL
TRRL	1001	1	P1 CONC UPSTAND 2 RAIL LOWER WITH ENERGY BRACKET
TRRL	1001	2	P1 ALUMINIUM POST AND 3 STEEL RAIL

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LOOK-UP TABLE XVIII - WATERPROOFING

MANUFACTURER	MANU CODE	PROOF CODE	WATERPROOFING DESCRIPTION
NOT APPLICABLE	1	1	NOT APPLICABLE
NOT APPLICABLE	1	2	NONE PROVIDED
UNKNOWN	2	1	MASTIC ASPHALT
UNKNOWN	2	2	COPPER BITUMEN
UNKNOWN	2	3	BITUMEN PAINT
UNKNOWN	2	4	BITUMEN SHEET
UNKNOWN	2	5	RUBBER SHEET
UNKNOWN	2	6	EPOXY COATING
UNKNOWN	2	7	SPRAYED/PAINTED
UNKNOWN	2	8	APPROVED PROPRIETARY SYSTEM
D ANDERSON	55	1	FAMLINER C250
D ANDERSON	55	2	FAMLINER C500
D ANDERSON	55	3	FAMGUARD
HERBERTS (BERGER PAINTS)	106	1	EPIFLEX
WILLIAM BRIGGS	108	1	AMASCO
BRITFLEX RESINS	109	1	BRITDEX
COLAS PRODUCTS LTD	154	1	LEOSEAL
COLAS PRODUCTS LTD	154	2	BAYTEC
DYNAMITE NOBEL (UK)	204	1	TROCAL 'RAR'
EXPANDITE	253	1	FAMGUARD
EXPANDITE	253	2	PROOFER 12
EXPANDITE	253	3	MULSEAL DP
EXPANDITE	253	4	FAMFLEX
W G GRACE (SERVICISE)	354	1	H D BITUTHENE WITH BITU-DEK
W G GRACE (SERVICISE)	354	2	H D BITUTHENE WITH BITU-SHIELD
W G GRACE (SERVICISE)	354	3	SERVI-DEK WITH 6MM SERVI-PAK
W G GRACE (SERVICISE)	354	4	SERVI-DEK WITH 12MM SERVI-PAK
W G GRACE (SERVICISE)	354	5	SERVI-DEK WITH 3MM SERVI-PAK
W G GRACE (SERVICISE)	354	6	ARMOR GRADE H D BITUTHENE
W G GRACE (SERVICISE)	354	7	H D BITUTHENE & SAND ASPHALT
W G GRACE (SERVICISE)	354	8	BITUTHENE 1000
W G GRACE (SERVICISE)	354	9	BITUTHENE 1200
STIRLING LLOYD	604	1	ELIMINATOR SA
MARLEY	656	1	MARLEYGARD
PERMANITE	802	1	PERMABIT 60/PERMASHIELD
PERMANITE	802	2	PERMABIT EP/PERMASHIELD
PERMANITE	802	3	DIAMAITE
PERMANITE	802	4	BRIDGEGUARD
RADMAT	901	1	EPOXY COATING
THE RUBEROID LTD	905	1	HYLOAD
THE RUBEROID LTD	905	2	PLUVEX
THE RUBEROID LTD	905	3	BRIDGESEAL SHEETS
SIKA	958	1	ELIMINATOR
PRISMO (THORMACK) LTD	1004	1	BAXENDEN FUTURA THANE 2000

LOOK-UP TABLE XIX - MANUFACTURERS

MANUFACTURER CODE	MANUFACTURER NAME
1	NOT APPLICABLE
2	UNKNOWN
3	PURPOSE MADE
4	HISTORIC
5	NONE PROVIDED
11	OTHER
51	ACME
52	ADVANCED SEALANTS LTD
53	ALH SYSTEMS LTD
54	ALLWEATHER EVODE PAINTS
55	D ANDERSON
56	ANDRE
57	ASSOCIATED ASPHALT
58	ASTOR CHEMICAL LTD
59	AVON INDUSTRIAL POLY
60	AVON RUBBER
101	BACO (ALUMINIUM)
102	BE DIVISION
103	BSC (STEEL)
104	BSC AND TRRL
105	BAKELITE & XYLONITE
106	HERBERTS (BERGER) LTD
107	BOSTIK LTD
108	WILLIAM BRIGGS
109	BRITFLEX RESINS
110	D S BROWN (ARMCO) LTD
151	CCL SYSTEMS LTD
152	CAMREX LTD
153	CHRISTIANI & NEILSON
154	COLAS PRODUCTS LTD
155	COLEBRAND LTD
156	CRAIG AND ROSE PLC
157	CRODA PAINTS LTD
158	CASCO NOBEL IND COATINGS (CROWN)
159	CONCRETE UTILITIES
160	CHARNWAY SYSTEMS LTD
201	DEMAG
202	DU PONT NEOPRENE
203	DESOTO TITANINE PLC
204	DYNAMITE NOBEL (UK)
251	EPC SYSTEMS LTD
252	EVANS H R LTD
253	EXPANDITE
254	ESS/CRISPTREND LTD
301	FEB LTD
302	FERRANTI
303	FLEXCELL
304	FLOUR CARBON
350	GEC LTD

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LOOK-UP TABLE XIX - MANUFACTURERS (Contd)

MANUFACTURER CODE	MANUFACTURER NAME
351	GLACIER
352	GLACIER-HONEL
353	GOODLASS WALL & CO
354	W G GRACE (SERVICISED) LTD
401	HDA LTD
402	HEMCOL
451	ICI LTD
452	ICI-FLUON LTD
453	INTERNATIONAL PAINT LTD
454	INDUSTRIAL FLOORING LTD
455	INDUSTRIAL LININGS LTD
501	JOBLING PURSER LTD
502	JOTUN-HENRY CLARK LTD
551	KREUTZ
601	LION EMULSIONS LTD
602	LOSSINGER SYSTEMS LTD
603	LUBRITEF
604	STIRLING LLOYD
651	MACLELLAN RUBBER
652	MACSPANSION
653	MAGEBA LTD
654	MAN GBH STEKRADE
655	MANDER DOMOLAC & CO
656	MARLEY
657	MAURER
658	MAURER (SUPPLIED BY LOSSINGER/MAGEBA)
659	MEBON LTD
660	METALISTIK
661	MEEHANITE
801	PSC EQUIPMENT LTD
802	PERMANITE
803	POLYMER ENGINEERING
804	WINN & COALES (DENSO LTD)
805	PETITJEAN
901	RADMAT
902	RHEINSTAHL
903	RICHARD KLINGER
904	ROAD RESEARCH LTD
905	THE RUBEROID LTD
951	S K
952	SEALOCRETE LTD
954	SIGMA COATINGS LTD
955	SIMON CARVES
956	SOLARBRIDGE ENGINEERING
957	STRONGHOLD
958	SIKA
1001	TRRL
1002	TELLE BORG
1003	THYSSEN RHEINSTAHL
1OO4	THORMAC LTD
1005	THORN EMI LTD
1051	UNITED PAINT CO LTD
1101	VALVOLINE D L CO LTD
1151	WESTWOOD
1301	ZEBRAFLEX

SPECIAL REQUIREMENTS : SCOTLAND AS BUILT RECORDS FOR TRUNK ROAD STRUCTURES

B1 Introduction

1. This Appendix supersedes the contents of SDD Circular 27/1989 which deal with As Built Records for trunk road structures.

2. As Built Records are a necessary requirement for the successful inspection and maintenance of road structures throughout their lives and the Engineer for each trunk road scheme should ensure that the As Built Records are carefully completed. The provision of adequate records of the works may make future investigations into their construction unnecessary. These records of the works should be prepared by site staff during the course of construction and should be finalised during the maintenance period.

3. A set of As Built Records for trunk road structures, as defined in this Appendix, shall be submitted to the Overseeing Organisation at the address below, within 6 months from the date of issue of the Maintenance Certificate:-

The Scottish Office Industry Department
Roads Directorate
Bridges Section
Room 52
James Craig Walk
EDINBURGH
EH1 3BA

4. Bridges Section will record As Built Records received in the trunk road bridges database and will issue copies to the appropriate Maintaining Agent for retention by their bridges maintenance personnel.

5. As Built Records for each highway structure shall consist of the following:-

5.1 Two full sets of As Built Drawings on good quality A2 size paper (each marked "As Built Drawing" in red). These should be accompanied by list of all drawings submitted.

5.2 Two full sets of 35mm Silver Halide Microfilm "As Built" Drawings mounted on 18.5cm x 8cm standard indexed aperture card complying with BS4210: 1977. The structure name and structure reference number should be recorded on each aperture card together with the drawing title.

5.3 Two copies of the Structural Maintenance Manual. (For each Structure or Group of structures) - see B2 for required contents.

5.4 Two Prints of Photograph(s) (Completed Structure.) Colour Prints - not less than 150mm x 100mm.

5.5 One set of database input sheets As Built for the trunk road bridges database (please refer to the Trunk Road Bridges Database As Built Records Guide).

5.6 Two copies of GA drawings, A2 size, showing the extent of silane impregnation carried out and marked up with the following information:-

i. Date of impregnation

ii. Type of product (including specification)

iii. Manufacturer

iv. Application contractor

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B2 STRUCTURAL MAINTENANCE MANUALS - REQUIRED CONTENTS

B.2.1 **Introduction**

I. For each structure or for a group of minor structures of similar design (eg culverts, sign gantries), the Engineer/Designer shall prepare an individual Manual of information from the design and construction phases which could have possible implications for future maintenance. This will be complementary to the As Built drawings.

B.2.2 **Contents**

i. **Location Plan**

The Engineer/Designer shall produce an outline description of the road structure(s) with a plan showing location.

ii. **Materials**

The following items should be considered for inclusion as appropriate. The lists are not exhaustive, and designers should consider adding other items which could be of value. The list should give the name and address of the supplier, sub-contractors, and where appropriate the source. (Example 1 in B3).

a. For concrete, the list should include:

Cement; GGBFS; PFA; aggregates; ready mixed concrete; admixtures; concrete mix design; reinforcing bars; prestressing wire; strand or bar.

b. For steel, the list should include:

Plate; rolled sections; prefabricated steelwork, etc.

c. Sources of imported fill should be included.

iii. **Components**

The list should give the name of the manufacturer/ supplier/sub-contractor; the part number and manufacturer's drawing number if not given on the As Built Drawings. (Example 2 in B4).

Items should include:

Expansion joints; bearings; parapets; waterproofing systems; precast units; reinforced earth components; brick, precast or masonry facings; lighting systems; and moving bridge equipment.

Where appropriate the manufacturer's recommendations for inspection and maintenance should be included along with their product literature.

iv. **Certification and Test Records**

These should be grouped in Appendices or folders, and should include load test results on eg precast beams, piles, bearings etc mill certificates, cement analyses, cube test results (related to position on general arrangement drawings), sulphate content in the mix, chloride ion content in the mix and also alkali - aggregate reactivity/sodium oxide equivalent content in the mix.

v. **Paint**

A copy of contract specification Appendices 19/1 to 19/4 of the Specification for Highway Works for new works or clause 5009 for maintenance painting, and a copy of all BE Forms BE/P2 should be included. (Example 3 in B5).

vi. **Concrete Impregnation**

A list of members impregnated stating date of application, type of product, manufacturer and application contractor.

vii. **Concrete Surface Coatings**

A list of members coated stating date of application, type of product, manufacturer and application contractor.

viii. **Problems During Construction**

A short report, supplemented with instrument readings, sketches or photographs as appropriate, of problems encountered and solutions adopted during construction which could have repercussions on future maintenance should be included.

ix. **Inspection and Maintenance**

Short notes on inspection and maintenance needs for elements or components of the structure where problems or deterioration may occur if neglected or design loadings are not obvious. (Example 4 in B6).

x. **Access and Security**

Details, including drawings of access to the site, walkways, ladders, manholes etc and details of security measures adopted to prevent unauthorised access, should be included.

B3 MATERIALS

EXAMPLE 1

SCHEME NAME:
BRIDGE NAME(S):
STRUCTURE REF NO(S):

Main Contractor:

MATERIALS SUPPLIERS/SOURCE

Material (enter all materials used)	***Supplier's Name and Address***	***Source Name and Address***
Concrete (Ready Mixed)		
Cement for concrete *i. insitu* *ii. precast*		
Coarse and fine aggregates for concrete *i. insitu* *ii. precast*		
Reinforcement *i. insitu* *ii. precast*		
Granular backfill		
etc		

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B.4 COMPONENTS AND PRODUCTS

EXAMPLE 2/1

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

JOINTS

Joint Location	***Relevant Drawing Nos: Contract Reference No:***	***Product***	***Manufacturer's Name and Address***
Deck/North Abutment Joint			
Deck/South Abutment Joint			
Deck Joint over pier			
Joints at pre-cast cover			
Sub-structure joints			
etc			

B4. COMPONENTS AND PRODUCTS

EXAMPLE 2/2

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

PARAPETS

Parapet Type	*Fabricator and Erector's Name and Address*	*Manufacturer's Drawings*	*Manufacturer's Name and Address*

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B4. COMPONENTS AND PRODUCTS

EXAMPLE 2/3

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

BRIDGE BEARINGS

Bearing Types	***Drawing No.*** _____ ***Contract Reference No.***	***Manufacturer's Reference Number***	***Manufacturer's Name and Address***
Rubber Pot Bearings			
Guides and Dowels			
Elastomeric Bearings			
etc			

B4. COMPONENTS AND PRODUCTS

EXAMPLE 2/4

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

WATERPROOFING

Component/Product/Material (enter all components/ products/materials used)	***Installer Name and Address***	***Manufacturer/Supplier /Source Name and Address***
Mastic asphalt to decks		
Bitumen paint to buried faces Colas Leoseal		
Eliminator (two coat)		

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B4. COMPONENTS AND PRODUCTS

EXAMPLE 2/5

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

MISCELLANEOUS

Component/Product/Material (enter all components/ products/materials used)	*Manufacturer/Supplier/Source (Name and address required)*
Pre-stressed Concrete Beams incorporating Reinforcement from Prestressing strand from Concrete from	
Permeable Backing	
Sand and Gravel Type A	
Ductile Iron Manhole Covers Gratings and Frames	
Aquamax gully combinations	
Pre-cast Concrete Cover Slabs (Service Bays on Bridges)	
GRP Formwork Mould (Patterned profile P7/F4)	
Epoxy Mortar (Bedding to bearings, cover plates etc) SBD Epoxy Plus Contract Mortar	
Cement Mortar (Bedding to bearing etc) SBD Five Star Grout	

B5. PROTECTION OF STEELWORK - CONTRACT SPECIFICATION 1900

EXAMPLE 3

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S)

PROTECTION OF STEELWORK AGAINST CORROSION

1910 Protective Systems

1. Environment: Exposure to road salts and grit.

2. Required durability of systems:

No maintenance: Up to 5 years
Minor maintenance: Between 5 and 8 years
Major maintenance: After 8 years

3. Paint system - metal bearings

Surface preparation: Blast clean 1st Quality BS 4232

Metal coating: Aluminium spray, applied at works

1st coat: Zinc Chromate etch primer, 2 packs, applied at works.

2nd coat: Zinc Phosphate Epoxy Ester, applied at works.

3rd coat: Zinc Phosphate Epoxy Ester, applied at works

4th coat: Silicon Alkyd Undercoat, applied on site.

5th coat: Silicon Alkyd Gloss Finish, applied on site.

Minium total dry film thickness 180 micron.

4. The treatments to be applied to the bearings at the works shall be continued or returned for at least 25mm on to surfaces which are to be permanently in contact with concrete.

5. The number of coats of paint comprising the system is indicative of requirements but may be varied at the time of tendering on form BES/P2 Paint System Sheet. In no case shall the total dry film thickness of the applied system or the minimum thickness of the last undercoat and the finish be less than that specified on BES/P2 Paint System Sheet. The minimum thickness specified for any one coat shall not be exceeded by more than 75 per cent.

6. Exposed ferrous fixings, bolts and nuts, if any shall be sheradised to BS 4921. After fixing they shall be protected by the site applied treatments.

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B6. NOTES FOR INSPECTION AND MAINTENANCE

EXAMPLE 4

SCHEME NAME:
BRIDGE NAME(S):
STRUCTURE REF NO(S)

Central Pier Base

Excavation to founding level revealed some small fissures in the underlying sandstone. These were cleaned out, inspected and grouted up prior to construction of the base slab. Further details are given in the report, sketch and correspondence following these notes.

Drainage

Bearing shelf drainage at abutments and centre pier should be inspected and cleared as necessary. The outlet pipes should be inspected and rodded. Gullies at base of abutments should be inspected and cleared as necessary. The rear face drainage layer outfalls by underground pipe to manholes. These outlets should be inspected to ensure they are functioning correctly. Any significant accumulations of silt and debris on the bearing shelf or in the drainage system should be noted and investigated.

Waterproofing

The bridge deck East service bay have a waterproof membrane of mastic asphalt. The West service bay invert is waterproofed with Conidec. Any defects in the deck surfacing should be investigated to assess possible damage to the waterproofing. The service bay cover slabs are covered by Bituthene and Bitushield. Deck waterproofing must remain intact for the reinforcement in the deck slab to be protected as required.

Joints

Sealants to expansion and movement joints should be checked for deterioration. The epoxy mortar transition strips should be checked for debonding or cracking. Holding down bolts to cover plates should be checked for tightness.

Bearings

Guides and dowels and rubber pot bearings should be inspected to ensure they are functioning correctly and to note any failure or excessive wear of moving elements. Metal sections of bearings, guides and dowels should be checked for corrosion and painted as necessary. Rubber bearings should be inspected to ensure that the rubber protection to the steel laminations has not cracked or debonded. The condition of the bearing seating material should also be checked. Holding-down bolts should be checked for tightness and any welds checked for cracking.

Alkali-Aggregate Reactivity

During the construction contract period The Scottish Office issued additional substitute specification clauses to cover potential alkali-aggregate problems. Messrs Sandberg carried out an assessment of the aggregates and concrete with particular reference to concrete mix details and cement contents. Calculations using the figures given in Sandberg's report with information from Rugby Cement gave total alkali contents for the Class 45/20 concrete marginally above the 3.0 kg/m^3 maximum recommended. Cement with a lower alkali content was used for the parapet edge beams. For the other mixes calculations gave total alkali contents less than 3.0 kg/m^3.

Further details are included in the appendix on Alkali-Aggregate Reactivity.

Services and Service Bays

The services carried on the deck are indicated on the drawings. Particular attention should be paid to the pipe bays to ensure they are properly drained and that services are not leaking. It should be noted that the pipe bays are not designed to carry backfill.

Vent pipes with flame traps lead from each service bay, to prevent pressure build up in the event of a mains failure.

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SPECIAL REQUIREMENTS : WALES
AS BUILT RECORDS, FORMS AND DATABASE

C.1 Introduction

1. This Appendix supersedes the contents of WOTRMM 2/88 which deal with As Built Records for trunk road structures.

2. As Built Records are a necessary requirement for the successful inspection and maintenance of road structures throughout their lives and the Engineer for each trunk road scheme should ensure that the As Built Records are carefully completed. The provision of adequate records of the works may make future investigations into their construction unnecessary. These records of the works should be prepared by site staff during the course of construction and should be finalised during the maintenance period.

3. A set of As Built Records for trunk road structures, as defined in this Appendix, shall be submitted to the Overseeing Organisation at the address below, within 6 months from the date of issue of the Maintenance Certificate:-

Welsh Office
Y Swyddfa Gymreig
Government Buildings
Ty Glas Road
Llanishen
Cardiff CF4 5PL

4. Network Management Division will record As Built Records received in the trunk road bridges database and will issue copies to the appropriate Maintaining Agent for retention by their bridges maintenance personnel.

5. As Built Records for each highway structure shall consist of the following:-

5.1 Two full sets of As Built Drawings on good quality A2 size paper (each marked "As Built Drawing" in red). These should be accompanied by list of all drawings submitted.

5.2 Two full sets of 35mm Silver Halide Microfilm "As Built" Drawings mounted on 18.5cm x 8cm standard indexed aperture card complying with BS4210: 1977. The structure name and structure reference number should be recorded on each aperture card together with the drawing title.

5.3 Two copies of the Structural Maintenance Manual. (For each Structure or Group of structures) - see C2 for required contents.

5.4 Two Prints of Photograph(s) (Completed Structure.) Colour Prints - not less than 150mm x 100mm.

5.5 One set of database input sheets As Built for the trunk road bridges database (please refer to the Trunk Road Bridges Database As Built Records Guide).

5.6 Two copies of GA drawings, A2 size, showing the extent of silane impregnation carried out and marked up with the following information:-

i. Date of impregnation

ii. Type of product (including specification)

iii. Manufacturer

iv. Application contractor

5.7 Two copies of Forms ROADS 277 (Rev 4/94) is required for each structure. For structures which consist of two or more sections due to widening or for long viaducts which have been subdivided into smaller elements, each element is regarded as being a separate structure and shall be treated accordingly.

6. A schedule of routine maintenance which is considered appropriate for the structure. Refer to Trunk road Maintenance Manual : Volume 2: Part 2 - Routine Maintenance of Highways Structures.

6.1 Information from Forms BE 11/94 is managed by WO and is held in a computerised database, the Welsh Office Trunk Road Bridges Database (WOTRBDB).

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6.2 For existing structures not in the ownership of the Department, Forms ROADS 277 shall be completed. The only details required are the location, a brief description and in the case of structures over the road, the headroom. Where there are difficulties in obtaining these from the owner, the forms may be supplied by the MA.

6.3 For new non-WO structures constructed as part of WO schemes, full records shall be completed for passing to the owner of the structure.

C2 STRUCTURAL MAINTENANCE MANUALS - REQUIRED CONTENTS

C.2.1 Introduction

i. For each structure or for a group of minor structures of similar design (eg culverts, sign gantries), the Engineer/Designer shall prepare an individual Manual of information from the design and construction phases which could have possible implications for future maintenance. This will be complementary to the As Built drawings.

ii. Any Special Maintenance/Inspection needs which have been assumed in the conception and design of the structure must be recorded in the Maintenance Manual with the information on the sections required and the frequency of these actions. eg. a Method Statement for Inspection and Maintenance work in confined spaces (eg. painting the inside of steel box girders).

C.2.2 Contents

i. **Location Plan**

The Engineer/Designer shall produce an outline description of the road structure(s) with a plan showing location.

ii. **Materials**

The following items should be considered for inclusion as appropriate. The lists are not exhaustive, and designers should consider adding other items which could be of value. The list should give the name and address of the supplier, sub-contractors, and where appropriate, the source. (Example 1 attached.)

a. For concrete, the list should include:

Cement; GGBFS; PFA; aggregates; ready mixed concrete; admixtures; concrete mix design; reinforcing bars; prestressing wire; strand or bar.

b. For steel, the list should include:

Plate; rolled sections; prefabricated steelwork, etc.

c. Sources of imported fill should be included.

iii. **Components**

The list should give the name of the manufacturer/ supplier/sub-contractor; the part number and manufacturer's drawing number if not given on the As Built Drawings. (Example 2 attached.)

Items should include:

Expansion joints; bearings; parapets; waterproofing systems; precast units; reinforced earth components; brick, precast or masonry facings; lighting systems; and moving bridge equipment.

Where appropriate the manufacturer's recommendations for inspection and maintenance should be included long with their product literature.

iv. **Certification and Test Records**

These should be grouped in Appendices or folders, and should include load test results on eg precast beams, piles, bearings etc mill certificates, cement analyses, cube test results (related to position on general arrangement drawings), sulphate content in the mix, chloride ion content in the mix and also alkali - aggregate reactivity/sodium oxide equivalent content in the mix.

v. **Paint**

A copy of contract specification Appendices 19/1 to 19/4 of the Specification for Highway Works for new works or clause 5009 for maintenance painting, and a copy of all BE Forms BE/P2 should be included. (Example 3 attached.)

vi. **Concrete Impregnation**

A list of members impregnated stating date of application, type of product, manufacturer and application contractor.

vii. **Concrete Surface Coatings**

A list of members coated stating date of application, type of product, manufacturer and application contractor.

viii. **Problems During Construction**

A short report, supplemented with instrument readings, sketches or photographs as appropriate, of problems encountered and solutions adopted during construction which could have repercussions on future maintenance should be included.

ix. **Inspection and Maintenance**

Short notes on inspection and maintenance needs for elements or components of the structure where problems or deterioration may occur if neglected or design loadings are not obvious. (Example 4 attached.)

x. **Access and Security**

Details, including drawings of access to the site, walkways, ladders, manholes etc and details of security measures adopted to prevent unauthorised access, should be included.

xi. **Land Plans**

Land Plans relating to construction and easement rights for maintenance. Any other local agreement made during the construction should also be listed.

xii. **Future Assessment**

Adequate records (including Approval in Principal details) shall be provided of the construction sequence and the construction joint positions where these may influence future assessment.

C3 MATERIALS

EXAMPLE 1

SCHEME NAME:
BRIDGE NAME(S):
STRUCTURE REF NO(S):

Main Contractor:

MATERIALS SUPPLIERS/SOURCE

Material (enter all materials used)	***Supplier's Name and Address***	***Source Name and Address***
Concrete (Ready Mixed)		
Cement for concrete *i. insitu* *ii. precast*		
Coarse and fine aggregates for concrete *i. insitu* *ii. precast*		
Reinforcement *i. insitu* *ii. precast*		
Granular backfill		
etc		

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C.4 COMPONENTS AND PRODUCTS

EXAMPLE 2/1

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

JOINTS

Joint Location	***Relevant Drawing Nos: Contract Reference No:***	***Product***	***Manufacturer's Name and Address***
Deck/North Abutment Joint			
Deck/South Abutment Joint			
Deck Joint over pier			
Joints at pre-cast cover			
Sub-structure joints			
etc			

C4. COMPONENTS AND PRODUCTS

EXAMPLE 2/2

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

PARAPETS

Parapet Type	*Fabricator and Erector's Name and Address*	*Manufacturer's Drawings*	*Manufacturer's Name and Address*

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C4. COMPONENTS AND PRODUCTS

EXAMPLE 2/3

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

BRIDGE BEARINGS

Bearing Types	***Drawing No.*** _____ ***Contract Reference No.***	***Manufacturer's Reference Number***	***Manufacturer's Name and Address***
Rubber Pot Bearings			
Guides and Dowels			
Elastomeric Bearings			
etc			

C4. COMPONENTS AND PRODUCTS

EXAMPLE 2/4

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

WATERPROOFING

Component/Product/Material (enter all components/ products/materials used)	*Installer Name and Address*	*Manufacturer/Supplier /Source Name and Address*
Mastic asphalt to decks		
Bitumen paint to buried faces Colas Leoseal		
Permabit 60 and Permashield		
Heavy duty Bituthene and Bitushield		

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C4. COMPONENTS AND PRODUCTS

EXAMPLE 2/5

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S):

MISCELLANEOUS

Component/Product/Material (enter all components/ products/materials used)	*Manufacturer/Supplier/Source (Name and address required)*
Pre-stressed Concrete Beams incorporating *Reinforcement from* *Prestressing strand from* *Concrete from*	
Permeable Backing	
Sand and Gravel Type A	
Ductile Iron Manhole Covers Gratings and Frames	
Aquamax gully combinations	
Pre-cast Concrete Cover Slabs (Service Bays on Bridges)	
GRP Formwork Mould (Patterned profile P7/F4)	
Epoxy Mortar (Bedding to bearings, cover plates etc) *SBD Epoxy Plus Contract Mortar*	
Cement Mortar (Bedding to bearing etc) *SBD Five Star Grout*	

C5. PROTECTION OF STEELWORK - CONTRACT SPECIFICATION 1900

EXAMPLE 3

SCHEME NAME:
BRIDGE NAME(S)
STRUCTURE REF NO(S)

PROTECTION OF STEELWORK AGAINST CORROSION

1910 Protective Systems

1. Environment: Exposure to road salts and grit.

2. Required durability of systems:

No maintenance: Up to 5 years
Minor maintenance: Between 5 and 8 years
Major maintenance: After 8 years

3. Paint system - metal bearings

Surface preparation: Blast clean 1st Quality BS 4232

Metal coating: Aluminium spray, applied at works

1st coat: Zinc Chromate etch primer, 2 packs, applied at works.

2nd coat: Zinc Phosphate Epoxy Ester, applied at works.

3rd coat: Zinc Phosphate Epoxy Ester, applied at works

4th coat: Silicon Alkyd Undercoat, applied on site.

5th coat: Silicon Alkyd Gloss Finish, applied on site.

Minium total dry film thickness 180 micron.

4. The treatments to be applied to the bearings at the works shall be continued or returned for at least 25mm on to surfaces which are to be permanently in contact with concrete.

5. The number of coats of paint comprising the system is indicative of requirements but may be varied at the time of tendering on form BES/P2 Paint System Sheet. In no case shall the total dry film thickness of the applied system or the minimum thickness of the last undercoat and the finish be less than that specified on BES/P2 Paint System Sheet. The minimum thickness specified for any one coat shall not be exceeded by more than 75 per cent.

6. Exposed ferrous fixings, bolts and nuts, if any shall be sheradised to BS 4921. After fixing they shall be protected by the site applied treatments.

C6. NOTES FOR INSPECTION AND MAINTENANCE

EXAMPLE 4

SCHEME NAME:
BRIDGE NAME(S):
STRUCTURE REF NO(S)

Central Pier Base

Excavation to founding level revealed some small issures in the underlying sandstone. These were cleaned out, inspected and grouted up prior to construction of the base slab. Further details are given in the report, sketch and correspondence following these notes.

Drainage

Bearing shelf drainage at abutments and centre pier should be inspected and cleared as necessary. The outlet pipes should be inspected and rodded. Gullies at base of abutments should be inspected and cleared as necessary. The rear face drainage layer outfalls by underground pipe to manholes. These outlets should be inspected to ensure they are functioning correctly. Any significant accumulations of silt and debris on the bearing shelf or in the drainage system should be noted and investigated.

Waterproofing

The bridge deck East service bay has a waterproof membrane of mastic asphalt. The West service bay invert is waterproofed with Permabit and Permashield. Any defects in the deck surfacing should be investigated to assess possible damage to the waterproofing. The service bay cover slabs are covered by Bituthene and Bitushield. Deck waterproofing must remain intact for the reinforcement in the deck slab to be protected as required.

Joints

Sealants to expansion and movement joints should be checked for deterioration. The epoxy mortar transition strips should be checked for debonding or cracking. Holding down bolts to cover plates should be checked for tightness.

Bearings

Guides and dowels and rubber pot bearings should be inspected to ensure they are functioning correctly and to note any failure or excessive wear of moving elements. Metal sections of bearings, guides and dowels should be checked for corrosion and painted as necessary. Rubber bearings should be inspected to ensure that the rubber protection to the steel laminations has not cracked or debonded. The condition of the bearing seating material should also be checked. Holding-down bolts should be checked for tightness and any welds checked for cracking.

Alkali-Aggregate Reactivity

During the construction contract period The Scottish Office issued additional substitute specification clauses to cover potential alkali-aggregate problems. Messrs Sandberg carried out an assessment of the aggregates and concrete with particular reference to concrete mix details and cement contents. Calculations using the figures given in Sandberg's report with information from Rugby Cement gave total alkali contents for the Class 45/20 concrete marginally above the 3.0 kg/m^3 maximum recommended. Cement with a lower alkali content was used for the parapet edge beams. For the other mixes calculations gave total alkali contents less than 3.0 kg/m^3.

Further details are included in the appendix on Alkali-Aggregate Reactivity.

Services and Service Bays

The services carried on the deck are indicated on the drawings. Particular attention should be paid to the pipe bays to ensure they are properly drained and that services are not leaking. It should be noted that the pipe bays are not designed to carry backfill.

Vent pipes with flame traps lead from each service bay, to prevent pressure build up in the event of a mains failure.

FORM ROADS 277 - EXPLANATORY NOTES

General

All entries should be completed without ambiguity. In particular, dashes shall be avoided unless the meaning is quite clear. The forms ROADS 277 must be fully consistent. Completed examples can be found at the end of this Appendix. If any item is unknown, a note shall be made to that effect at that point in the form. A blank is not helpful.

The design loading should specify which version of the standard has been used.

The Form ROADS 277 must contain the details to enable the codes to be derived for the data base. In many cases this will mean a special simplified sketch which will show the positions and types of bearings and joints for example. A reduced photocopy of an original GA will not suffice when this does not contain the level of detail required or where original components such as waterproofing and parapets have been replaced.

Widened Structures

For widened structures each part is regarded as being a separate structure and a Form ROADS 277 and BE 13/94 should be produced for each. For inspection and maintenance and assessment work each structure must be treated separately. In order to differentiate between bridges which have been widened the original part retains its number and new parts given a suffix of 'A', 'B' etc, providing that the widened parts are continuous with the original to make what is in effect a single bridge. If the widening has been carried out by building a completely separate bridge which is discontinuous with the existing structure, the original bridge carried a suffix 'A' and the new bridge a suffix 'B'. For structures other than bridges, the widened parts are given a suffix '1', '2' etc.

Twin Deck Bridges

Bridges which have been constructed with twin decks which are regarded as being two structures, even if the abutments are common to both.

Split Bridges

Long structures such as large viaducts or sections of elevated road may have been split into smaller sections for historical reasons or for convenience. In this case, each section is regarded as being a separate structure and inspection reports, maintenance bids etc must be produced for each section. Each section is differentiated from the previous by use of a suffix '1', '2' etc or by the kilometerage.

Headroom

It is important that the headroom is measured in strict accordance with TD 27 (DMRB 6.1) to take into account the effect of crossfall and camber and that the headroom over the hard shoulder should also be recorded in the maintenance manual in case it is necessary to use the hard shoulder during road works. This is particularly relevant in the case of framed or arched bridges where the headroom reduces towards the end supports.

THE WELSH OFFICE
Y SWYDDFA GYMREIG

Structure Name DOGS LANE

ROADS 277 (Rev 4/94)

WO Structure No: A483 110 C26
National Grid Ref: 297312 201422
County/Borough: GWENT
WO File Reference: 13 A1
Date of Issue of form:

Maintaining Agent:
For Structure: GWENT C.C.
For Road Surface: GWENT C.C.
Maintaining Agent Structure Ref: M 999/1

Date of Last Principal Inspection: 14-SEP-1990
Structure Owner (If not HA):

Year Structure Commissioned: 1984
Design Office: PVH & PARTNERS
Does the road go *over/under* *Railway, Canal, River, Road?: M.999
Railway Bridge Number:
Is the Canal tidal? yes ☐ no ☑
Is the Canal navigable? yes ☑ no ☐
Name of Navigation/Drainage Authority: BRITISH WATERWAYS

Is the structure susceptible to scour? yes ☐ no ☑
Is the Structure on the High Load Route? yes ☐ no ☑
Is the Structure on the Heavy Load Route? yes ☑ no ☐
Is the structure scheduled as an Ancient Monument? yes ☐ no ☑

Name of Statutory undertakers having services on bridge:
B. T.
N. W. E. B.

*Please delete as necessary

Min Headroom Clearance* under/over
*Motorway/Trunk Road carriageways
*N. Bound / W. Bound: 5.27
S. Bound / E. Bound: 5.30
*Please delete as necessary

Design load: HA + 45 HB
Design standard version:
*Special loading/restriction:

Construction Details

Materials: Deck / Wall / Mast etc (eg In situ PSC):
SPANS 1, 2, 3, 4 & 6 – R.C. SPAN 2 (PART) PRECAST R.C.
SPAN 5 PRETENSIONED, PRESTRESSED 'M' BEAMS WITH INSITU R.C.

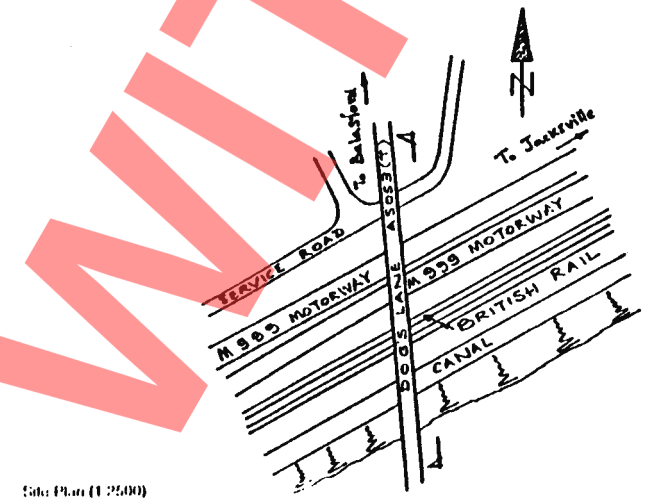
Type of Construction (eg Solid Slab):
SPANS 1, 3, 4 & 6 VOIDED SLAB, SPAN 2 SOLID SLAB
SPAN 5 BEAM & SLAB

Form of Deck (eg Propped Cantilever):
SPANS 1, 3 & 4 CONTINUOUS, SPAN 2 CANTILEVER & SUSPENDED
SPANS 5 & 6 SIMPLY SUPPORTED

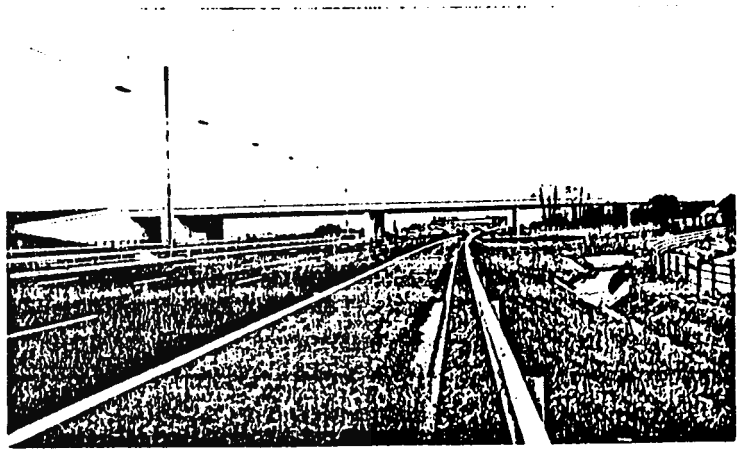
End Supports (eg Skeleton Abutment):
SOUTH END R.C. BANK SEAT
NORTH END R.C. CANTILEVER ABUTMENT

Intermediate Supports (eg Slab Wall):
SPAN 2: CONCRETE COLUMN / SLAB WALL, SPAN 3: SLAB WALL
SPAN 4: SLAB WALL / TEE HEAD COLUMN, SPAN 5: TEE HEAD COLUMNS

Nature of Foundations (eg Caissons):
600 DIA. CAST IN PLACE PILES EXCEPT WITH ABUTMENT
WHICH IS SPREAD FOOTING



Site Plan (1:2500)



Photograph

PTO

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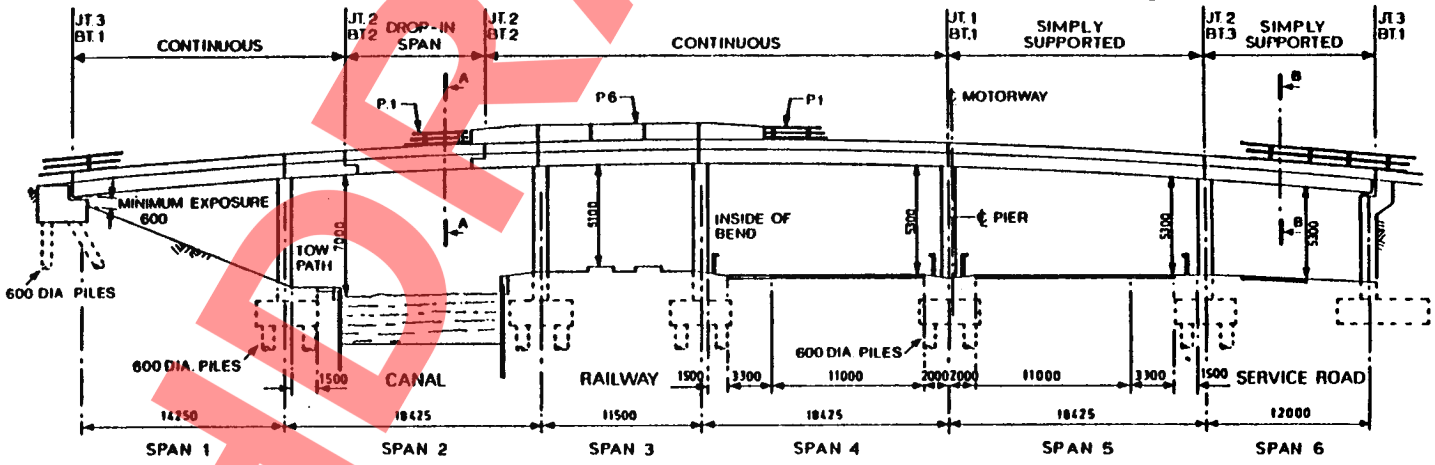
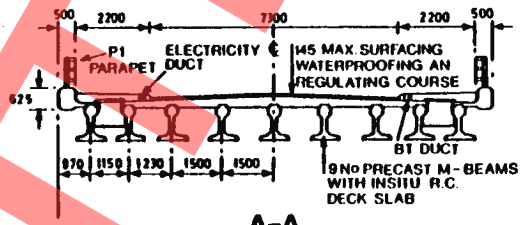
Dimensional Elevation, Cross Section and Components of Structure.
Indicate all materials of construction, eg steel wrought iron, cast iron, concrete, brick, stone, etc.
Indicate roadway and pavement widths of the reference road and also of the crossing road where appropriate (include spans).
Indicate type and position of bearings and joints.

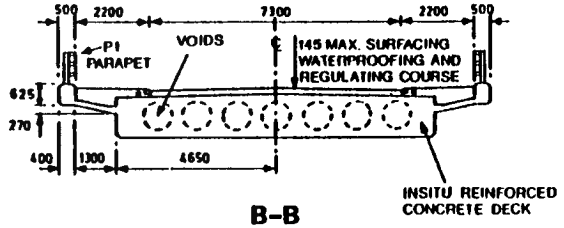
Dimensional Elevation and Cross Section of Bridge



ELEVATION



A–A



B–B

		Manufacturer	Type
Prestressing System		DOWMAC	M. BEAMS
Paint System:	Parapet	CROWN	P.78 GALVANISED COATED WITH ACRYLIC RUBBER
	Internal	N/A	N/A
	External	N/A	N/A

	Manufacturer	Type	Position
Bearings*	ANDRE RUBBER	PTFE SLIDING ELASTOMERIC PLAIN	BT. 1 BT. 2
	— · — · —	ELASTOMERIC MONOPLATE	BT. 3
Joints*	MAURER (UK)	D 80 N SINGLE ELEMENT	JT. 1
	FEISMO	THERMAJOINT	JT. 2
	USL	TRANSFLEX	JT. 3
Parapets	BRITISH STEEL	P. 1	—
	UNKNOWN	P. 6 CONCRETE	—
Waterproofing	EXPANDITE	FAMGUARD	—
			—

* Indicate on sketch above.

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SPECIAL REQUIREMENTS : NORTHERN IRELAND

D1 As Built, Maintenance and Alteration Records Database

D1.1 The Data to be recorded for new, existing or altered Highway Structures shall be in accordance with the requirements set out in the Bridge Management and Maintenance Information Technology System for Northern Ireland.