



Janet T. Mills
GOVERNOR

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0016

Dale F. Doughty
ACTING COMMISSIONER

January 29, 2026
Subject: Bridge Construction
WIN: 016714.02
Location: **Machias**
Amendment No. 1

Dear Sir/Ms.:

REMOVE pages 17-24 “**CONTRACT AGREEMENT OFFER & AWARD**”, two copies, and **REPLACE** with the attached revised “**CONTRACT AGREEMENT OFFER & AWARD**”, two copies, 4 pages each, dated January 27, 2026.

REMOVE page 40, “**SPECIAL PROVISION, SECTION 104, GENERAL RIGHTS AND RESPONSIBILITIES**”, from the bid book, and **REPLACE** with the attached revised “**SPECIAL PROVISION, SECTION 104, GENERAL RIGHTS AND RESPONSIBILITIES**”, 1 page, dated January 27, 2026.

REMOVE page 41, “**SPECIAL PROVISION, SECTION 105, LIMITATIONS OF OPERATIONS**”, from the bid book, and **REPLACE** with the attached revised “**SPECIAL PROVISION, SECTION 107, LIMITATIONS OF OPERATIONS**”, 1 page, dated January 27, 2026.

REMOVE page 42, “**SPECIAL PROVISION, SECTION 107, CONTRACT TIME**”, from the bid book, and **REPLACE** with the attached revised “**SPECIAL PROVISION, SECTION 107, CONTRACT TIME**”, 1 page, dated January 27, 2026.

REMOVE page 45, “**SPECIAL PROVISION, SECTION 202, REMOVING EXISTING BRIDGE**”, from the bid book, and **REPLACE** with the attached revised “**SPECIAL PROVISION, SECTION 202, REMOVING EXISTING BRIDGE**”, 1 page, dated January 27, 2026.

The following questions have been received:

Question: Are the substructure components (footings, wing walls & abutments) meant to be Cast in Place or Precast.

Response: The plans show the footings, wing walls & abutments to be precast. The contractor may submit a cast-in-place alternative after the contract award. This will be done by contract modification at no increase to the project cost.

Question: Special Provision sections 104 & 107 state the completion date is May 1, 2026. **The project cannot be completed in this allotted timeframe; we are assuming this is a Typo and is supposed to indicate completion date of May 1, 2027; confirm our understanding?**

Response: The completion date has been extended to **June 1, 2026**, with a requirement to open Route 1 to 2 lanes of traffic by May 1, 2026. Special Provision 104 – General Rights and Responsibilities, Special Provision 105 – General Scope of Work, and Special Provision 107 – Time shall be removed in their entirety and replaced with the attached Special Provisions.

Question: Plan sheets 13 & 14 identify temporary barrier anchoring. There is not enough detail to properly plan and price these connections. It appears these are anchored with thread bar either through (modified) barrier with thru-sleeves, or at the ends where the thread bar anchors would also act as the pin connections between the barrier. **Provide more detail to price and plan this work.**

Response: The temporary barriers shall have full height sleeves to accommodate a 1 1/8" diameter Threadrod. On top of the temporary concrete barrier shall be a 5" x 5" x 1" galvanized plate washer and a nut on the threadrod snug tight with Loctite 272 Permanent Threadlocker.

Question: Plan sheet 11 note 2 states to place two shims on each of the six footing pieces. **Is this a typo intended to say “...at the six splice locations on each footing piece”?** The Assembly Section below this note seems to show two shims at each of the “Six” rebar/splice locations.

Response: Yes, this is a typo. The first sentence of note 2 on plan sheet 11 shall read **“Install two 3x3 UHMW shim packs on each if the rebar splice locations approximately centered.”** Make this change in pen and ink.

Question: Please provide the specifications of the in-place MAYBE bridge including dimensions, unit weights etc., and any assembly/disassembly documents.

Response: Attached is a photo of the site and manual for the MABEY Bridge.



Question: Plan sheet 11 calls for placing “Dry Pack Grout” between the abutment footing block and abutment/wings; including between the shim packs. **Is using a flowable grout and/or wet-setting the segments into the grout an acceptable alternative?**

Response: Flowable grout and/or wet setting the segments into the grout are acceptable.

Question: There are currently temporary concrete barriers acting as retaining walls for the approach fills. **Is the department retaining ownership of these and are they to be delivered to the DOT at a certain location? Where is work related to these barriers paid for?**

Response: The Department is retaining ownership of the concrete barriers in the existing approaches. The location and method of payment are in the new Special Provision 202. The Special Provision 202 – Removing Existing Bridge shall be removed in its entirety and replaced with the attached Special Provision.

Question: On the plan sheets showing cross sections of the approaches, it appears that pavement is to continue down the side-slopes to the extents of the box cuts/fills; **please confirm this is the expectation.**

Response: To clarify the pavement limits should be as follows:

At station 11+50, pavement limits are from edge of box cut to edge of box cut and outside of those limits is pavement everywhere at this location.

At Station 12+00 to Abutment #1, pavement limits are from 18ft left to 18 feet right and the side slopes get 4" of erosion control mix.

At Abutment #2 to Station 14+00, pavement limits are 18 feet left to 18 feet right with erosion control mix on the slopes.

At Station 14+50, pavement limits are from 18 feet left to 19.5' Right and erosion control mix is on the slopes.

At Station 15+00, pavement limits are from 18 feet left to 18.5' Right and erosion control mix is on the left slope the right pavement limit ties in with existing pavement.

At Station 15+50, pavement limits are 20.25' left to 19 feet right with erosion control mix on the left slope and the right side pavement butting with existing pavement

At Station 16+00, pavement limits are from 18 feet left to 16 feet right with erosion control mix on the slope on the left and the right side pavement ties into the existing pavement.

At Station 16+50, pavement limits are 16 feet left and 16 feet right "match existing".

Question: On the profile plan sheet 3, the new finish grade under the bridge will be approximately elevation 9', and it appears to be lower than the adjacent existing old road, not in use, and the rail trail. **What are the limits of this excavation for clearance under the new bridge on the North side of the new bridge?**

Response: To the north of the bridge, the excavation limits are to be one foot north of the end of the abutment.

Question: No hydrology is provided; however, it appears the abutment footing excavation could be close to high tide. **Is the high tide expected to be below the abutment excavation? Are the tide elevations available?**

Response: Normal High Tide is expected to be approximately 3" over the bottom of the footing based on historical plans and current survey data.

Question: We have not noticed any restrictions relative to weight and/or equipment over the existing buried culvert system that the MAYBE bridge spans over. **Are there any restrictions for equipment traveling and/or working over the existing culvert system below the causeway?**

Response: The only limitations over the buried timber structure are located in the General Notes, on page 34 of the Spec Book. "No construction vehicles or stock piling of material over the limits of the existing timber structure."

Question: Would the Department consider allowing a temporary suspension of work or an extension to the completion date due to potential HMA plant startup delays and early-season weather and temperature conditions?

Response: The completion date has been moved to June 1, 2026, with a requirement to open Route 1 to 2 lanes of traffic by May 1, 2026. Special Provision 104 – General Rights and Responsibilities, Special Provision 105 – General Scope of Work, and Special Provision 107 – Time shall be removed in their entirety and replaced with the attached Special Provisions.

Consider these changes and information prior to submitting your bid on **February 4, 2026.**

Sincerely,



George M. A. Macdougall P.E.
Contracts & Specifications Engineer

CTM: _____
TEDOCS# _____
CSN _____
AWP _____

1/27/2026

CONTRACT AGREEMENT, OFFER & AWARD

AGREEMENT made on the date last signed below, by and between the State of Maine, acting through and by its Department of Transportation (Department), an agency of state government with its principal administrative offices located at Child Street, Augusta, Maine, with a mailing address at 16 State House Station, Augusta, Maine 04333-0016, and _____(Contractor) a corporation or other legal entity organized under the laws of the State of _____, with its principal place of business located at _____.

The Department and the Contractor, in consideration of the mutual promises set forth in this Agreement (the "Contract"), hereby agree as follows:

A. The Work.

The Contractor agrees to complete all Work as specified or indicated in the Contract including Extra Work in conformity with the Contract, **WIN 016714.02 for Bridge Construction in the Town of Machias, County of Washington**, Maine. The Work includes construction, maintenance during construction, warranty as provided in the Contract, and other incidental work.

The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **June 1, 2026**. Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

_____ Performance Bond and Payment Bond each being 100% of the amount of this Contract.

D. Contract.

This Contract, which may be amended, modified, or supplemented in writing only, consists of the Contract documents as defined in the Plans, *Standard Specifications, March 2020 Edition, Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds. It is agreed and understood that this Contract will be governed by the documents listed above.

E. Certifications.

By signing below, the Contractor hereby certifies that to the best of the Contractor's knowledge and belief:

1. All of the statements, representations, covenants, and/or certifications required or set forth in the Bid and the Bid Documents, including those in the Contract are still complete and accurate as of the date of this Agreement.
2. The Contractor knows of no legal, contractual, or financial impediment to entering into this Contract.
3. The person signing below is legally authorized by the Contractor to sign this Contract on behalf of the Contractor and to legally bind the Contractor to the terms of the Contract.

F. Offer.

The undersigned, having carefully examined the site of work, the Plans, *Standard Specifications March 2020 Edition*, *Standard Details March 2020 Edition* as updated through advertisement, Supplemental Specifications, Special Provisions, Contract Agreement; and Contract Bonds contained herein for construction of:

WIN 016714.02 for Bridge Construction in the Town of Machias, County of Washington,

State of Maine, on which bids will be received until the time specified in the “Notice to Contractors” do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached “Schedule of Items.”

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached “Schedule of Items” in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached “Schedule of Items,” which may be ordered by the Resident, and to accept as full compensation the amount determined upon a “Force Account” basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier’s check, certificate of deposit or U. S. Postal Money Order in the amount given in the “Notice to Contractors”, payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Fifth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

Date

(Signature of Legally Authorized Representative
of the Contractor)

Witness

(Name and Title Printed)

G. Award.

Your offer is hereby accepted.
documents referenced herein.

This award consummates the Contract, and the

MAINE DEPARTMENT OF TRANSPORTATION

Date

By: Dale F. Doughty, Commissioner

Witness

CTM: _____
TEDOCS# _____
CSN _____
AWP _____

1/27/2026

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The Contractor shall be responsible for furnishing all supervision, labor, equipment, tools supplies, permanent materials and temporary materials required to perform the Work including construction quality control including inspection, testing and documentation, all required documentation at the conclusion of the project, warranting its work and performing all other work indicated in the Contract.

The Department shall have the right to alter the nature and extent of the Work as provided in the Contract; payment to be made as provided in the same.

B. Time.

The Contractor agrees to complete all Work, except warranty work, on or before **June 1, 2026**. Further, the Department may deduct from moneys otherwise due the Contractor, not as a penalty, but as Liquidated Damages in accordance with Sections 107.7 and 107.8 of the *State of Maine Department of Transportation Standard Specifications, March 2020 Edition* and related Special Provisions.

C. Price.

The quantities given in the Schedule of Items of the Bid Package will be used as the basis for determining the original Contract amount and for determining the amounts of the required Performance Surety Bond and Payment Surety Bond, and that the amount of this offer is _____

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State of Maine, on which bids will be received until the time specified in the “Notice to Contractors” do(es) hereby bid and offer to enter into this contract to supply all the materials, tools, equipment and labor to construct the whole of the Work in strict accordance with the terms and conditions of this Contract at the unit prices in the attached “Schedule of Items.”

The Offeror agrees to perform the work required at the price specified above and in accordance with the bids provided in the attached “Schedule of Items” in strict accordance with the terms of this solicitation, and to provide the appropriate insurance and bonds if this offer is accepted by the Government in writing.

As Offeror also agrees:

First: To do any extra work, not covered by the attached “Schedule of Items,” which may be ordered by the Resident, and to accept as full compensation the amount determined upon a “Force Account” basis as provided in the *Standard Specifications, March 2020 Edition*, and as addressed in the contract documents.

Second: That the bid bond at 5% of the bid amount or the official bank check, cashier’s check, certificate of deposit or U. S. Postal Money Order in the amount given in the “Notice to Contractors”, payable to the Treasurer of the State of Maine and accompanying this bid, shall be forfeited, as liquidated damages, if in case this bid is accepted, and the undersigned shall fail to abide by the terms and conditions of the offer and fail to furnish satisfactory insurance and Contract bonds under the conditions stipulated in the Specifications within 15 days of notice of intent to award the contract.

Third: To begin the Work as stated in Section 107.2 of the *Standard Specifications March 2020 Edition* and complete the Work within the time limits given in the Special Provisions of this Contract.

Fourth: That this offer shall remain open for 30 calendar days after the date of opening of bids.

Fifth: The Bidder hereby certifies, to the best of its knowledge and belief that: the Bidder has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of competitive bidding in connection with its bid, and its subsequent contract with the Department.

IN WITNESS WHEREOF, the Contractor, for itself, its successors and assigns, hereby execute this Agreement and thereby binds itself to all covenants, terms, and obligations contained in the Contract Documents.

CONTRACTOR

Date

(Signature of Legally Authorized Representative
of the Contractor)

Witness

(Name and Title Printed)

G. Award.

Your offer is hereby accepted.
documents referenced herein.

This award consummates the Contract, and the

MAINE DEPARTMENT OF TRANSPORTATION

Date

By: Dale F. Doughty, Commissioner

Witness

SPECIAL PROVISION
SECTION 104
GENERAL RIGHTS AND RESPONSIBILITIES

104.4.10 Coordination of Bridge Closure Notification

US Route 1 may be closed to traffic for a maximum of 30 calendar days. Roadway may be opened with traffic on gravel or temporary pavement. Final roadway grading and paving may take place during single lane traffic closures using flaggers.

The contractor shall notify the public officials, public agencies, and organizations as listed in section 104.4.10 of the MaineDOT Standard Specification (March 2020) two weeks in advance of the date on which the road will be closed.

Route 1 shall be opened to two lanes of traffic by **May 1, 2026**.

All work shall be completed before **June 1, 2026**.

See Special Provision 107 for Liquidated Damages.

SPECIAL PROVISION
SECTION 105
GENERAL SCOPE OF WORK
(Limitations of Operations)

The Contractor's traffic control plan must be operationally effective, complete and in conformity with Federal requirements, Contract provisions, the current edition of the MUTCD and Department policy and procedures as determined by the Department prior to beginning work.

A Preconstruction meeting must be held prior to any work being started.

A Preplacement meeting must be held prior to any delivery or placement of concrete.

A 48-hour notice is required for any change in work schedule.

The road may be closed to traffic for up to 30 calendar days. Route 1 shall be opened to two lanes of traffic by **May 1, 2026**.

At least one lane traffic shall be maintained through the project areas at all times, when the detour is not in place or when Work is to be performed in a work area not included in the detour. The minimum roadway width shall be 12'0".

Message Boards shall be installed and operational 2 weeks prior to the start of work.

Notification must be made to the Town of Machias 2 weeks prior to the start of work.

Inspections by MaineDOT will be done at key points to be determined by the Department. The Contractor shall plan operations so that the Department will have sufficient advance notification of daily work schedules to provide the necessary inspection and testing. Sufficient notification will be considered 48 hours, unless otherwise agreed by the Department.

SPECIAL PROVISION
SECTION 107
TIME
(Contract Time)

Section 107 – TIME of the 2020 Standard Specifications shall apply in its entirety. The following directives shall be followed by the contractor in addition to the Standard Specifications:

The Contractor shall be allowed to commence Work on the Contract provided that the Contract has been awarded, all required plans/submittals have been received and determined to be acceptable by the Department, and a preconstruction meeting has been held.

The specified Contract Completion Date is **June 1, 2026**. All Work must be Complete by the Contract Completion Date specified in the Contract, and any authorized extensions.

The Contractor must notify the Department 48 hours prior to working any Saturdays or Sundays.

Completion of Physical Work occurs when the Work is complete and has undergone a successful final inspection. Liquidated Damages will cease upon the physical completion of the Work. Completion occurs when the Contractor has finished all Work pursuant to the Contract, the Work is complete and undergone a successful final inspection and delivered documentation is complete and accepted. Completion does not mean substantial Completion.

SPECIAL PROVISION
SECTION 202
REMOVING EXISTING BRIDGE

202.03 Removing Existing Superstructure, Structural Concrete, Railings, Curbs, Sidewalks and Bridge. The following is added to this subsection:

The Contractor shall schedule the dismantling of the MABEY Bridge Structure and the prompt return of all components as soon as possible after the MABEY Bridge Structure is no longer required.

The Contractor shall remove and disassemble the MABEY Bridge Structure. The complete bridge will be cleaned by high pressure water spray. After disassembly, pins and pin holes shall be lubricated with light grease and the MABEY Bridge Structure shall be placed on pallets and securely bound to the pallets, ready for shipping. The size of the pallets shall be such that no damage will occur to the pallets or the materials stored on them. Parts too large to fit on pallets shall be transported as directed. The Contractor shall provide wooden boxes with covers for loose, small parts. All parts shall be sorted by part type. All pallets and wooden boxes shall be labeled with a list of parts included and an inventory master list with all parts listed shall be provided to the Resident.

The Contractor shall transport the MABEY Bridge components and any concrete barriers in the existing approaches to the Department's storage yard in Hancock, Maine located at 327 Thorsen Road. One week prior to delivering the components, contact Shawn Brann (207-592-5746) who will provide notification to the Region and assistance in locating the steel on the lot.

202.08 Basis of Payment The following is added to this subsection:

The accepted quantity of removing the MABEY Bridge System shall be paid for at the contract unit price, such payment being full compensation for all labor, materials, equipment, and incidentals necessary to complete the work.

The accepted quantity of removing the concrete barriers in the approaches shall be paid for at the contract unit price, such payment being full compensation for all labor, materials, equipment, and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>		<u>Unit</u>
202.19	Removing Existing Bridge	LS



MABEY COMPACT BAILEY BRIDGE SYSTEM

COMPACT 200 MANUAL



THE QUALITY STANDARD FOR
STEEL BRIDGE COMPONENTS

PREVIOUS AWARDS 1972 1978 1987

Publication Reference. 90C2 — **SEPTEMBER 1990**

MABEY & JOHNSON LTD. Floral Mile, Twyford, Reading, England. RG10 9SQ
Telephone Reading(0734) 403921 Fax(0734)403941 Telex 848649MABEY T G

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I N T R O D U C T I O N

The **MABEY COMPACT BAILEY BRIDGE SYSTEM** is now established worldwide, a tribute to its superiority over all other types of panel bridging.

It is the latest and most advanced form of Bailey bridging which has been designed and developed by Mabey Engineers.

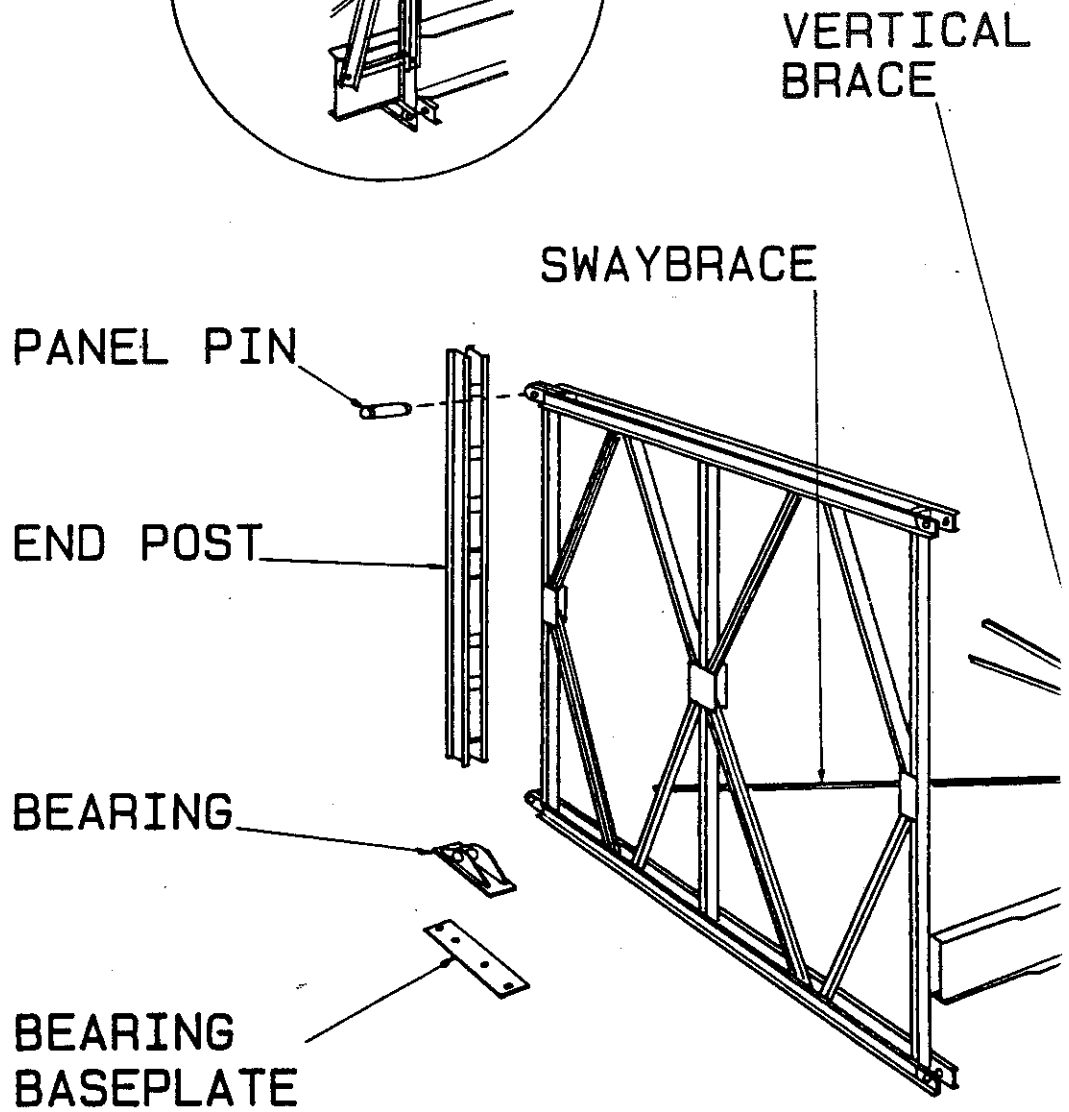
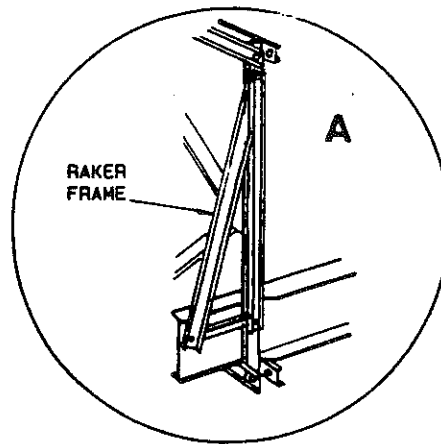
Factors contributing to the overall success and popularity of the **MABEY COMPACT BAILEY BRIDGE SYSTEM** are, the improved load carrying capacity, enhanced fatigue life, greater stability, increased safety and low level of in-service maintenance required. There are also fewer components than with other similar systems, thus facilitating faster and more efficient erection.

All of these benefits are the result of an extensive research and development programme, culminating in a series of full scale tests to demonstrate the capabilities of the bridge.

The **MABEY GROUP OF COMPANIES** has more than 130 years of experience in bridge building, and this expertise is at your service to provide the best and most effective solution to your bridging requirements.

On many occasions that solution will be the **MABEY COMPACT BRIDGE**.

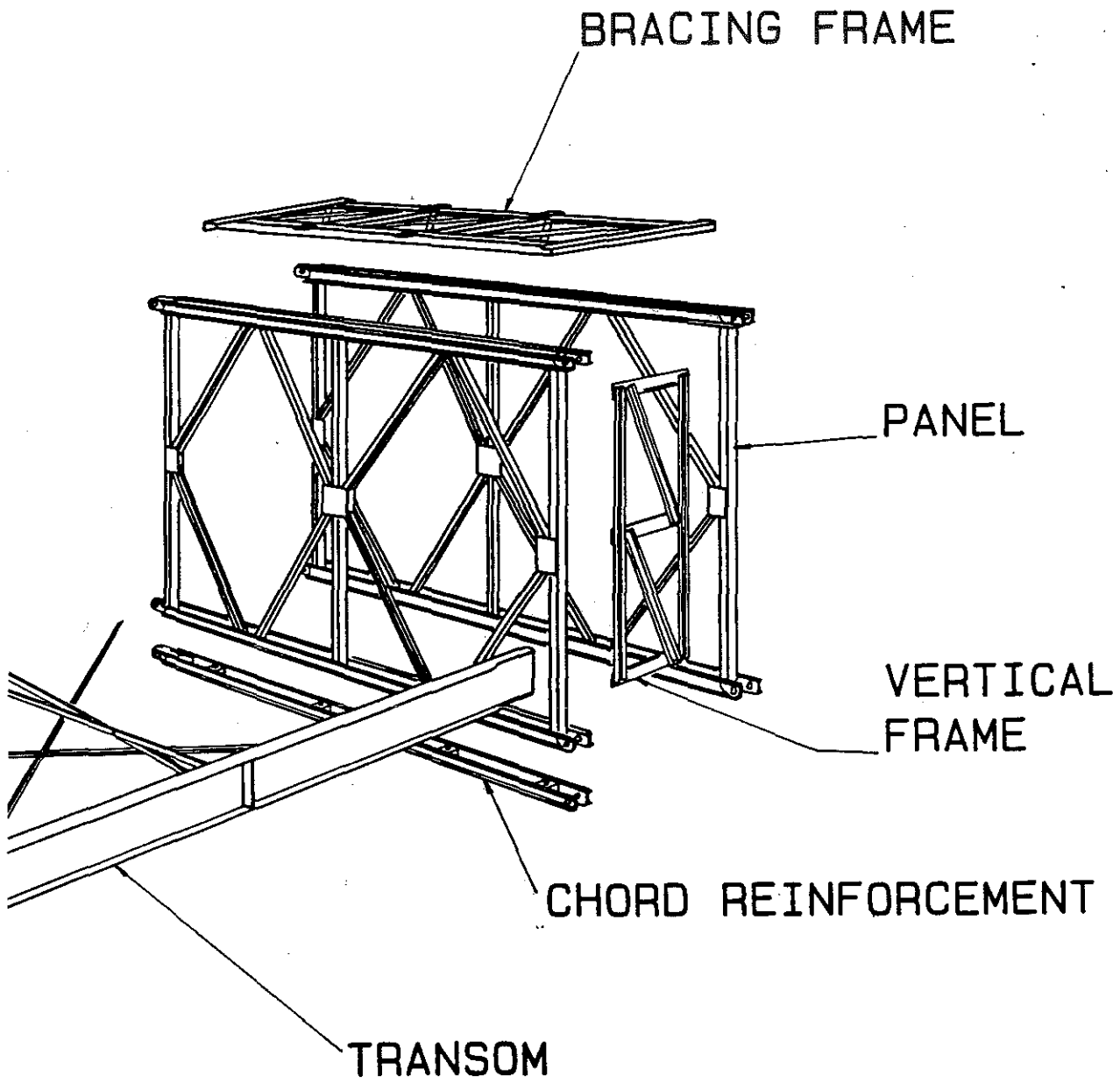
M A B E Y



RAKER FRAME

OMITTED FOR CLARITY
SEE DETAIL A ABOVE

BASIC BRIDGE COMPONENTS



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RECENT IMPROVEMENTS

1. COMPACT 200 PANELS

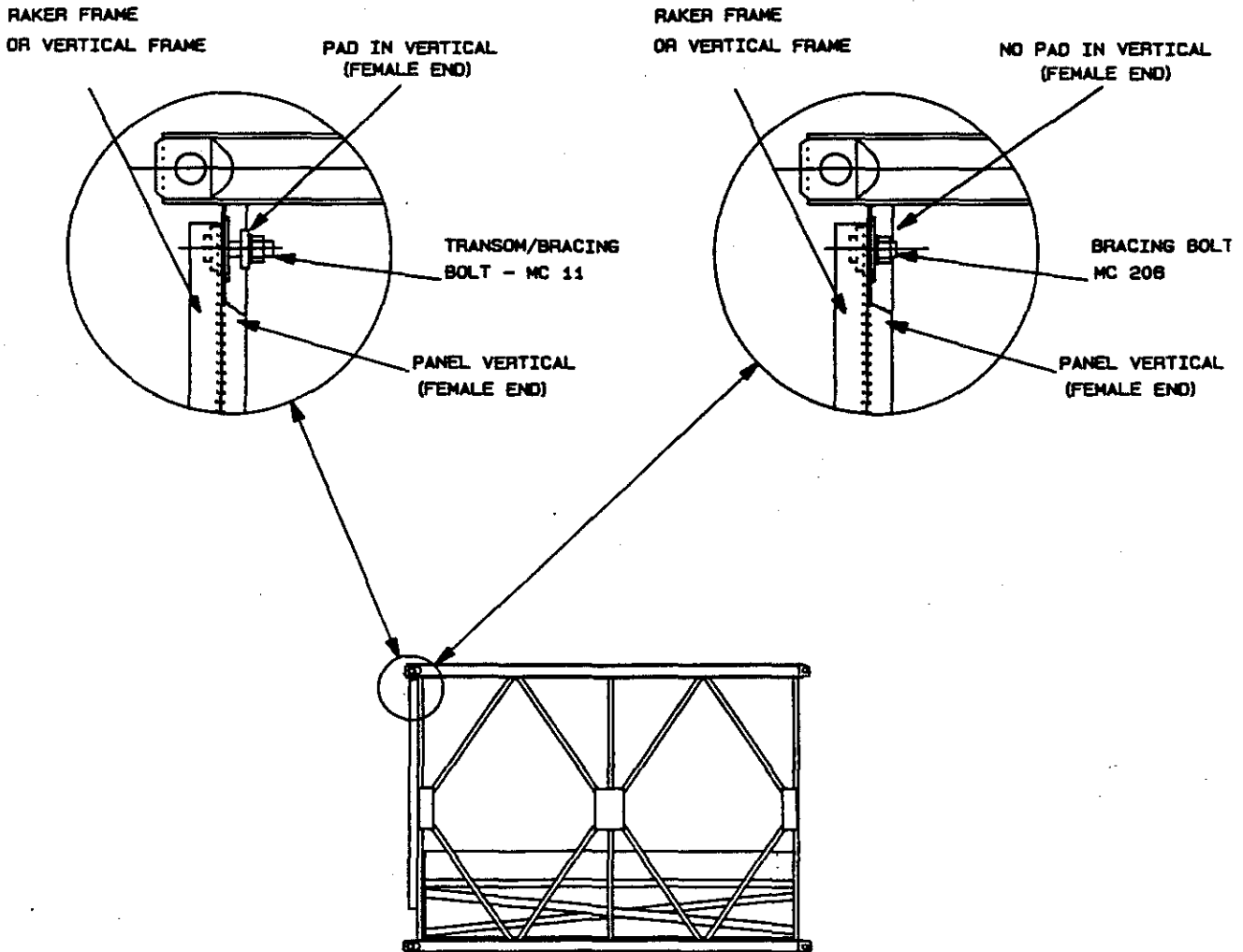
In line with our policy of continual development and improvement of our products, we now manufacture our Compact 200 Bridge Panels with sophisticated Robot Welding Machines which provide consistently high quality welds. Furthermore, we now fabricate the Female End Vertical of the Panel from a stronger section which provides a better fatigue detail, and enables us to omit the pad near the top of the vertical where the stabilising Raker or Vertical Frames connect to the Panel. As a result, the connection of the Raker or Vertical Frames to the Panel at this position is made with the shorter Bracing Bolts (MC206) and not as previously necessary with the longer Transom Bolts (MC11).

ORIGINAL
PANELS

MC 200 or MC201

CURRENT
PANELS

MC200A or MC201A



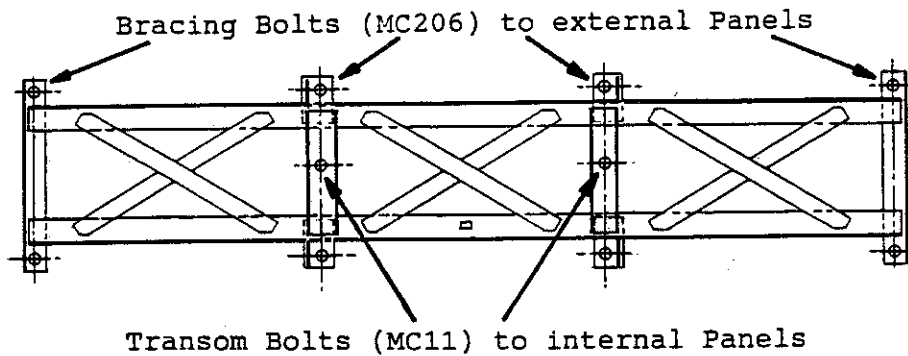
RECENT IMPROVEMENTS

2. COMPACT 200 BRACING FRAMES

The manufacturing detail of Compact 200 Bracing Frames has also been improved. Consequently, the connection of the Bracing Frames to the internal Panels of Triple and Quadruple Truss constructions are now made with the shorter Bracing Bolts (MC206) and not as was previously necessary with Transom Bolts (MC11).

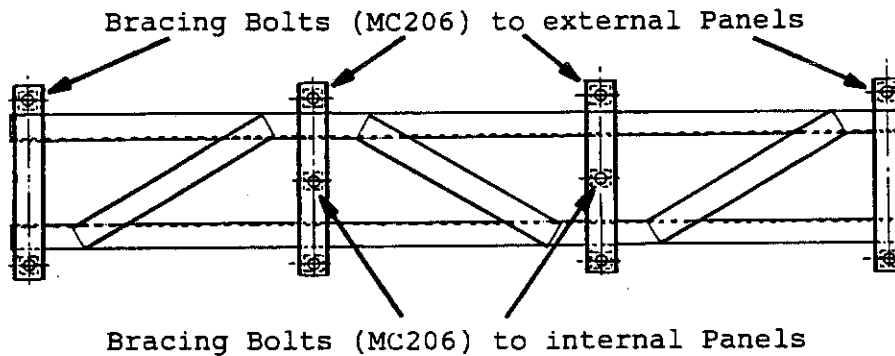
ORIGINAL BRACING FRAMES

MC333 or NLC8092



CURRENT BRACING FRAMES

MC358 or MC359



NOTE: For DSR1(H) & DSR2(H) truss constructions, the Chord Bolts are used to connect the Bracing Frames to the reinforced external Panels.

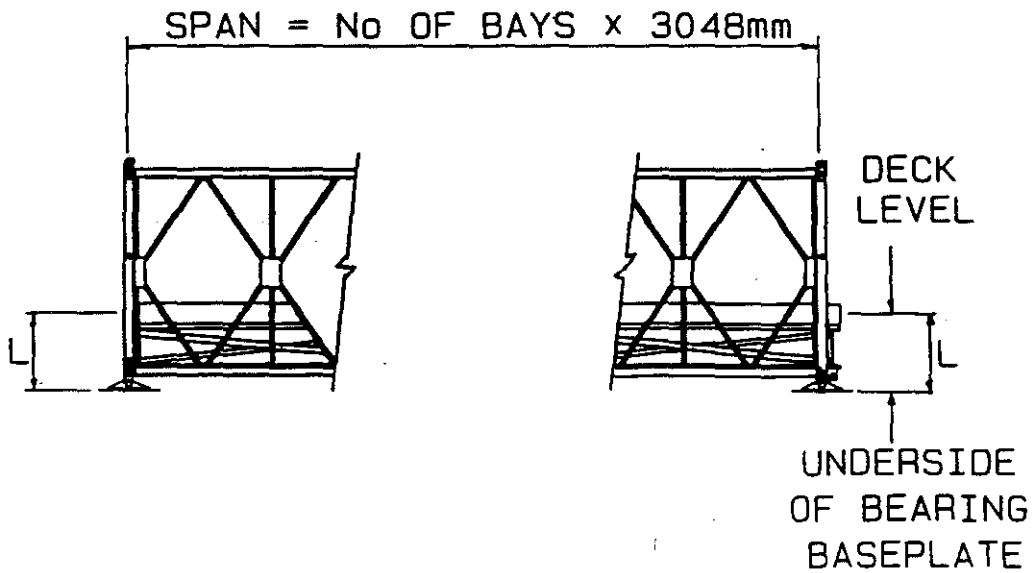
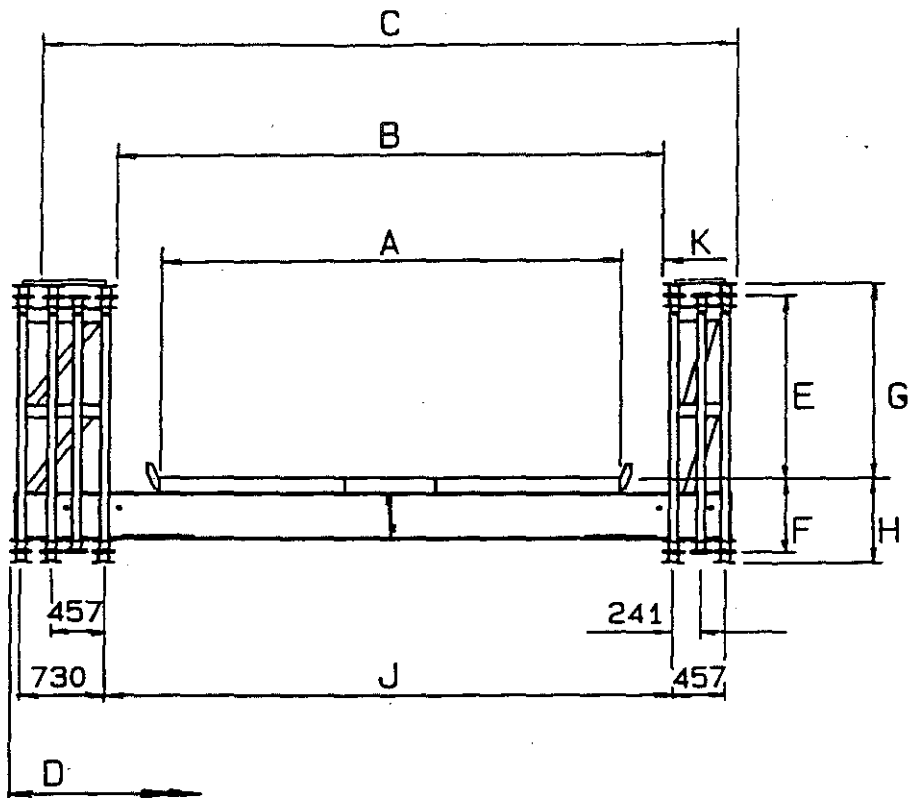
The current Compact 200 Manual (Ref 90C2 - Sept 1990) reflects these improvements with respect to Sections 3, 5, 6 and 7, which relate to Parts per Bay, Assembly Details, Erection and Multi-Span Bridges.

If local stocks of original Compact 200 Panels (MC200 and MC201) and Bracing Frames (MC333 and NLC8092) are to be used, then due account should be made of the fact that Transom Bolts (MC11) must be used in place of Bracing Bolts (MC206) for the appropriate connections shown here, when quantifying parts for supply to site and when erecting.

SECTION 1
BRIDGE DESIGN
INFORMATION

BRIDGE DIMENSIONS

M.B.G.V



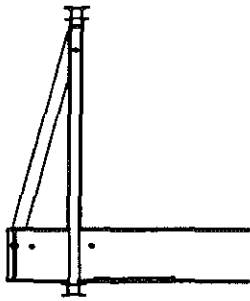
BRIDGE DIMENSIONS

DIMENSIONS	SINGLE LANE HS20, HA/MS250				TWO LANE	
	STANDARD WIDTH		EXTRA WIDE		HS20	HA/MS250
	STEEL	TIMBER	STEEL	TIMBER	STEEL	STEEL
A	3226	3320	4029	4120	7241	7241
B	3757	3757	4773	4773	8050	8050
C	5031	5031	6047	6047	9324	9324
D					9870	9870
E	1595	1502	1591	1498	1395	1385
F	641	734	645	738	841	851
G	1697	1604	1693	1600	1497	1487
H	743	836	747	840	943	953
J	3937	3937	4953	4953	8230	8230
K	266	219	372	327	405	405
L	800	893	803	896	999	1009

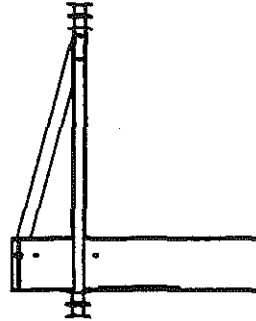
NOTES

- 1 Dimensions E & G in the table are given to the top of the chord. For all triple and quadruple truss constructions, 70mm is to be added to these dimensions to account for the Bracing Frames.
- 2 While it is the norm for double truss constructions to have the Bracing Frames fitted to the underside of the top chords, it is possible with DS and DSR2(H) constructions to fit them onto the top of the chords. If this is done then dimensions E & G in the table are again to be increased by 70mm.
- 3 Dimension L in the table is given from deck level to the bottom of the Bearing Baseplate (MC236). If Grillage Beams (MC235) are used instead of baseplates, this dimension increases by 117mm.
- 4 Dimensions pertaining to timber decking assume that the chesses used are 75mm thick.
- 5 Dimensions are nominal and subject to manufacturing tolerances.
- 6 Dimension D in the table represents the overall width of a two lane quadruple truss bridge.

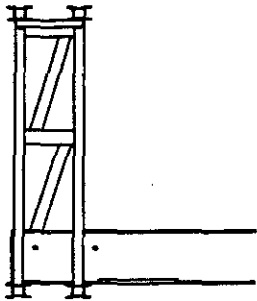
BRIDGE GIRDER CONSTRUCTIONS



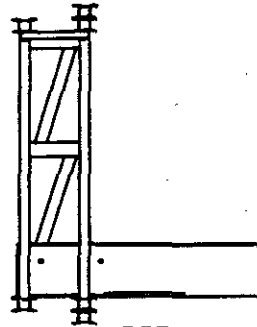
SS



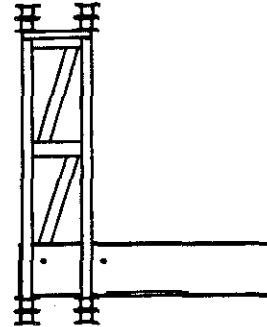
SSR
SSRH



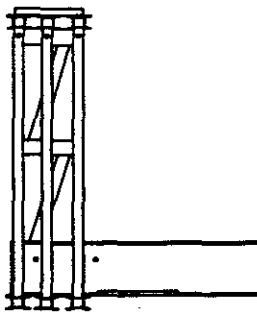
DS



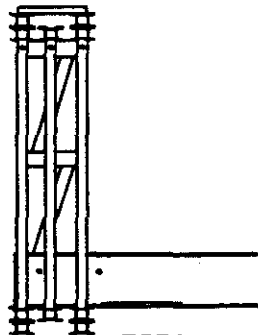
DSR1
DSR1H



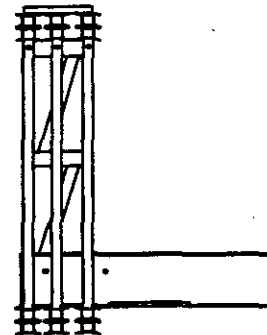
DSR2
DSR2H



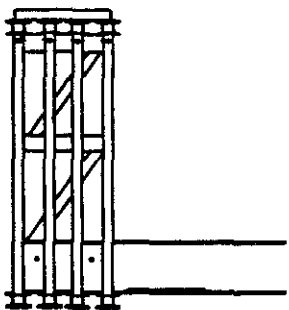
TS



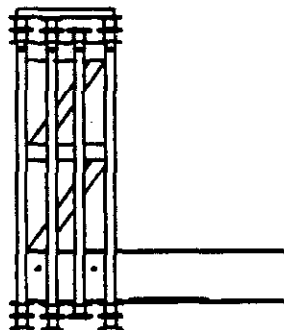
TSR2
TSR2H



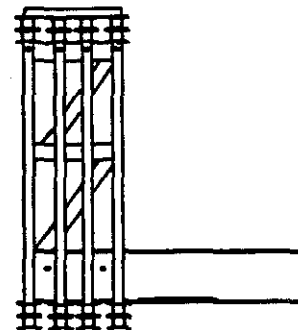
TSR3
TSR3H



GS



GSR3
GSR3H



GSR4
GSR4H

PROPERTIES OF CONSTRUCTION

BENDING MOMENT & SHEAR CAPACITIES

CONST.	IMPERIAL UNITS			S.I. UNITS			C.G.S. UNITS		
	MOMENT	SHEAR	T.	MOMENT	SHEAR kN		MOMENT	SHEAR t.	
	T.ft	STD.	H.S.	kN.m.	STD.	H.S.	t.m.	STD.	H.S.
SS	825	45	70	2507	448	697	255	46	71
SSR	1650	45	70	5014	448	697	511	46	71
SSRH	1886	45	70	5730	448	697	584	46	71
DS	1650	90	140	5014	897	1395	511	91	142
DSR1	2475	68	105	7521	673	1047	766	69	107
DSR1H	2711	68	105	8237	673	1047	839	69	107
DSR2	3300	90	140	10028	897	1395	1022	91	142
DSR2H	3772	90	140	11460	897	1395	1168	91	142
TS	2475	135	210	7521	1345	2092	766	137	213
TSR2	4125	113	175	12535	1121	1743	1277	115	178
TSR2H	4597	113	175	13967	1121	1743	1423	115	178
TSR3	4950	135	210	15042	1345	2092	1533	137	213
TSR3H	5658	135	210	17190	1345	2092	1752	137	213
QS	3300	180	280	10028	1794	2790	1022	183	284
QSR3	5775	158	245	17549	1570	2442	1788	160	249
QSR3H	6483	158	245	19697	1570	2442	2007	160	249
QSR4	6600	180	280	20056	1794	2790	2044	183	284
QSR4H	7544	180	280	22920	1794	2790	2336	183	284

The figures tabulated above are consistent with a minimum factor of safety of 1.7 for both bending moment and shear.

The figures tabulated for shear take account of maldistribution of load between unevenly reinforced trusses (DSR1, TSR2 etc.)

ABBREVIATIONS

STD. = Standard Panel H.S. = High Shear Panel

T = Tons = 2240lbs kN = kiloNewtons t = tonnes = 1000kg

ft = feet m = metres

KEY TO BRIDGE CONSTRUCTIONS

SS = Single Single DS = Double Single
 TS = Triple Single QS = Quadruple Single

R indicates Chords are Reinforced as follows:

R1 = Reinforced on inner Panel lines only
 R2 = Reinforced on inner and outer Panel lines
 R3 = Reinforced inner, one intermediate and outer Panels
 R4 = Reinforced on all Panel lines of QS truss

H indicates Heavy Chord Reinforcements are used.

WEIGHTS PER BAY

COMPACT 200 BRIDGES WITH STEEL DECK

BRIDGE TRUSS CONSTRUCTION	SINGLE LANE ROADWAYS		TWO LANE ROADWAY	
	HS20/HS25/MS250/HA		HS20	MS250/HA
	STD. WIDTH	EXTRA WIDE		
SS	2.28	2.70	4.57	4.82
SSR	2.64	3.06	4.93	5.17
SSRH	2.71	3.13	5.00	5.24
DS	3.00	3.42	5.30	5.54
DSR1	3.36	3.77	5.65	5.89
DSR1H	3.43	3.84	5.72	5.96
DSR2	3.72	4.13	6.01	6.25
DSR2H	3.85	4.27	6.15	6.39
TS	3.59	4.00	5.88	6.12
TSR2	4.31	4.72	6.60	6.84
TSR2H	4.44	4.86	6.74	6.98
TSR3	4.67	5.08	6.96	7.20
TSR3H	4.88	5.29	7.17	7.41
QS	-	-	6.51	6.75
QSR3	-	-	7.58	7.82
QSR3H	-	-	7.79	8.03
QSR4	-	-	7.94	8.18
QSR4H	-	-	8.22	8.46
TOTAL ADDITIONAL WEIGHT OF END OF BRIDGE COMPONENTS				
SS	0.73	0.86	1.59	1.83
DS	0.96	1.09	1.82	2.05
TS	1.40	1.53	2.26	2.50
QS	-	-	2.67	2.90
WEIGHT PER BAY OF DECKING - DEDUCT IF NOT FITTED				
DECK & KERBS	1.23	1.53	2.68	2.69
ADDITIONAL WEIGHT PER BAY OF HIGH SHEAR PANELS				
CONSTRUCTION	SS	DS	TS	QS
ADD PER BAY	0.10	0.19	0.29	0.39

NOTES:

1. The weights are given in tonnes per 3.048 metre long bay.
2. The weights are based upon theoretical component weights, with the allowance of 2.5% for finishes to the steelwork.
3. End bays are normally of unreinforced truss construction.
4. If 803mm deck units are used throughout, weights per bay are increased by 0.015 tonnes per lane of roadway.
5. 5% should be subtracted from the above tabulated weights when calculating the restoring moments during launching.

WEIGHTS PER BAY

COMPACT 200 BRIDGES WITH TIMBER DECK

BRIDGE TRUSS CONSTRUCTION	SINGLE LANE ROADWAYS (ONLY)			
	HS20 LOADING		HS25/MS250/HA LOADINGS	
	STD.WIDTH	EXTRA WIDE	STD.WIDTH	EXTRA WIDE
SS	2.11	2.46	2.17	2.53
SSR	2.47	2.82	2.53	2.89
SSRH	2.54	2.89	2.60	2.96
DS	2.83	3.18	2.89	3.25
DSR1	3.19	3.53	3.25	3.60
DSR1H	3.26	3.60	3.32	3.67
DSR2	3.55	3.89	3.61	3.96
DSR2H	3.68	4.03	3.74	4.10
TS	3.42	3.76	3.48	3.83
TSR2	4.14	4.48	4.20	4.55
TSR2H	4.27	4.62	4.33	4.69
TSR3	4.50	4.84	4.56	4.91
TSR3H	4.71	5.05	4.77	5.12
TOTAL ADDITIONAL WEIGHT OF END OF BRIDGE COMPONENTS				
SS	0.65	0.76	0.65	0.76
DS	0.87	0.98	0.87	0.98
TS	1.32	1.42	1.32	1.42
WEIGHT PER BAY OF DECKING - DEDUCT IF NOT FITTED				
ALL DECKING	1.06	1.29	1.12	1.36
CHESSSES+KERBS	0.58	0.68	0.58	0.68
CHESSSES ONLY	0.43	0.53	0.43	0.53
ADDITIONAL WEIGHT PER BAY OF HIGH SHEAR PANELS				
TRUSS CONSTRUCTION	SS	DS	TS	
ADDITION PER BAY	0.10	0.19	0.29	

NOTES:

1. The weights are given in tonnes per 3.048 metre long bay.
2. The weights are based upon theoretical component weights, with the allowance of 2.5% for finishes to the steelwork.
3. The weights presume the use of 75mm thick timber chesses, with a density of 590kg/m³. Where thicker chesses and/or timber of a different density are to be used, the weight of chesses tabulated above should be adjusted (pro-rata), and the construction weight per bay ammended accordingly.
4. End bays are normally of unreinforced truss construction.
5. 5% should be subtracted from the above tabulated weights when calculating the restoring moments during launching.

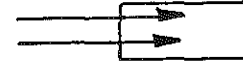
**LOAD CAPACITY FOR ESTIMATION OF MAXIMUM SINGLE VEHICLE
STANDARD ROADWAY**

M.B.E.

Max. Load as limited by Standard Panels

Max. Load as limited by High Shear Panels

Max. Load is limited by bending when figures are the same value



tonnes
tonnes

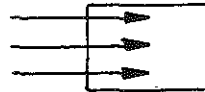
SPAN		S	S	S	D	D	D	D	D	T	T	T	T	T
Ft	M	S	S	S	S	S	S	S	S	S	S	S	S	S
		R	R	R	H	H	H	H	H	R	R	R	R	R
		1	2	3	1	2	3	1	2	1	2	3	1	2
30	9.144	73			73					73				
		73			73					73				
40	12.192	67			97					97				
		97			97					97				
50	15.240	50	49	49	100	100	100	100	100	100	100	100	100	100
		67	100	100	100	100	100	100	100	100	100	100	100	100
60	18.288	44	42	42	100	76	76	100	100	100	100	100	100	100
		46	85	85	100	100	100	100	100	100	100	100	100	100
70	21.336	35	38	38	94	66	65	100	100	100	100	100	100	100
		35	73	73	94	100	100	100	100	100	100	100	100	100
80	24.384	28	35	35	70	60	59	90	89	100	100	100	100	100
		28	66	66	70	100	100	100	100	100	100	100	100	100
90	27.432	22	33	32	55	55	55	82	81	98	100	100	100	100
		22	57	61	55	100	100	100	100	98	100	100	100	100
100	30.480	18	31	30	45	51	51	76	75	78	100	100	100	100
		18	47	57	45	80	91	100	100	78	100	100	100	100
110	33.528	14	29	28	38	48	48	71	70	65	98	97	100	100
		14	40	48	38	66	75	99	100	65	100	100	100	100
120	36.576	11	27	27	32	46	45	67	66	54	92	91	100	100
		11	34	40	32	56	63	83	100	54	100	100	100	100
130	39.624		26	25	26	43	43	64	63	46	87	86	100	100
			28	35	26	48	54	71	85	46	94	100	100	100
140	42.672		24	24	22	41	41	61	60	39	81	82	100	100
			24	29	22	41	46	61	74	39	81	95	100	100
150	45.720		20	22	18	35	39	53	57	33	70	78	90	99
			20	25	18	35	40	53	64	33	70	82	90	100
160	48.768		17	21	14	29	34	45	55	28	60	71	78	95
			17	21	14	29	34	45	56	28	60	71	78	95
170	51.816		13	18	11	25	29	39	48	23	52	62	68	83
			13	18	11	25	29	39	48	23	52	62	68	83
180	54.864		10	14		20	24	34	42	19	45	54	59	73
			10	14		20	24	34	42	19	45	54	59	73
190	57.912			11		17	20	29	36	15	39	47	52	64
				11		17	20	29	36	15	39	47	52	64
200	60.960					13	16	24	31	11	33	40	45	56
						13	16	24	31	11	33	40	45	56

- NOTES:-
1. This table is based on uniformly distributed loading of intensity 8 tonnes/metre with allowances for Impact of 25% and for vehicles eccentric by 10% of the road-width from the centreline.
 2. The deck system must be checked separately.
 3. In cases where fatigue may become a criterion this should be separately assessed.

**BENDING AND SHEAR PROPERTIES AVAILABLE FOR LIVE LOAD
STANDARD ROADWAY**

(M.B.C.V)

Available Bending Strength
Available Shear Strength (Standard Panels)
Available Shear Strength (High Shear Panels)



tonne metres.
tonnes.
tonnes.

SPAN		S	S	S	D	D	D	D	D	T	T	T	T	T
Ft	M	S	S	S	D	D	D	D	D	T	T	T	T	T
		S	S	S	D	D	D	D	D	T	T	T	T	T
		S	R	R	S	S	S	S	S	S	R	R	R	R
				H		1	1	2	2		2	2	3	3
						H	H	H	H		H	H	H	H
30	9.144	247 42 67			500 86 137					753 131 207				
40	12.192	241 41 66			492 85 136					744 129 205				
50	15.240	233 40 65	485 39 64	558 39 64	482 83 134	733 60 98	806 60 98	986 81 132	1131 81 132	731 128 204	1235 104 167	1380 103 166	1488 125 201	1705 124 200
60	18.288	223 39 64	474 38 63	546 37 62	469 82 133	719 58 96	791 58 96	970 79 130	1115 79 130	716 126 202	1217 102 165	1362 101 164	1468 122 198	1685 122 198
70	21.336	212 38 63	461 36 61	533 36 61	454 80 131	703 57 95	774 56 94	952 77 128	1096 77 128	698 124 200	1196 99 162	1340 99 162	1445 120 196	1660 119 195
80	24.384	199 36 61	446 35 60	517 35 60	437 79 130	684 55 93	755 55 93	931 76 127	1074 75 126	678 122 198	1171 97 160	1314 97 160	1419 118 194	1633 117 193
90	27.432	184 35 60	429 34 59	500 33 58	418 77 128	662 53 91	733 53 91	907 74 125	1049 73 124	655 120 196	1143 95 158	1285 95 158	1388 115 191	1601 115 191
100	30.480	168 34 59	410 32 57	480 32 57	396 76 127	637 52 90	708 51 89	880 72 123	1021 71 122	629 119 195	1112 93 156	1253 92 155	1355 113 189	1566 112 188
110	33.528	149 33 58	389 31 56	459 31 56	372 74 125	611 50 88	680 50 88	850 70 121	990 69 120	600 117 193	1078 91 154	1218 90 153	1317 111 187	1527 110 186
120	36.576	129 32 57	366 30 55	435 29 54	346 73 124	581 48 86	650 48 86	817 68 119	956 67 118	569 115 191	1040 89 152	1179 88 151	1276 108 184	1484 107 183
130	39.624	108 31 56	341 28 53	409 28 53	317 71 122	549 47 85	618 46 84	782 66 117	920 65 116	534 113 189	999 86 149	1137 86 149	1232 106 182	1437 105 181
140	42.672	84 30 55	313 27 52	286 27 52	286 70 121	515 45 83	582 44 82	744 64 115	880 64 115	497 111 187	955 84 147	1091 83 146	1184 104 180	1387 102 178
150	45.720	59 28 53	284 26 51	253 25 50	253 68 119	477 43 81	544 43 81	703 63 114	837 62 113	458 110 186	907 82 145	1042 81 144	1132 101 177	1333 100 176
160	48.768	32 27 52	253 24 49	218 24 49	218 67 118	438 42 80	504 41 79	659 61 112	792 60 111	415 108 184	856 80 143	989 79 142	1077 99 175	1276 97 173
170	51.816	3 26 51	220 23 48	180 22 47	180 65 116	396 40 78	461 39 77	612 59 110	744 58 109	370 106 182	802 78 141	934 77 140	1018 97 173	1214 95 171
180	54.864		185 22 47	249 21 46	140 64 115	351 38 76	415 38 76	562 57 108	692 56 107	322 104 180	744 76 139	874 75 138	956 94 170	1149 93 169
190	57.912		147 20 45	211 20 45	98 62 113	303 37 75	367 36 74	510 55 106	638 54 105	272 102 178	684 74 137	812 72 135	890 92 168	1080 90 166
200	60.960		108 19 44	170 18 43	53 61 112	253 35 73	316 34 72	455 53 104	581 52 103	218 101 177	620 71 134	746 70 133	821 90 166	1008 88 164

- NOTES:-
1. No allowance has been made for impact, maldistribution, fatigue or other effects. These allowances must be made in the Live Load calculation.
 2. If High Shear Panels are required, then a calculation is needed to determine how many bays at each end of the bridge require them.

**LOAD CAPACITY FOR ESTIMATION OF MAXIMUM SINGLE VEHICLE
EXTRA WIDE ROADWAY**

MABE

Max. Load as limited by Standard Panels
Max. Load as limited by High Shear Panels



tonnes
tonnes

Max. Load is limited by bending when figures are same value

SPAN		S	S	S	D	D	D	D	D	T	T	T	T	T
Ft	M	S	S	S	D	D	D	D	D	T	T	T	T	T
		S	S	S	D	D	D	D	D	T	T	T	T	T
		S	R	R	S	S	S	S	S	S	S	S	S	S
		1	1	1	1	1	1	1	1	1	1	1	1	1
		H	H	H	H	H	H	H	H	H	H	H	H	H
30	9.144	73			73					73				
		73			73					73				
40	12.192	64			97					97				
		97			97					97				
50	15.240	49	47	47	100	100	100	100	100	100	100	100	100	100
		66	100	100	100	100	100	100	100	100	100	100	100	100
60	18.288	42	41	40	100	74	73	100	100	100	100	100	100	100
		45	82	82	100	100	100	100	100	100	100	100	100	100
70	21.336	34	36	36	91	64	63	100	100	100	100	100	100	100
		34	71	70	91	100	100	100	100	100	100	100	100	100
80	24.384	26	33	33	67	57	57	87	86	100	100	100	100	100
		26	64	63	67	100	100	100	100	100	100	100	100	100
90	27.432	21	31	30	53	53	52	79	78	95	100	100	100	100
		21	55	59	53	97	100	100	100	95	100	100	100	100
100	30.480	16	29	28	43	49	49	73	72	76	100	100	100	100
		16	45	54	43	77	88	100	100	76	100	100	100	100
110	33.528	12	27	26	36	46	46	68	68	62	95	94	100	100
		12	37	45	36	64	73	96	100	62	100	100	100	100
120	36.576		25	24	29	43	43	65	64	52	89	88	100	100
			31	38	29	53	61	80	98	52	100	100	100	100
130	39.624		23	23	24	41	40	61	60	44	84	83	100	100
			26	32	24	45	52	68	82	44	91	100	100	100
140	42.672		21	21	19	38	38	58	57	37	78	78	100	100
			21	27	19	38	44	58	71	37	78	91	100	100
150	45.720		17	19	15	32	36	50	54	30	67	75	87	96
			17	22	15	32	37	50	61	30	67	78	87	100
160	48.768		14	18	11	27	31	42	51	25	57	68	75	91
			14	18	11	27	31	42	52	25	57	68	75	91
170	51.816		10	15		22	26	36	45	20	49	59	65	79
			10	15		22	26	36	45	20	49	59	65	79
180	54.864			11		17	21	30	39	16	42	50	56	69
				11		17	21	30	39	16	42	50	56	69
190	57.912					13	17	25	33	12	36	43	48	60
						13	17	25	33	12	36	43	48	60
200	60.960					10	13	21	27		30	37	41	52
						10	13	21	27		30	37	41	52

- NOTES:-
1. This table is based on uniformly distributed loading of intensity 8 tonnes/metre with allowances for Impact of 25% and for vehicles eccentric by 10% of the road-width from the centreline.
 2. The deck system must be checked separately.
 3. In cases where fatigue may become a criterion this should be separately assessed.

**BENDING AND SHEAR PROPERTIES AVAILABLE FOR LIVE LOAD
EXTRA WIDE ROADWAY**

MSBGV

Available Bending Strength

Available Shear Strength (Standard Panels)

Available Shear Strength (High Shear Panels)



tonne metres.

tonnes.

tonnes.

SPAN		S	S S	S S	D	D S	D S	D S	D S	T	T	T	T	T
Ft	M	S	R	R H	S	R 1	R 1 H	R 2	R 2 H	S	R 2	R 2 H	R 3	R 3 H
30	9.144	245 41 66			499 85 136					752 131 207				
40	12.192	238 40 65			490 84 135					741 129 205				
50	15.240	229 39 64	481 38 63	554 38 63	478 82 133	730 59 97	802 59 97	982 80 131	1127 80 131	727 127 203	1232 103 166	1376 102 165	1484 124 200	1701 123 199
60	18.288	217 37 62	469 36 61	541 36 61	464 80 131	714 57 95	786 57 95	965 78 129	1109 78 129	711 125 201	1212 100 163	1356 100 163	1463 121 197	1679 121 197
70	21.336	204 36 61	453 35 60	525 35 60	447 79 130	695 55 93	767 55 93	944 76 127	1088 76 127	691 123 199	1188 98 161	1332 97 160	1438 119 195	1653 118 194
80	24.384	189 35 60	436 33 58	507 33 58	427 77 128	674 53 91	745 53 91	921 74 125	1063 73 124	668 121 197	1161 96 159	1304 95 158	1409 116 192	1623 115 191
90	27.432	171 33 58	416 32 57	487 31 56	405 75 126	649 52 90	720 51 89	894 72 123	1036 71 122	642 119 195	1131 93 156	1273 93 156	1376 114 190	1588 113 189
100	30.480	152 32 57	394 30 55	464 30 55	380 73 124	622 50 88	692 49 87	864 70 121	1005 69 120	613 117 193	1097 91 154	1237 90 153	1339 111 187	1550 110 186
110	33.528	130 31 56	369 29 54	439 28 53	353 72 123	592 48 86	661 47 85	831 68 119	971 67 118	581 115 191	1059 89 152	1198 88 151	1298 109 185	1508 107 183
120	36.576	106 29 54	343 27 52	412 27 52	323 70 121	559 46 84	628 45 83	795 66 117	933 65 116	546 113 189	1018 86 149	1156 85 148	1254 106 182	1461 105 181
130	39.624	81 28 53	313 26 51	382 25 50	290 68 119	523 44 82	591 44 82	756 64 115	893 63 114	508 111 187	973 84 147	1110 83 146	1205 103 179	1411 102 178
140	42.672	53 27 52	282 24 49	350 24 49	255 67 118	484 42 80	552 42 80	713 62 113	849 61 112	467 109 185	924 81 144	1060 80 143	1153 101 177	1356 99 175
150	45.720	23 25 50	248 23 48	315 22 47	217 65 116	442 40 78	509 40 78	667 60 111	801 58 109	423 107 183	872 79 142	1006 78 141	1097 98 174	1298 97 173
160	48.768		212 21 46	278 20 45	177 63 114	398 38 76	464 38 76	619 57 108	751 56 107	375 105 181	816 77 140	948 76 139	1037 96 172	1236 94 170
170	51.816		174 19 44	239 19 44	134 61 112	350 36 74	416 36 74	567 55 106	697 54 105	325 103 179	757 74 137	887 73 136	973 93 169	1169 92 168
180	54.864		133 18 43	197 17 42	88 60 111	300 35 73	364 34 72	512 53 104	640 52 103	272 101 177	694 72 135	823 71 134	905 91 167	1098 89 165
190	57.912		90 16 41	153 16 41	40 58 109	247 33 71	310 32 70	453 51 102	580 50 101	215 99 175	627 70 133	754 68 131	834 88 164	1024 86 162
200	60.960		44 15 40	106 14 39		191 31 69	253 30 68	392 49 100	517 48 99	156 97 173	557 67 130	682 66 129	758 86 162	945 84 160

- NOTES:-
1. No allowance has been made for impact, maldistribution, fatigue or other effects. These allowances must be made in the Live Load calculation.
 2. If High Shear Panels are required, then a calculation is needed to determine how many bays at each end of the bridge require them.

**LOAD CAPACITY FOR ESTIMATION OF MAXIMUM SINGLE VEHICLE
TWO LANE ROADWAY**

(MHB)

Max. Load as limited by Standard Panels
 Max. Load as limited by High Shear Panels
 Max. Load is limited by bending when figures are the same value



tonnes
tonnes

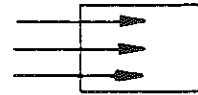
SPAN		S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q
Ft	M	S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q
		S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q
		S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q
		S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q
30	9.144	73			73					73					73			
40	12.192	53			97					97					97			
50	15.240	40	39	39	100	81	81	100	100	100	100	100	100	100	100	100	100	100
60	18.288	34	32	32	100	62	62	100	100	100	100	100	100	100	100	100	100	100
70	21.336	26	28	28	79	53	53	86	85	100	100	100	100	100	100	100	100	100
80	24.384	18	24	24	57	47	46	74	73	100	100	100	100	100	100	100	100	100
90	27.432	12	21	21	44	42	41	66	65	83	97	96	100	100	100	100	100	100
100	30.480		18	18	33	38	37	60	59	64	87	86	100	100	100	100	100	100
110	33.528		15	15	25	34	34	55	54	51	80	79	100	100	79	100	100	100
120	36.576		13	12	18	31	30	51	50	40	73	72	98	96	64	100	100	100
130	39.624		10	10	12	27	27	47	46	31	68	67	91	89	51	100	100	100
140	42.672					24	24	43	42	24	63	62	85	83	41	100	100	100
150	45.720					18	21	35	39	17	52	58	70	78	32	89	98	100
160	48.768					12	17	28	35	11	42	52	58	73	24	74	90	92
170	51.816						11	21	29		33	42	48	62	17	61	76	77
180	54.864							14	22		26	34	39	51	11	50	63	65
190	57.912								16		18	26	31	42		41	52	53
200	60.960								10		12	19	23	33		32	43	43

- NOTES:-
1. This table is based on uniformly distributed loading of intensity 8 tonnes/metre with allowances for Impact of 25% and for vehicles eccentric by 10% of the road-width from the centreline.
 2. The deck system must be checked separately.
 3. In cases where fatigue may become a criterion this should be separately assessed.
 4. This table is based on weight for H.A. type decking.

BENDING AND SHEAR PROPERTIES AVAILABLE FOR LIVE LOAD
TWO LANE ROADWAY

(M.A.B.C.V)

Available Bending Strength
Available Shear Strength (Standard Panels)
Available Shear Strength (High Shear Panels)



tonne metres.
tonnes.
tonnes.

SPAN		S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q	Q
Ft	M	S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q	Q
		S	S	S	D	D	D	D	D	T	T	T	T	T	Q	Q	Q	Q	Q
		S	R	R	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S
		H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H
30	9.144	238			492					745					998				
		38			82					127					273				
		63			133					203									
40	12.192	225			477					728					980				
		36			79					124					169				
		61			130					200					270				
50	15.240	209	461	534	458	709	782	962	1107	707	1211	1356	1464	1681	957	1713	1930	1966	2255
		33	33	32	77	54	54	75	75	121	97	97	119	118	166	140	139	162	161
		58	58	57	128	92	92	126	126	197	160	160	195	194	267	229	228	263	262
60	18.288	188	440	512	435	685	757	936	1080	682	1183	1327	1434	1650	929	1680	1896	1931	2219
		31	30	30	74	51	51	72	71	118	94	94	115	114	162	136	135	158	157
		56	55	55	125	89	89	123	122	194	157	157	191	190	263	225	224	259	258
70	21.336	165	414	486	407	656	727	905	1048	651	1149	1292	1398	1613	895	1642	1857	1891	2178
		29	27	27	71	48	48	69	68	115	90	90	111	111	159	132	131	154	153
		54	52	52	122	86	86	120	119	191	154	153	187	187	260	221	220	255	254
80	24.384	137	384	456	375	622	693	869	1012	616	1110	1252	1357	1571	857	1597	1811	1844	2129
		26	25	25	68	45	45	66	65	112	87	87	108	107	156	128	127	150	149
		51	50	50	119	83	83	117	116	188	150	150	184	183	257	217	216	251	250
90	27.432	106	351	422	340	584	655	829	970	577	1065	1207	1310	1523	813	1546	1759	1791	2074
		24	22	22	66	42	42	62	62	109	84	83	104	103	152	124	123	146	144
		49	47	47	117	80	80	113	113	185	147	146	180	179	253	213	212	247	245
100	30.480	71	314	384	299	541	611	783	924	532	1016	1157	1258	1469	764	1490	1701	1732	2013
		21	20	19	63	39	39	59	59	106	80	80	101	99	149	120	119	142	140
		46	45	44	114	77	77	110	110	182	143	143	177	175	250	209	208	243	241
110	33.528	32	272	342	255	494	564	733	873	483	961	1101	1201	1410	710	1427	1636	1666	1945
		19	17	17	60	36	36	56	55	103	77	76	97	96	145	116	115	138	136
		44	42	42	111	74	74	107	106	179	140	139	173	172	246	205	204	239	237
120	36.576		227	296	207	442	512	679	817	430	901	1040	1137	1345	651	1358	1566	1595	1871
			14	14	57	33	33	53	52	100	73	73	93	92	142	113	111	133	132
			39	39	108	71	71	104	103	176	136	136	169	168	243	202	200	234	233
130	39.624		178	246	154	386	455	619	756	371	836	973	1069	1274	587	1284	1489	1517	1791
			12	11	54	30	30	50	49	97	70	69	90	88	139	109	107	129	128
			37	36	105	68	68	101	100	173	133	132	166	164	240	198	196	230	229
140	42.672		124	192	97	326	393	555	690	308	766	901	995	1198	517	1204	1407	1433	1704
			9	9	52	27	27	47	46	94	67	66	86	85	135	105	103	125	123
			34	34	103	65	65	98	97	170	130	129	162	161	236	194	192	226	224
150	45.720		67	134	36	261	328	486	620	241	690	824	915	1116	443	1117	1318	1342	1610
			7	6	49	24	24	44	43	91	63	62	83	81	132	101	99	121	119
			32	31	100	62	62	95	94	167	126	125	159	157	233	190	188	222	220
160	48.768		6	72		191	257	412	544	169	609	742	830	1029	363	1025	1223	1246	1510
			4	4		21	21	41	39	88	60	59	79	77	129	97	95	117	115
			29	29		59	59	92	90	164	123	122	155	153	230	186	184	218	216
170	51.816			7		117	182	333	464	92	523	654	740	936	278	926	1122	1143	1404
				1		18	18	37	36	84	56	55	75	74	125	93	91	113	111
				26		56	56	88	87	160	119	118	151	150	226	182	180	214	212
180	54.864					38	103	250	379	10	432	561	644	837	188	822	1015	1034	1291
						15	15	34	33	81	53	52	72	70	122	89	87	109	106
						53	53	85	84	157	116	115	148	146	223	178	176	210	207
190	57.912					19	162	289			336	462	542	732	93	712	902	918	1172
						12	31	30			50	48	68	66	118	85	83	105	102
						50	82	81			113	111	144	142	219	174	172	206	203
200	60.960							69	194			234	359	435	622		596	783	797
								28	27			46	45	65	62		81	79	101
								79	78			109	108	141	138		170	168	202
																			199

- NOTES:-
1. This table is based on weight for H.A. type decking.
 2. No allowance has been made for impact, maldistribution, fatigue or other effects. These allowances must be made in the Live Load calculation.
 3. If High Shear Panels are required, then a calculation is needed to determine how many bays at each end of the bridge require them.

BRIDGE FOUNDATIONS

The typical foundation layout required to dimensionally facilitate the installation of Mabey Compact 200 Bridges is shown opposite.

The bridge foundations must be locally designed to sustain the loads to which they will be subjected, both in service and during erection, without settlement.

Depending upon the ground conditions particular to the site, the bearing base may need to be extended forwards in order to accept the launching rollers.

The abutment ballast walls should not be constructed until the bridge has been launched and jacked down into position on its bearings. Starter bars for reinforcements should be bent clear of the bridge during launching, and should be omitted completely from areas where jacks are to be used.

Dimensions marked thus * on the diagram allow for a 20mm clearance between the abutment ballast walls and the ends of the bridge deck. These dimensions must be adjusted as necessary to cater for thermal expansion appropriate to the local temperature range.

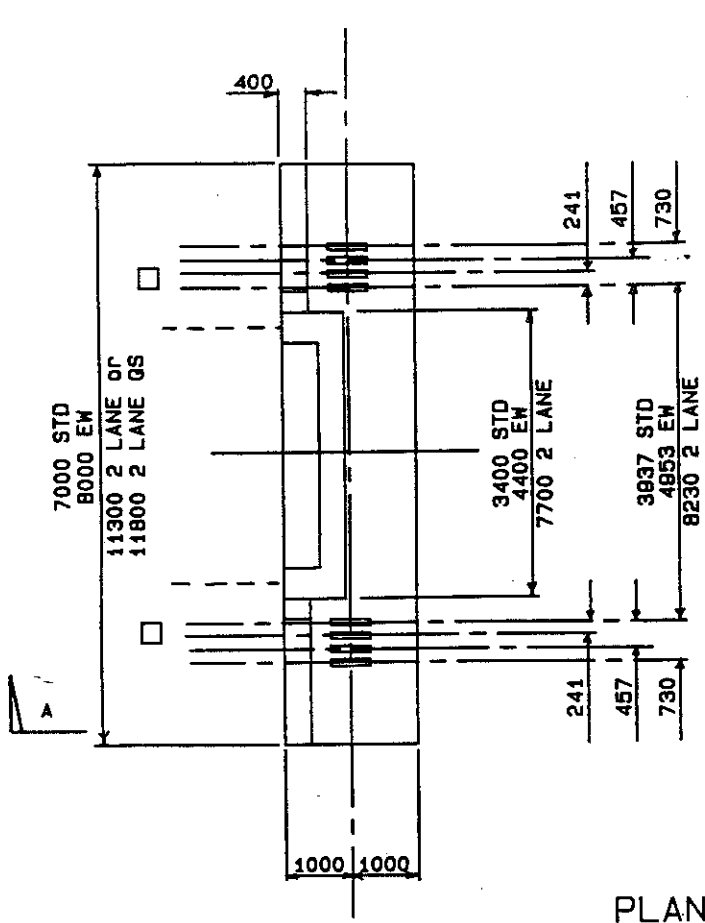
It is essential that all of the bearings on an abutment are set at the same level, to avoid maldistribution of stresses in the bridge.

The bollards shown in the diagram, whilst not an essential feature, are recommended for protection of the ends of the bridge trusses.

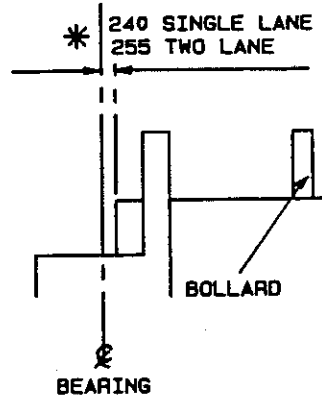
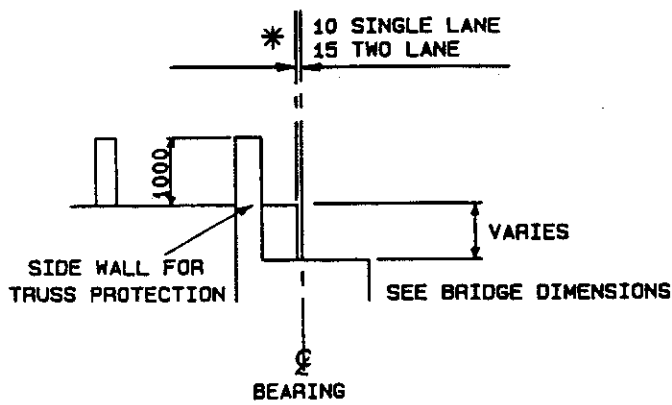
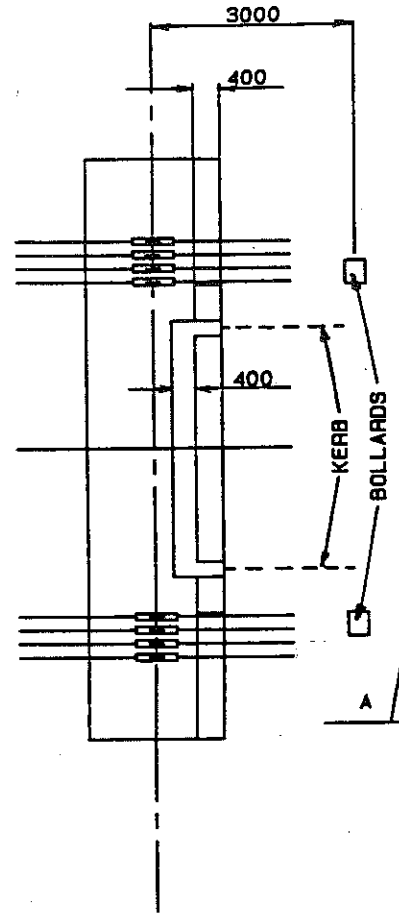
All dimensions given in millimetres. (1 inch = 25.4 millimetres)

TYPICAL FOUNDATION LAYOUT

M&B&V



PLAN

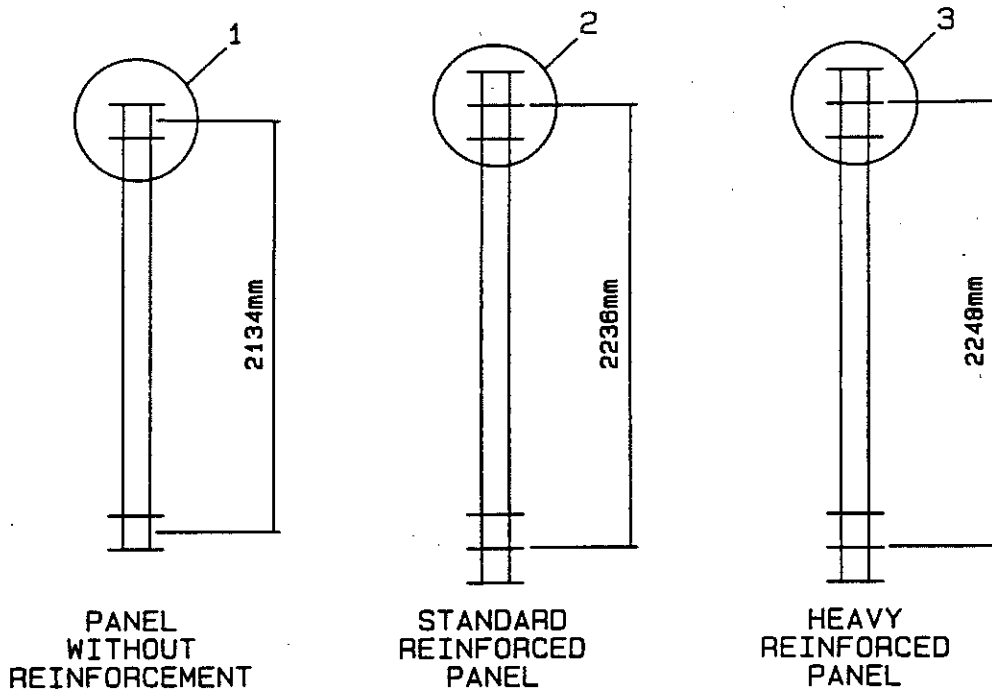


SECTION A-A

STRENGTH OF PARTS



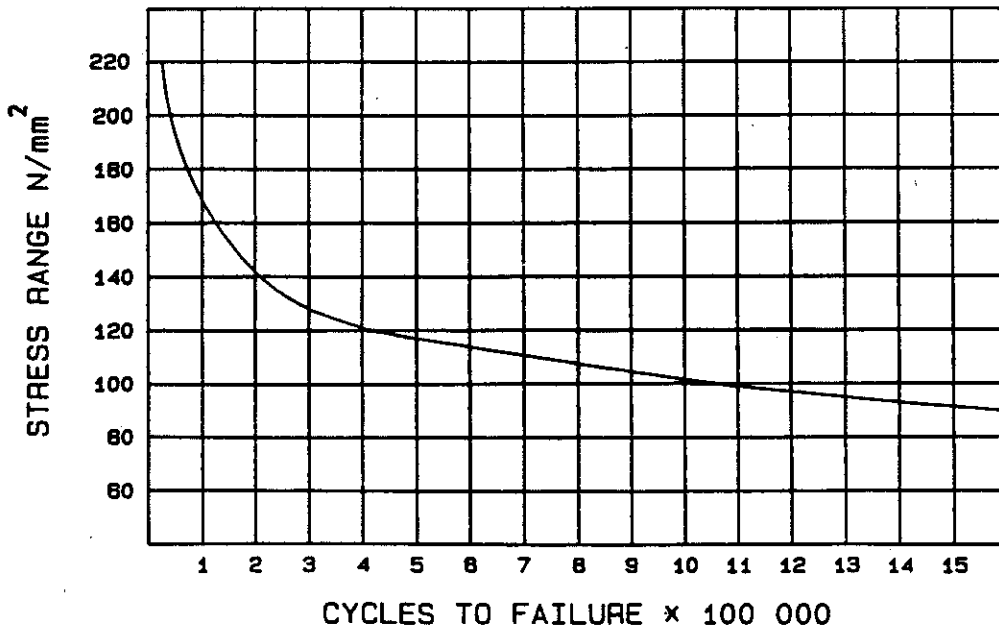
EFFECTIVE LEVER ARMS TO CHORD CENTROIDS



CROSS SECTIONAL AREA OF COMBINED CHORDS

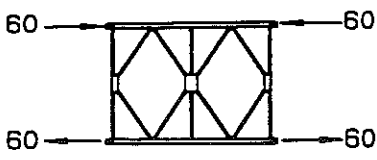
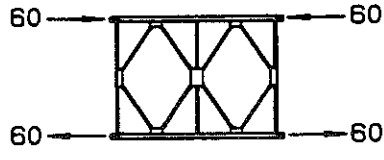
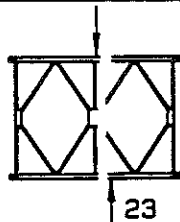
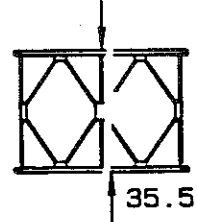
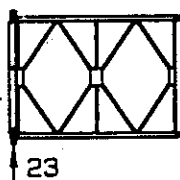
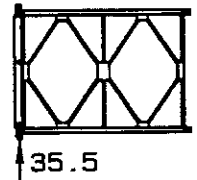
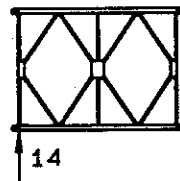
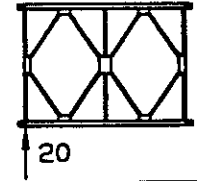
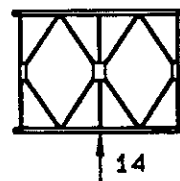
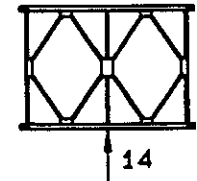
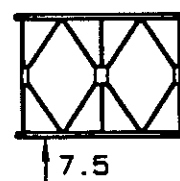
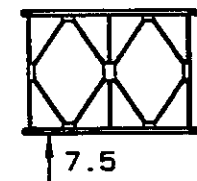
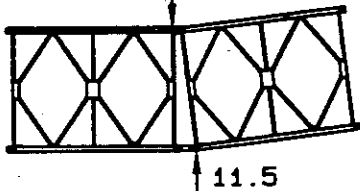
- 1 PANEL WITHOUT REINFORCEMENT = 2656mm
- 2 STANDARD REINFORCED PANEL = 5312mm
- 3 HEAVY REINFORCED PANEL = 6014mm

FATIGUE CHARACTERISTICS



STRENGTH OF PARTS



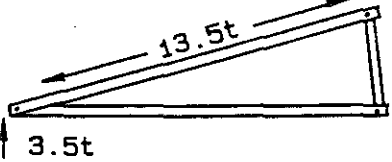
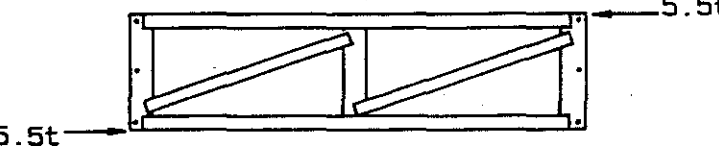
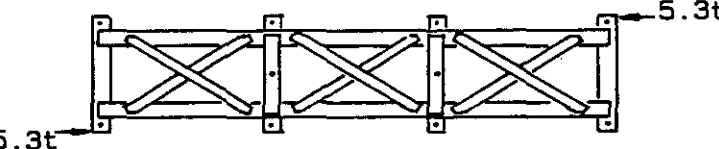

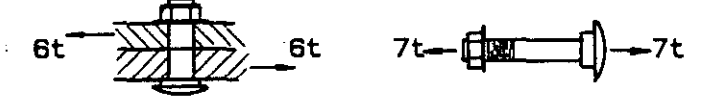
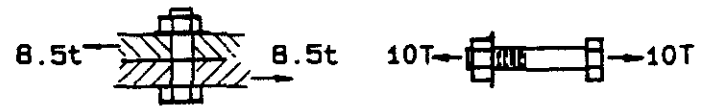

MABCY

MC 200 PANEL	MC 201 HIGH SHEAR PANEL
	
	
	
	
	
	
	

The above loads are in tonnes (1000Kg) and assume the panels to be stabilised


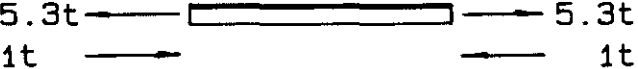
STRENGTH OF PARTS

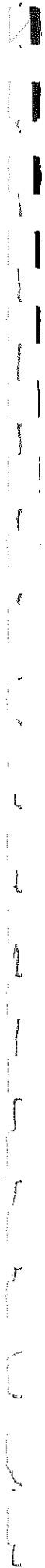
MABG

<p>STANDARD CHORD (MC 302)</p>	
<p>HEAVY CHORD (MC 304)</p>	
<p>RAKER FRAME (MC 314)</p>	
<p>VERTICAL FRAME (MC 312)</p>	
<p>BRACING FRAME (MC 333)</p>	
<p>END POSTS (MC 317 & MC 318)</p>	
<p>M20 BOLTS (MC 10)</p>	
<p>M24 BOLTS (MC 11, MC 206 & MC 207)</p>	
<p>PANEL PIN (MC 307)</p>	

STRENGTH OF PARTS

MAECV

TRANSOM STD. SINGLE LANE (MC 313)	ALLOWABLE BENDING MOMENT = 21tm
TRANSOM EW. SINGLE LANE (MC 320)	ALLOWABLE BENDING MOMENT = 30tm
TRANSOM 2 LANE - HS20 (MC 334)	ALLOWABLE BENDING MOMENT = 71tm
TRANSOM 2 LANE - HA (MC 330)	ALLOWABLE BENDING MOMENT = 91tm
SWAYBRACE (MC 15, MC 134 & MC 331)	
VERTICAL BRACE (MC 222)	
1606 DECKS (MC 211 & MC 213)	ALLOWABLE BENDING MOMENT = 18tm (distributed) ALLOWABLE SINGLE WHEEL LOAD = 7.5t or when side to side bolted = 10t
803 DECKS (MC 212 & MC 214)	ALLOWABLE BENDING MOMENT = 9tm (distributed) ALLOWABLE SINGLE WHEEL LOAD = 7.5t or when side to side bolted = 10t
STRINGERS (MC 7 & MC 8)	ALLOWABLE BENDING MOMENT = 5.3tm



SECTION 2
BRIDGE LOAD
SPECIFICATIONS

LOAD SPECIFICATIONS

AS APPLICABLE TO SIMPLY SUPPORTED BRIDGE TRUSSES

H.A. LOADING (B.S.5400) - NORMAL TRAFFIC

H.A. Loading comprises a Knife Edge Load combined with a co-existent Uniformly Distributed Load, which varies in intensity with the span.

DESIGN LANE LOADING

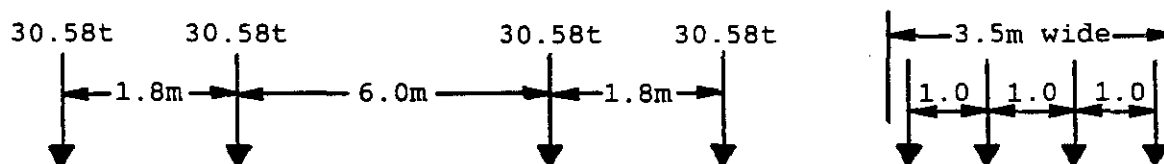
1. KNIFE EDGE LOAD: for all spans K.E.L. = 12.232 tonnes.
2. UNIFORMLY DISTRIBUTED LOAD:
 - a) for span "L" up to 30 metres, U.D.L. = 3.058 tonnes per metre.
 - b) for span "L" above 30 metres, U.D.L. = $15.39 \times (1/L)^{0.475}$ t/m.

For Single Lane Bridges where carriageway width "W" exceeds 3 metres, the Design Lane Loading (K.E.L. & U.D.L.) is to be increased by W/3.

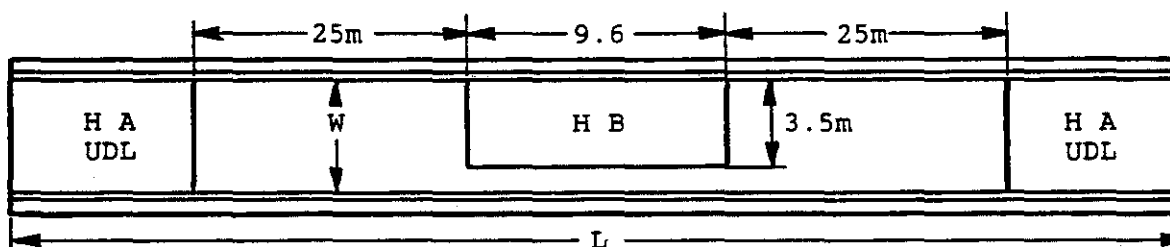
For Multi-Lane Bridges multiply Design Lane Loading x Number of Lanes

H.B. LOADING (B.S.5400) - ABNORMAL VEHICLE.

H.B. VEHICLE (30 UNITS) - Axle loads (tonnes) and spacings (metres).



The H.B. Vehicle is to be positioned in one lane, and combined with the H.A. U.D.L. loading, appropriate for the span, as shown below:



Single Lane Bridges are to be loaded according to the above diagram.

Two Lane Bridges are to have one lane loaded as per the above diagram whilst the adjacent lane is fully loaded with H.A. (K.E.L. & U.D.L.)

NOTE - it is usual to allow an overstress of 25% when considering the effects of an infrequent Abnormal Vehicle upon the structure.

SPAN CONSTRUCTION TABLE

BRITISH LOADING

SPAN			TYPE HA			TYPE HA &/OR 30 UNITS HB		
BAYS	FEET	METRES	STD.	E.W.	2 LANE	STD.	E.W.	2 LANE
3	30	9.144	SS	SS	SS	SS	SS	SS*
4	40	12.192	SS	SS	SS*	SS*	SS*	SSR*
5	50	15.240	SS	SS	SSR*	SS*	SS*	DS*
6	60	18.288	SSR	SSR*	DS	SSR*	SSR**	TS*
7	70	21.336	SSR*	SSR*	TS	SSR**	DS*	TS*
8	80	24.384	SSR*	DSR1*	DSR2*	DS*	DSR1*	DSR2**
9	90	27.432	SSR**	DSR1*	DSR2**	DSR1*	DSR1**	TSR2**
10	100	30.480	DSR1*	DSR1H**	TSR2*	DSR1**	DSR1H**	TSR2**
11	110	33.528	DSR1*	DSR2*	TSR2H**	DSR1**	DSR2*	TSR2H**
12	120	36.576	DSR1H*	DSR2*	TSR3*	DSR2*	DSR2**	TSR3H*
13	130	39.624	DSR2	DSR2H*	TSR3H*	DSR2*	DSR2H**	QSR3H*
14	140	42.672	DSR2	TSR2	QSR3H*	DSR2H*	TSR2*	QSR4H*
15	150	45.720	DSR2H*	TSR3	QSR4H*	TSR2*	TSR3*	QSR4H*
16	160	48.768	TSR2H	TSR3H	-	TSR2H*	TSR3H*	-
17	170	51.816	TSR3	-	-	TSR3	-	-
18	180	54.864	TSR3H	-	-	TSR3H	-	-
19	190	57.912	-	-	-	-	-	-
20	200	60.960	-	-	-	-	-	-

The constructions tabulated above are suitable to accept a minimum of 100,000 cycles of the relevant loading, as described opposite.

* = 1 bay of High Shear Panels is required at each end of the span

** = 2 bays of High Shear Panels are required at each end of the span

The following section gives the lists of parts required for the above constructions, complete with adjustments necessary for H.A. loading.

Note - the H.A. single nominal wheel loading of 10.19 tonnes is to be uniformly distributed over a contact patch 500mm wide by 200mm long.

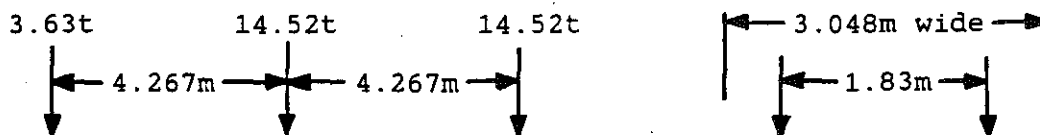
LOAD SPECIFICATIONS

AS APPLICABLE TO SIMPLY SUPPORTED BRIDGE TRUSSES.

HS20-44 LOADING (AASHTO)

HS20-44 Loading consists of two alternative forms of highway loading, both of which should be analysed for the span under consideration, and the worst effects of either applied to the bridge structure.

A. VEHICLE LOADING - Axle loads (tonnes) and spacings (metres).



B. LANE LOADING

The lane loading comprises a Uniformly Distributed Load combined with a co-existent Knife Edge Load.

- i) UNIFORMLY DISTRIBUTED LOAD: U.D.L. = 0.952 tonnes per metre.
- ii) KNIFE EDGE LOAD: K.E.L. = 11.79 tonnes for SHEAR assessment,
K.E.L. = 8.16 tonnes for MOMENT assessment.

NOTES

1. Both Vehicle and Lane Loadings occupy a Design Lane 3.048m wide. For Single Lane Bridges, the Design Lane is placed Eccentrically within the available roadway to produce the maximum effect upon the bridge structure. For Two Lane Bridges having a roadway less than 7.3m wide, a Design Lane is placed eccentrically within each half of the available roadway to produce the maximum effect upon the bridge structure.
2. Both Vehicle and Lane Loadings are also subject to an increase in effect upon the bridge structure, to account for dynamic impact, according to the following formula:

$$I = 1 + (15.24 / (L + 38.1)) \text{ to a maximum value of } 1.3$$

where I is the impact factor and L is the span of the bridge.

HS25 LOADING (AASHTO)

HS25 Loading is of an identical format to the above HS20-44 loading, except that all loads (U.D.L. & K.E.L.) are increased by 25 percent.

SPAN CONSTRUCTION TABLE

AMERICAN LOADING

SPAN			HS20 LOADING			HS25 LOADING		
BAYS	FEET	METRES	STD.	E.W.	2 LANE	STD.	E.W.	2 LANE
3	30	9.144	SS	SS	SS	SS	SS	SS*
4	40	12.192	SS	SS	SS*	SS	SS	DS
5	50	15.240	SS	SS	SSR*	SS	SS	DS
6	60	18.288	SS	SS	DS	SS	SSR*	DS*
7	70	21.336	SS	SSR	DS	SSR*	SSR*	DSR2*
8	80	24.384	SSR	SSR*	DSR1**	SSR*	SSR**	DSR2*
9	90	27.432	SSR	SSR*	DSR1**	SSR*	SSR**	DSR2*
10	100	30.480	SSR	SSR*	DSR1**	SSR**	SSR**	DSR2**
11	110	33.528	SSR*	SSR**	DSR2*	SSR**	SSRH**	DSR2**
12	120	36.576	SSR*	SSRH**	DSR2*	SSRH**	DSR1	DSR2H**
13	130	39.624	SSR*	DSR1	DSR2H**	DSR1	DSR1*	TSR2H**
14	140	42.672	SSRH**	DSR1	TSR2*	DSR1	DSR1H*	TSR3*
15	150	45.720	DSR1	DSR1H*	TSR2H*	DSR1H*	DSR2	TSR3H*
16	160	48.768	DSR1	DSR2	TSR3H	DSR2	DSR2H	QSR3H
17	170	51.816	DSR2	DSR2	QSR3H	DSR2	DSR2H*	QSR4H
18	180	54.864	DSR2	DSR2H	QSR4H	DSR2H	TSR2H	
19	190	57.912	DSR2H	TSR2H	QSR4H	TSR2H	TSR3	
20	200	60.960	TSR3	TSR3		TSR3	TSR3H	

The constructions tabulated above are suitable to accept a minimum of 100,000 cycles of the relevant loading, as described opposite.

* = 1 bay of High Shear Panels is required at each end of the span

** = 2 bays of High Shear Panels are required at each end of the span

The following section gives the lists of parts required for the above constructions, complete with adjustments necessary for HS25 loading.

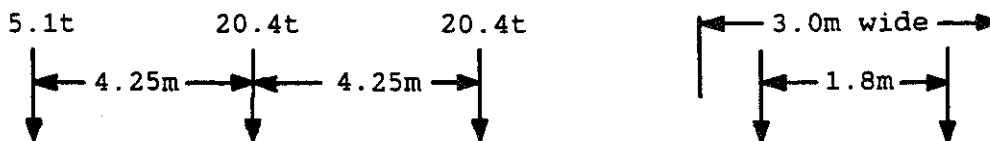
LOAD SPECIFICATIONS

AS APPLICABLE TO SIMPLY SUPPORTED BRIDGE TRUSSES.

MS250 LOADING (CSA)

MS250 Loading consists of two alternative forms of highway loading, both of which should be analysed for the span under consideration, and the worst effects of either applied to the bridge structure.

A. VEHICLE LOADING - Axle loads (tonnes) and spacings (metres).



B. LANE LOADING

The lane loading comprises a Uniformly Distributed Load combined with a co-existent Knife Edge Load.

- i) UNIFORMLY DISTRIBUTED LOAD: U.D.L. = 1.274 tonnes per metre.
- ii) KNIFE EDGE LOAD: K.E.L. = 16.56 tonnes for SHEAR assessment,
K.E.L. = 11.47 tonnes for MOMENT assessment.

NOTES

1. Both Vehicle and Lane Loadings occupy a Design Lane 3.0m wide. For Single Lane Bridges, the Design Lane is placed eccentrically within the available roadway to produce the maximum effect upon the bridge structure. For Two Lane Bridges having a roadway less than 7.3m wide, a Design Lane is placed eccentrically within each half of the available roadway to produce the maximum effect upon the bridge structure.
2. Both Vehicle and Lane Loadings are also subject to an increase in effect upon the bridge structure, to account for dynamic impact, according to the following formula:

$$I = 1 + (15/(L + 38)) \text{ to a maximum value of } 1.3$$

where I is the impact factor and L is the span of the bridge.

SPAN CONSTRUCTION TABLE

CANADIAN LOADING

SPAN			MS250 LOADING		
BAYS	FEET	METRES	STD.	E.W.	2 LANE
3	30	9.144	SS	SS	SS*
4	40	12.192	SS	SS	DS
5	50	15.240	SS	SS*	DS*
6	60	18.288	SSR*	SSR*	TS
7	70	21.336	SSR*	SSR*	TS
8	80	24.384	SSR*	SSR**	DSR2*
9	90	27.432	SSR*	SSR**	DSR2**
10	100	30.480	SSR**	SSRH**	DSR2**
11	110	33.528	SSRH**	DSR1*	DSR2H**
12	120	36.576	DSR1	DSR1*	TSR2**
13	130	39.624	DSR1	DSR1H*	TSR2H**
14	140	42.672	DSR1*	DSR2	TSR3H*
15	150	45.720	DSR2	DSR2	QSR3H*
16	160	48.768	DSR2	DSR2H*	QSR4
17	170	51.816	DSR2H	TSR2	QSR4H
18	180	54.864	TSR2	TSR3	-
19	190	57.912	TSR2H	TSR3H	-
20	200	60.960	TSR3H	-	-

The constructions tabulated above are suitable to accept a minimum of 100,000 cycles of the relevant loading, as described opposite.

* = 1 bay of High Shear Panels is required at each end of the span

** = 2 bays of High Shear Panels are required at each end of the span

The following section gives the lists of parts required for the above constructions, complete with adjustments necessary for MS250 loading.

S E C T I O N 3
B R I D G E
P A R T S L I S T S

BRIDGE PARTS LISTS

PROCEDURE FOR USE OF THE TABLES ON THE FOLLOWING PAGES

1. The following information must be known:

- a) Roadwidth
- b) Deck Type
- c) Loading Type
- d) Bridge Construction
- e) Length of Span in Bays
1 Bay = 10ft. = 3.048m

2. Choose the appropriate table for roadwidth and deck type.

If the loading is of the HS25/MS250/HA type, disregard this fact for the moment.

If the bridge is of chord reinforced construction, has bays of high shear panels, or if it is intended to utilise 803mm wide deck units throughout, disregard these facts for the moment.

3. For each part, consider the quantities listed beneath the appropriate construction. Multiply the quantity listed for "intermediate bay" by the number of intermediate bays in the bridge, and add the quantities listed for "male end bay" and for "female end bay".

For unreinforced constructions with standard panels and decking throughout, this gives the total quantity of parts required for HS20 type loadings.

4. If the bridge is of chord reinforced construction, turn to page 3.10 Section "A" for the necessary adjustments to quantities.

- a) Multiply the quantities listed beneath the appropriate construction in table (i) by the number of intermediate bays in the bridge. Add these quantities to those established in "3" above.
- b) Multiply the quantities listed beneath the appropriate construction in table (ii) by the number of intermediate bays in the bridge. Deduct these quantities from those established in "3" above.
- c) Deduct the quantities listed beneath the appropriate construction in table (iii) from the total bridge quantities established above.

For reinforced constructions with standard panels and decking throughout, this gives the total quantity of parts required for HS20 type loadings.

5. If the bridge has bays of high shear panels, turn to page 3.10 Section "B" for the necessary adjustments to quantities.

Multiply the quantities listed beneath the appropriate construction by the number of bays of high shear panels required in the total bridge. Add or subtract these quantities, as indicated, to the quantities established above.

For unreinforced or reinforced constructions, with bays of high shear panels, but with standard decking throughout, this gives the total quantity of parts required for HS20 type loadings.

6. If the loading is of the HS25/MS250/HA type, turn to page 3.11 Section "C" for the necessary adjustments to quantities.

Multiply the quantities listed beneath the appropriate roadwidth and deck type in the table by the total number of bays in the bridge. Add these quantities to those established above.

Furthermore, for two lane bridges, change the transom type to suit the heavier loading as indicated beneath the table.

For unreinforced or reinforced constructions, with or without high shear panels, but with standard decking throughout, this gives total quantity of parts required for HS25/MS250/HA type loadings.

7. If it is intended to utilise 803mm wide deck units throughout turn to page 3.11 Section "D" for the necessary adjustments to quantities.

For all loadings, consider the quantities listed beneath the appropriate roadwidth in table (i). Multiply the quantity listed for "intermediate bay" by the number of intermediate bays in the bridge. Add or subtract these quantities, as indicated, to those established above.

Furthermore, add or subtract the quantities, as indicated, listed for "male end bay" and for "female end bay" to those established above.

For HS25/MS250/HA type loadings, also consider the quantities listed beneath the appropriate roadwidth in table (ii).

Multiply the quantity listed for "intermediate bay" by the number of intermediate bays in the bridge, and add the quantities listed for "male end bay" and for "female end bay".

Add this quantity to that previously established above to give the total quantity of parts required.

BRIDGE PARTS LIST

EXAMPLE OF USAGE OF THE TABLES ON THE FOLLOWING PAGES.

1. Given the following bridge information:

- a) Two lane roadway
- b) Steel Deck
- c) HA Loading
- d) DSR2H** Construction
- e) 11 bay span.

Calculate the quantities required of:

- A) MC200A - Panel
- B) MC201A - Panel - High Shear
- C) MC307 - Panel Pin
- D) MC206 - Bracing Bolt

2. Refer to the table "TWO LANE ROADWAY-STEEL DECK-HS20 LOADING" Disregard, for the moment, that this bridge is for HA loading, is of reinforced construction and has bays of high shear panels.

3. Extract quantities from the "DS" columns.

The number of intermediate bays is $11 - 2 = 9$ hence

Quantity of MC200A - Panel	=	$4 \times 9 + 4 + 4$	=	44
Quantity of MC307 - Panel Pin	=	$8 \times 9 + 8 + 16$	=	96
Quantity of MC206 - Bracing Bolt	=	$35 \times 9 + 23 + 19$	=	357

4. See Section A "ADJUSTMENTS FOR REINFORCED CONSTRUCTIONS".

Extract adjustments from the "DSR2H" columns.

Table (i) gives:	MC307 - Panel Pin:	$+ 8 \times 9$	=	+72
Table (ii) gives:	MC206 - Bracing Bolt:	-16×9	=	-144
Table (iii) gives:	MC307 - Panel Pin:		=	-8

5. See Section B "ADJUSTMENTS FOR BRIDGES WITH HIGH SHEAR PANELS"

** indicates that two bays of high shear panels are required at each end of the span, hence the total number of bays of high shear panels in the bridge = 4.

Extract adjustments from the DSR(H) column.

MC200A - Panel:		$- 4 \times 4$	=	-16
MC201A - Panel - High Shear:		$+ 4 \times 4$	=	+16

6. See Section C "ADJUSTMENTS FOR HS25/MS250/HA TYPE LOADINGS"

Extract adjustments from "TWO LANE" column.

MC206 - Bracing Bolt: + 12 x 11 = +132.

Note that this sub-section also informs one that for a two lane roadway carrying HA loading an MC330 - Transom - MS250 should be utilized (not MC334 - Transom - HS20).

THE TOTAL QUANTITIES REQUIRED THEREFORE ARE AS FOLLOWS:

A)	MC200A - Panel:	44 + 0 + 0 - 0 - 16 + 0 = 28
B)	MC201A - Panel - H.S.	0 + 0 + 0 - 0 + 16 + 0 = 16
C)	MC307 - Panel Pin:	96 + 72 + 0 - 8 + 0 + 0 = 160
D)	MC206 - Bracing Bolt:	357 + 0 - 144 - 0 + 0 + 132 = 345

Note that the quantities calculated do not allow for any spares.

PARTS PER BAY

STANDARD WIDTH SINGLE LANE - STEEL DECK - HS20 TYPE LOADING

Part Mark No.	Description of Component	Intermediate Bay			Male End Bay			Female End Bay		
		SS	DS	TS	SS	DS	TS	SS	DS	TS
MC200A	PANEL	2	4	6	2	4	6	2	4	6
MC314	RAKER FRAME	2	-	-	2	-	-	-	-	-
MC312	VERTICAL FRAME	-	2	2	-	2	2	-	-	-
MC358	BRACING FRAME	-	2	2	-	-	-	-	-	-
MC313	TRANSOM-STD	1	1	1	2	2	2	1	1	1
MC15	SWAYBRACE-STD	2	2	2	2	2	2	2	2	2
MC222	VERTICAL BRACE	2	2	2	2	2	2	2	2	2
MC211	DECK-1606	2	2	2	-	-	-	-	-	-
MC213	DECK-1606-EOB	-	-	-	2	2	2	2	2	2
MC300	KERB	2	2	2	-	-	-	-	-	-
MC301	KERB-EOB	-	-	-	2	2	2	2	2	2
MC317	MALE END POST	-	-	-	-	-	-	2	4	6
MC318	FEMALE END POST	-	-	-	2	4	6	-	-	-
MC329	TIE BEAM-EOB	-	-	-	-	2	2	-	2	2
MC19	BEARING	-	-	-	2	4	6	2	4	6
MC236	BASEPLATE	-	-	-	2	4	6	2	4	6
MC307	PANEL PIN	4	8	12	4	8	12	8	16	24
MC307A	SAFETY CLIP	8	16	24	8	16	24	16	32	48
MC11	TRANSOM BOLT	8	8	8	10	12	12	6	8	8
MC206	BRACING BOLT	16	34	40	16	22	26	14	18	20
MC271	DECK SCREW	8	8	8	12	12	12	4	4	4
MC272	DECK NUT	8	8	8	12	12	12	4	4	4

NOTE: No Spares are included in the above quantities.

As necessary, refer to the following sections on pages 3.10 and 3.11:

- A. For adjustments to Parts Required for Reinforced Constructions
- B. For adjustments to Parts Required for Bridges with High Shear Panel
- C. For adjustments to Parts Required for HS25/MS250/HA Type Loadings
- D. For adjustments to Parts Required to utilise 803 mm Deck Units only

PARTS PER BAY

STANDARD WIDTH SINGLE LANE - TIMBER DECK - HS20 TYPE LOADING

Part Mark No.	Description of Component	Intermediate Bay			Male End Bay			Female End Bay		
		SS	DS	TS	SS	DS	TS	SS	DS	TS
MC200A	PANEL	2	4	6	2	4	6	2	4	6
MC314	RAKER FRAME	2	-	-	2	-	-	-	-	-
MC312	VERTICAL FRAME	-	2	2	-	2	2	-	-	-
MC358	BRACING FRAME	-	2	2	-	-	-	-	-	-
MC313	TRANSOM-STD	1	1	1	2	2	2	1	1	1
MC15	SWAYBRACE-STD	2	2	2	2	2	2	2	2	2
MC222	VERTICAL BRACE	2	2	2	2	2	2	2	2	2
MC7	PLAIN STRINGER	2	2	2	2	2	2	2	2	2
MC8	BUTTON STRINGER	2	2	2	2	2	2	2	2	2
MC14	TIMBER CHESS-STD	13	13	13	13	13	13	13	13	13
MC13	KERB-TIMBER DECK	2	2	2	2	2	2	2	2	2
NLC8087	TIMBER INFILL-STD	-	-	-	1	1	1	1	1	1
MC317	MALE END POST	-	-	-	-	-	-	2	4	6
MC318	FEMALE END POST	-	-	-	2	4	6	-	-	-
MC329	TIE BEAM-EOB	-	-	-	-	2	2	-	2	2
MC19	BEARING	-	-	-	2	4	6	2	4	6
MC236	BASEPLATE	-	-	-	2	4	6	2	4	6
MC307	PANEL PIN	4	8	12	4	8	12	8	16	24
MC307A	SAFETY CLIP	8	16	24	8	16	24	16	32	48
MC11	TRANSOM BOLT	8	8	8	10	12	12	6	8	8
MC206	BRACING BOLT	8	26	32	8	14	18	6	10	12
MC271	DECK SCREW	8	8	8	12	12	12	4	4	4
MC272	DECK NUT	8	8	8	12	12	12	4	4	4
MC10	KERB BOLT	8	8	8	8	8	8	8	8	8

NOTE: No Spares are included in the above quantities.

As necessary, refer to the following sections on pages 3.10 and 3.11:

- A. For adjustments to Parts Required for Reinforced Constructions
- B. For adjustments to Parts Required for Bridges with High Shear Panels
- C. For adjustments to Parts Required for HS25/MS250/HA Type Loadings

PARTS PER BAY

EXTRA WIDE SINGLE LANE - STEEL DECK - HS20 TYPE LOADING

Part Mark No.	Description of Component	Intermediate Bay			Male End Bay			Female End Bay		
		SS	DS	TS	SS	DS	TS	SS	DS	TS
MC200A	PANEL	2	4	6	2	4	6	2	4	6
MC314	RAKER FRAME	2	-	-	2	-	-	-	-	-
MC312	VERTICAL FRAME	-	2	2	-	2	2	-	-	-
MC358	BRACING FRAME	-	2	2	-	-	-	-	-	-
MC320	TRANSOM-E.W.	1	1	1	2	2	2	1	1	1
MC134	SWAYBRACE-E.W.	2	2	2	2	2	2	2	2	2
MC222	VERTICAL BRACE	2	2	2	2	2	2	2	2	2
MC211	DECK-1606	2	2	2	-	-	-	-	-	-
MC212	DECK-803	1	1	1	-	-	-	-	-	-
MC213	DECK-1606-EOB	-	-	-	2	2	2	2	2	2
MC214	DECK-803-EOB	-	-	-	1	1	1	1	1	1
MC300	KERB	2	2	2	-	-	-	-	-	-
MC301	KERB-EOB	-	-	-	2	2	2	2	2	2
MC317	MALE END POST	-	-	-	-	-	-	2	4	6
MC318	FEMALE END POST	-	-	-	2	4	6	-	-	-
MC329	TIE BEAM-EOB	-	-	-	-	2	2	-	2	2
MC19	BEARING	-	-	-	2	4	6	2	4	6
MC236	BASEPLATE	-	-	-	2	4	6	2	4	6
MC307	PANEL PIN	4	8	12	4	8	12	8	16	24
MC307A	SAFETY CLIP	8	16	24	8	16	24	16	32	48
MC11	TRANSOM BOLT	8	8	8	10	12	12	6	8	8
MC206	BRACING BOLT	16	34	40	16	22	26	14	18	20
MC271	DECK SCREW	12	12	12	18	18	18	6	6	6
MC272	DECK NUT	12	12	12	18	18	18	6	6	6

NOTE: No Spares are included in the above quantities.

As necessary, refer to the following sections on pages 3.10 and 3.11:

- A. For adjustments to Parts Required for Reinforced Constructions
- B. For adjustments to Parts Required for Bridges with High Shear Pane
- C. For adjustments to Parts Required for HS25/MS250/HA Type Loadings
- D. For adjustments to Parts Required to utilise 803 mm Deck Units onl

PARTS PER BAY

EXTRA WIDE SINGLE LANE - TIMBER DECK - HS20 TYPE LOADING

Part Mark No.	Description of Component	Intermediate Bay			Male End Bay			Female End Bay		
		SS	DS	TS	SS	DS	TS	SS	DS	TS
MC200A	PANEL	2	4	6	2	4	6	2	4	6
MC314	RAKER FRAME	2	-	-	2	-	-	-	-	-
MC312	VERTICAL FRAME	-	2	2	-	2	2	-	-	-
MC358	BRACING FRAME	-	2	2	-	-	-	-	-	-
MC320	TRANSOM-E.W.	1	1	1	2	2	2	1	1	1
MC134	SWAYBRACE-E.W.	2	2	2	2	2	2	2	2	2
MC222	VERTICAL BRACE	2	2	2	2	2	2	2	2	2
MC7	PLAIN STRINGER	3	3	3	3	3	3	3	3	3
MC8	BUTTON STRINGER	2	2	2	2	2	2	2	2	2
MC144	TIMBER CHESS-E.W.	13	13	13	13	13	13	13	13	13
MC13	KERB-TIMBER DECK	2	2	2	2	2	2	2	2	2
NLC8088	TIMBER INFILL-E.W.	-	-	-	1	1	1	1	1	1
MC317	MALE END POST	-	-	-	-	-	-	2	4	6
MC318	FEMALE END POST	-	-	-	2	4	6	-	-	-
MC329	TIE BEAM-EOB	-	-	-	-	2	2	-	2	2
MC19	BEARING	-	-	-	2	4	6	2	4	6
MC236	BASEPLATE	-	-	-	2	4	6	2	4	6
MC307	PANEL PIN	4	8	12	4	8	12	8	16	24
MC307A	SAFETY CLIP	8	16	24	8	16	24	16	32	48
MC11	TRANSOM BOLT	8	8	8	10	12	12	6	8	8
MC206	BRACING BOLT	8	26	32	8	14	18	6	10	12
MC271	DECK SCREW	10	10	10	15	15	15	5	5	5
MC272	DECK NUT	10	10	10	15	15	15	5	5	5
MC10	KERB BOLT	8	8	8	8	8	8	8	8	8

NOTE: No Spares are included in the above quantities.

As necessary, refer to the following sections on pages 3.10 and 3.11:

- A. For adjustments to Parts Required for Reinforced Constructions
- B. For adjustments to Parts Required for Bridges with High Shear Panels
- C. For adjustments to Parts Required for HS25/MS250/HA Type Loadings

PARTS PER BAY

TWO LANE ROADWAY - STEEL DECK - HS20 TYPE LOADING

Part Mark No.	Description of Component	Intermediate Bay				Male End Bay				Female End Bay			
		SS	DS	TS	QS	SS	DS	TS	QS	SS	DS	TS	QS
MC200A	PANEL	2	4	6	8	2	4	6	8	2	4	6	8
MC314	RAKER FRAME	2	-	-	-	2	-	-	-	-	-	-	-
MC312	VERTICAL FRAME	-	2	2	-	-	2	2	-	-	-	-	-
NLC8091	VERT. FRAME-QS	-	-	-	2	-	-	-	2	-	-	-	-
MC358	BRACING FRAME	-	2	2	-	-	-	-	-	-	-	-	-
MC359	BRAC. FRAME-QS	-	-	-	2	-	-	-	-	-	-	-	-
MC334	TRANSOM-2 LANE	1	1	1	1	2	2	2	2	1	1	1	1
MC331	SWAY.-2 LANE	4	4	4	4	4	4	4	4	4	4	4	4
MC222	VERTICAL BRACE	2	2	2	2	2	2	2	2	2	2	2	2
MC211	DECK-1606	4	4	4	4	-	-	-	-	-	-	-	-
MC212	DECK-803	1	1	1	1	-	-	-	-	-	-	-	-
MC213	DECK-1606-EOB	-	-	-	-	4	4	4	4	4	4	4	4
MC214	DECK-803-EOB	-	-	-	-	1	1	1	1	1	1	1	1
MC300	KERB	2	2	2	2	-	-	-	-	-	-	-	-
MC301	KERB-EOB	-	-	-	-	2	2	2	2	2	2	2	2
MC317	MALE END POST	-	-	-	-	-	-	-	-	2	4	6	8
MC318	FEMALE END POST	-	-	-	-	2	4	6	8	-	-	-	-
MC329	TIE BEAM-EOB	-	-	-	-	-	2	2	-	-	2	2	-
NLC8093	TIE BEAM-EOB-QS	-	-	-	-	-	-	-	2	-	-	-	2
MC19	BEARING	-	-	-	-	2	4	6	8	2	4	6	8
MC236	BASEPLATE	-	-	-	-	2	4	6	8	2	4	6	8
MC307	PANEL PIN	4	8	12	16	4	8	12	16	8	16	24	32
MC307A	SAFETY CLIP	8	16	24	32	8	16	24	32	16	32	48	64
MC11	TRANSOM BOLT	12	12	12	14	14	16	16	20	10	12	12	14
MC206	BRACING BOLT	17	35	41	47	17	23	27	31	15	19	21	23
MC271	DECK SCREW	20	20	20	20	30	30	30	30	10	10	10	10
MC272	DECK NUT	20	20	20	20	30	30	30	30	10	10	10	10

NOTE: No Spares are included in the above quantities.

As necessary, refer to the following sections on pages 3.10 and 3.11:

- A. For adjustments to Parts Required for Reinforced Constructions
- B. For adjustments to Parts Required for Bridges with High Shear Panel
- C. For adjustments to Parts Required for HS25/MS250/HA Type Loadings
- D. For adjustments to Parts Required to utilise 803 mm Deck Units only

PARTS LIST ADJUSTMENTS

A. ADJUSTMENTS TO PARTS REQUIRED FOR REINFORCED CONSTRUCTIONS

(i) FOR EACH INTERMEDIATE BAY ADD THE FOLLOWING:

Mark No.	Component Description	SSR DSR1	SSRH DSR1H	DSR2 TSR2	DSR2H TSR2H	TSR3 QSR3	TSR3H QSR3H	QSR4	QSR4H
MC302	CHORD REINFORCEM'T	4	-	8	-	12	-	16	-
MC304	CHORD REINF.-HEAVY	-	4	-	8	-	12	-	16
MC207	CHORD BOLT	16	16	32	32	48	48	64	64
MC307	PANEL PIN	4	4	8	8	12	12	16	16
MC307A	SAFETY PIN	8	8	16	16	24	24	32	32

(ii) FOR EACH INTERMEDIATE BAY DEDUCT THE FOLLOWING:

Mark No.	Component Description	SSR SSRH	DSR1 DSR1H	DSR2 DSR2H	TSR2 TSR2H	TSR3 TSR3H	QSR3 QSR3H	QSR4 QSR4H
MC206	BRACING BOLT	-	8	16	4	-	4	-

(iii) FROM THE TOTAL BRIDGE QUANTITIES DEDUCT THE FOLLOWING:

Mark No.	Component Description	SSR SSRH	DSR1 DSR1H	DSR2 DSR2H	TSR2 TSR2H	TSR3 TSR3H	QSR3 QSR3H	QSR4 QSR4H
MC307	PANEL PIN	4	4	8	8	12	12	16
MC307A	SAFETY CLIP	8	8	16	16	24	24	32

B. ADJUSTMENTS TO PARTS REQUIRED FOR BRIDGES WITH HIGH SHEAR PANELS

FOR EACH BAY OF HIGH SHEAR PANELS ADJUST THE PARTS LIST AS FOLLOWS:

Mark No.	Component Description	SS SSR(H)	DS DSR(H)	TS TSR(H)	QS QSR(H)
MC200A	PANEL	-2	-4	-6	-8
MC201A	PANEL - HIGH SHEAR	+2	+4	+6	+8

PARTS LIST ADJUSTMENTS

C. ADJUSTMENTS TO PARTS REQUIRED FOR HS25/MS250/HA TYPE LOADINGS

FOR EACH BAY OF BRIDGE ADJUST THE PARTS LIST AS FOLLOWS:

Part Mark No.	Description of Component	Single Lane				Two Lane
		Std Width		Extra Wide		Steel Deck
		Steel	Timber	Steel	Timber	
MC206	BRACING BOLT	+3	+4	+6	+5	+12
MC226	DECK STIFFENER-STD.	-	+1	-	-	-
MC227	DECK STIFFENER-E.W.	-	-	-	+1	-

FURTHERMORE, FOR TWO LANE ROADWAYS, SUBSTITUTE MC330-TRANSOM-MS250 FOR MC334-TRANSOM-HS20 IN THE PARTS LIST.

D. ADJUSTMENTS TO PARTS REQUIRED TO UTILISE 803 DECKS ONLY

(i) FOR ALL LOADINGS ADJUST THE PARTS LIST AS FOLLOWS:

Mark No.	Component Description	Intermediate Bay			Male End Bay			Female End Bay		
		Std.	EW	2 lane	Std.	EW	2 lane	Std.	EW	2 lane
MC211	DECK-1606	-2	-2	-4	-	-	-	-	-	-
MC212	DECK-803	+4	+4	+8	-	-	-	-	-	-
MC213	DECK-1606-EOB	-	-	-	-2	-2	-4	-2	-2	-4
MC214	DECK-803-EOB	-	-	-	+4	+4	+8	+4	+4	+8

(ii) FURTHERMORE, FOR HS25/MS250/HA TYPE LOADINGS, ADD THE FOLLOWING

Mark No.	Component Description	Intermediate Bay			Male End Bay			Female End Bay		
		Std.	EW	2 lane	Std.	EW	2 lane	Std.	EW	2 lane
MC206	BRACING BOLT	6	6	12	6	6	12	6	6	12

BRIDGE PARTS - SIMPLE SPANS

LIST OF PARTS ILLUSTRATED ON THE FOLLOWING PAGES

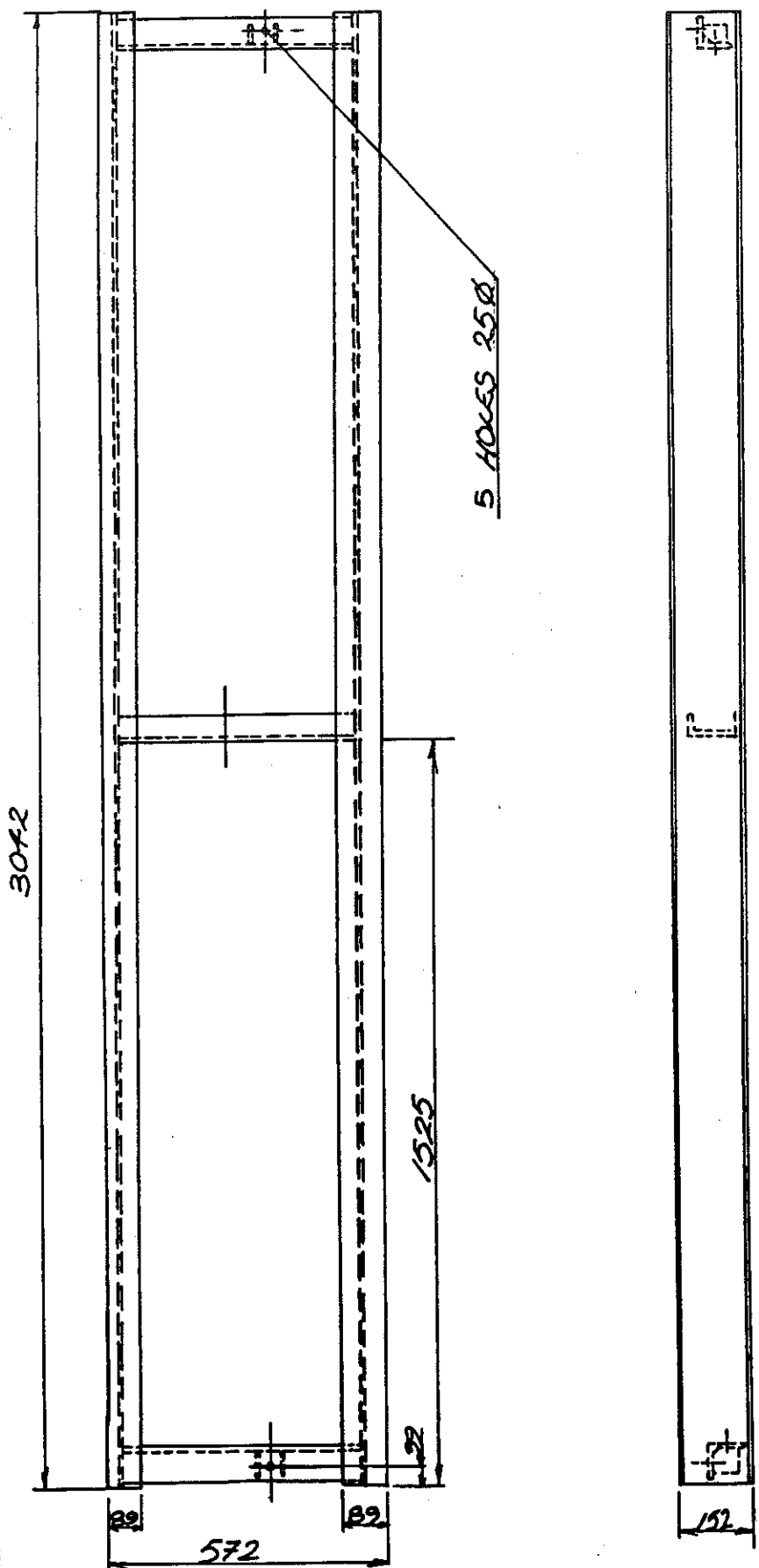
MC7	Stringer-Plain	MC300	Kerb-Steel Deck
MC8	Stringer-Button	MC301	Kerb-Steel Deck-EOB
MC10	Bolt-Kerb-Timber Deck	MC302	Chord Reinf-3m
MC11	Bolt-Transom/Bracing	MC304	Chord Reinf-3m-Heavy
MC13	Kerb-Timber Deck	MC307	Panel Pin
MC14	Chess-Std	MC307A	Safety Clip
MC15	Swaybrace-Std	MC312	Vertical Frame
MC19	Bearing	MC314	Raker Frame
MC134	Swaybrace-EW	MC313	Transom-Std
MC144	Chess-EW	MC320	Transom-EW
MC200A	Panel	MC317	End Post-Male
MC201A	Panel-High Shear	MC318	End Post-Female
MC206	Bolt-Bracing	MC329	Tie Beam-EOB
MC207	Bolt-Chord	MC331	Swaybrace-2 Lane
MC211	Deck-1606	MC330	Transom-2 Lane-MS250
MC212	Deck-803	MC334	Transom-2 Lane-HS20
MC213	Deck-1606-EOB	MC358	Bracing Frame
MC214	Deck-803-EOB	MC359	Bracing Frame - QS
MC222	Brace-Vertical		
MC226	Stiff-Timber Deck-Std		
MC227	Stiff-Timber Deck-EW		
MC235	Grillage Beam	NLC8087	Timber Infill-EOB-Std
MC236	Bearing Baseplate	NLC8088	Timber Infill-EOB-EW
MC271	Screw-Deck Clamp	NLC8091	Vertical Frame-QS
MC272	Nut-Deck Screw	NLC8093	Tie Beam-EOB-QS

5/87

MC7
STRINGER - PLAIN . WEIGHT : 117 Kg.

9 13 7

CA54



OVERALL DIMENSIONS : 3042 x 572 x 152 . CUBE (M³) 0.265 .

CHECKED	DATE
SBO	20.2.86



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5/84

MC 8

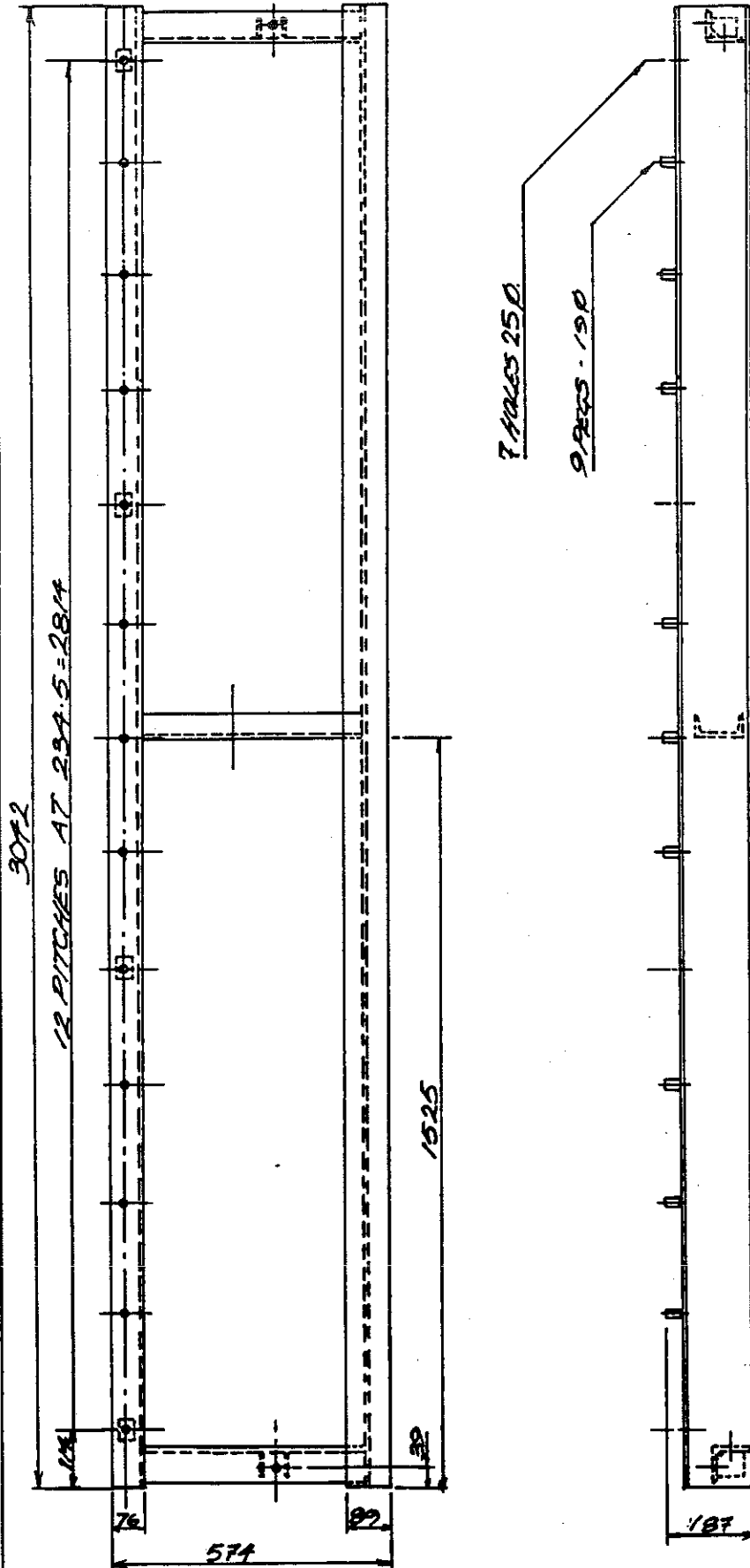
STRINGER - BUTTON . WEIGHT : 120 Kg.

9

13

8

CA 53



CUBE (M³) : 0.327.

OVERALL DIMENSIONS : 3042 x 574 x 187.

CHECKED	DATE
SBD	20-2-86



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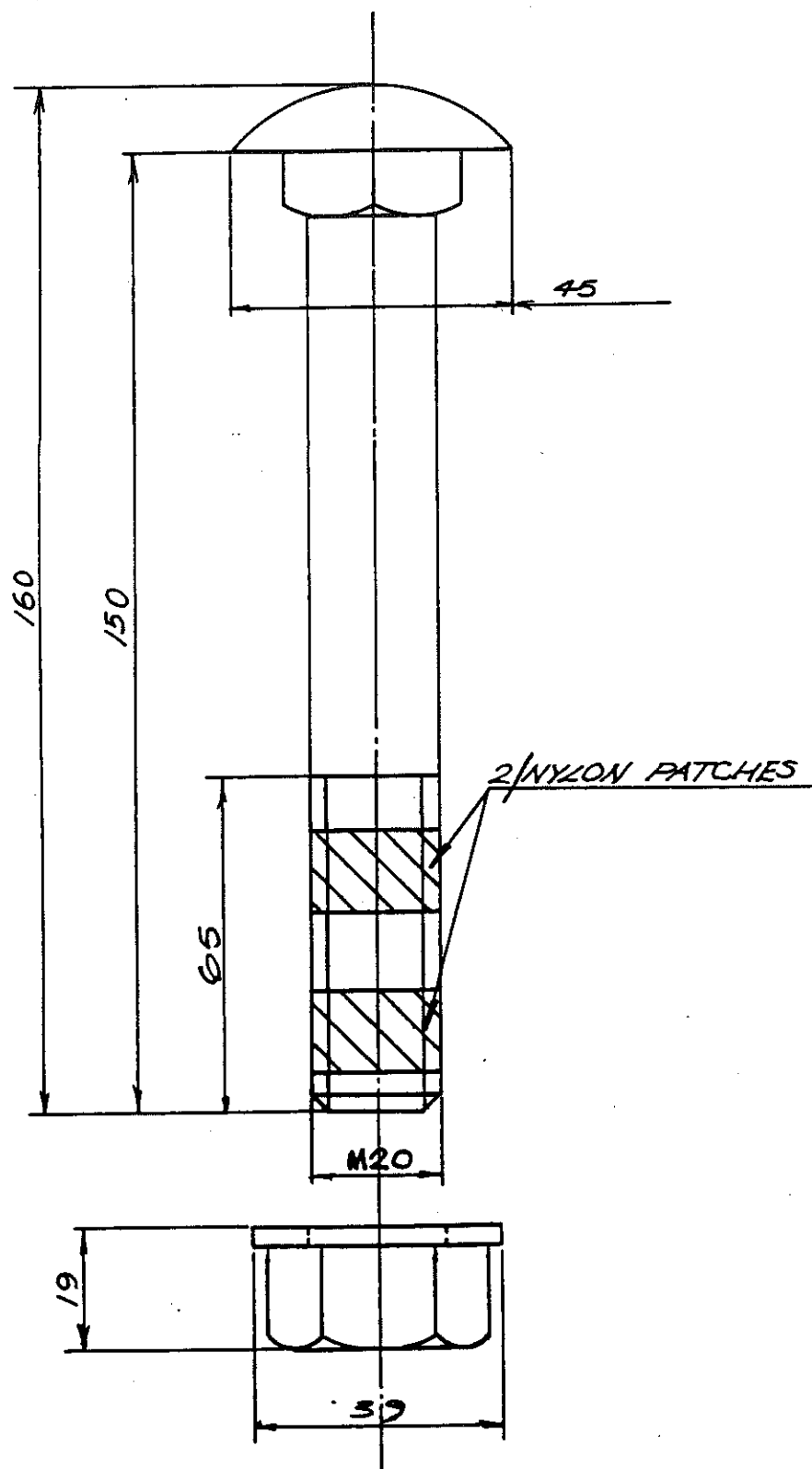
9/84

9	13	10
CA 60		

MC 10.

BOLT - KERB.

WEIGHT: 0.509 Kg.



OVERALL DIMENSIONS: 45 DIA. x 160 LG. CUBE (M³) 0.00025.

CHECKED	DATE
SBD	14.2.86



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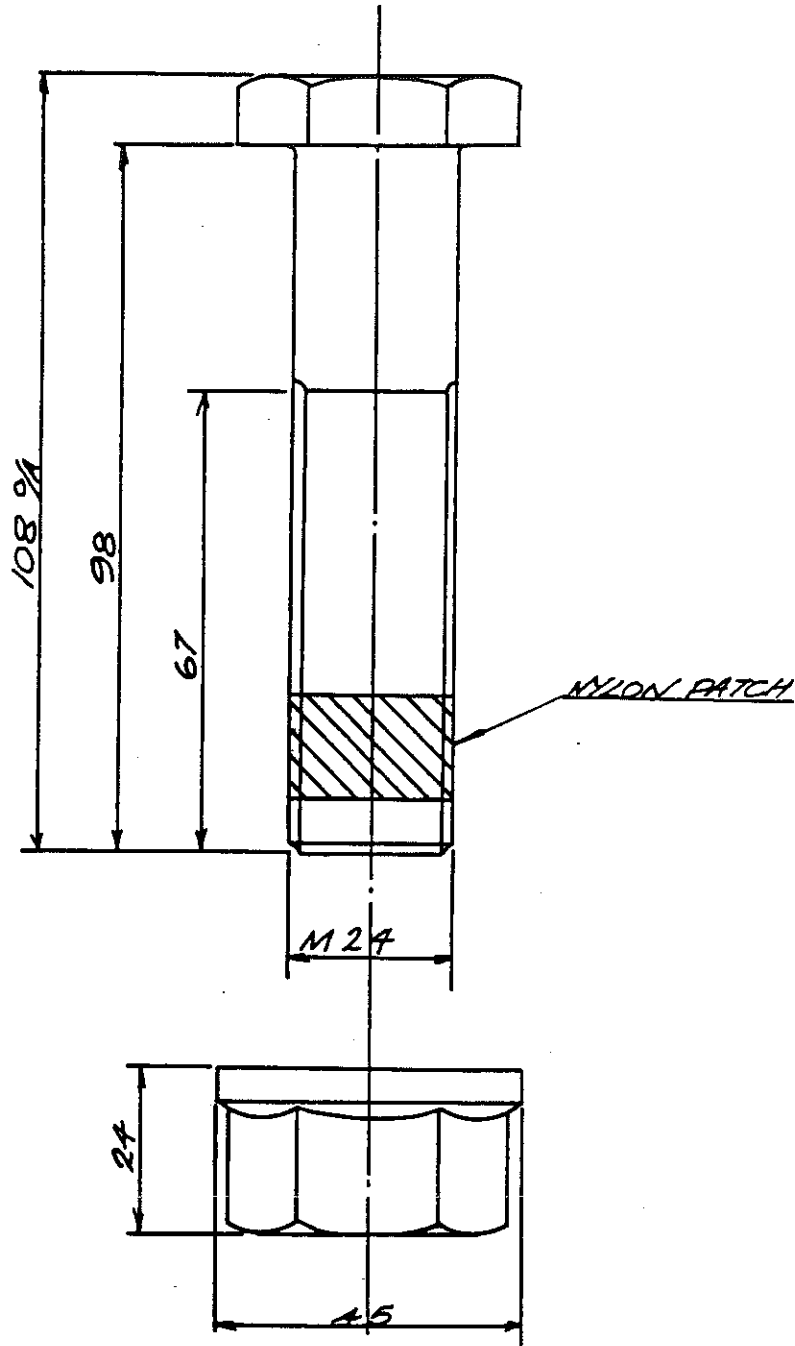
2/86

MC 11

9	13	11
CA 146		

BOLT - TRANSOM.

WEIGHT: 0.096 kg.



OVERALL DIMENSIONS : 45 DIA. x 108 LG.

CUBE (M³) - 0.00017 .

CHECKED	DATE
SBD	14.2.86



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5/84

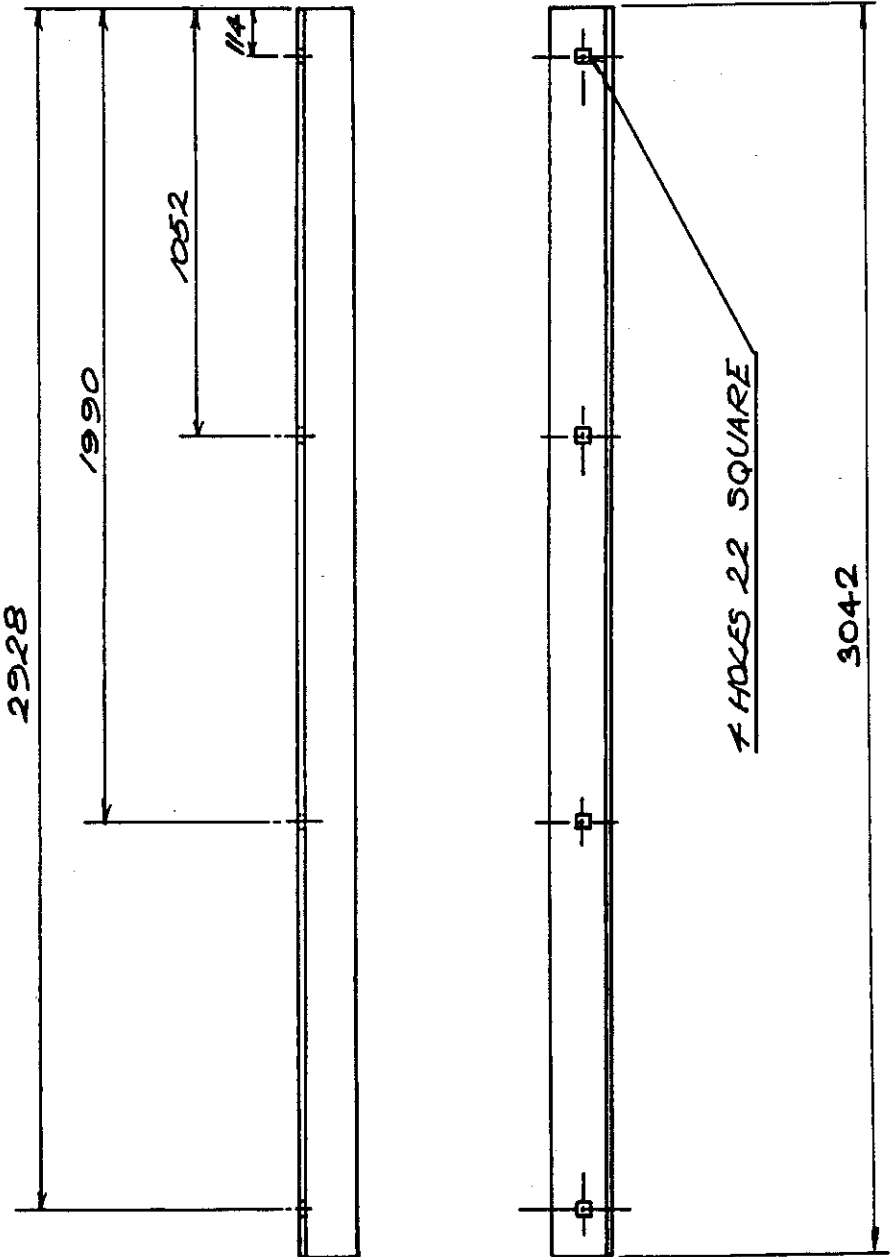
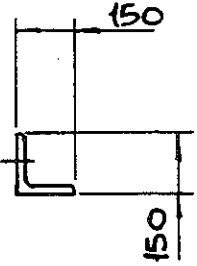
MC 13

9	13	13
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CA55

KERB - TIMBER DECK.

WEIGHT: 69.8 Kg.



OVERALL DIMENSIONS: 3042 x 150 x 150.

CUBE (M³) 0.0685.

CHECKED	DATE
SBD	14.2.86



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0/89

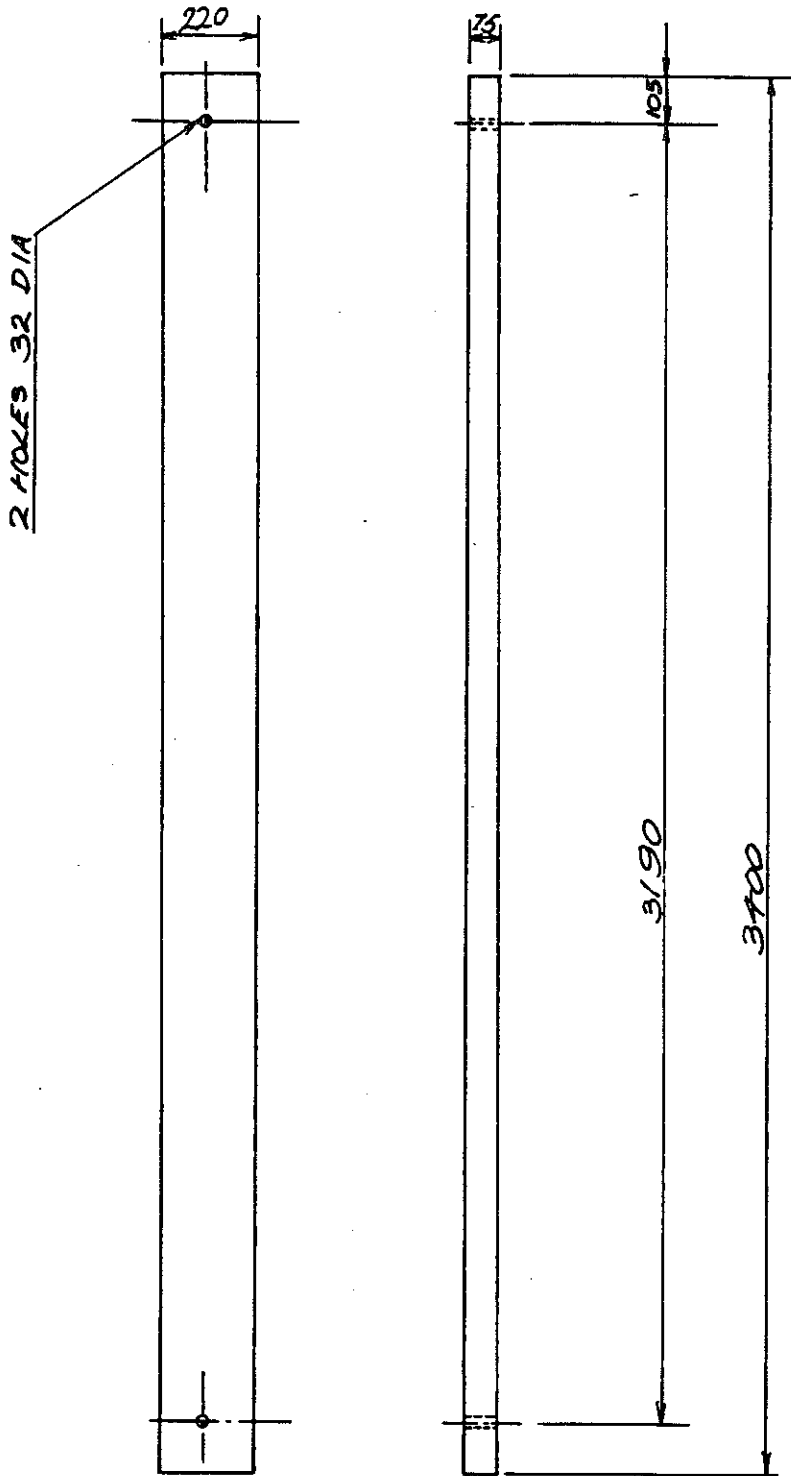
MC 14

9 13 14

CA58

CHES - STD. - 75 mm.

WEIGHT: 33.1 kg. @ 590 kg/m³



OVERALL DIMENSIONS: 3400 x 220 x 75

CUBE (M³) 0.0561.

CHECKED	DATE
RLB	24/7/89



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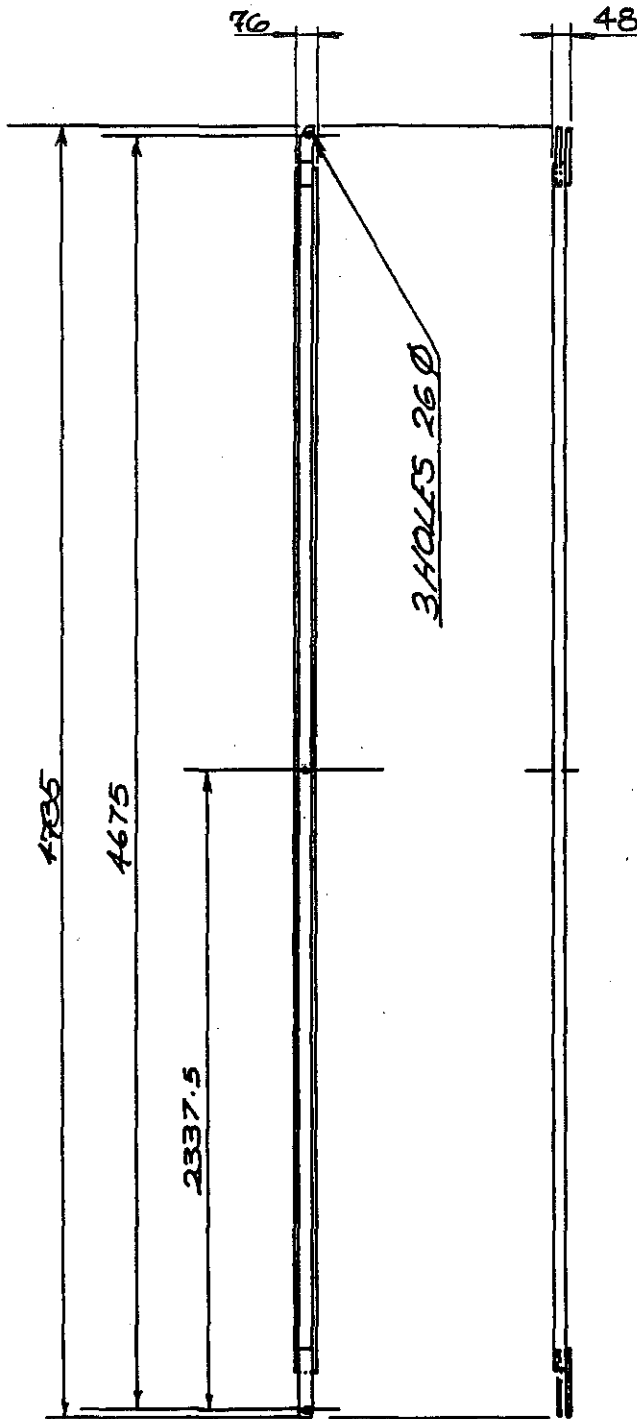
2/86

9	13	15
CAB		

MC 15

SWAYBRACE - STD.

WEIGHT: 34.3 kg.



OVERALL DIMENSIONS: 4735 x 76 x 48

CUBE (M³) 0.0173.

CHECKED	DATE
SBD	14.2.86

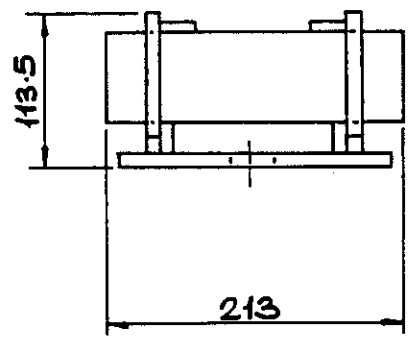
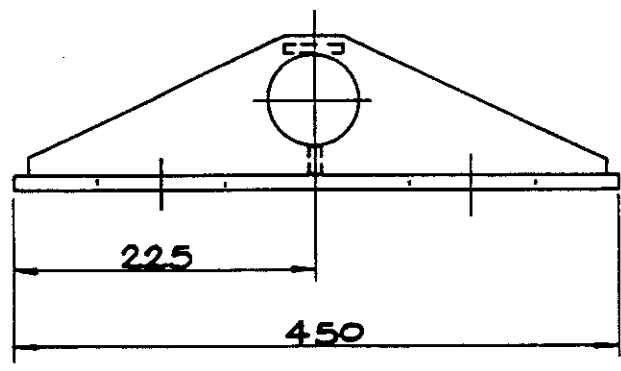
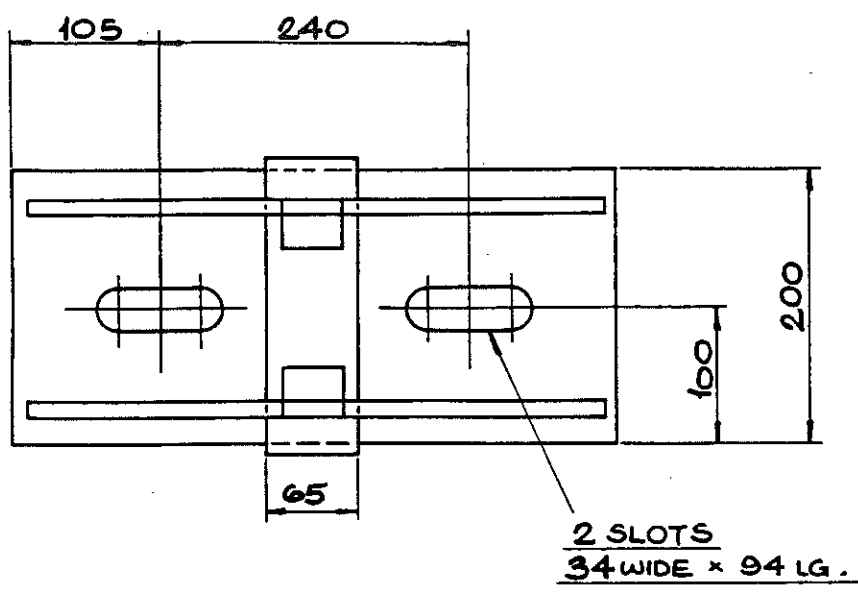


2/86

9	13	19
BA 910		

MC 19
BEARING - SINGLE.

WEIGHT: 17.67 Kg.



OVERALL DIMENSIONS: 450 x 213 x 113.5.

CUBE (M³) 0.0109.

CHECKED	DATE
SBD	14.2.86



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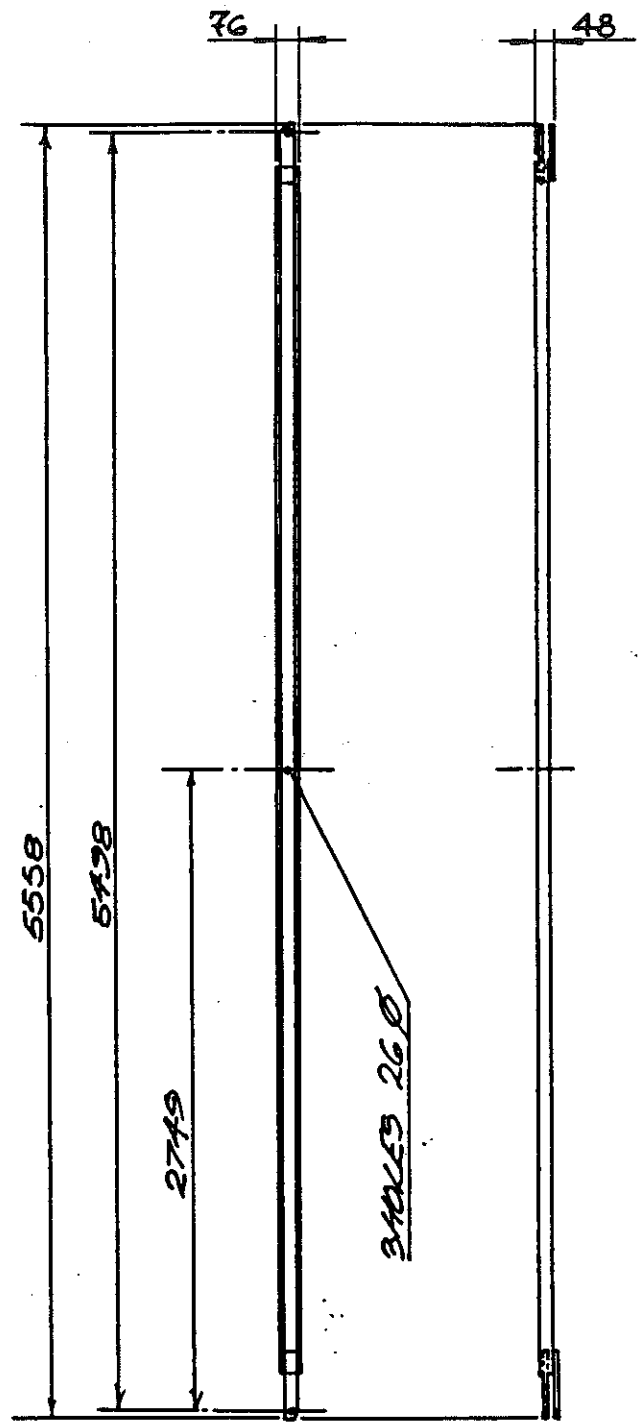
2/86

MC 134.

9	13	134
CA 98		

SWAYBRACE - EW.

WEIGHT : 39.8 kg.



OVERALL DIMENSIONS : 5558 x 76 x 48.

CUBE (M³) 0.0203.

CHECKED	DATE
SBD	14.2.86



2/86

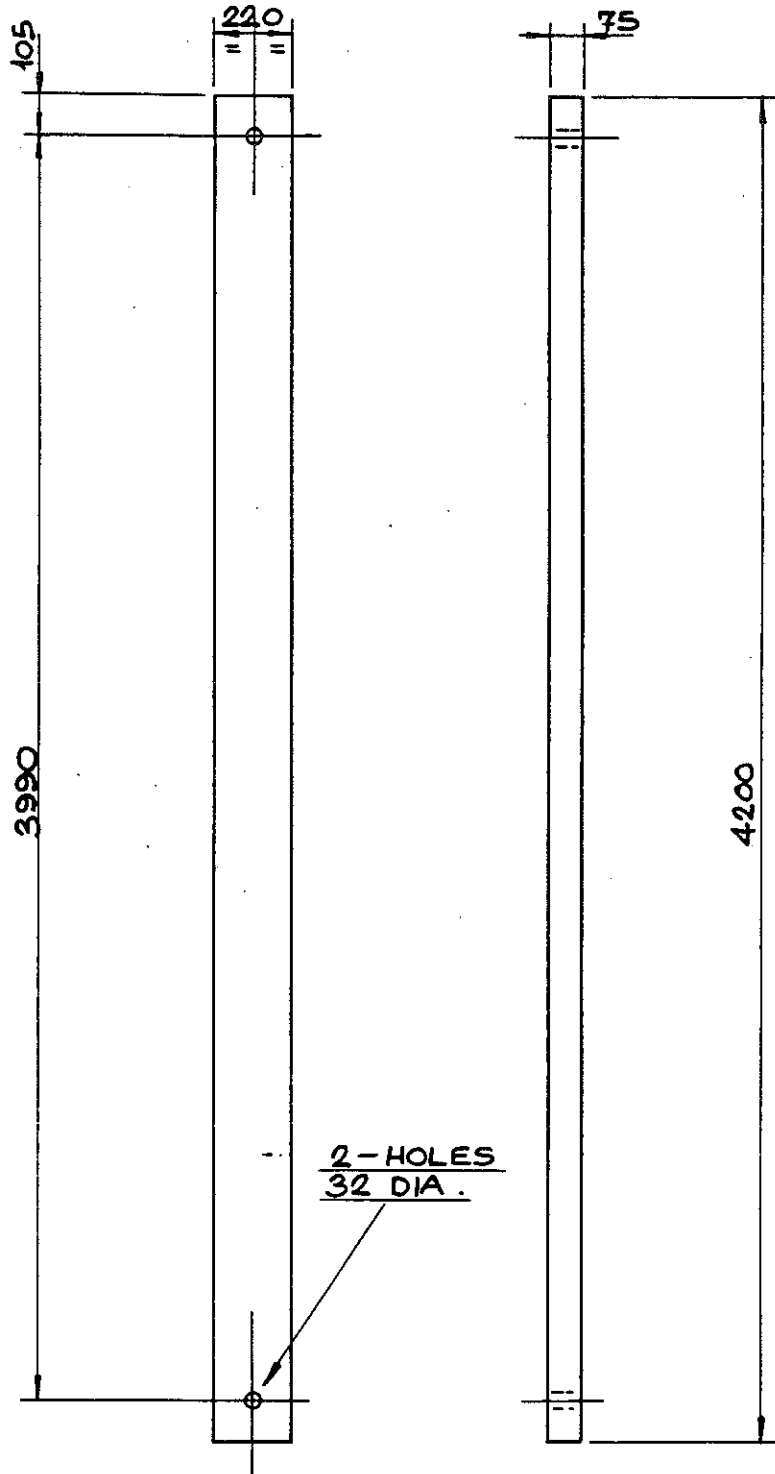
MC 144 .

9 13 144

CA 59 .

CHESS - E.W. - 75 mm.

WEIGHT: 40.9 Kg. @ 590 kg/m³



OVERALL DIMENSIONS: 4200 x 220 x 75 .

CUBE (M³) 0.0693 .

CHECKED	DATE
RLB	24/7/89



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2/90

MC 200A

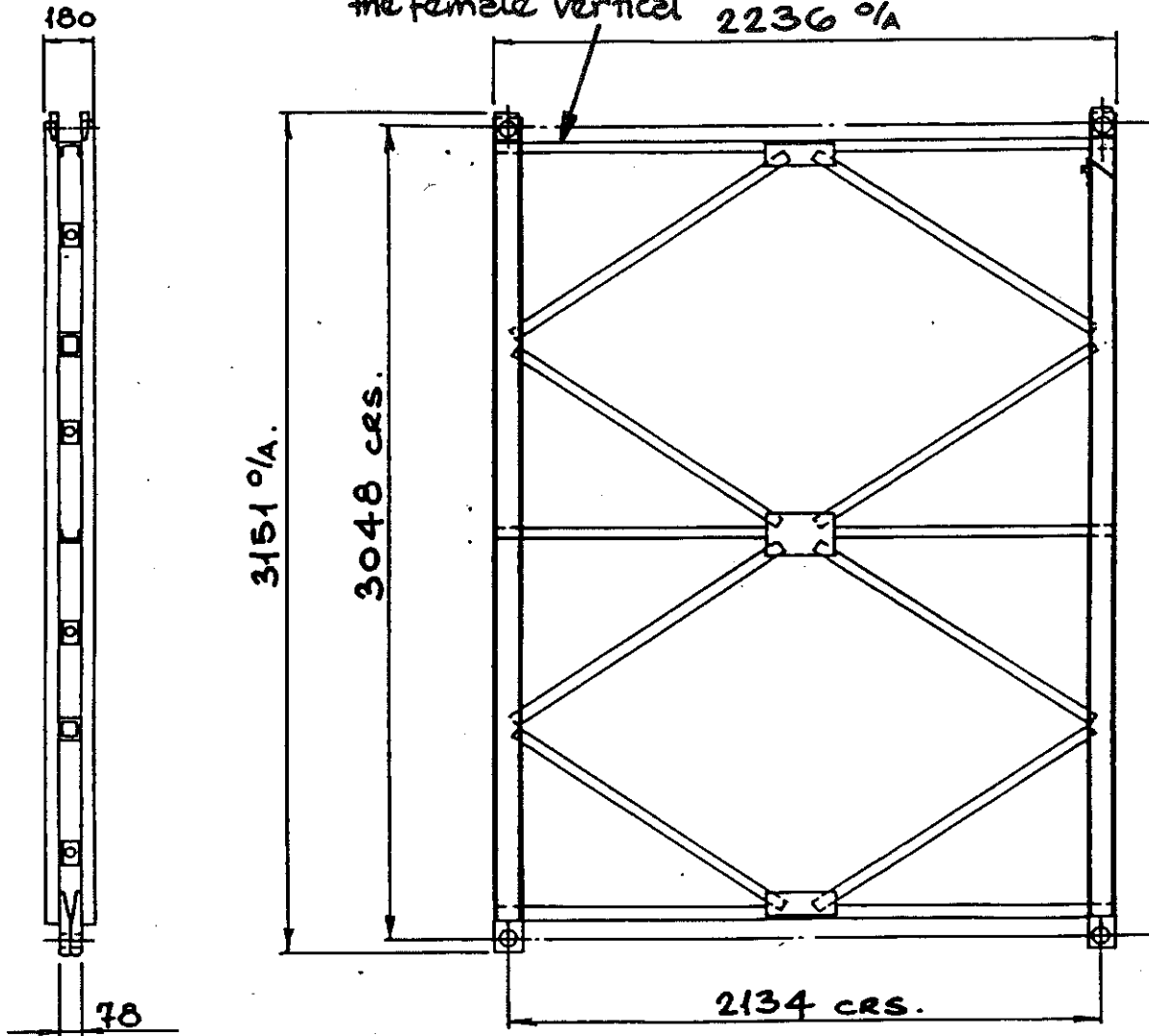
9 13 200A

PANEL 200

CA 357

WEIGHT: 285.891 Kg.

NOTE: MC 200A is identifiable from MC 200 by lack of a spacing plate at the top of the female vertical 2236 o/a



OVERALL DIMENSIONS: 3151 x 2236 x 180

CUBE (M3): 1.27

CHECKED	DATE
Poul B.	6/2/90



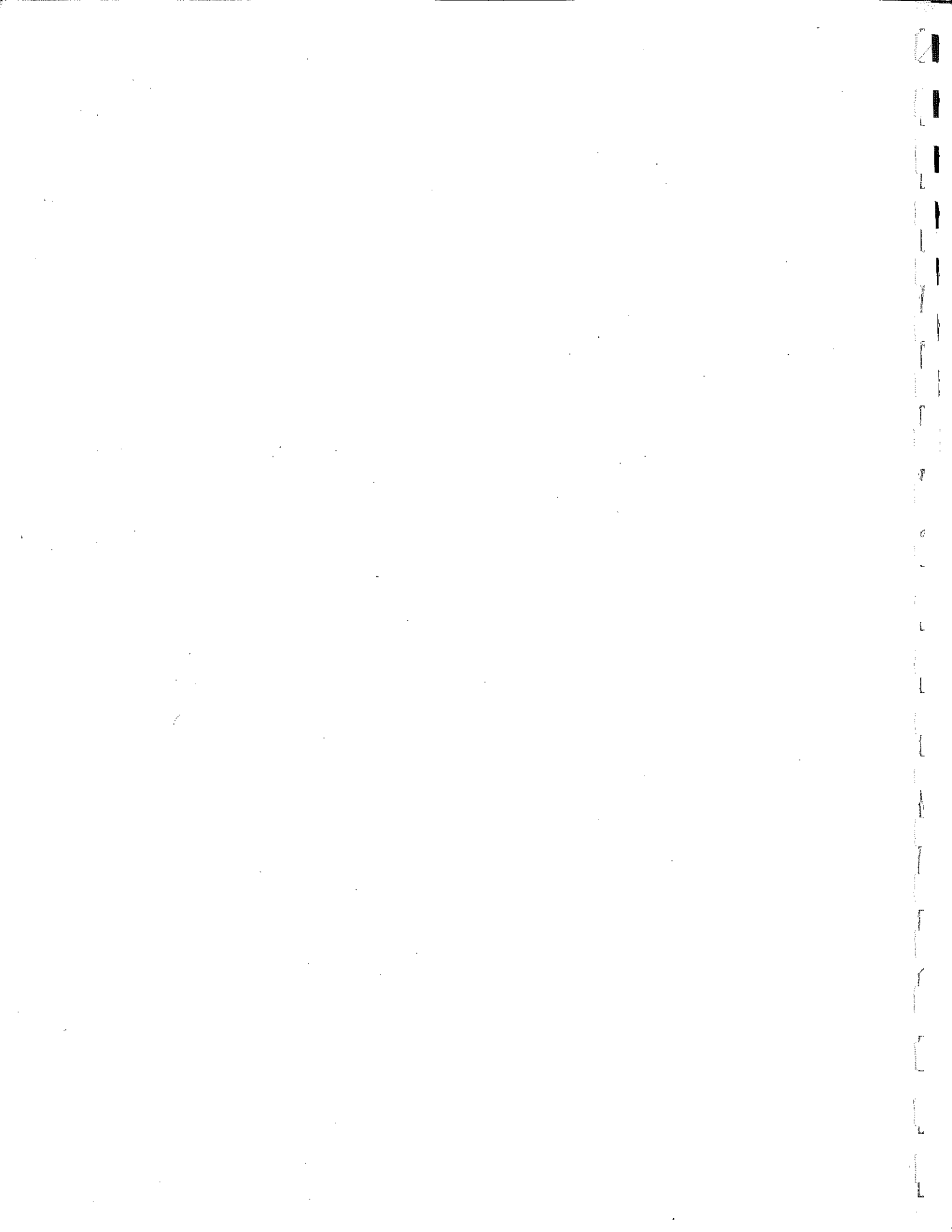
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CONVERSION FACTORS APPLICABLE TO THE COMPACT 200 MANUAL
AND THE ACCOMPANYING C200 BROCHURE

abbreviations used

mm - millimetre
ins - inch
m - metre
ft - feet
t - tonne
kip - 1000lb
kg - kilogramme
lb - pound
N - Newton
kN - kiloNewton
sq - square

1 mm	- 0.039 ins	1 ins	- 25.4 mm
1 m	- 3.281 ft	1 ft	- 0.305 m
1 mm	- 0.0016 sq ins	1 sq ins	- 645 mm
1 m	- 10.76 sq ft	1 sq ft	- 0.093 m
1 t	- 2.205 kip	1 kip	- 0.454 t
1 kg	- 2.205 lb	1 lb	- 0.454 kg
1 kN	- 0.225 kip	1 kip	- 4.449 kN
1 t.m	- 7.234 kip.ft	1 kip.ft	- 0.138 t.m
1 N/mm	- 145 lb/sq ins	1 lb/sq ins	- 0.0069 N/mm



1/90

MC 201A

9

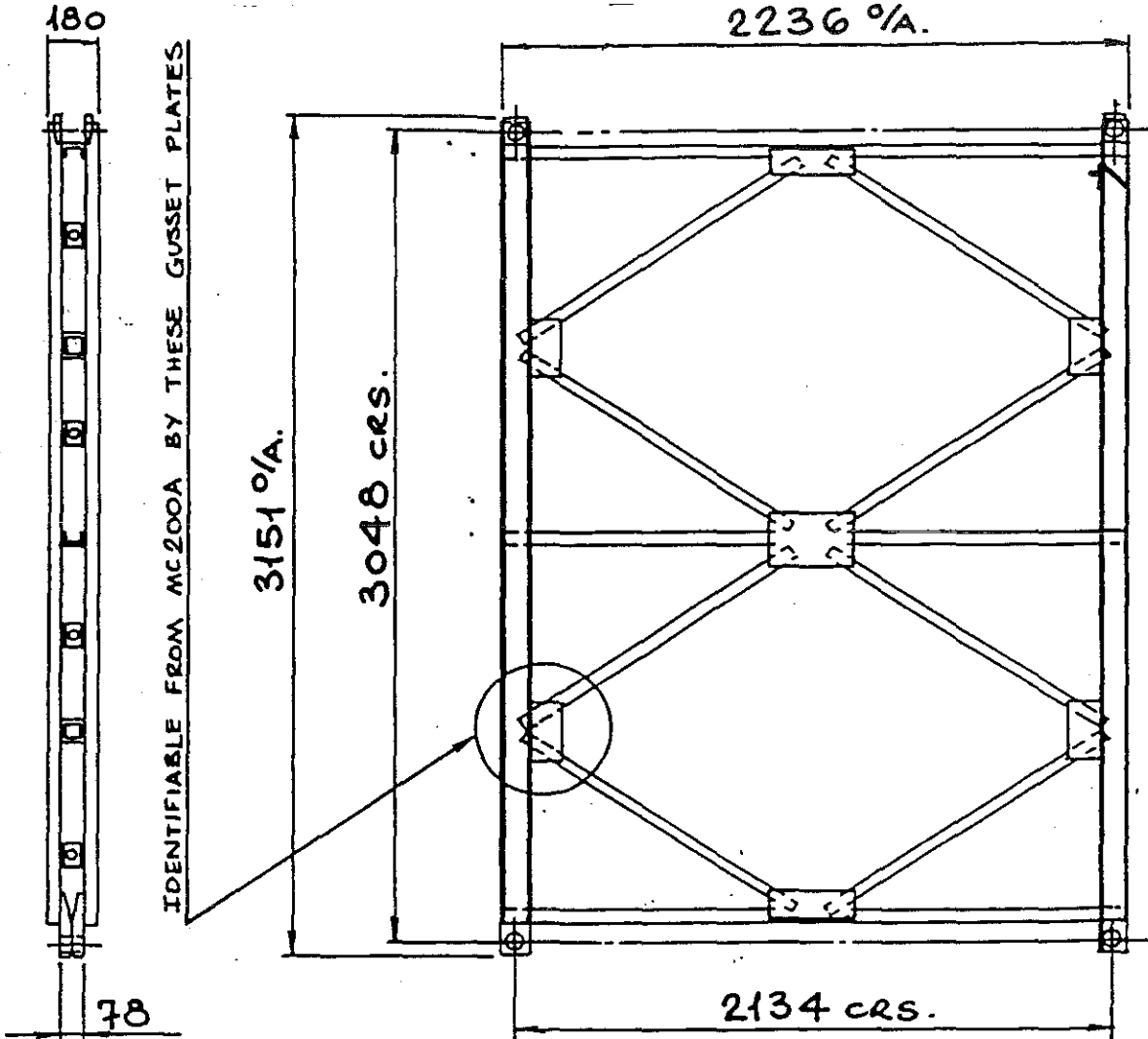
13

201A

PANEL 200-HIGH SHEAR.

CA 358

WEIGHT : 387.8 Kg. 855#



OVERALL DIMENSIONS : 3151 x 2236 x 180

CUBE (M³) : 1.27

CHECKED	DATE
Paul B.	6/2/90



2/90

MC 2018

9

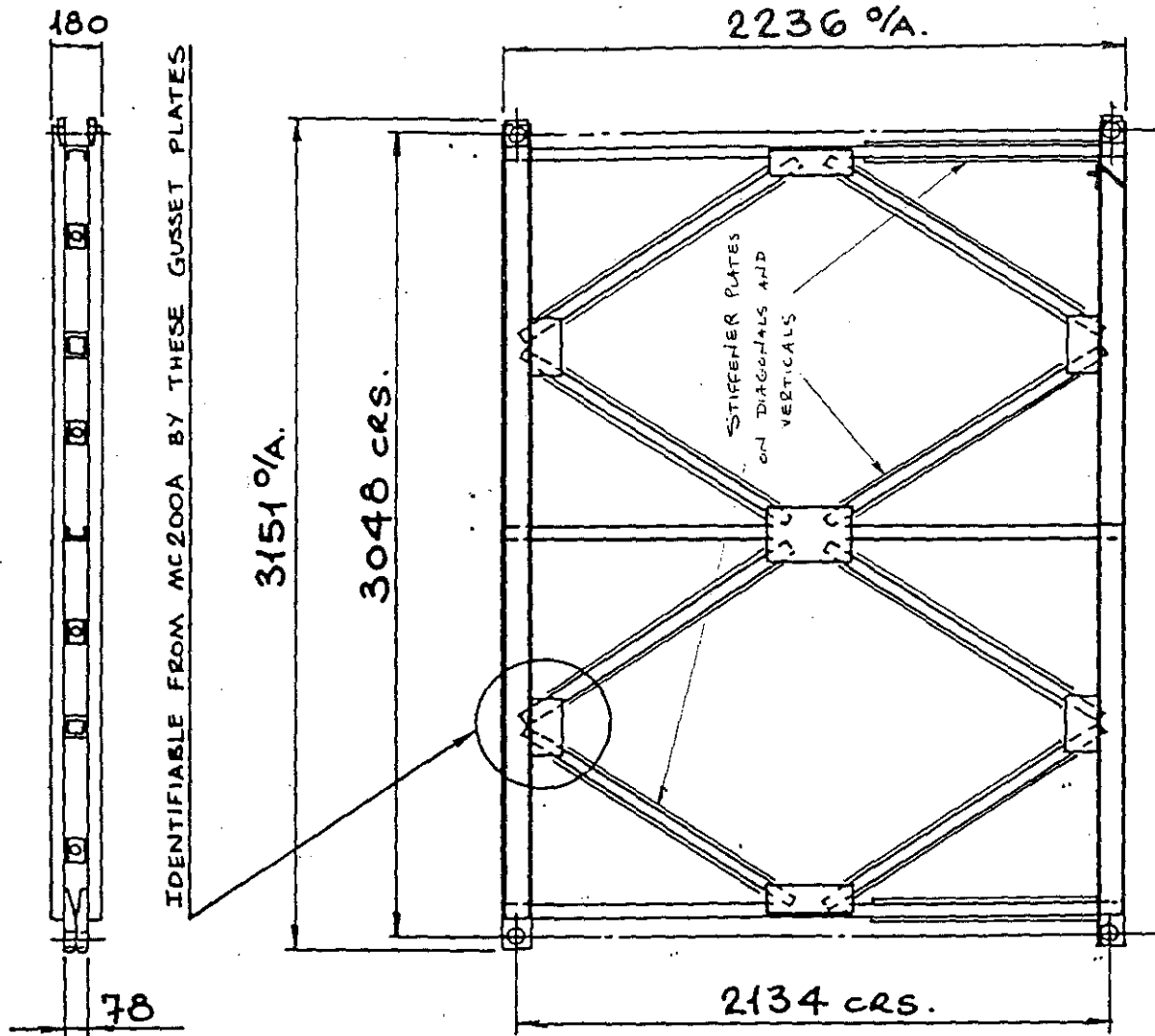
13

201A

PANEL 200 - 50 tonne

CA 358

WEIGHT: 446.7 Kg. 985#



OVERALL DIMENSIONS: 3151 x 2236 x 180

CUBE (M3): 1.27

CHECKED	DATE
Paul B.	6/2/90



2/90

9 13 201A

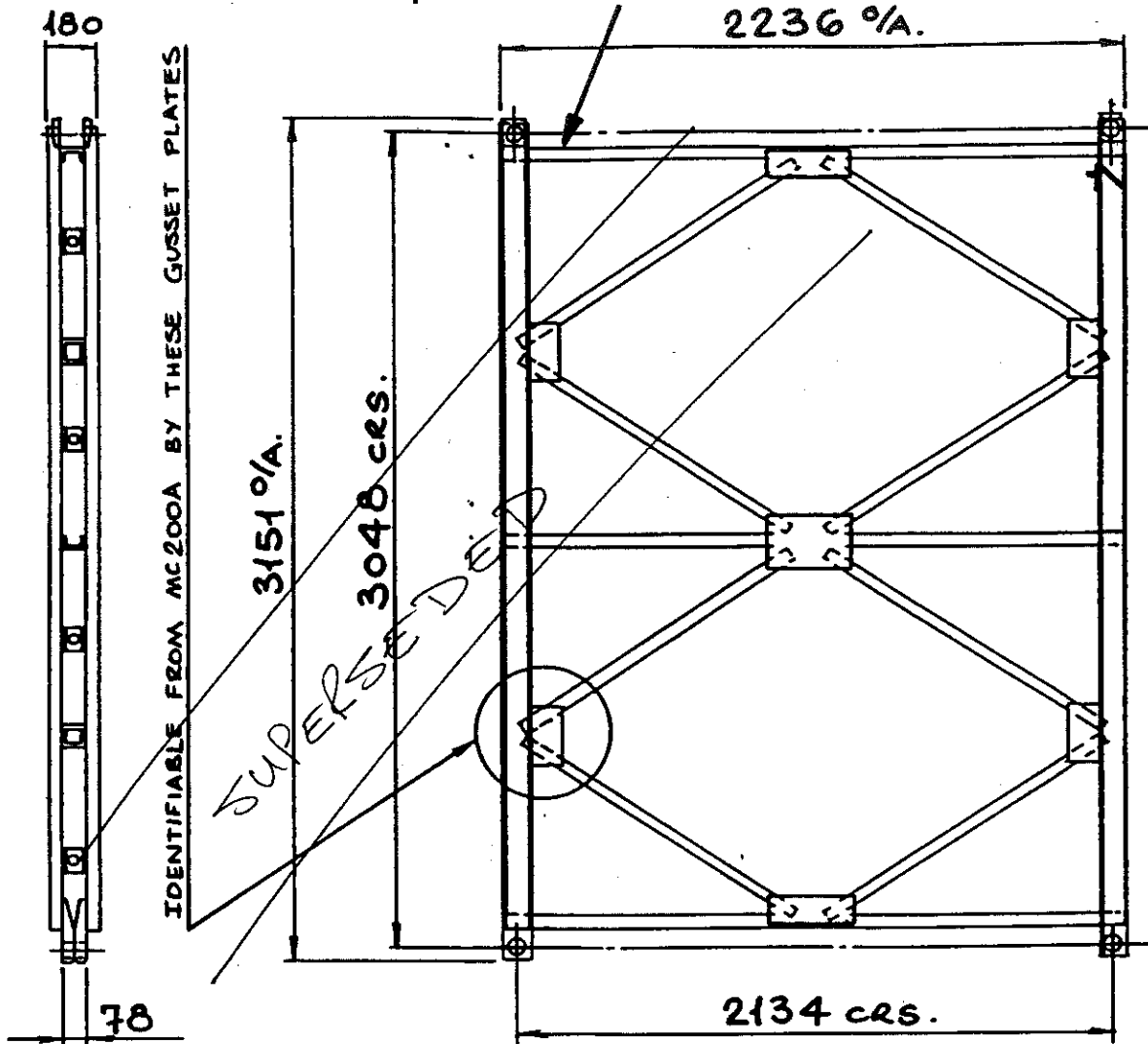
MC 201A

CA 358

PANEL 200-HIGH SHEAR.

WEIGHT : 334.987 Kg.

NOTE: MC201A is identifiable from MC201 by the lack of a spacing plate at the top of the female vertical



OVERALL DIMENSIONS: 3151 x 2236 x 180

CUBE (M3): 1.27

CHECKED	DATE
Paul B.	6/2/90



2/86

MC 206

9

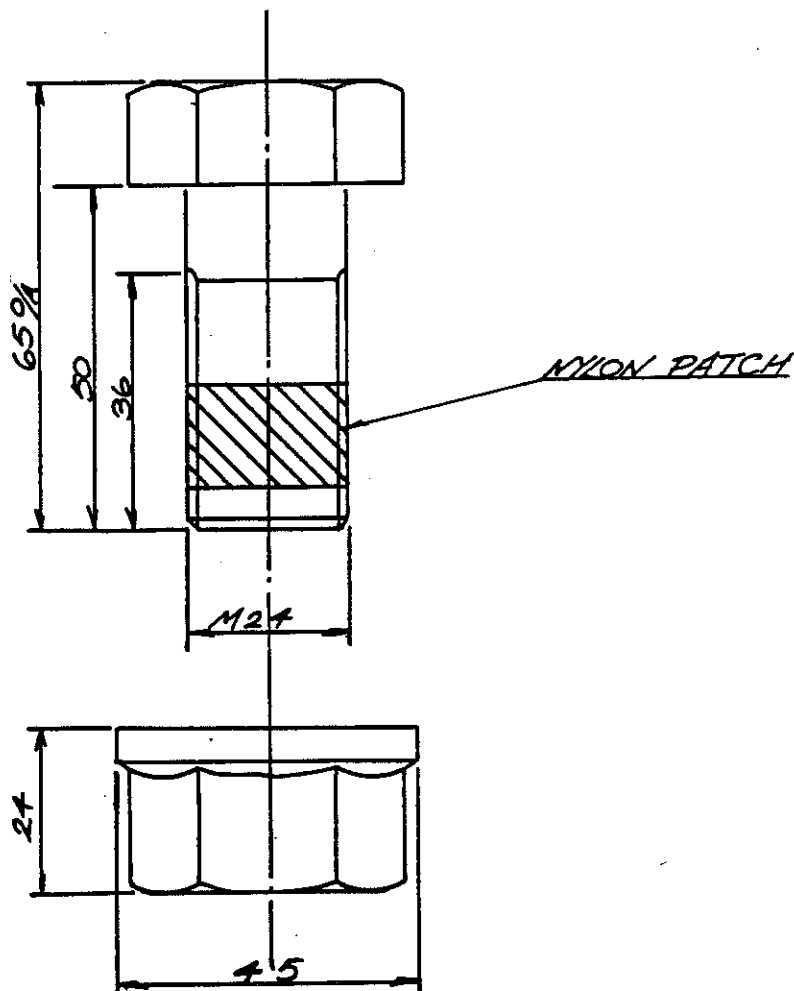
13

206

BOLT-BRACING-SHORT

UA 296

WEIGHT: 0.434 . KG.



OVERALL DIMENSIONS : 65 LG x 45 DIA.

CUBE(M³): 0.0001.

CHECKED	DATE
SBD	14.2.86

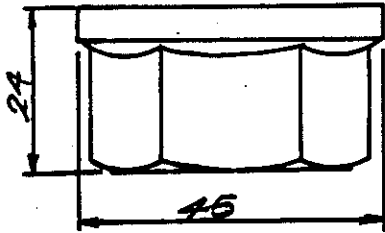
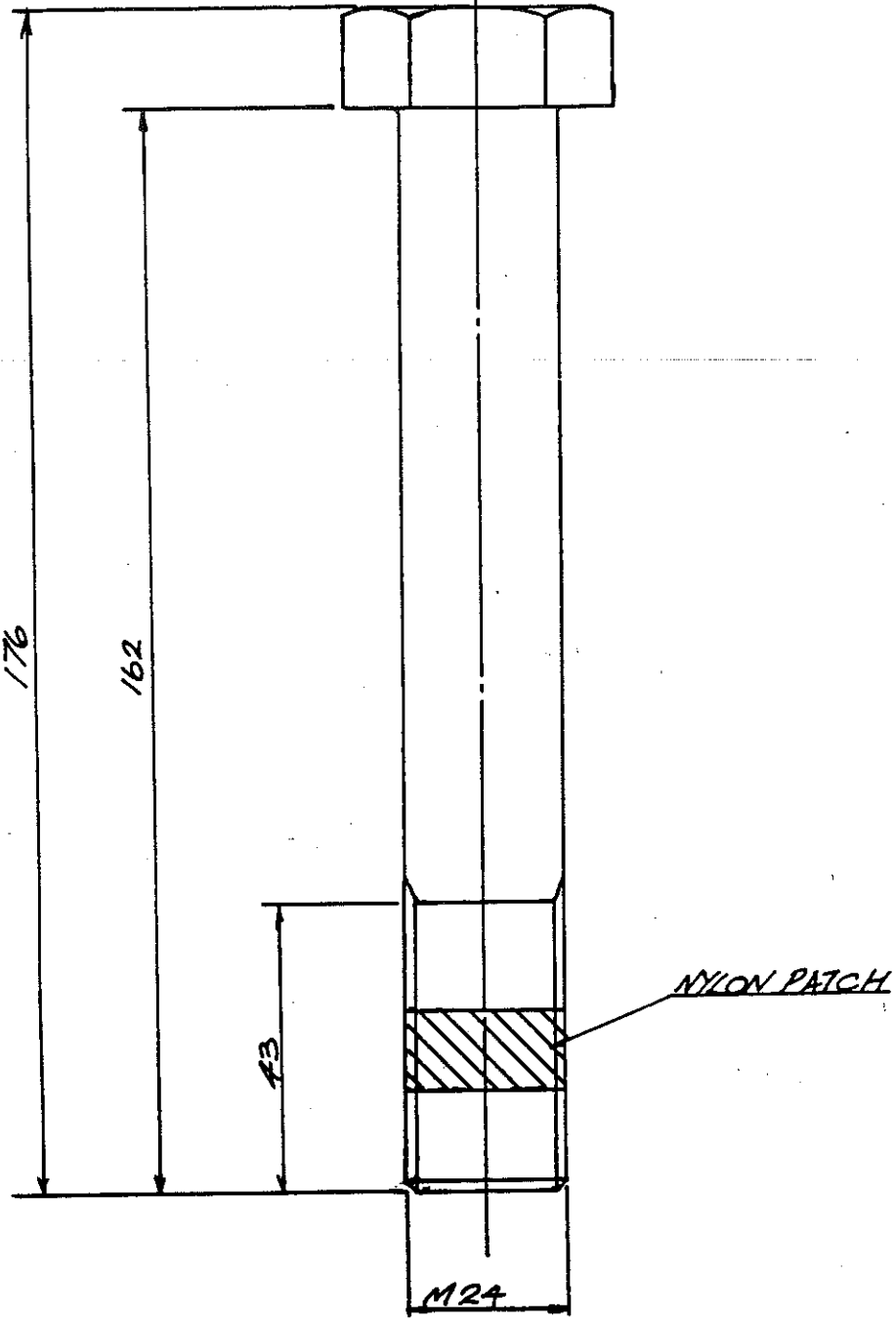


2/86

MC 207
BOLT-CHORD-SHORT
WEIGHT: 0.804 KG.

9	13	207
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CA 73



OVERALL DIMENSIONS: 45 DIA x 176 LG.
CUBE (M³) 0.00028.

CHECKED	DATE
SBD	14.2.86



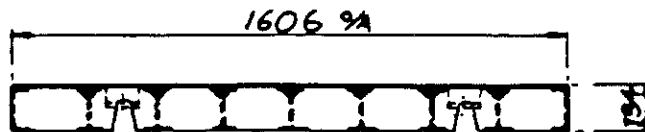
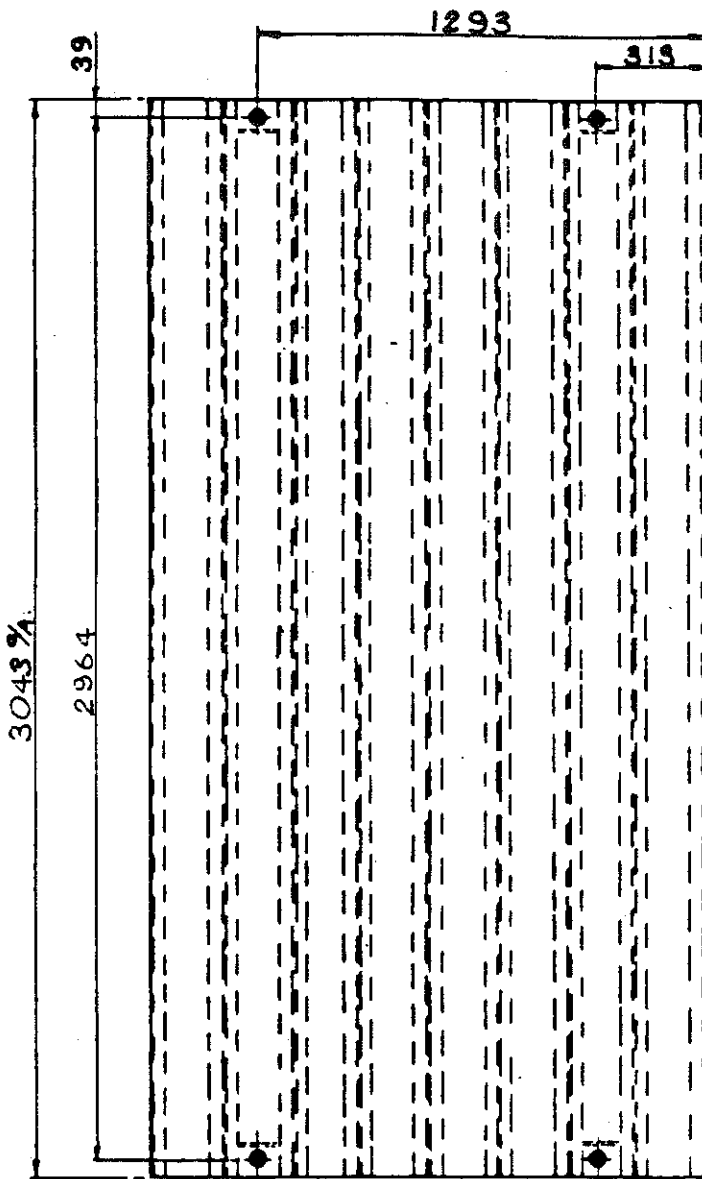
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7/90

MC 211
DECK - 1606
WEIGHT :- 564 KG.

9 13 211

CA 255



OVERALL DIMENSIONS :- 3043 x 1606 x 134

CUBE (M³) : 0.655

CHECKED	DATE
STEVE. B.	3 / 7 / 90



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9BQ

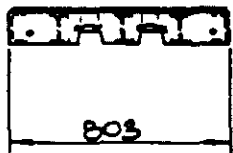
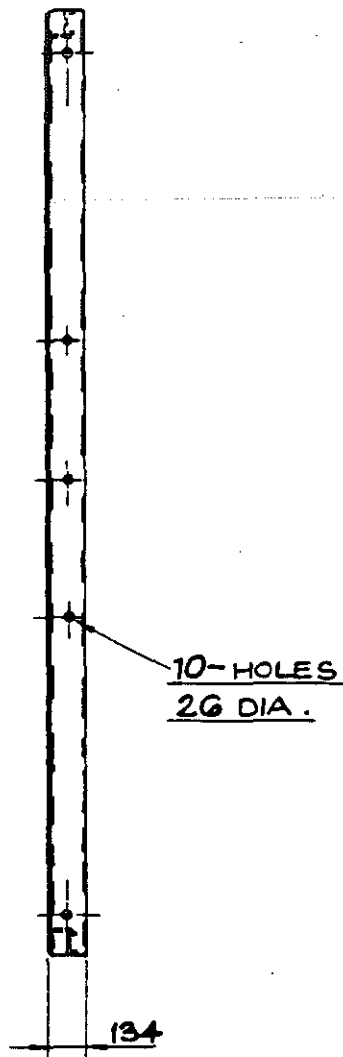
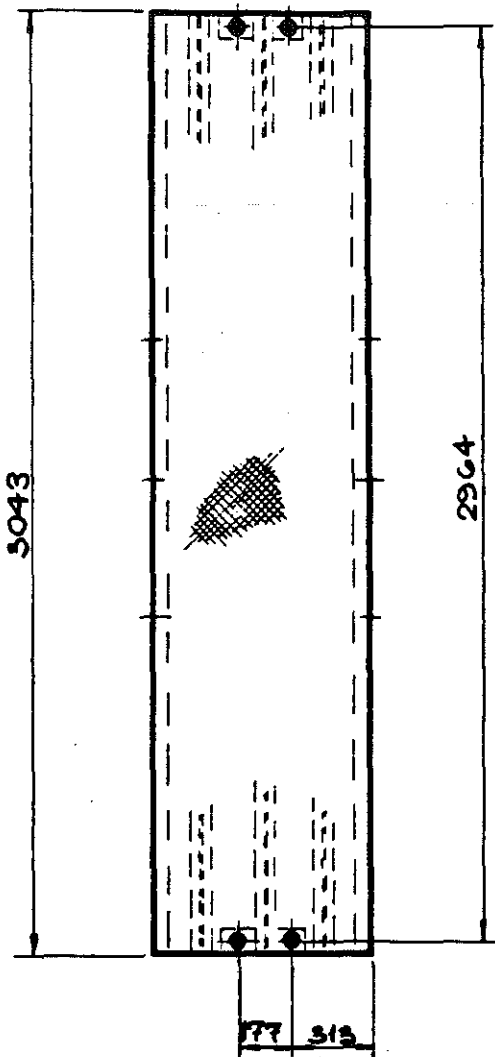
7/86

9	13	212
CA256		

MC212

DECK - 803.

WEIGHT: 285 kg.



OVERALL DIMENSIONS : 3043 x 803 x 134.

CUBE (M³) 0.327.

CHECKED	DATE
ELBut	5/7/06



7/90

MC214

9

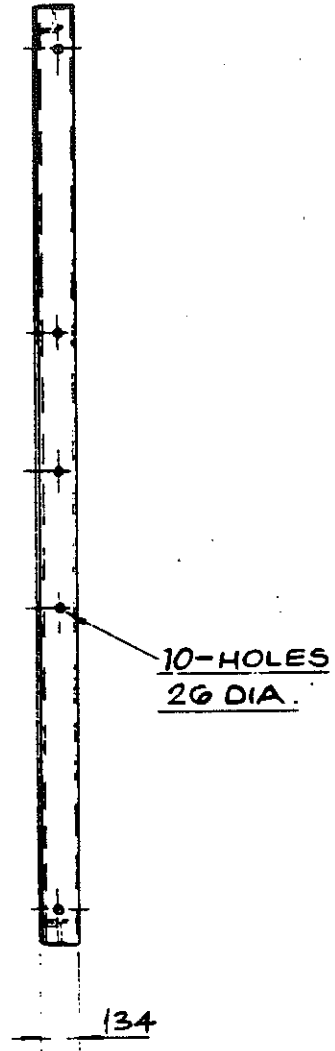
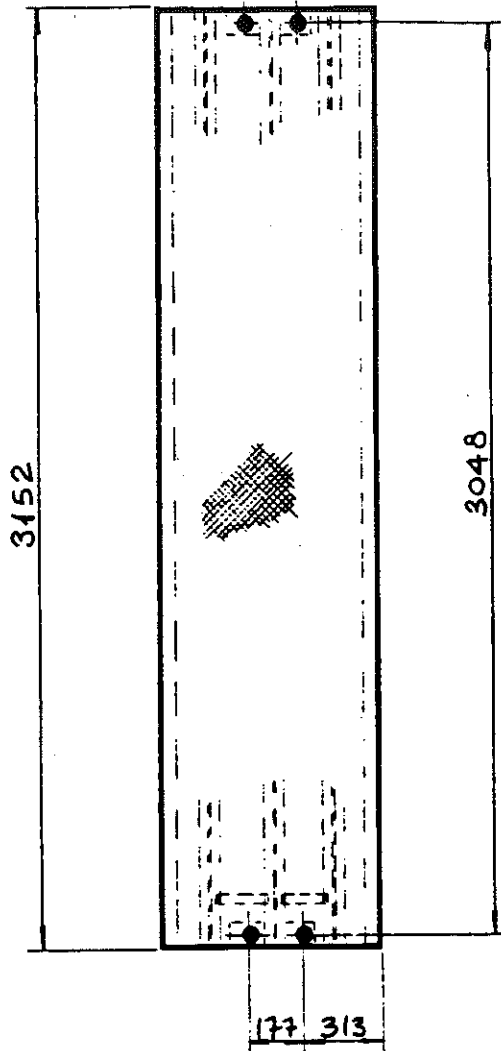
13

214

CA 333

DECK - 803 - EOB .

WEIGHT: 296 Kg.



OVERALL DIMENSIONS : 3152 x 803 x 134 .

CUBE (M³) 0.339 .

CHECKED	DATE
STEVE. B.	3/7/90

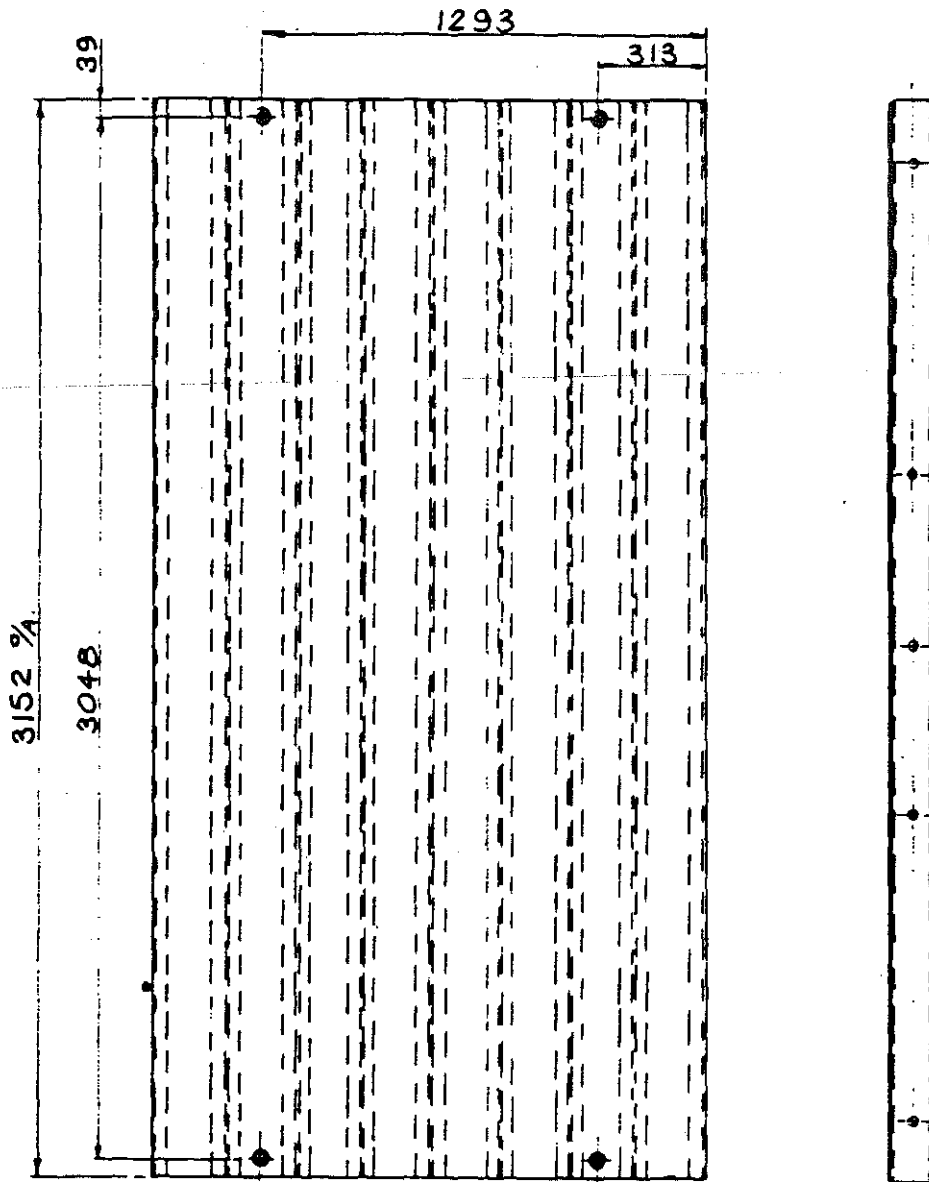


Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

7/90

MC 213
DECK - E.O.B - 1606
WEIGHT - 583 KG.

9	13	213
CA 332		



OVERALL DIMENSIONS : 3152 x 1606 x 134

CUBE (M³) : 0.678

CHECKED	DATE
STEVE.B.	3/7/90



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5/88

MC 222

9

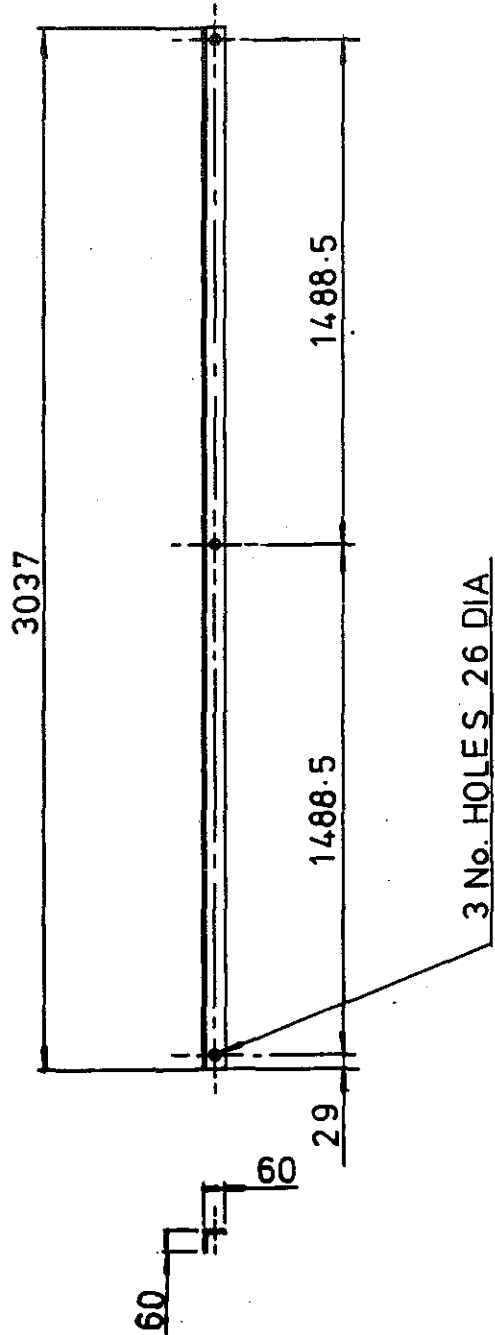
13

222

CA 292

BRACE VERTICAL

WEIGHT : 16.39 kg



OVERALL DIMENSIONS : 3037 x 60 x 60

CUBE (m³) : 0.0109

Checked

Date

16/0/88



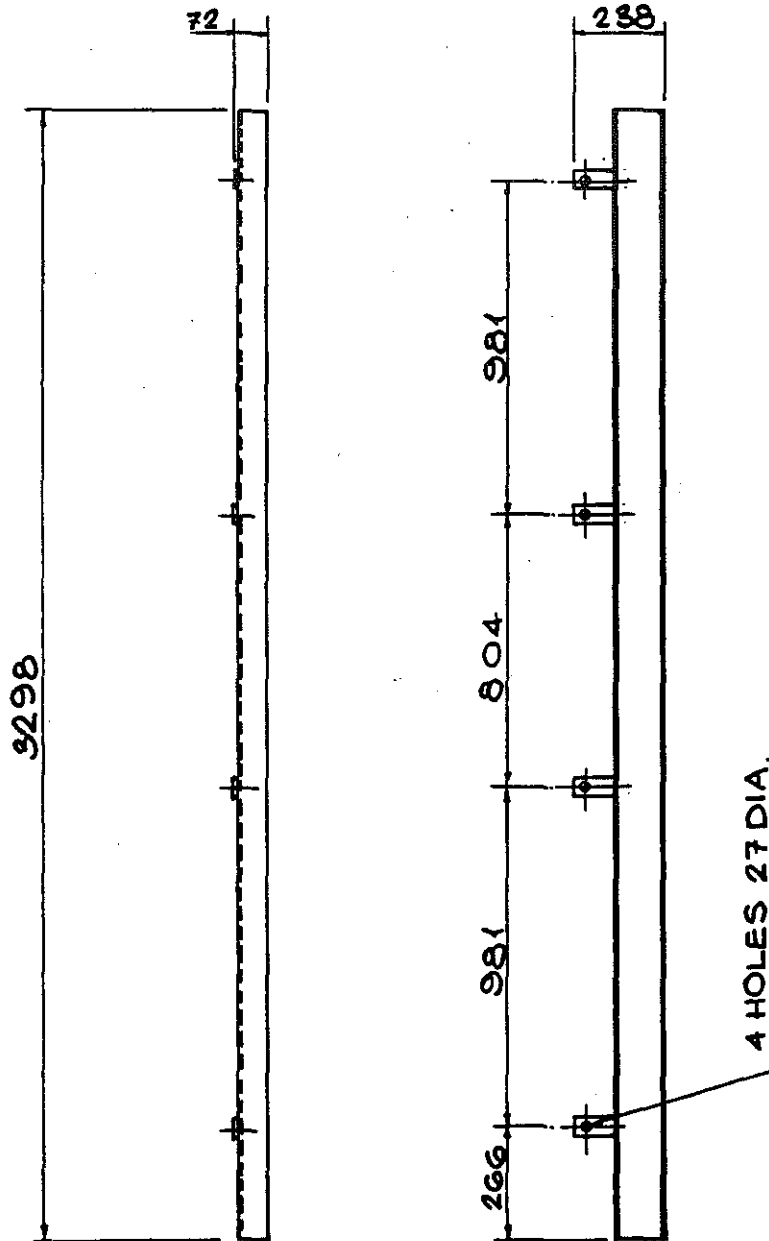
2/86

MC 226

9	13	226
CAG 1		

STIFFENER-TIMBER DECK-STD

WEIGHT: 51.7 KG.



OVERALL DIMENSIONS: 3298x 238x 72

CUBE (M³): 0.0565

CHECKED	DATE
SBD	14-2-86



2/86

MC 227

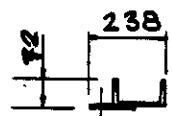
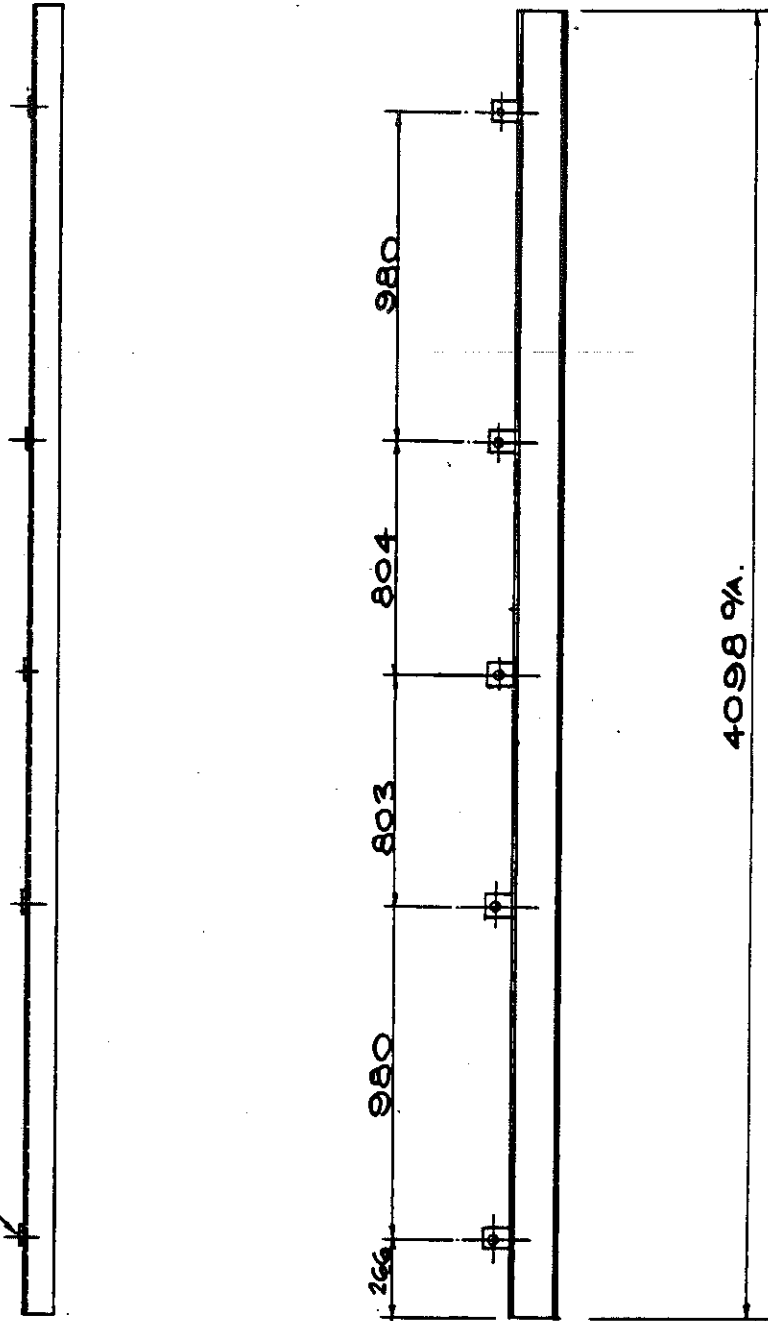
9 13 227

STIFFENER-TIMBER DECK-EW.

CAG2

WEIGHT: 64.3 KG.

5 HOLES 27 DIA.



OVERALL DIMENSIONS: 4098 x 238 x 72

CUBE (M³): 0.0702

CHECKED	DATE
SBD	14.2.86



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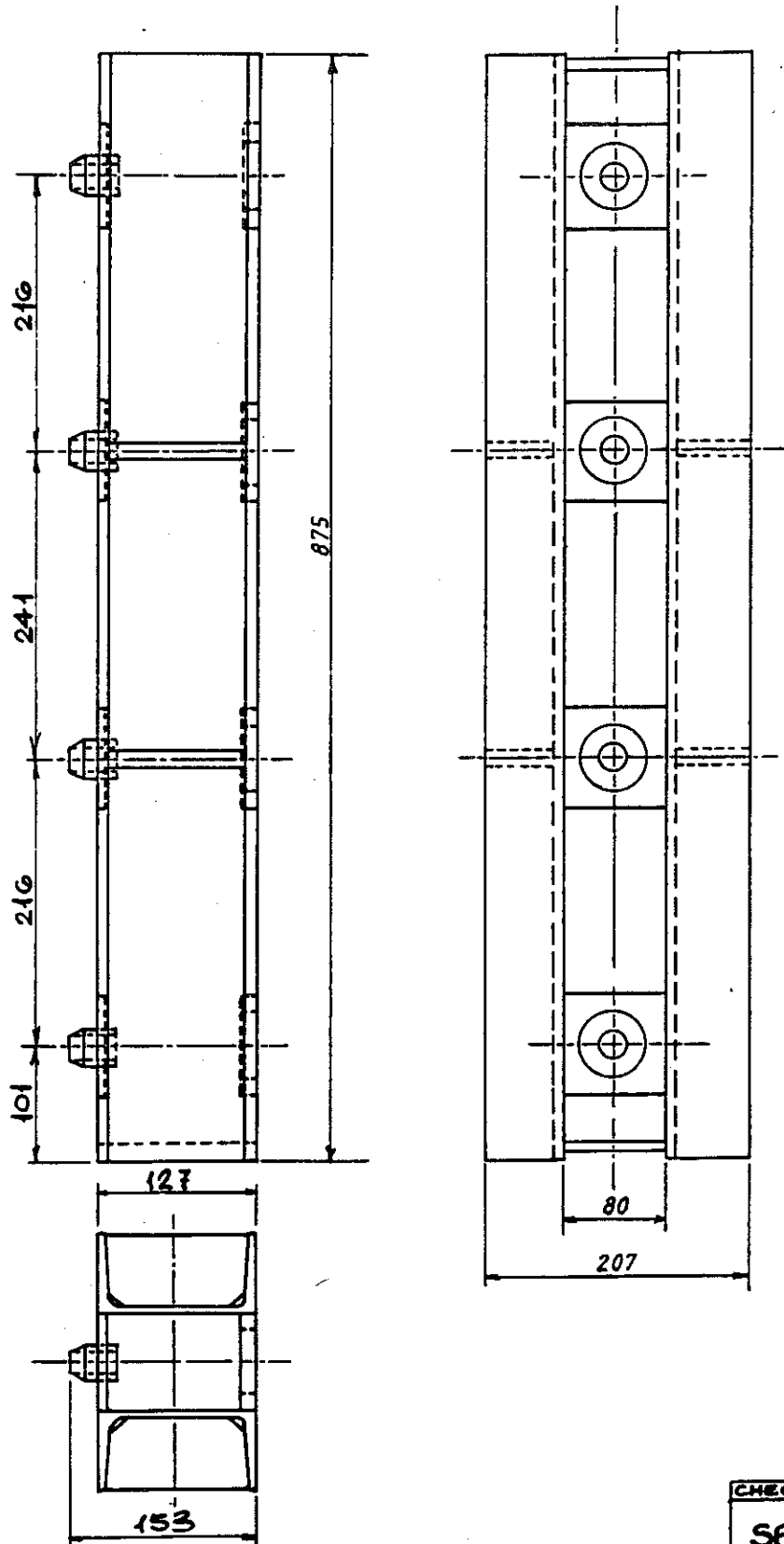
2/86

MC 235

9	13	235
	BA	914

BEAM - GRILLAGE

WEIGHT: 31.73 KG.



OVERALL 875 x 207 x 153

CUBE M³ : 0.0277

CHECKED	DATE
SBD	20.2.86



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

2/86

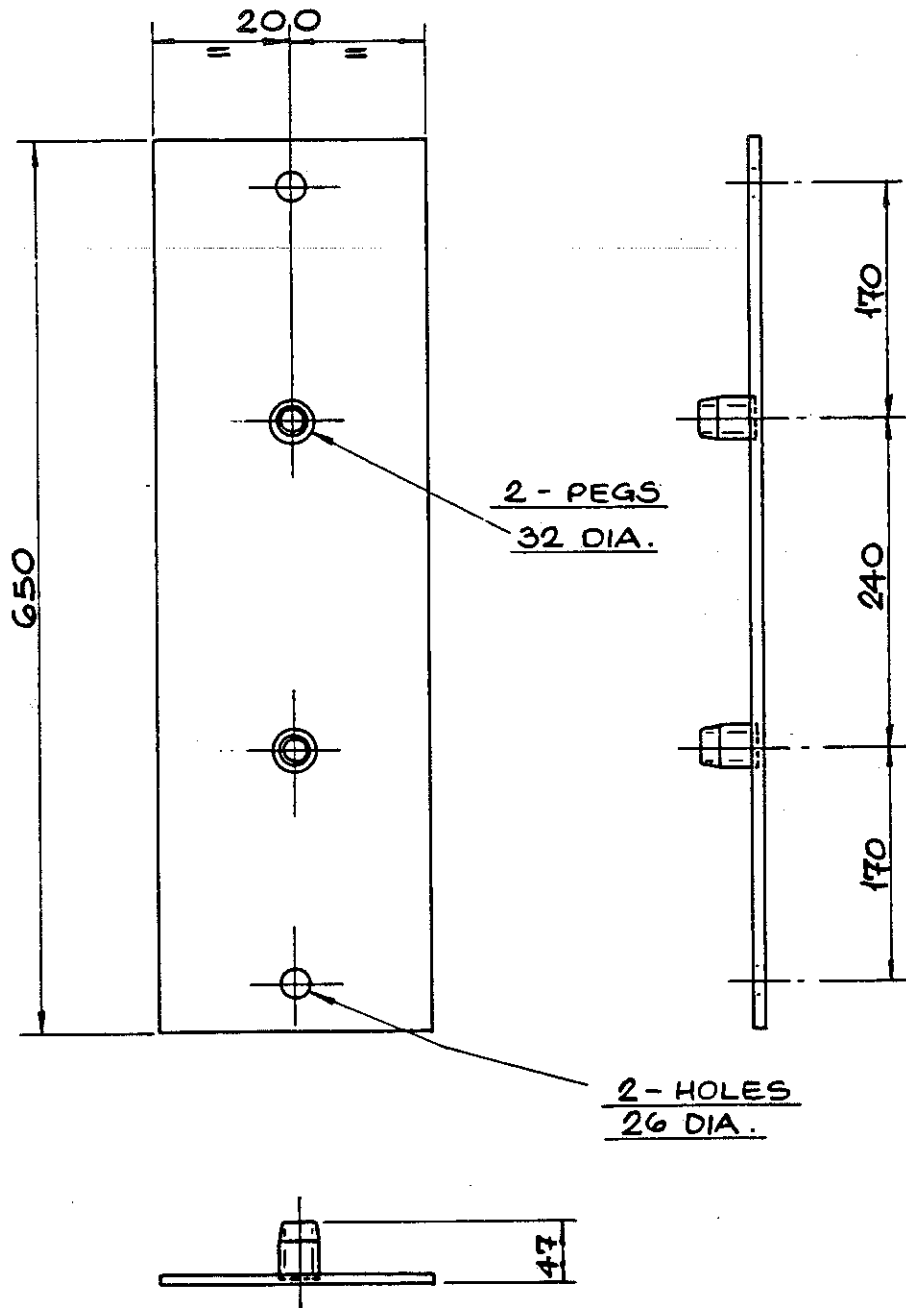
9 13 236

CA 40

MC 236

BEARING PLATE.

WEIGHT: 10.2 Kg.



OVERALL DIMENSIONS : 650 x 200 x 47.

CUBE (M³) 0.00611.

CHECKED	DATE
SBD	14.2.86



2/86

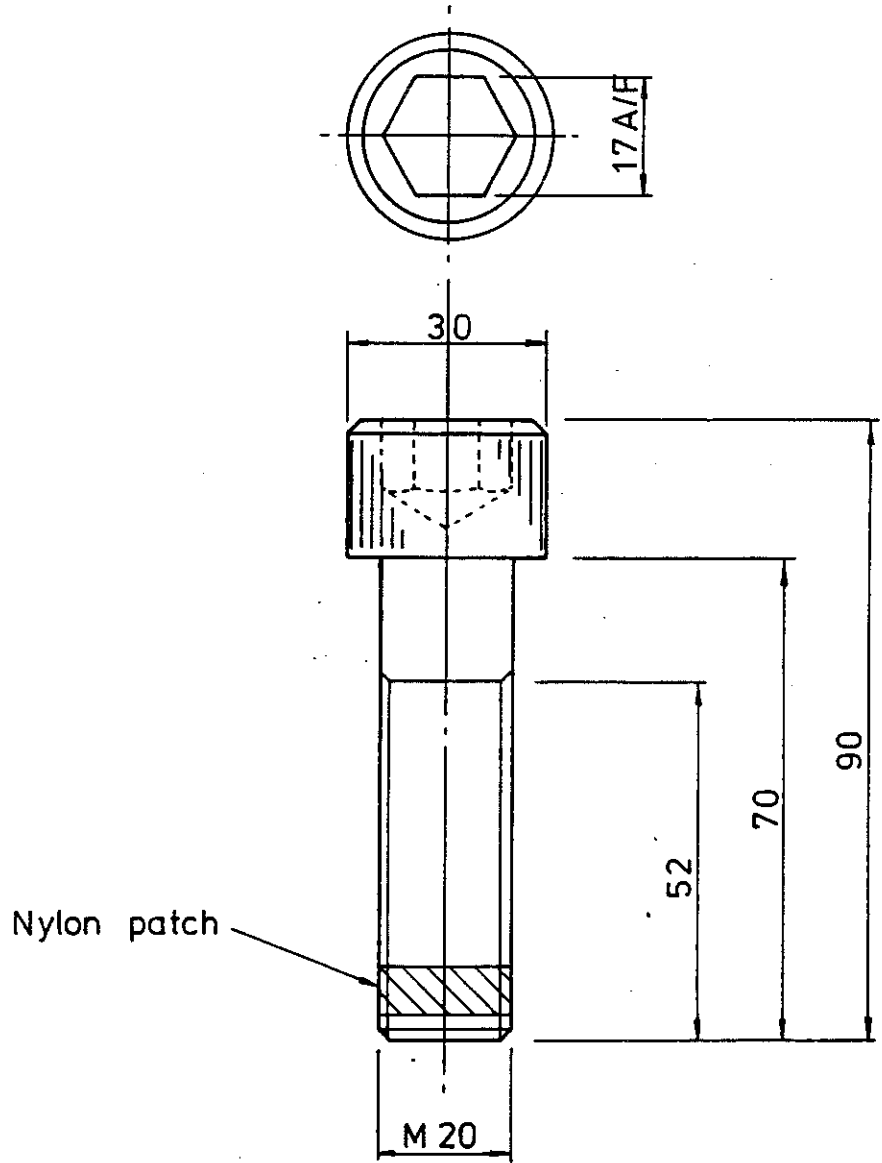
MC 271

9 13 271

SCREW - DECK CLAMP

UA 356

WEIGHT: 0.16 kg



OVERALL DIMENSIONS : 30 Dia. x 90 Lg.

CUBE (m³) 0.00006.

CHECKED	DATE
SBD	14.2.86



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

2/86

MC 272

9

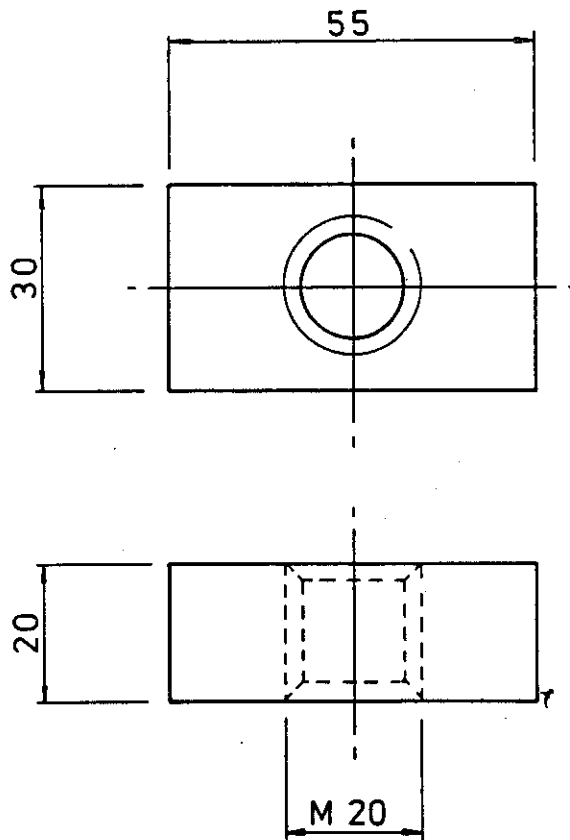
13

272

NUT - DECK CLAMP - M20

CA 144

WEIGHT: 0.221 kg



Overall Dimensions: 55 x 30 x 20

Cube (m³) 0.00003

CHECKED	DATE
SBD	14.2.86



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7/86

MC 300

KERB

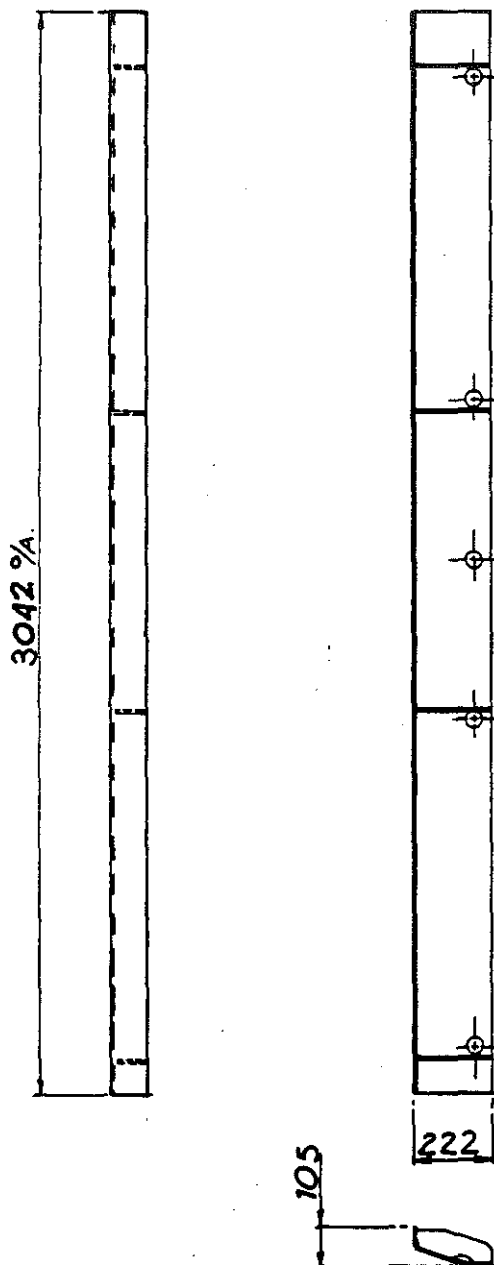
WEIGHT: 34.04 KG.

9

13

300

CA 259



OVERALL DIMENSIONS : 3042 x 222 x 105

CUBE (M³) : 0.071

CHECKED	DATE
RLB:et	10/7/86



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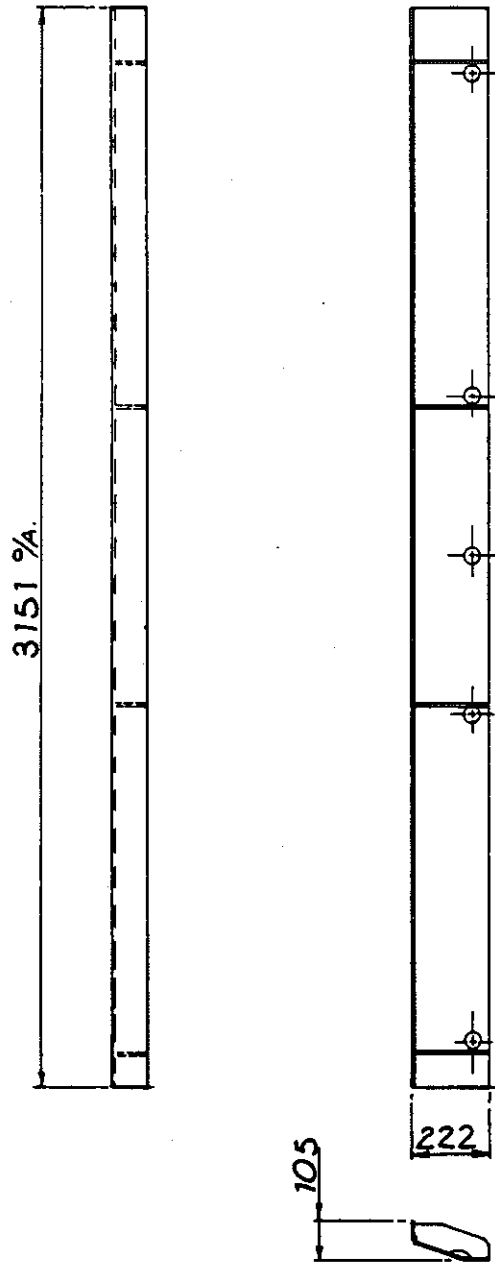
7/86

MC 301
KERB - E.O.B.

9 13 301

CA 260

WEIGHT: 35.17 KG.



OVERALL DIMENSIONS: 3151 x 222 x 105

CUBE (M³): 0.073

CHECKED	DATE
RLB/RT	10/7/86



9/86

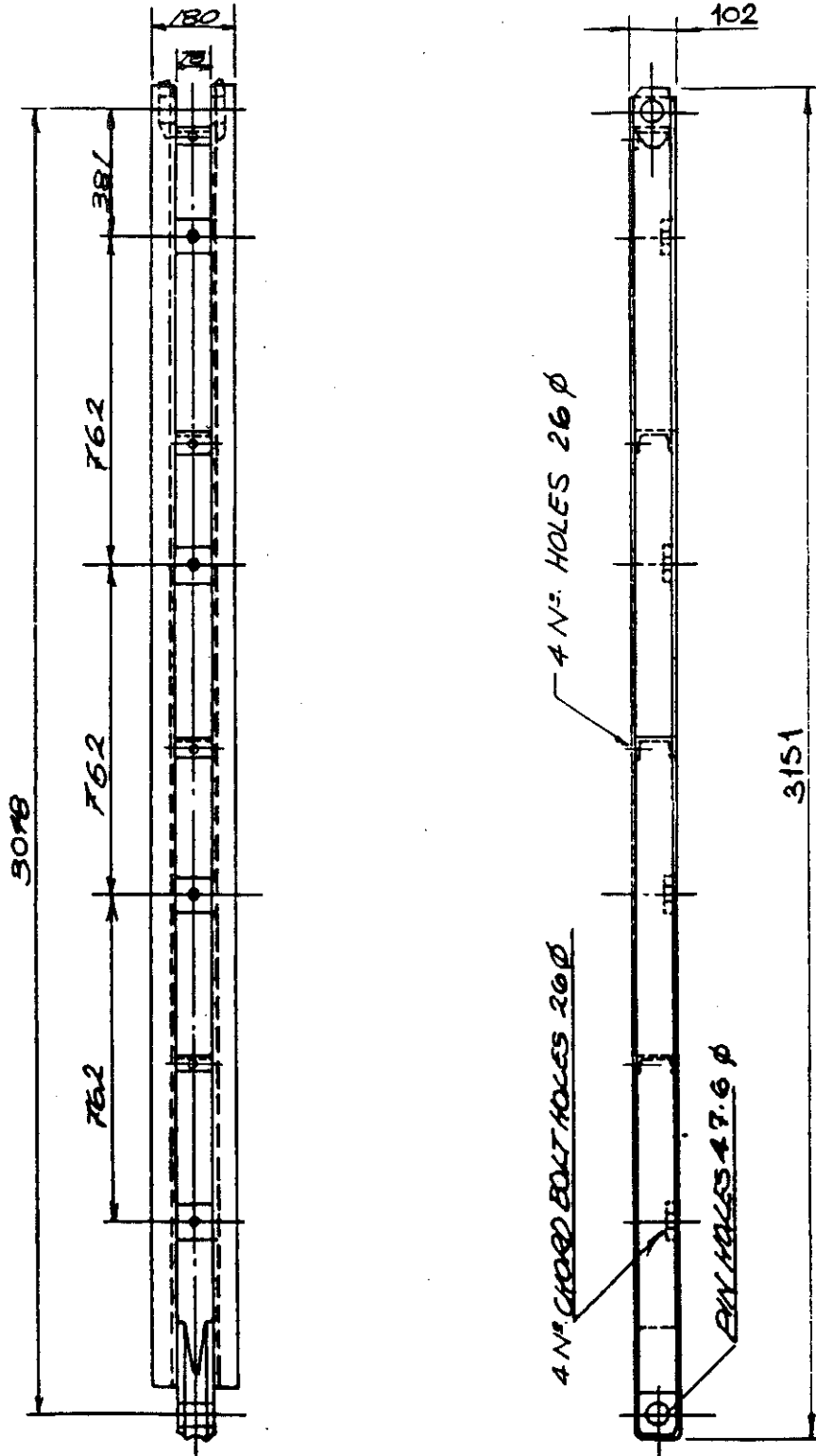
MC 302

9 13 302

CA 313

REINFORCEMENT - CHORD - 3M. MK II.

WEIGHT : 81.78 Kg.



OVERALL DIMENSIONS : 3151 x 180 x 102 CUBE (M³) 0.0578

CHECKED	DATE
R.L.B	4/4/09



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5/88

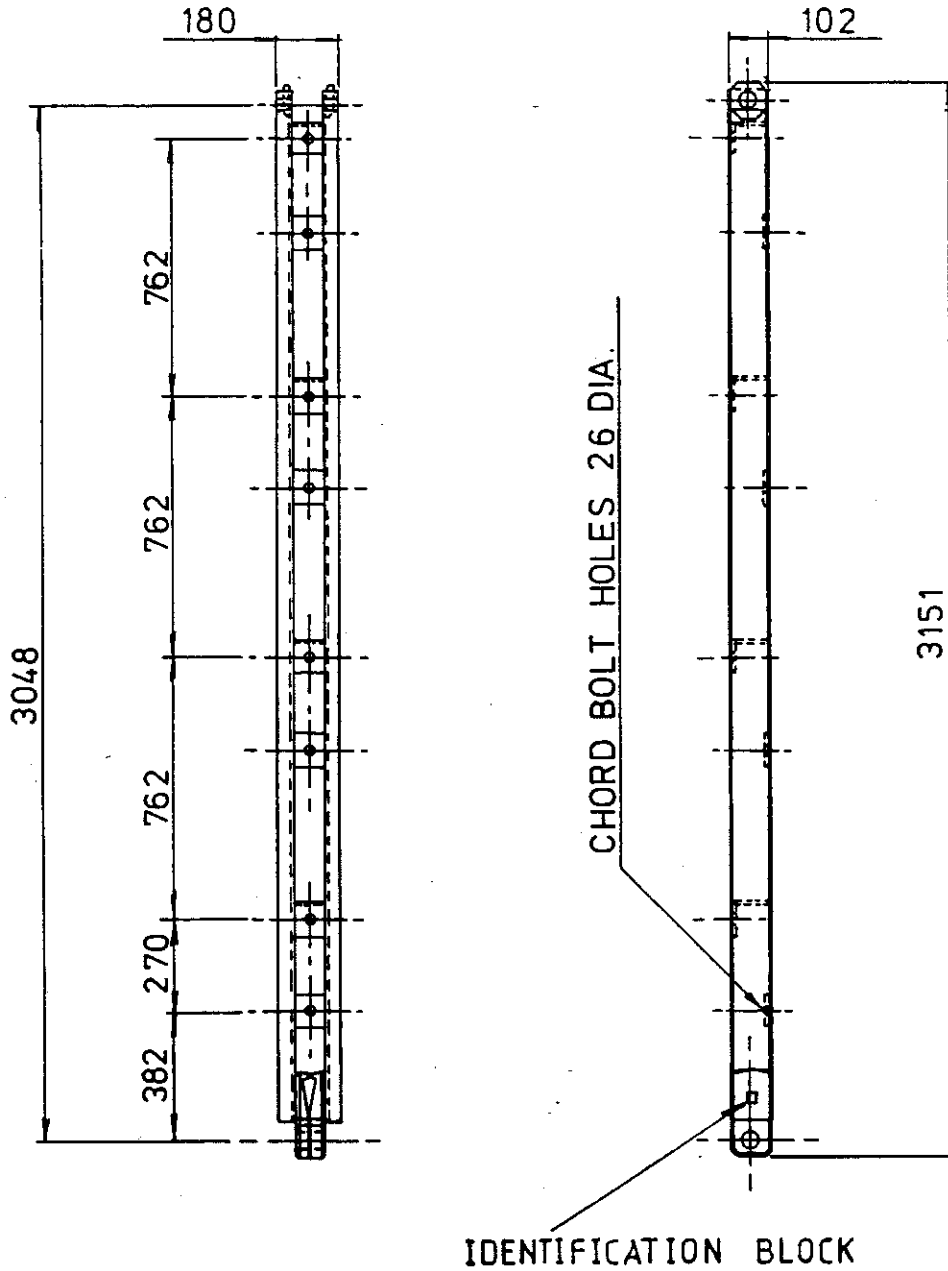
MC 304

9 13 304

CA 314

REINFORCEMENT - HEAVY - 3m - MK 2

WEIGHT : 98.76 kg



OVERALL DIMENSIONS : 3151 x 180 x 102

CUBE (m³) : 0.0578

Checked <i>[Signature]</i>	Date 16/10/00
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3/87

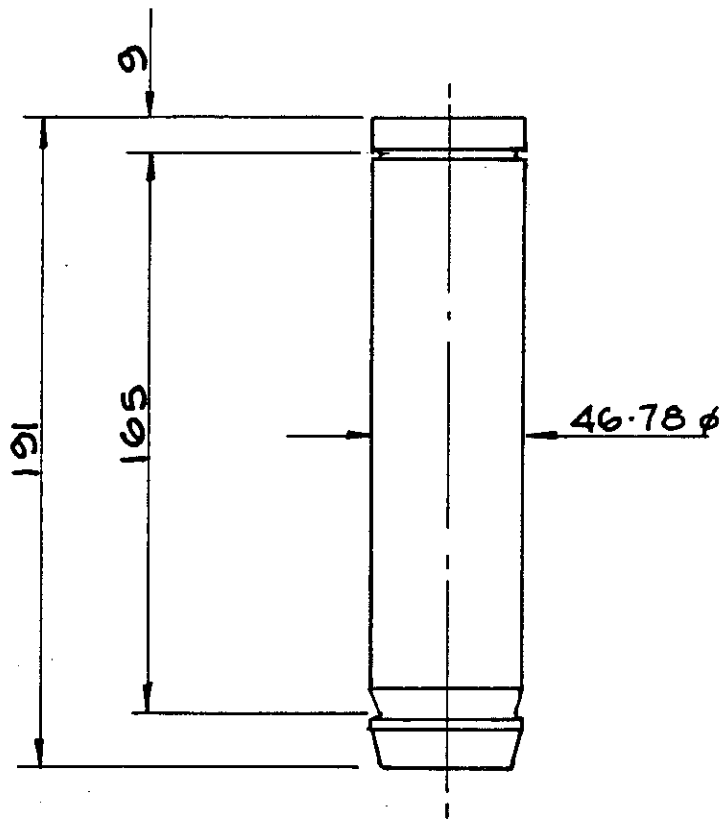
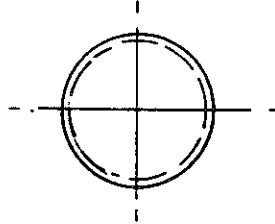
MC 307

9 | 13 | 307

PIN - PANEL

CA262

WEIGHT: 2.53kg



OVERALL DIMENSIONS:- 47 DIA x 191
CUBE (m³) 0.00033

Checked	Date
A.D	5/6/87



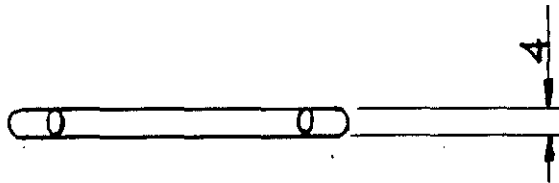
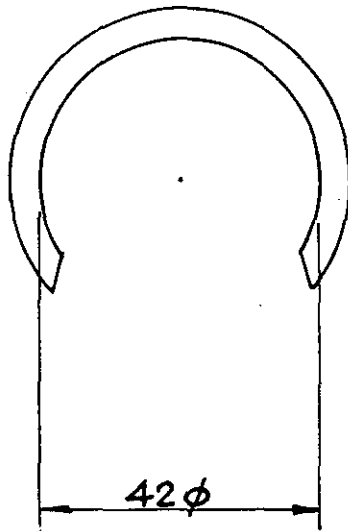
Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

3/87

MC 307 A
CLIP-PANEL-PIN
WEIGHT:- 0.01 kg

9 13 307A

CA 263



OVERALL DIMENSIONS:- 50 DIA x 4
CUBE (m^3) 0.00007

Checked	Date
A.D	5/6/87



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6/87

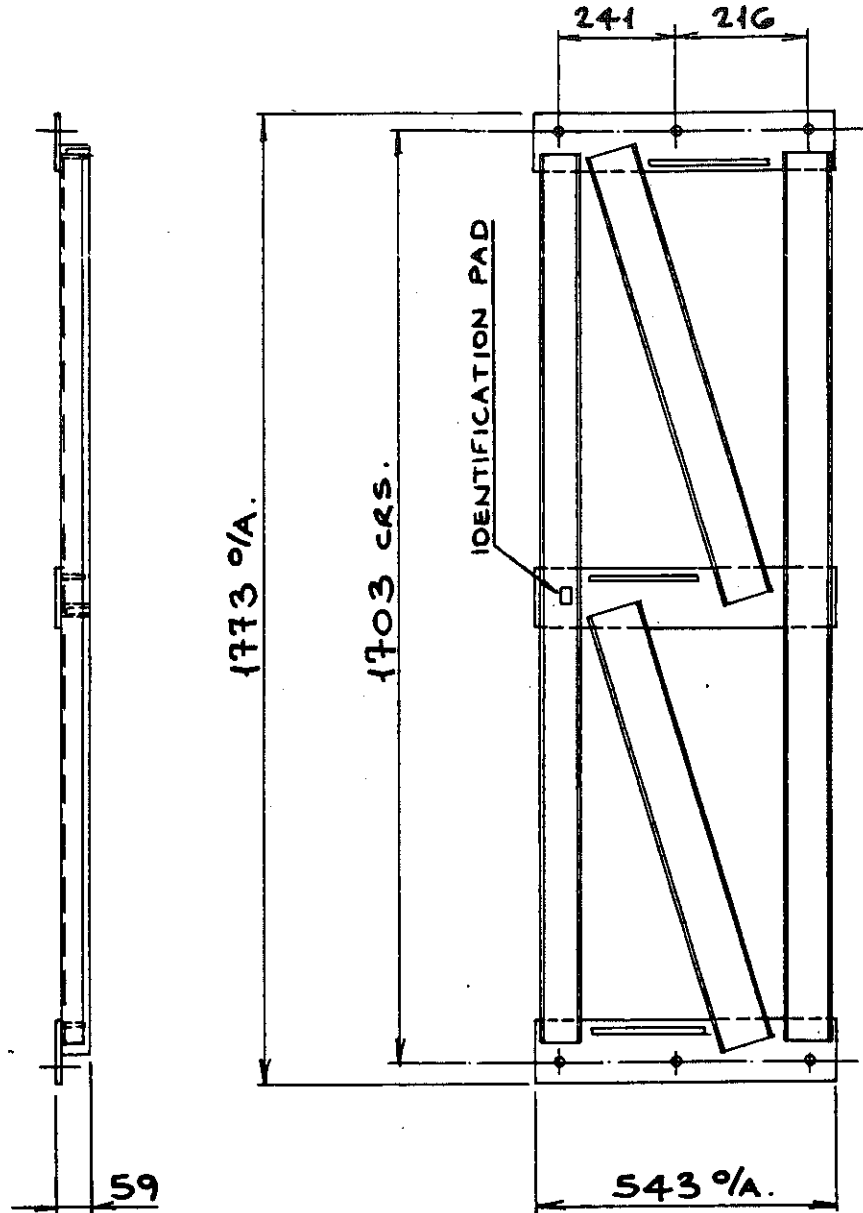
MC 312

9 13 312

CA 315

VERTICAL FRAME - 200

WEIGHT : 52.82 Kg.



OVERALL DIMENSIONS: 1773 x 543 x 59

CUBE (M³): 0.057

CHECKED	DATE
CFT	5.6.87

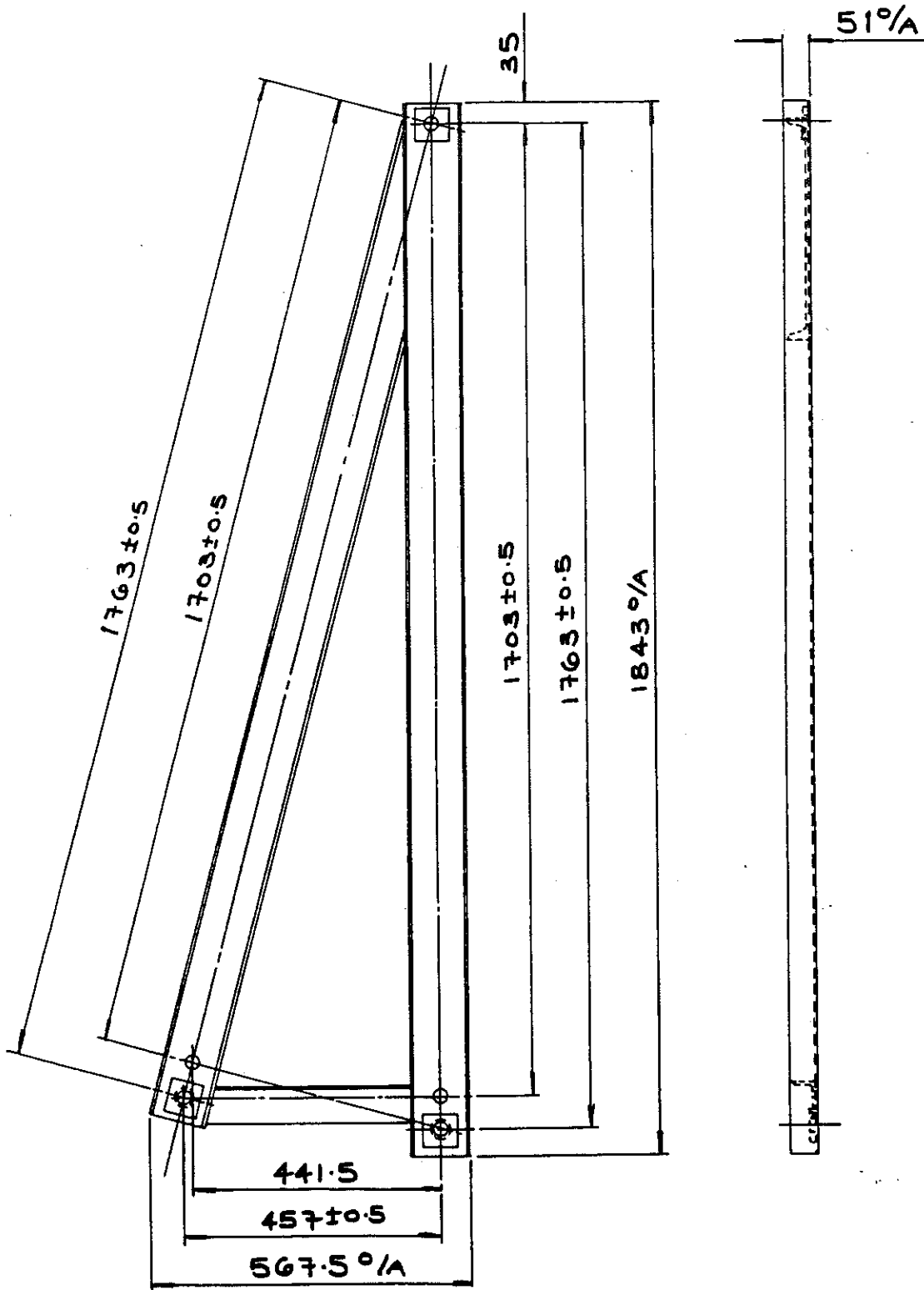


Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 980

8/
88

MC 314
RAKER FRAME - 200
WEIGHT - 37.91 Kg

9	13	314
CA 316		



OVERALL DIMENSIONS: 1843 x 51 x 567.5
CUBE (M³) = 0.0533

Checked <i>AD</i>	Date 16/8/88
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5/88

MC 313

TRANSOM-STD -200. WEIGHT .271.49kg

9

13

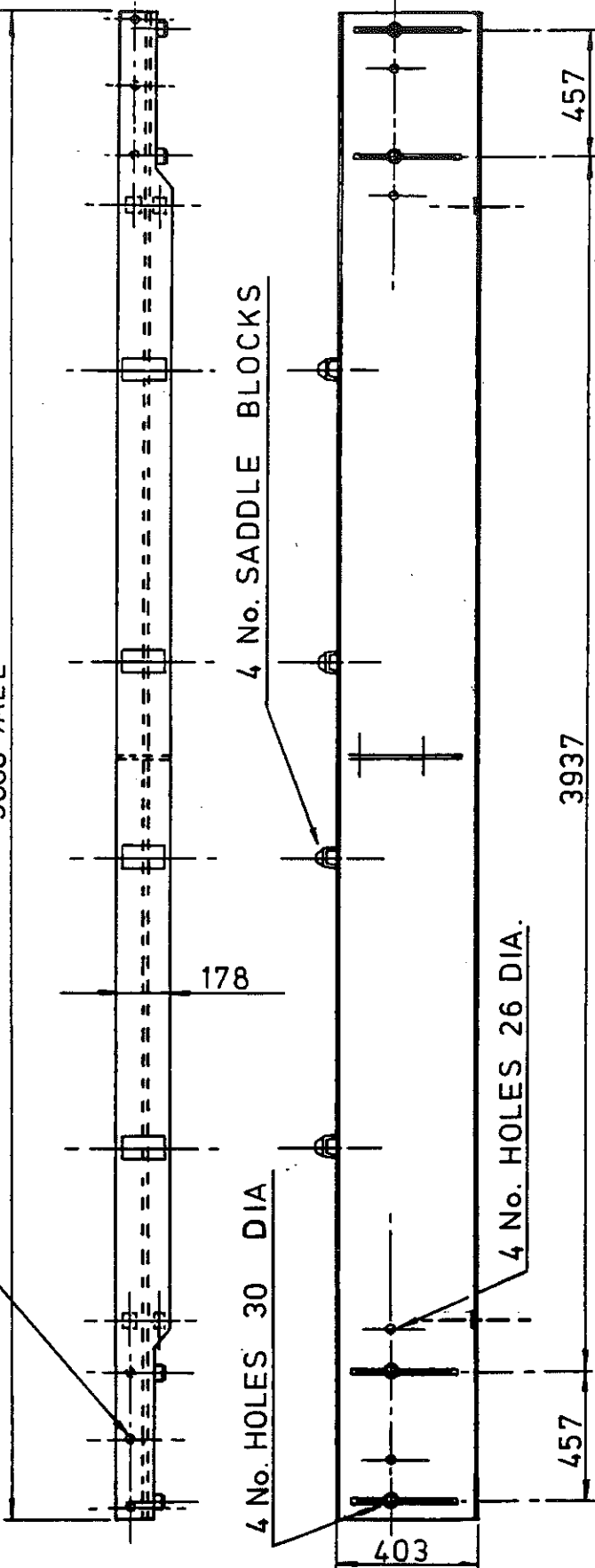
313

CA 269

IDENTIFICATION PAD X FLANGE WIDTH = 178mm

3 No. HOLES 31 DIA (EACH END)

5000 %ALL



4 No. SADDLE BLOCKS

4 No. HOLES 30 DIA

4 No. HOLES 26 DIA

CUBE (m³) : 0.4183

OVERALL DIMENSIONS: 5000 x 470 x 178

Checked *[Signature]*

Date 16/9/08



IDENTIFICATION PAD ✓ FLANGE WIDTH = 178 mm

12/88

4953

178

4 NO. HOLES 26 DIA

6 NO. HOLES 31 DIA

4 NO. HOLES 30 DIA.

6 SADDLE BLOCKS.

MC320
TRANSON EW
WEIGHT 380KG

457

457

473

406

457

130

4 NO. HOLES 26 DIA.

130

457

Identification Pad

6000

Checked	Date
SMP	21/2/89

9	13	320
CA	325	

Overall Dimension: 6000 x 473 x 178

Cube . 0.50516 m³

6/88

MC 317

9

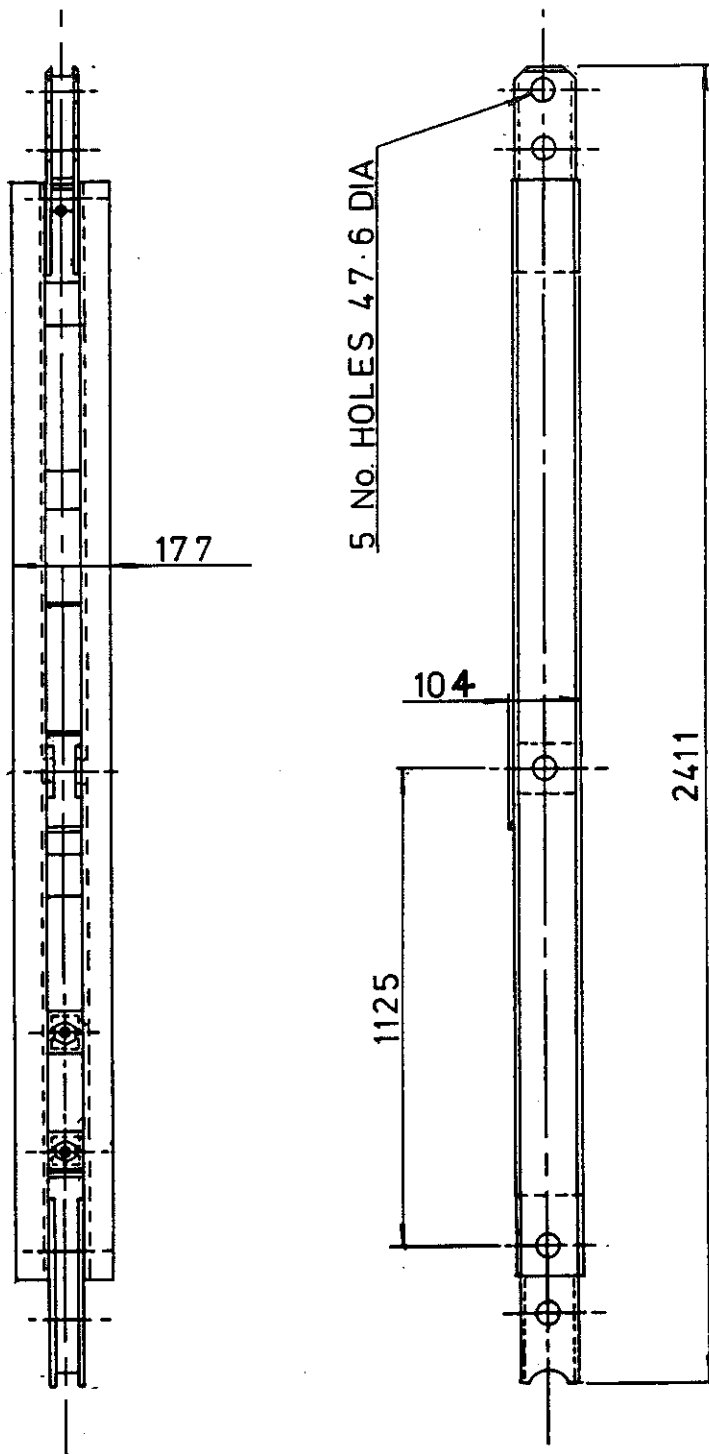
13

317

CA 231

POST END MALE 200

WEIGHT : 72.99 kg.



OVERALL DIMENSIONS : 2411 x 177 x 104

CUBE (m³) : 0.04438

Checked

Date

16/6/88



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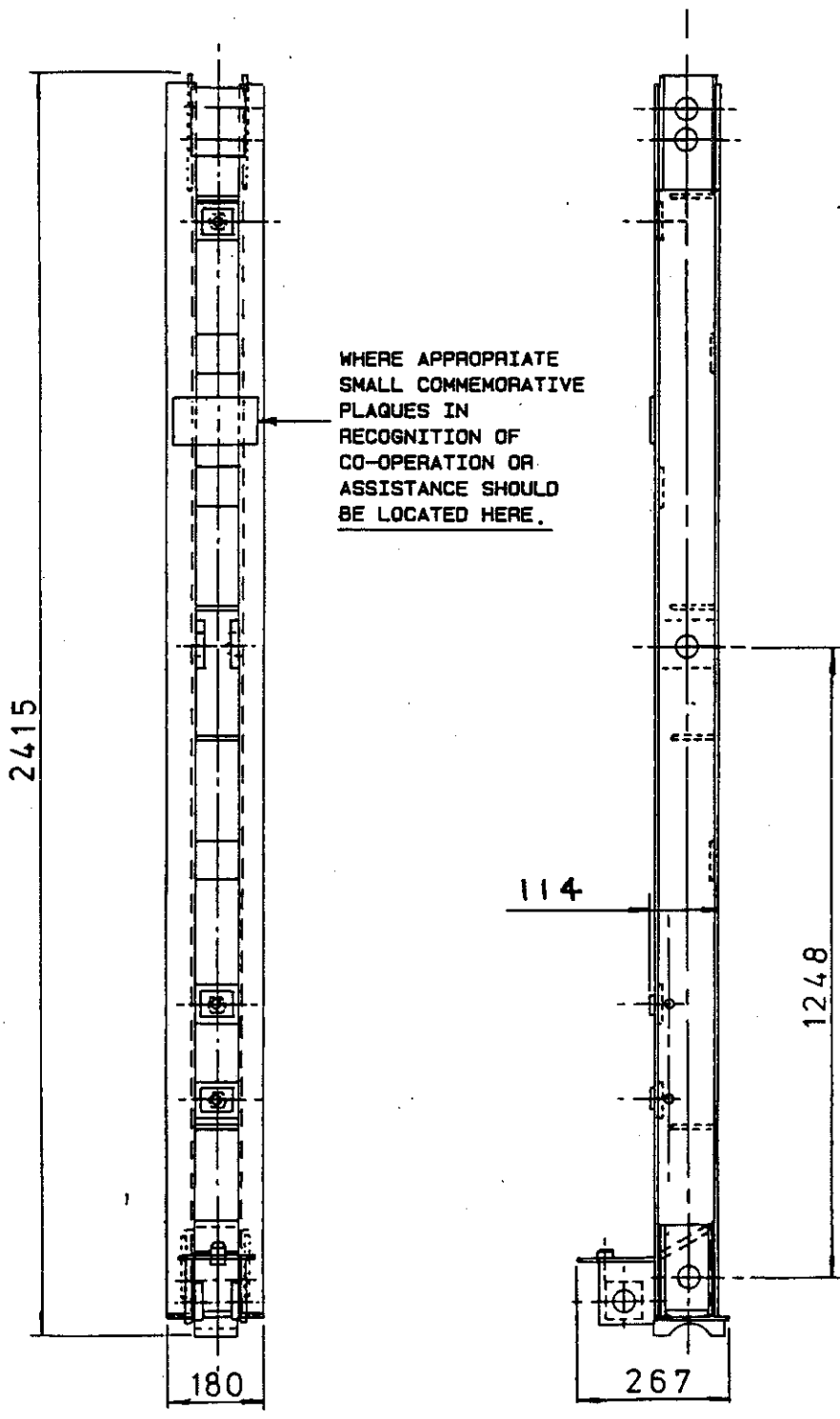
7/90

MC 318

9	13	318
CA 232		

POST-END-FEMALE - 200

WEIGHT : 84.03 kg



WHERE APPROPRIATE
 SMALL COMMEMORATIVE
 PLAQUES IN
 RECOGNITION OF
 CO-OPERATION OR
 ASSISTANCE SHOULD
 BE LOCATED HERE.

OVERALL DIMENSIONS : 2415 x 267 x 180
 CUBE (m³) : 0.116

Checked	Date
S.P	4/7/90



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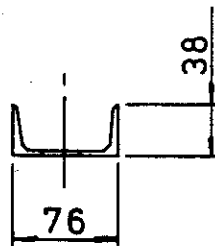
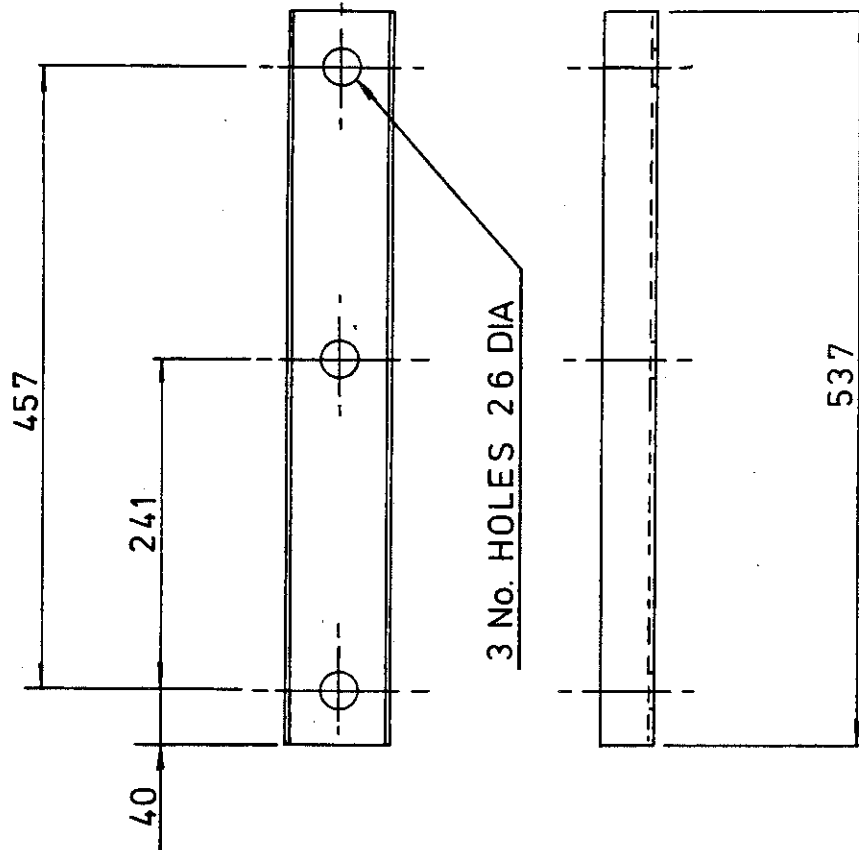
5/88

9	13	329
CA 329		

MC 329

BEAM - TIE - EOB - 200

WEIGHT : 3.53 kg



OVERALL DIMENSIONS: 537 x 76 x 38

CUBE (m³): 0.0015

Checked <i>AA</i>	Date 16/8/88
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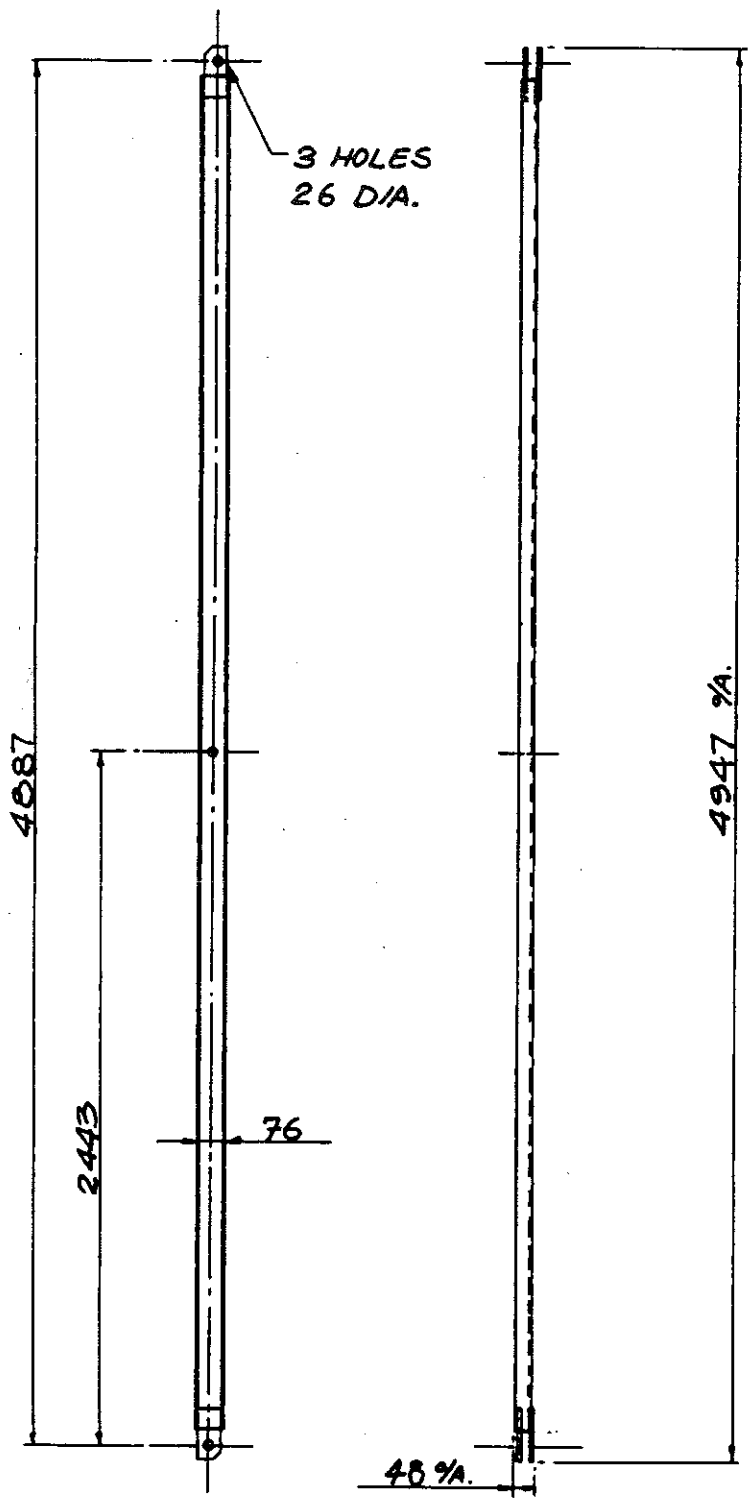
9/88

MC 331

9	13	331
CA 334		

SWAYBRACE - 7.3m

Weight :- 35.78 Kg



OVERALL DIMENSIONS :- 4087 x 76 x 48

CUBE (M³) :- 0.018

CHECKED	DATE
DFG	29/6/89



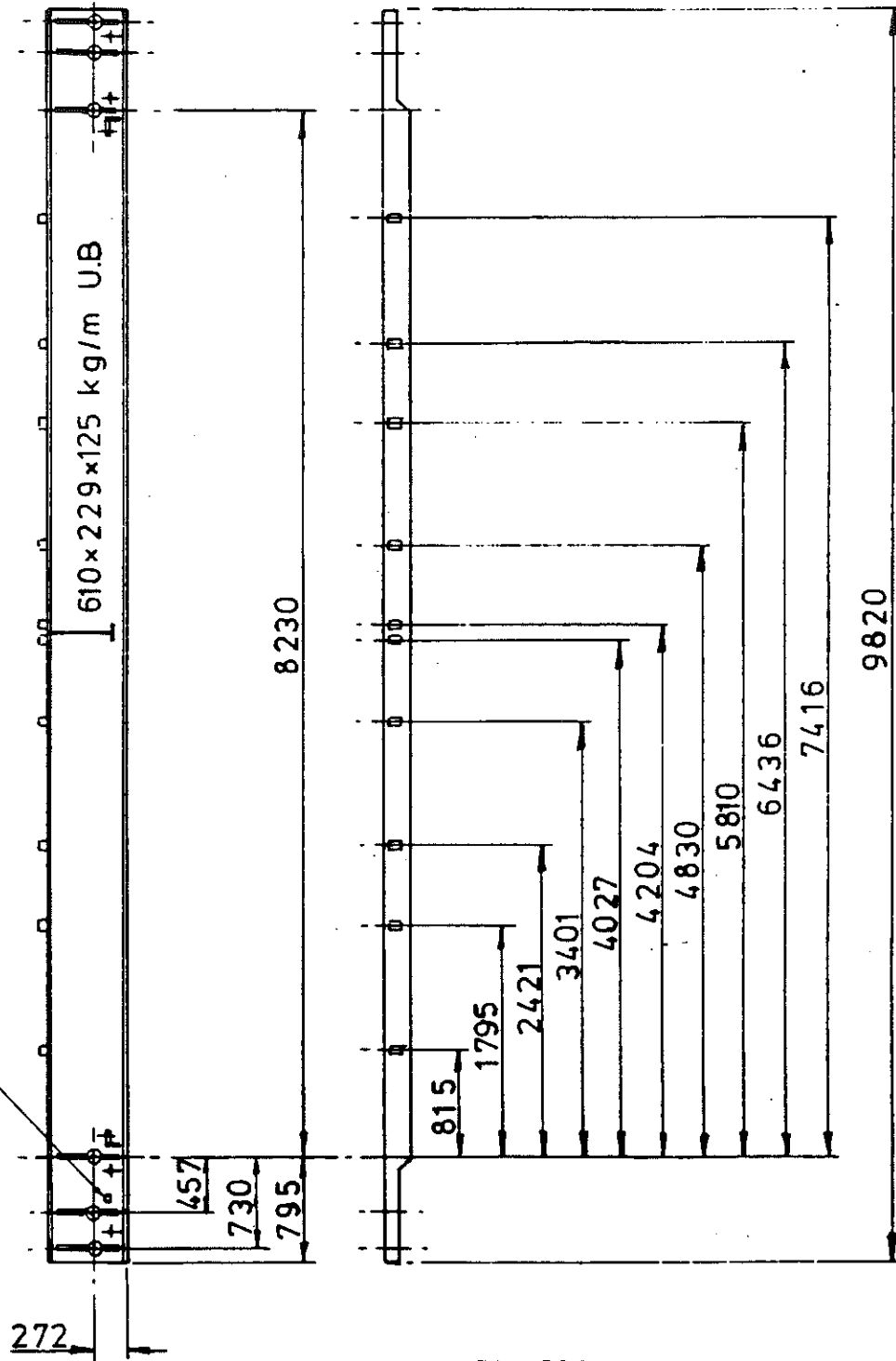
Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

9/88

MC 330
TRANSOM 7.3m Roadway-MS250
WEIGHT : 1235Kg

9	13	330
		CD 93

IDENTIFICATION PAD



Overall:- 9820 x 679 x 229
Cube:- 1.527m³

Checked	Date
RLB	4/4/89



9/88

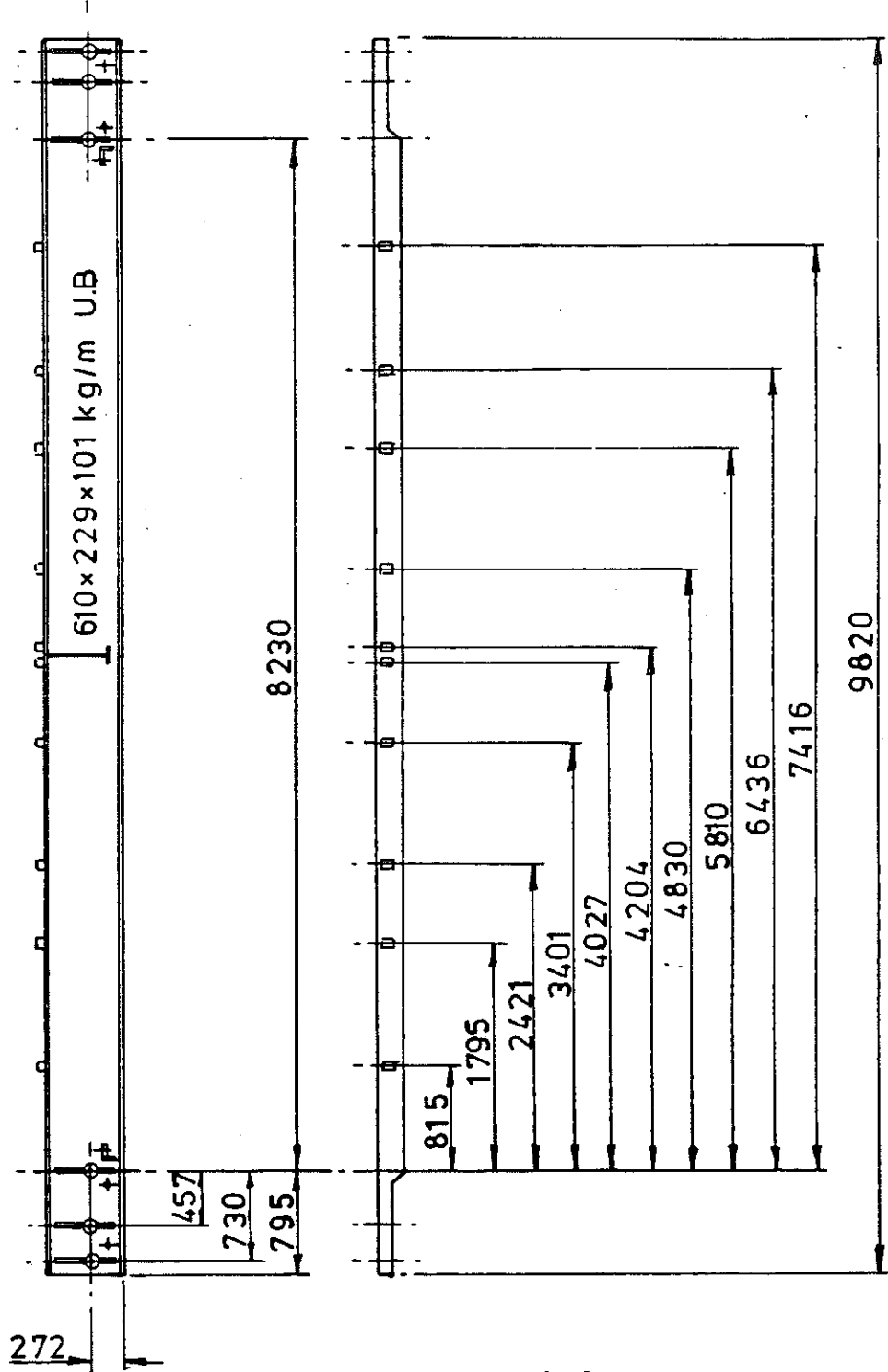
MC334

TRANSOM 7.3m Roadway-HS20

WEIGHT: 1004 Kg

9	13	334
CD92		

NO IDENTIFICATION PAD



Overall:- 9820 x 669 x 228

Cube:- 1.498 m³

Checked	Date
RLB	4/4/89



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7/90

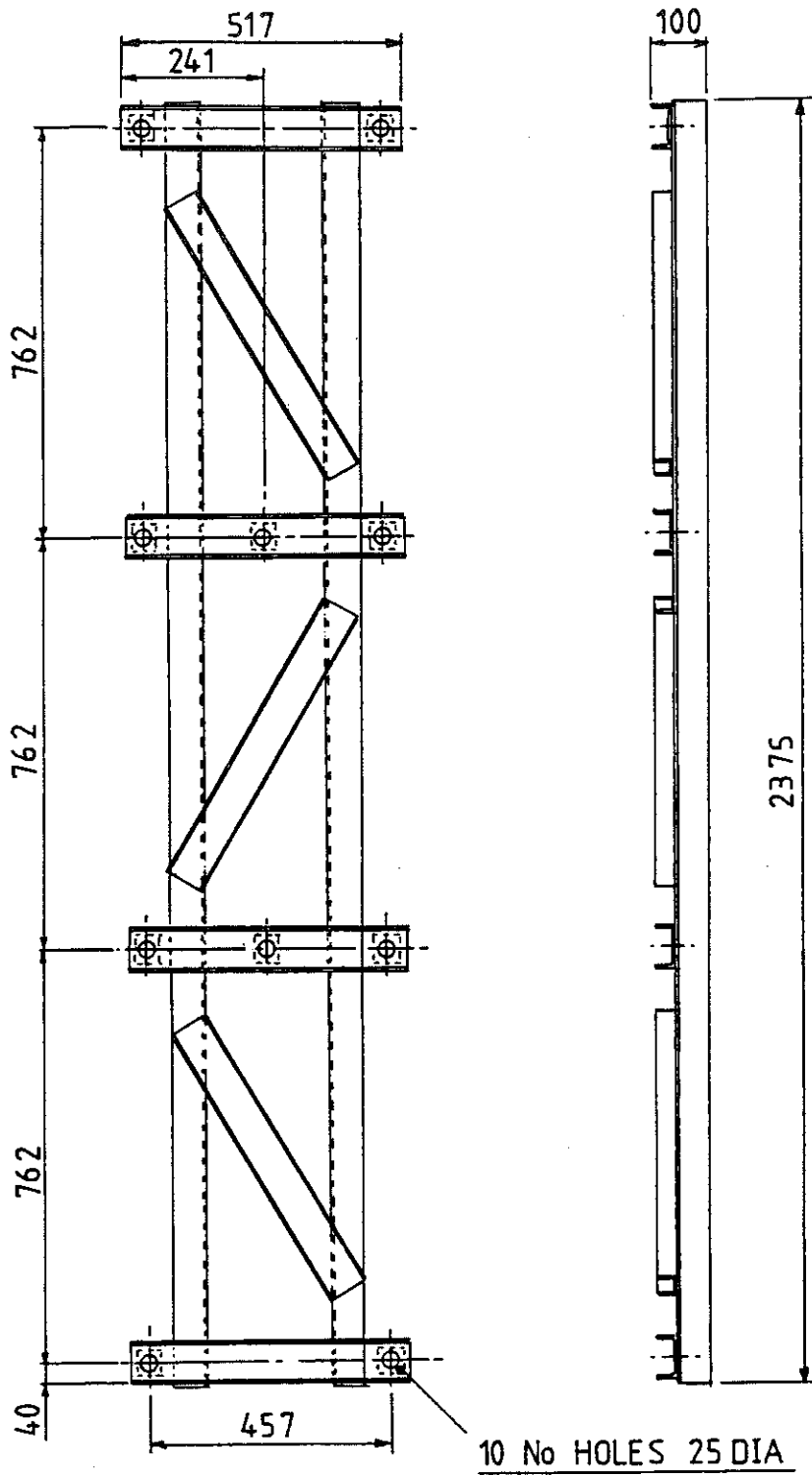
9

13

358

CA 366

MC 358
FRAME BRACING - 200
WEIGHT 48.24Kg



OVERALL DIMENSIONS : 2375 x 517 x 100

CUBE : 0.13

Checked SP	Date 5/7/90
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Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

Admel P/2/547

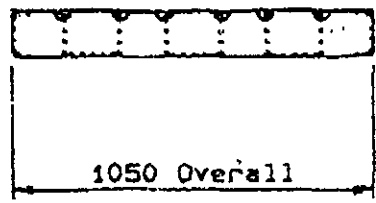
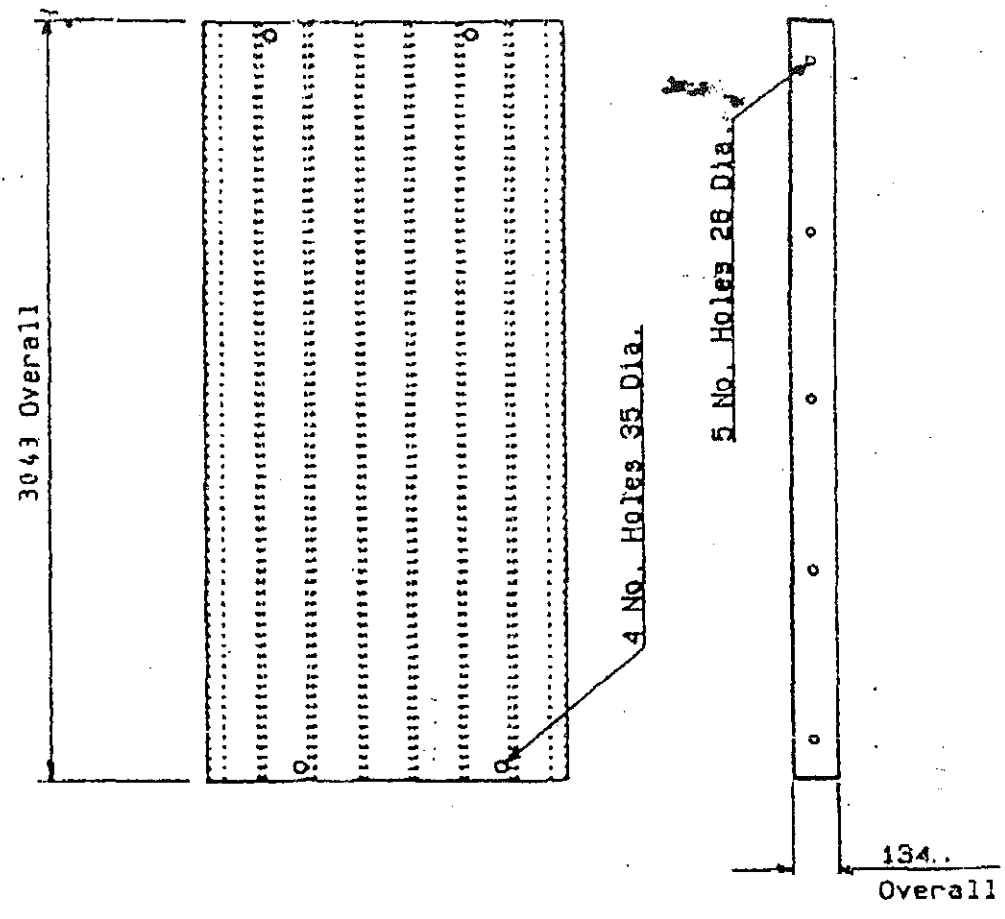
8/90

MC 360

CL 140

DECK - 1050 - STD.

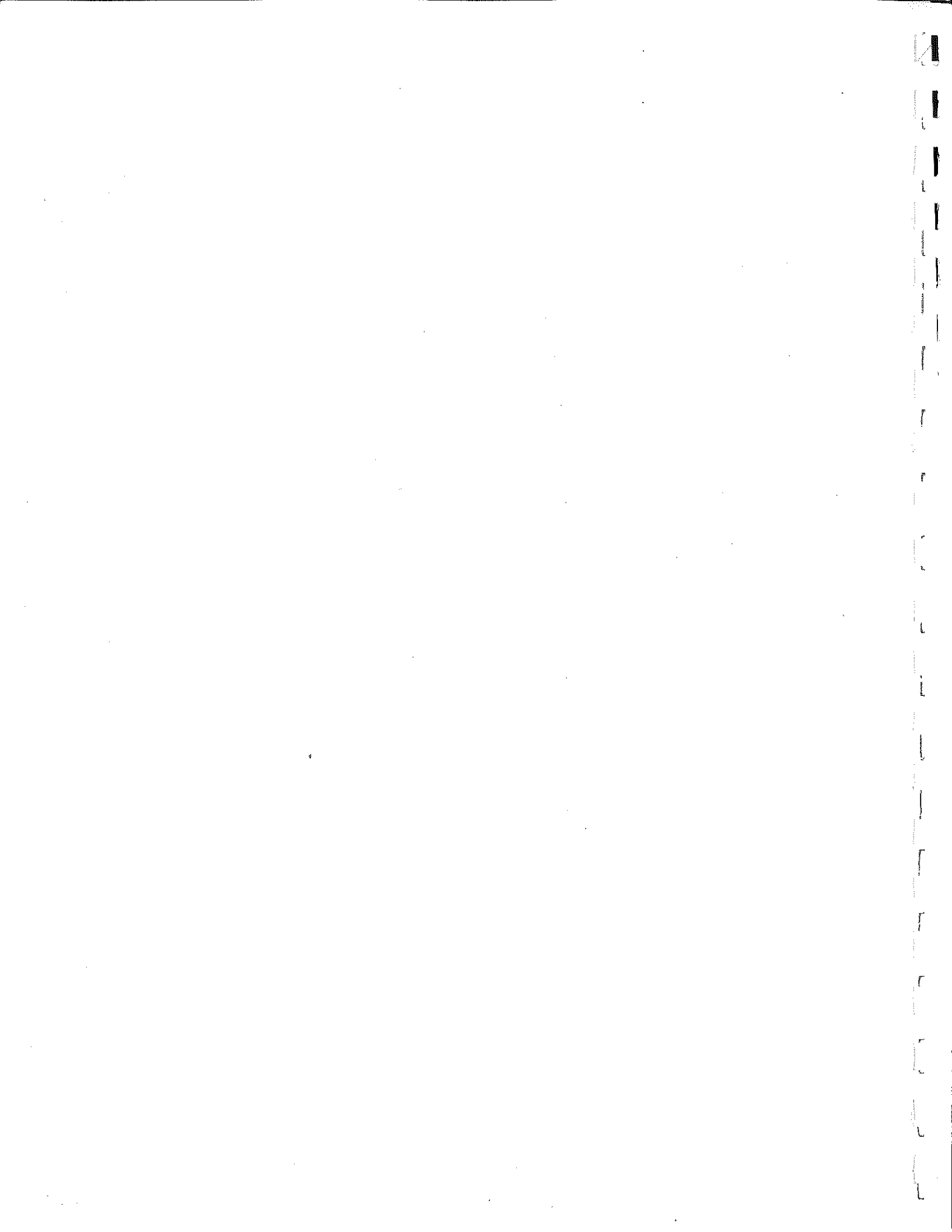
WEIGHT: -305.53Kg



Overall Dimensions : 3043 x 1050 x 134

Cube (m³) : 0.428

Checked	Date



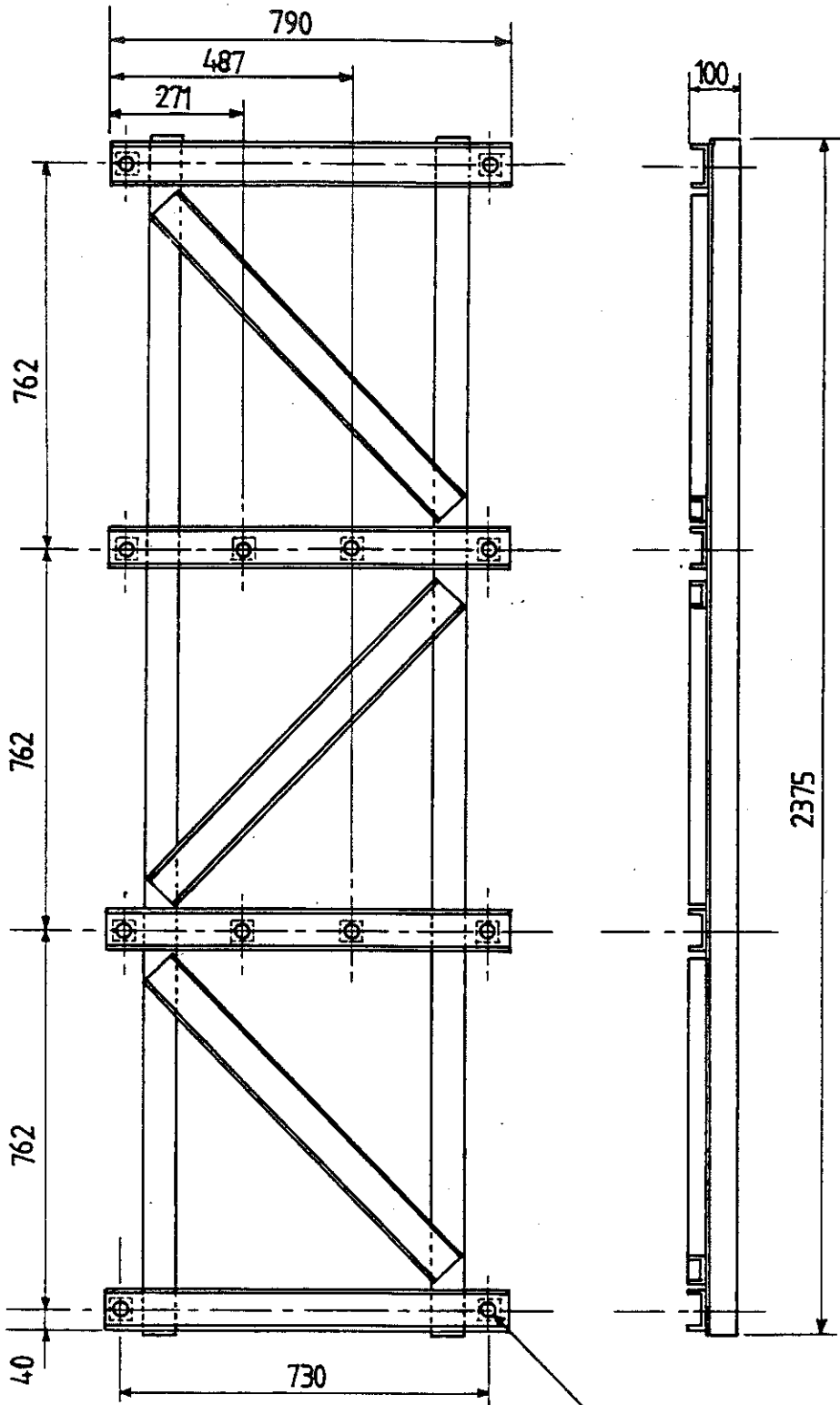
1/90

MC 359
FRAME BRACING - 200-QS

9

13

359



12 No. 25 DIA. HOLES

OVERALL DIMENSIONS : 2375 x 790 x 100

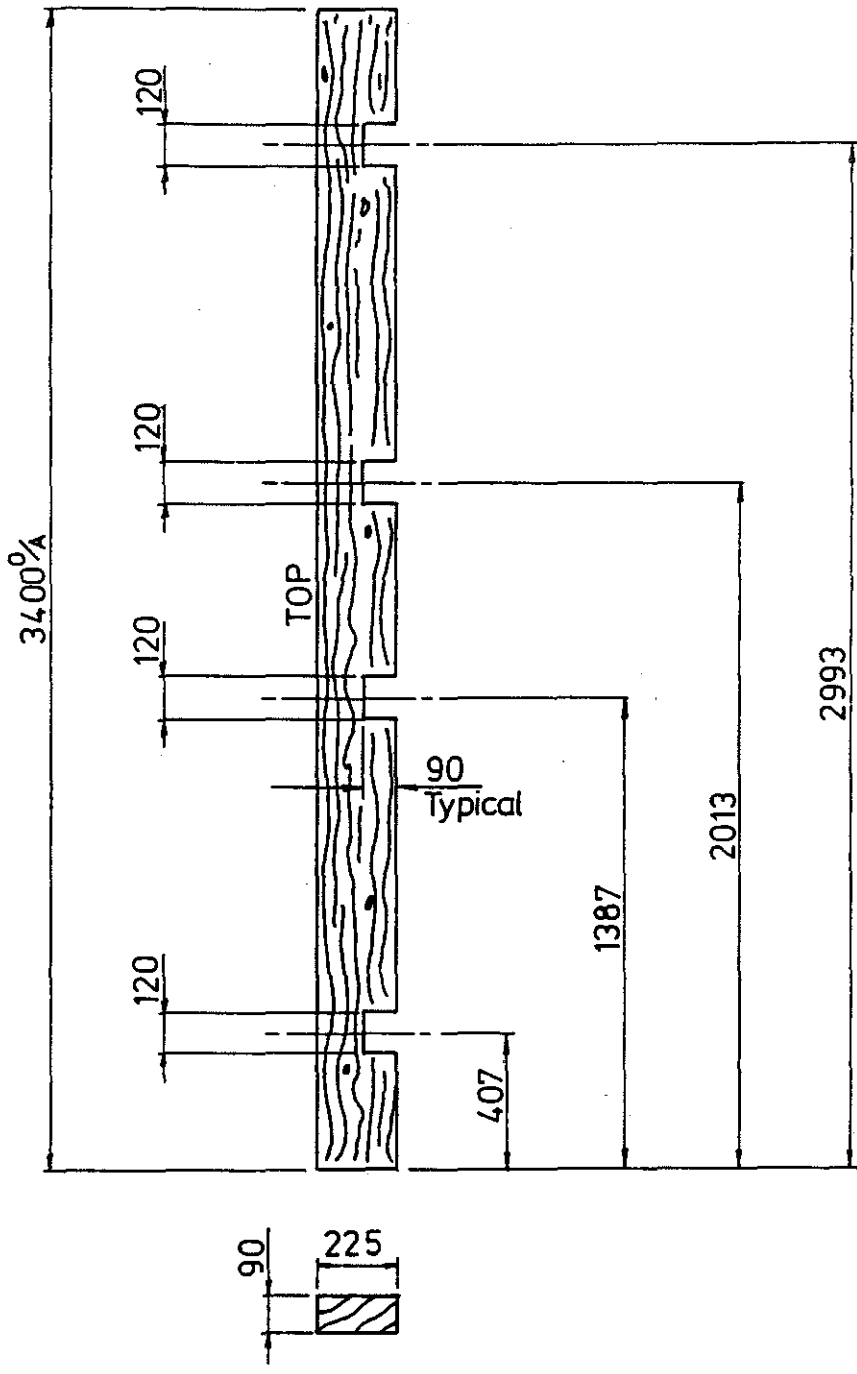
CUBE : 0.19

Checked	Date
SP	5/7/90



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NLC 8087
TIMBER INFILL-EOB-STD-200
WEIGHT-38.33Kg



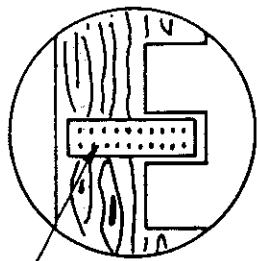
OVERALL DIMENSIONS - 3400x225x90

CUBE - 0.0688m³

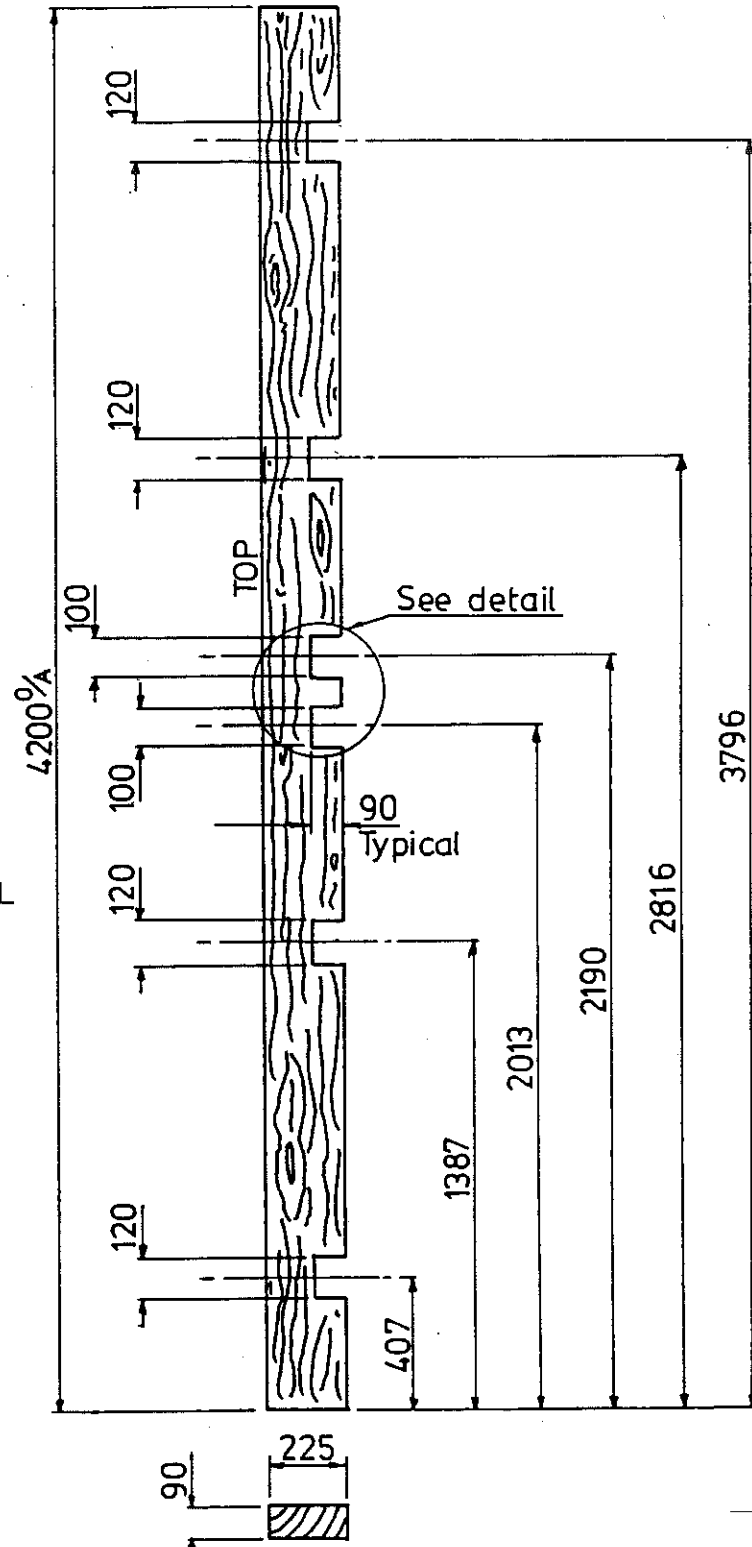
Checked	Date
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NLC 8088
TIMBER INFILL-EOB-EW-200
WEIGHT 46.93Kg.



Nail strip (using Gang nails to prevent splitting.



OVERALL DIMENSIONS :- 4200x225x90

CUBE :- 0.0851m³

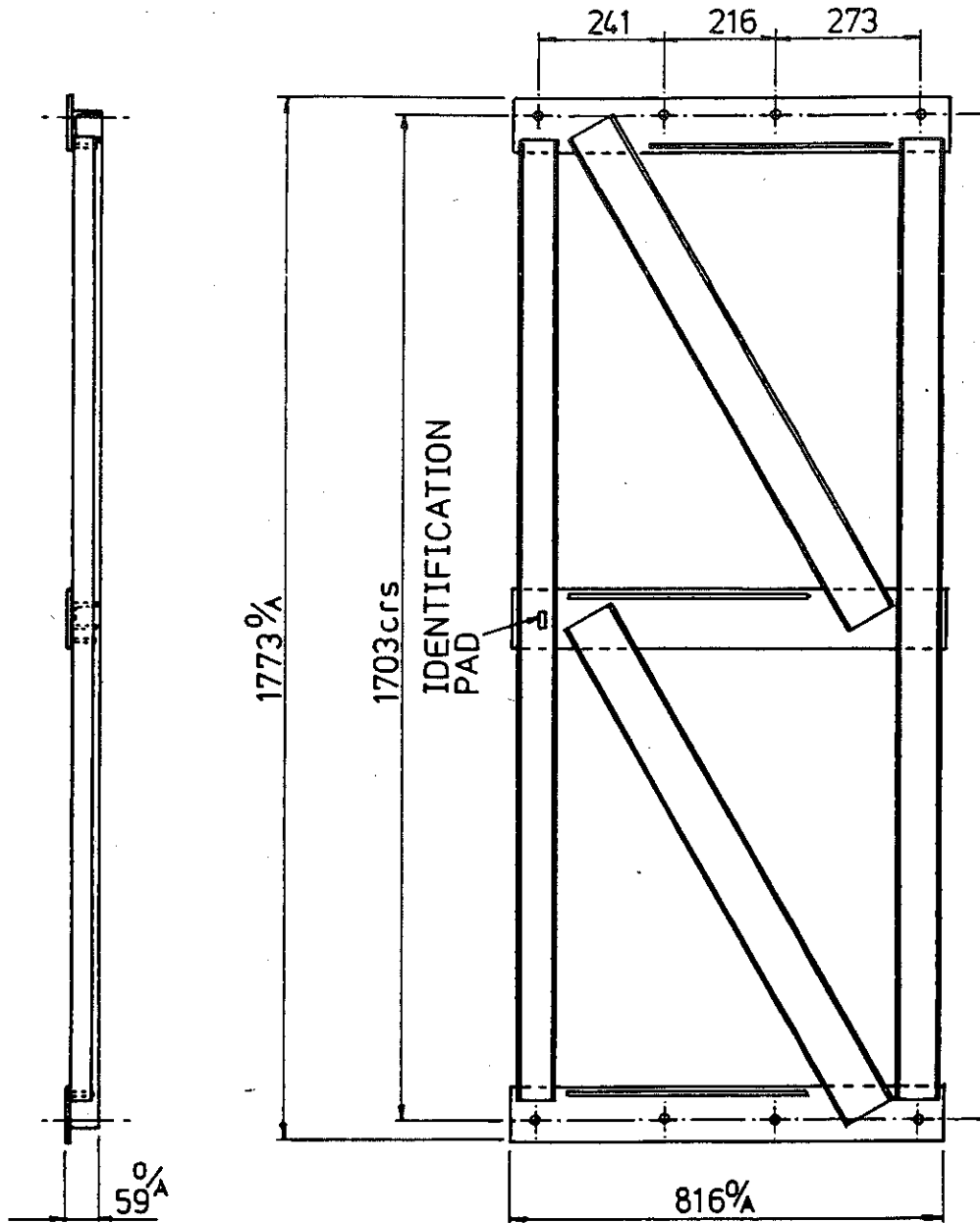
Checked Date



1/89

CD 94

NLC 8091
VERTICAL FRAME - QS - 200
WEIGHT 6345Kg



OVERALL DIMENSIONS : 1773 x 816 x 59

CUBE : 0.085 m³

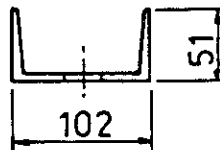
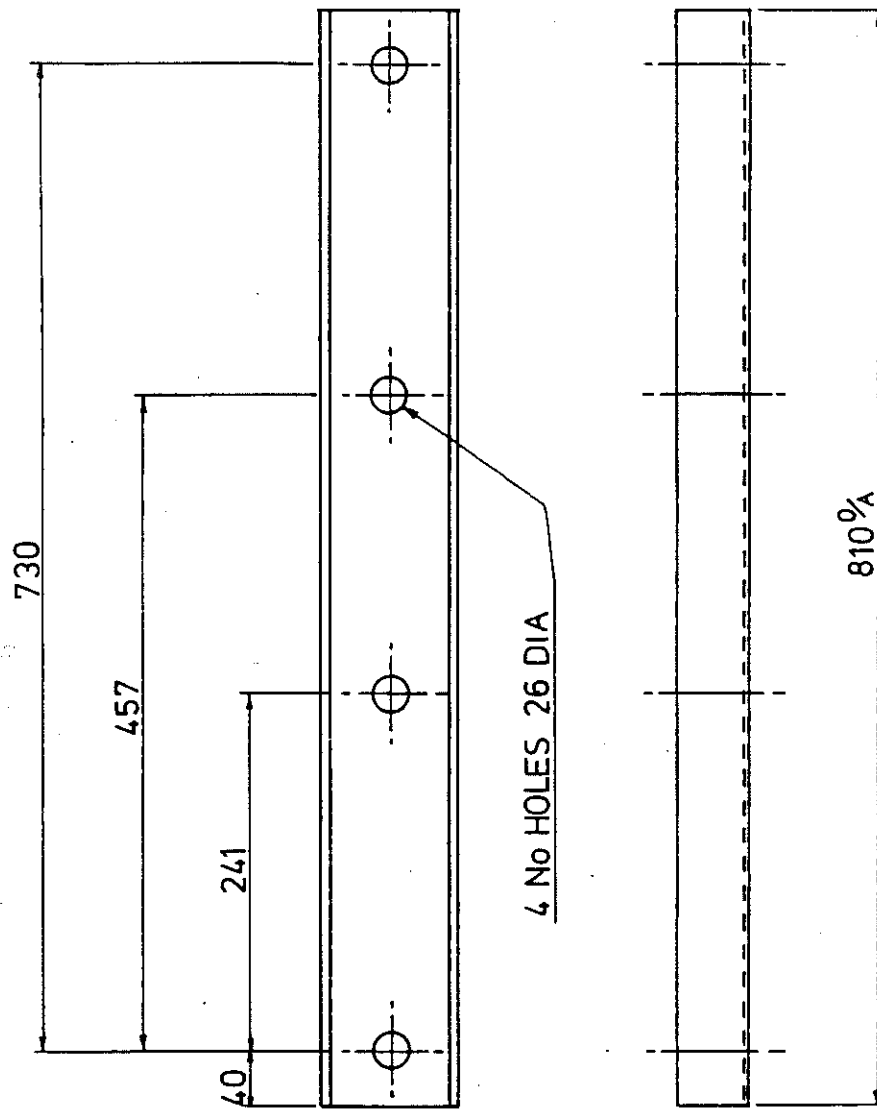
Checked	Date
P.B.	3/2/89



1/89

NLC 8093
TIE BEAM-EOB-QS-200
WEIGHT 8.34Kg

CD96

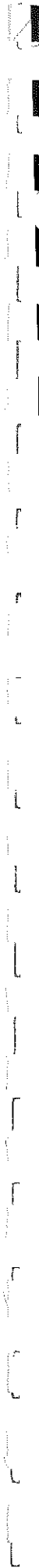


OVERALL DIMENSIONS :- 810x102x51
CUBE :- 0.0042m³

Checked	Date
P. B.	3/2/89



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ



SECTION 4
ERECTION & LAUNCHING
EQUIPMENT

BRIDGE ERECTION AND LAUNCHING EQUIPMENT

Listed opposite are all of the basic hand tools and sundry equipment required to construct a Mabey Compact Bailey Bridge. Additionally, it would be beneficial if a power wrench, complete with power supply (compressor/generator) were available, especially when constructing a large span containing many bolts.

It is a design feature of the bridge that it can be erected by hand. It is obviously advantageous, however, to have the facility of a crane in order to ease and speed up the erection process.

When launching a structure (see below) due consideration must also be given to the method of moving the structure. It is possible to push small spans across the gap to be bridged by hand, however, a larger span will require some form of mechanical plant, preferably a winch.

A basic principle of the Mabey Compact 200 bridge is that it can be constructed on one bank, on rollers, and then launched across the gap to be bridged without requiring any temporary intermediate supports.

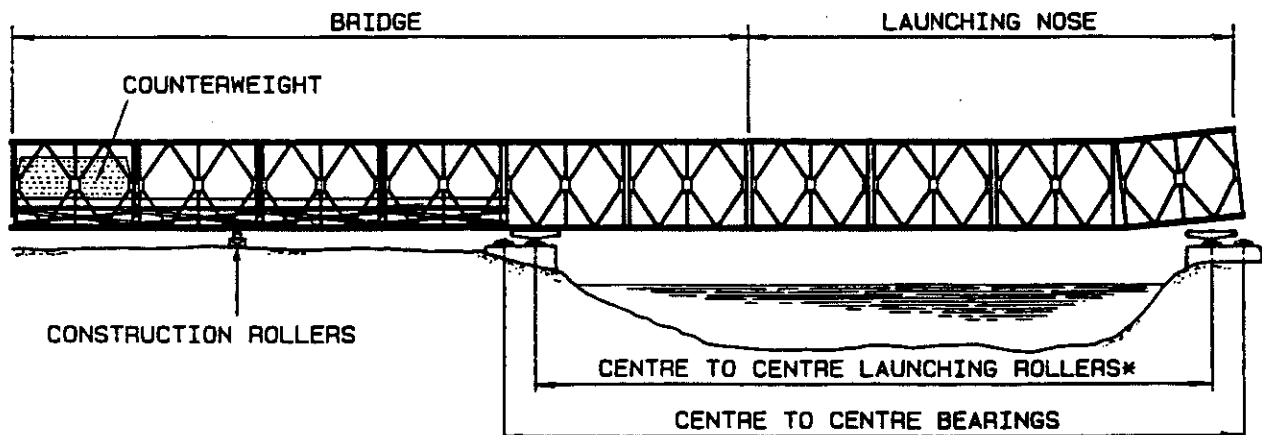
This is achieved by building a temporary skeleton structure, called the "Launching Nose", onto the front of the bridge, constructed from the same standard Mabey Compact 200 components as used in the bridge. Alternatively, Mabey Compact 100 or Super Bailey bridge components can be used to construct the launching nose.

The launching nose is built of such a length that when the structure is rolled forwards across the gap, the tip of the nose touches down on the far bank landing rollers before the centre of gravity passes the near bank launching rollers.

It should be noted that the rollers required to launch Mabey Compact bridges are the same as those used for all other Bailey type bridges.

Once the bridge is in position across the gap, the launching nose is dismantled, the bridge jacked up, the launching and landing rollers removed, and the bridge lowered onto its bearings on the abutments.

Alternatively, where adequate crange is available, the bridge can be erected on one bank and then lifted into position as a complete unit.



* The rollers may be placed on bearing positions if a tail bay is used

STANDARD TOOLS - MABEY COMPACT BRIDGING

1. <u>SPANNERS ETC</u>	<u>MARK NO.</u>	<u>QTY</u>	
Fitting Tool - Safety Clip	MC352	2	
Removal Tool - Safety Clip	MC353	2	
Drift Pin - 24mm. Diameter	MC357	4	
Spanner - Open Podger - 36A/F	NLC9003	2	
Spanner - Ring Podger - 36A/F	NLC9004	2	
Sliding T Bar - 3/4" Drive	NLC8004	2	
Reversible Ratchet - 3/4" Drive	NLC8003	2	
Socket - 3/4" Drive - 36A/F	NLC8005	4	
Wrench Brace - 17A/F	MC273	2	
 <u>SUPPLEMENT FOR STEEL DECK</u>			
Deck Lifting Hook	MC356	4	
 <u>SUPPLEMENT FOR TIMBER DECK</u>			
Socket - 3/4" Drive - 30A/F (Long)	NLC9002	2	
 <u>SUPPLEMENT FOR FOOTWALKS</u>			
Screwdriver - large	NLC9005	2	
Hexagonal Key - 5/16" A/F	NLC9019	2	
 2. <u>BASIC TOOLS</u>			
Sledge Hammer - 3.25kg (7lb)	NLC8006	2	
Spare Handle - Sledge Hammer	NLC9006	1	
Club Hammer - 1kg (2.5lb)	NLC9007	2	
Spare Handle - Club Hammer	NLC9008	1	
Crow Bar - 1.5m (60")	NLC9009	1	
Nail Bar - 0.6m (24")	NLC9010	1	
Tin Snips	NLC9011	1	
Adjustable Wrench - 28A/F max	NLC9015	1	
 <u>SUPPLEMENT FOR LARGE SPANS</u>			
Chain Pull Lift - 1.5t	NLC9016	1	
 <u>SUPPLEMENT FOR SETTING OUT</u>			
Steel Tape - 30m (100ft)	NLC9012	1	
Nylon Line - 30m x 50kg (100lbs)	NLC9013	1	
Spirit Level - 1m (3ft)	NLC9014	1	
 3. <u>JACKING EQUIPMENT</u>			
		<u>J<40t</u>	<u>J>40</u>
Jacking Frame	MC263	2	4
Vertical Frame - 100	MC221	0	2
Jack - Screwed Ram - 35t	NLC9017	2	4
Service Kit - 35t Jack	NLC9018	2	4
 <u>SUPPLEMENT FOR JACKING UNDER A PANEL</u>			
Plate - Jack Head	NLC9169	2	2

Quantify according to J = Total Jacking Load per End of Bridge.

NOTE - Tools will be supplied as requested when not available locally

BRIDGE ERECTION AND LAUNCHING EQUIPMENT

LIST OF ITEMS ILLUSTRATED ON THE FOLLOWING PAGES

HAND TOOLS

Wrench Brace - 17A/F	MC273
Fitting Tool - Safety Clip	MC352
Removal Tool - Safety Clip	MC353
Deck Lifting Hook	MC356
Drift Pin - 24mm Diameter	MC357
Reversible Ratchet - 3/4" Drive	NLC8003
Sliding T Bar - 3/4" Drive	NLC8004
Socket - 3/4" Drive - 36A/F	NLC8005
Socket - 3/4" Drive - 30A/F	NLC9002
Spanner - Open Podger - 36A/F	NLC9003
Spanner - Ring Podger - 36A/F	NLC9004
Screwdriver	NLC9005
Hexagonal Key - 5/16" A/F	NLC9019

JACKING EQUIPMENT

Vertical Frame	MC221
Jacking Frame	MC263
Jack - Screwed Ram - 35t	NLC9017
Plate - Jack Head	NLC9169

ROLLER EQUIPMENT

Plain Roller	BB58
Rocking Roller	BB59
Balance Beam Assembly	MC350 (MBB1128)
Balance Beam Adaptor	MC351

LAUNCHING NOSE EQUIPMENT - COMPACT 200

Launching Link - 200	MC66
Nose Drop Bolt Assembly	MC268
Extension Sway - Std.	MC348
Extension Sway - E.W. & 2 Lane	MC349

LAUNCHING NOSE EQUIPMENT - COMPACT 100 & BAILEY

Launching Link - 100 & MBB	MC65
Link Swaybrace - Std. - 100	MC346
Link Swaybrace - E.W. - 100	MC347
Adaption Frame - 200 to 100 & MBB	NLC8043
Diagonal Brace - E.W. - 100 & MBB	NLC8044
Top Horizontal - E.W. - 100 & MBB	NLC8045
Bot Horizontal - E.W. - 100 & MBB	NLC8046
Locating Plate - MBB	NLC8047
Diagonal Brace - Std. - 100 & MBB	NLC8048
Top Horizontal - Std. - 100 & MBB	NLC8049
Bot Horizontal - Std. - 100 & MBB	NLC8050

STANDARD TOOLS - MABEY COMPACT BRIDGING

1. <u>SPANNERS ETC</u>	<u>MARK NO.</u>	<u>QTY</u>	
Fitting Tool - Safety Clip	MC352	2	
Removal Tool - Safety Clip	MC353	2	
Drift Pin - 24mm. Diameter	MC357	4	
Spanner - Open Podger - 36A/F	NLC9003	2	
Spanner - Ring Podger - 36A/F	NLC9004	2	
Sliding T Bar - 3/4" Drive	NLC8004	2	
Reversible Ratchet - 3/4" Drive	NLC8003	2	
Socket - 3/4" Drive - 36A/F	NLC8005	4	
Wrench Brace - 17A/F	MC273	2	
 <u>SUPPLEMENT FOR STEEL DECK</u>			
Deck Lifting Hook	MC356	4	
 <u>SUPPLEMENT FOR TIMBER DECK</u>			
Socket - 3/4" Drive - 30A/F (Long)	NLC9002	2	
 <u>SUPPLEMENT FOR FOOTWALKS</u>			
Screwdriver - large	NLC9005	2	
Hexagonal Key - 5/16" A/F	NLC9019	2	
 2. <u>BASIC TOOLS</u>			
Sledge Hammer - 3.25kg (7lb)	NLC8006	2	
Spare Handle - Sledge Hammer	NLC9006	1	
Club Hammer - 1kg (2.5lb)	NLC9007	2	
Spare Handle - Club Hammer	NLC9008	1	
Crow Bar - 1.5m (60")	NLC9009	1	
Nail Bar - 0.6m (24")	NLC9010	1	
Tin Snips	NLC9011	1	
Adjustable Wrench - 28A/F max	NLC9015	1	
 <u>SUPPLEMENT FOR LARGE SPANS</u>			
Chain Pull Lift - 1.5t	NLC9016	1	
 <u>SUPPLEMENT FOR SETTING OUT</u>			
Steel Tape - 30m (100ft)	NLC9012	1	
Nylon Line - 30m x 50kg (100lbs)	NLC9013	1	
Spirit Level - 1m (3ft)	NLC9014	1	
3. <u>JACKING EQUIPMENT</u>		<u>J<40t</u>	<u>J>40</u>
Jacking Frame	MC263	2	4
Vertical Frame - 100	MC221	0	2
Jack - Screwed Ram - 35t	NLC9017	2	4
Service Kit - 35t Jack	NLC9018	2	4
 <u>SUPPLEMENT FOR JACKING UNDER A PANEL</u>			
Plate - Jack Head	NLC9169	2	2

Quantify according to J = Total Jacking Load per End of Bridge.

NOTE - Tools will be supplied as requested when not available locally

2/86

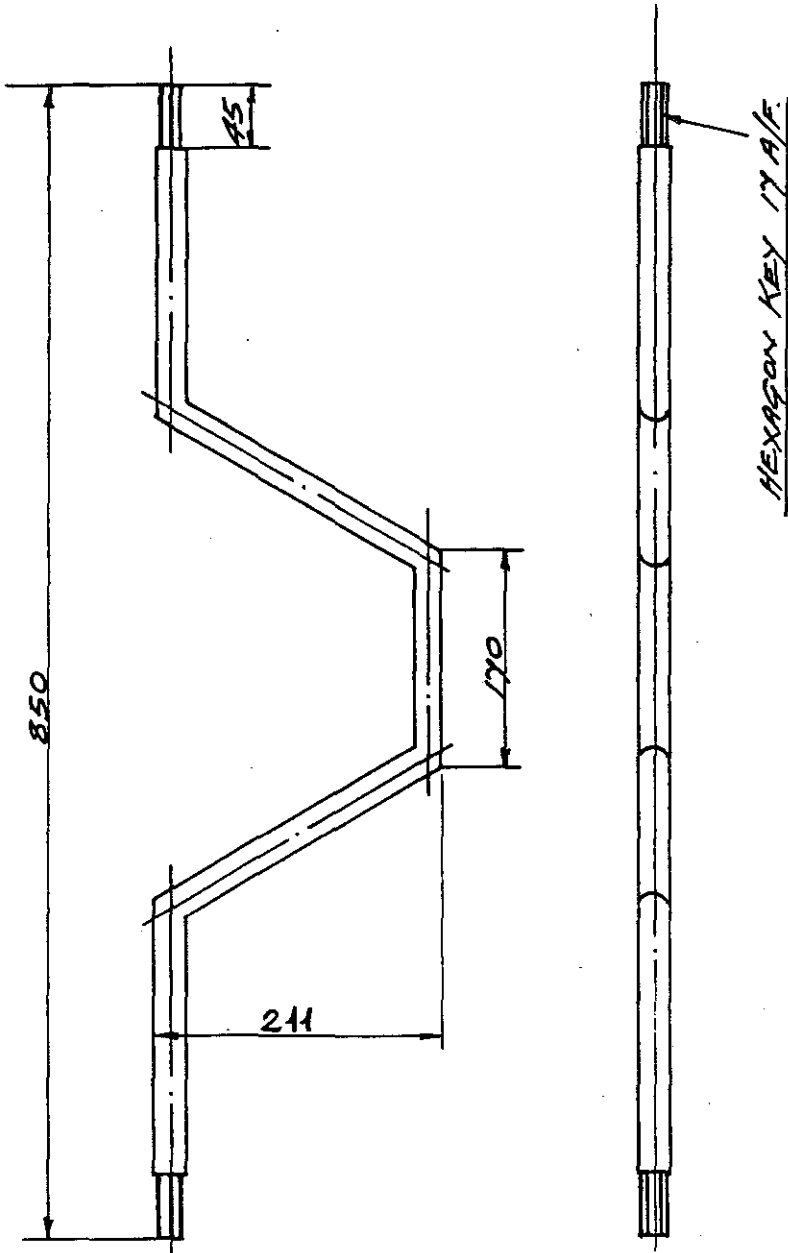
MC 273

9 13 273

BRACE - WRENCH - M20.

CE 11

WEIGHT = 1.87 Kg



OVERALL DIMENSIONS : 850 x 211 x 22

CUBE (M³) 0.00395.

CHECKED	DATE



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7/90

MC 352

9

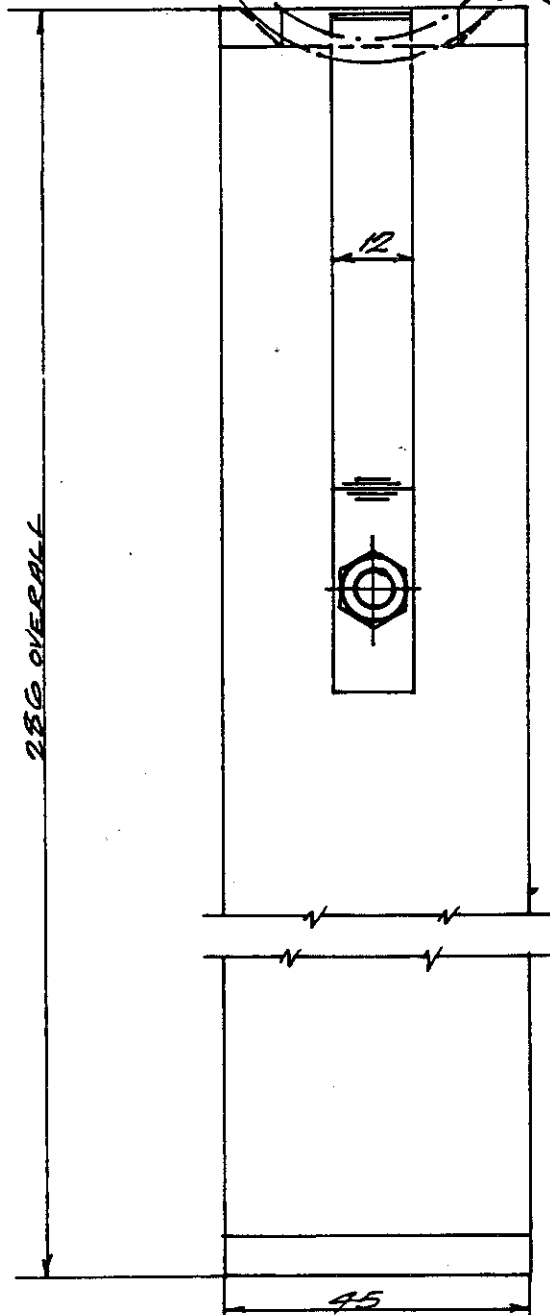
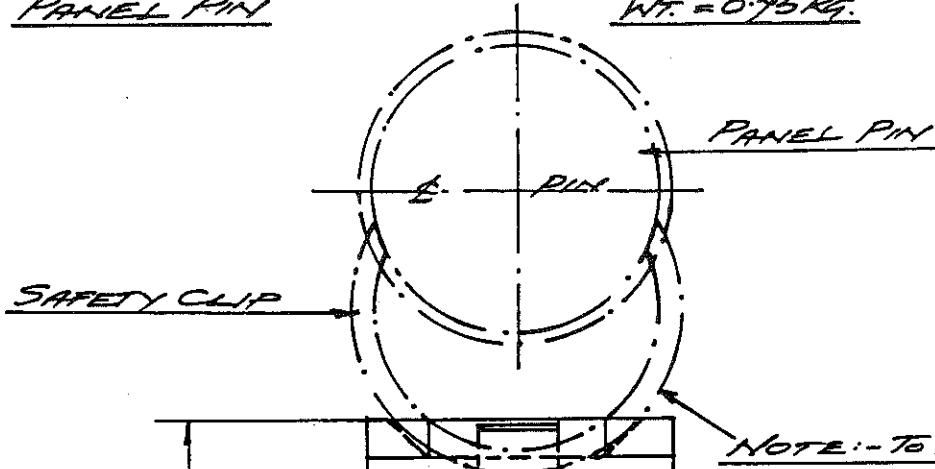
13

352

SAFETY CLIP FITTING TOOL FOR
PANEL PIN

WT. = 0.75 KG.

CD 32



NOTE:- TO LOCATE
SAFETY CLIP INTO
FITTING TOOL PLACE
CLIP THIS IN THE
GROOVE WITH THE
TENSION FROM
LEAF SPRING
PUSHING UPWARDS.
THEN PUSH ON THE
END OF FITTING
TOOL & CLIP WILL
SLIDE ONTO PANEL
PIN.

OVERALL DIMENSIONS:-
280 x 45 x 32
CUBE:- 0.0004 M³

CHECKED	DATE
STEVE. B	3/7/90

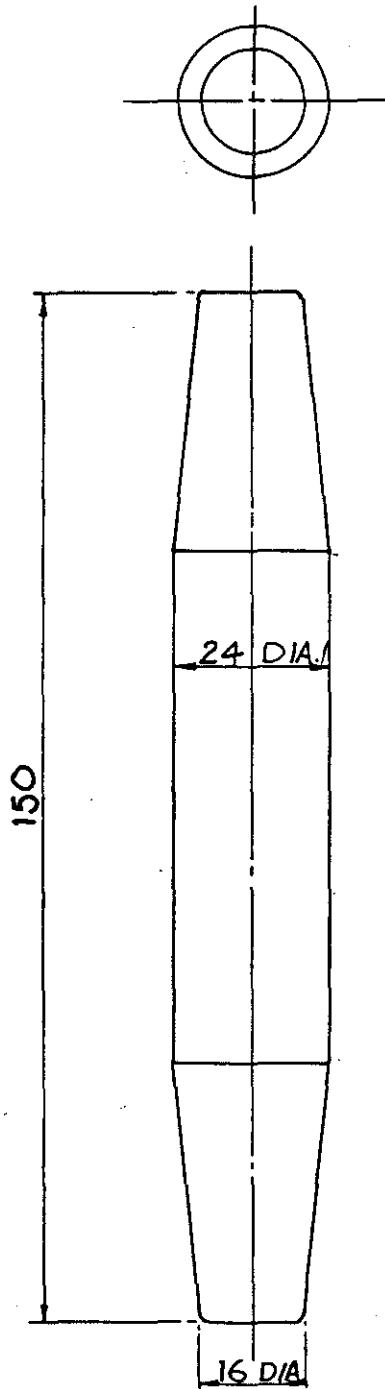


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7/90

MC 357
PIN - DRIFT - M24
WEIGHT: 0.414 KG.

9	13	357
CE 10		



OVERALL DIMENSIONS : 150 x 24 DIA.

CHECKED	DATE
STEVE.B	3/7/90



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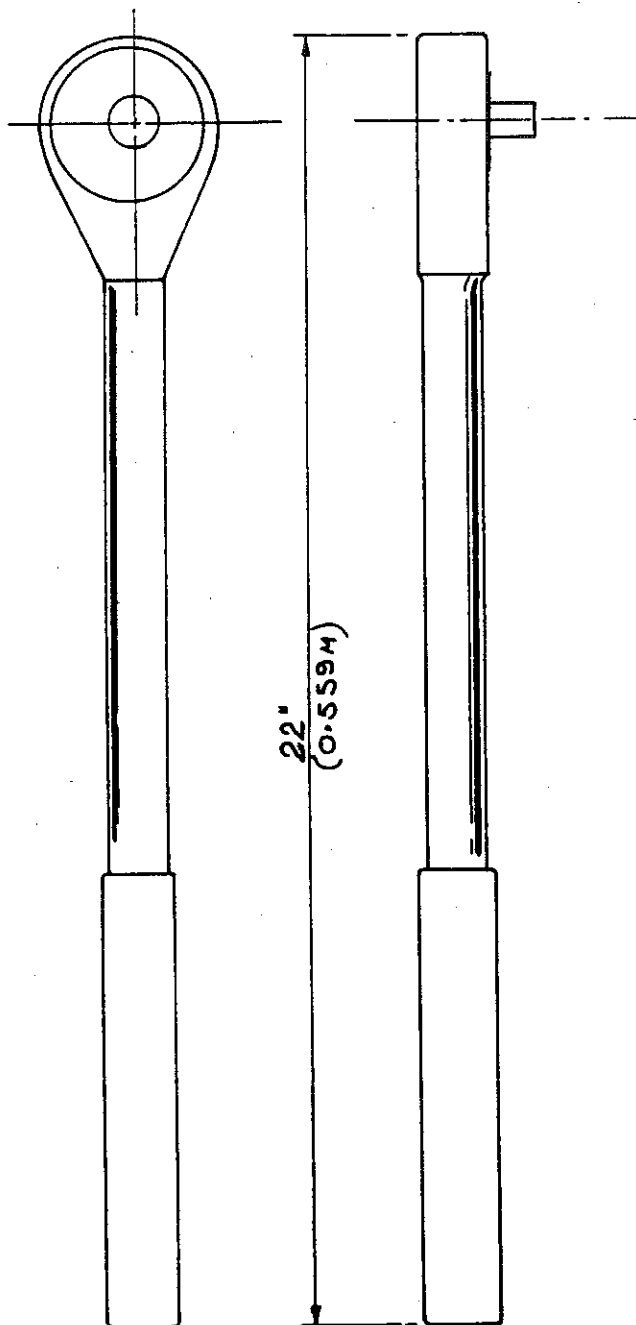
1/88

RATCHET SPANNER - 3/4" DRIVE

9

13

NLC 8003



CHECKED	DATE
RLB	19/1/00



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 6SQ

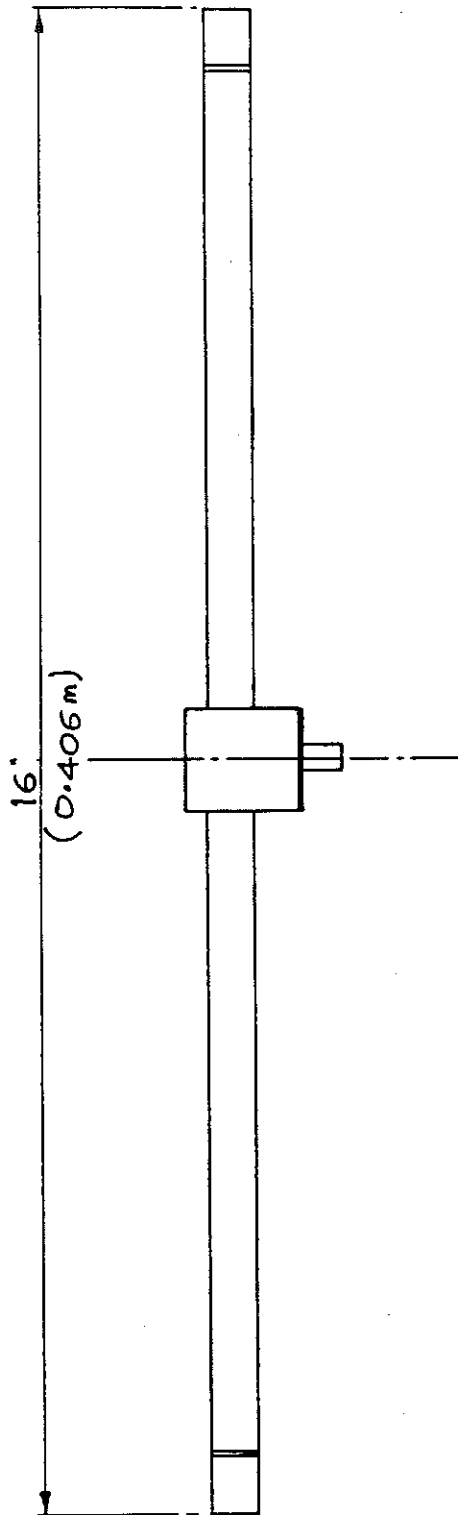
1/88

SLIDING T-BAR 3/4" DRIVE-406

9

13

NLC 8004



CHECKED	DATE
RLB	19/1/08



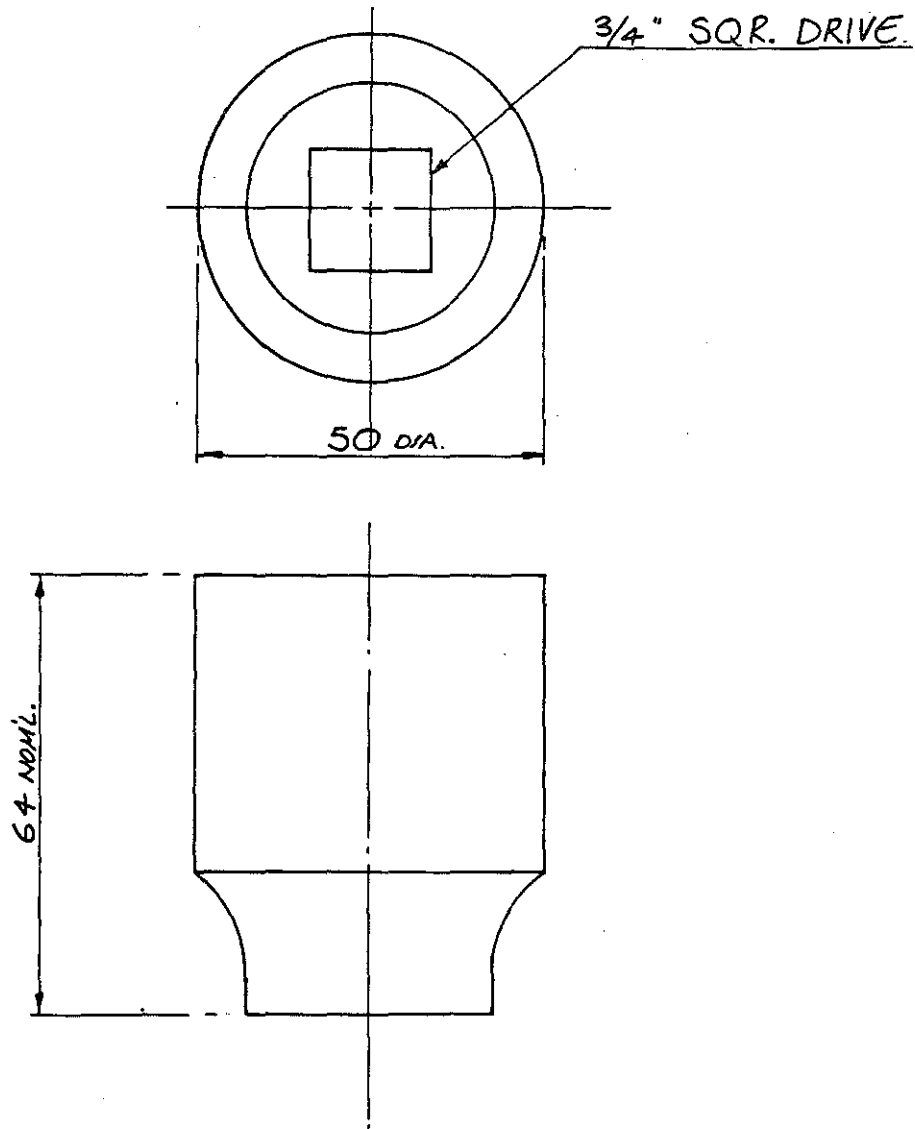
Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

1/88

SOCKET WRENCH 36 A/E.

9 13

NLC 8005



CHECKED	DATE
R.L.B	19/11/88



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

7/90

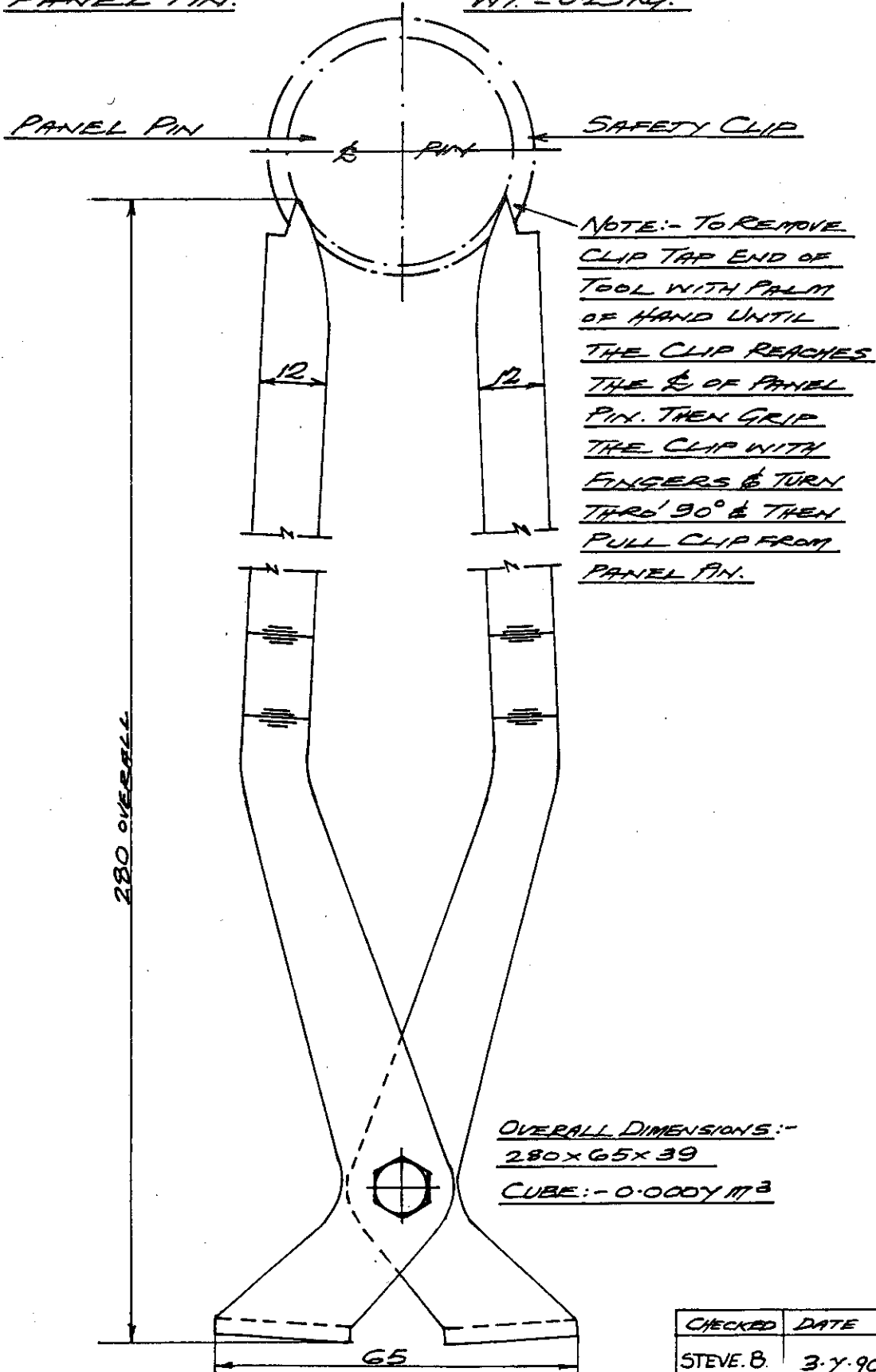
MC 353

9 13 353

SAFETY CLIP REMOVAL TOOL FOR
PANEL PIN.

CD 33

WT. = 0.23 KG.



CHECKED	DATE
STEVE.B	3.Y.90



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

7/86

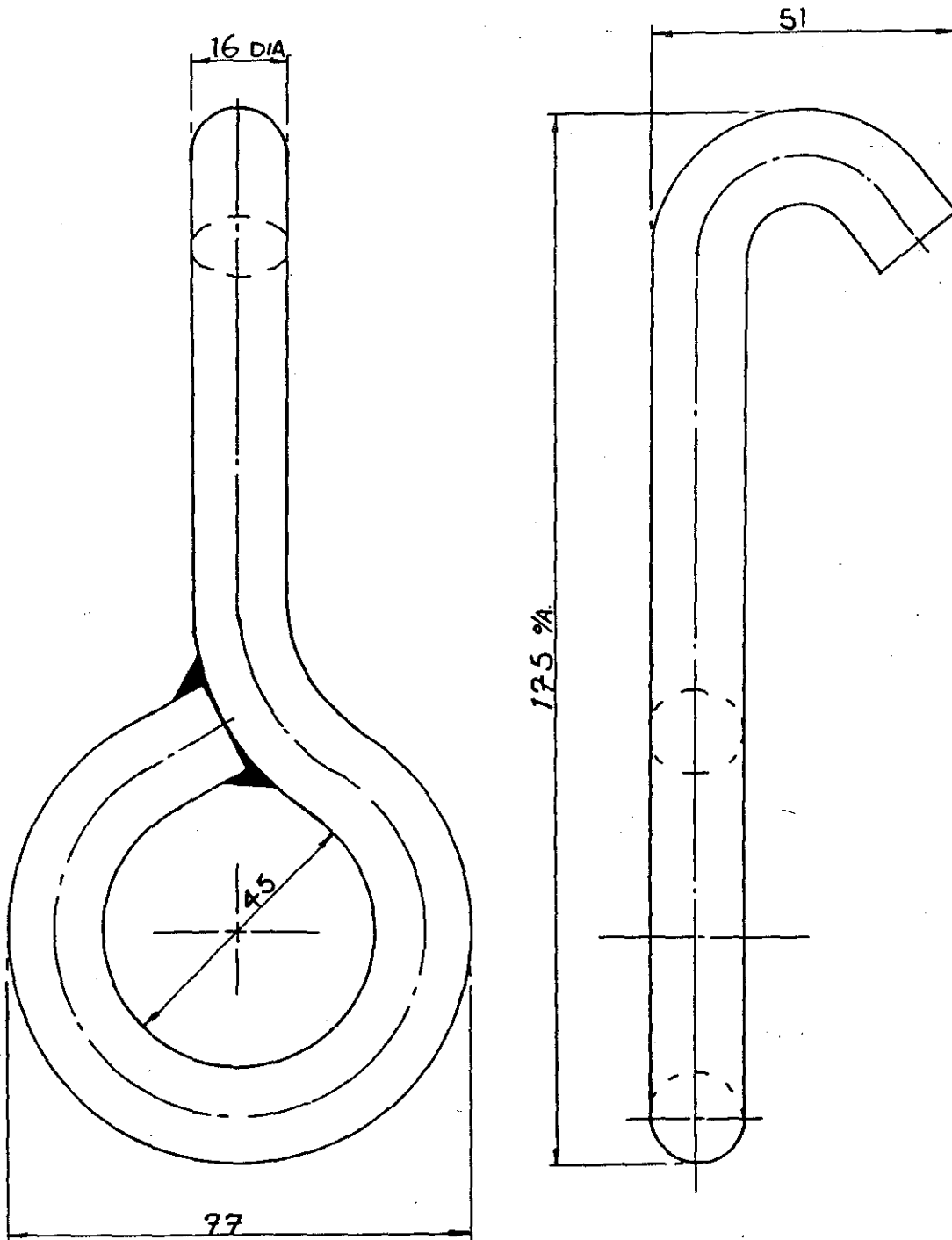
MC 356
HOOK - DECK - LIFTING
WEIGHT : 0.482 KG.

9

13

356

CE 9



OVERALL DIMENSIONS : 175 x 77 x 51

CHECKED	DATE.
SP	5/7/90



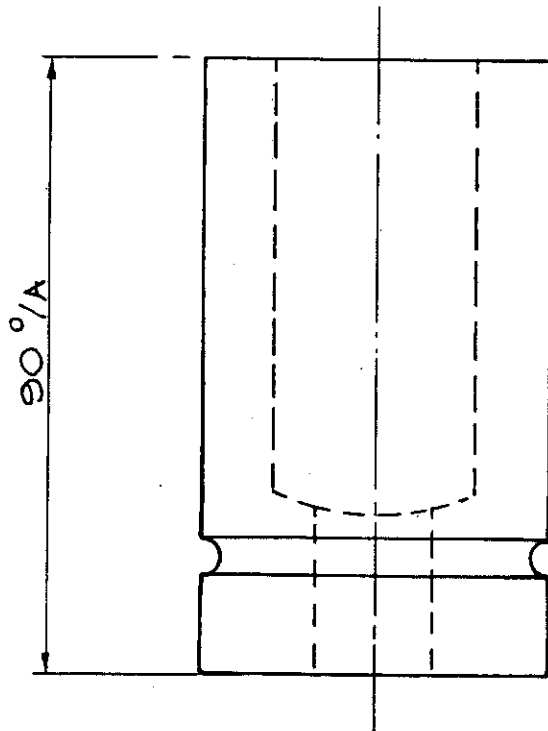
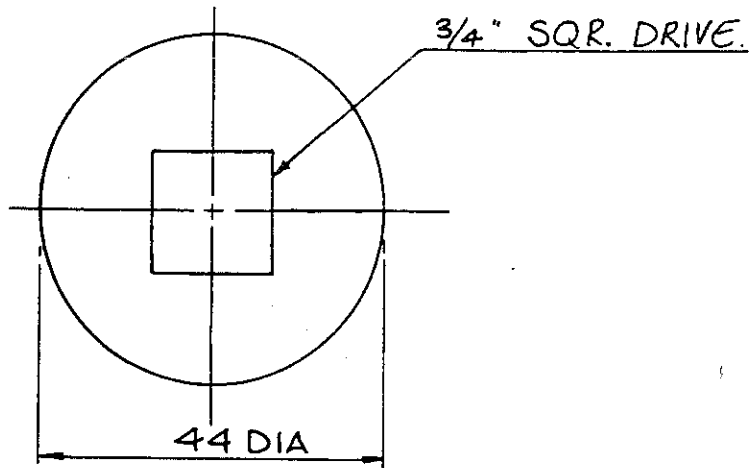
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1/88

SOCKET WRENCH 30 1/2 (long)

9 13

NLC 9002



CHECKED	DATE



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7/86

NLC 9003

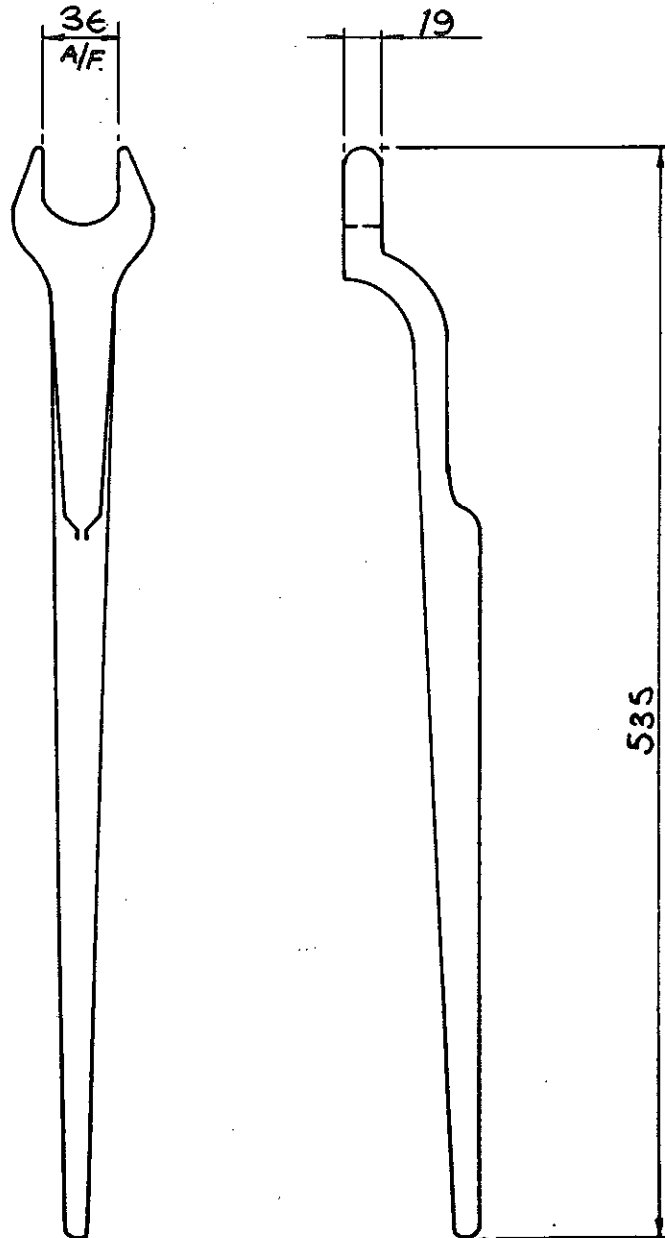
12

13

677

SPANNER - OPEN ENDED PODGER

WEIGHT : 2.00 KG.



CHECKED	DATE
RL BIRT	10/7/86



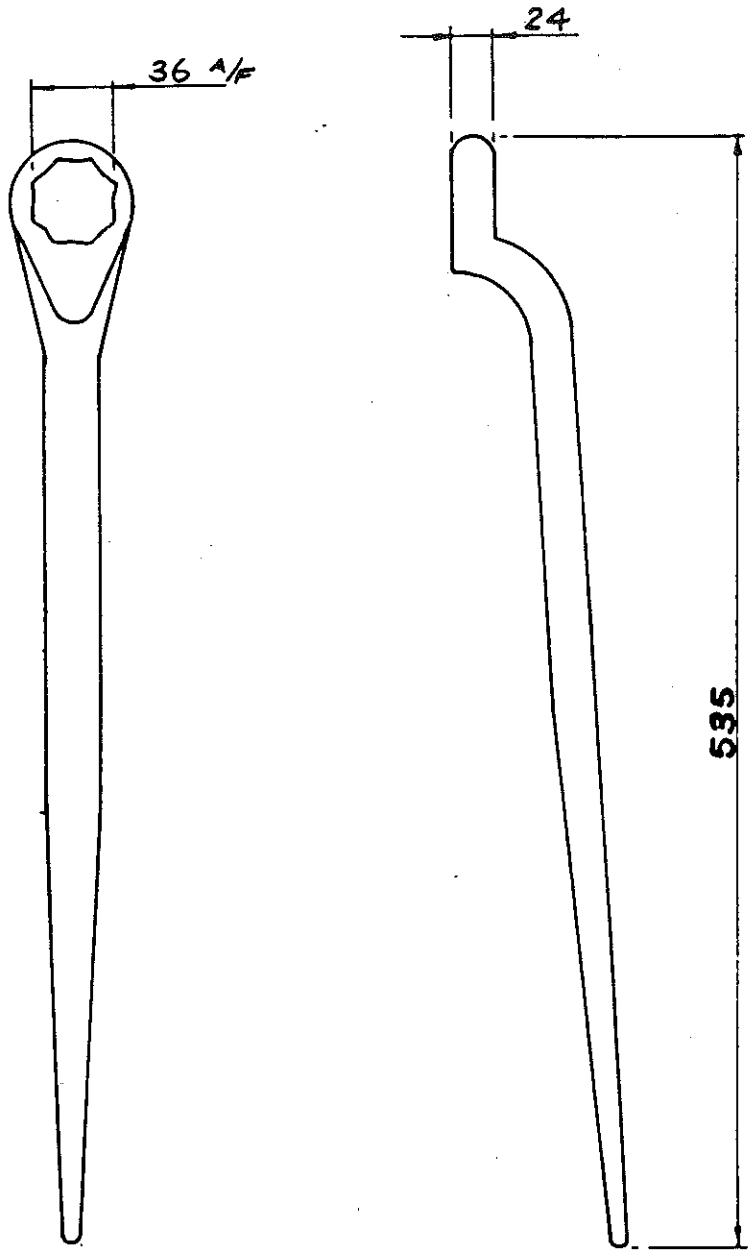
Mabey & Johnson Limited, Floral Mill, Twyford, Reading, RG10 6BQ

7/86

12	13	673
----	----	-----

NLC 9004
SPANNER - RING PODGER.

WEIGHT: 1.80 KG.



CHECKED	DATE
RLB/RT	10/7/86



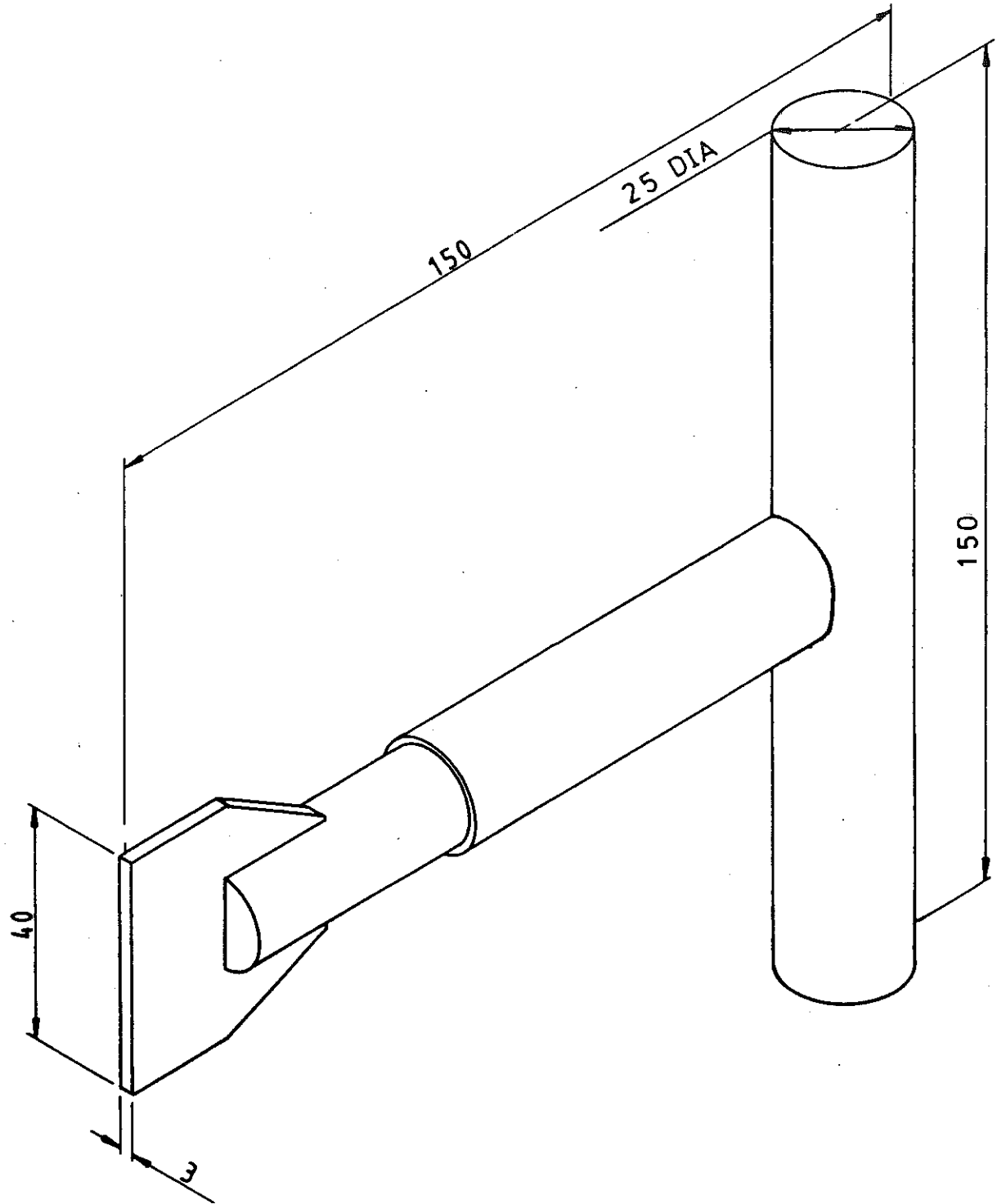
Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

9/80

12 13 668

'T'-Bar Screwdriver

NLC 9005. Weight : 0.61 kg.

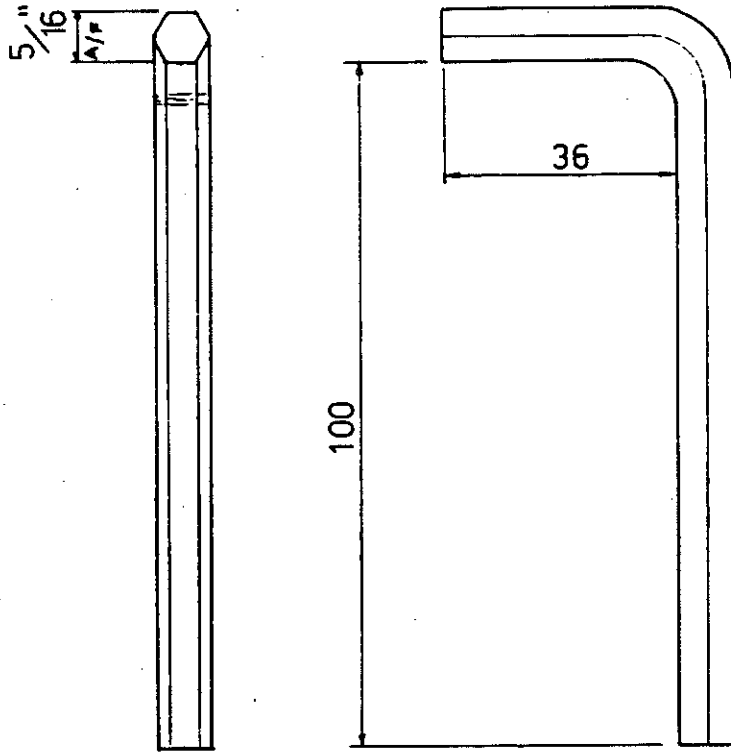


Mabey & Johnson Limited, Floral Mills, Twyford, Reading, RG10 9SQ

3/29

9 13

NLC 9019
HEXAGONAL KEY
WEIGHT=0.059Kg



Checked	Date
DFG	6/3/89



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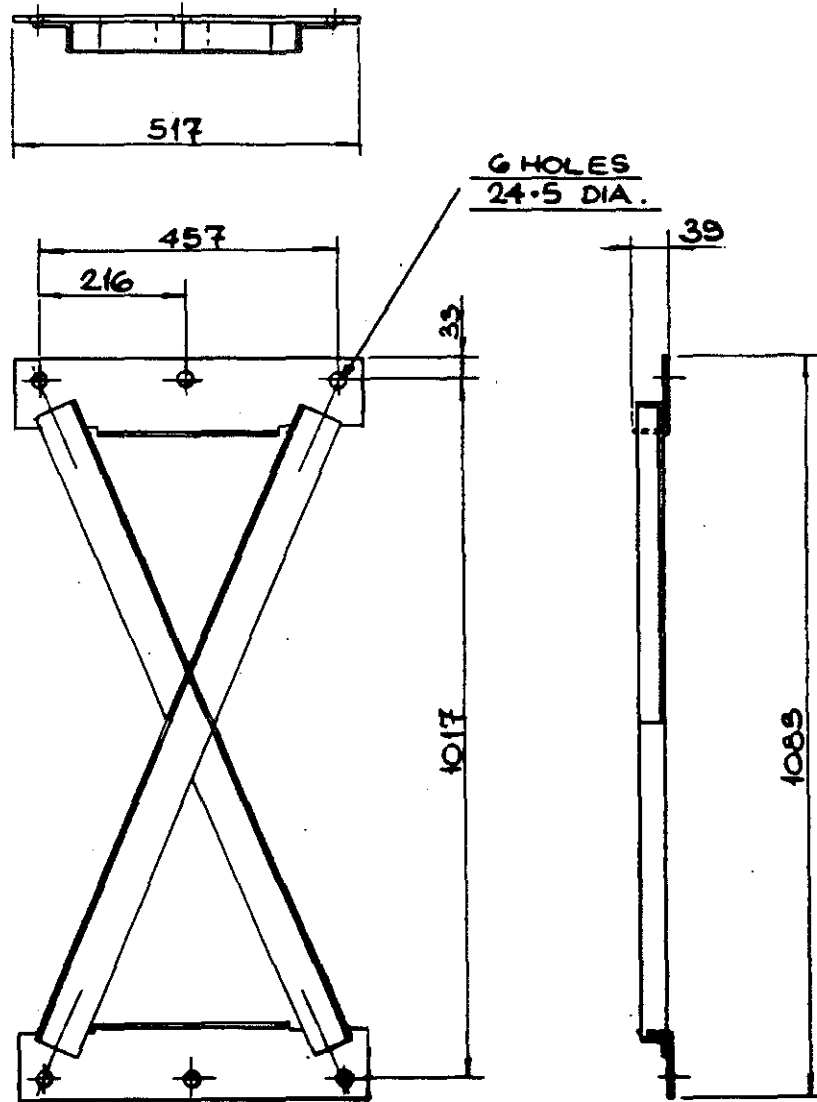
9/86

9	13	221
CA 175		

MC 221

FRAME - VERTICAL - 457

WEIGHT: 13.97 kg.



OVERALL DIMENSIONS: 1083 x 517 x 39

CUBE (M³) 0.218

CHECKED	DATE
SBD	10.9.86



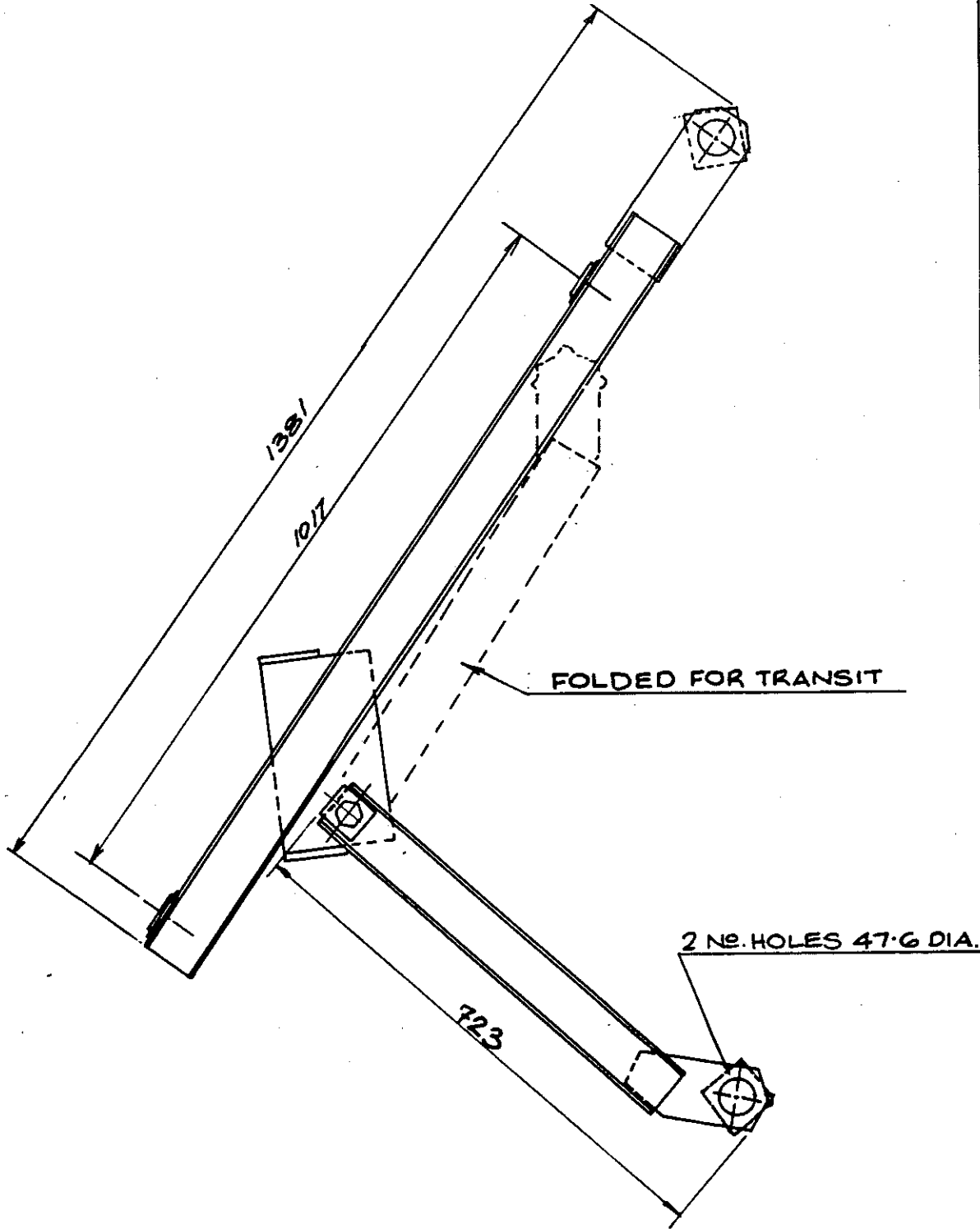
Mebey & Johnson Limited, Floral Mill, Twyford, Reading, RG10 000

2/86

MC 263

FRAME - JACKING
WEIGHT : 38.35 KG.

9	13	263
CE	6	



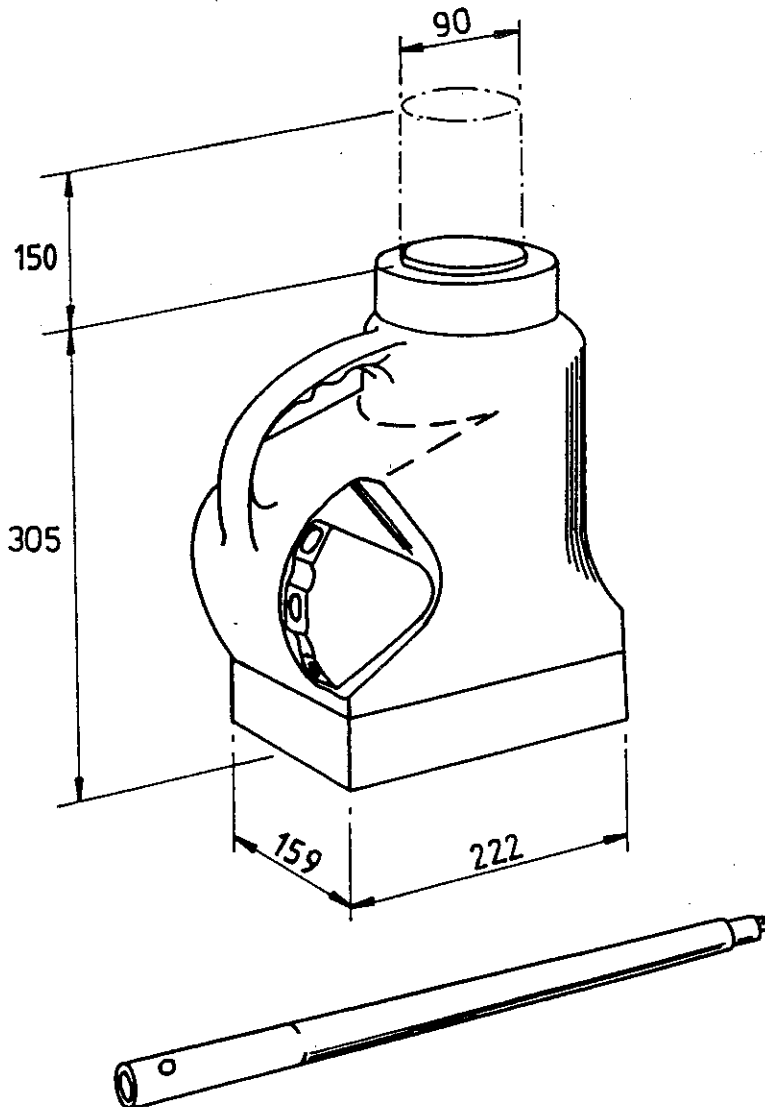
OVERALL DIMENSIONS 1381 x 285 x 120 (WHEN FOLDED FOR TRANSIT)
 CUBE (M³) : 0.0472

CHECKED:	DATE:
SBD	28.4.86



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9BQ

Screwed ram model



Weight : 21.30 kg.

4/80

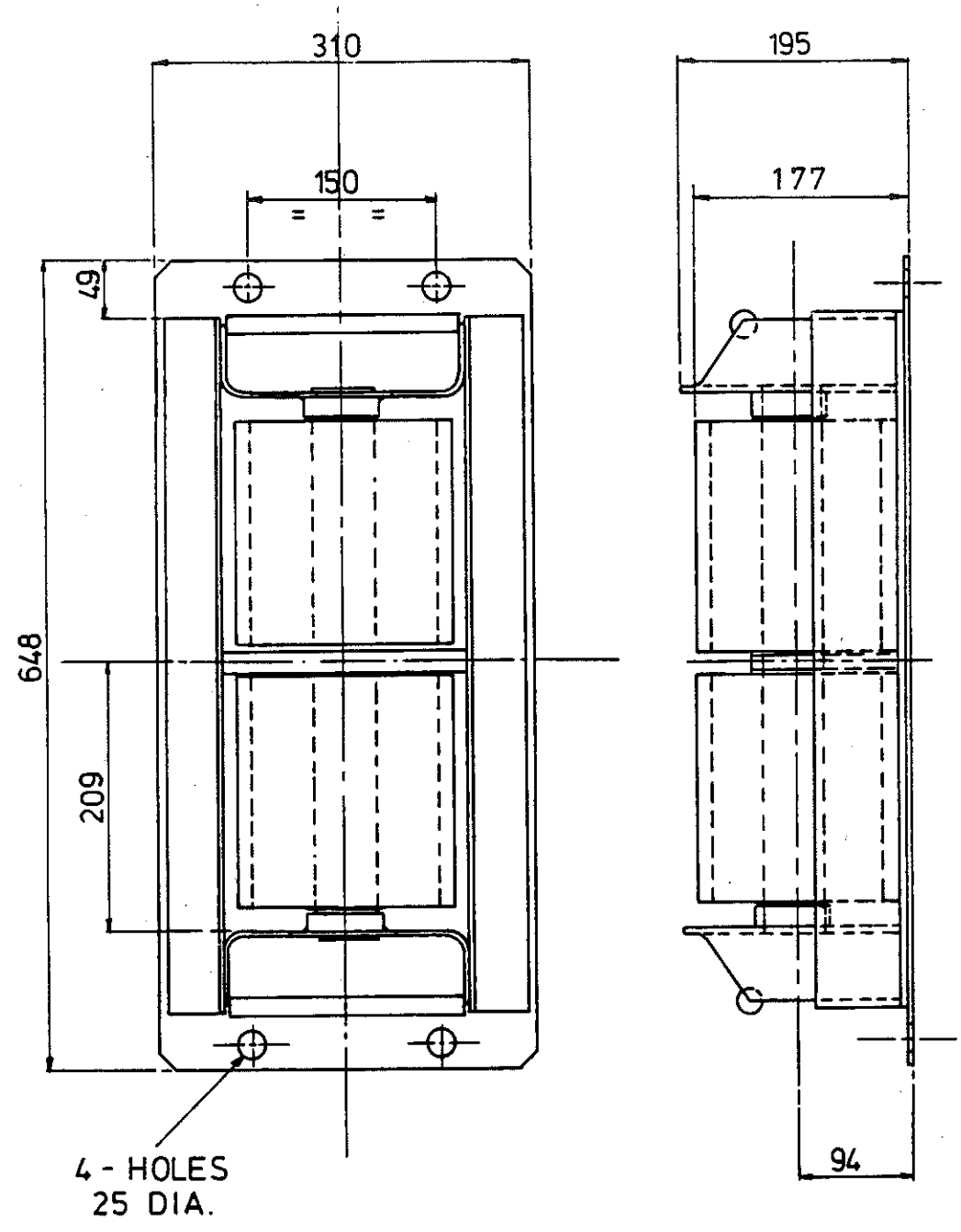
BB 58

2	13	58
---	----	----

BE 39.

PLAIN ROLLER ASSEMBLY

WEIGHT = 50.2 KG.



4 - HOLES
25 DIA.

OVERALL DIMENSIONS = 648 x 310 x 195

CUBE (M³) 0.0391.

DESIGNED BY	DATE
RGH.	25.4.80



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9BQ

JACK HEAD PLATE

CD 119

NLC 9169

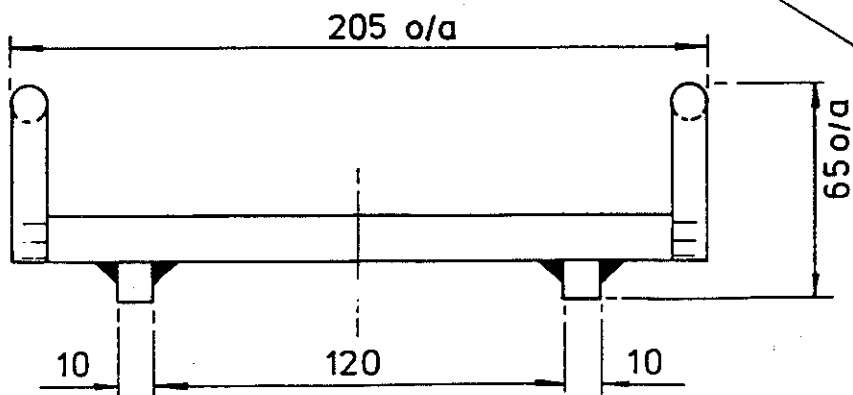
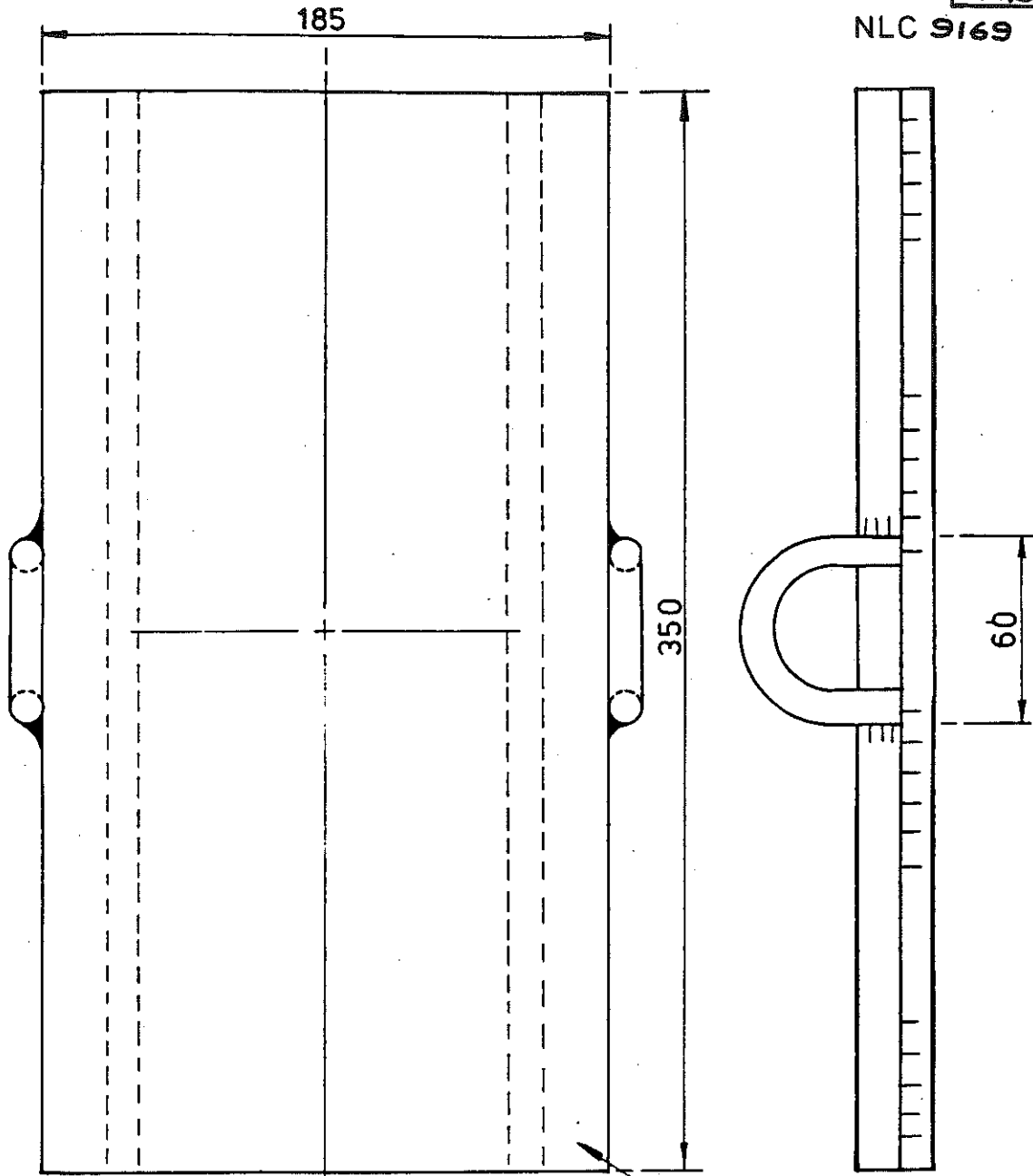


Plate 15 thick

WEIGHT - 8.5 Kg

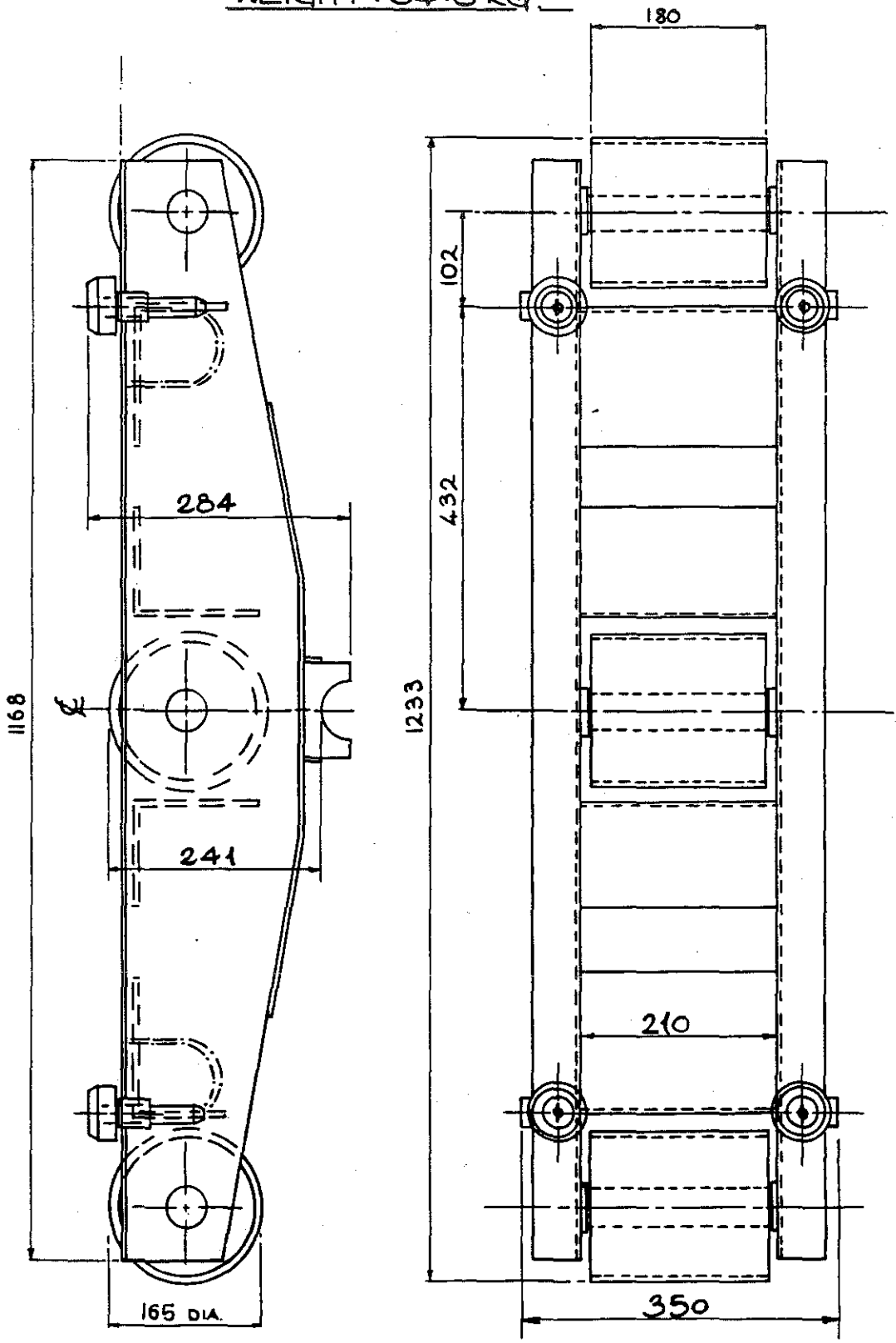


Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

4/86

BB 59
ROCKING ROLLER
WEIGHT : 94.5 KG

2	13	59
BA 299		



OVERALL DIMENSIONS : 1233 x 284 x 350
CUBE (M³) : 0.123

CHECKED	DATE
RJH.	25.4.82



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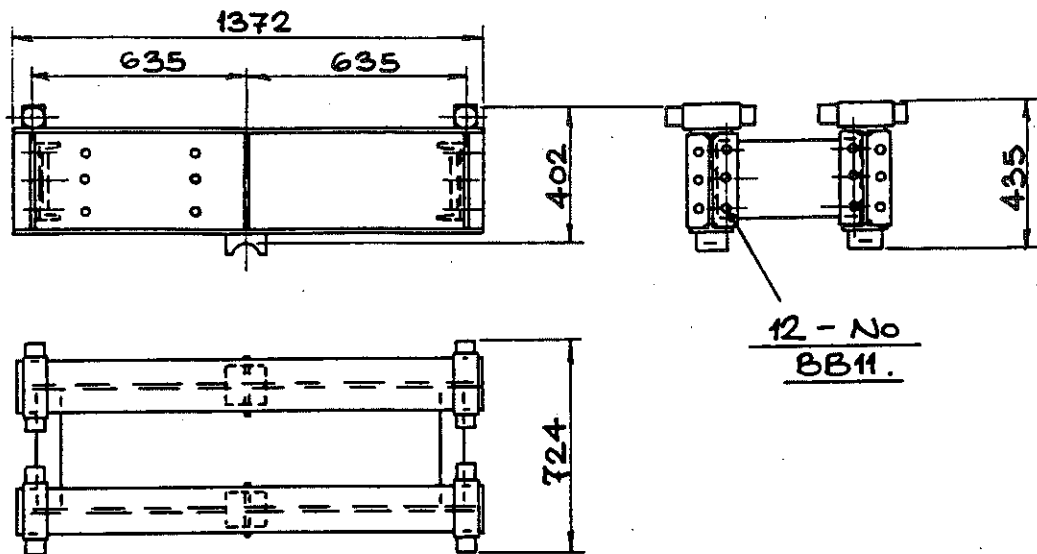
7/90

2	13	1128
BA 833		

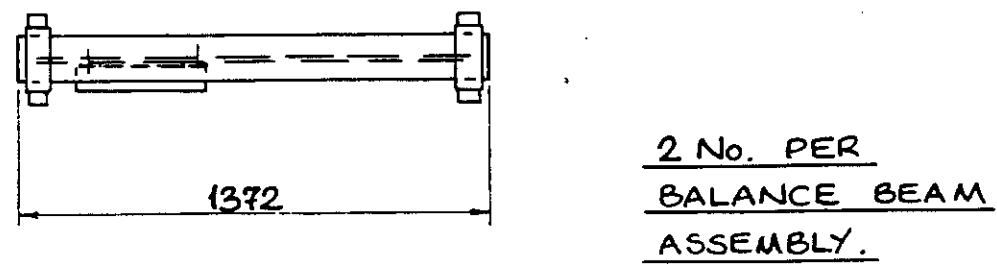
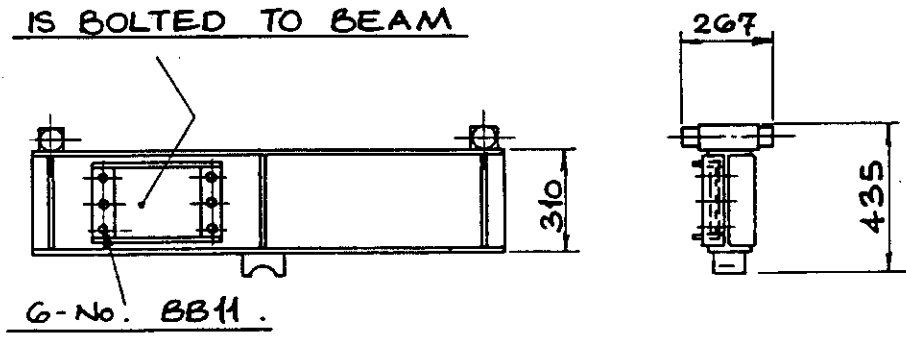
MC 350 (M BB 1128)

BALANCE BEAM ASSEMBLY

WEIGHT: 233 kg.



NOTE: FOR TRANSPORTATION & STORAGE, DIAPHRAGM IS BOLTED TO BEAM



OVERALL DIMENSIONS: 1372 x 435 x 207.

CUBE (M³): 0.159, (EACH).

CHECKED	DATE.
SP.	5/7/90



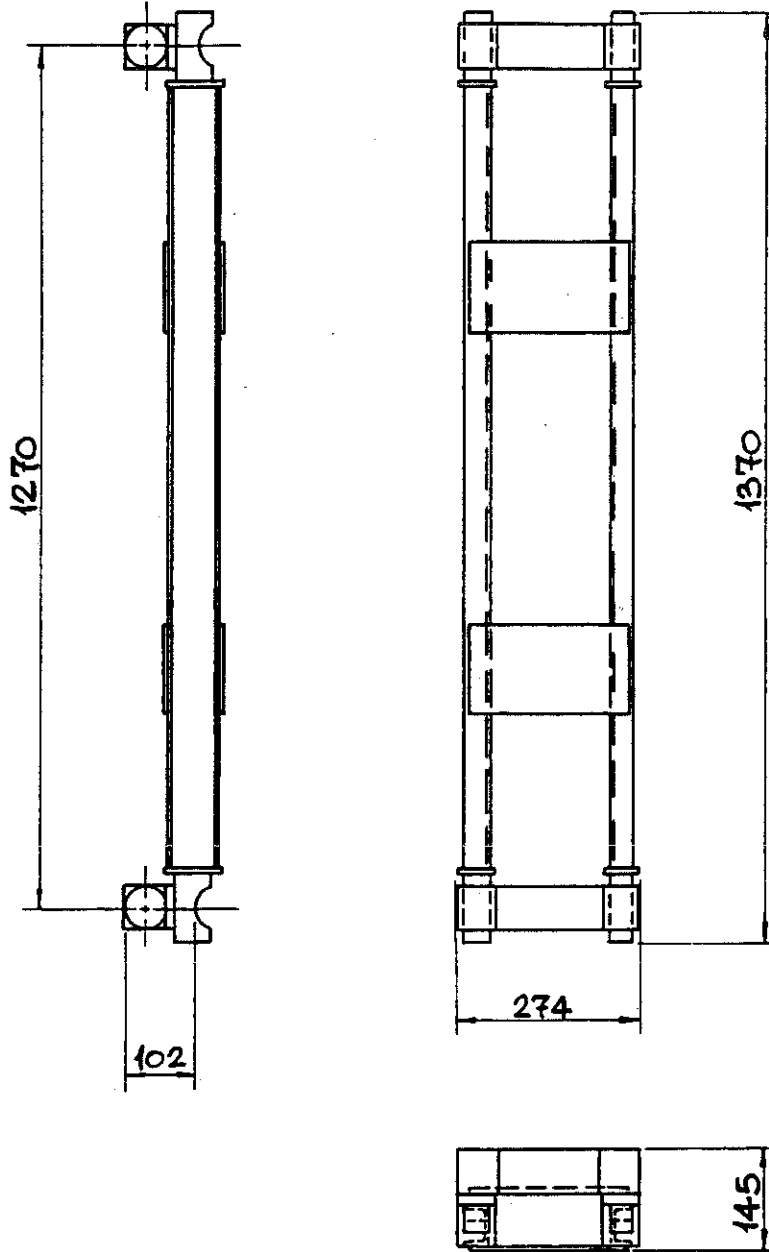
7/90

9	13	351
CE 4.		

MC 351

ADAPTOR - BALANCE BEAM.

WEIGHT: 45.3 kg.



OVERALL DIMENSIONS : 1370 x 274 x 145 .

CUBE (M³) : 0.0544 .

CHECKED	DATE .
STEVE.B.	3-7-90



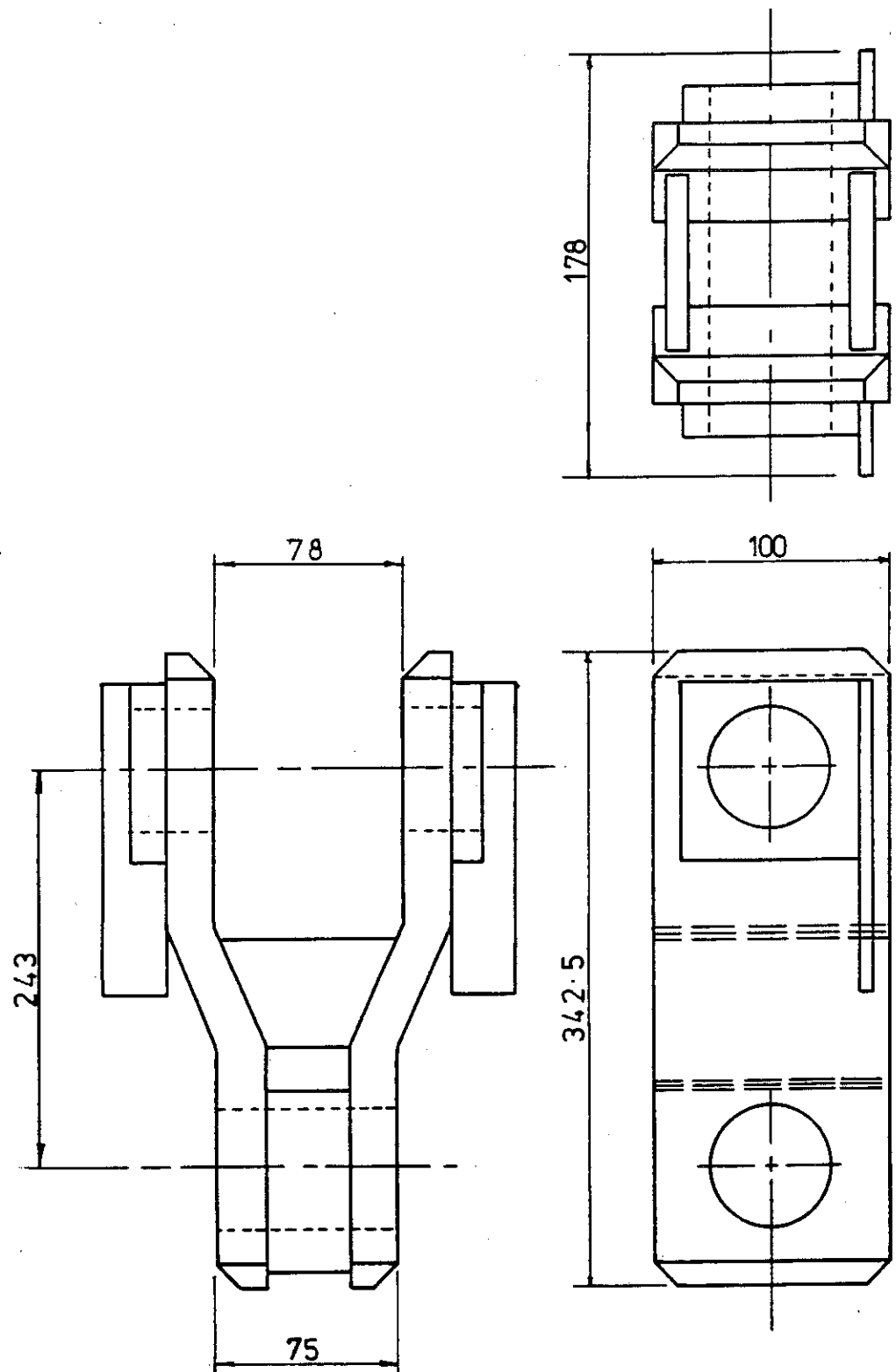
Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

9/88

9 13 66

MC66
LINK - LAUNCHING-200
WEIGHT: 13.29 kg

CA 340



OVERALL DIMENSIONS:- 342.5x178x100
CUBE:- 0.0061 m

Checked:	Date:
D.F.G.	3/10/88



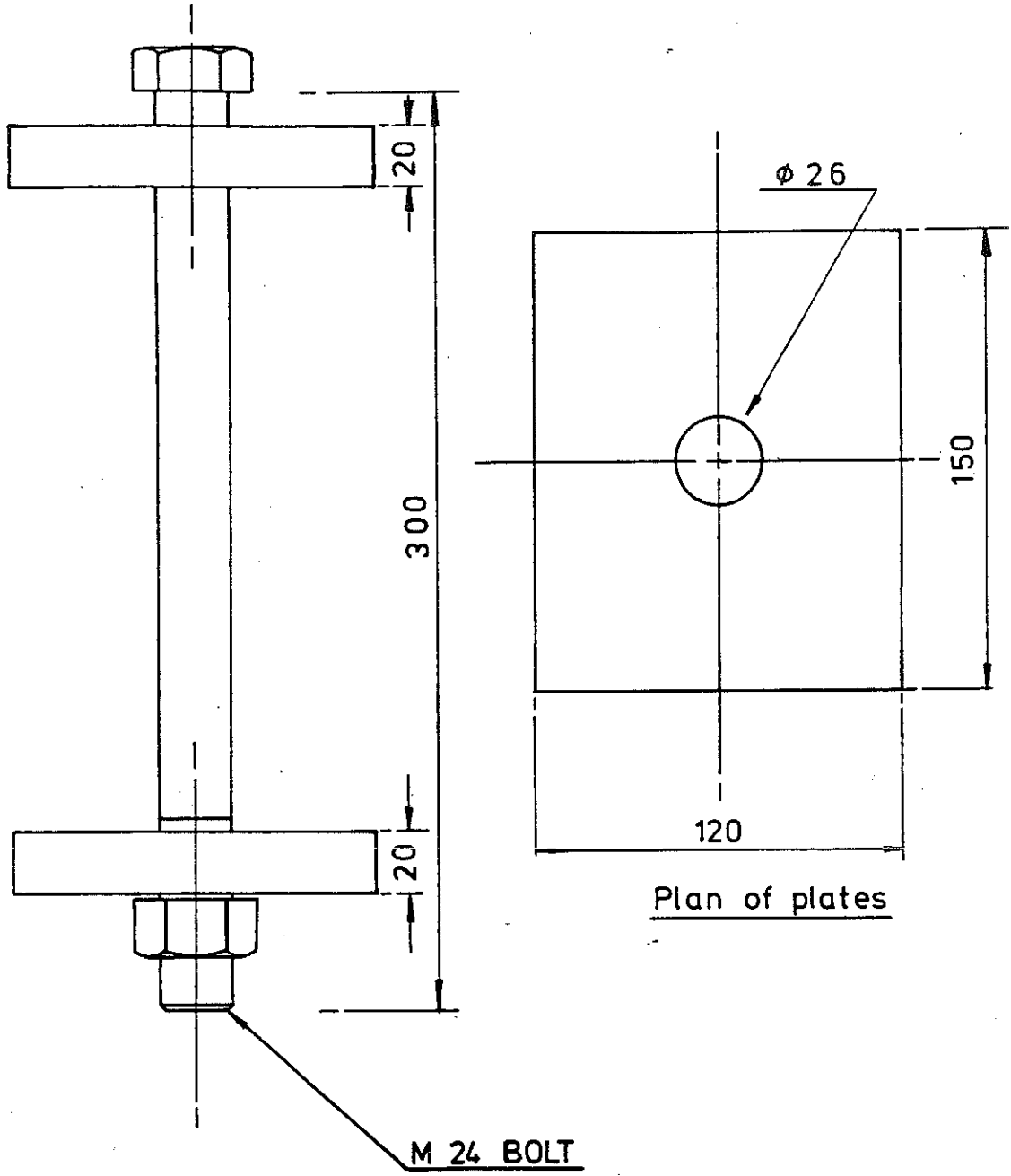
Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

2/
86

9	13	268
CE	2	

MC 268
BOLT-DROP-NOSE ASSEMBLY

Weight :- 6.72 kg



Overall :- 315 x 150 x 120
Cube :- 0.00567 m³

Checked	Date
SB0	20-2-86



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7/90

MC 348

9

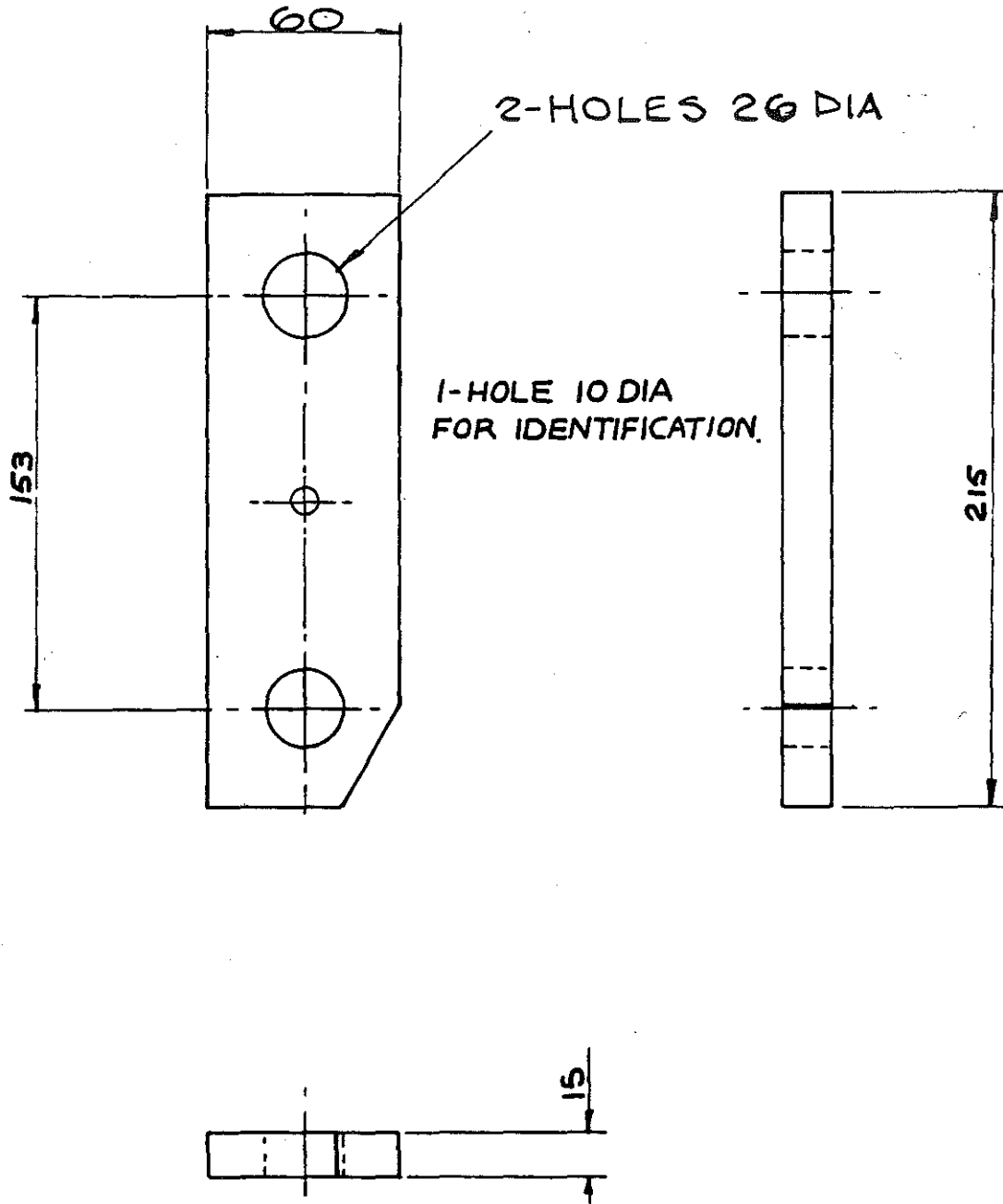
13

348

EXTENSION SWAYBRACE - STD - 200

CA338

WEIGHT:- 1.36 kg



OVERALL DIMENSIONS:- 215 x 60 x 15

CUBE:- 0.00019.

Checked	Date
STEVE. B.	3/7/90



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

7/90

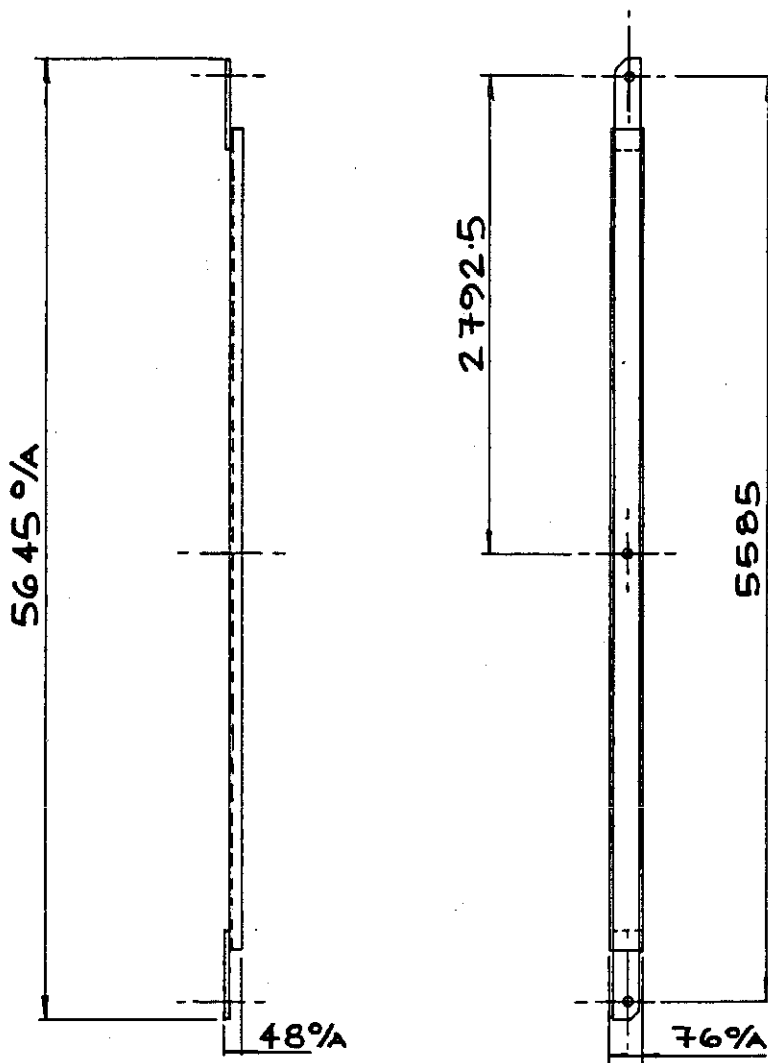
MC 347

9 13 347

CA 337

SWAYBRACE - E.W. - LINK.

WEIGHT: 37.52 Kg.



OVERALL DIMENSIONS: 5645 x 76 x 48

CUBE (M³): 0.0206

Checked
STEVE.B

Date
3/7/90



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8/88

NLC8043

9 13 8043

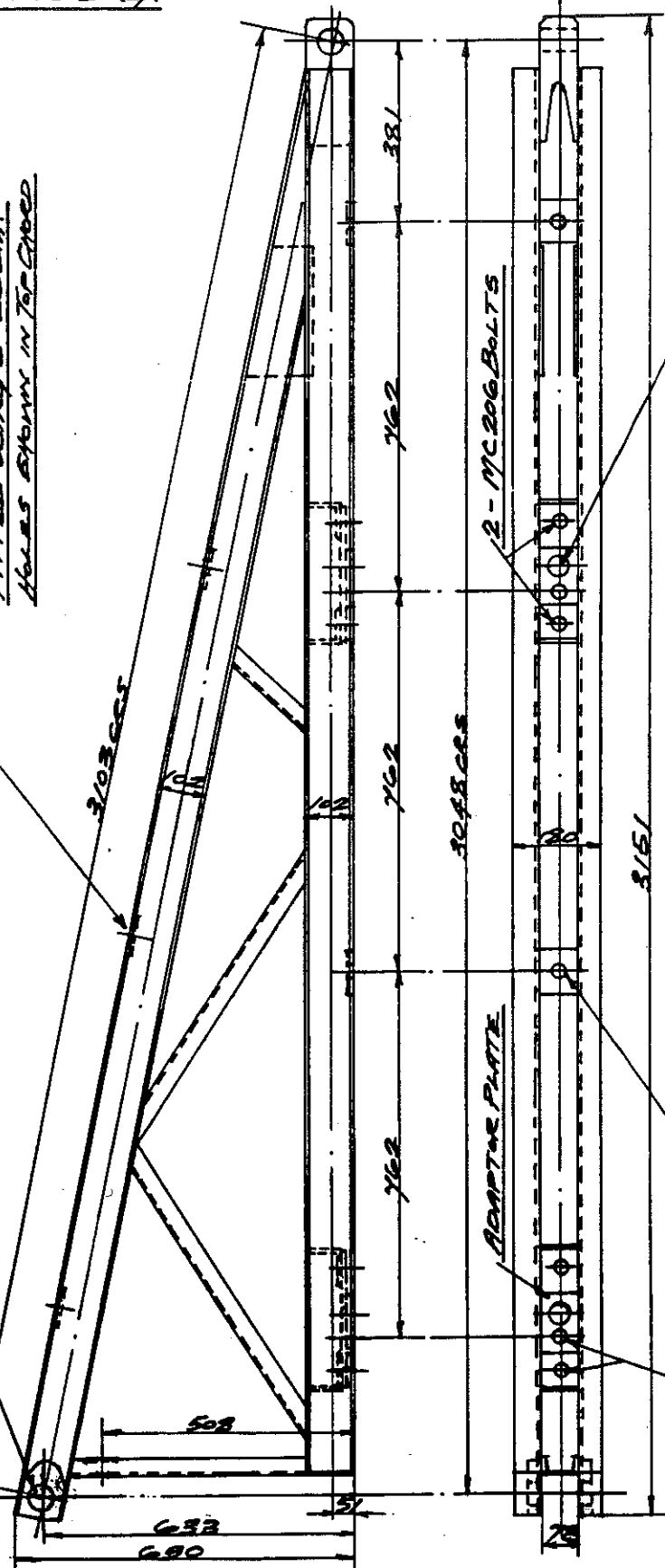
LAUNCHING FRAME - TOP-200 COMPACT

CD62

WEIGHT = 186 KG.

NOTE:- ON DOUBLE CONSTRUCTION
A BRACING FRAME CAN BE
FITTED USING 8-26 DIA.
POLES STAINY IN TOP CHORD

2-HOLES 97.6 DIA.



2-16 DIA. POLES

PLAN ON UNDERSIDE OF FRAME

NOTE:- THE ADAPTIVE PLATE IS SHOWN IN POSITION
TO RECEIVE A COMPACT BAILEY PANEL. REMOVE
MC 206 BOLTS & REVERSE ADAPTIVE PLATE TO
PERMIT BAILEY PANEL TO BE FITTED & REPLACE BOLTS.

OVERALL DIMENSIONS :- 3151 x 690 x 80. CURB :- 0.39 M3

Checked	Date
RGH.	15.8.88



7/85

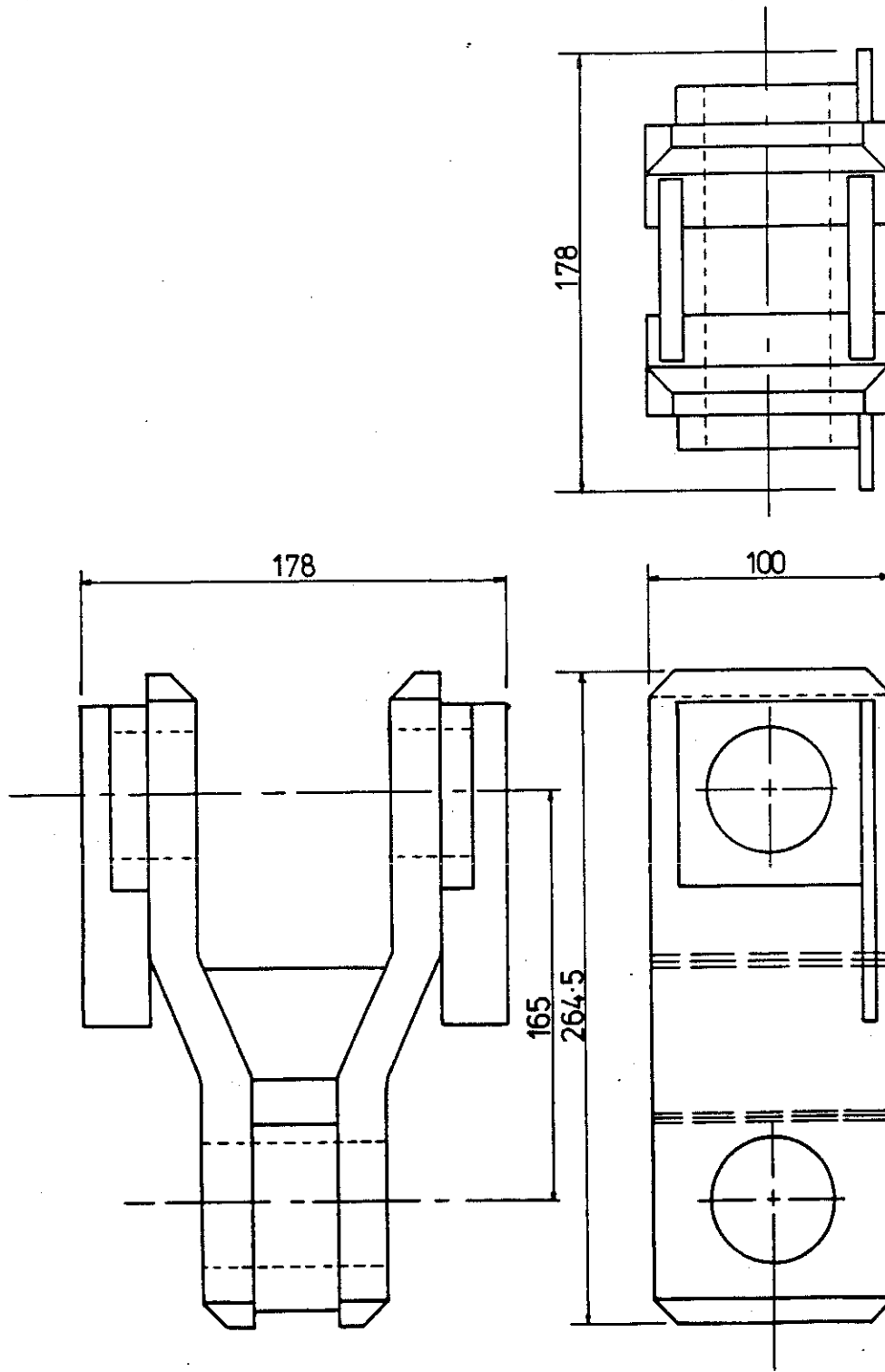
9

13

65

MC 65
LINK - LAUNCHING
WEIGHT: 10.2 kg

CA145



OVERALL DIMENSIONS : 264.5 x 178 x 100

CUBE : 0.00471 m³

Checked:

MJM.

Date:

31.7.85



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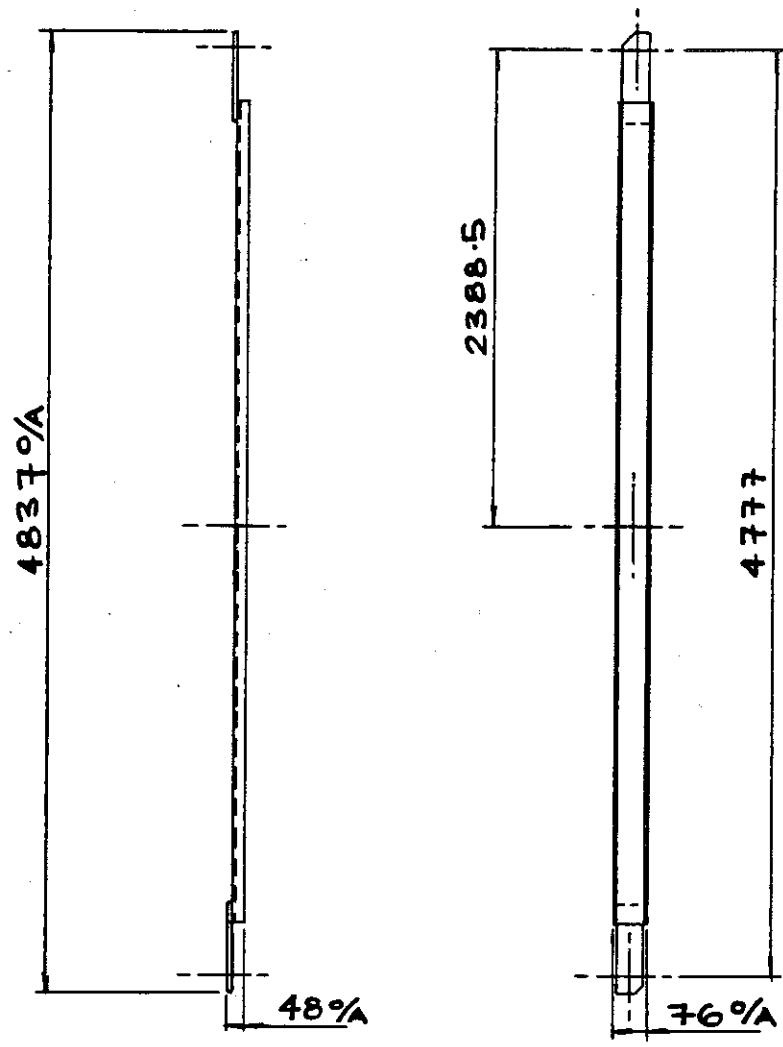
7/90

MC 346

9	13	346
CA 336		

SWAYBRACE - STD - LINK

WEIGHT : 32.00 Kg.



OVERALL DIMENSIONS: 4837 x 48 x 76

CUBE (M³): 0.0176

Checked	Date
STEVE.B	3/7/90



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

7/90

MC 349

9

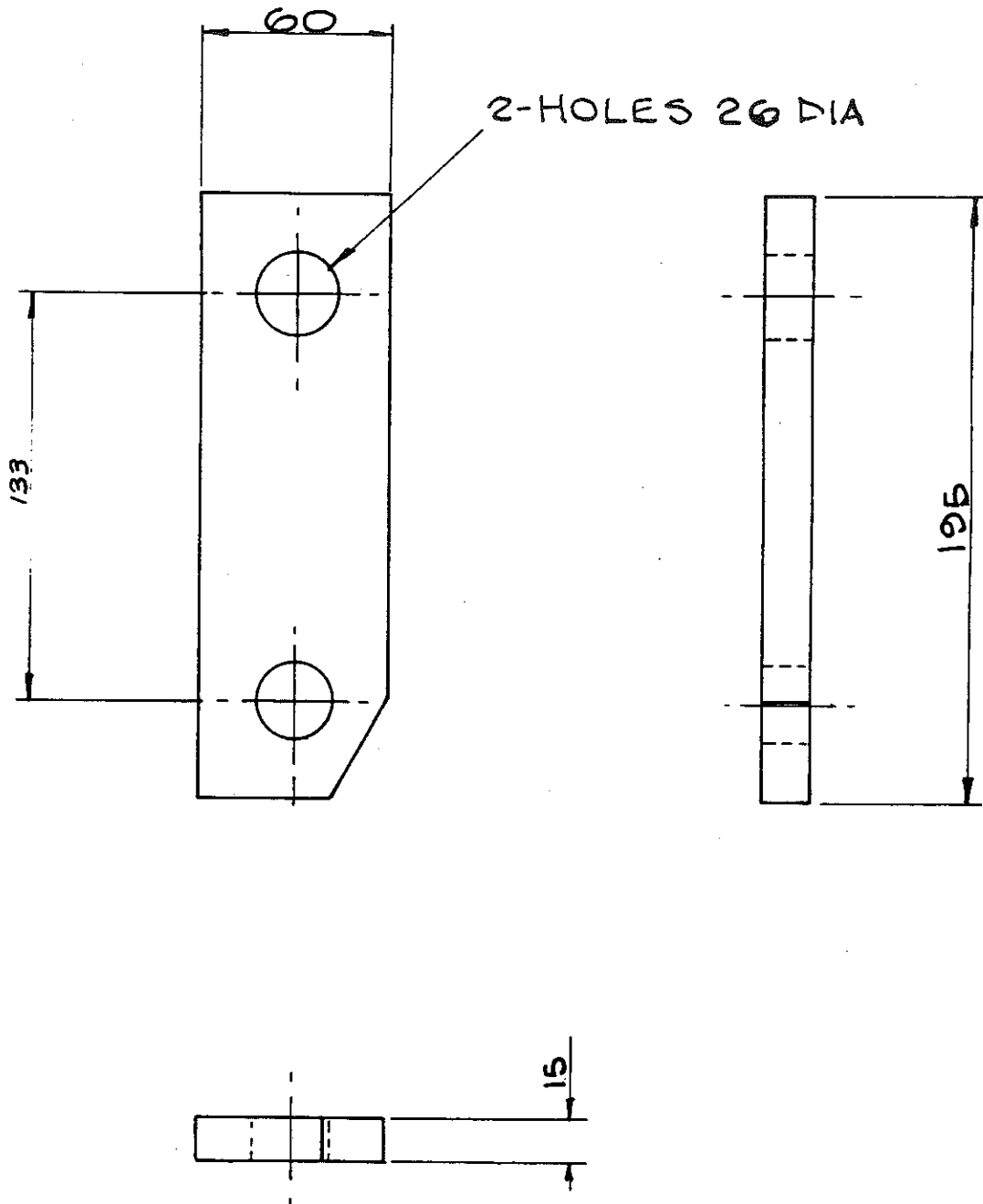
13

349

EXTENSION SWAYBRACE - E.W & 2 LANE - 200

CA 339

WEIGHT:- 1.21 kg



OVERALL DIMENSIONS:- 195 x 60 x 15
CUBE:- 0.00018

Checked	Date
STEVE. B.	3/7/90



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MABCV



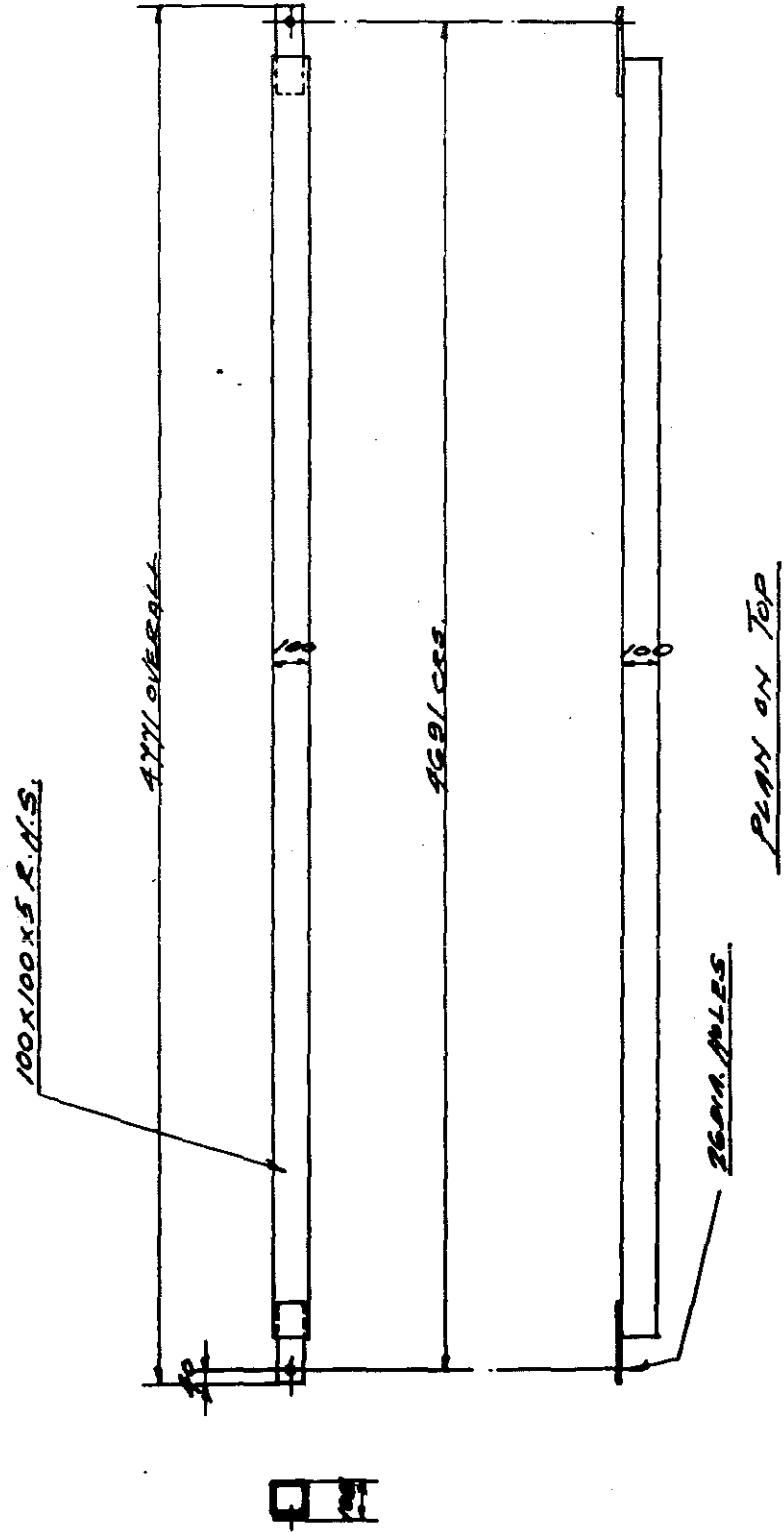
8/88

E.W. DIAGONAL BRACE - 200

9 13 8044

NLC 8044 WEIGHT = 69 KG.

CD 67



OVERALL DIMENSIONS:- 477/ x 108 x 100 CUBE:- 0.052 M³

CHECKED	DATE
RGH.	15.8.88



8/85

E.W. HORIZONTAL BRACE - TOP - 200

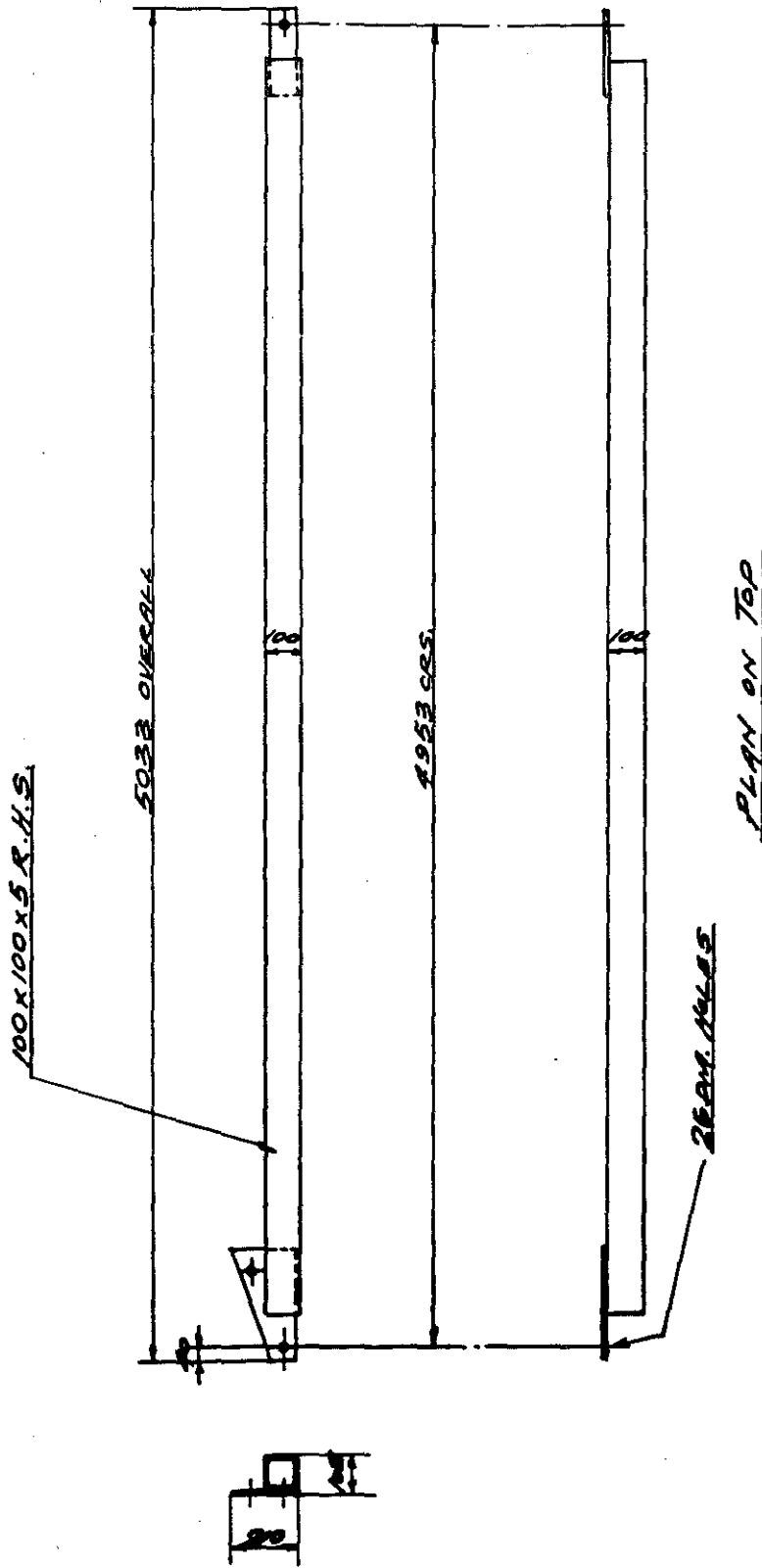
9

13

8045

NLC 8045 WEIGHT = 74 KG.

CD 68



Overall Dimensions:- 5033x210x108 CURB:- 0.119 M³

CHECKED	DATE
R.F.H.	15.8.88



8/88

E.W. HORIZONTAL BRACE - BOTTOM - 200

9

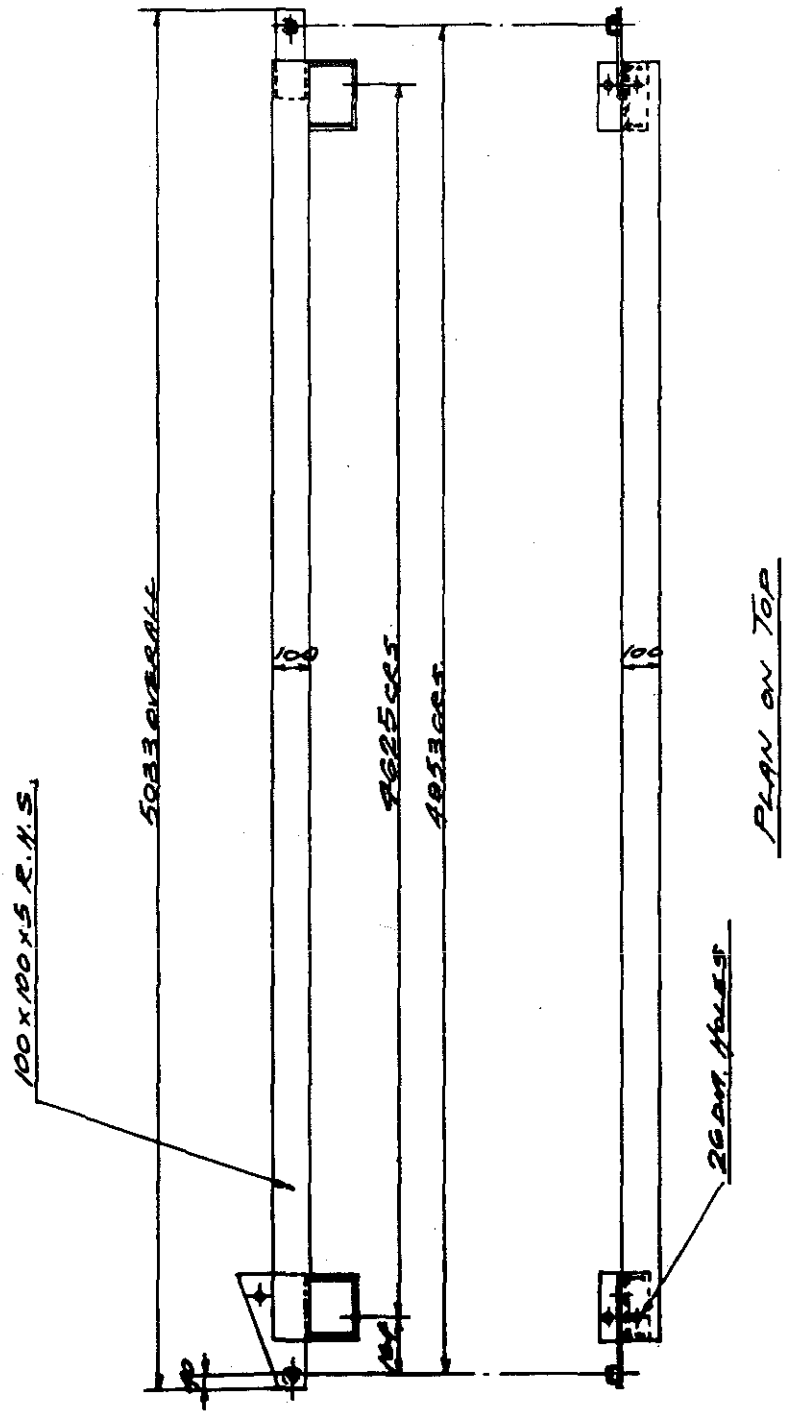
13

8046

NLC 8046

HEIGHT = 82 KG.

CD 69



PLAN ON TOP

OVERALL DIMENSIONS :- 5033 X 350 X 159 CUBE :- 0.28 M³



Checked	Date
RCH	15.8.88



Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 8BQ

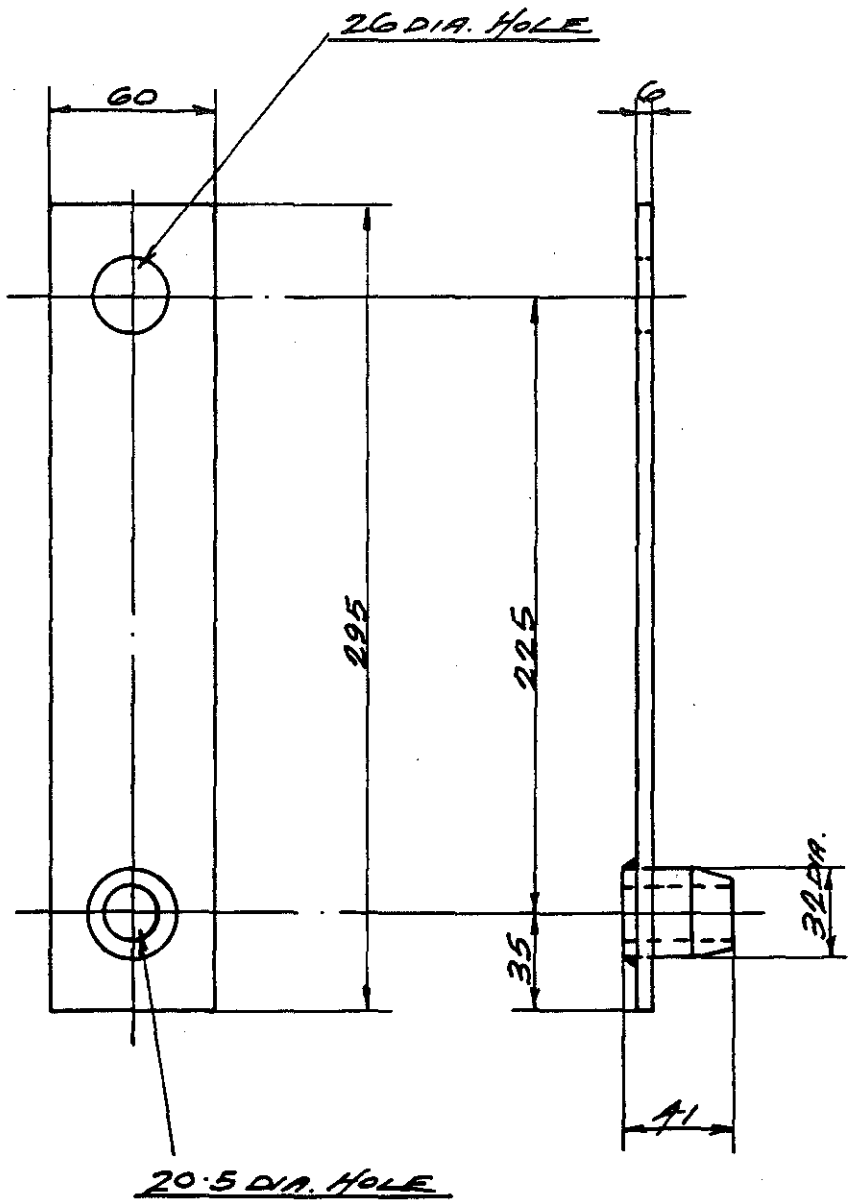
8/88

LOCATING PLATE-NLC8047

9 13 8047

WEIGHT = 1 KG.

CD70



NOTE:- THIS PART IS ONLY USED
WHEN BAILEY PANELS
ARE IN THE LAUNCHING
NOSE ON COMPACT RCD

CHECKED	DATE
RGH.	15.8.88



Mabey & Johnson Limited, Floral Mills, Twyford, Reading, RG10 6BQ

8/88

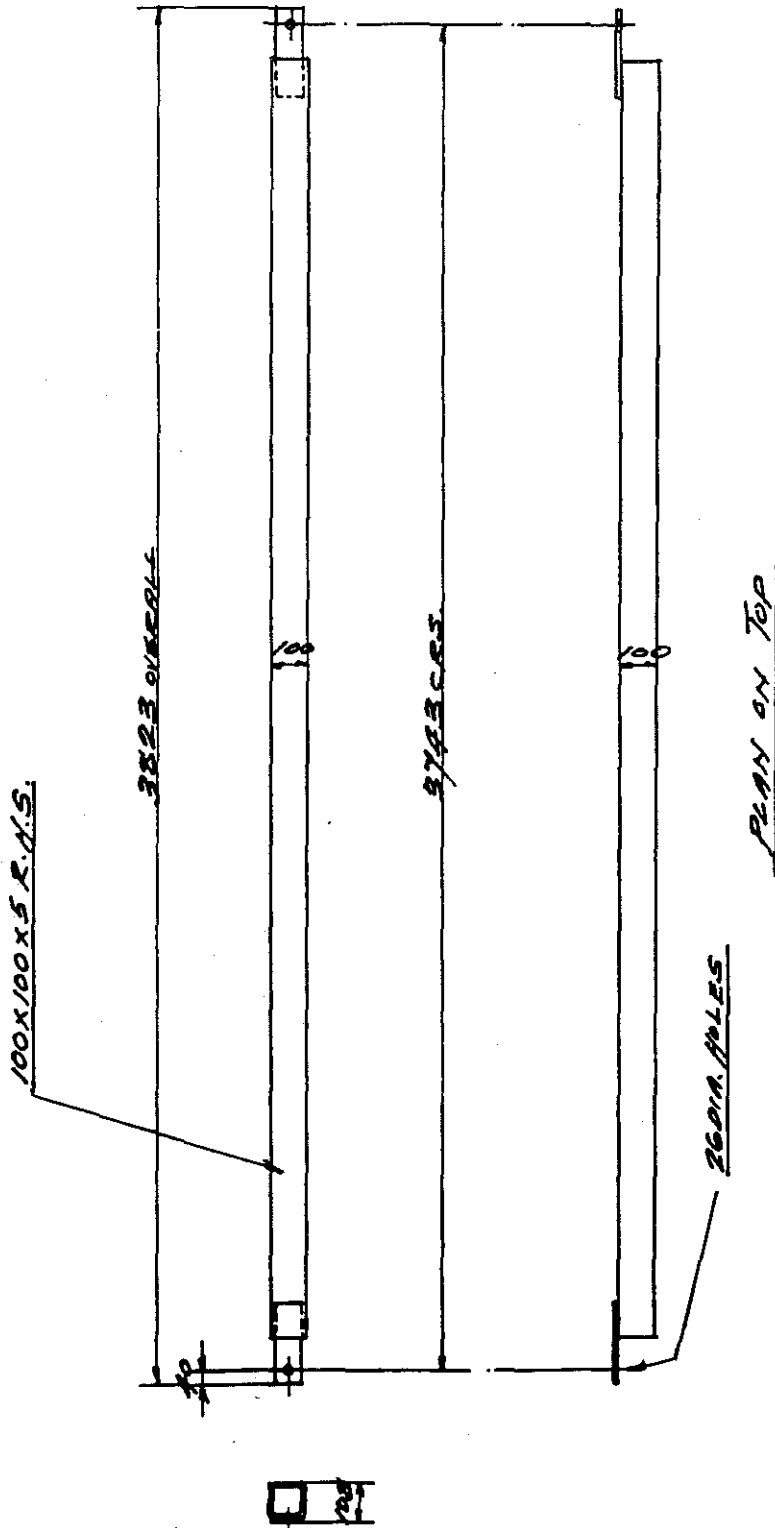
STD. DIAGONAL BRACE - 200

9 13 8048

NLC 8048

WEIGHT = 55 KG.

CD 71



OVERALL DIMENSIONS:- 3823 X 108 X 100 CUBE:- 0.09 M³

CHECKED	DATE
R.G.H.	15.8.88

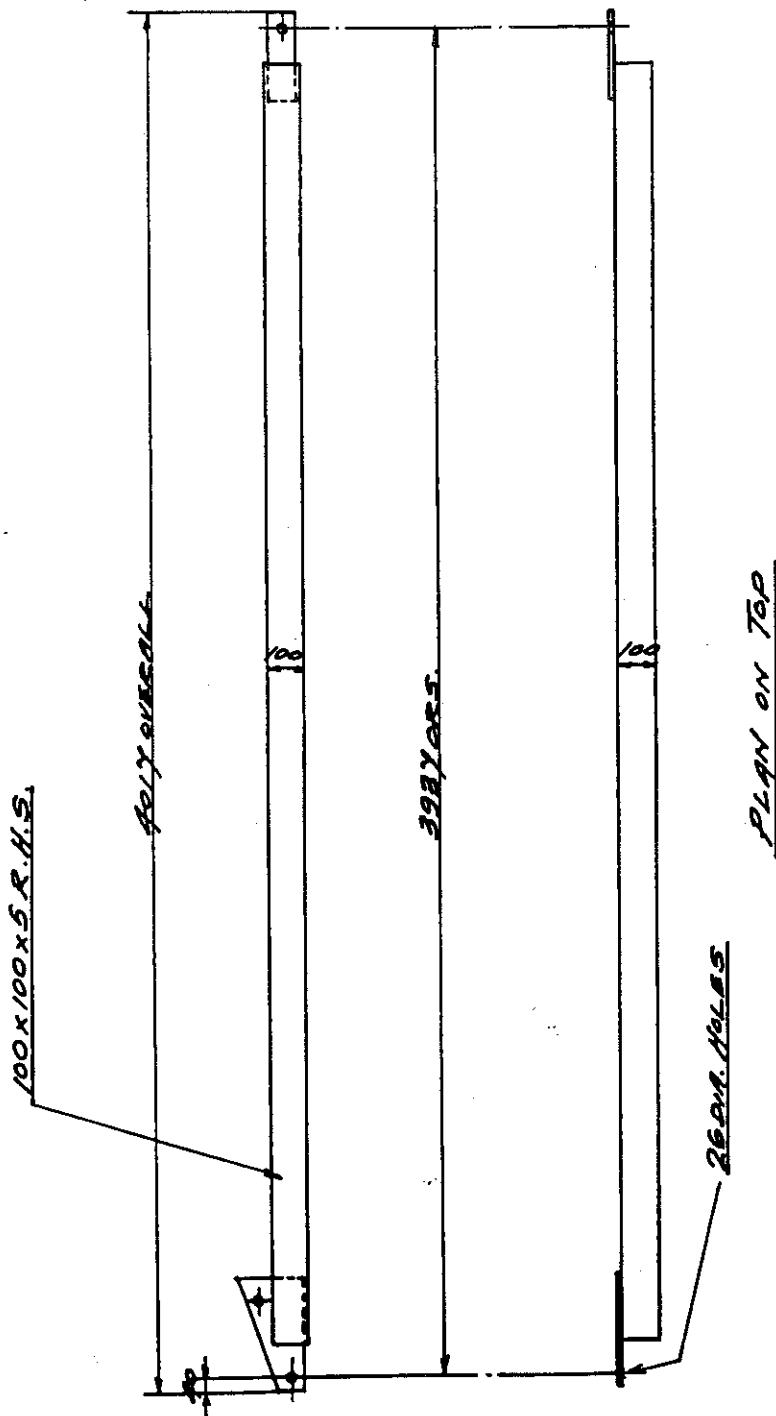


8/88

STD. HORIZONTAL BRACE - TOP - 200

NLC 8049 WEIGHT = 60KG.

9	13	8049
CD 72		



OVERALL DIMENSIONS:- 4017 X 210 X 103 CUBE:- 0.09 M³

CHECKED	DATE
RGH.	15.8.88



MABCV

S E C T I O N 5

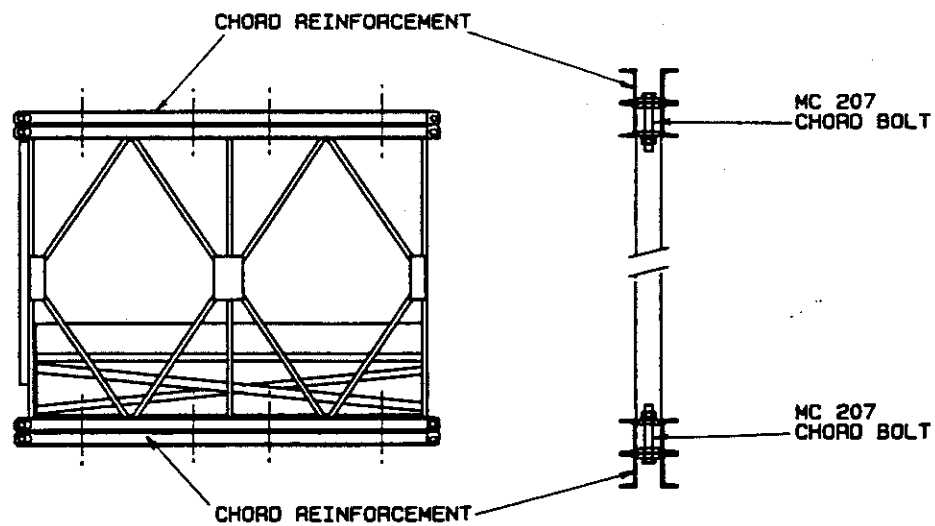
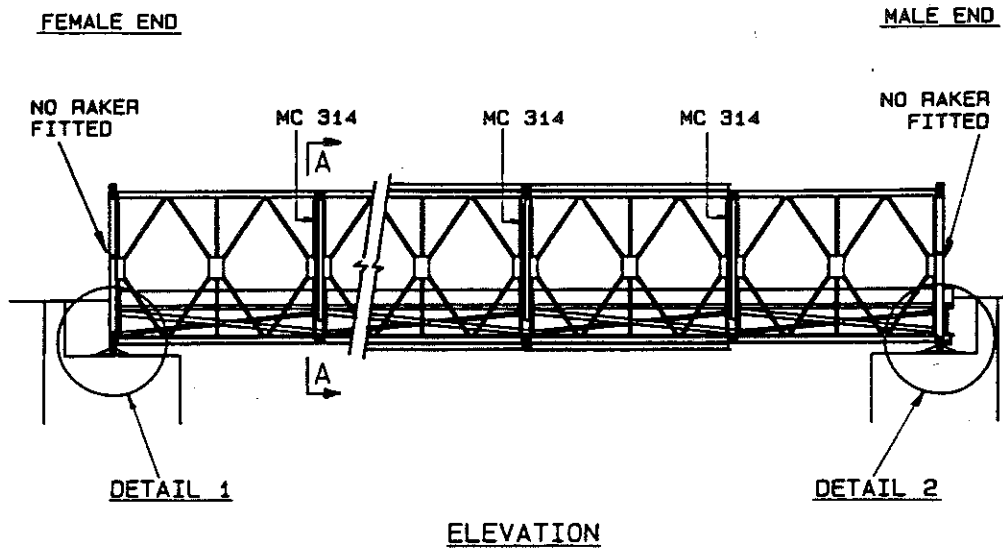
A S S E M B L Y

D E T A I L S

ASSEMBLY DETAILS

MARBGV

SINGLE TRUSS CONSTRUCTIONS

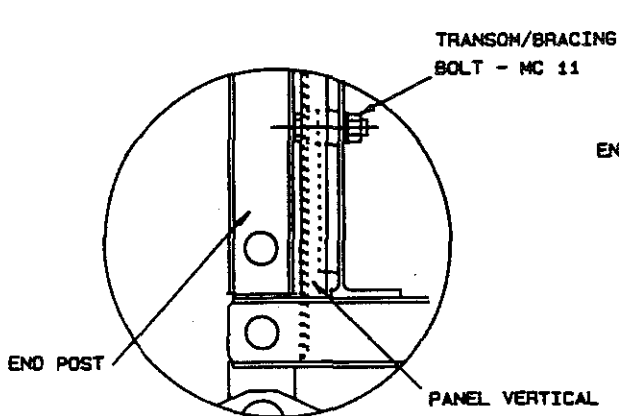


CHORD REINFORCEMENTS

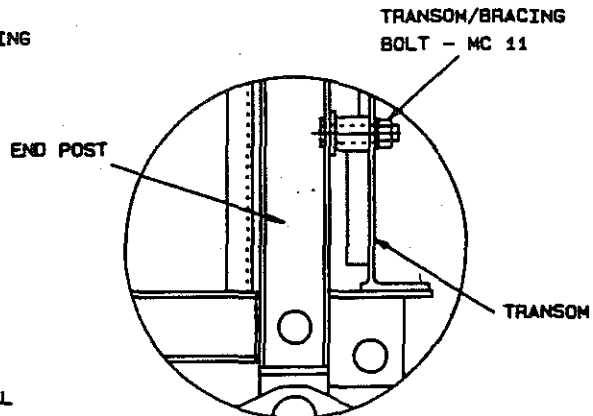
ASSEMBLY DETAILS

SINGLE TRUSS CONSTRUCTIONS

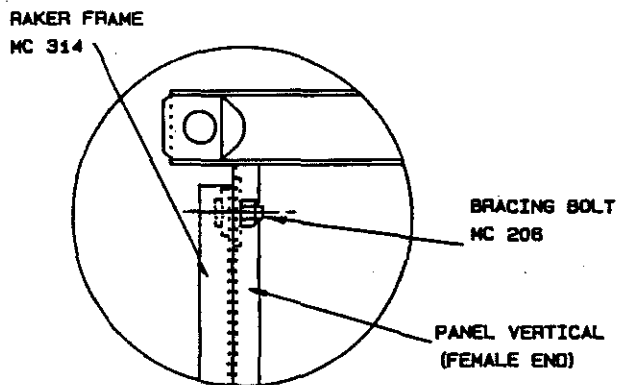
TRUSS BRACING DETAILS



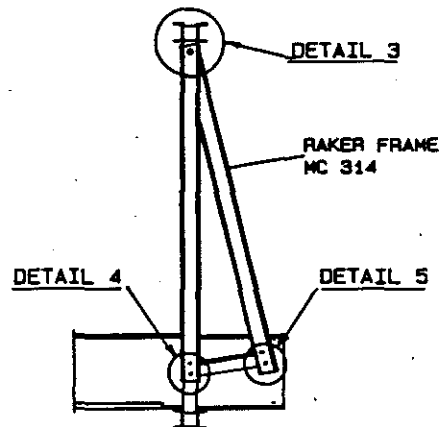
DETAIL 1
FEMALE END OF BRIDGE



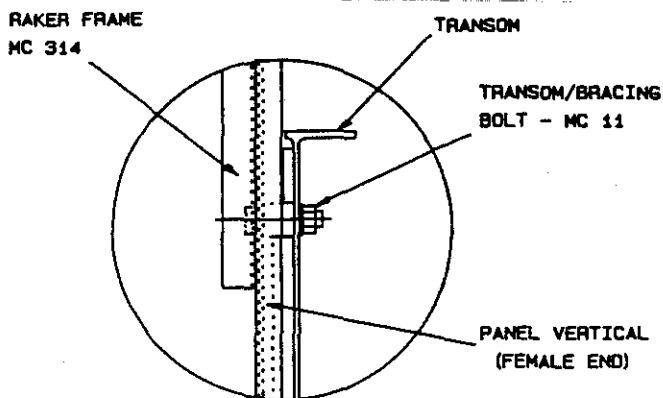
DETAIL 2
MALE END OF BRIDGE



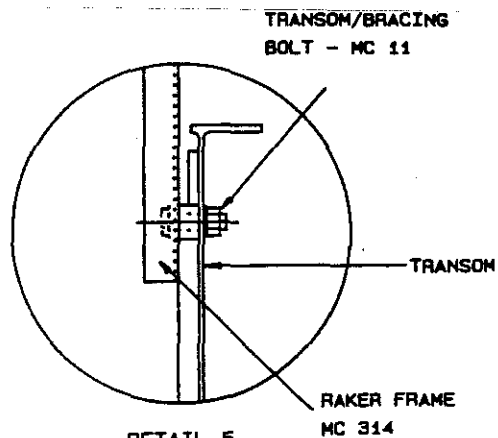
DETAIL 3
RAKER TO PANEL



TYPICAL SECTION A-A



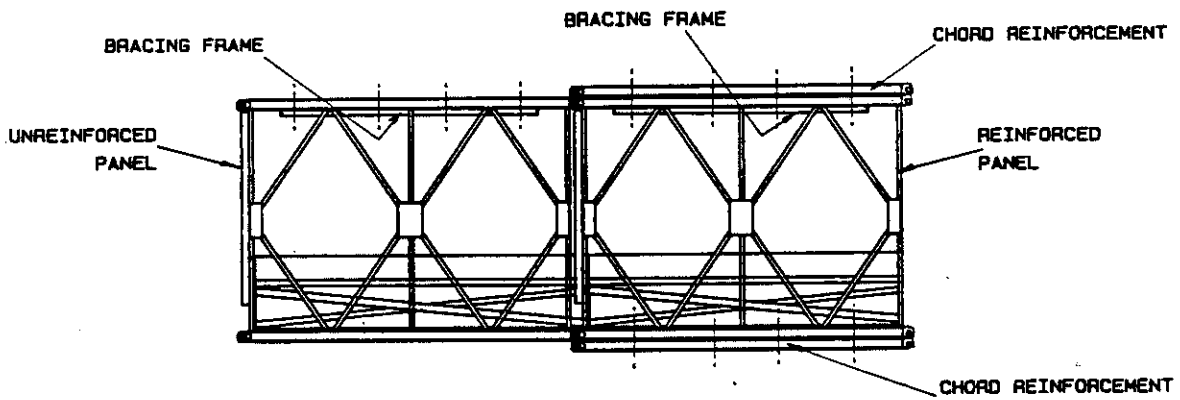
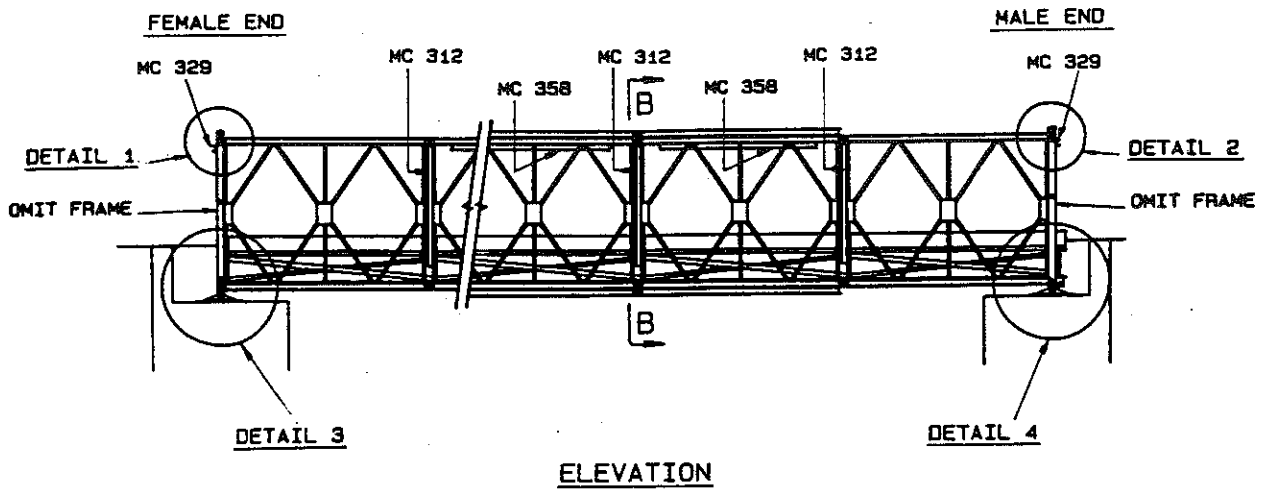
DETAIL 4
RAKER & TRANSOM TO PANEL



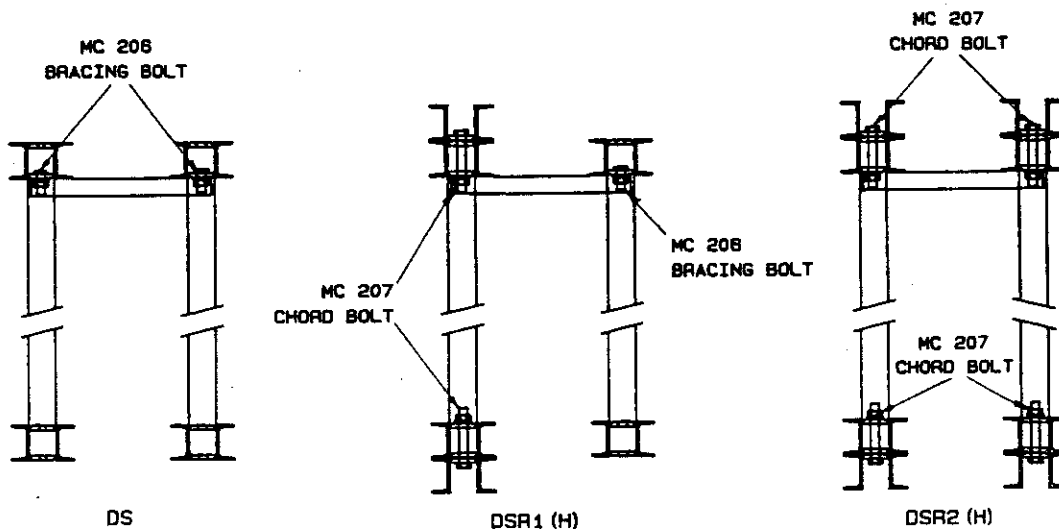
DETAIL 5
RAKER TO TRANSOM

ASSEMBLY DETAILS

DOUBLE TRUSS CONSTRUCTIONS



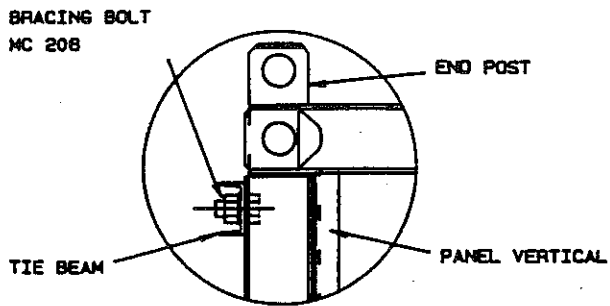
CHORD REINFORCEMENTS & BRACING FRAMES
(FITTED TO INTERMEDIATE BAYS ONLY)



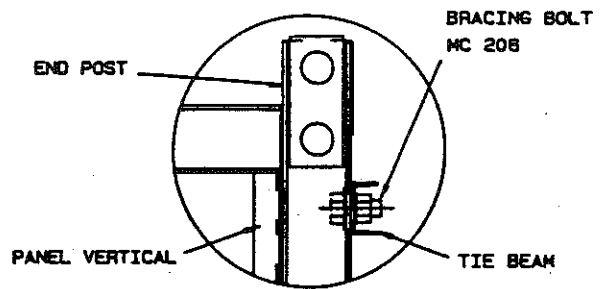
ASSEMBLY DETAILS

DOUBLE TRUSS CONSTRUCTIONS

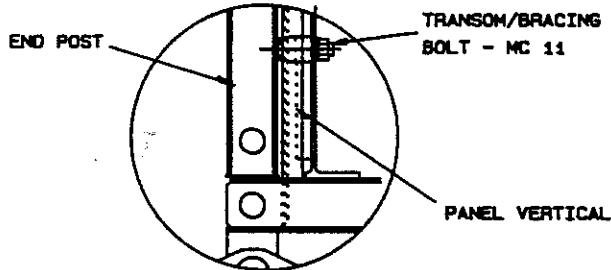
TRUSS BRACING DETAILS



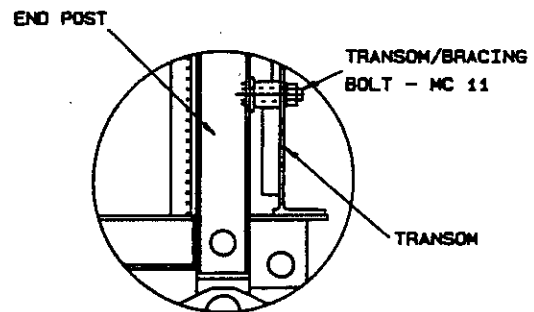
DETAIL 1
E.O.B TIE BEAM TO END POST
(FEMALE END)



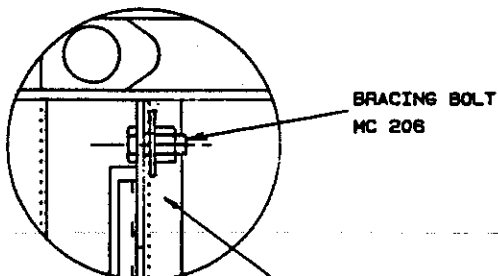
DETAIL 2
E.O.B TIE BEAM TO END POST
(MALE END)



DETAIL 3
FEMALE END OF BRIDGE

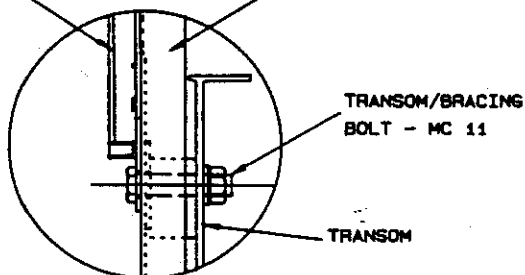


DETAIL 4
MALE END OF BRIDGE

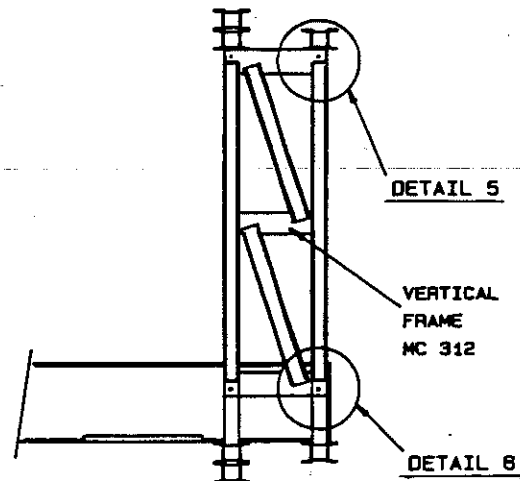


DETAIL 5

VERTICAL FRAME
MC 312



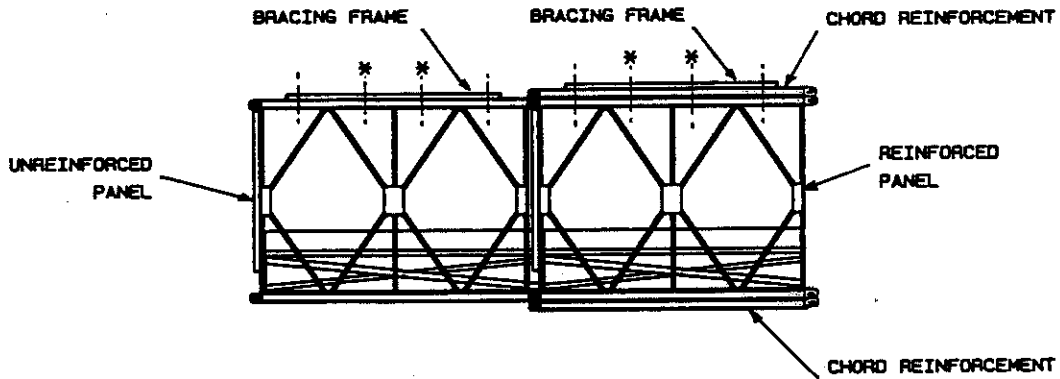
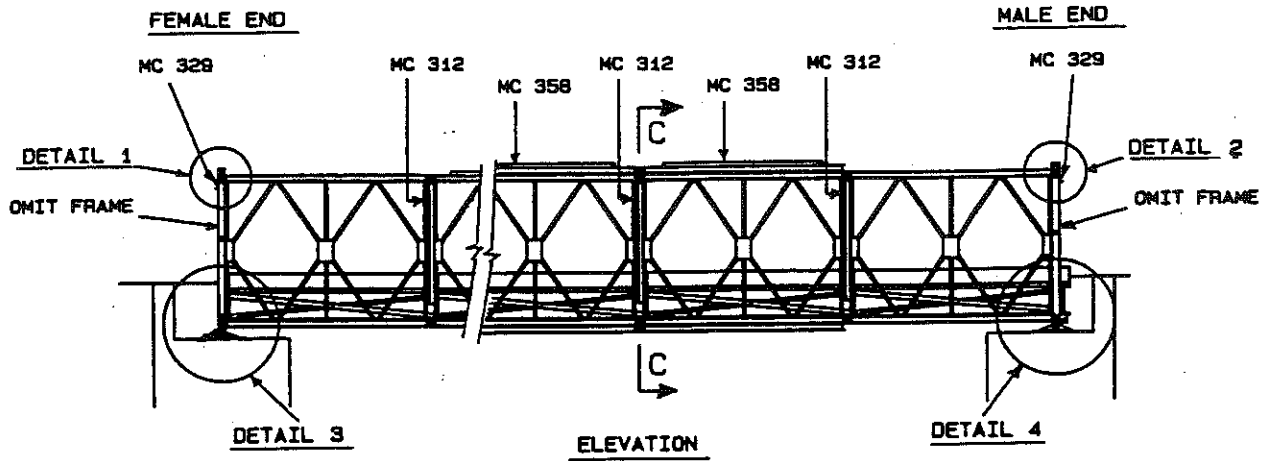
DETAIL 6



TYPICAL SECTION B-B

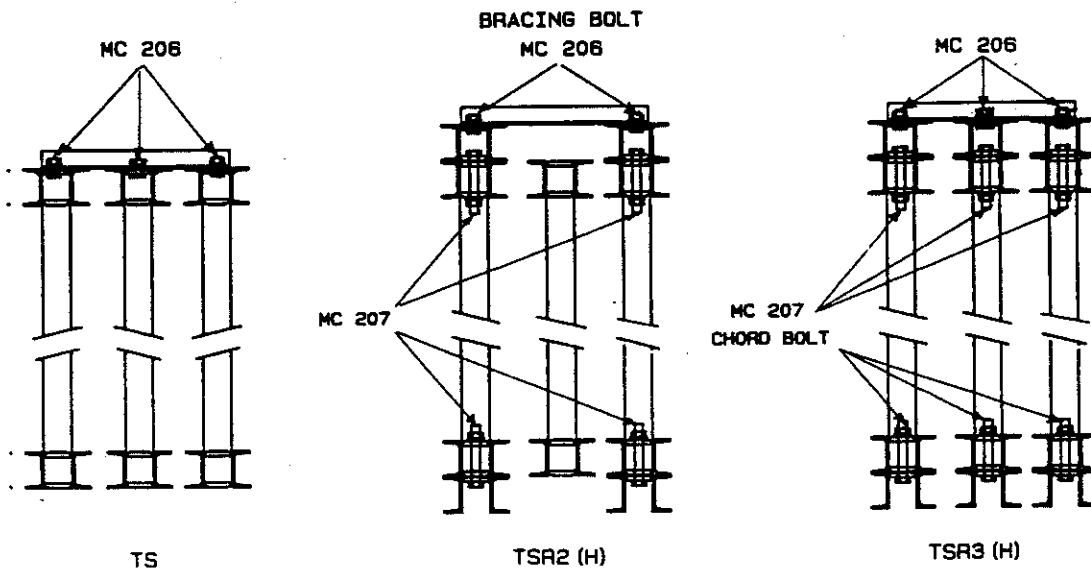
ASSEMBLY DETAILS

TRIPLE TRUSS CONSTRUCTIONS



CHORD REINFORCEMENTS & BRACING FRAMES
(FITTED TO INTERMEDIATE BAYS ONLY)

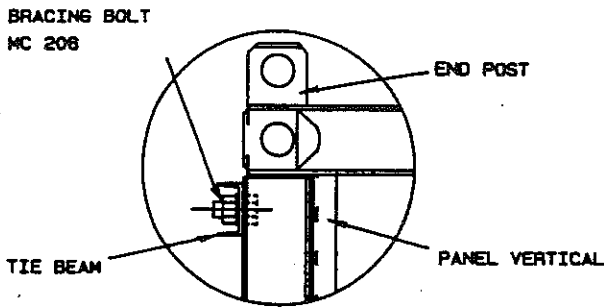
NOTE : BRACING FRAMES ARE CONNECTED TO THE INTERNAL PANELS OF TS & TSR3 (H) CONSTRUCTIONS AT THE TWO CENTRAL POSITIONS ONLY, MARKED THUS *



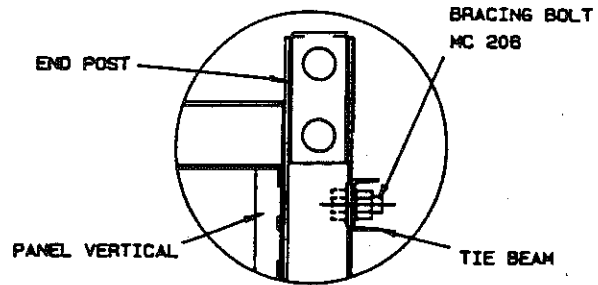
ASSEMBLY DETAILS

TRIPLE TRUSS CONSTRUCTIONS

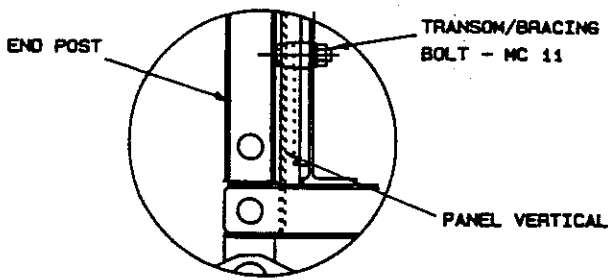
TRUSS BRACING DETAILS



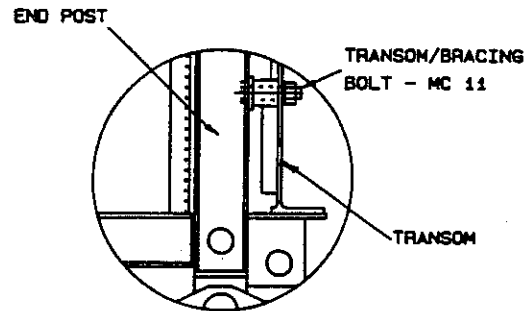
DETAIL 1
E.O.B TIE BEAM TO END POST
(FEMALE END)



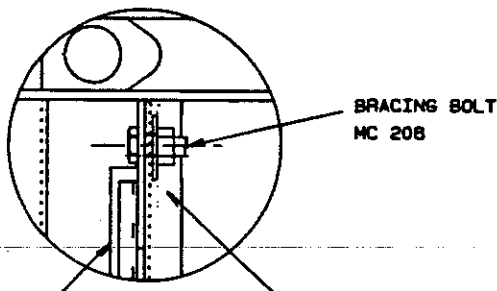
DETAIL 2
E.O.B TIE BEAM TO END POST
(MALE END)



DETAIL 3
FEMALE END OF BRIDGE



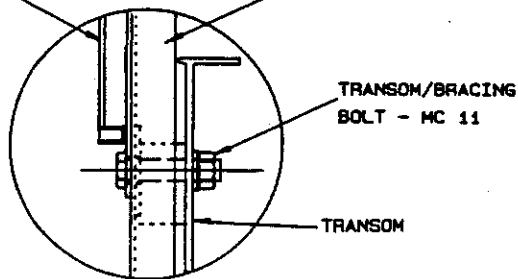
DETAIL 4
MALE END OF BRIDGE



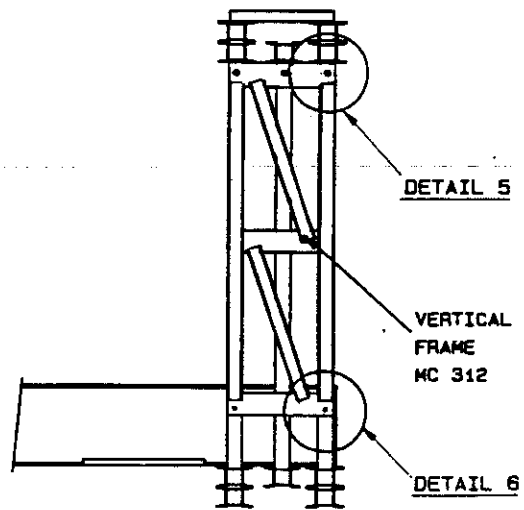
DETAIL 5

VERTICAL FRAME
MC 312

PANEL VERTICAL
(FEMALE END)



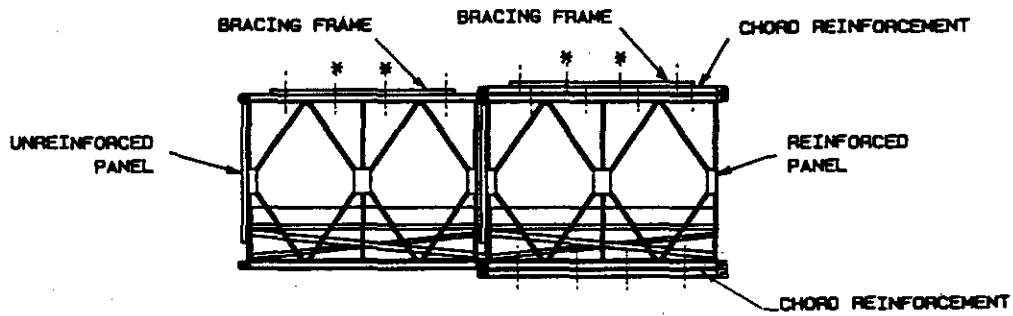
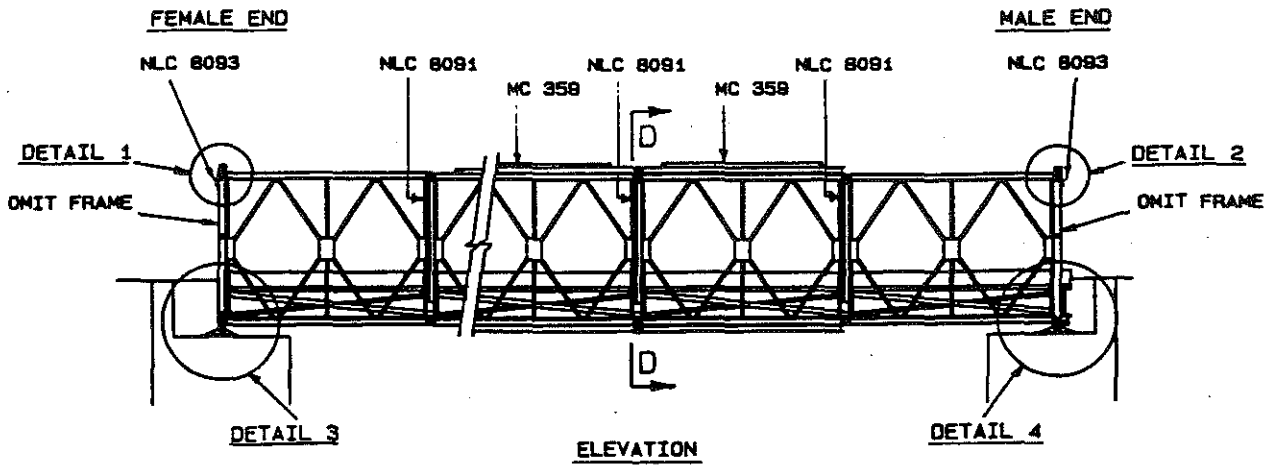
DETAIL 6



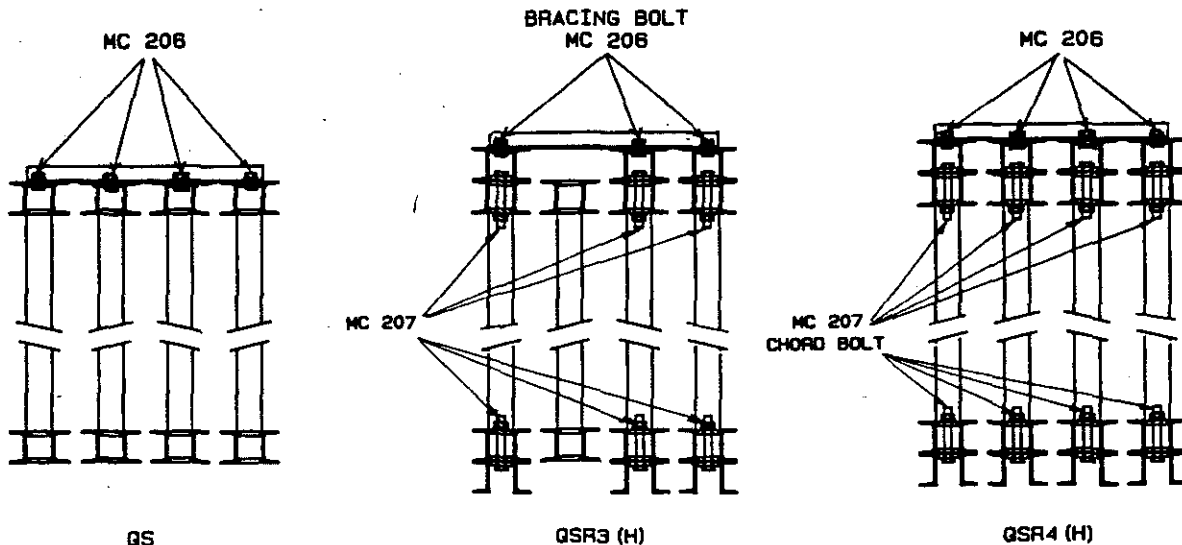
TYPICAL SECTION C-C

ASSEMBLY DETAILS

QUADRUPLE TRUSS CONSTRUCTIONS



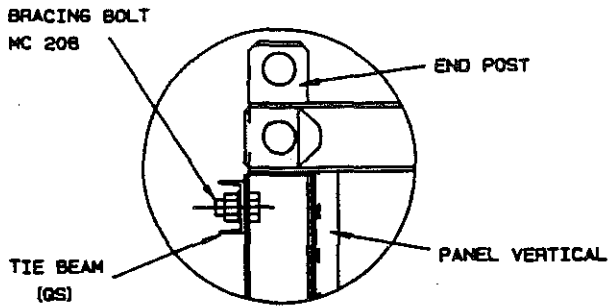
NOTE : BRACING FRAMES ARE CONNECTED TO THE INTERNAL PANELS AT THE TWO CENTRAL POSITIONS ONLY, MARKED THUS *



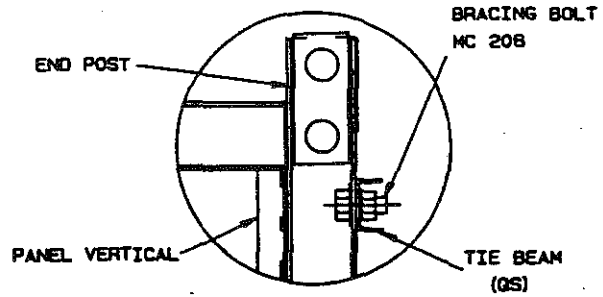
ASSEMBLY DETAILS

QUADRUPLE TRUSS CONSTRUCTIONS

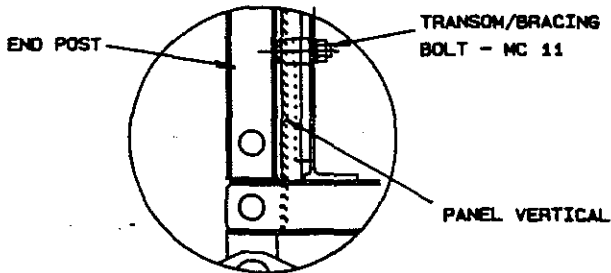
TRUSS BRACING DETAILS



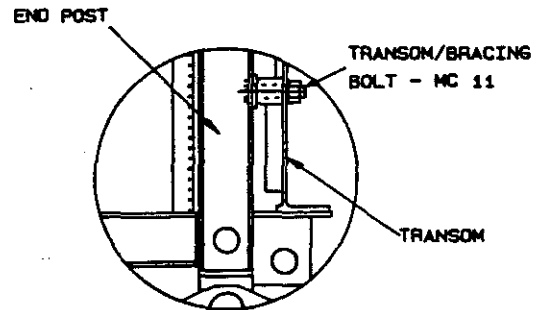
DETAIL 1
E.O.B TIE BEAM TO END POST
(FEMALE END)



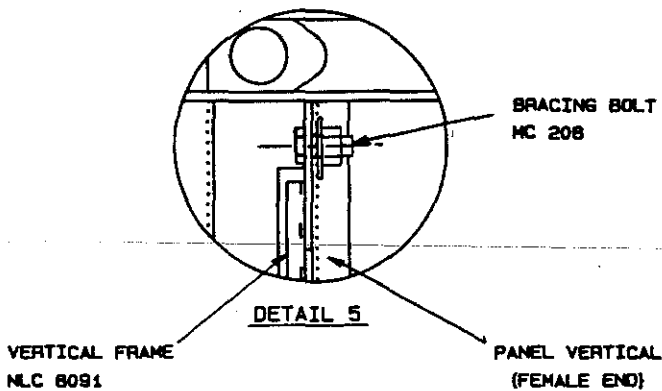
DETAIL 2
E.O.B TIE BEAM TO END POST
(MALE END)



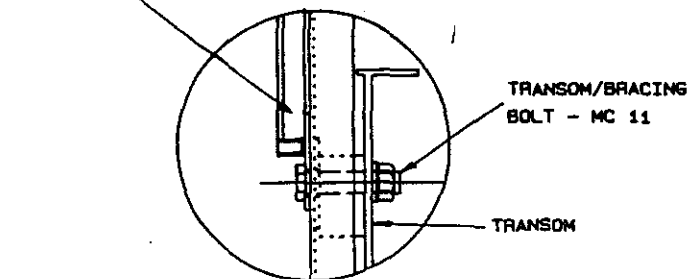
DETAIL 3
FEMALE END OF BRIDGE



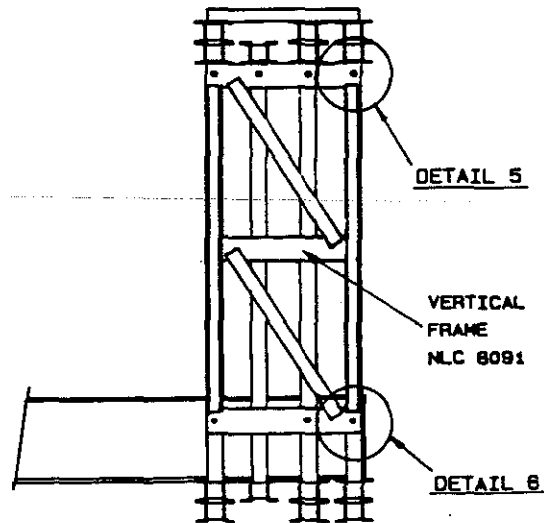
DETAIL 4
MALE END OF BRIDGE



DETAIL 5



DETAIL 6

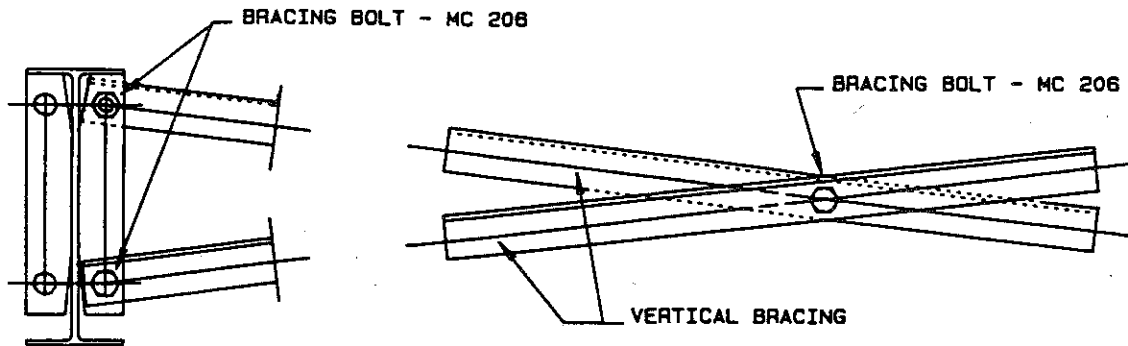


TYPICAL SECTION D-D

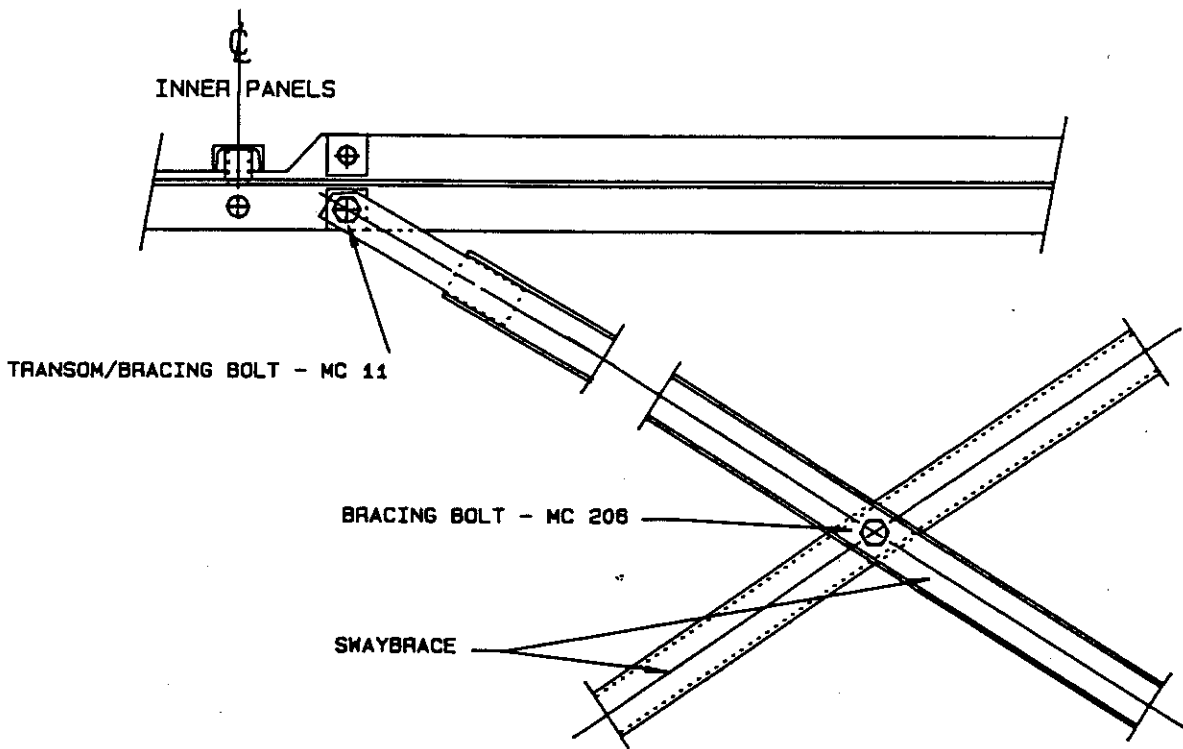
ASSEMBLY DETAILS

MARBY

VERTICAL AND HORIZONTAL BRACING



PART ELEVATION OF VERTICAL BRACING

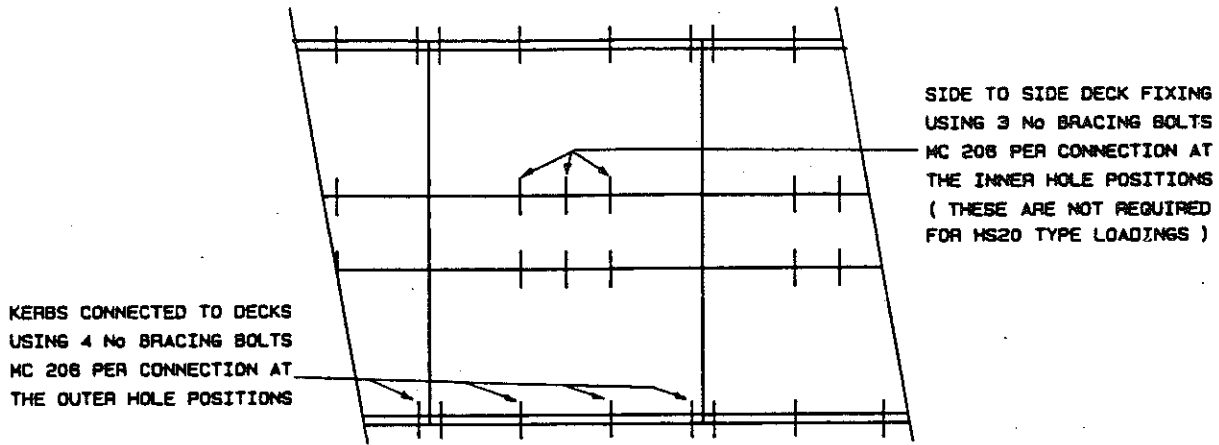


PART PLAN ON HORIZONTAL SWAYBRACING

ASSEMBLY DETAILS



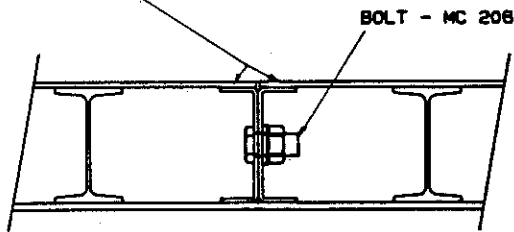
STEEL DECKING



TYPICAL PLAN ON DECKING

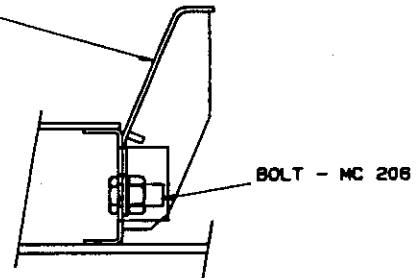
(EW ROADWAY SHOWN - STD & 2 LANE ROADWAYS SIMILAR)

DECK - MC 211, MC 212, MC 213 or MC 214.

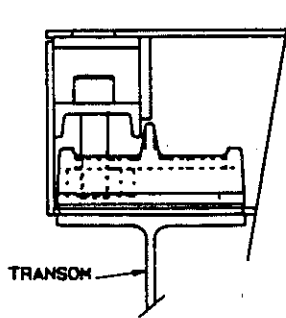


SECTION ON SIDE BOLT CONNECTION

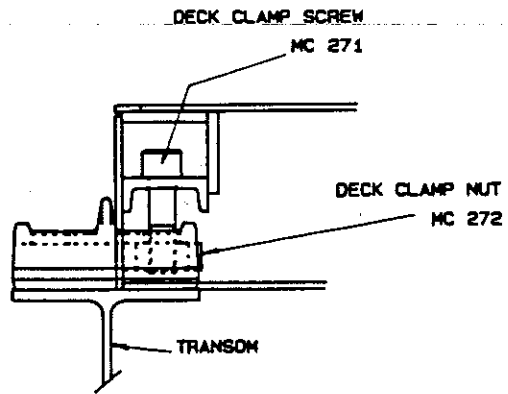
KERB - MC 300 or MC 301



SECTION ON KERB BOLT CONNECTION



END OF BRIDGE



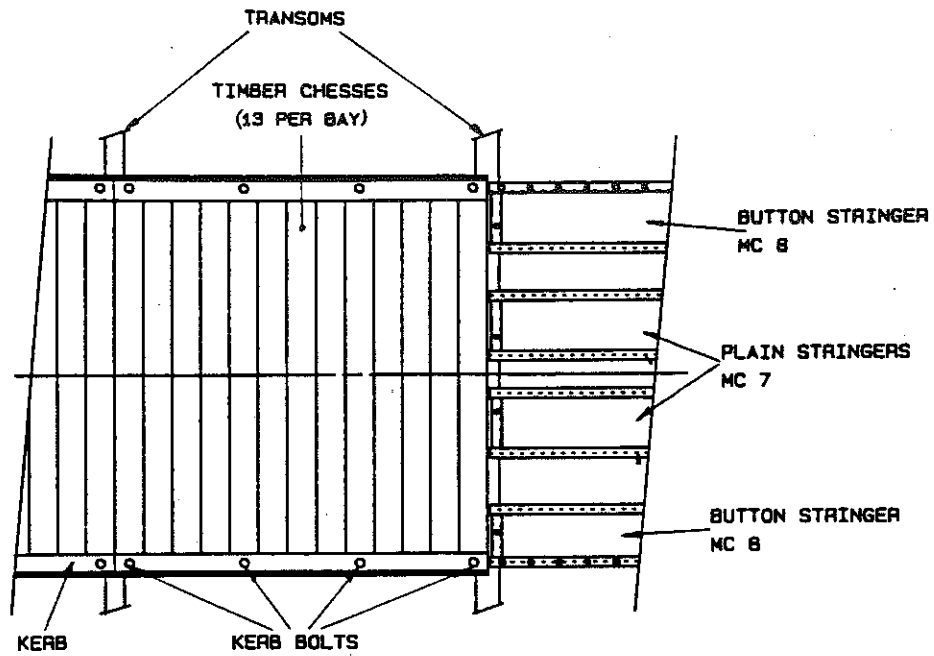
INTERMEDIATE

SECTIONS ON TYPICAL DECK HOLDING DOWN DETAILS

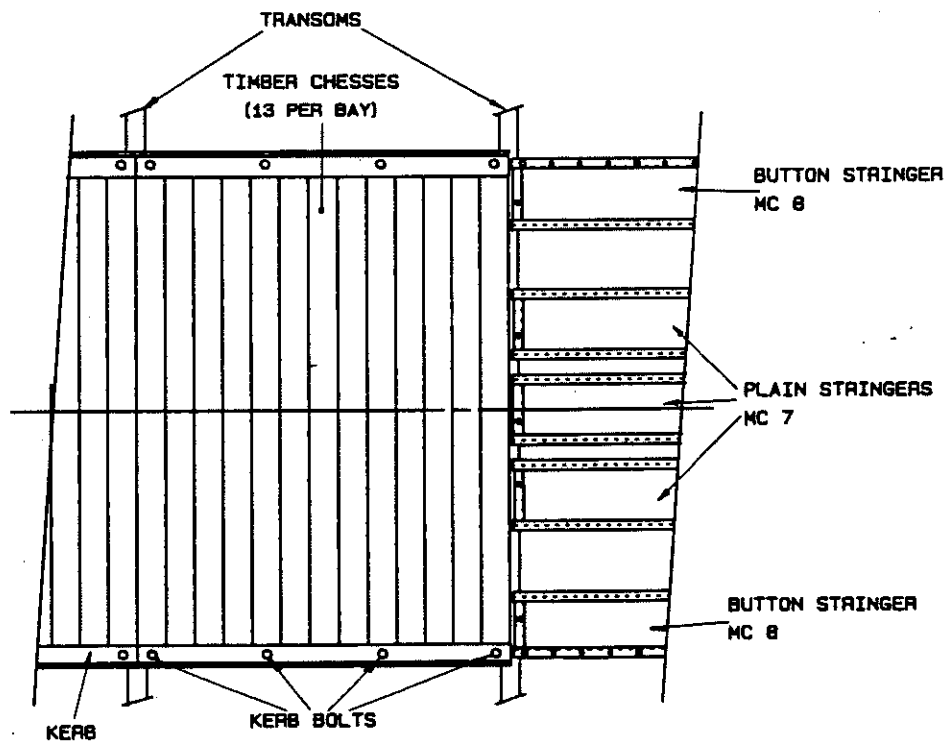
ASSEMBLY DETAILS

M.B.V.

TIMBER DECKING



STANDARD WIDTH SINGLE LANE

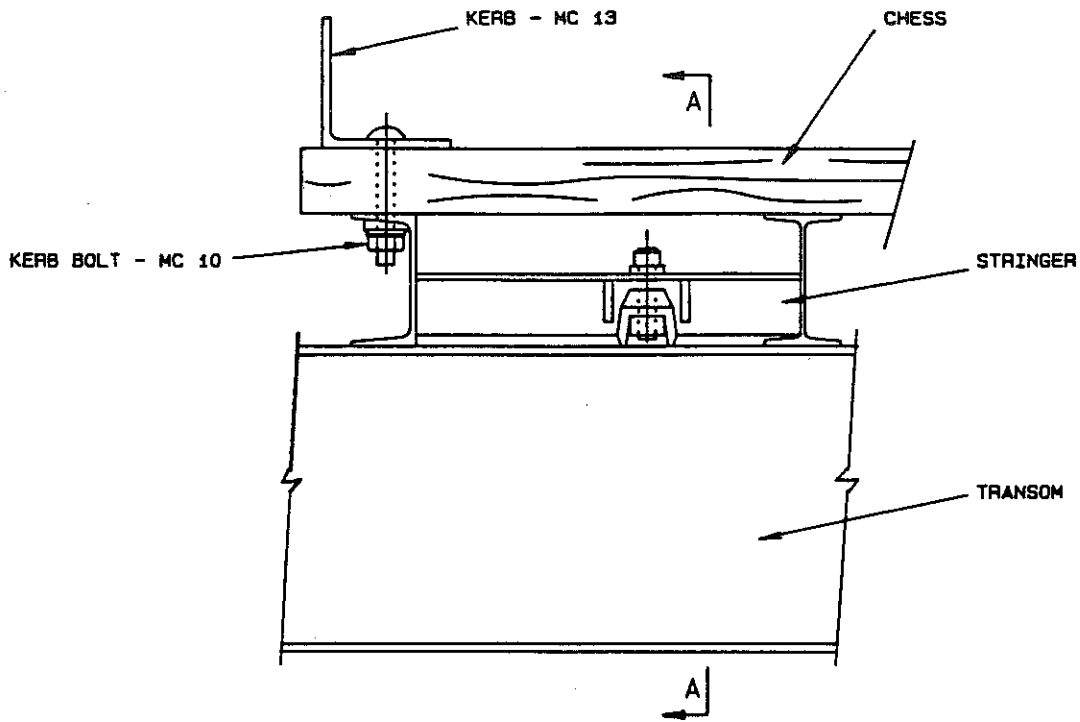


EXTRA WIDE SINGLE LANE

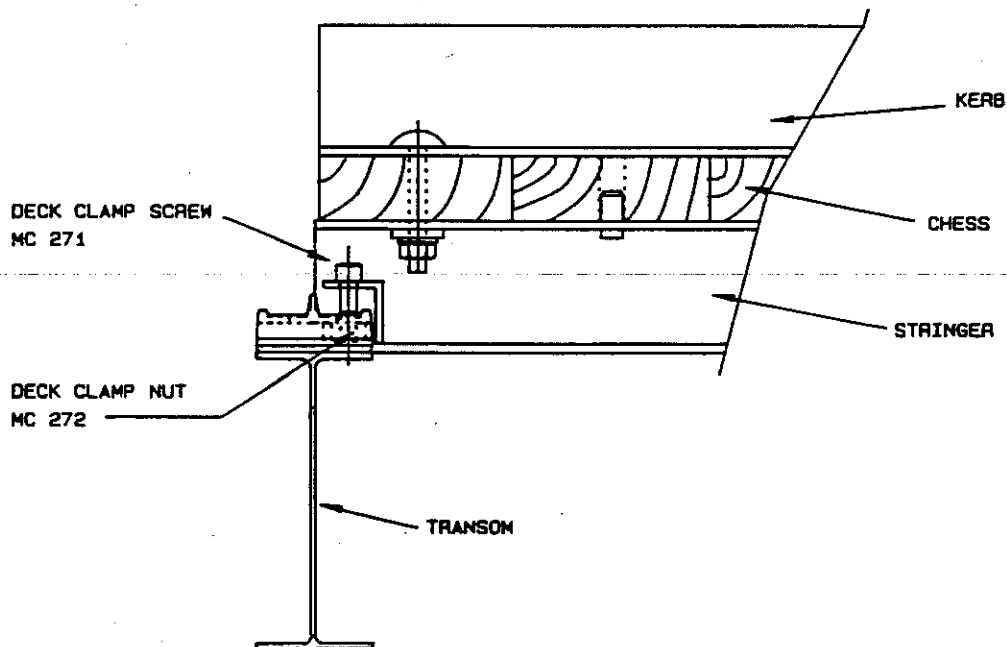
ASSEMBLY DETAILS

MARBY

TIMBER DECKING



TYPICAL HOLDING DOWN DETAILS



SECTION A-A



S E C T I O N 6

B R I D G E
E R E C T I O N

I M P O R T A N T

Bridge building and launching must be supervised by a responsible and competent engineer. The Supervisor's responsibilities include the following:-

1. Safety.
2. Checking that the bridge span is correct for the site.
3. Confirming that the launching method is suited to the site.
4. Checking setting out dimensions and levels of rollers.
5. Ensuring that the structure is erected correctly.
6. Ensuring that launching is executed correctly.
7. Ensuring that jacking is carried out properly.
8. Inspecting the finished bridge to ensure that all components have been correctly fitted and that all bolts have been tightened, before permitting traffic to cross.

If at any time the Supervisor is in doubt, he must refer to his superiors, or to Mabey and Johnson.

**GENERAL INSTRUCTIONS AND GUIDELINES
FOR THE ERECTION OF SINGLE SPAN BRIDGES**

1. Before starting to build, study the launching information provided (whether drawings or tables) and the following information from start to finish. Ensure that all points are fully understood.
2. Set out the rollers to line and level. Ensure that the dimension between launching and landing rollers is correct, and that all rollers are of the correct type (plain rollers, rocking rollers or balance beam assemblies) and quantity.
3. Mark the centreline of the bridge clearly on both abutments and along the construction area. Check to this frequently during the construction of the first few bays, and after every movement of the structure.
4. Determine the position of the "Launching Links", and by which method they will be fitted.
5. Determine the position of the "Nose Drop Bolt" (only applicable for chord reinforced bridges).
6. Build the launching nose, bridge and tail (if required), bay by bay, referring to the following pages for each construction type.
7. Pay particular attention to the fact that some bays of bridge may not be built, for launching, in their final configuration. For example, additional, or fewer, chord reinforcements may be fitted initially.
8. Determine how many bays of bridge should be fitted with decking, and how many should not.
9. Determine how much counterweight should be placed on the rear of the bridge.
10. The nose and bridge may be built, complete, on the home bank before being launched forwards across the gap.

~~A procedure often adopted however, is to build several bays and move them forwards a little: build a little more and move a little more, etc. This has two advantages, which are that the launching area required is shorter and that building can be done nearer to stockpiles of equipment.~~

When using this method of erection it is essential not to allow the incomplete structure to fall into the gap. When pushing forwards never let the "Centre of Gravity" of the section built approach closer than one panel length to the launching rollers.

11. When building a structure on rollers, it is important that it should not move accidentally. A suitable method of preventing movement, on a level launching plane, is to pass spikes through the bottom chords of panels into the roller cages.

12. Before moving a structure, place a man at all roller positions. Each is to watch for any sign of a roller jamming, a pack under a roller becoming unstable, or anything else untoward occurring whilst the structure is being moved. In the event of a problem arising, the observer is immediately, by pre-arranged signal, to notify the supervisor to stop the movement of the structure.

Remove all spikes from the rollers and check that there are no other obstructions. Then move the structure slowly forwards to its new position.

13. Bridges may be pulled or pushed across a gap. Long bridges which may tend to go off-line should, preferably, be pulled. The force required to move the structure can be satisfactorily estimated as being one tenth of the structure weight, for a level launching plane. The force should be applied on, or symmetrically about, the centreline of the structure, otherwise it will be likely to go off-line. Be careful not to cause damage by pushing or pulling on a part which is not strong enough.
14. Always provide a method of stopping the structure from over-running its new position. For example, a cable may be connected to the structure and passed around a strong tree, or connected to a bull-dozer.
15. When building is complete, check that decking and counterweight are correctly placed. Position a man at each roller as before. Push (or pull) the structure slowly and steadily across the gap towards the landing rollers.
16. Check the alignment of the landing rollers with the approaching nose. It may be necessary to stop the launch, in order to adjust the position, or the level, of these rollers.

It is possible to move the end of the nose sideways, a little, by pushing or pulling. Greater movement can be achieved when the structure is almost on the "point of balance" on the launching rollers, but this should be undertaken with great care.

The rollers must be adjusted for height if the nose is too low and will not pass over them, or if the nose is too high and will, when the "point of balance" is reached, descend too forcefully onto them.

17. Having adjusted the landing rollers, if necessary, continue to launch the structure forwards until the bridge section is correctly located over its bearing positions.

Do not remove any nose until the bridge is correctly located, unless the launching scheme specifically permits. Consult with Mabey and Johnson engineers if removal of the nose is necessary, but is not already specifically permitted.

18. Jacking at the rear of the bridge, remove the rollers and lower the bridge onto its bearings.
19. Remove the nose from the front of the bridge. By jacking, remove the rollers and lower the front of the bridge onto its bearings.

20. If the bridge must be lowered a long way it will be necessary to carry out the jacking in stages. Jack first at the back, then at the front and back alternatively, until the operation is completed. Limit the longitudinal slope of the bridge to 1 in 100 during this sequence.

Never have both ends of the bridge supported on jacks at the same time.

Avoid transverse slopes during jacking by working at both trusses simulataneously.

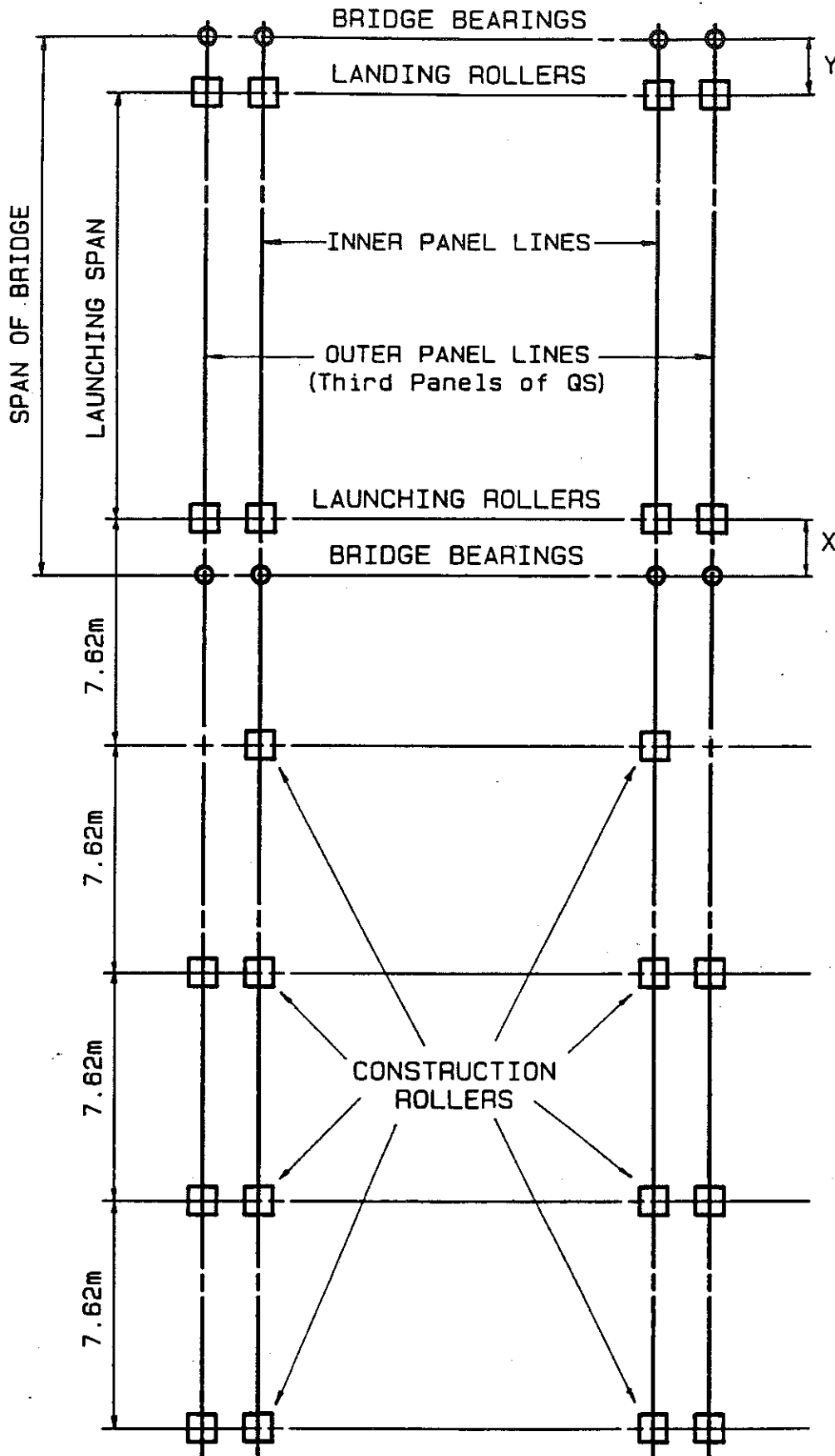
21. When the jacking operation is completed, place the remainder of the decking.
22. Carry out a final inspection.

NOTES

- A. Always try to achieve a level launching plane. While it is possible to build and launch a bridge on a gradient, either up or down hill, much greater care must be taken with pushing/pulling methods, preventer tackles and safety. Sloping launching planes should therefore be avoided if possible.
- B. Always remain aware of the stability of the structure which you are building, and use packs as necessary to prevent tipping. This is particularly important in the early stages of building until three roller positions are covered. Remember the structure can tip backwards, as well as forwards.
- C. When positioning jacks and packs be aware of the loads which will be imposed on the bridge above them. Try to work under verticals or diagonals of panels. Do not bend or break parts of the bridge by imposing loads at the weak points. Use jacking frames when working at the ends of the bridge.
- D. When jacking, always use "catch packs". A "catch pack" is a pack adjacent to a jack, and beneath a strong point of the structure. It must be adjusted continually for height so that it is only just beneath the structure. If the jack should fail, or sink, load is immediately carried by the "catch pack" and the structure cannot fall.
- E. When building, do not tighten the bolts in a bay until the next bay has been assembled. This allows a little flexibility in the structure, and eases the assembly of subsequent parts.
- F. It is important that no more than three bays at the rear of the structure should have un-tightened bolts, all other bolts must be fully tightened. Tighten the bolts in the last three bays before launching the structure.
- G. Multi-span bridges, whether broken-span or continuous, need special consideration in some respects. Whilst most procedures remain the same as for single spans, the special features are not dealt with here.

LAUNCHING SITE LAYOUT

MTCBQV



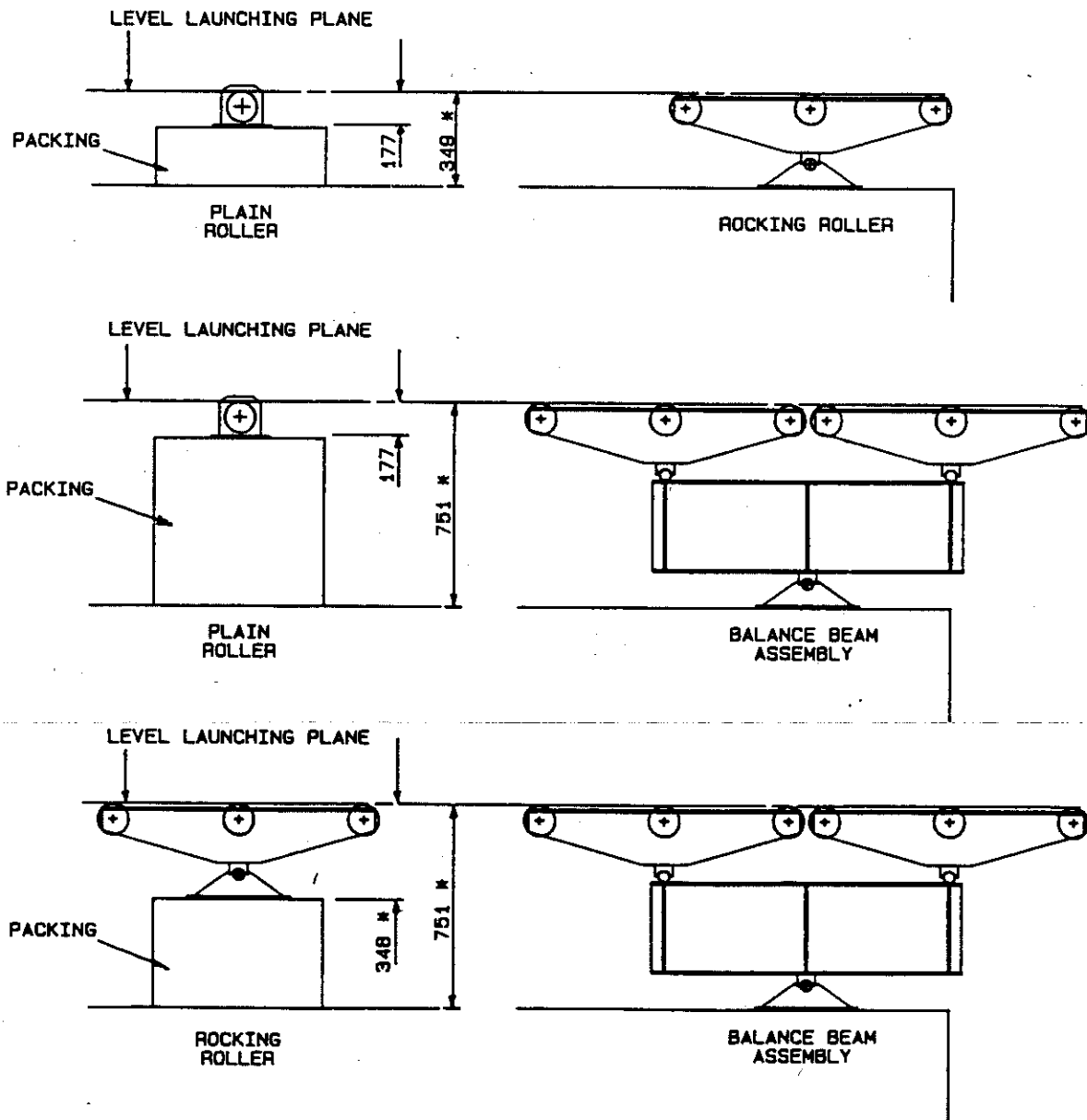
LAUNCHING SITE LAYOUT

MCB3V

Launching and landing rollers are normally placed clear of, and inset from, the bridge bearing positions, as shown on the diagram opposite. Inset dimensions X and Y vary with the type of roller being used. Balance Beam Assemblies require 1.5m. Rocking Rollers require 0.75m.

If it is necessary to place the launching and landing rollers on the bridge bearing positions, a tail bay will be required. Furthermore, it must be confirmed that the launching nose, roller type and layout and erection sequences are suitable for the revised launching span.

RELATIVE ROLLER HEIGHTS



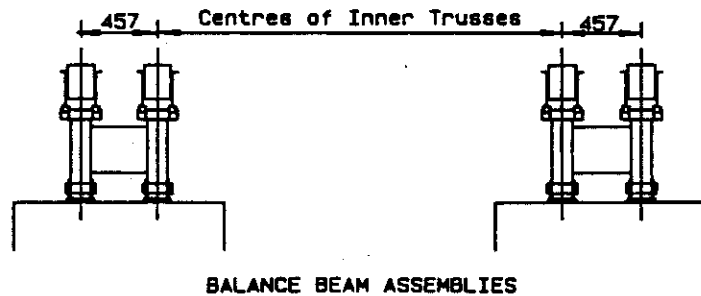
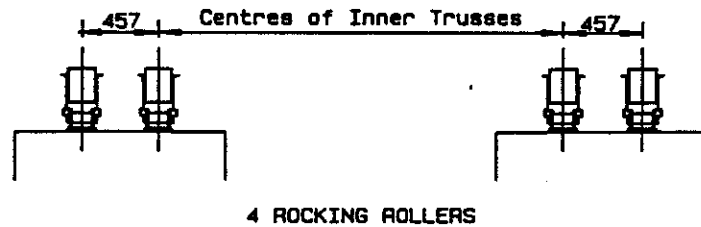
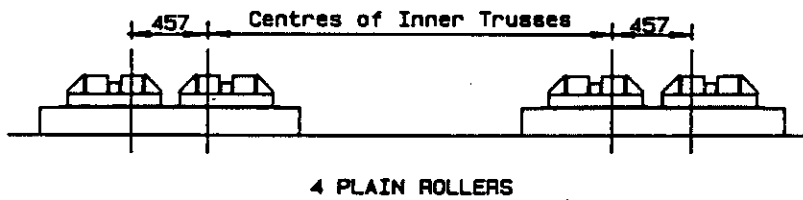
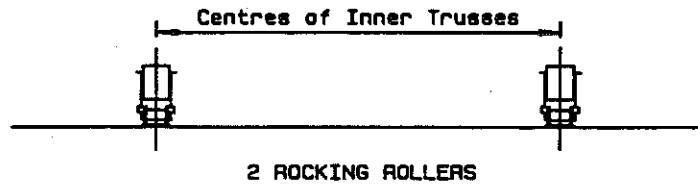
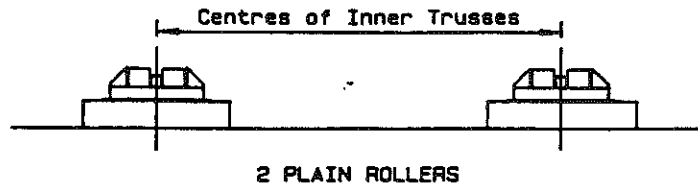
* Assumes MC 236 Baseplates are used under the bearings.

LAUNCHING SITE LAYOUT

MSCV

SETTING OUT OF ROLLERS

1. When launching SS, SSR(H), DS, DSR2(H) or TSR2(H) constructions set out the rollers transversely as shown in the diagrams below



CENTRES of INNER TRUSSES

STD. SINGLE = 3937mm E.W. SINGLE = 4953mm TWO LANE = 8230mm

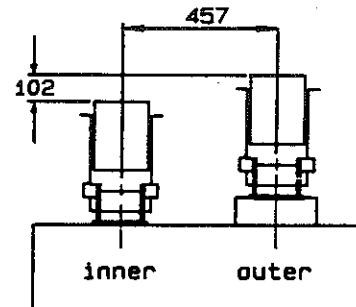
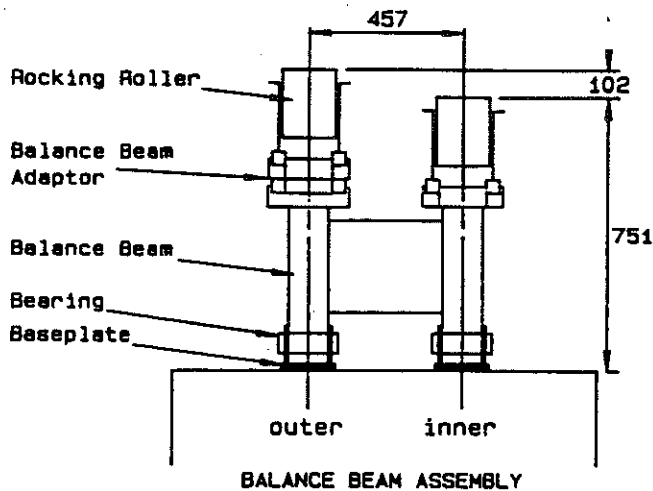
NOTE: Rocking Rollers, whether with or without Balance Beams, should be angled towards the approaching bridge structure with temporary packing installed for stability.

LAUNCHING SITE LAYOUT

MGBGV

SETTING OUT OF ROLLERS

2. When launching DSR1(H) constructions it is necessary to raise the rollers beneath the outer panel lines as shown below. It should be noted however that Transoms in the nose prior to the Nose Drop Bolt can foul the guides on these raised rollers. To avoid this, either install the outer rollers after the Nose Drop Bolt position has passed, or tip the outer rollers clear of the Transoms as they pass.

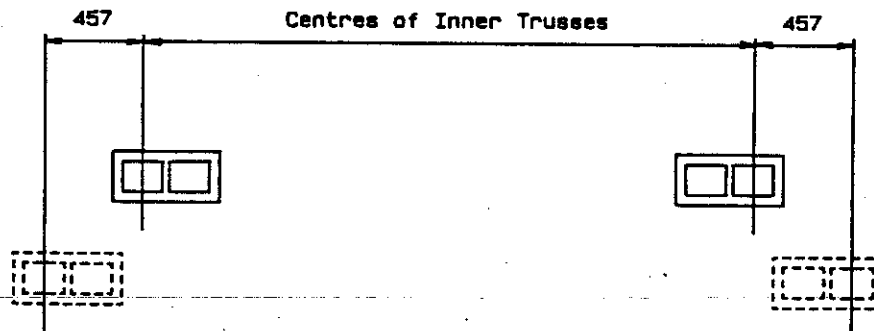


ROCKING ROLLERS

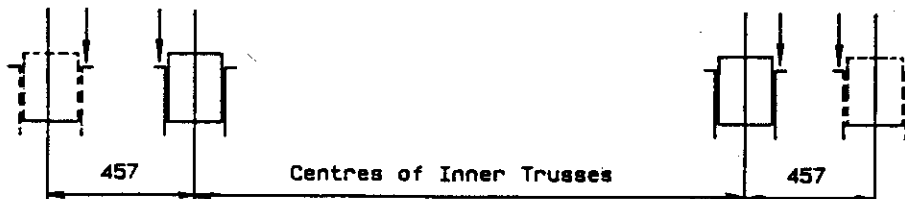
Note - a similar detail is required for Plain Rollers

All other setting out details are as per the previous page.

3. When launching TS, TSR3(H), QS, QSR3(H) or QSR4(H) constructions utilising 2 or 4 Plain Rollers it is necessary to place them in a staggered format as shown below.



4. When launching TS, TSR3(H), QS or QSR4(H) constructions using 2 or 4 Rocking Rollers whether with or without Balance Beams, it is necessary to remove the guide rollers indicated below



When launching QSR3(H) constructions, Rocking Roller format is as above but it is not necessary to remove any guide rollers.

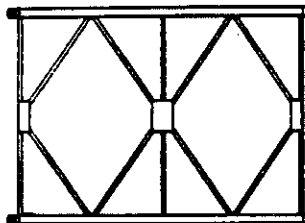
PRELIMINARY ERECTION NOTES

COMPACT 200 PANELS

There are two types of Compact 200 Panel; the Standard Panel (MC200) and the High Shear Panel (MC201). High Shear Panels are utilised at the ends of a span where the truss construction would otherwise have to be increased to cope with the higher shear forces which are local to the ends of the bridge.

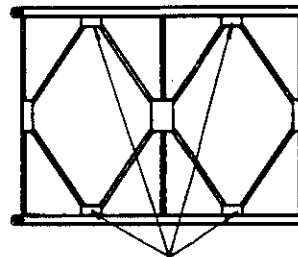
It is important to place the High Shear Panels in the correct bays, when they are required. To assist recognition, the diagrams below highlight the main visual difference between the two types of Panel. This is that the High Shear Panels have gussets where the diagonals meet the chords, whereas the Standard Panels do not.

STANDARD PANEL (MC200)



no gussets

HIGH SHEAR PANEL (MC201)



gussets

TRANSOM BRACING

Vertical Braces are not required in any of the launching nose bays. They are also temporarily omitted from the first bay of the bridge, where they are fitted after the bridge has been launched, the nose dismantled, the End Posts attached and the end Transom connected.

Vertical Braces are fitted to all of the other bays of the bridge, including the tail bay where applicable, as the erection progresses.

PARTS REQUIRED in addition to those needed for normal construction.

<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Vertical Brace	MC222	2
Bracing Bolt	MC206	5

BUILDING PROCEDURE

1. Connect the Vertical Braces between the vertical plates at the centre of adjacent Transoms. Each brace spans from the top of the plate on one Transom to the bottom of the plate on the other. To facilitate ease of fitting, pass a Bracing Bolt through the Vertical Brace first and then through the plate on the Transom.
2. Bolt the Vertical Braces together, back to back, where they cross at their centres, with a Bracing Bolt.

NOTE - Do not tighten the bolts until the next bay has been erected.

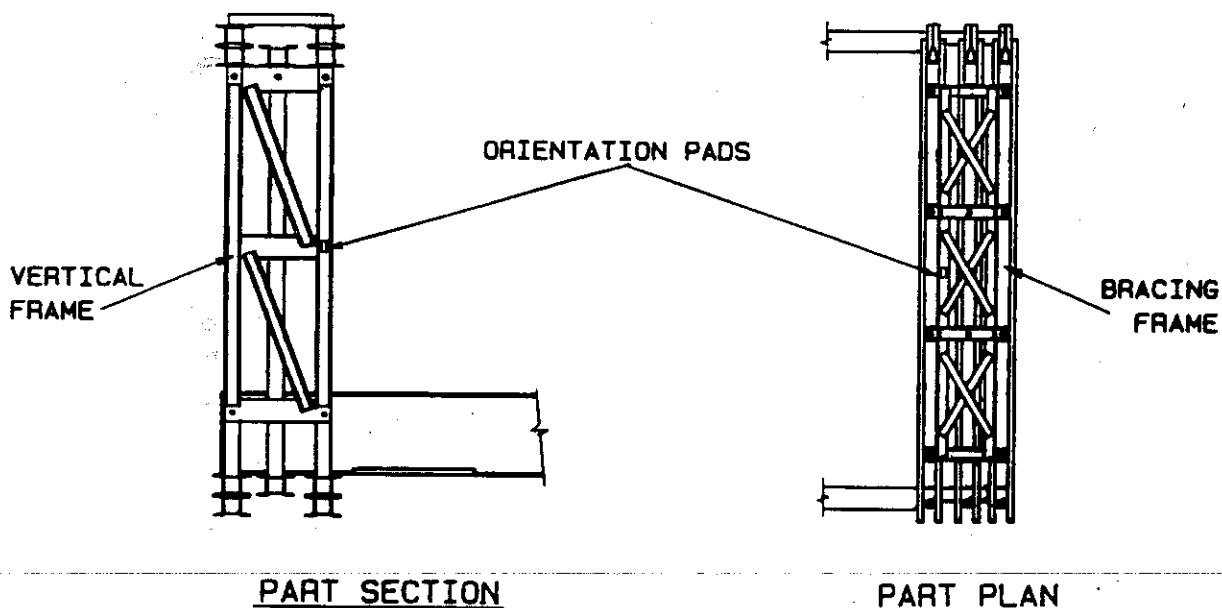
PRELIMINARY ERECTION NOTES

TRUSS BRACING

Single truss constructions have only one type of truss bracing, the Raker Frame, which is connected vertically to the rear (female) end of the Panel and to the Transom.

Double, Triple and Quadruple truss constructions have two types of truss bracing, the Vertical Frame and the horizontal Bracing Frame. Vertical Frames are connected to the rear (female) end of the Panel and to the Transom, and horizontal Bracing Frames are connected to the top chords of the Panel Lines.

Vertical Frames and horizontal Bracing Frames have to be fitted with a specific orientation in order to connect to the central Panel lines of Triple and Quadruple truss constructions. Small pads are welded to the frames to facilitate ease of orientation. The frames should be connected to the trusses such that these pads are on the side of the inner Panel lines, as highlighted in the diagrams below.

Notes:

1. Horizontal Bracing Frames are not required in the first bay of a bridge when in service, but are temporarily fitted to this bay for launching.
2. Horizontal Bracing Frames are not fitted to the last bridge bay.
3. Neither Raker Frames nor Vertical Frames are fitted to the last bay of a bridge unless a tail bay is required during launching, in which case they are temporarily fitted to both the last bay of bridge and the tail bay.

LAUNCHING LINKS

PURPOSE

When a bridge is launched, there is a natural tendency for downward deflection of the nose below the level of the landing rollers. Launching Links are fitted in the launching nose, therefore, to raise the front of the structure sufficiently to overcome this phenomenon.

PARTS REQUIRED in addition to those for Single Single construction.

<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Launching Link	MC66	2 *
Panel Pin	MC307	2 *
Safety Clip	MC307A	4 *
Swaybrace Extension	Varies	2 Single Lane 4 Two Lanes
Transom/Bracing Bolt	MC11	2 Single Lane 4 Two Lanes

In the uncommon case that Launching Links are to be fitted to a bay of Double Single construction, double the quantities marked thus *.

BUILDING PROCEDURE

Pin Launching Links to the rear of the bottom chords of the Panels in the bay preceding the link position. When fitting the Panels of the subsequent bay, pin the top chords of the panels together as usual, but pin the bottom chords to the Launching Links.

Due to the introduction of the Launching Links, the distance between the Transoms of the adjacent bays is increased, and it is therefore necessary to fit Swaybrace Extensions in this bay. Note that it is not then possible to connect the Swaybraces back to back where they cross, as this no longer occurs at the centre of the swaybraces.

METHODS OF INSTALLATION

The principles of three basic installation methods are illustrated on the following pages. Selection of a suitable method depends upon the bridge site and upon the construction equipment available.

METHOD 1 incorporates Launching Links as building proceeds.

METHOD 2 introduces Launching Links by raising the front of the nose.

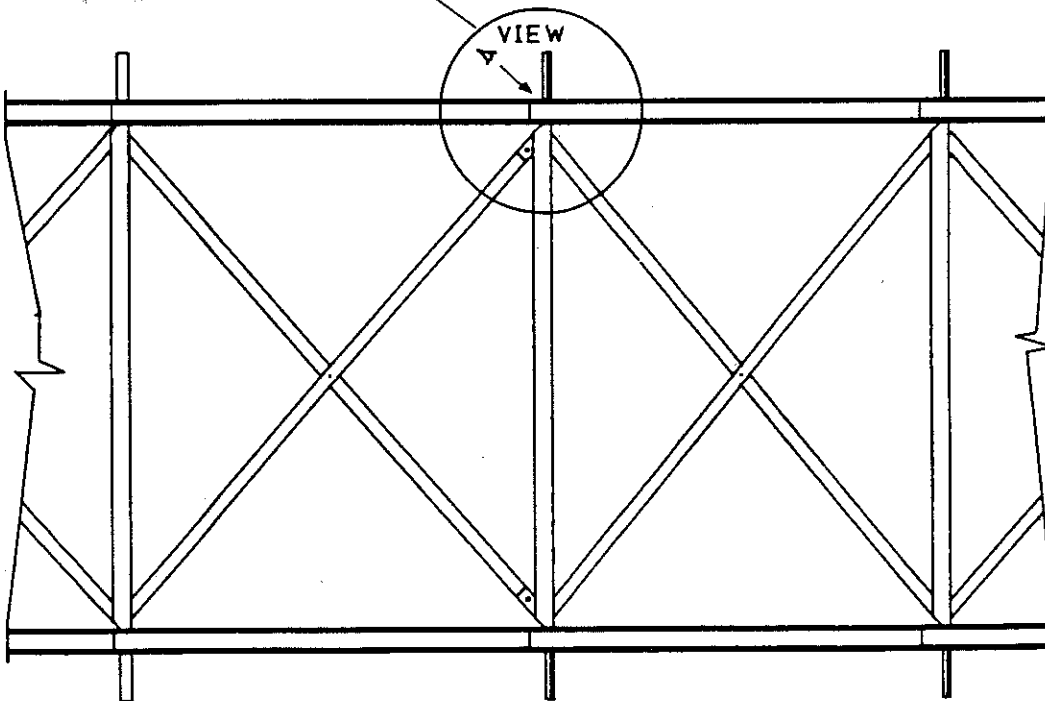
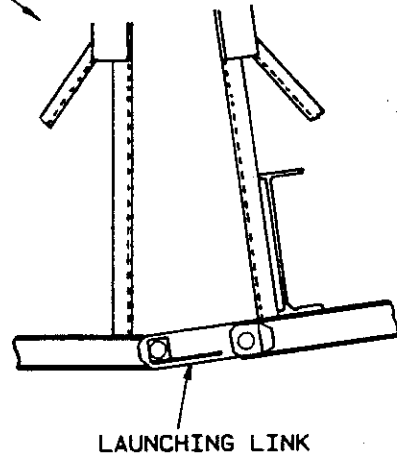
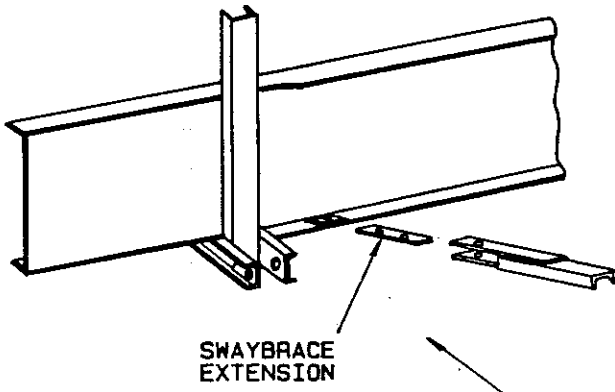
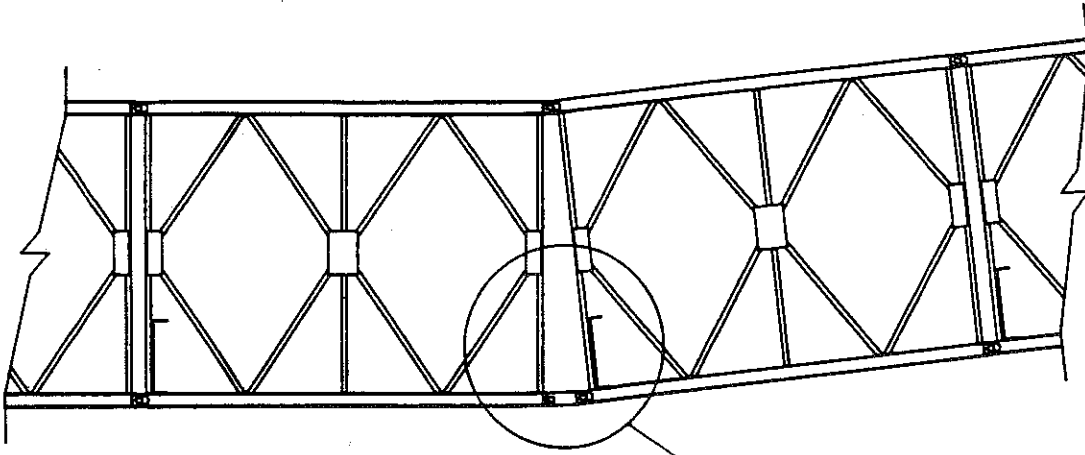
METHOD 3 builds the bays in front of the Launching Links in reverse.

In all methods it is important constantly to assess the position of the centre of gravity of the structure, and to use temporary packing as necessary to prevent any part of the structure from tipping.

Note that Launching Links are never fitted more than four bays back from the tip of the nose. If this fails to give sufficient uplift, additional Links are fitted after the first, second or third bay. Never, however, fit two sets of Launching Links at the same position. The fitting of two sets of Launching Links is not illustrated, but the principles of the installation methods remain the same.

LAUNCHING LINKS

MABEV

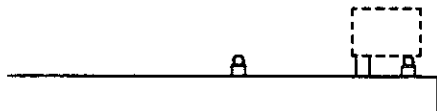


LAUNCHING LINKS

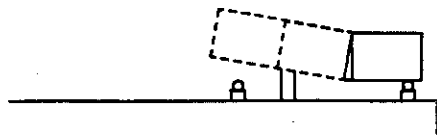
M.B.G.V.

INSTALLATION METHOD 1

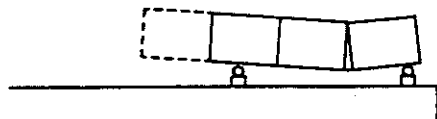
(i) Launching Links at rear of nose bay 1



Erect bay 1, packing the rear of the panels



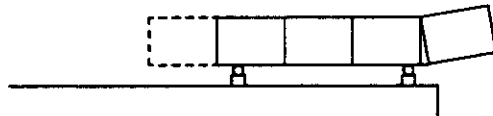
Erect bays 2 & 3, packing as necessary and building in the launching links at the rear of bay 1.



Remove packing and lower structure onto rollers

Erect bay 4

Advance structure 10 feet.

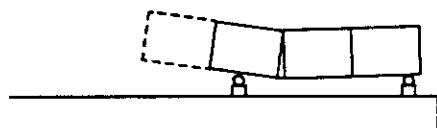


Continue erection as per specific scheme provided.

(ii) Launching Links at rear of nose bay 2.



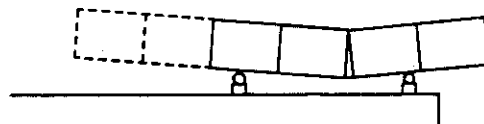
Erect bays 1 & 2, packing as necessary and building in the launching links at the rear of bay 2.



Remove packing and lower structure onto rollers.

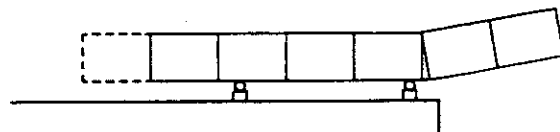
Erect bay 3.

Advance structure 10 feet.



Erect bays 4 & 5.

Advance structure 10 feet.



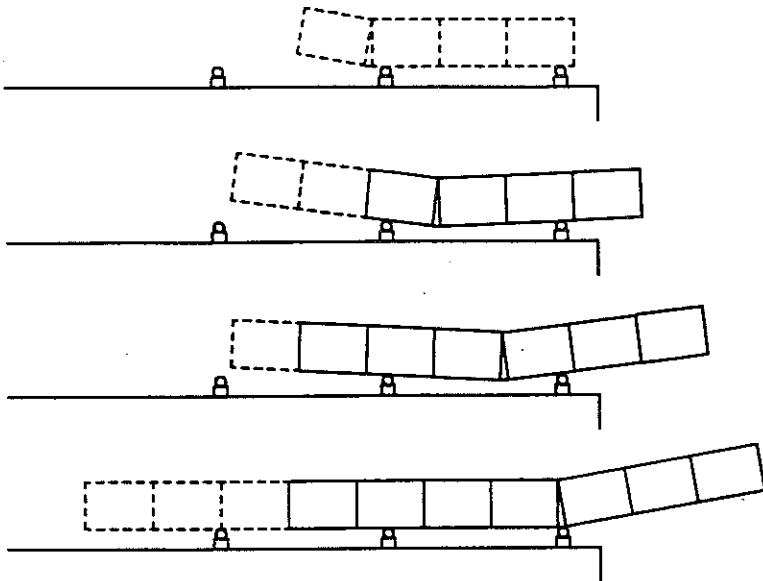
Continue erection as per specific scheme provided

LAUNCHING LINKS



INSTALLATION METHOD 1

(iii) Launching Links at rear of nose bay 3



Erect bays 1 to 4 packing as necessary and building in the launching links at the rear of bay 3.

Advance structure.

Erect bays 5 & 6.

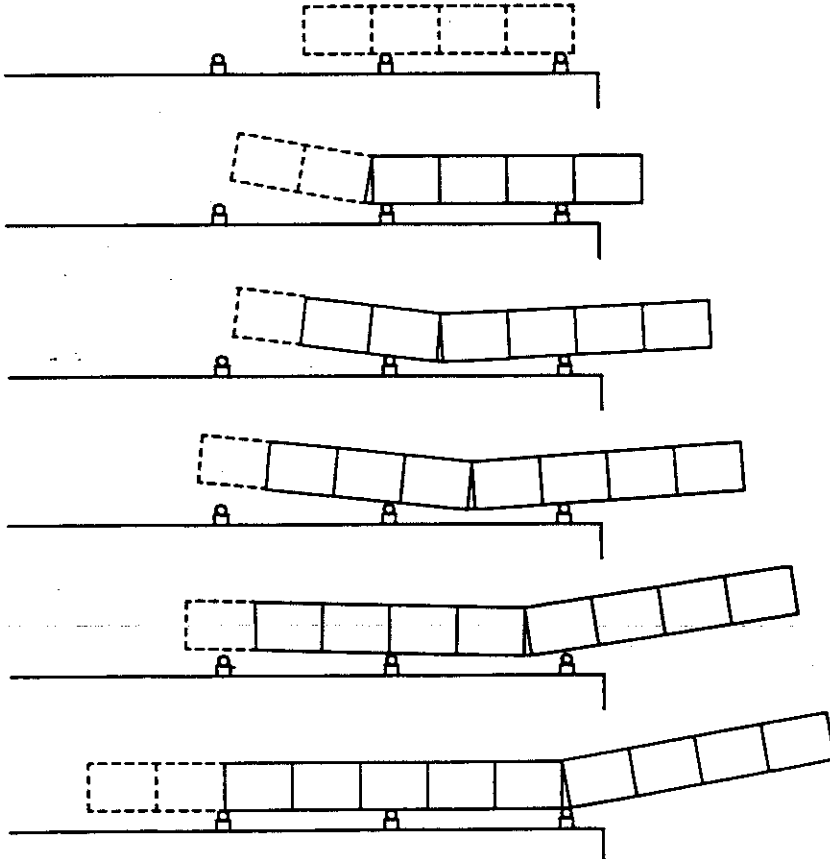
Advance structure.

Erect bay 7.

Advance structure until link is clear of rollers.

Continue erection as per specific scheme provided.

(iv) Launching Links at rear of nose bay 4



Erect bays 1 to 4 using packing as necessary

Advance structure.

Erect bays 5 & 6 building in the launching links at the rear of bay 4.

Advance structure.

Erect bay 7.

Advance structure.

Erect bay 8

Advance structure.

Erect bay 9

Advance structure until link is clear of rollers.

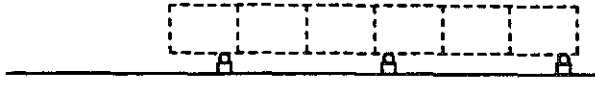
Continue erection as per specific scheme provided.

LAUNCHING LINKS

MARBY

INSTALLATION METHOD 2

(i) Launching Links at rear of nose bay 1



Erect bays 1 to 6 using packing as necessary.

Advance structure.

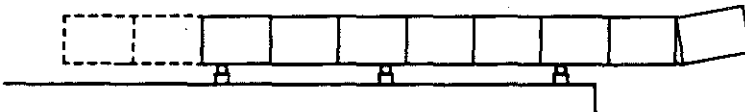


Erect bays 7 & 8.



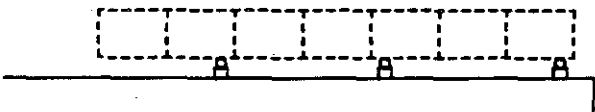
Raise the first nose bay and insert the launching links between bays 1 & 2.

Advance structure.



Continue erection as per specific scheme provided.

(ii) Launching links at rear of nose bay 2.

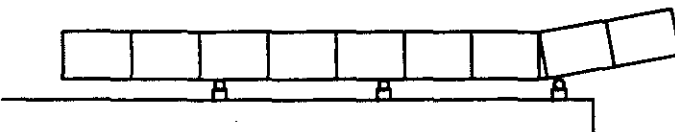


Erect bays 1 to 7 using packing as necessary.

Advance structure.

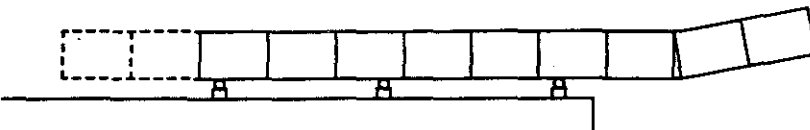


Erect bays 8 & 9.



Raise the front two bays and insert the launching links between bays 2 & 3.

Advance structure.



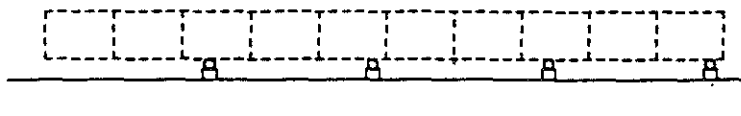
Continue erection as per specific scheme provided.

LAUNCHING LINKS

MARCONI

INSTALLATION METHOD 2

(iii) Launching links at rear of nose bay 3

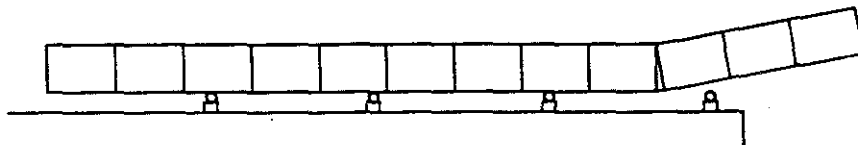


Erect bays 1 to 10 using packing as necessary.

Advance structure.

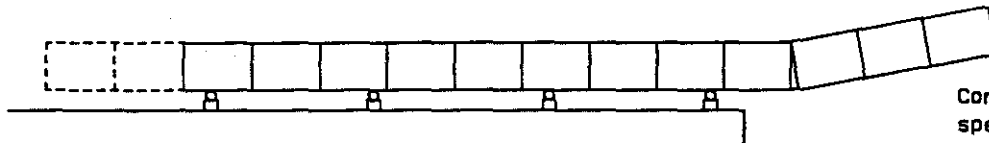


Erect bays 11 & 12.



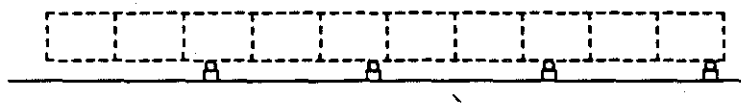
Raise three bays of nose and insert the launching links between bays 3 & 4.

Advance structure.



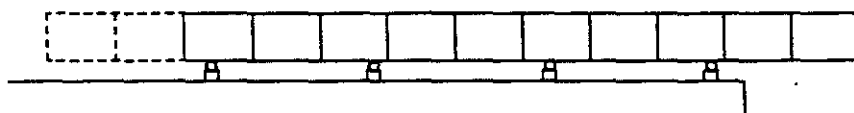
Continue erection as per specific scheme provided

(iv) Launching Links at rear of nose bay 4



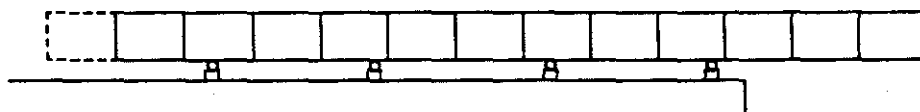
Erect bays 1 to 10 using packing as necessary

Advance structure.



Erect bays 11 & 12

Advance structure.

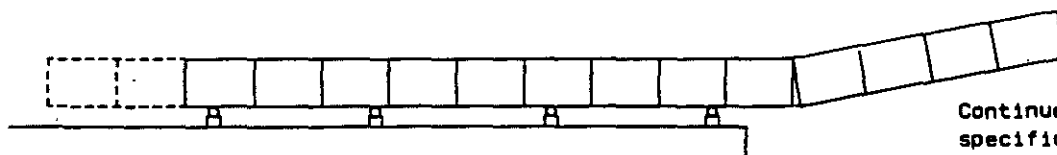


Erect bay 13



Raise four bays of nose and insert the launching links between bays 4 & 5

Advance structure.



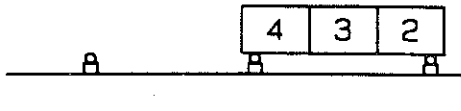
Continue erection as per specific scheme provided

LAUNCHING LINKS

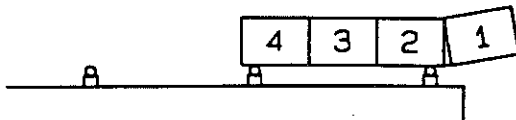
MBCV

INSTALLATION METHOD 3

(i) Launching Links at rear of nose bay 1

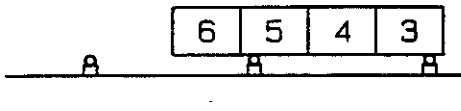


Erect bays 2 to 4 using packing as necessary.

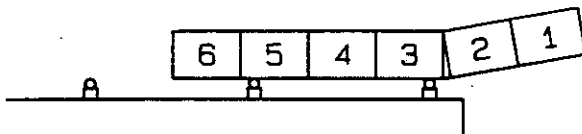


Add bay 1 onto the front and insert the launching links between bays 1 & 2.

(ii) Launching Links at rear of nose bay 2

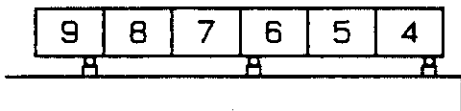


Erect bays 3 to 6 using packing as necessary.

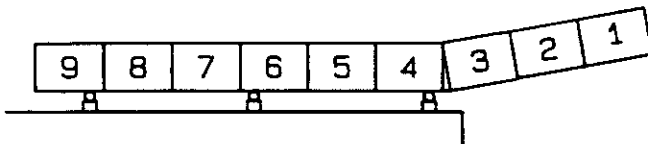


Add bays 1 & 2 in front, building them in reverse, and insert the launching links between bays 2 & 3.

(iii) Launching Links at rear of nose bay 3

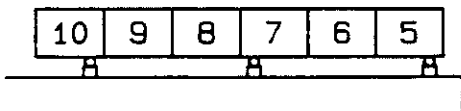


Erect bays 4 to 9 using packing as necessary.

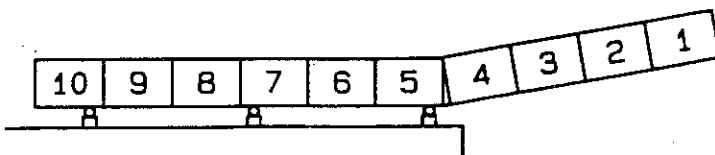


Add bays 1 to 3 in front, building them in reverse, and insert the launching links between bays 3 & 4.

(iv) Launching links at rear of nose bay 4



Erect bays 5 to 10 using packing as necessary



Add bays 1 to 4 in front, building them in reverse, and insert the launching links between bays 4 & 5.

LAUNCHING LINKS

NOTES PERTAINING TO METHODS OF INSTALLATION

1. The illustrations show typical examples of the principles only. For specific cases, refer to the launching and erection scheme drawings provided with the bridging equipment.
2. Ensure, at all stages, that the structure does not tip, either backwards or forwards, using temporary packing as necessary.
3. Avoid accidental movement of the structure.
4. Avoid overloading the construction rollers.
5. Take additional care when jacking beneath a sloping panel.
6. As required, raise and lower both trusses simultaneously.
7. When moving the structure forwards onto the Launching Rollers, ensure that the rollers are not pushed forwards.
8. Check the alignment of the structure after every movement.
9. When using Method 2 to install the Links, during the initial building stages the following components may be omitted:
 - A. Panel Pins in the bottom chords where links will be fitted.
 - B. Swaybraces in the bay behind the Launching Link position.
10. Method 3 requires a crane of sufficient capacity and reach to place the components in the front bays of the nose.
11. When using Method 3, give due consideration to the safety of workers on the nose. Note that reverse building is less easy.
12. Method 3 may be employed with the structure positioned further back on the construction rollers, but pay particular attention to Notes 4, 7 and 8 above.
13. In the descriptions of the building sequences for the various constructions, on the following pages of this section, it has been assumed that Links are installed by Methods 1 or 2.

NOSE DROP BOLT

PURPOSE

When launching bridges of reinforced construction, it is desirable to have a transition, within the nose, to unreinforced construction in order to provide a lighter, more economical, launching nose. As a plane underside to the structure must be maintained however, such that it passes smoothly over the rollers, a step in the level of the panels is necessary at this transition point. To achieve this, the bay preceding the transition has chord reinforcements attached to the top chords of the panels only, and the bay following has chord reinforcements attached to the bottom chords of the panels only. In order to maintain shear strength at the transition, nose drop bolts are fitted to the rear of the bay preceding the transition point.

PARTS REQUIRED in addition to those needed for normal construction.

<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Nose Drop Bolt Assembly	MC268	2 (Single Truss) 4 (Double Truss)

BUILDING PROCEDURE

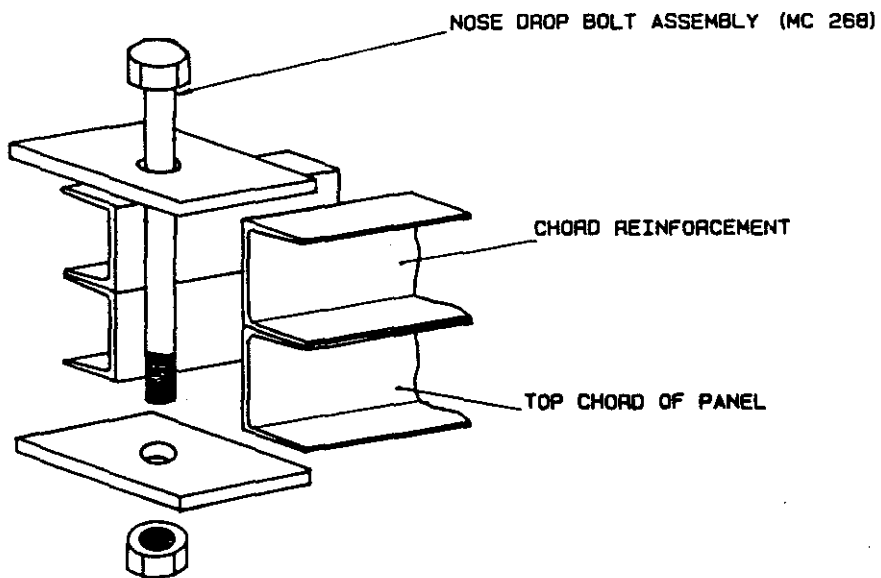
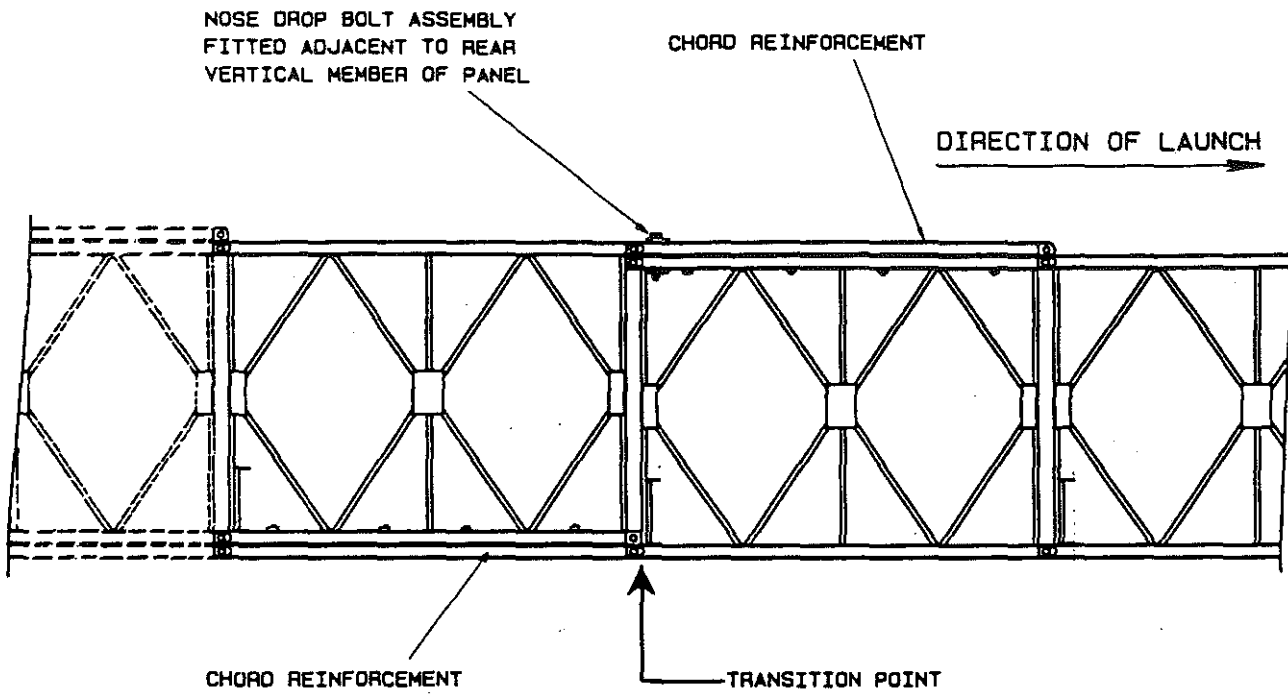
1. Fit the Nose Drop Bolts to the rear of the bay preceding the transition point, clamping the Chord Reinforcements to the top chords of the Panels. Position the bolts as close as possible to the rear vertical members of the Panels.
2. The following bay has Chord Reinforcements fitted to the bottom of the Panels. To erect this bay, pin the top chords of the Panels to the Chord Reinforcements of the preceding bay, and pin the Chord Reinforcements to the bottom chords of the Panels of the preceding bay.

NOTES

1. Despite the difference in levels of the Panels either side of the transition point, Swaybracing may be fitted as normal.
2. Some launching noses have more than one bay with Chord Reinforcements attached to the top chords of the Panels only. In this case, Nose Drop Bolts are fitted only to the bay immediately preceding the transition point.

NOSE DROP BOLT

MBCV



DETAIL OF NOSE DROP BOLT ASSEMBLY

FIRST BAY OF SINGLE SINGLE

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	2
Transom	Varies	1
Raker Frame	MC314	2
Transom/Bracing Bolt	MC11	4
Bracing Bolt	MC206	2

BUILDING SEQUENCE

1. Build two packs, both 450mm (1ft 6ins) inside the inner truss lines of the bridge, at a distance of 2.4m (8ft) behind the front launching roller wheel.

The height of the packs must be 110mm (4 $\frac{1}{4}$ ins.) above the level of the rollers.

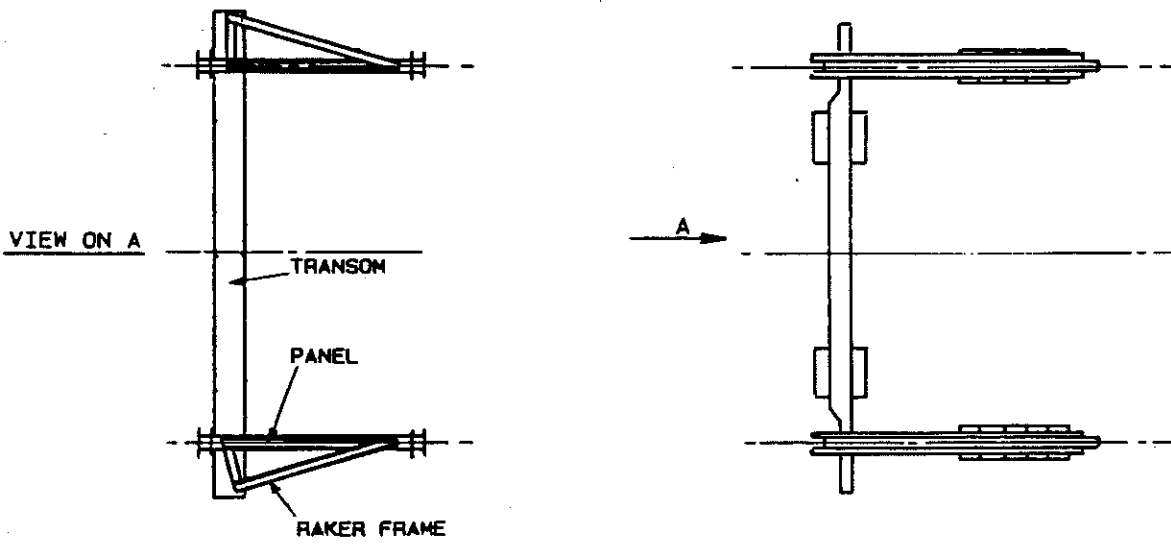
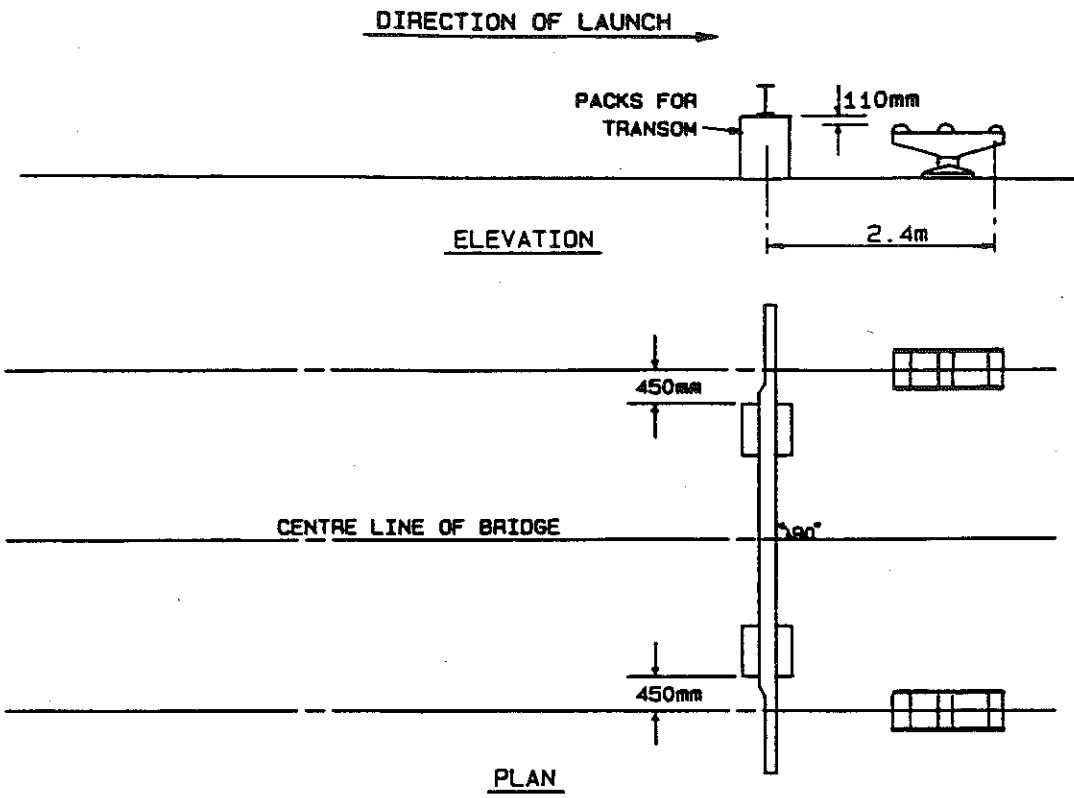
2. Place a Transom on the two packs, so that the flange cut-outs are on the side furthest away from the launching rollers. Adjust the position of the Transom until it is centred on, and at right angles to, the centre line of the bridge.
3. Lift a Panel, ensuring that the transom seat is at the bottom, and with the male end towards the gap to be bridged, feed the female end onto one end of the Transom. Engage the Panel's transom seat peg into the inner truss peg-hole in the bottom flange of the Transom, whilst sitting the front (male) end of the panel on the launching rollers. Hold the panel in this position.
4. Fit a Raker Frame (MC314) to the Panel vertical and Transom, with two Transom/Bracing Bolts (MC11) and one Bracing Bolt (MC206) as indicated on page 5.2. Pass the bolts through the Raker Frame first and then into the Panel Vertical and/or the Transom.

This assembly of transom and panel should now be stable, on packs and rollers, the panel can therefore be released.

5. Repeat steps '3' and '4' at the other end of the Transom.

NOTES:

1. During this initial procedure, take particular care regarding the stability of the transom and of the rollers.
2. Swaybracing is not fitted in this first bay.



SECOND AND SUBSEQUENT BAYS OF SINGLE SINGLE

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	2
Transom	Varies	1
Raker Frame	MC314	2
Swaybrace	Varies	2 Single Lane 4 Two Lanes
Transom/Bracing Bolt	MC11	8 Single Lane 12 Two Lanes
Bracing Bolt	MC206	3 Single Lane 4 Two Lanes
Panel Pin	MC307	4
Safety Clip	MC307A	8

BUILDING SEQUENCE

1. Pin a Panel to each of the Panels of the preceding bay. When the Panel Pins have been driven, fit a Safety Clip to both ends of each one.
2. Fit a Transom in the rear of these Panels.
3. Fit Raker Frames to both trusses and secure them to the Panel Verticals and the Transom with Transom/Bracing Bolts (MC11) and Bracing Bolts (MC206) as indicated on page 5.2.
4. Fit Swaybraces between the Transom in this bay and the Transom in the previous bay using Transom/Bracing Bolts (MC11). Connect the Swaybraces together where they cross at their centres using a Bracing Bolt (MC206). All of these bolts should be entered downwards, so that the nuts are at the bottom.
5. Fit Vertical Braces, if required in this bay.

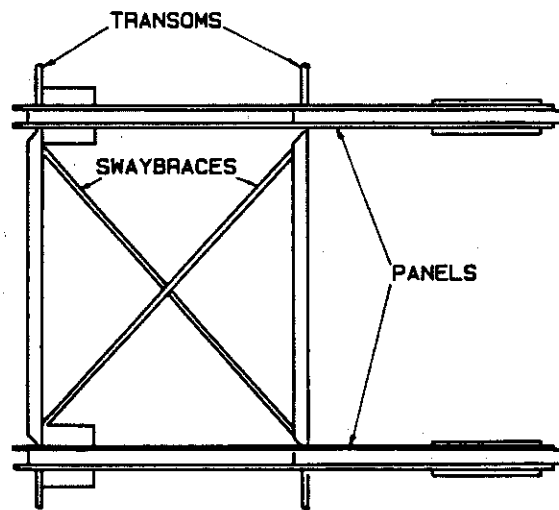
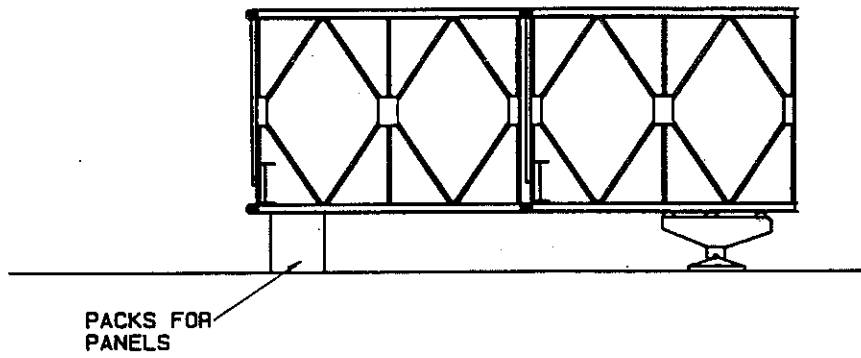
NOTES:

1. Packing should be placed under the rear of the Panels to ensure stability, if required.
2. Remove packing from preceding bays when it is no longer required for stability.
3. The packs beneath the Transom of the first bay must be removed before fitting the swaybracing in the second bay.
4. Raker Frames are not fitted to the last bay of a bridge. The Transom is connected directly to the Panels, therefore, using Transom/Bracing Bolts (MC11). The quantities required for this bay are, therefore, reduced.

Deduct the following:

Raker Frame	MC314	2 No.
Transom/Bracing Bolt	MC11	2 No.
Bracing Bolt	MC206	2 No.

If a tail bay is required for launching however, Raker Frames are fitted temporarily to the last bridge bay and the tail bay.



FIRST BAY OF DOUBLE SINGLE

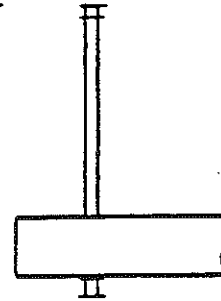
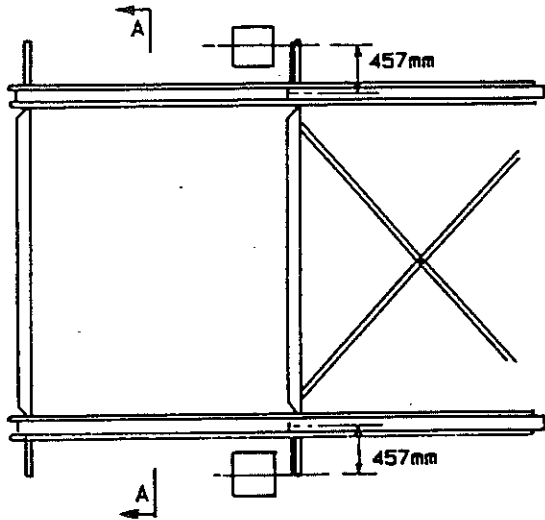
<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	4
Transom	Varies	1
Vertical Frame	MC312	2
Bracing Frame	MC358	2
Swaybrace	Varies	2 Single Lane 4 Two Lanes
Transom/Bracing Bolt	MC11	8 Single Lane 12 Two Lanes
Bracing Bolt	MC206	21 Single Lane 22 Two Lanes
Panel Pin	MC307	4
Safety Clip	MC307A	8

BUILDING SEQUENCE

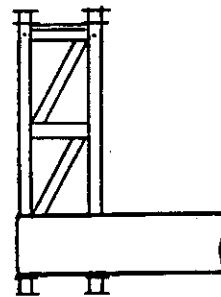
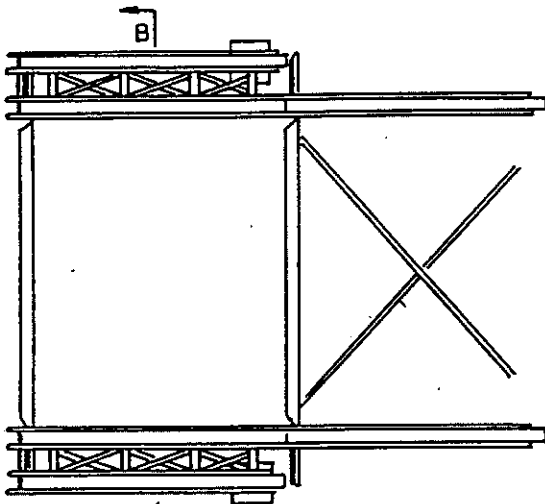
1. Pin a Panel to each of the Panels of the preceding bay.
2. Fit a Transom in the rear of these Panels.
3. Form two packs outside the front of these Panels, to support the forward ends of the two new outer Panels. Position the packs at 457mm (1ft 6ins) outside the existing panel lines, and approximately the same distance behind the Transom of the preceding bay. The top of the packs must be level with the underside of the panels just fitted.
4. Lift a Panel, ensuring that the transom seat is at the bottom, and with the male end towards the gap to be bridged, feed the female end onto one end of the Transom. Engage the Panel's transom seat peg into the appropriate peg-hole in the bottom flange of the Transom. For single lane roadways this is the outermost peg hole in the Transom however, for two lane roadways this is the pen-ultimate peg hole in the Transom. The male end of the Panel will now be on a pack. Ensure that the Panel is parallel to its neighbour and hold the Panel in this position.
5. Fit a Vertical Frame (MC312) to the rear of both Panels, using two Transom/Bracing Bolts (MC11) and two Bracing Bolts (MC206) as indicated on page 5.4. Pass the bolts through the Vertical Frame first and then into the Panel Vertical (and Transom). When this frame has been fitted the Panel may be released.
6. Fit a Bracing Frame (MC358) between the two panels. Connect it to the underside of the top chords, at the chord bolt positions, using eight Bracing Bolts (MC206).
7. Repeat steps '4', '5' and '6' for the opposite truss.
8. Fit Swaybraces between the Transoms.

NOTES:

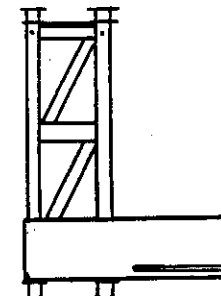
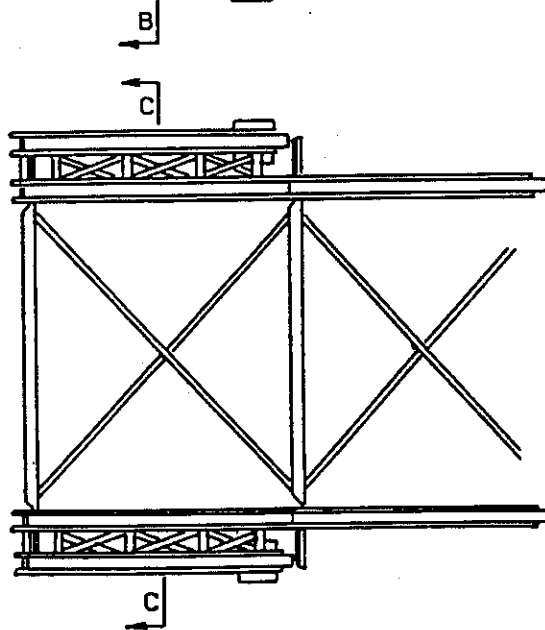
1. If applicable, see the section "CHORD REINFORCED CONSTRUCTIONS".
2. The structure must not be rolled forwards at this stage. Wait, at least, until one more bay of Double Single has been built.



PART SECTION A-A



PART SECTION B-B



PART SECTION C-C

SECOND AND SUBSEQUENT BAYS OF DOUBLE SINGLE

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	4
Transom	Varies	1
Vertical Frame	MC312	2
Bracing Frame	MC358	2
Swaybrace	Varies	2 Single Lane 4 Two Lanes
Transom/Bracing Bolt	MC11	8 Single Lane 12 Two Lanes
Bracing Bolt	MC206	21 Single Lane 22 Two Lanes
Panel Pin	MC307	4
Safety Clip	MC307A	8

BUILDING SEQUENCE

1. Pin a Panel to each Panel of the preceding bay.
2. Fit a Transom in the rear of the Panels.
3. Fit a Vertical Frame to the rear of each truss.
4. Fit a Bracing Frame to the top of each truss.
5. Fit Swaybraces to this bay.
6. Fit Vertical Braces, if required in this bay.

NOTES:

1. When building the second bay of Double Single, the outer panels should be supported at their rear ends by temporary packing, until the Vertical Frames have been fitted.
2. Bracing Frames are not required in the first bay of a bridge when in service, but are temporarily fitted to this bay for launching.
3. Bracing Frames and Vertical Frames are not fitted to the last bay of a bridge. The Transom is connected directly to the Panels, using Transom/Bracing Bolts (MC11).

The quantities required for this bay are, therefore, reduced.

Deduct the following:

Vertical Frame	MC312	2 No.
Bracing Frame	MC358	2 No.
Bracing Bolt	MC206	20 No.

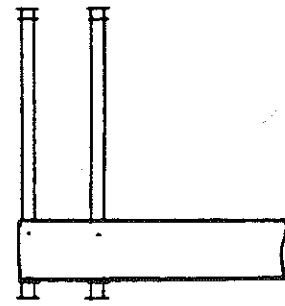
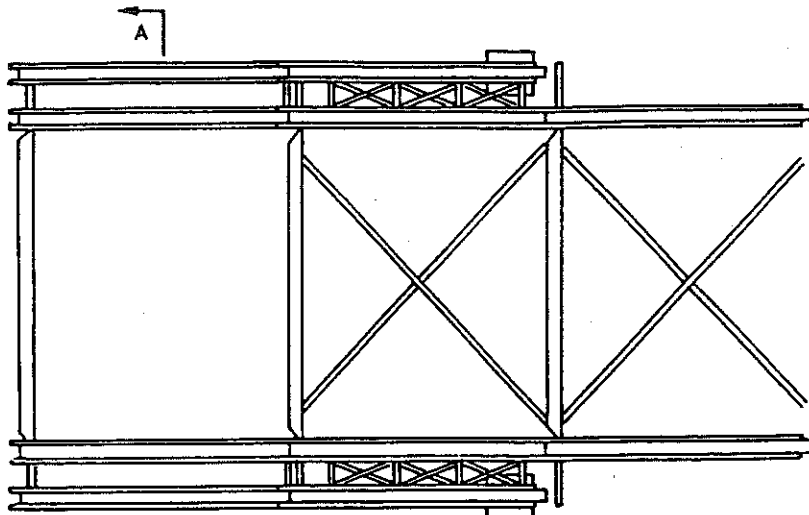
If a tail bay is required for launching however, Vertical Frames are fitted temporarily to the last bridge bay and the tail bay.

4. If the trusses are of Reinforced construction, the Chord Bolts are utilised to connect the Bracing Frames to the Panel Chords.

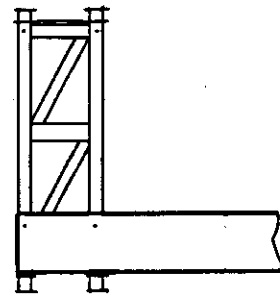
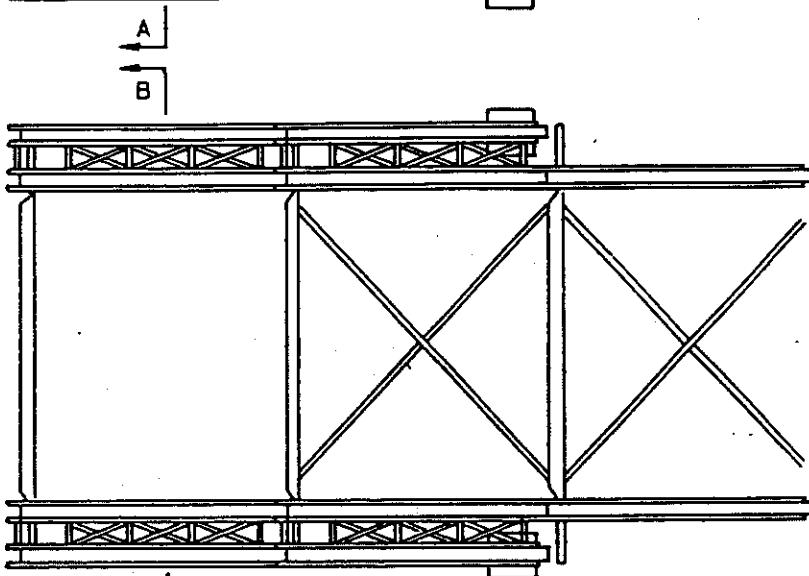
The quantities required for such bays are, therefore, reduced.

Deduct the following:

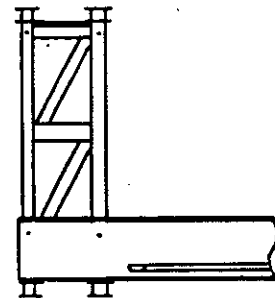
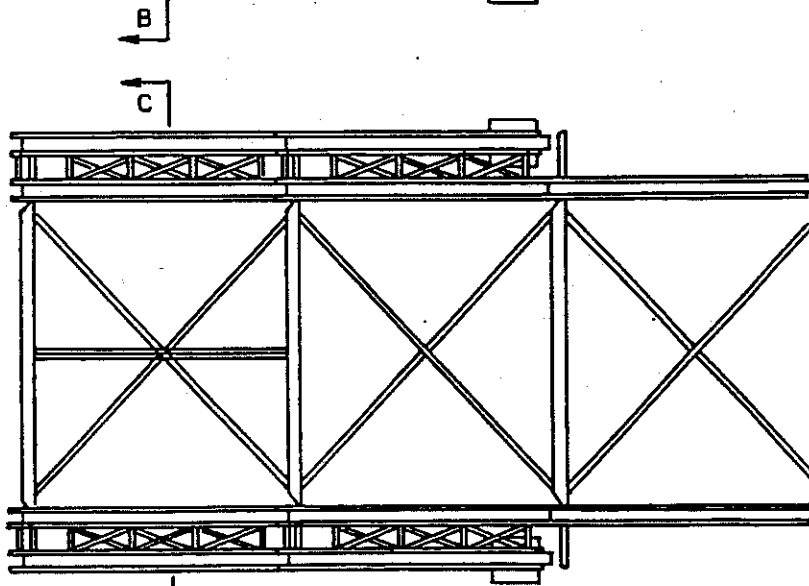
Bracing Bolt	MC206	DSR1(H) 8 No.	DSR2(H) 16 No.
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PART SECTION A-A



PART SECTION B-B



PART SECTION C-C

FIRST BAY OF TRIPLE SINGLE

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	6
Transom	Varies	1
Vertical Frame	MC312	2
Bracing Frame	MC358	2
Swaybrace	Varies	2 Single Lane 4 Two Lanes
Transom/Bracing Bolt	MC11	8 Single Lane 12 Two Lanes
Bracing Bolt	MC206	27 Single Lane 28 Two Lanes
Panel Pin	MC307	4*
Safety Clip	MC307A	8*

* Quantities given assume the previous may to be Single Single.
Double these quantities if the previous bay is Double Single.

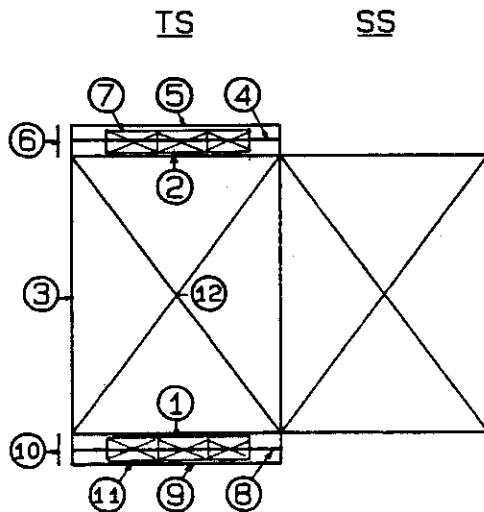
BUILDING SEQUENCE

1. Pin a Panel to each of the Panels of the preceding bay.
2. A. If the construction of the previous bay is Single Single:
 - i) Fit a Transom in the rear of these Panels.
 - ii) Form two packs outside the front of these panels, to support the forward ends of the four new outer Panels. Position the packs approximately 457mm (1ft 6ins) behind the Transom of the preceding bay. The top of the packs must be level with the underside of the Panels just fitted.
 - iii) Lift a Panel, ensuring that the transom seat is at the bottom, and with the male end towards the gap to be bridged feed the female end onto one end of the Transom. Engage the Panel's transom seat peg into the peg hole, in the bottom flange of the Transom, adjacent to the inner panel. The male end of the panel will now be on a pack. Ensure that the Panel is parallel to its neighbour and hold the Panel in this position, by additional packing at the rear. Fit another Panel outside this one in the same manner, engaging it into the next peg hole of the Transom, and hold it in position parallel to its neighbours.
 - iv) Fit a Vertical Frame (MC312) to the rear of the Panels with two Transom/Bracing Bolts (MC11) and three Bracing Bolts (MC206) as indicated on page 5.6. Pass the bolts through the Vertical Frame first and then into the Panel vertical (and Transom). Note that the centre Panel is not bolted at the bottom to the Transom (and Vertical Frame). When this frame has been fitted the Panels may be released.
 - v) Fit a Bracing Frame (MC358) to the top of the Panels. Connect it to the inner and outer Panels using eight Bracing Bolts (MC206), and to the centre panel using two Bracing Bolts (MC206), as indicated on page 5.5.
 - vi) Repeat Steps iii), iv) and v) for the opposite truss

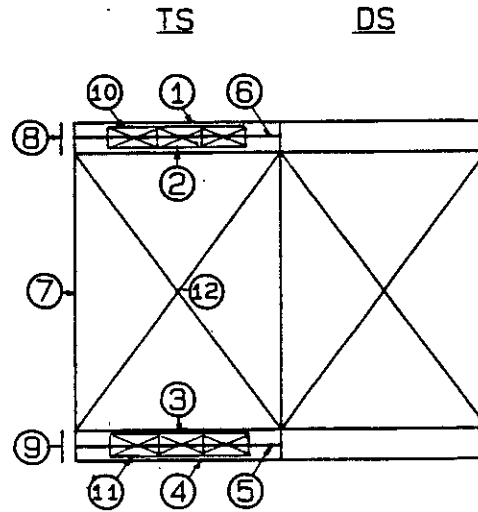
2. B. If the construction of the previous bay is Double Single:
 - i) Form four packs, two per truss, to support the new centre Panels. Each pair of packs should be approximately 2.4m (8ft) apart, longitudinally, and placed centrally between the Panels just fitted. The tops of the packs must be level with the underside of the Panels just fitted.
 - ii) Lift a Panel, ensuring that the transom seat is at the bottom, and with the male end towards the gap to be bridged, feed it between the two Panels of one truss. Position the Panel on the packs such that it is parallel to the inner Panel and distant from it by 241mm (9½ins) centre to centre. Support the Panel in position.
 - iii) Repeat the above procedure to place the centre Panel of the opposite truss.
 - iv) Fit a Transom in the rear of the Panels, engaging all transom seat pegs.
 - v) Fit a Vertical Frame (MC312) to the rear of each truss with two Transom/Bracing Bolts (MC11) and three Bracing Bolts (MC206) per frame, as indicated on page 5.6. Note that the centre Panel of each truss is not bolted at the bottom to the Transom (and Vertical Frame). When these frames have been fitted the Panels may be released.
 - vi) Fit a Bracing Frame (MC358) to the top of each truss. Connect to the inner and outer Panels using eight Bracing Bolts (MC206) per frame, and to the centre Panels using two Bracing Bolts (MC206) per frame, as indicated on page 5.5.
3. Fit Swaybraces between the Transoms.

NOTES:

1. If applicable, see the section "CHORD REINFORCED CONSTRUCTIONS".
2. The structure must not be rolled forwards at this stage. Wait, at least, until one more bay of Triple Single has been built.



SEQUENCE



SEQUENCE

SECOND AND SUBSEQUENT BAYS OF TRIPLE SINGLE

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	6
Transom	Varies	1
Vertical Frame	MC312	2
Bracing Frame	MC358	2
Swaybrace	Varies	2 Single Lane 4 Two Lanes
Transom/Bracing Bolt	MC11	8 Single Lane 12 Two Lanes
Bracing Bolt	MC206	27 Single Lane 28 Two Lanes
Panel Pin	MC307	12
Safety Clip	MC307A	24

BUILDING SEQUENCE

1. Pin a Panel to each Panel of the preceding bay.
2. Fit a Transom in the rear of the Panels.
3. Fit a Vertical Frame to the rear of each truss.
4. Fit a Bracing Frame to the top of each truss.
5. Fit Swaybraces to this bay.
6. Fit Vertical Braces, if required in this bay.

NOTES:

1. When building the second bay of Triple Single, the centre and outer Panels should be supported at their rear ends by temporary packing, until the Vertical Frames have been fitted.
2. Bracing Frames are not required in the first bay of a bridge when in service, but are temporarily fitted to this bay for launching.
3. Bracing Frames and Vertical Frames are not fitted to the last bay of a bridge. The Transom is connected directly to the Panels, using Transom/Bracing Bolts (MC11).

The quantities required for this bay are, therefore, reduced.

Deduct the following:

Vertical Frame	MC312	2 No.
Bracing Frame	MC358	2 No.
Bracing Bolt	MC206	26 No.

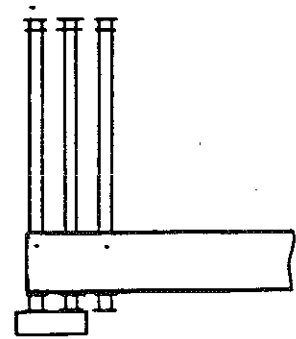
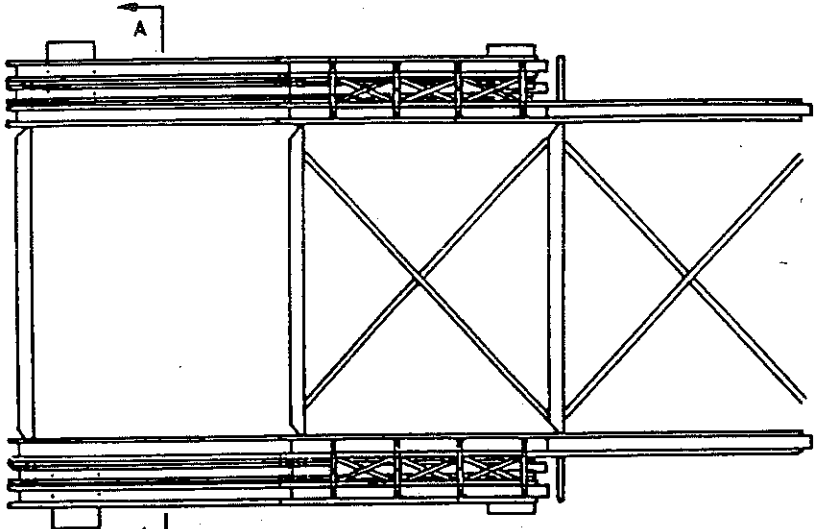
If a tail bay is required for launching however, Vertical Frames are fitted temporarily to the last bridge bay and the tail bay.

4. If the trusses are of TSR2(H) construction, the Bracing Frames are connected to the inner and outer panel lines only, not to the centre panel lines.

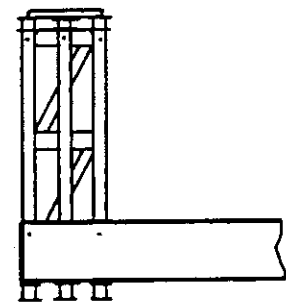
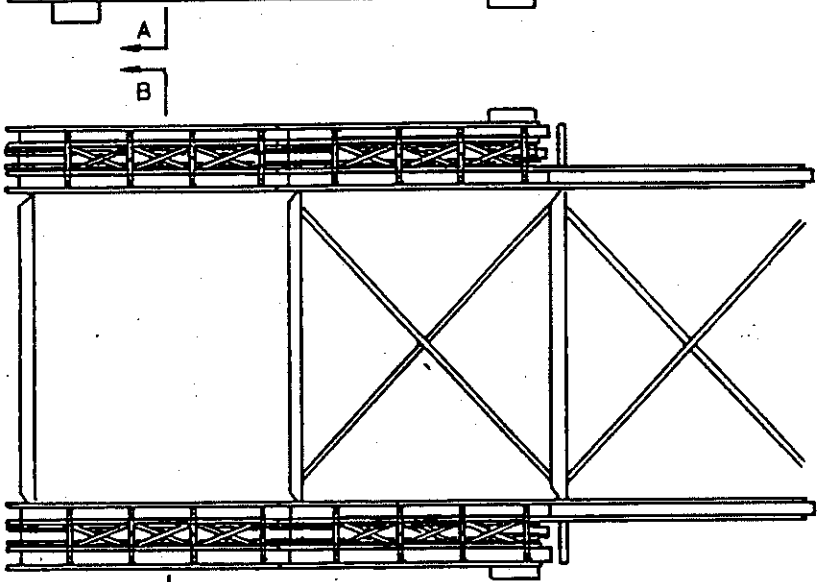
The quantities required for such bays are, therefore, reduced.

Deduct the following:

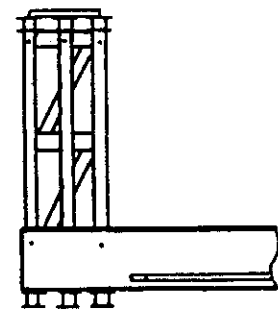
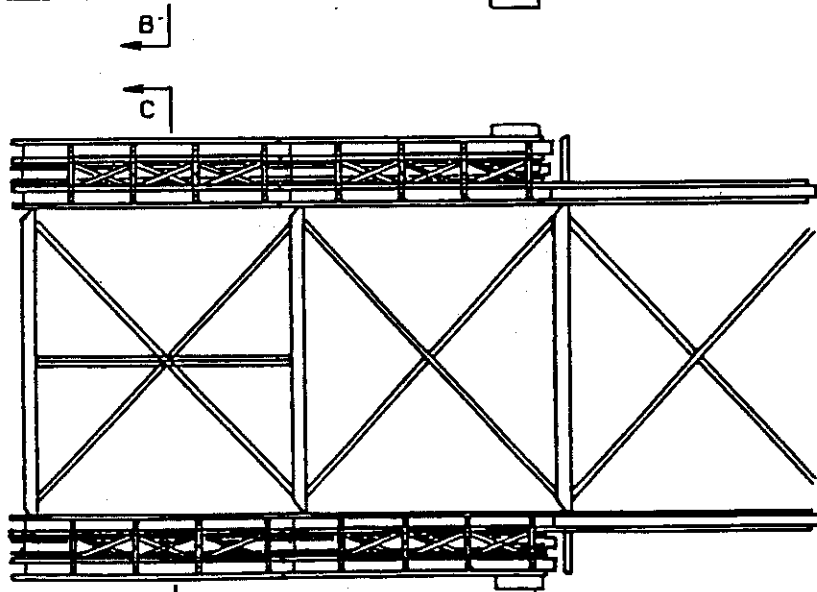
Bracing Bolt	MC206	4 No.
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PART SECTION A-A



PART SECTION B-B



PART SECTION C-C

FIRST BAY OF QUADRUPLE SINGLE

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	8
Transom	Varies	1
Vertical Frame - QS	NLC8091	2
Bracing Frame - QS	MC259	2
Swaybrace - 2 Lane	MC331	4
Transom/Bracing Bolt	MC11	14
Bracing Bolt	MC206	34
Panel Pin	MC307	8 *
Safety Clip	MC307A	16 *

* Quantities given assume the previous bay to be double single.

BUILDING SEQUENCE - assuming the previous bay to be double single

1. Pin a Panel to each of the Panels of the preceding bay.
2. Form eight packs, four per truss, to support the new centre and outer Panels. The packs should be placed in pairs approximately 2.4m (8ft) apart, longitudinally. One pair, per truss, should be placed centrally between the Panels just fitted, and another pair, per truss, should be placed approximately 270mm (11ins) outside the outer Panel just fitted. The tops of the packs must be level with the underside of the Panels.
3. Lift a Panel, ensuring that the Transom seat is at the bottom, and with the male end towards the gap to be bridged, feed it between the two Panels of one truss. Position the Panel on the packs such that it is parallel to the inner panel and distant from it by 241mm. (9½ins), centre to centre. Lift another Panel, in the same manner, and place it outside the outer Panel of the same truss. Position it such that it is parallel to the outer Panel and distant from it by 273mm (10¾ins), centre to centre.
4. Fit a Bracing Frame (MC259) to the top of each truss. Connect to the inner and outer panels using eight Bracing Bolts (MC206) per frame, and to the central panels using four Bracing Bolts (MC206) per frame (2 per panel).
5. Repeat steps '3' and '4' for the opposite truss.
6. Fit a Transom in the Panels, engaging all transom seat pegs.
7. Fit a Vertical Frame (NLC8091) to the rear of each truss, using three Transom/Bracing Bolts (MC11) and four Bracing Bolts (MC206) per frame, as indicated on page 5.8. Note that the second panel from the inside of each truss is not bolted at the bottom to the Transom (and Vertical Frame). When these Frames have been fitted the Panels may be released.
8. Fit Swaybraces between the Transoms.

NOTES

1. If applicable, see the section "CHORD REINFORCED CONSTRUCTIONS".
2. The structure must not be rolled forwards at this stage. Wait, at least, until one more bay of Quadruple Single has been built.

SECOND AND SUBSEQUENT BAYS OF QUADRUPLE SINGLE

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>
Panel	MC200A or 201A	8
Transom	Varies	1
Vertical Frame - QS	NLC8091	2
Bracing Frame - QS	MC259	2
Swaybrace - 2 Lane	MC331	4
Transom/Bracing Bolt	MC11	14
Bracing Bolt	MC206	34
Panel Pin	MC307	16
Safety Clip	MC307A	32

BUILDING SEQUENCE

1. Pin a Panel to each Panel of the preceding bay.
2. Fit a Transom in the rear of the Panels.
3. Fit a Vertical Frame to the rear of each truss.
4. Fit a Bracing Frame to the top of each truss.
5. Fit Swaybraces to this bay.
6. Fit Vertical Braces, if required in this bay.

NOTES

1. When building the second bay of quadruple single, the second and fourth Panel lines should be supported at their rear ends by temporary packing, until the Vertical Frames have been fitted.
2. Bracing Frames are not required in the first bay of a bridge when in service, but are temporarily fitted to this bay for launching.
3. Bracing Frames and Vertical Frames are not fitted to the last bay of a bridge. The Transom is connected directly to the Panels, using Transom/Bracing Bolts (MC11).

The quantities required for this bay are, therefore, reduced.

Deduct the following:

Vertical Frame - QS	NLC8091	2 No.
Bracing Frame - QS	MC259	2 No.
Bracing Bolt	MC206	32 No.

If a tail bay is required for launching however, Vertical Frames are fitted temporarily to the last bridge bay and the tail bay.

4. If the trusses are of QSR3(H) construction, the Bracing Frames are connected to the inner, third and fourth (outer) Panel lines only, not to the second Panel lines.

The quantities required for such bays are, therefore, reduced.

Deduct the following:

Bracing Bolt	MC206	4 no.
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CHORD REINFORCED CONSTRUCTIONS

When required in a bridge span, Chord Reinforcements are fitted to both the top and bottom chords of the Panels in all but the end bays.

In SSR, DSR2, TSR3 and QSR4 constructions, Chord Reinforcements are fitted to all panel lines. In DSR1 construction, they are fitted to the inner panel lines only, in TSR2 construction, they are fitted to the inner and outer panel lines only, and in QSR3 construction, they are fitted to the inner, third and fourth (outer) panel lines only.

When launching a bridge of chord reinforced construction, some bays of the launching nose and bridge require Chord Reinforcements to be fitted either to the top chords only, or to the bottom chords only. Such constructions are denoted by the use of the letters "D" and "N" respectively. For example, SSD construction has reinforced top chords only whereas SSN construction has reinforced bottom chords only.

Furthermore, as with the bridge constructions, such bays may not require Chord Reinforcements to be fitted to all of the panel lines. For example, DSN1 construction has reinforced bottom chords on the inner panel lines only and TSN2 construction has reinforced bottom chords on the inner and outer panel lines only.

Chord Reinforcements are available in two strengths, standard and heavy. Heavy Chord Reinforcements (MC304) are identifiable by small plates attached to the webs of the channels near to the male end. Standard Chord Reinforcements (MC302) do not have these small plates.

Heavy Chord Reinforcements impart greater bending strength to the structure than Standard Chord Reinforcements. Standard Reinforcements must never, therefore, be substituted for Heavy Reinforcements.

PARTS REQUIRED

CONSTRUCTION		SSD SSN DSN1 TSN1	DSD DSN2 TSN2 QSN2	SSR DSR1	DSR2 TSR2	TSR3 QSR3	QSR4
COMPONENT	MARK NO.	QUANTITY					
CHORD REINFORCEMENT	MC302	2	4	4	8	12	16
CHORD BOLT	MC207	8	16	16	32	48	64
PANEL PIN *	MC307	2	4	4	8	12	16
SAFETY CLIP *	MC307A	4	8	8	16	24	32

* The quantities of these parts may be reduced, depending upon the construction of the preceding bay.

Where constructions require Heavy Chord Reinforcements, substitute MC304 for MC302 in the above table.

BUILDING SEQUENCE

A. BOTTOM CHORD REINFORCEMENT

Chord Reinforcements are most easily fitted to the bottom of Panels before the Panels are connected to the main structure.

1. Ensure that the male ends of both Panel and Chord Reinforcement are facing the same direction.
2. Pass four Chord Bolts (MC207) into the Chord Reinforcement and through the bottom chord of the Panel. Fit nuts to the bolts but **do not** fully tighten.
3. Fit this sub-assembly into the main structure, connecting the top and bottom chords of the Panel to those of the preceding bay, before connecting the Chord Reinforcement to that of the preceding bay, with Panel Pins (MC307).

B. TOP CHORD REINFORCEMENT

Chord Reinforcements are most easily fitted to the top of Panels after the Panels have been connected to the main structure.

1. Construct a bay in the same manner as for an unreinforced bay, but with bottom Chord Reinforcements pre-attached to the Panels, as per the above method, where applicable.
2. Place Chord Reinforcements on top of the relevant Panels, ensuring that the male ends of the Reinforcements face the same direction as those of the Panels.
3. Pass four Chord Bolts (MC207) down into each Chord Reinforcement and through the top chord of the Panel. Fit nuts to the bolts but **do not** fully tighten.
4. Connect the Chord Reinforcements to those of the preceding bay, where applicable, with Panel Pins (MC307).

NOTES

1. Double truss constructions require Bracing Frames (MC358) to be connected to the underside of the top chords of the Panels. Where a Panel is chord reinforced, the Chord Bolts are utilised to connect both the Chord Reinforcement and the Bracing Frame to the Panel. In this case it is necessary to fit the Bracing Frame over the protruding ends of the Chord Bolts before attaching nuts to the bolts.
2. Triple and Quadruple truss constructions have Bracing Frames connected to the top of the Chord Reinforcements, in the same manner as they would be connected to the top chords of the Panels in unreinforced constructions.
3. If difficulty is found in driving a Panel Pin when connecting Chord Reinforcements to those of the adjacent bay, it may be beneficial to loosen the Chord Bolts.
4. Do not fully tighten the Chord Bolts in any bay until the subsequent bay has been constructed.

STEEL DECKING FOR HS20 TYPE LOADINGS

<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>QUANTITIES</u>		
		<u>STD.</u>	<u>E.W.</u>	<u>2 LANE</u>
Deck - 1606	MC211	2	2	4
Deck - 803	MC212	-	1	1
Deck Screw	MC271	8	12	20
Deck Nut	MC272	8	12	20
Kerb	MC300	2	2	2
Bracing Bolt	MC206	8	8	8

BUILDING SEQUENCE

1. Place Deck Nuts (MC272) into the facing openings of the saddles on the top flanges of adjacent Transoms.
2. Place the requisite Deck Units, appropriate for the roadwidth, spanning between the adjacent Transoms. Locate the Deck Units such that the holes in their top plates are directly above the holes in the saddles on the Transoms. Note that each saddle has an upstand, at its centre, which must remain outside the end diaphragm of the Deck Unit.
3. Look down through the holes in the top plates of the Deck Units and ensure that the Deck Nuts are correctly located.
4. Fit the Deck Screws (MC271) but do not tighten them until the decking has been placed in the adjacent bays.
5. Attach a Kerb (MC300) to the side of each outer Deck Unit using four Bracing Bolts (MC206).

PARTS REQUIRED FOR END OF BRIDGE BAYS

The components and quantities required for an End of Bridge bay are as per those listed above for an Intermediate Bay except as follows:

- A. For Deck - 1606 (MC211) substitute Deck - 1606 - EOB (MC213)
- B. For Deck - 803 (MC212) substitute Deck - 803 - EOB (MC214)
- C. For Kerb (MC300) substitute Kerb - EOB (MC301)

BUILDING SEQUENCE

The procedure for an End of Bridge bay is identical to that for an Intermediate Bay, except that the Deck Nuts must be located in the outermost positions in the saddles on top flange of the end Transom. Note that EOB Decks completely cover the saddles on the end Transom.

NOTES

1. If suitable lifting equipment is available, it is easier to bolt the kerbs onto the Decks before placing them onto the structure.
2. Ensure, when lifting Deck Units, that they are safely supported.
3. Pairs of 803 Deck Units may be used in place of 1606 Deck Units.

STEEL DECKING FOR HS25/MS250/HA TYPE LOADINGS

The steel decking for these heavier design load systems is identical to that used for the HS20 type loadings, except that the Deck Units are bolted together, side to side, to enhance load distribution.

Hence the quantities required per bay are increased as follows:

<u>PARTS REQUIRED</u>		<u>QUANTITIES</u>		
<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>STD.</u>	<u>E.W.</u>	<u>2 LANE</u>
Bracing Bolt	MC206	+3	+6	+12

BUILDING SEQUENCE

1. Fit the decking as described for HS20 type loadings.
2. Bolt the individual Deck Units together, side to side, using three Bracing Bolts (MC206) per joint. There are five holes in the side channels of the Deck Units, the inner three of which are to be used for this side to side connection (that is the hole in the centre and the holes at 500mm either side of the centre).

NOTES

1. If suitable lifting equipment is available, it is easier to bolt the kerbs onto the decks before placing them onto the structure.
2. Ensure, when lifting Deck Units, that they are safely supported.
3. Pairs of 803 Deck Units may be used in place of 1606 Deck Units. This will increase the number of deck joints however, which will further increase the quantity of Bracing Bolts required per bay.

<u>PARTS REQUIRED</u>		<u>QUANTITIES</u>		
<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>STD.</u>	<u>E.W.</u>	<u>2 LANE</u>
Bracing Bolt	MC206	+6	+6	+12

TIMBER DECKING FOR HS20 TYPE LOADINGS

<u>PARTS REQUIRED FOR INTERMEDIATE BAYS</u>		<u>QUANTITIES</u>	
<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>STD.</u>	<u>E.W.</u>
Plain Stringer	MC7	2	3
Button Stringer	MC8	2	2
Deck Screw	MC271	8	10
Deck Nut	MC272	8	10
Kerb - Timber Deck	MC13	2	2
Kerb Bolt	MC10	8	8
Chess - Std	MC14	13	-
Chess - E.W.	MC144	-	13

BUILDING SEQUENCE

1. Place Deck Nuts (MC272) into the facing openings of the saddles on the top flanges of adjacent Transoms. Note that all saddles are used for Standard roadway, but for Extra Wide roadway, one of the two opposing pairs which are adjacent to the centreline of the bridge is not used, hence do not place nuts in one pair. It is unimportant from which of the two pairs the nuts are omitted, but it is best to be consistent along the length of the bridge.
2. Place a Button Stringer (MC8) spanning between adjacent Transoms at the outer position adjacent to each truss line, and such that the pegs are on the side nearest to the Panels. They should be located such that the holes in the end diaphragms are directly above the holes in the saddles on the Transoms.
3. Place two Plain Stringers (MC7) for Standard roadway, or three for Extra Wide roadway, spanning between the adjacent Transoms at the inner positions, such that the holes in the end diaphragms are directly above the holes in the saddles on the Transoms.

The Plain Stringers adjacent to the Button Stringers should be oriented such that they are as close as possible to the latter.

Confirm that the Deck Nuts have been placed in the correct pair of saddles beneath the centre stringer of an Extra Wide roadway.

4. Look down through the holes in the end diaphragms of all of the Stringers and ensure that the Deck Nuts are correctly located.
5. Fit, but do not tighten, the Deck Screws (MC271).
6. Omitting the first and the last Chesses of the bay, place eleven Chesses, locating on the Button Stringer pegs where applicable.
7. Tighten the Deck Screws to clamp all of the Stringers.
8. Place the two end Chesses, then fit a Timber Deck Kerb (MC13) to each side using four Kerb Bolts (MC10). Enter the bolts down through the Kerb, Chess and Stringer, then fit nuts and tighten.

PARTS REQUIRED FOR END OF BRIDGE BAYS

The Components and quantities required for an End of Bridge bay are as per those for an intermediate bay with the following additions:

Timber Infill - EOB - STD. NLC8087 1 No. (Standard Roadway)
 Timber Infill - EOB - E.W. NLC8088 1 No. (Extra Wide Roadway)

BUILDING SEQUENCE

The procedure for an End of Bridge bay is identical to that for an Intermediate bay, except that finally the Timber Infill is placed on the end Transom, to cover the protruding edge of the top flange.

TIMBER DECKING FOR HS25/MS250/HA TYPE LOADING

The Timber Decking for these heavier design loadings is identical to that used for the HS20 type loadings, except for the addition of an under-deck stiffener, fitted transversly beneath the Stringers, to enhance load distribution.

Hence the quantities required per bay are increased as follows:

PARTS REQUIRED PER BAY

QUANTITIES

<u>DESCRIPTION</u>	<u>MARK NO.</u>	<u>STD.</u>	<u>E.W.</u>
Stiffener - Timber Deck - Std.	MC226	+1	-
Stiffener - Timber Deck - E.W.	MC227	-	+1
Bracing Bolt	MC206	+4	+5

BUILDING SEQUENCE

Fit the decking by the procedure described for HS20 type loadings, but immediately before placing the Chesses, fit the Stiffener to the underside of the Stringers, connecting it to the centre diaphragm of each one with a Bracing Bolt (MC206).

ENDS OF BRIDGE - SINGLE TRUSS

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>	
		<u>FEMALE END</u>	<u>MALE END</u>
End Post - Male	MC317	2	-
End Post - Female	MC318	-	2
Panel Pin	MC307	4	4
Safety Clip	MC307A	8	8
Transom	Varies	-	1
Transom/Bracing Bolt	MC11	-	2
Bearing	MC19	2	2
Baseplate	MC236	2	2

BUILDING SEQUENCE - This sequence describes assembly of parts only, refer also to the following section on Jacking.

FEMALE END (TAIL) OF BRIDGE

1. Pin a Male End Post (MC317) to the rear of each Panel with bolt-holes facing outward.
2. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
3. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

MALE END (NOSE) OF BRIDGE

1. Pin a Female End Post (MC318) to the front of each Panel.
2. Locate a Transom Bolt (MC11) in the bottom of each End Post.
3. Place a Transom on the End Posts, engaging the Transom seat pegs into the peg-holes in the bottom flange of the Transom.
4. Locate the Transom Bolts through the web of the Transom, fit nuts and tighten, ensuring that the heads of the bolts are located in the hexagonal recesses within the End Posts.
5. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
6. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

ENDS OF BRIDGE - DOUBLE TRUSS

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>	
		<u>FEMALE END</u>	<u>MALE END</u>
End Post - Male	MC317	4	-
End Post - Female	MC318	-	4
Panel Pin	MC307	8	8
Safety Clip	MC307A	16	16
Tie Beam	MC329	2	2
Bracing Bolt	MC206	4	4
Transom	Varies	-	1
Transom/Bracing Bolt	MC11	-	4
Bearing	MC19	4	4
Baseplate	MC236	4	4

BUILDING SEQUENCE - This sequence describes assembly of parts only, refer also to the following section on Jacking.

FEMALE END (TAIL) OF BRIDGE

1. Pin a Male End Post (MC317) to the rear of each Panel with bolt-holes facing outward.
2. Locate a Bracing Bolt (MC206) in the top of each End Post.
3. Fit a Tie Beam (MC329) across the End Posts of each truss line. Place the Beams over the protruding ends of the Bracing Bolts, fit nuts and tighten, ensuring that the heads of the bolts are located in the hexagonal recesses within the End Posts.
4. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
5. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

MALE END (NOSE) OF BRIDGE

1. Pin a Female End Post (MC318) to the front of each Panel.
2. Locate a Bracing Bolt (MC206) in the top of each End Post.
3. Fit a Tie Beam (MC329) across the End Posts of each truss line.
4. Locate a Transom Bolt (MC11) in the bottom of each End Post.
5. Place a Transom on the End Posts, engaging the Transom seat pegs into the peg-holes in the bottom flange of the Transom.
6. Locate the Transom Bolts through the web of the Transom, fit nuts and tighten, ensuring that the heads of the bolts are located in the hexagonal recesses within the End Posts.
7. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
8. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

ENDS OF BRIDGE - TRIPLE TRUSS

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>	
		<u>FEMALE END</u>	<u>MALE END</u>
End Post - Male	MC317	6	-
End Post - Female	MC318	-	6
Panel Pin	MC307	12	12
Safety Clip	MC307A	24	24
Tie Beam	MC329	2	2
Bracing Bolt	MC206	6	6
Transom	Varies	-	1
Transom/Bracing Bolt	MC11	-	4
Bearing	MC19	6	6
Baseplate	MC236	6	6

BUILDING SEQUENCE - This sequence describes assembly of parts only, refer also to the following section on Jacking.

FEMALE END (TAIL) OF BRIDGE

1. Pin a Male End Post (MC317) to the rear of each Panel with bolt-holes facing outward.
2. Locate a Bracing Bolt (MC206) in the top of each End Post.
3. Fit a Tie Beam (MC329) across the End Posts of each truss line. Place the Beams over the protruding ends of the Bracing Bolts, fit nuts and tighten, ensuring that the heads of the bolts are located in the hexagonal recesses within the End Posts.
4. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
5. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

MALE END (NOSE) OF BRIDGE

1. Pin a Female End Post (MC318) to the front of each Panel.
2. Locate a Bracing Bolt (MC206) in the top of each End Post.
3. Fit a Tie Beam (MC329) across the End Posts of each truss line.
4. Locate a Transom Bolt (MC11) in the bottom of the inner and outer End Posts of each truss line.
5. Place a Transom on the End Posts, engaging the Transom seat pegs into the peg-holes in the bottom flange of the Transom.
6. Locate the Transom Bolts through the web of the Transom, fit nuts and tighten, ensuring that the heads of the bolts are located in the hexagonal recesses within the End Posts.
7. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
8. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

ENDS OF BRIDGE - QUADRUPLE TRUSS

<u>PARTS REQUIRED</u>	<u>MARK NO</u>	<u>QUANTITY</u>	
		<u>FEMALE END</u>	<u>MALE END</u>
End Post - Male	MC317	8	-
End Post - Female	MC318	-	8
Panel Pin	MC307	16	16
Safety Clip	MC307A	32	32
Tie Beam - QS	NLC8093	2	2
Bracing Bolt	MC206	8	8
Transom	Varies	-	1
Transom/Bracing Bolt	MC11	-	6
Bearing	MC19	8	8
Baseplate	MC236	8	8

BUILDING SEQUENCE - This sequence describes assembly of parts only, refer also to the following section on jacking.

FEMALE END (TAIL) OF BRIDGE

1. Pin a Male End Post (MC317) to the rear of each Panel, with the bolt holes facing outward.
2. Locate a Bracing Bolt (MC206) in the top of each End Post.
3. Fit a Tie Beam (NLC8093) across the End Posts of each truss line, placing the Ties over the protruding ends of the Bracing Bolts. Fit nuts and tighten, ensuring that the heads of the bolts are located in the hexagonal recesses within the End Posts.
4. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
5. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

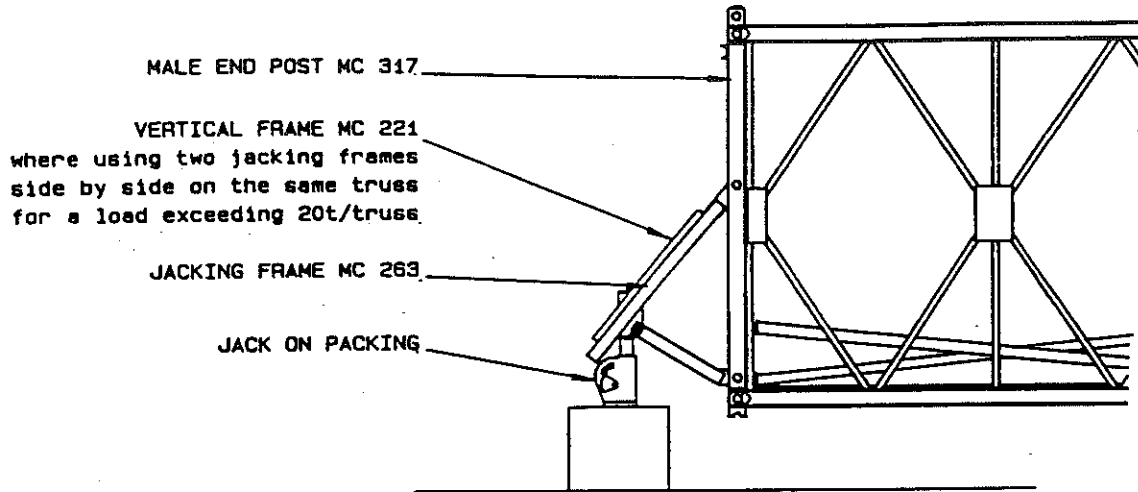
MALE END (NOSE) OF BRIDGE

1. Pin a Female End Post (MC318) to the front of each Panel.
2. Locate a Bracing Bolt (MC206) in the top of each End Post.
3. Fit a Tie Beam (NLC8093) across the End Posts of each truss line.
4. Locate a Transom Bolt (MC11) in the bottom of the inner, third & fourth (outer) End Posts of each truss line.
5. Place a Transom on the End Posts, engaging the transom seat pegs into the peg holes in the bottom flange of the Transom.
6. Locate the Transom Bolts through the web of the Transom, fit nuts and tighten, ensuring that the heads of the bolts are located in the hexagonal recesses within the End Posts.
7. Place a Bearing (MC19) on a Baseplate (MC236) beneath each Post.
8. Lower the Bridge onto the Bearings, locating the half-round cups on the bottom of the Posts over the round bars of the Bearings.

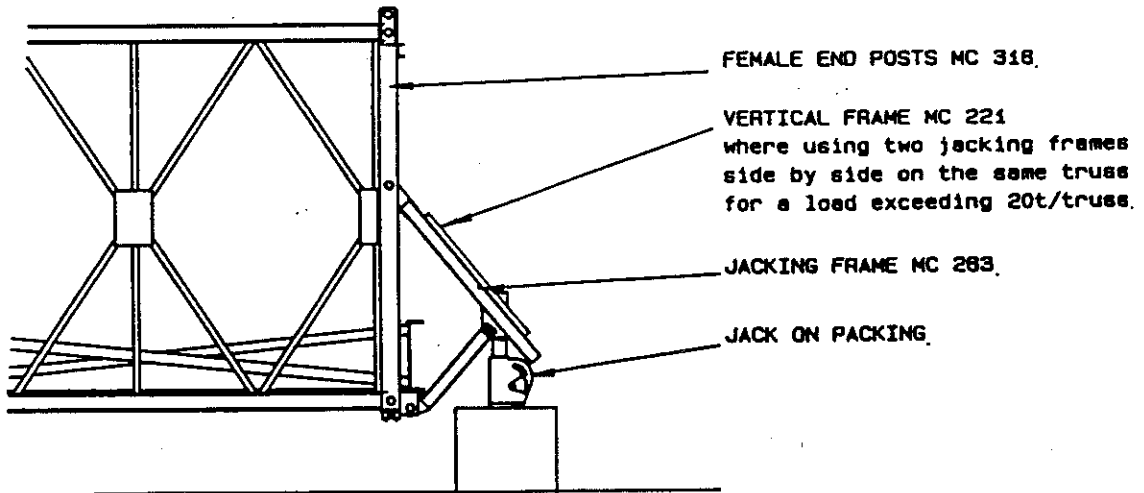
JACKING FRAME

MARBCV

FEMALE END OF BRIDGE



MALE END OF BRIDGE



JACKING

<u>PARTS REQUIRED</u>	<u>MARK NO.</u>	<u>QUANTITY</u>	
		<u>JACKING LOAD PER END OF BRIDGE</u>	
		<u>UP TO 40t</u>	<u>ABOVE 40t</u>
Jacking Frame	MC263	2	4
Panel Pin	MC307	4	8
Safety Clip	MC307A	8	16
Vertical Frame-100	MC221	-	2
Bracing Bolt	MC206	-	8
Jack - 30t	-	2	4

The above quantities of parts are sufficient for one end of a bridge. They should be transferred from end to end as necessary when jacking.

JACKING SEQUENCE

The following procedures assume that the launching and the landing rollers have been in set from the bridge bearing positions, such that no tail bay has been required, and that the launching nose can be completely dismantled prior to commencement of jacking.

If the launching and/or the landing rollers have been placed on the bridge bearing positions, additional stages will be necessary during the jacking procedure, as the rollers have to be removed before the tail bay and/or the last bay of the launching nose can be dismantled. The principles of the procedures, however, remain unaltered.

JACKING AT THE REAR (FEMALE) END OF A BRIDGE

1. Spike the landing rollers to prevent any movement of the bridge.
2. Remove any counterweight from the end bays of the bridge.
3. Pin a Male End Post (MC317) to the rear of each end bay Panel.
4. Fit a Tie Beam across the End Posts of each multiple panel truss.
5. If the bridge trusses are of single panel construction, pin a Jacking Frame (MC263) to each of the End Posts.

If the bridge trusses are of multiple panel construction, and the jacking load per end of bridge is 40t or less, pin a Jacking Frame (MC263) to the inner End Post of each truss.

If the bridge trusses are of double or triple panel construction, and the jacking load per end of bridge exceeds 40t, pin a Jacking Frame (MC263) to the inner and outer End Posts of each truss.

If the bridge trusses are of quadruple panel construction, and the jacking load per end of bridge exceeds 40t, pin a Jacking Frame (MC263) to the inner and third End Posts of each truss.

6. Where two Jacking Frames are fitted side by side on each truss, fit a Vertical Frame-100 (MC221) to each pair of Jacking Frames using four Bracing Bolts (MC206) per Vertical Frame.

7. Place a Jack (30t) on stable packing beneath each Jacking Frame.
8. Raise both sides of the bridge, simultaneously, by 50mm (2ins).
9. Remove the launching rollers from beneath the end bay of bridge.
10. Place stable packs, of equal height, beneath each End Post.
11. Lower both sides of the bridge, simultaneously, onto the packs.
12. Decrease the height of the packing under the Jacks.
13. Raise both sides of the bridge, simultaneously, off the packs.
14. Decrease the height of the packs under the End Posts.
15. If Chord Reinforcements have been fitted to the underside of the Panels in the last bay of bridge, remove them now.
16. Lower both sides of the bridge, simultaneously, onto the packs.
17. Continue to lower the bridge in stages, by decreasing the height of the packing under the Jacks and the End Posts alternately, until the End Posts are located on the Bearings.

If the longitudinal slope of the bridge approaches 1:100 during this process however, lower the bridge onto stable packs, under the End Posts, and proceed to the other end of the bridge.

JACKING AT THE FRONT (MALE) END OF AN UNREINFORCED BRIDGE

1. Dismantle the launching nose completely.
2. Pin a Female End Post (MC318) to the front of each end bay Panel.
3. Fit a Tie Beam across the End Posts of each multiple panel truss.
4. Fit a Transom onto the End Posts.
5. Fit Swaybraces and Vertical Braces in the end bay of the bridge.
6. If the bridge trusses are of single panel construction, pin a Jacking Frame (MC263) to each of the End Posts.

If the bridge trusses are of multiple panel construction, and the jacking load per end of bridge is 40t or less, pin a Jacking Frame (MC263) to the inner End Post of each truss.

If the bridge trusses are of double or triple panel construction, and the jacking load per end of bridge exceeds 40t, pin a Jacking Frame (MC263) to the inner and outer End Posts of each truss.

If the bridge trusses are of quadruple panel construction, and the jacking load per end of bridge exceeds 40t, pin a Jacking Frame (MC263) to the inner and third End Posts of each truss.

7. Where two Jacking Frames are fitted side by side on each truss, fit a Vertical Frame-100 (MC221) to each pair of Jacking Frames using four Bracing Bolts (MC206) per Vertical Frame.

8. Place a Jack (30t) on stable packing beneath each Jacking Frame.
9. Raise both sides of the bridge, simultaneously, by 50mm (2ins).
10. Remove the landing rollers from beneath the end bay of bridge.
11. Place stable packs, of equal height, beneath each End Post.
12. Lower both sides of the bridge, simultaneously, onto the packs.
13. By systematically decreasing the height of the jacking packs, raising the bridge, decreasing the height of the End Post packs and lowering the bridge, install the bridge on its bearings.

If the longitudinal slope of the bridge approaches 1:100 during this process however, lower the bridge onto stable packs, under the End Posts, and proceed to the other end of the bridge.

JACKING AT THE FRONT (MALE) END OF A REINFORCED BRIDGE

1. Dismantle all but the last bay of launching nose.
2. If the remaining bay of nose is a "Nose Drop Bay" (SSD or DSD), remove it, dispense with Chord Reinforcements, then refit it to the end bay of bridge Panel to Panel (SS or DS).
3. Remove any Chord Reinforcements from the remaining bay of nose.
4. If the jacking load at this end of the bridge exceeds 40t, and the remaining bay of nose is of Single Single construction, then increase the construction of this bay to Double Single.
5. If the jacking load at this end of the bridge is less than 40t, and the remaining bay of nose is of Single Single construction, pin a Female End Post (MC318) to the front end of each Panel.

If the jacking load at this end of the bridge is less than 40t, and the remaining bay of nose is of Double Single construction, pin a Female End Post (MC318) to the inner Panel of each truss.

If the jacking load at this end of the bridge exceeds 40t, pin a Female End Post (MC318) to all four Panels of the nose bay.

6. Fit a Transom onto the End Posts and reinstate Swaybraces in the nose bay. It is not necessary to fit Vertical Braces however.
7. Pin a Jacking Frame (MC263) to each of the End Posts.
8. Where two Jacking Frames are fitted side by side on each truss, fit a Vertical Frame-100 (MC221) to each pair of Jacking Frames using four Bracing Bolts (MC206) per Vertical Frame.
9. Place a Jack (30t) on stable packing beneath each Jacking Frame.
10. Raise both sides of the bridge, simultaneously, by 50mm (2ins).
11. Remove the landing rollers from beneath the end bay of bridge.
12. Remove the Chord Reinforcements from the end bay of bridge.

13. Place stable packs, of equal height, beneath the end bay of the bridge. They should be positioned as close as possible to the junction of the bridge and the nose bay, but clear of the joint to facilitate the removal of the nose bay Panels.
14. Lower both sides of the bridge, simultaneously, onto the packs.
15. Dismantle the remaining bay of the launching nose.
16. Pin a Female End Post (MC318) to the front of each end bay Panel.
17. Fit a Tie Beam across the End Posts of each multiple panel truss.
18. Fit a Transom onto the End Posts.
19. Fit Swaybraces and Vertical Braces in the end bay of the bridge.
20. Pin Jacking Frames to the End Posts, in the same configuration as previously used when they were pinned to the nose bay, and refit Vertical Frames-100 to the Jacking Frames as appropriate.
21. Place a Jack (30t) on stable packing beneath each Jacking Frame.
22. By jacking and alternately decreasing the pack heights beneath the end bay and the Jacks, lower the bridge onto its bearings.

If the longitudinal slope of the bridge approaches 1:100 during this process however, lower the bridge onto stable packs, under the End Posts, and proceed to the other end of the bridge.

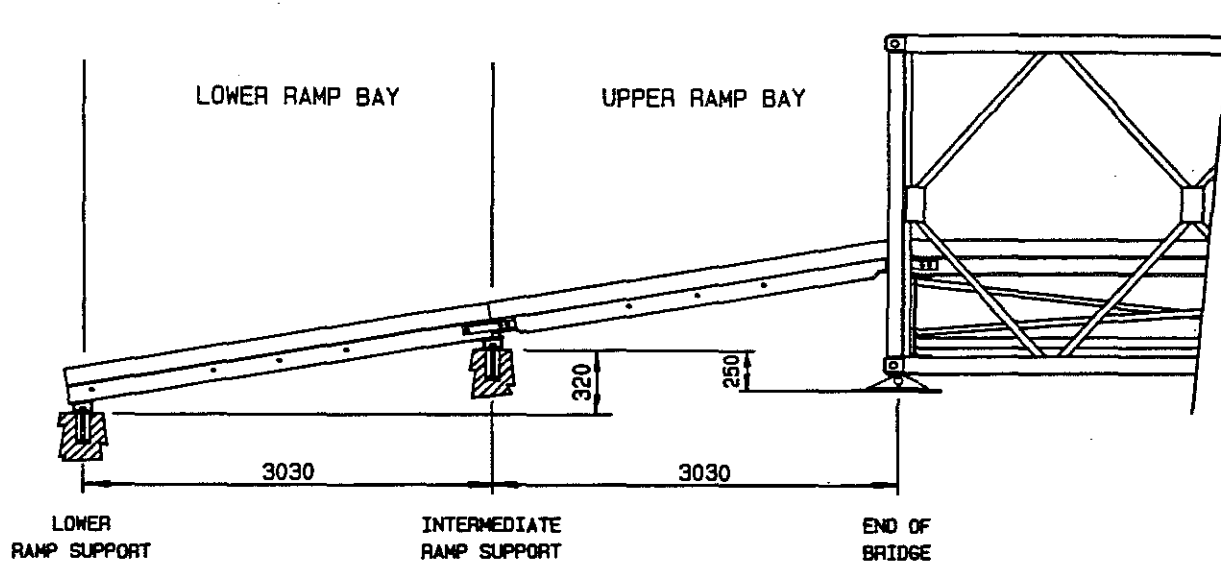
NOTES:

1. When Jacking, it is important to ensure that both of the trusses are raised and lowered simultaneously. Furthermore, when two Jacks are used beneath two adjacent Jacking Frames on each truss, ensure that the applied load is shared equally between the Jacks.
2. Always have a catch pack positioned for safety when jacking.
3. Never work under a structure supported only by Jacks.
4. Never support both ends of the bridge on Jacks at the same time.
5. When jacking at one end of a bridge, ensure that the other end is safely supported and cannot move.
6. Where horizontal Bracing Frames have been fitted temporarily, for launching, to the first or last bay of bridge, they may now be removed.
7. It is advisable to fix the bearing baseplates to the foundations, using two 24mm diameter bolts (approx. 250mm long) per baseplate. If this is to be done however, the bolts must be installed under the bearing baseplates, in pockets within the foundations, before the bridge is lowered onto its bearings. Subsequently, once the bridge has been enplaced, the bolts can be fixed with grout.

END OF BRIDGE RAMPS

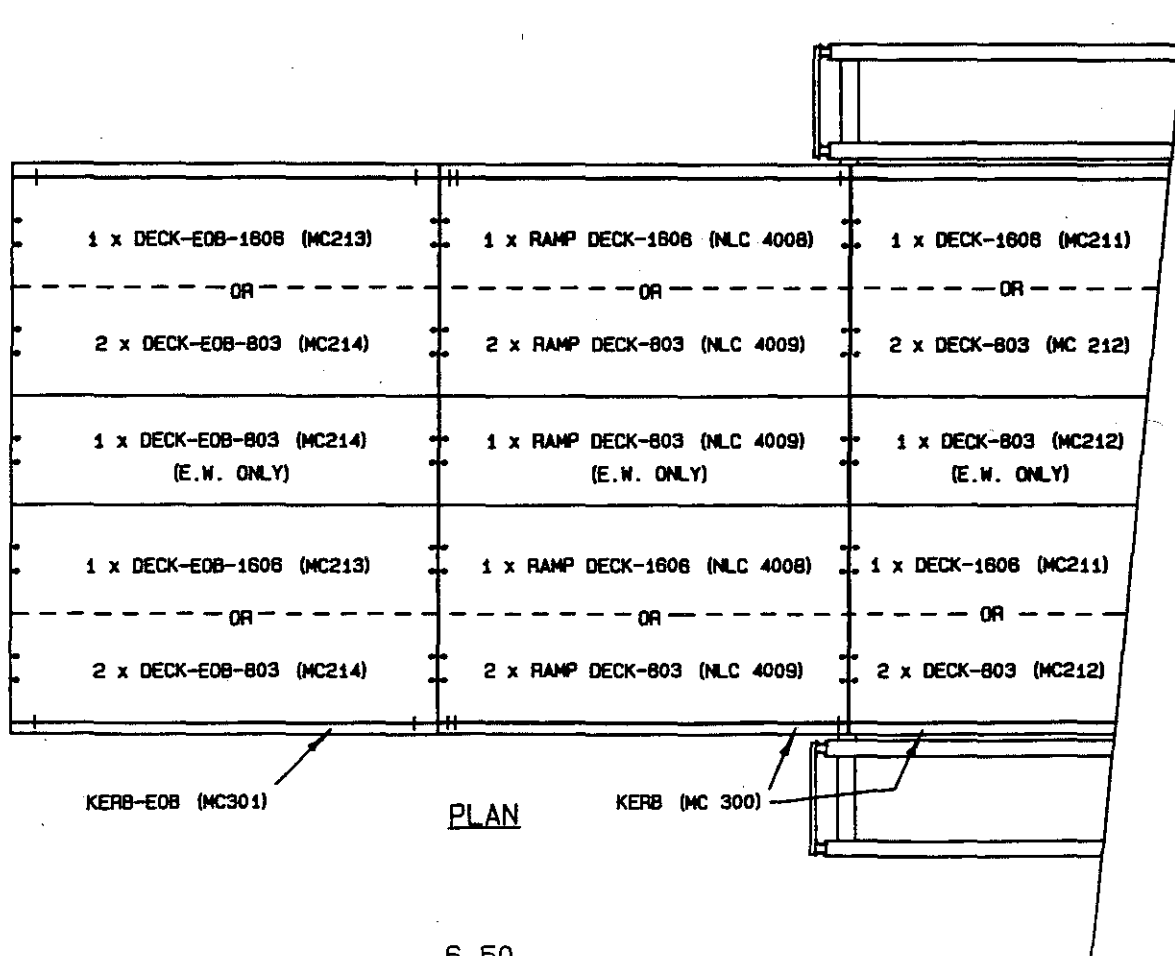
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GENERAL ARRANGEMENT



ELEVATION

(Nearside kerbs omitted for clarity)



END OF BRIDGE RAMPS

PARTS REQUIRED PER RAMP

QUANTITIES

<u>DESCRIPTION</u>	<u>MARK NO</u>	<u>STD</u>	<u>E W</u>
DECK - 1606	MC211	2	2
DECK - 803	MC212	-	1
RAMP DECK - 1606	NLC4008	2	2
RAMP DECK - 803	NLC4009	-	1
DECK SCREW	MC271	16	24
DECK NUT	MC272	16	24
KERB	MC300	4	4
CLAMP PLATE	NLC10145	4	4
BRACING BOLT	MC206	22	28
RAMP SUPPORT - STD	NLC10143	2	-
RAMP SUPPORT - E W	NLC10144	-	2
CLAMP BOLT	NLC10146	4	4

Note that the above quantities are per ramp. Where a ramp is required at both ends of a bridge supply double the above quantities to site.

BUILDING SEQUENCE

1. Insert a Clamp Bolt (NLC10146) into the holes at each end of both Ramp Supports (NLC10143 or NLC10144).
2. Place the Ramp Supports on the concrete bases (detailed opposite) with the Clamp Bolts hanging down into the pre-formed recesses.
3. If the concrete bases are not absolutely level such that the Ramp Supports do not sit completely flat upon them, add grout where it is necessary to ensure that they do so.
4. Place intermediate bridge bay Deck Units (MC211 & MC212) onto the end bay of the bridge, in place of the normal end of bridge bay Deck Units (MC213 & MC214), connecting them as appropriate in the manner described previously in this section for Steel Decking.
5. Insert Deck Nuts (MC272) into the facing openings of the saddles on the end of bridge Transom and the adjacent Ramp Support in the upper ramp bay.
6. Place the requisite Ramp Deck Units appropriate to the roadwidth, spanning between the end of bridge Transom and the adjacent Ramp Support. Regardless of the highway loading, connect the Ramp Deck Units together, side to side, using three Bracing Bolts (MC206) per connection.
7. Locate the Ramp Deck Units onto the Transom and Ramp Support with Deck Screws (MC271) in the manner as described previously in this section for Steel Decking.
8. Insert Deck Nuts (MC272) into the facing openings of the saddles on the two Ramp Supports in the lower ramp bay.
9. Place the requisite end of bridge bay Deck Units (MC213 & MC214) appropriate to the roadwidth, spanning between the Ramp Supports. These units are available from the end bay of the bridge, due to the substitution of intermediate bay decking there.

END OF BRIDGE RAMPS

BUILDING PROCEDURE CONTINUED

10. Regardless of the highway loading, connect all of the Deck Units in the lower ramp bay together, side to side, using three Bracing Bolts (MC206) per connection.
11. Locate the Decks onto the Ramp Supports with Deck Screws, in the manner as described previously in this section for steel decking.
12. Attach intermediate bridge bay Kerbs (MC300) to the sides of the outer Deck Units in the end bay of the bridge and the upper ramp bay, and attach end of bridge bay Kerbs (MC301) to the sides of the outer Deck Units in the lower ramp bay.

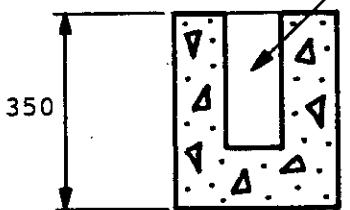
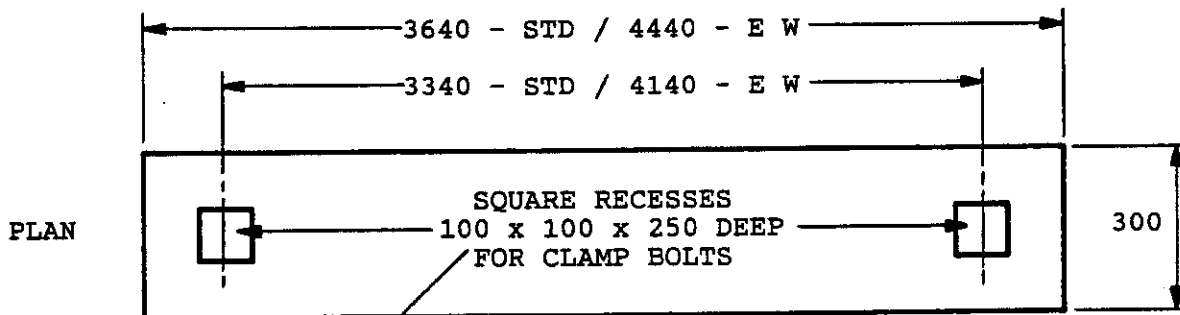
Each Kerb is to be connected to an outer Deck Unit in the normal manner, using four Bracing Bolts (MC206), but additionally, it is necessary to insert Clamp Plates (NLC10145) between the Kerbs and the Decks at the junction of the end of bridge bay and the upper ramp bay, and at the junction of the upper and lower ramp bays.

See assembly details overleaf for clarification.

13. Ensure that all ramp components are properly aligned, tighten all bolts and screws, then secure the Clamp Bolts within the recesses of the concrete bases with grout.

NOTE: Pairs of 803 Deck Units (MC212, NLC4009 & MC214) may be used in place of 1606 Deck Units (MC211, NLC4008 & MC213). This increases the number of side to side deck connections necessary however, which will require an additional 12 Bracing Bolts (MC206) per ramp.

CONCRETE BASES FOR RAMP SUPPORTS



The overall dimensions of the concrete bases shown are those recommended as a minimum to accommodate Ramp Supports. The actual size of the bases required will depend upon the in-situ condition of the ground and the highway loading to which they will be subjected. They must be designed locally accordingly.

NOTE: All dimensions are millimetres.

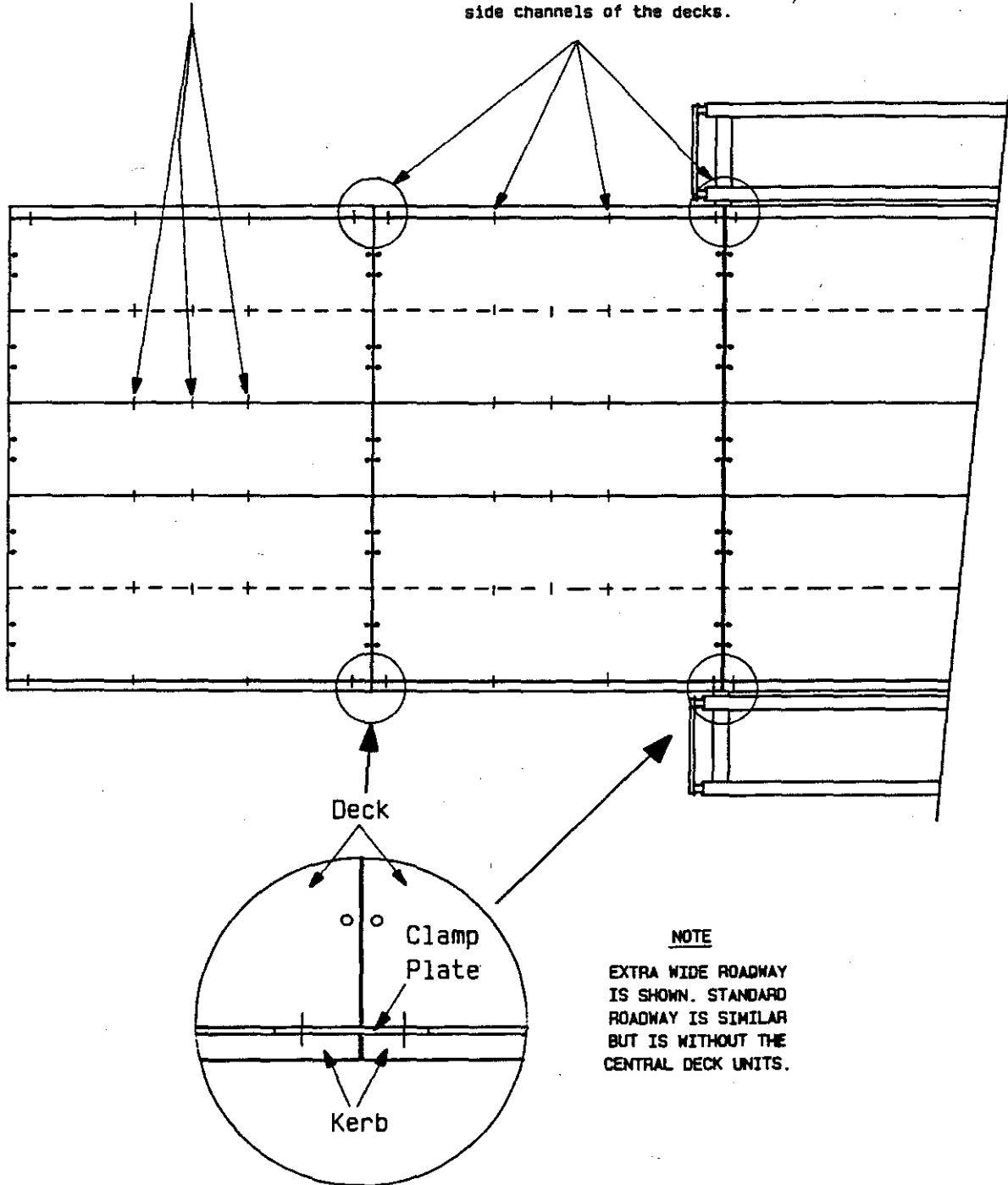
END OF BRIDGE RAMPS

MABEV

CONNECTION DETAILS

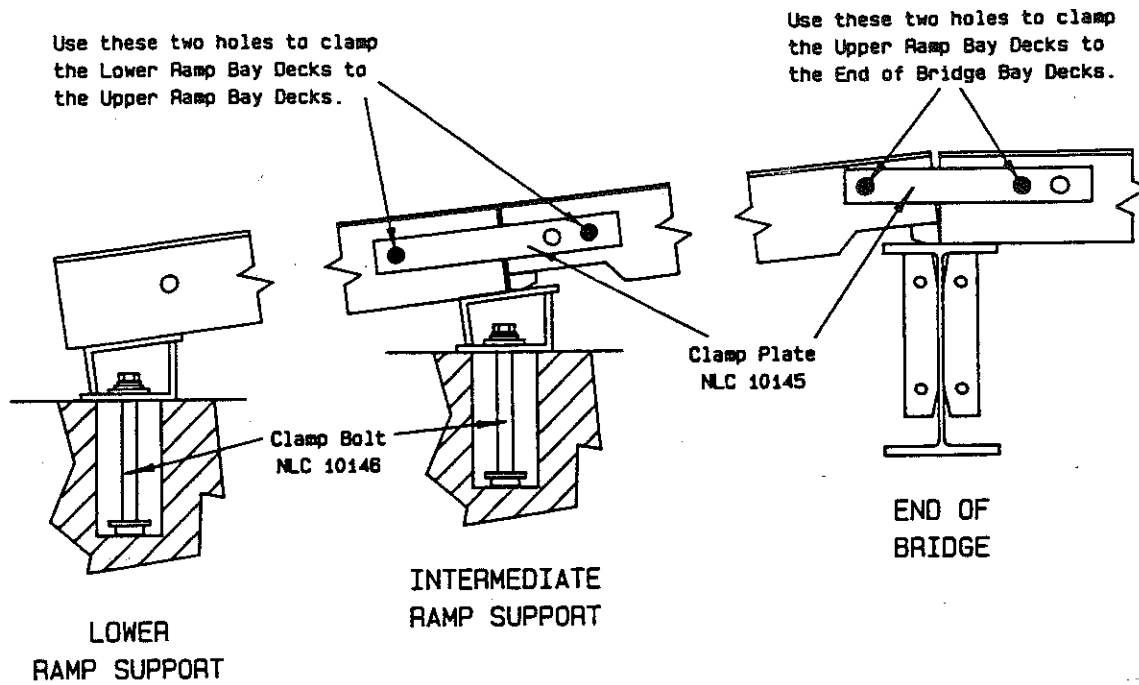
Decks connected side to side with 3 Bracing Bolts (mc206) per connection utilising the three innermost holes in the side channels of the decks

Kerbs connected to outer decks (with clamp plates in between) with 4 bracing bolts (mc206) per connection utilising the four outermost holes in the side channels of the decks.

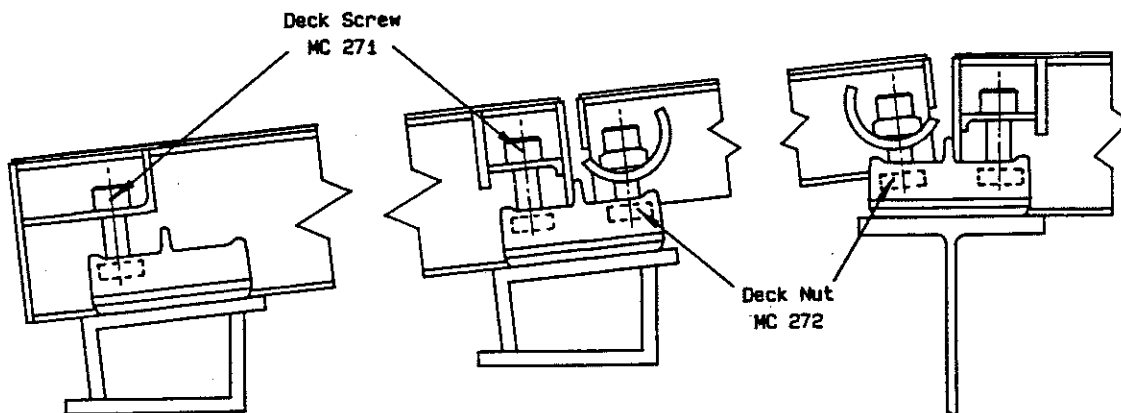


END OF BRIDGE RAMPS

CONNECTION DETAILS



RAMP CLAMPING DETAILS (Kerbs omitted for clarity)



DECK HOLDING DOWN DETAILS

END OF BRIDGE RAMP PARTS

LIST OF PARTS ILLUSTRATED ON THE FOLLOWING PAGES

NLC4008	Ramp Deck - 1606
NLC4009	Ramp Deck - 803
NLC10145	Clamp Plate
NLC10143	Ramp Support - Std
NLC10144	Ramp Support - E W
NLC10146	Clamp Bolt

Note that all of the other parts which are used in the Ramps are standard bridge deck components, which are illustrated previously at the rear of Section 3 of this manual.

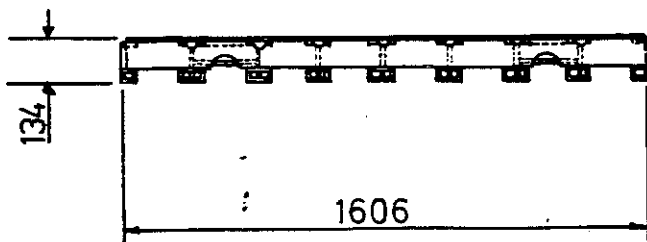
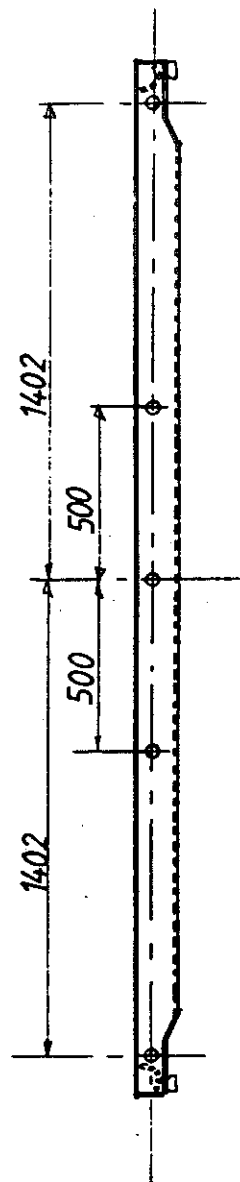
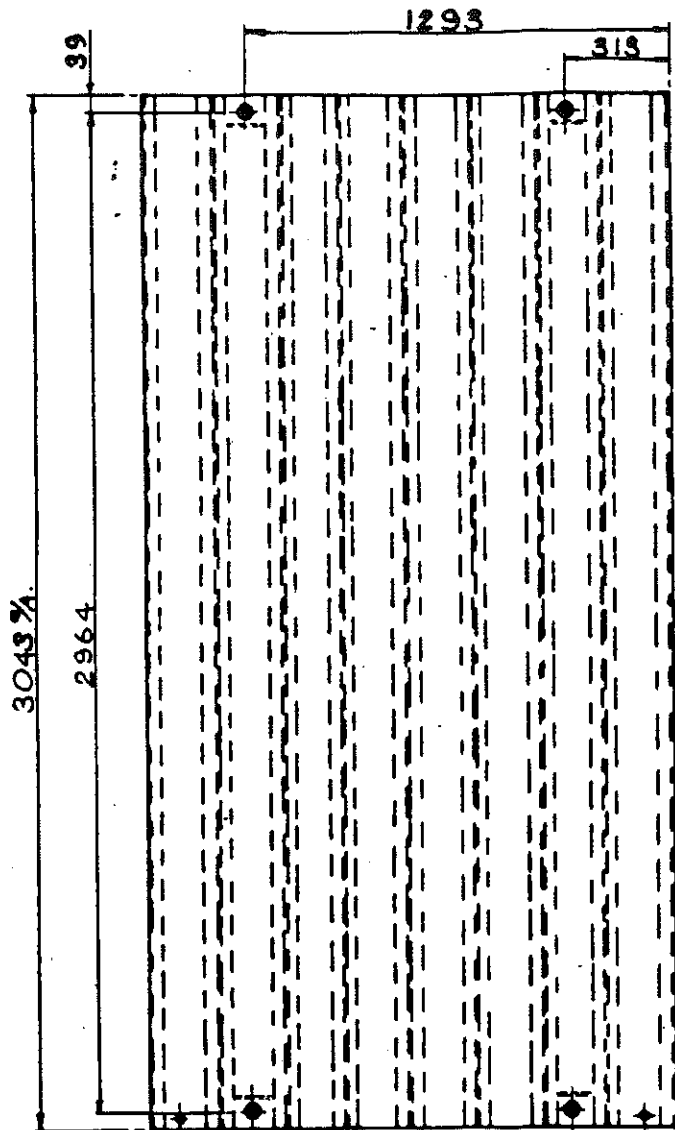
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NLC 4008

9 13 4008

DECK RAMP - 1606

WEIGHT - 550 Kg.



OVERALL DIMENSIONS - 3042 x 1606 x 134
 CUBE - 0.654

Checked	Date
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NLC 4009

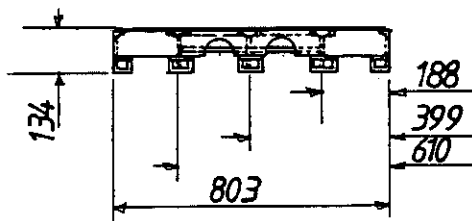
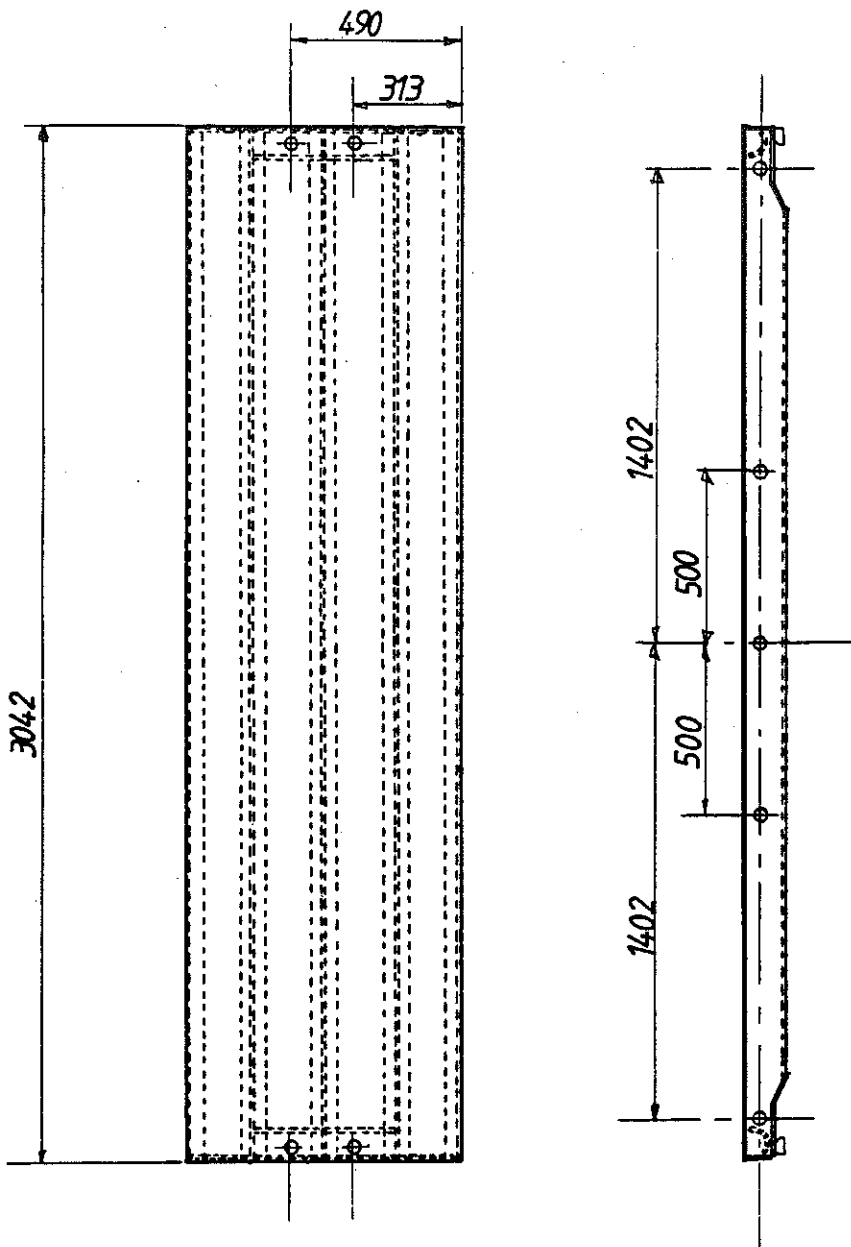
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13

4009

DECK RAMP - 803.

WEIGHT - 275 Kg.



OVERALL DIMENSIONS - 3042 x 803 x 134
 CUBE - 0.33.

Checked	Date



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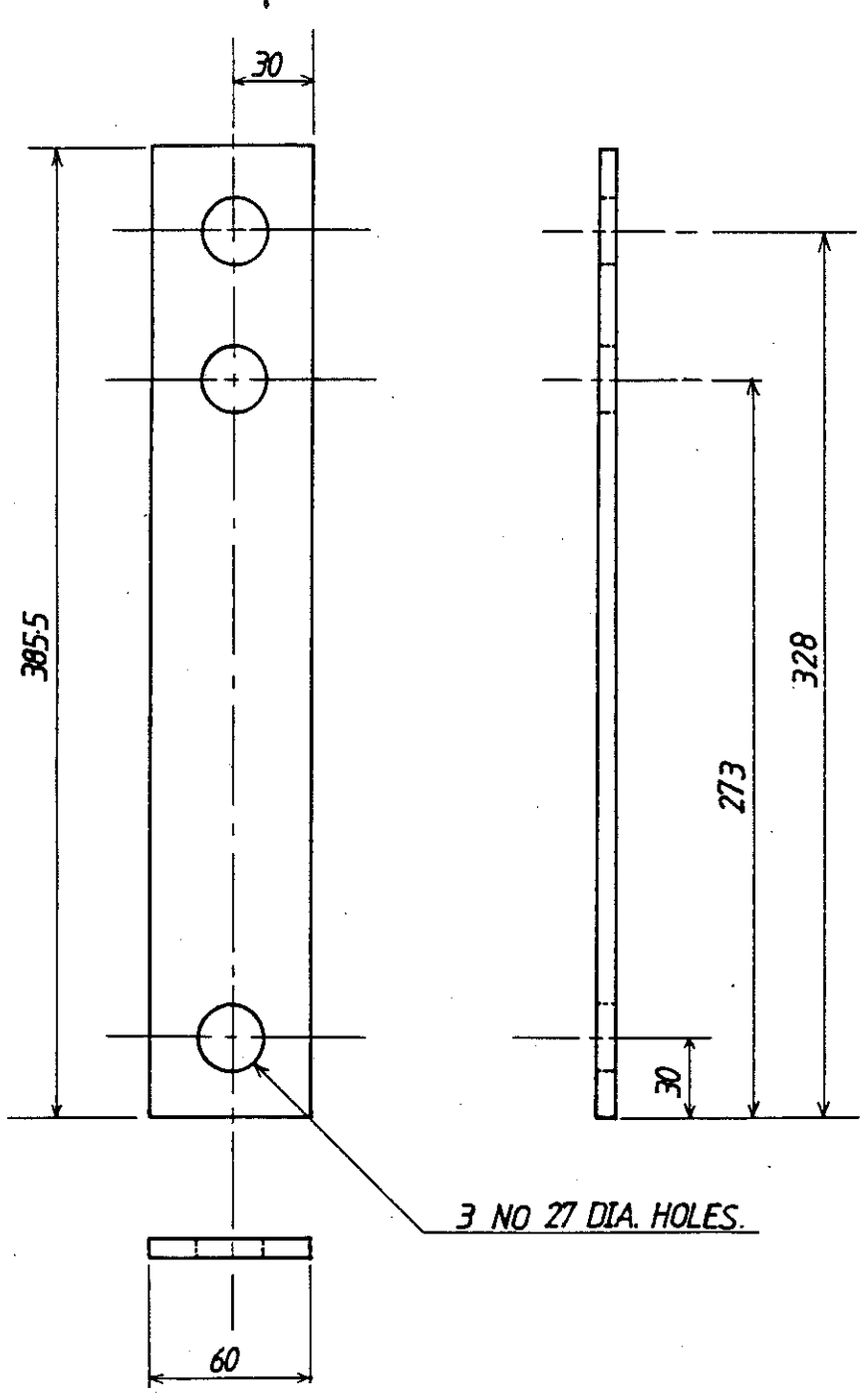
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9 13 10145

NLC 10145

RAMP CLAMP PLATE.

WEIGHT - 0.93 Kg.



3 NO 27 DIA. HOLES.

OVERALL DIMENSIONS - 0.386 x 0.06 x 0.008.
CUBE - 0.00019.

Checked	Date
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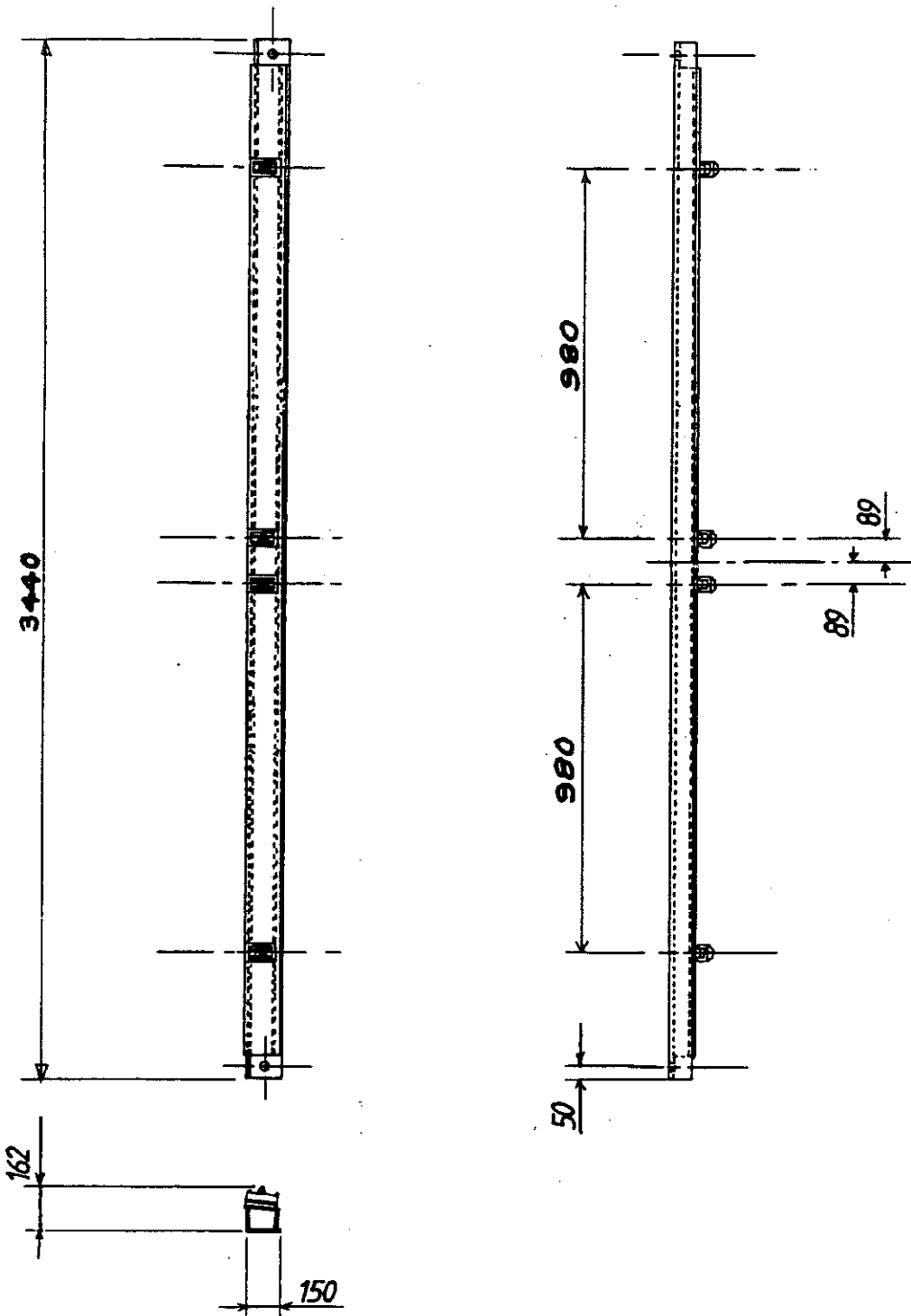
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9 13 10143

NLC 10143

RAMP SUPPORT - STD

WEIGHT - 125 kg.



OVERALL DIMENSIONS - 0.162 x 0.15 x 3.44
CUBE - 0.08

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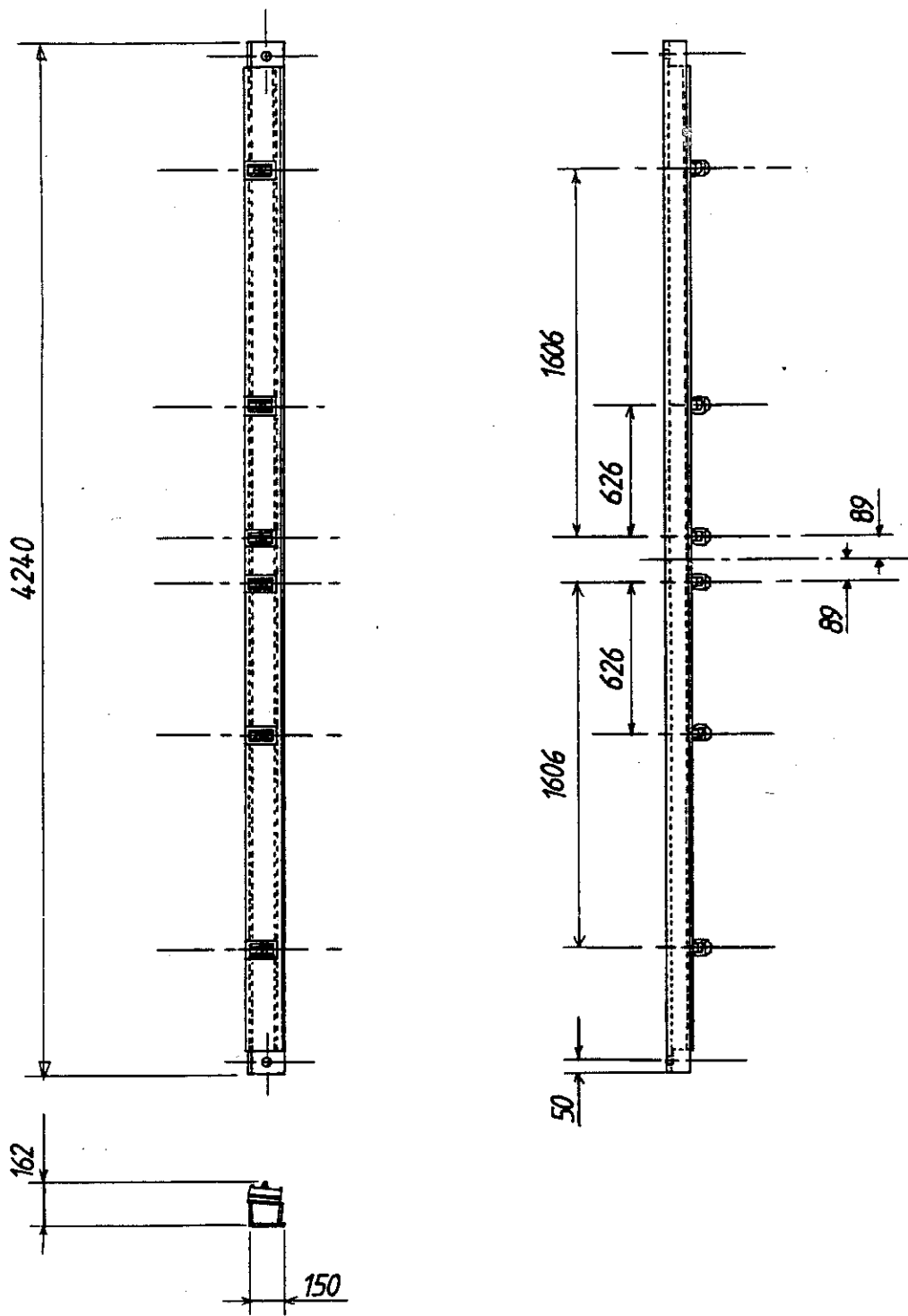
7/90

9 13 10144

NLC 10144

RAMP SUPPORT - EW

WEIGHT - 155.46.Kg.



OVERALL DIMENSIONS - 0.162 x 0.15 x 4.24.
CUBE - 0.1

Checked	Date



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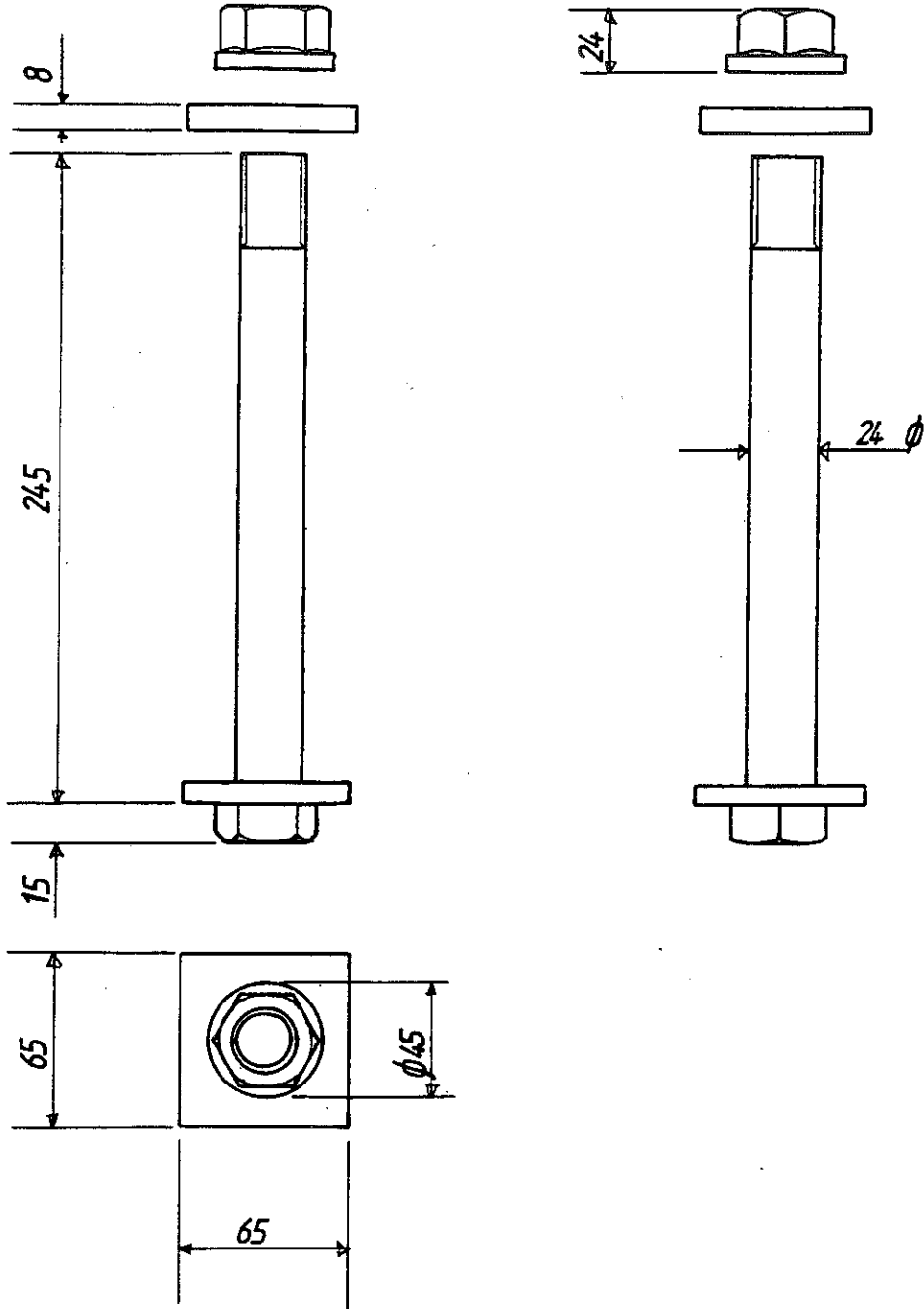
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9 13 10146

NLC 10146

FOUNDATION BOLT ASSEMBLY

WEIGHT - 1.568 Kg.



OVERALL DIMENSIONS - 0.26 x 0.065 x 0.065.

CUBE - 0.001

Checked	Date



S E C T I O N 7
M U L T I - S P A N
B R I D G E S

MULTI-SPAN BRIDGES

Where a gap to be bridged is too wide to be economically crossed by a single span structure, it is necessary to provide intermediate piers and install a multi-span bridge.

The positioning of intermediate piers is often dictated by the local geology and topography of the site. Otherwise, the positioning and quantity of piers depends upon the most economic balance between the cost of the piers and the cost of the bridge construction appropriate to the varying span lengths.

It is a design feature of Mabey Compact Bridging that in addition to simple spans, it may also be erected to form multi-span structures. This can be done in two ways; either with continuous bridge trusses supported at intermediate piers by load distribution beams (fig. 1), or as a series of broken-spans linked at each intermediate pier by span junction equipment (fig. 2). It should be noted that both of these options provide a continuous road deck for the traffic.

The continuous truss option may lead to economy in the construction of the side girders, as the maximum bending moment may be less than that for the equivalent broken span option. This is not always the case however, especially where spans are shear critical, or where some spans are considerably shorter than others, when a broken span will facilitate the inclusion of a lighter truss construction.

Furthermore, there are inherent dangers in using continuous trusses. Should an end span be shorter than the adjacent intermediate span, the end posts will tend to lift off their bearings when a heavy load passes over the intermediate span. Also, if the nature of the ground is such that settlement of an intermediate pier is likely, then the bridge trusses may be subjected to stresses beyond the safety limit. In either case, the correct solution is the broken span option.

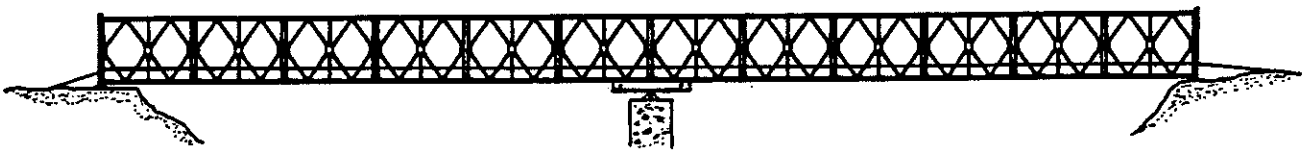


Fig. 1

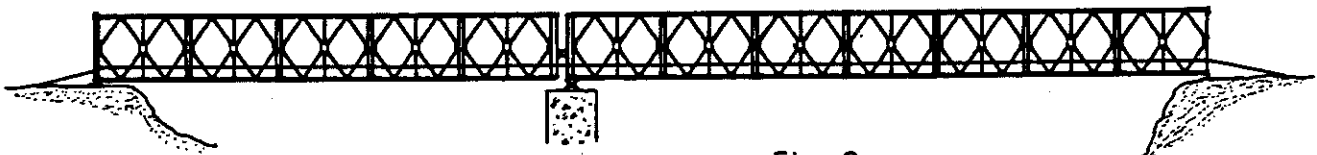
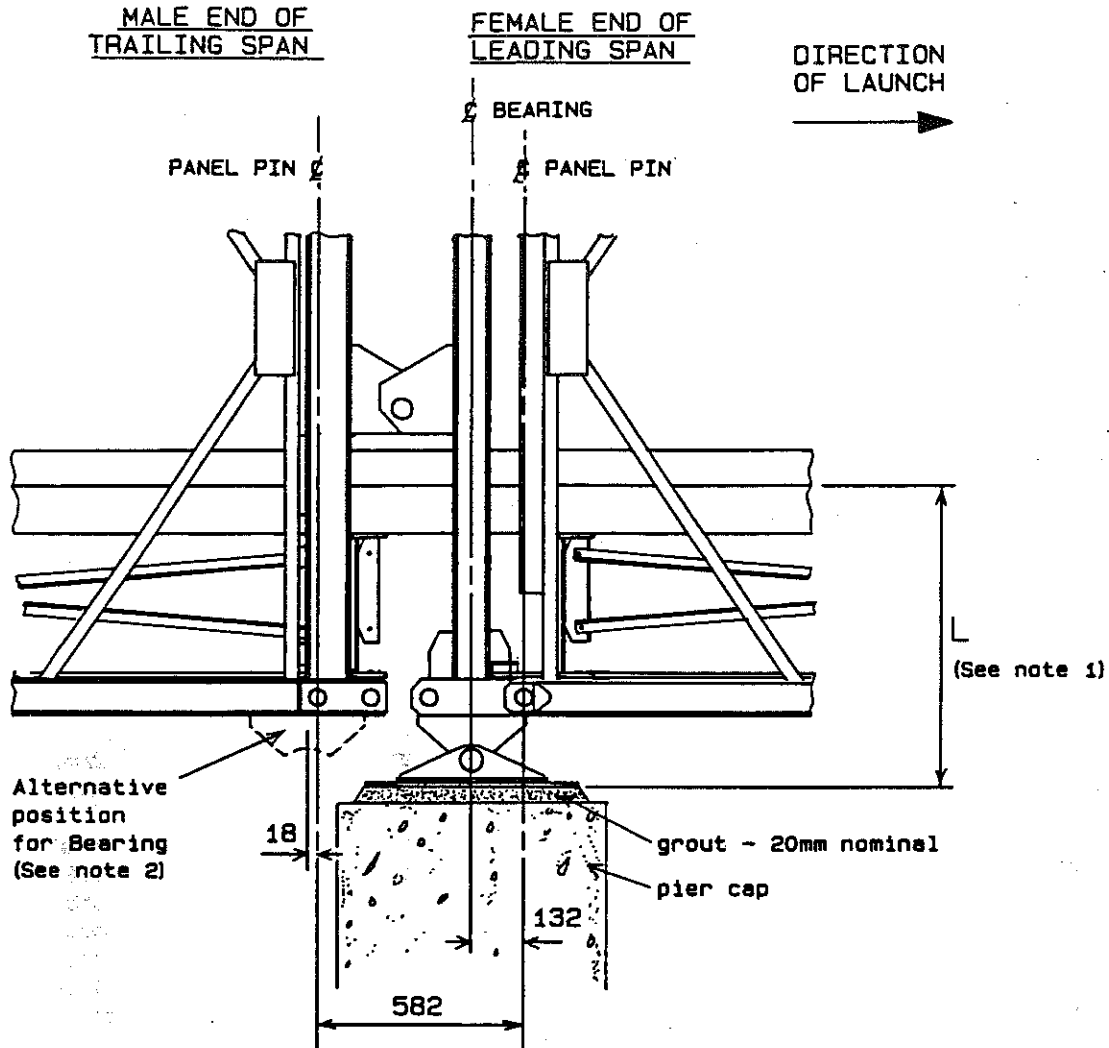


Fig. 2

SPAN JUNCTION DIMENSIONS

MABCV



ROADWAY	STANDARD		EXTRA WIDE		TWO LANE	
	STEEL	TIMBER	STEEL	TIMBER	HS20	HA/MS250
DIMENSION L	854	847	857	850	1053	1083

NOTES

Dimension L is given from the Deck Level to the underside of the Bearing Baseplate (MC236). If Grillage Beams (MC235) are used instead of Baseplates, Dimension L increases by 117mm.

! Where adjacent spans are of identical Truss construction and are of the same length, the Span Junction bearings may be placed in either of the positions shown. Where one span is longer than the other however, the Span Junction bearings should be placed under the Posts attached to the longer span.

Where adjacent spans are of different truss construction the Span Junction bearings must be placed under the posts attached to the span with the heavier truss construction

PARTS PER SPAN JUNCTION

PROCEDURE FOR USE OF THE TABLES ON THE FOLLOWING PAGES

1. Calculate the parts required for each individual span, following the procedure described in Section 3, then summate the quantities of all components to give a parts list for the total bridge.
2. For each Span Junction in turn, choose the table appropriate for the leading span truss construction and adjust the quantities of the Truss Parts as directed, using the column appropriate for the trailing span truss construction.
3. Refer to table "B" and adjust the quantities of the Deck Parts as directed, using the column appropriate for the type of roadway. As the truss construction is irrelevant to the adjustments to the deck parts, the quantities tabulated are to be multiplied by the number of Span Junctions in the bridge.

EXAMPLE OF USAGE OF THE TABLES ON THE FOLLOWING PAGES

GIVEN THE FOLLOWING:

CALCULATE QUANTITIES OF:

Two Lane Roadway
 Steel Deck
 HA Loading
 5 Bay/10 Bay/7 Bay Spans
 SSRH*/TSR2H*/DSR1H Const.

MC 19 - Bearing
 MC314 - Raker Frame
 MC312 - Vertical Frame
 MC213 - Deck-1606-EOB
 MC211 - Deck-1606

1. Refer to the table for 2 Lane Roadways on page 3.9 of Section 3.
- a) Extract the quantities appropriate for the Spans & Constructions.

PARTS	5 Bay SSRH*	10 Bay TSR2H*	7 Bay DSR1H
MC 19	2 + 2 = 4	6 + 6 = 12	4 + 4 = 8
MC314	3 x 2 + 2 = 8	0	0
MC312	0	8 x 2 + 2 = 18	5 x 2 + 2 = 12
MC213	4 + 4 = 8	4 + 4 = 8	4 + 4 = 8
MC211	3 x 4 + 0 = 12	8 x 4 + 0 = 32	5 x 4 + 0 = 20

Note that the fact that the bridge is of reinforced construction, contains High Shear End Panels, and is for H.A. Loading does not affect the quantities of the components required in this example, hence no further adjustments are necessary.

- b) Summate the quantities to give total requirement for the bridge.

MC 19 - Bearing	= 4 + 12 + 8 = 24
MC314 - Raker Frame	= 8 + 0 + 0 = 8
MC312 - Vertical Frame	= 0 + 18 + 12 = 30
MC213 - Deck-1606-EOB	= 8 + 8 + 8 = 24
MC211 - Deck-1606	= 12 + 32 + 20 = 64

PARTS PER SPAN JUNCTION

2. Calculate adjustments to the quantities of Truss Parts required.

a) 1st Span Junction: leading span = SSRH* & trailing span = TSR2H*
hence extract the adjustments from the third column of table A1.

MC 19 - Bearing = -2
MC314 - Raker Frame = +2

b) 2nd Span Junction: leading span = TSR2H* & trailing span = DSR1H
hence extract the adjustments from the second column of table A3.

MC 19 - Bearing = -4
MC312 - Vertical Frame = +2

Hence the adjusted quantities of Truss Parts required are:

MC 19 - Bearing = 24 - 2 - 4 = 18
MC314 - Raker Frame = 8 + 2 = 10
MC312 - Vertical Frame = 30 + 2 = 32

3. Calculate adjustments to the quantities of Deck Parts required.

Extract the adjustments from the column for 2 Lane HA in table B
and multiply the quantities by the number of Span Junctions (=2).

MC213 - Deck-1606-EOB = -8 x 2 = -16
MC211 - Deck-1606 = +8 x 2 = +16

Hence the adjusted quantities of Deck Parts required are:

MC213 - Deck-1606-EOB = 24 - 16 = 8
MC211 - Deck-1606 = 64 + 16 = 80

HENCE THE QUANTITIES REQUIRED OF THE COMPONENTS REQUESTED ARE:

MC 19 - Bearing = 18
MC314 - Raker Frame = 10
MC312 - Vertical Frame = 32
MC213 - Deck-1606-EOB = 8
MC211 - Deck-1606 = 80

PARTS PER SPAN JUNCTION

A. ADJUSTMENTS TO TRUSS PARTS REQUIRED

1. LEADING SPAN TRUSS CONSTRUCTION = SS(R)

i) DEDUCT THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC317	END POST-MALE	2	2	2	2
MC318	END POST-FEMALE	2	4	6	8
MC329	TIE BEAM-EOB	-	2	2	-
NLC8093	TIE BEAM-EOB-QS	-	-	-	2
MC19	BEARING	2	2	2	2
MC236	BASEPLATE	2	2	2	2

ii) ADD THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC315	SPAN JUNC POST-MALE	2	2	2	2
MC336	SPAN JUNC POST-FEMALE	2	4	6	8
MC234	SPAN JUNC PIN	2	2	2	2
MC4A	SAFETY CLIP-SJ PIN	2	2	2	2
MC70	BEARING BLOCK-SJ	2	4	6	8
MC314	RAKER FRAME	2	2	2	2
MC312	VERTICAL FRAME	-	-	-	-
NLC8091	VERTICAL FRAME-QS	-	-	-	-
MC358	BRACING FRAME	-	2	2	-
MC359	BRACING FRAME-QS	-	-	-	2
MC11	TRANSOM BOLT	2	2	2	2
MC206	BRACING BOLT	2	14	16	18

NOTE:- For the Adjustments to Deck Parts required refer to Page 7.9

PARTS PER SPAN JUNCTION

A. ADJUSTMENTS TO TRUSS PARTS REQUIRED2. LEADING SPAN TRUSS CONSTRUCTION = DS(R)

i) DEDUCT THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC317	END POST-MALE	4	4	4	4
MC318	END POST-FEMALE	2	4	6	8
MC329	TIE BEAM-EOB	2	4	4	2
NLC8093	TIE BEAM-EOB-QS	-	-	-	2
MC19	BEARING	2	4	4	4
MC236	BASEPLATE	2	4	4	4

ii) ADD THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC315	SPAN JUNC POST-MALE	4	4	4	4
MC336	SPAN JUNC POST-FEMALE	2	4	6	8
MC234	SPAN JUNC PIN	2	4	4	4
MC4A	SAFETY CLIP-SJ PIN	2	4	4	4
MC70	BEARING BLOCK-SJ	4	4	6	8
MC314	RAKER FRAME	-	-	-	-
MC312	VERTICAL FRAME	2	2	2	2
NLC8091	VERTICAL FRAME-QS	-	-	-	-
MC358	BRACING FRAME	2	4	4	2
MC359	BRACING FRAME-QS	-	-	-	2
MC11	TRANSOM BOLT	-	-	-	-
MC206	BRACING BOLT	16	28	30	32

NOTE:- For the Adjustments to Deck Parts required refer to Page 7.9

PARTS PER SPAN JUNCTION

A. ADJUSTMENTS TO TRUSS PARTS REQUIRED

3. LEADING SPAN TRUSS CONSTRUCTION = TS(R)

i) DEDUCT THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC317	END POST-MALE	6	6	6	6
MC318	END POST-FEMALE	2	4	6	8
MC329	TIE BEAM-EOB	2	4	4	2
NLC8093	TIE BEAM-EOB-QS	-	-	-	2
MC19	BEARING	2	4	6	6
MC236	BASEPLATE	2	4	6	6

ii) ADD THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC315	SPAN JUNC POST-MALE	6	6	6	6
MC336	SPAN JUNC POST-FEMALE	2	4	6	8
MC234	SPAN JUNC PIN	2	4	6	6
MC4A	SAFETY CLIP-SJ PIN	2	4	6	6
MC70	BEARING BLOCK-SJ	6	6	6	8
MC314	RAKER FRAME	-	-	-	-
MC312	VERTICAL FRAME	2	2	2	2
NLC8091	VERTICAL FRAME-QS	-	-	-	-
MC358	BRACING FRAME	2	4	4	2
MC359	BRACING FRAME-QS	-	-	-	2
MC11	TRANSOM BOLT	-	-	-	-
MC206	BRACING BOLT	20	32	34	36

NOTE:- For the Adjustments to Deck Parts required refer to Page 7.9

PARTS PER SPAN JUNCTION

A. ADJUSTMENTS TO TRUSS PARTS REQUIRED

4. LEADING SPAN TRUSS CONSTRUCTION = QS(R)

i) DEDUCT THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC317	END POST-MALE	8	8	8	8
MC318	END POST-FEMALE	2	4	6	8
MC329	TIE BEAM-EOB	-	2	2	-
NLC8093	TIE BEAM-EOB-QS	2	2	2	4
MC19	BEARING	2	4	6	8
MC236	BASEPLATE	2	4	6	8

ii) ADD THE FOLLOWING PER S.J. TRAILING SPAN TRUSS CONSTRUCTION

MARK NO	COMPONENT DESCRIPTION	SS(R)	DS(R)	TS(R)	QS(R)
MC315	SPAN JUNC POST-MALE	8	8	8	8
MC336	SPAN JUNC POST-FEMALE	2	4	6	8
MC234	SPAN JUNC PIN	2	4	6	8
MC4A	SAFETY CLIP-SJ PIN	2	4	6	8
MC70	BEARING BLOCK-SJ	8	8	8	8
MC314	RAKER FRAME	-	-	-	-
MC312	VERTICAL FRAME	-	-	-	-
NLC8091	VERTICAL FRAME-QS	2	2	2	2
MC358	BRACING FRAME	-	2	2	-
MC359	BRACING FRAME-QS	2	2	2	4
MC11	TRANSOM BOLT	-	-	-	-
MC206	BRACING BOLT	24	36	38	40

NOTE:- For the Adjustments to Deck Parts required refer to Page 7.9

PARTS PER SPAN JUNCTION

B. ADJUSTMENTS TO DECK PARTS REQUIRED

i) DEDUCT THE FOLLOWING PER S.J. STD. SINGLE E.W. SINGLE TWO LANE

MARK NO	COMPONENT DESCRIPTION	STEEL	TIM	STEEL	TIM	HS-20	H.A.
MC213	DECK-1606-EOB	4	-	4	-	8	8
MC214	DECK-803-EOB	-	-	2	-	2	2
MC301	KERB-EOB	4	-	4	-	4	4
NLC8087	TIMBER INFILL-STD.	-	2	-	-	-	-
NLC8088	TIMBER INFILL-E.W.	-	-	-	2	-	-

ii) ADD THE FOLLOWING PER S.J. STD. SINGLE E.W. SINGLE TWO LANE

MARK NO	COMPONENT DESCRIPTION	STEEL	TIM	STEEL	TIM	HS-20	H.A.
MC 17	S.J. SWAYBRACE-STD.	1	1	-	-	-	-
MC136	S.J. SWAYBRACE-E.W.	-	-	1	1	-	-
NLC9034	S.J. SWAY-2 LANE-L.H.	-	-	-	-	1	1
NLC9035	S.J. SWAY-2 LANE-R.H.	-	-	-	-	1	1
NLC9036	TIE FRAME-S.J. SWAY	-	-	-	-	1	1
MC211	DECK-1606	4	-	4	-	8	8
MC212	DECK-803	-	-	2	-	2	2
MC300	KERB-STEEL DECK	4	-	4	-	4	4
MC218	DECK-1606-S.J.	-	-	-	-	2	2
MC219	DECK-803-S.J.	-	-	1	-	1	1
MC295	DECK-1606-S.J. (KERB)	2	-	2	-	2	2
MC223	STRINGER-S.J.-PLAIN	-	2	-	3	-	-
MC224	STRINGER-S.J.-BUTTON	-	2	-	2	-	-
MC225	KERB-S.J.-TIMBER DECK	-	2	-	2	-	-
MC14	CHESS-STD.	-	2	-	-	-	-
MC144	CHESS-E.W.	-	-	-	2	-	-
MC260	CHESS-STD.-S.J.	-	1	-	-	-	-
MC261	CHESS-E.W.-S.J.	-	-	-	1	-	-
MC11	TRANSOM BOLT	2	2	2	2	4	4
MC206	BRACING BOLT	2	2	2	2	6	6
MC271	DECK SCREW	8	8	12	10	20	20
MC272	DECK NUT	8	8	12	10	20	20
MC10	KERB BOLT-TIM. DECK	-	4	-	4	-	-

NOTES:

- For Bridges utilising 803mm Decks only, adjust the parts in the same manner as described above except that for each deduction of an MC213-DECK-1606-EOB substitute 2 x MC214-DECK-803-EOB, and for each addition of an MC211-DECK-1606 substitute 2 x MC212-DECK-803
- If MC316 Female Span Junction Posts are utilised instead of MC336 it is necessary for one Transom, MC313, MC320, MC330 or MC334, to be replaced by a Span Junction Transom, NLC9030, NLC9031, NLC9032 or NLC9033 respectively, per span junction.

PARTS PER SPAN JUNCTION

LIST OF PARTS ILLUSTRATED ON THE FOLLOWING PAGESTRUSS PARTS

MC315 Span Junction Post - Male
MC336 Span Junction Post - Female
MC234 Span Junction Pin
MC 4A Safety Pin - S.J. Pin
MC 70 Span Junction Bearing Block

SWAYBRACING

MC 17 Span Junction Swayframe - Std
MC136 Span Junction Swayframe - E W
NLC9034 Span Junction Swayframe - 2 Lane - L/H
NLC9035 Span Junction Swayframe - 2 Lane - R/H
NLC9036 Tie Frame - S.J. Swaybracing - 2 Lane

STEEL DECKING

MC218 Span Junction Deck - 1606
MC219 Span Junction Deck - 803
MC295 Span Junction Deck - 1606 - Kerbed

TIMBER DECKING

MC223 Span Junction Stringer - Plain
MC224 Span Junction Stringer - Button
MC260 Span Junction Chess - Std
MC261 Span Junction Chess - E W
MC225 Span Junction Kerb - Timber Deck

LAUNCHING PARTS

MC 65 Launching Link - Compact 100 / MBB
MC161 Reinforcement Chord - Span Junction

5/88

MC 315

9

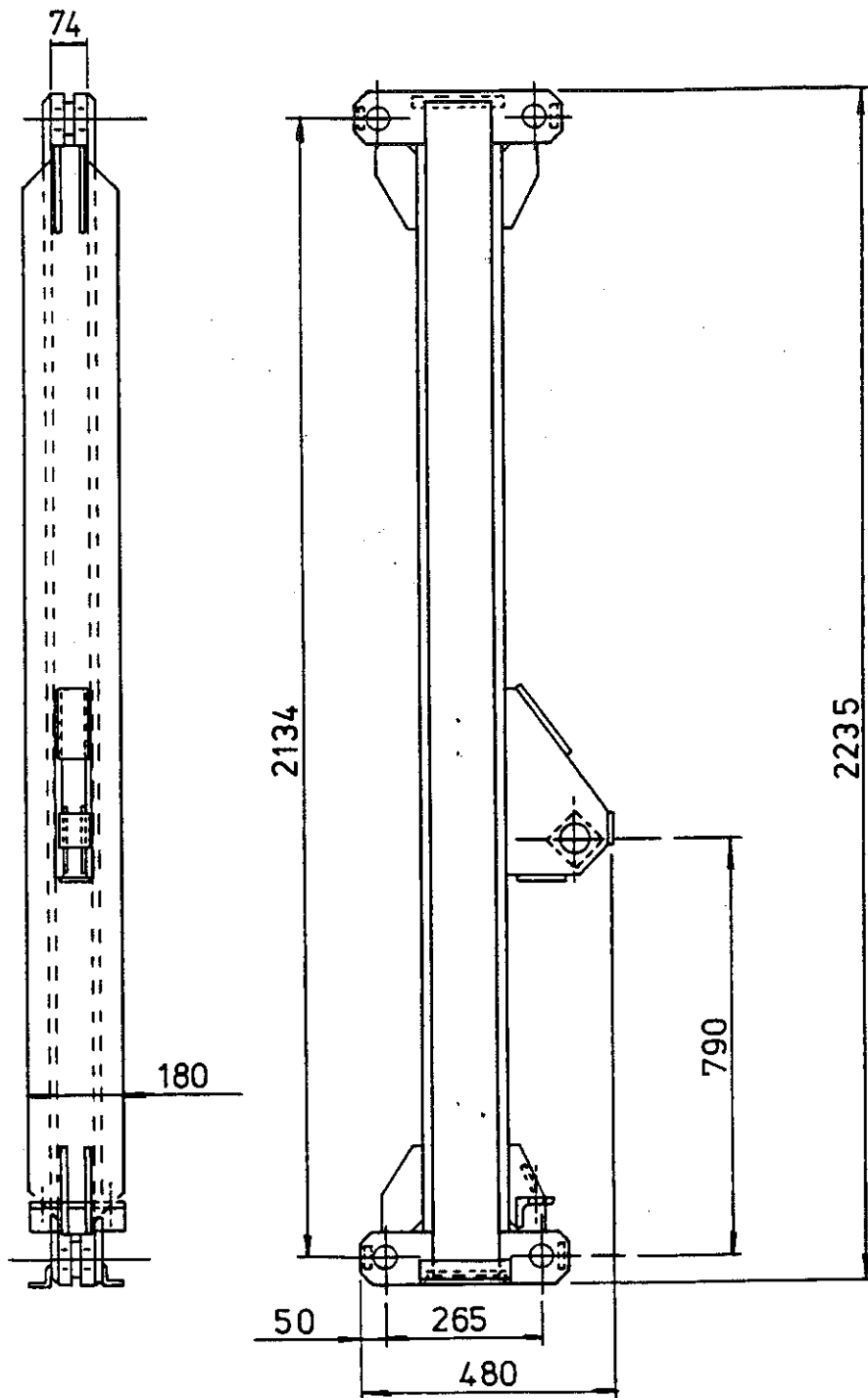
13

315

CD 103

POST - S.J. - MALE - 200

WEIGHT : 211.52 kg



OVERALL DIMENSIONS : 2235 x 480 x 180

CUBE (m³) : 0.1931

Checked

Date

16/8/88



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5/88

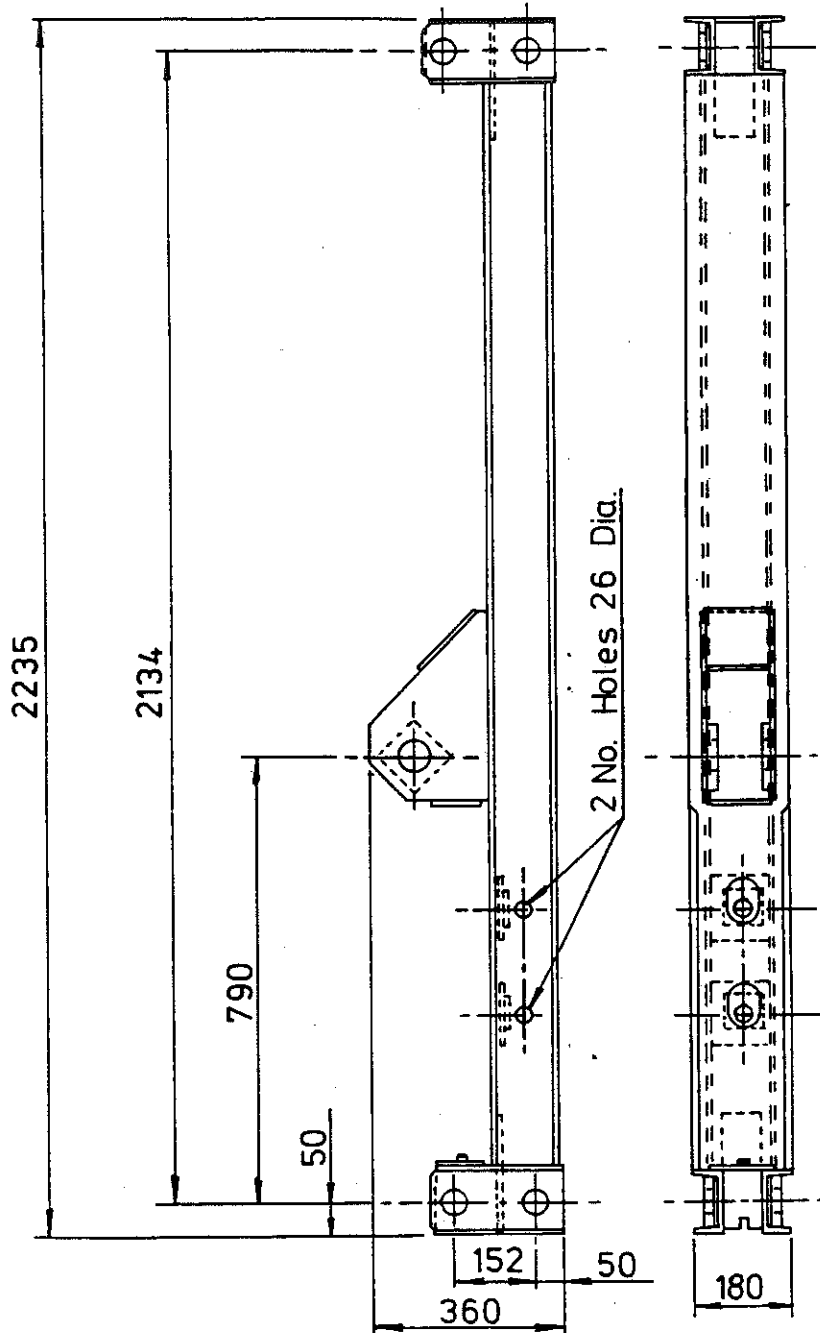
MC 336

9 13 336

CD 102

POST-S.J.-FEMALE-200

WEIGHT : 186.84



OVERALL DIMENSIONS : 2235.5 x 360 x 180

CUBE (m³) : 0.1448

Checked

Date

16/8/88



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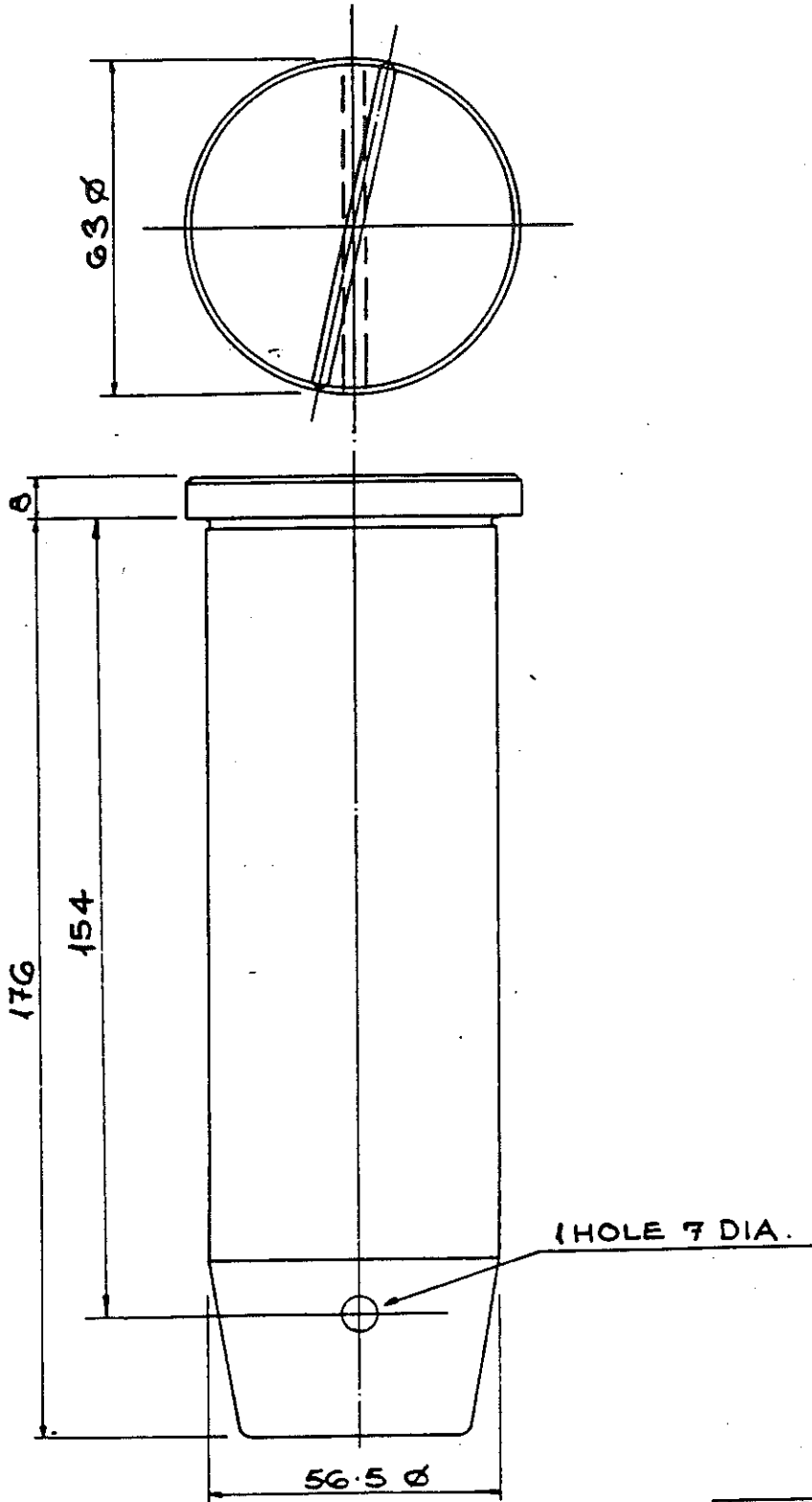
2/86

MC 234

PIN - S.J.

WEIGHT: 3.54 KG.

9	13	234
CA 37		



OVERALL DIMENSIONS: 184 x 63 ϕ
CUBE (M³): 0.00057

CHECKED	DATE
SBD	14.2.86



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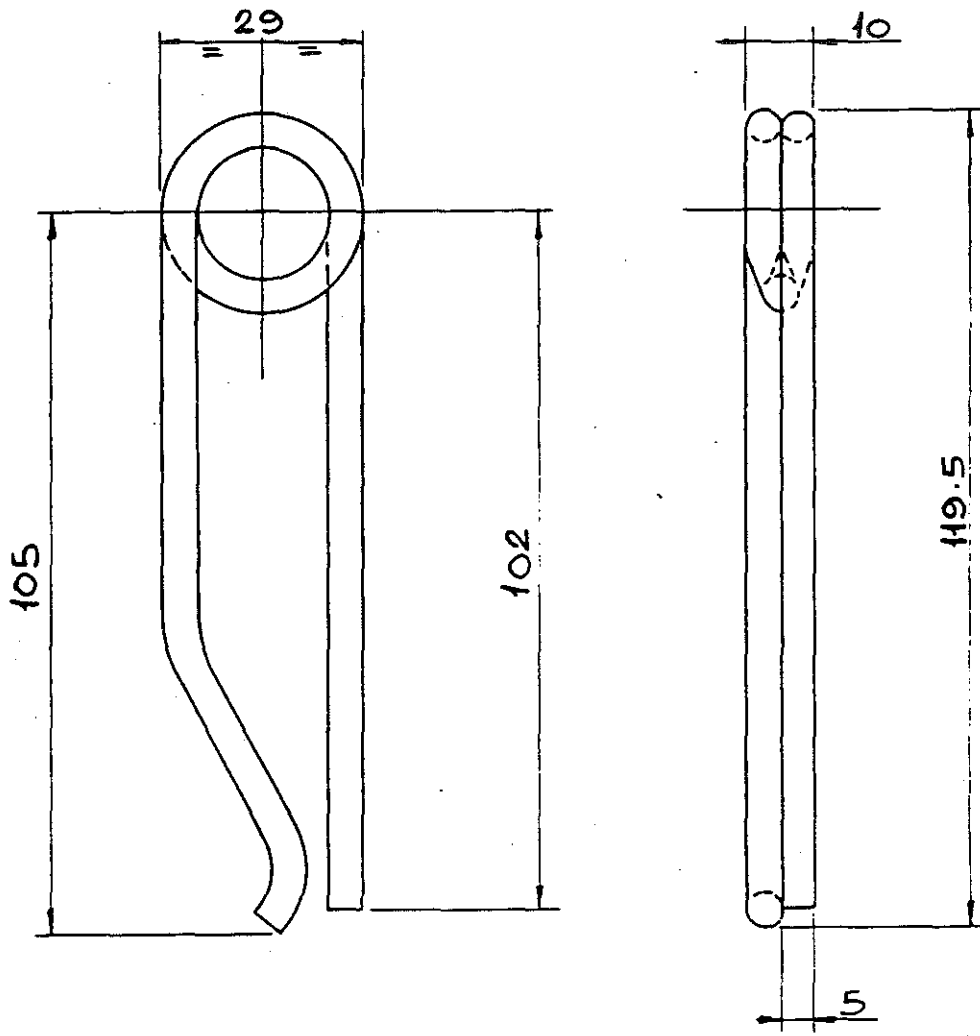
2/86

9	13	4A
BA 11.		

MC 4 A .

PIN - SAFETY .

WEIGHT: 0.05 Kg.



OVERALL DIMENSIONS : 120 x 29 x 10.

CUBE (M³) 0.00004 .

CHECKED	DATE
SBD	14.2.86



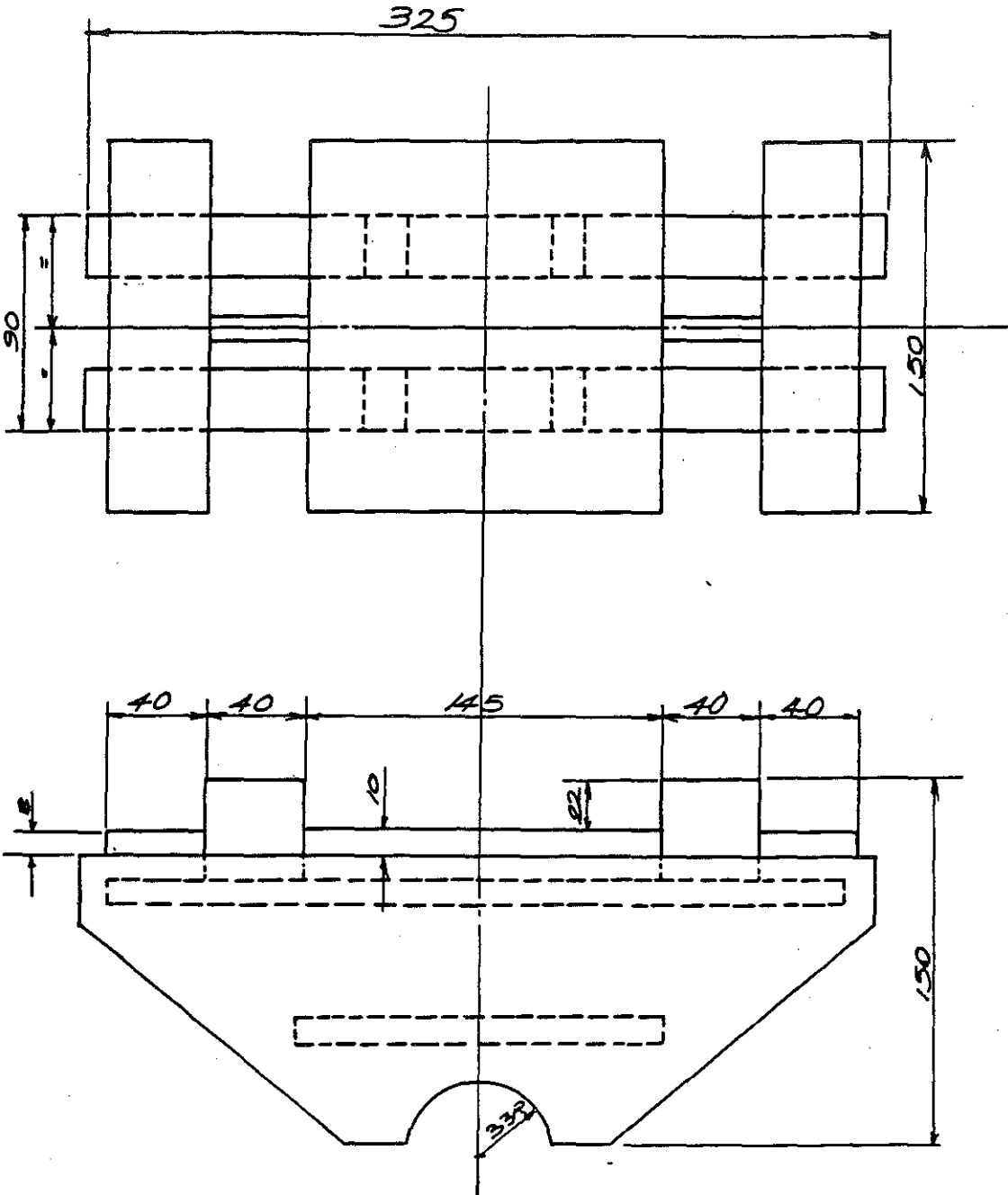
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5/84

9	13	70
CA 42		

MC 70.
BLOCK - BEARING - SJ.

WEIGHT: 9.6 Kg.



OVERALL DIMENSIONS: 325 x 150 x 150.

CUBE (M³) 0.00731.

CHECKED	DATE
SBD	20.2.86



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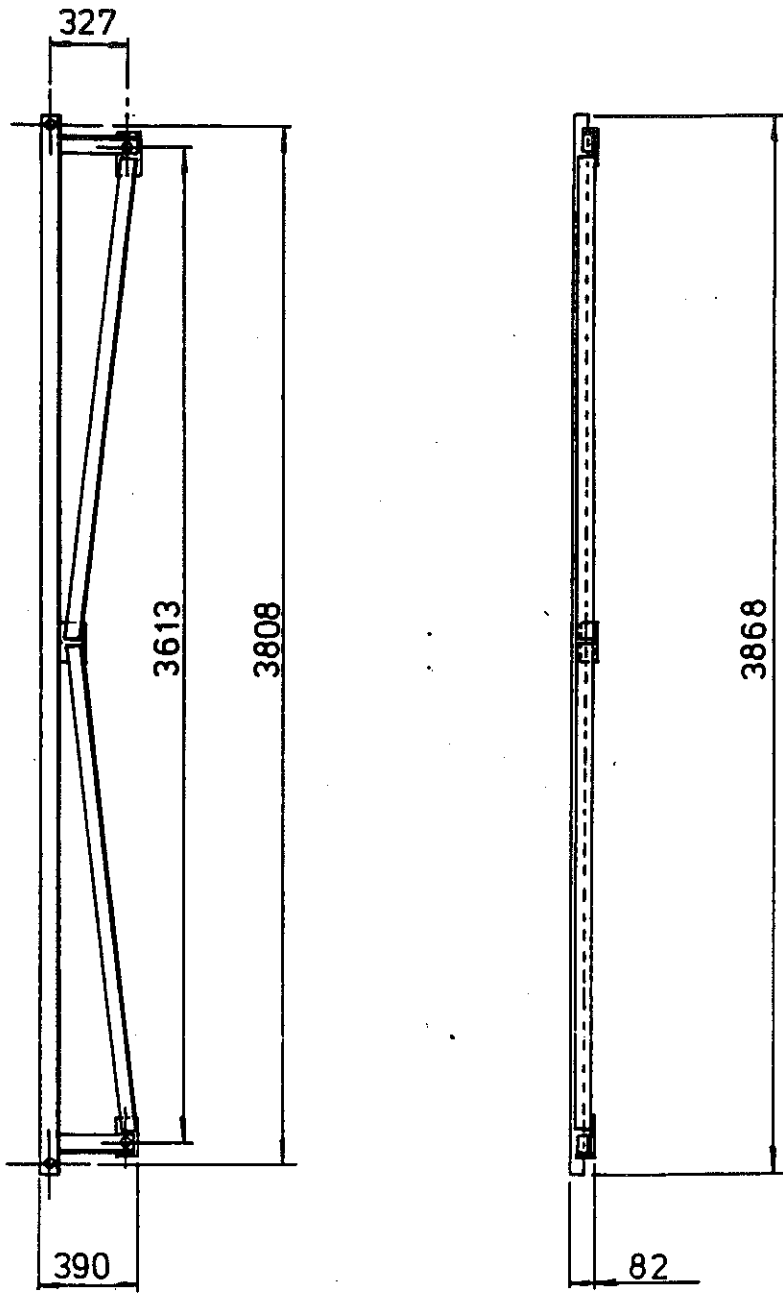
7/90

9	13	17
CD 57		

MC 17

SWAYFRAME - SJ - STD - 200

WEIGHT : 37.92 kg



OVERALL DIMENSIONS : 3868 x 390 x 82

CUBE (m³) : 0.124

Checked	Date
SP	6/7/90



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7/90

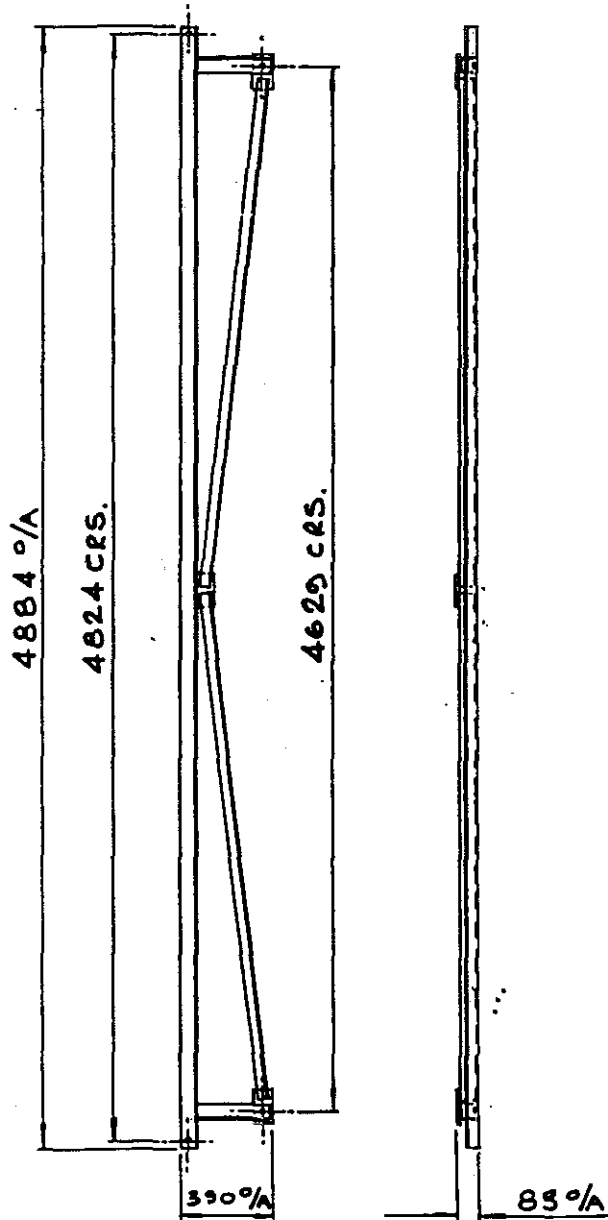
MC 136

9 13 136

SWAYFRAME - SJ - E.W. - 200

CA 345

WEIGHT : 40.72 Kg



OVERALL DIMENSIONS: 390 x 83 x 4884

CUBE (M³): 0.1581

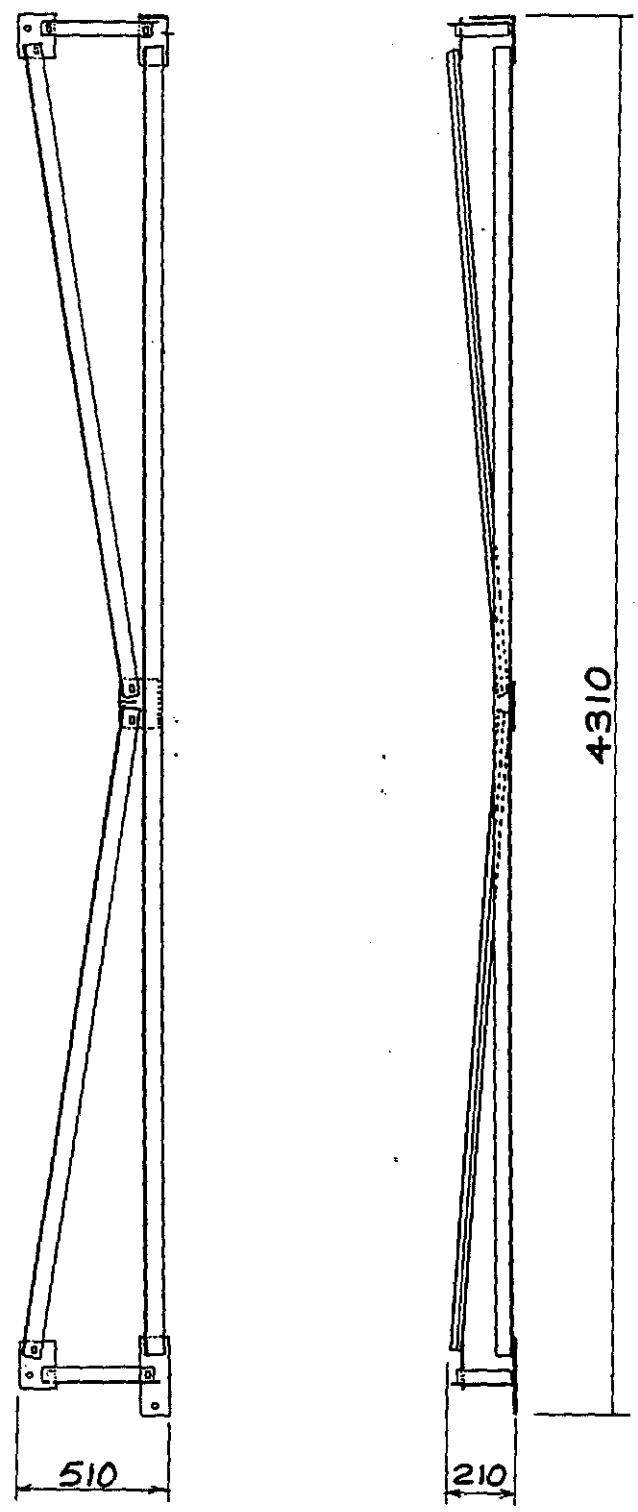
Checked	Date
SP	6/7/90



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7/90

NLC 9034
SPAN JUNCTION SWAYFRAME
- TWO LANE 1/4 -



OVERALL DIMENSIONS = 4310 x 510 x 210
CUBE = 0.46 M³ WEIGHT = 50.21 Kg-

Checked	Date
SF	6/7/90

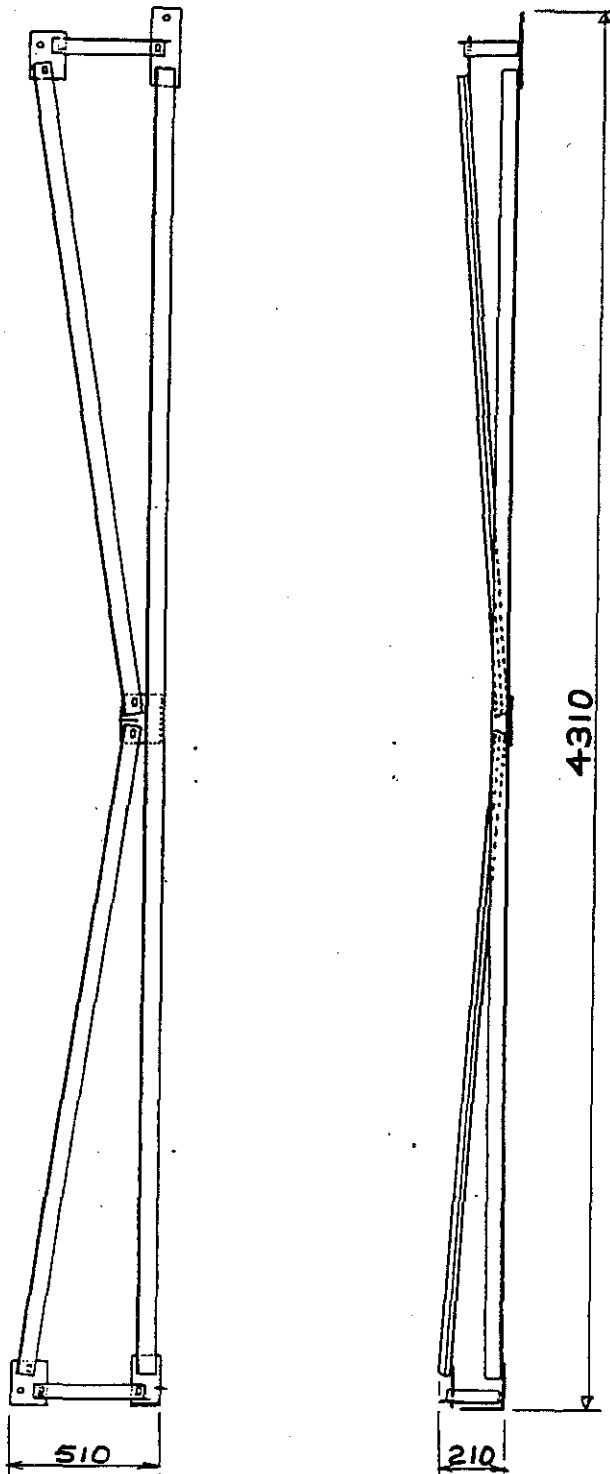


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Adm 10/1/67

7/90

NLC 9035
SPAN JUNCTION SWAYFRAME.
- TWO LANE R/H -



OVERALL DIMENSIONS = 4310 x 510 x 210

CUBE = 0.46 M³

WEIGHT = 50.21 Kg

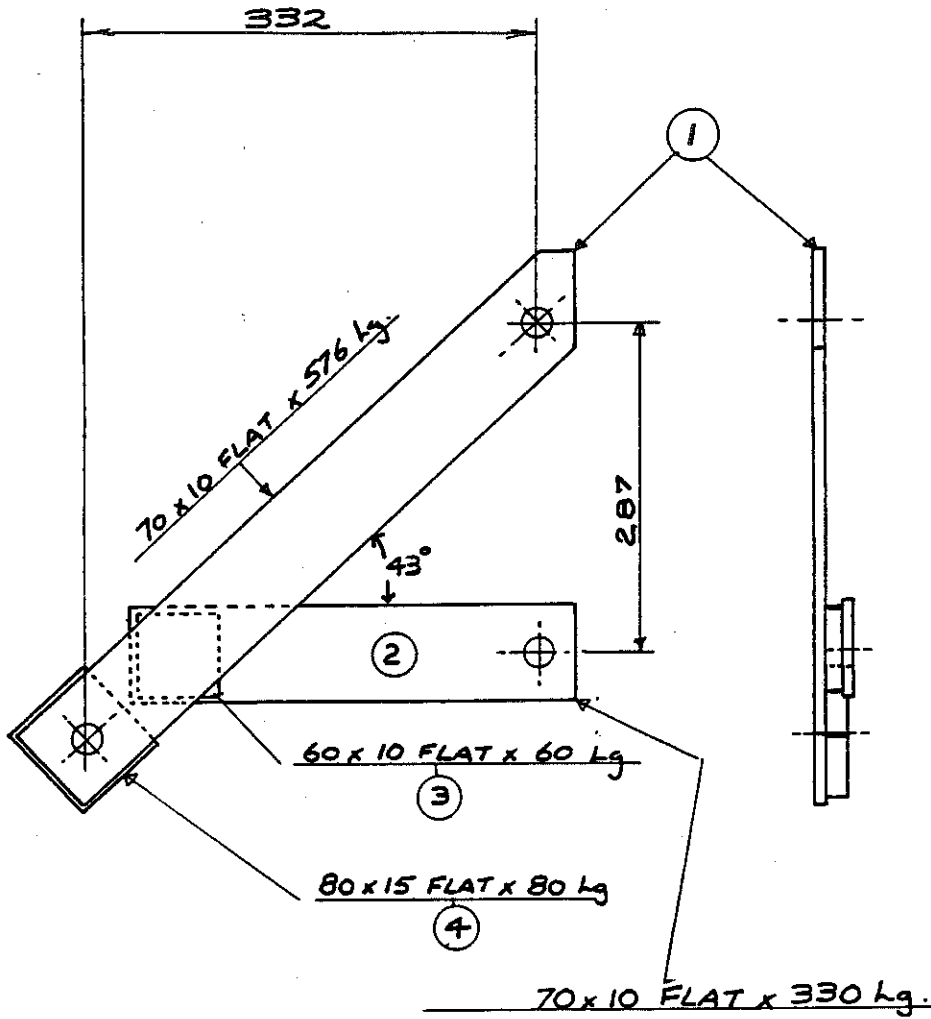
Checked	Date
SP	6/7/90



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TIE - BRACKET - 2 LANE
NLC 9036
WEIGHT 6.2 Kg.

903/4.



NOTES

1. All holes 26 diameter.
2. All welds 5 fillet
3. See M.S 903/4 for Material parts list.
4. This drug to be read in conjunction with 903/3.

Checked	Date
SP	6/7/90



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7/87

MC 218

9

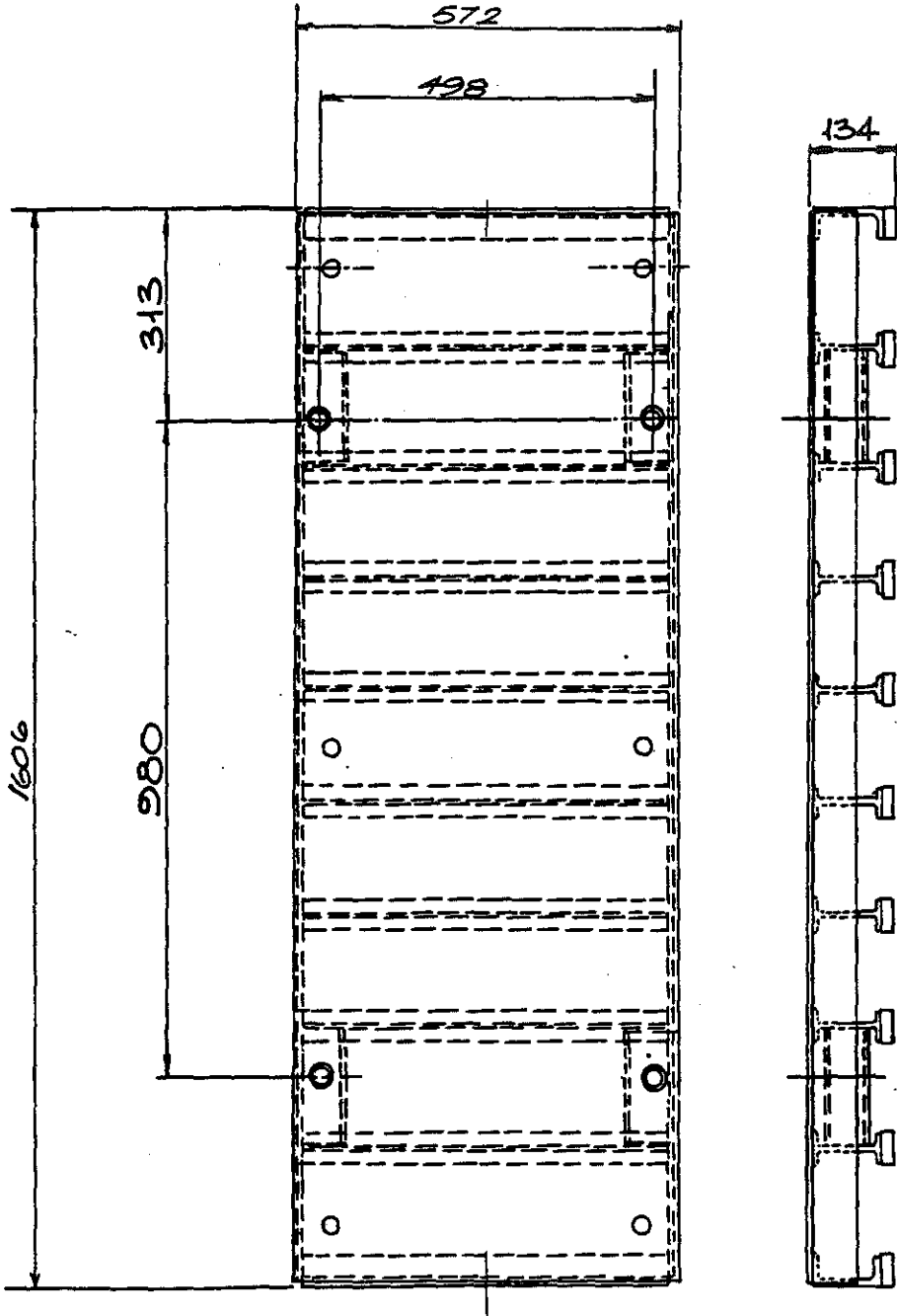
13

218

DECK-1606-S.J.

CA 237

WEIGHT 109 KG.



OVERALL DIMENSIONS : 1606 x 572 x 134

CUBE (M3) : 0.123

CHECKED	DATE
EBD	31.7.87



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2/86

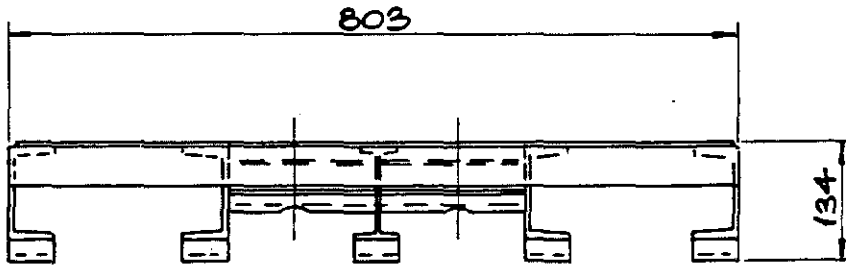
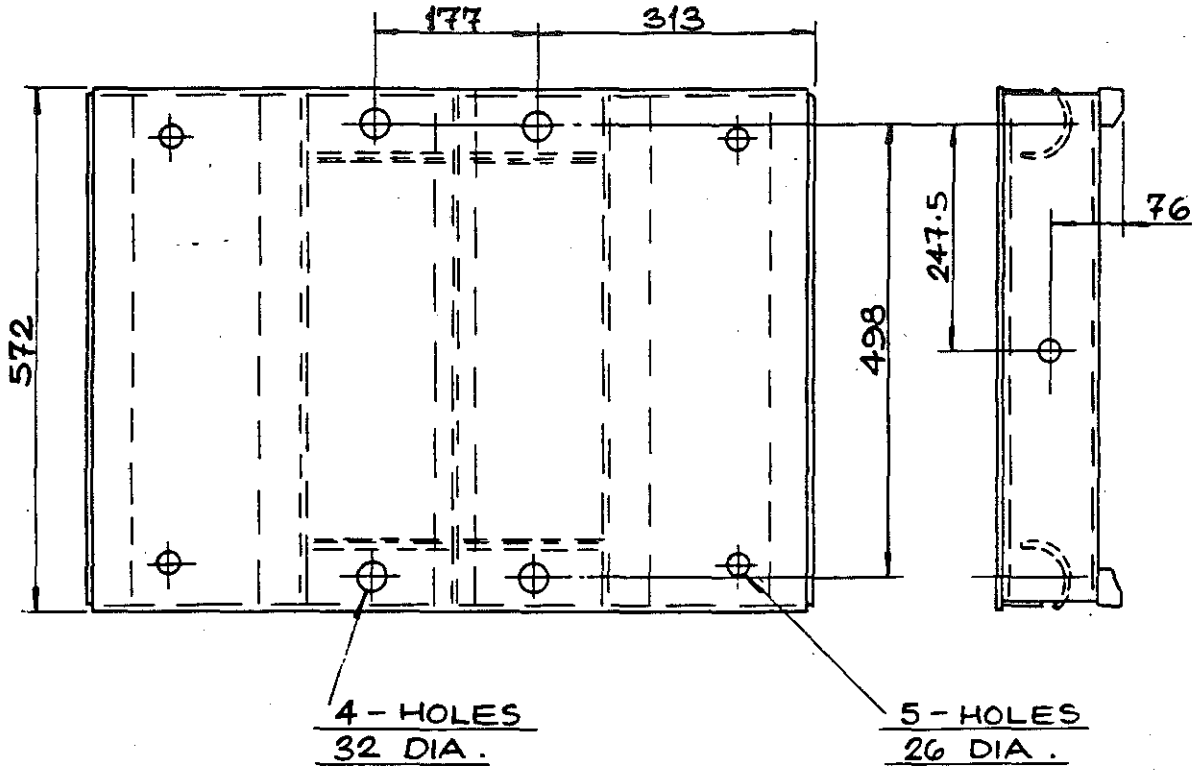
9 13 219

CA 238

MC 219

DECK - 803 - SJ .

WEIGHT: 64.0 Kg.



OVERALL DIMENSIONS : 572 x 803 x 134 .

CUBE (M³) 0.0616 .

CHECKED	DATE
SBD	14.2.86

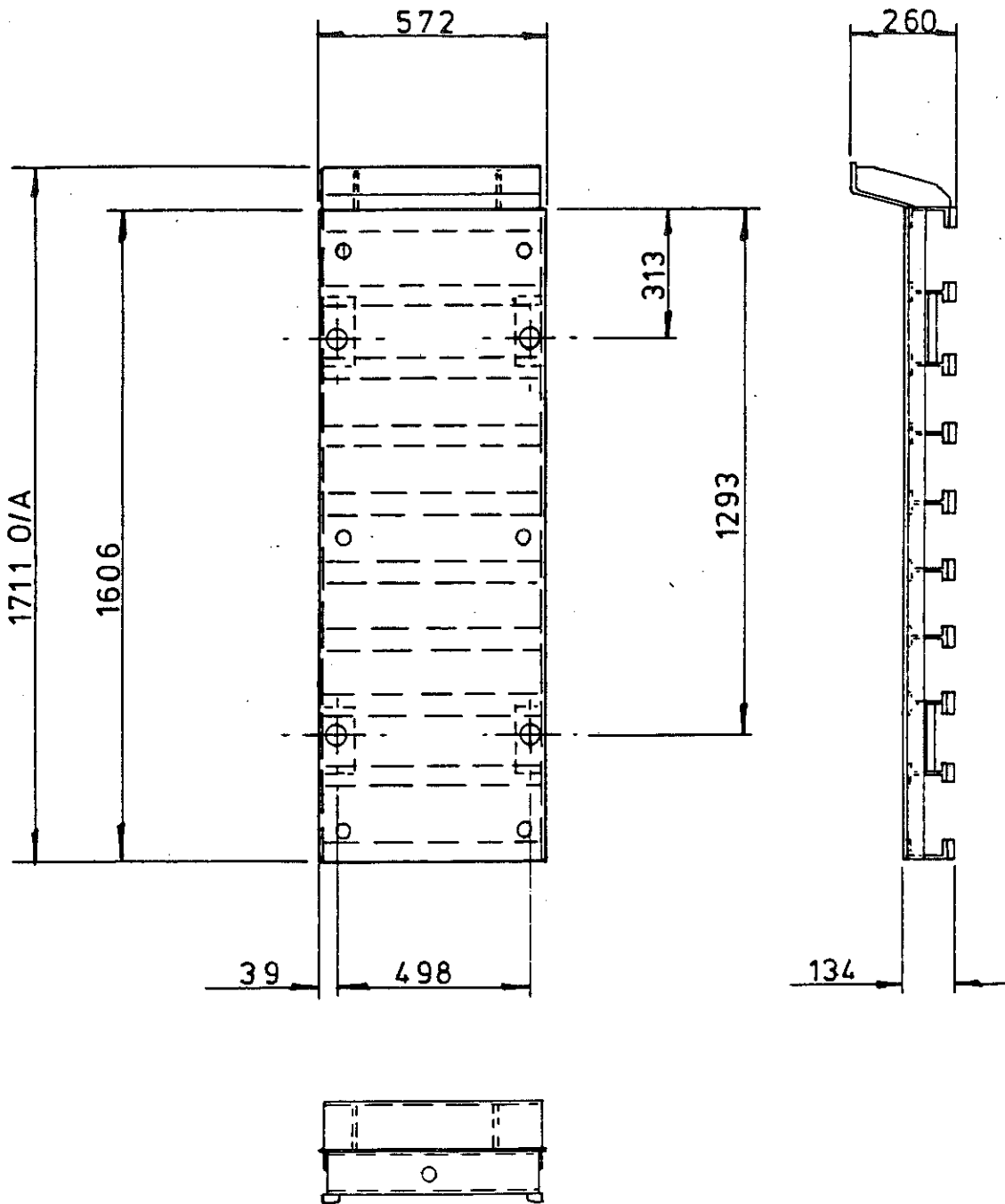


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3/86

MC 295
DECK-1606-KERB-SJ.
WEIGHT: 114 kg

9	13	295
CA 239		



OVERALL DIMENSIONS: 1711x572x260
CUBE [m³] 0.2545

CHECKED	DATE
D.F.G.	21/3/86



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12/84

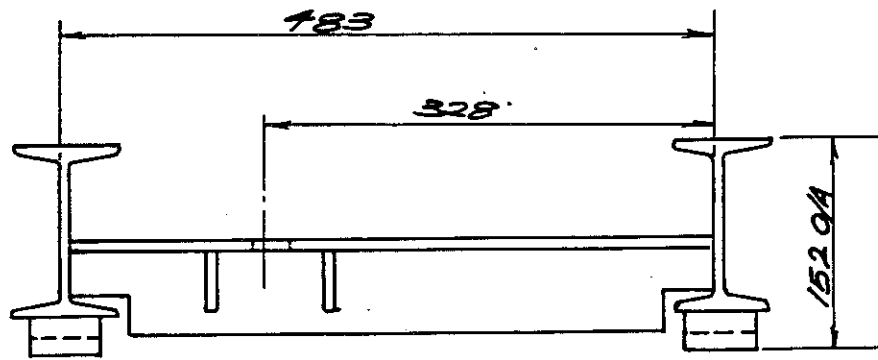
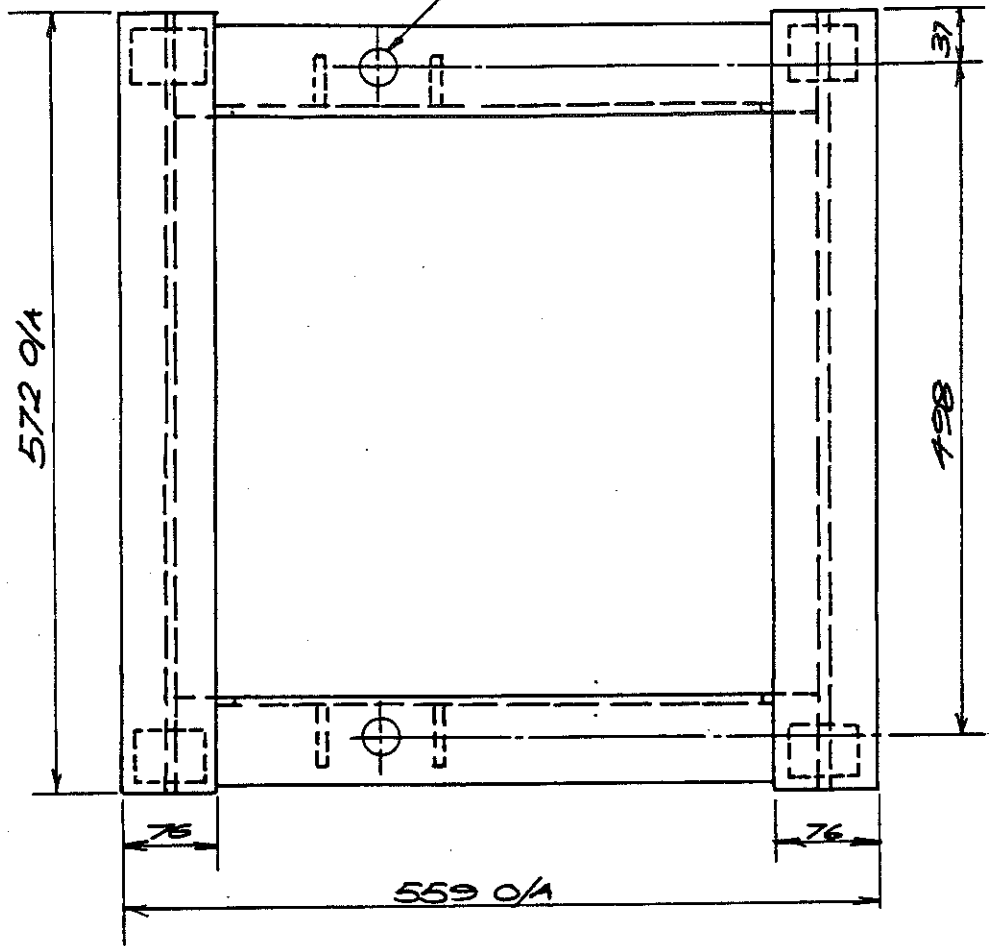
MC 223

9	13	223
CA	81	

STRINGER-PLAIN-S.J.

WEIGHT : 24.80 KG.

2-HOLES
22 DIA.



OVERALL DIMENSIONS : 572 x 559 x 152

CUBE (M³) : 0.0486

CHECKED	DATE
SBD	21.2.86



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2/86

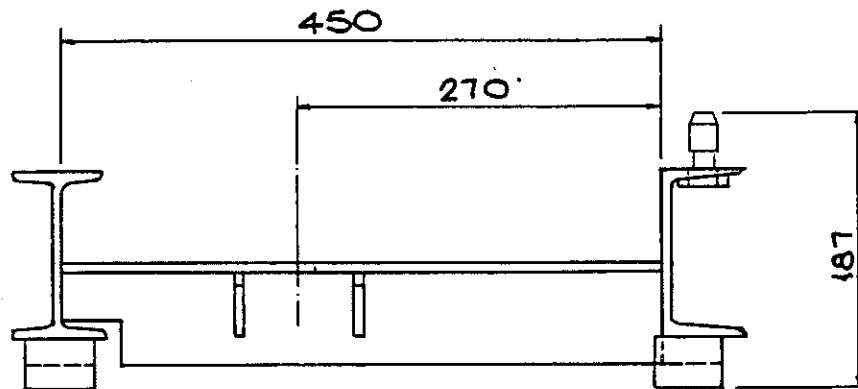
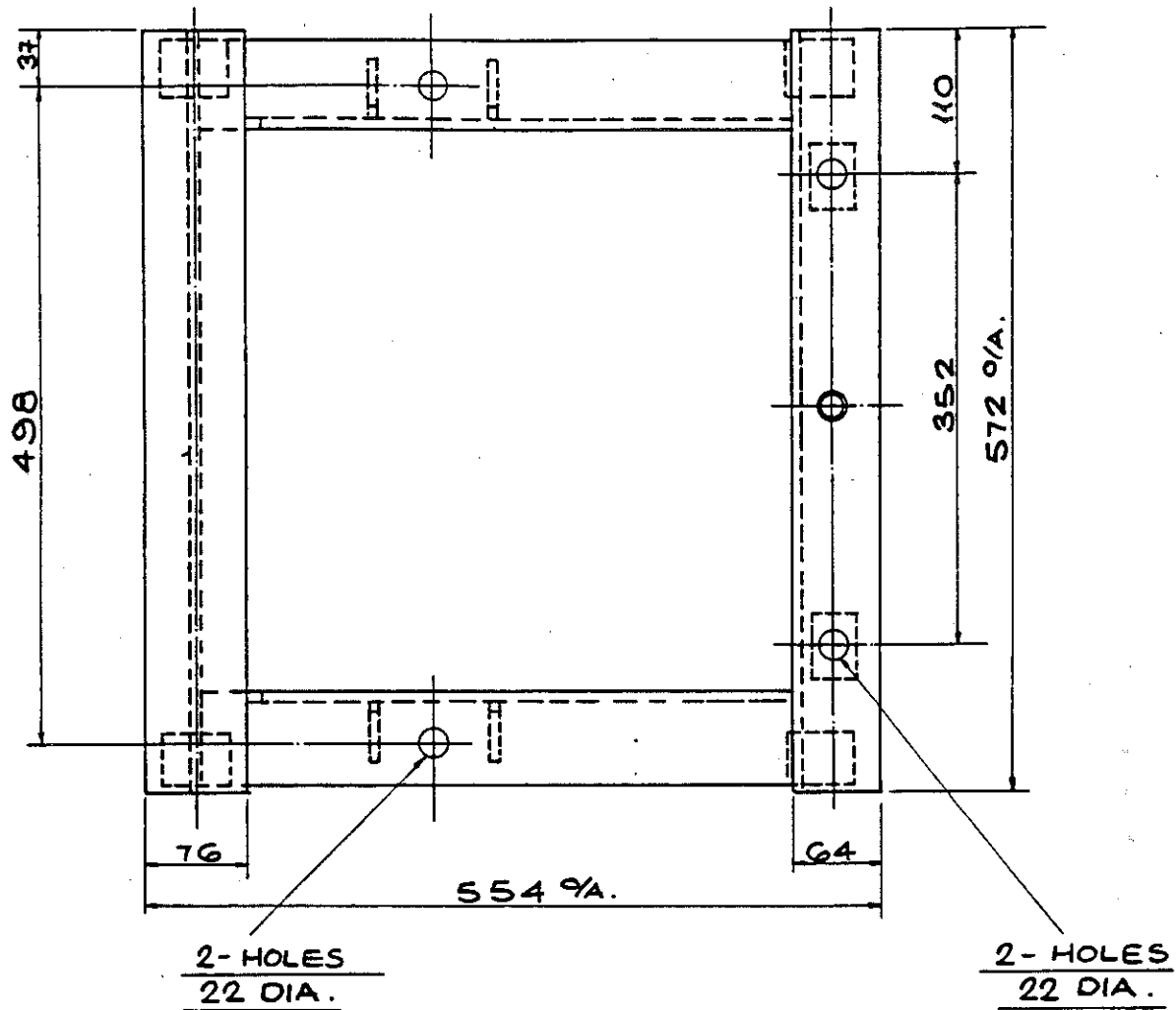
MC 224

STRINGER-BUTTON - SJ.

WEIGHT: 25.6 KG.

9 13 224

CA 80



OVERALL DIMENSIONS: 572 x 554 x 187

CUBE (M³): 0.0593.

CHECKED	DATE
SBD	21.2.86

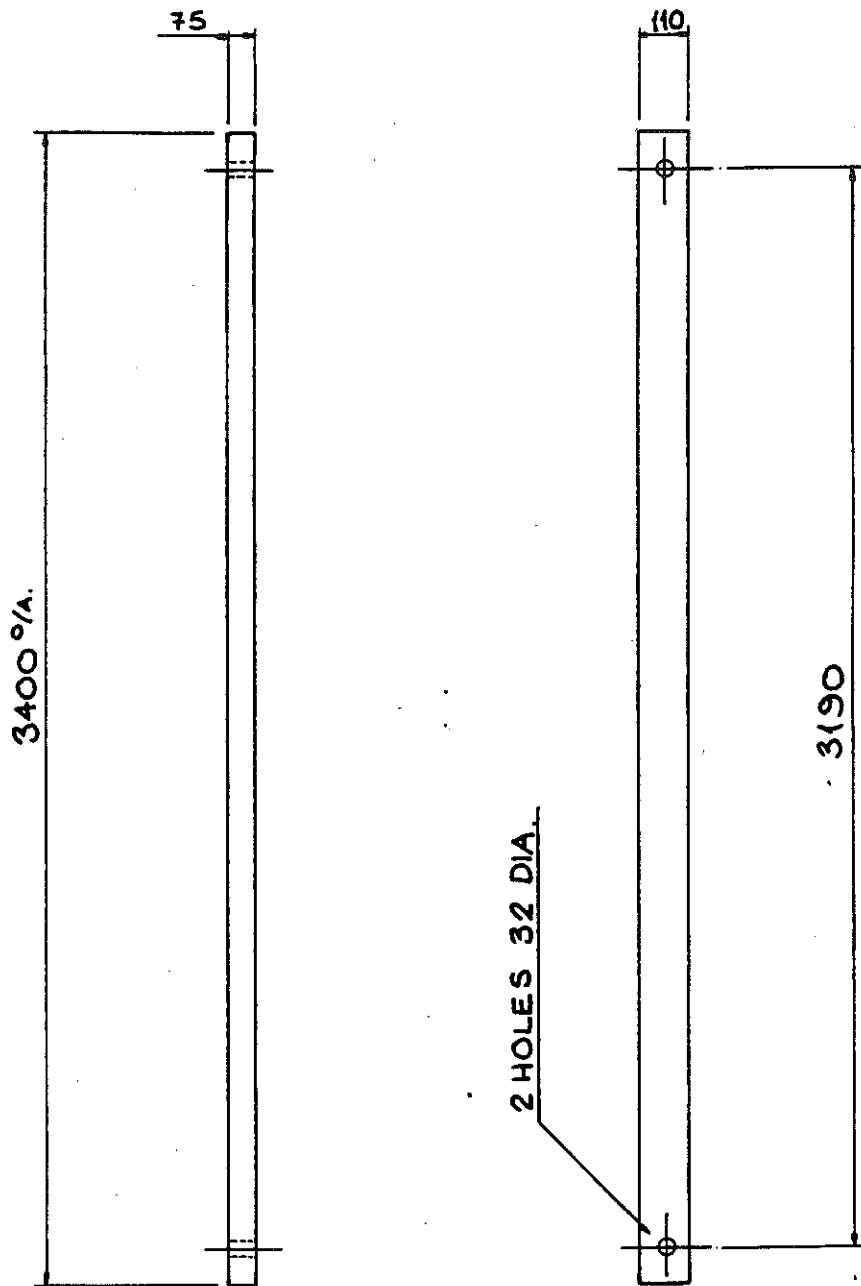


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2/86

MC 260
CHES - S.J. - STD - 75 MM.
WEIGHT: 14.8 KG.

9	13	260
CA 87		



OVERALL DIMENSIONS : 3400 x 110 x 75
CUBE (M³) : 0.0281

CHECKED	DATE
SBO	14.2.86



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2/86

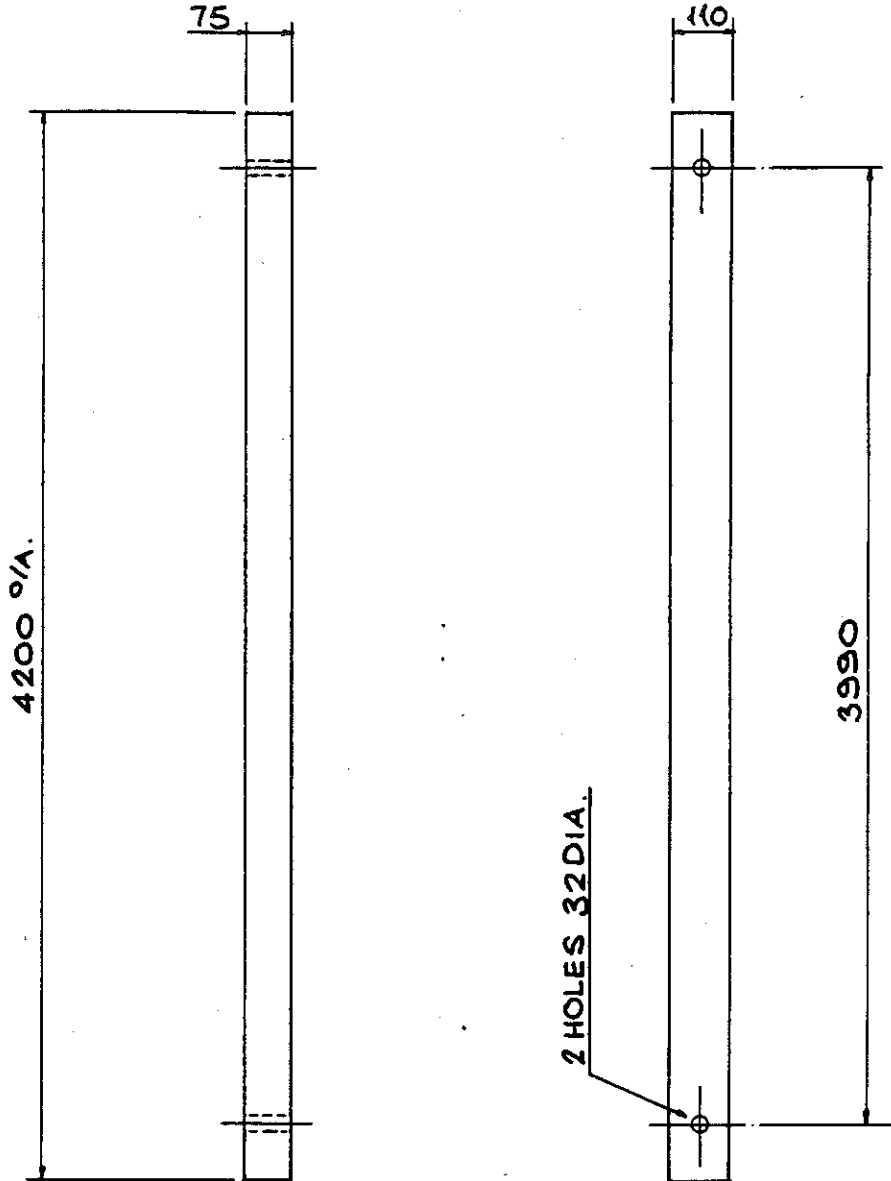
MC 261

9 13 261

CHESS - S. J. - EW. - 75 MM.

CA 92

WEIGHT : 18.4 KG.



OVERALL DIMENSIONS : 4200 x 110 x 75

CUBE (M³) : 0.0347

CHECKED	DATE
SBD	14.2.86



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2/86

MC 225

9

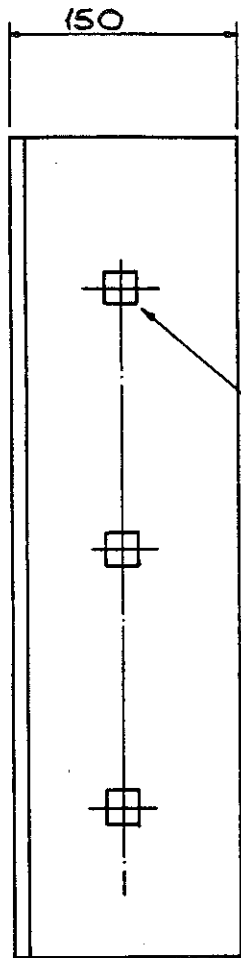
13

225

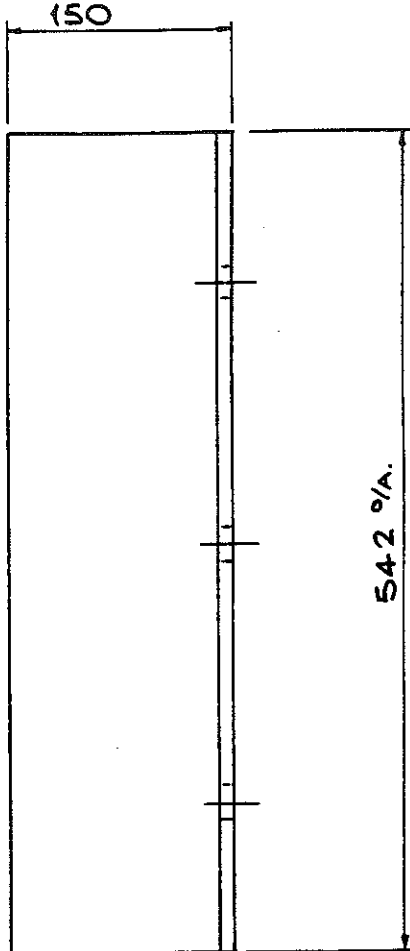
KERB - S.J. - TIMBER DECK.

CA 89

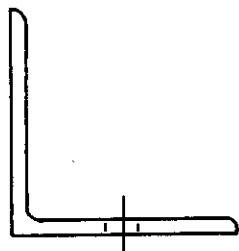
WEIGHT: 12.35 KG.



3 HOLES 22 SQ.



542 o/a.



OVERALL DIMENSIONS: 542 x 150 x 150

CUBE (M³): 0.0122

CHECKED	DATE
SBD	14.2.86



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7/85

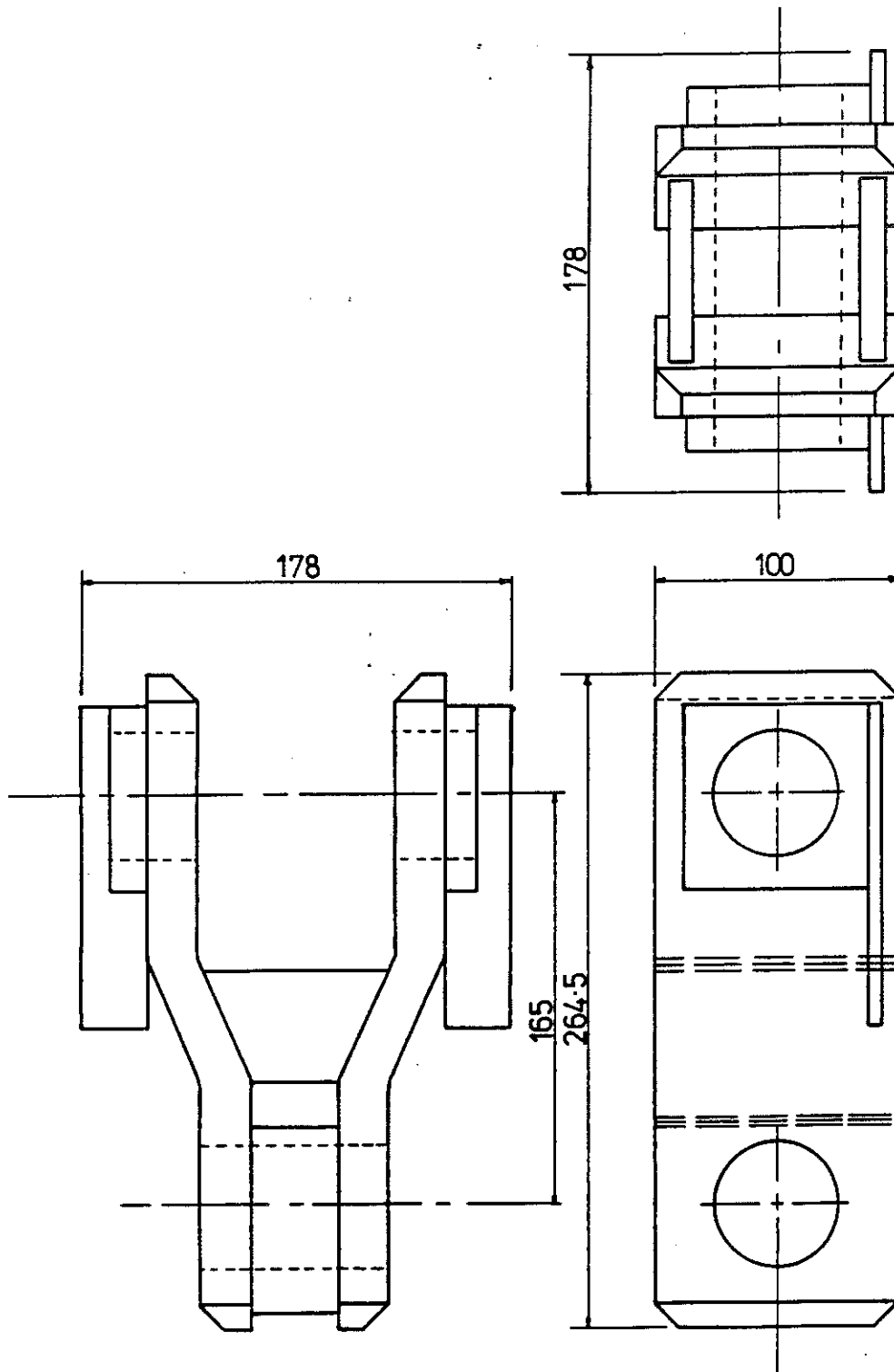
9

13

65

MC 65
LINK - LAUNCHING
WEIGHT: 10.2 kg

CA145



OVERALL DIMENSIONS : 264.5 x 178 x 100
CUBE : 0.00471 m³

Checked:

MJM.

Date:

21.7.85



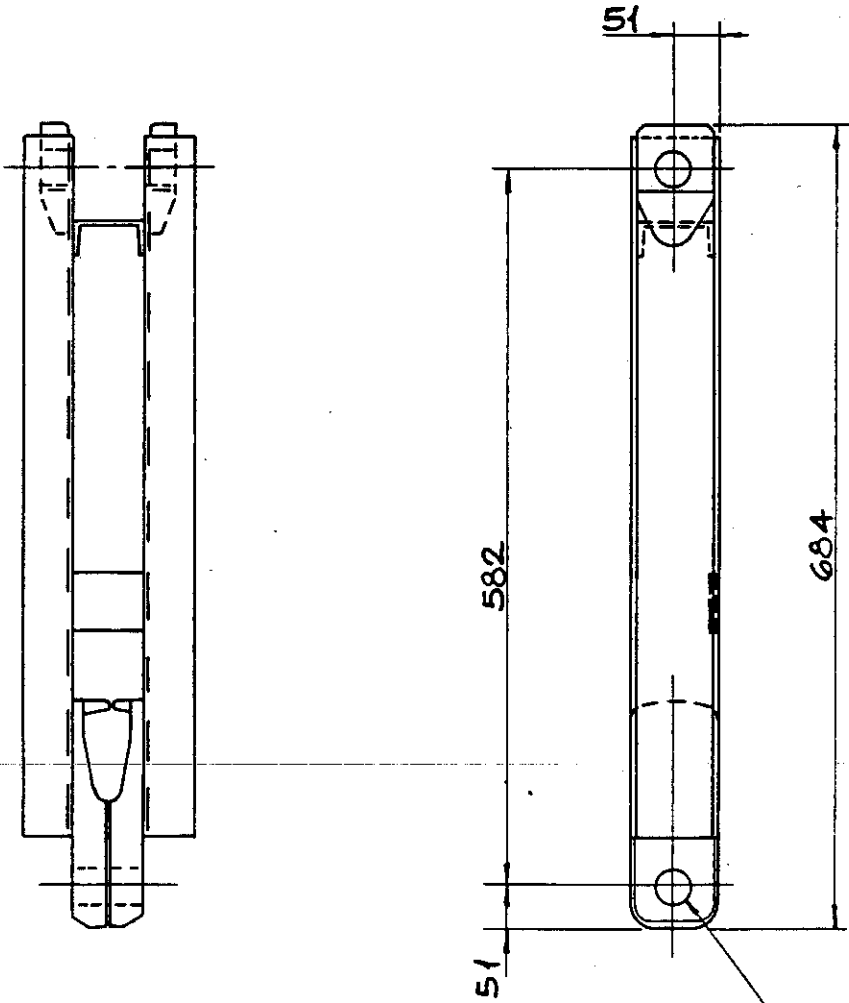
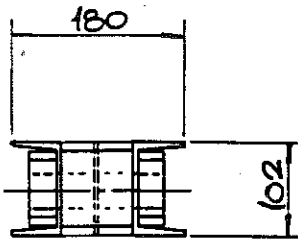
1/86

9	13	161
CA48		

MC 161

REINFORCEMENT - CHORD - SJ.

WEIGHT: 23.4 Kg.



2-HOLES
47.6 DIA.

OVERALL DIMENSIONS : 684 x 180 x 102.

CUBE (M.³) 0.0126.

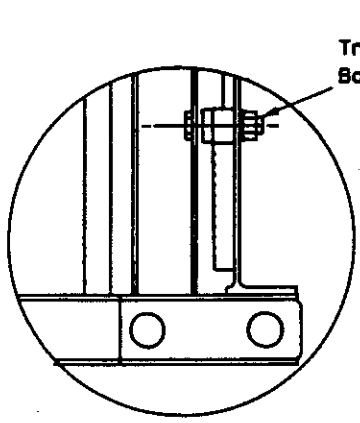
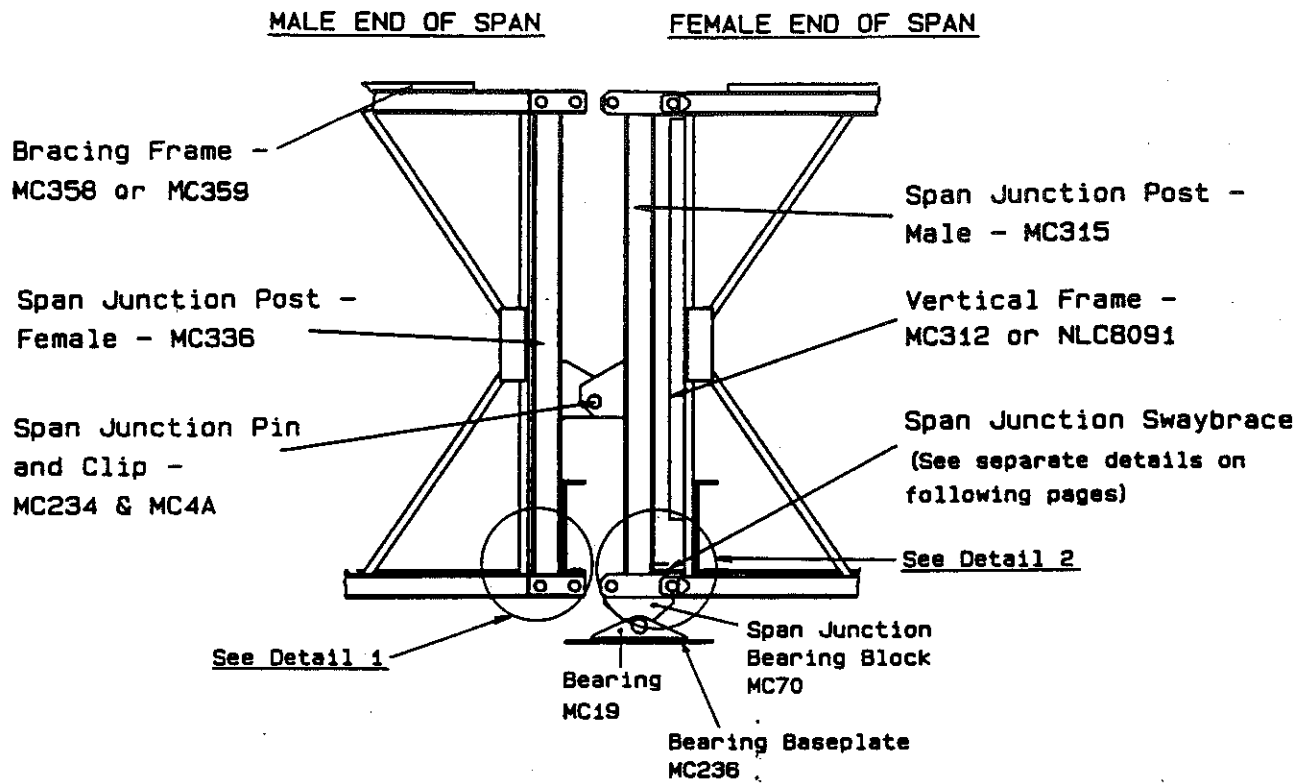
CHECKED	DATE
SBD	14.2.86



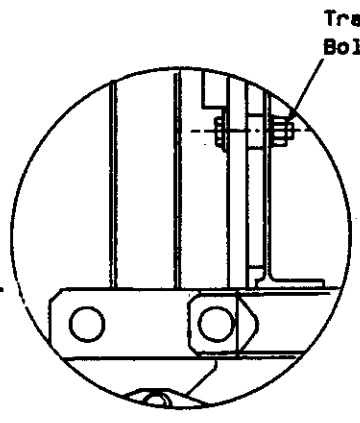
Mabey & Johnson Limited, Floral Mile, Twyford, Reading, RG10 9SQ

SPAN JUNCTION ASSEMBLY DETAILS

TRUSSES



DETAIL 1



DETAIL 2

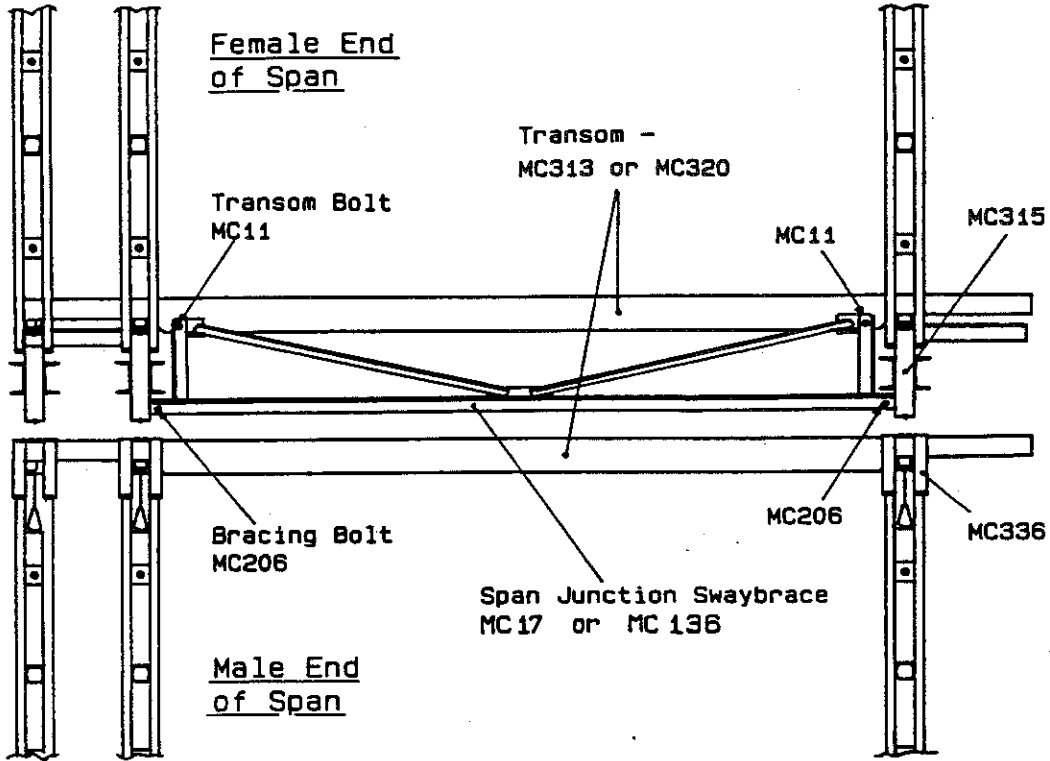
All other connections are shown in Section 5 Assembly Details.

The above illustration applies to DS, TS and QS constructions only. A similar arrangement is used for Single Truss constructions except that Bracing Frames are omitted and Raker Frames (MC314) are fitted in place of Vertical Frames (MC312 or NLC8091)

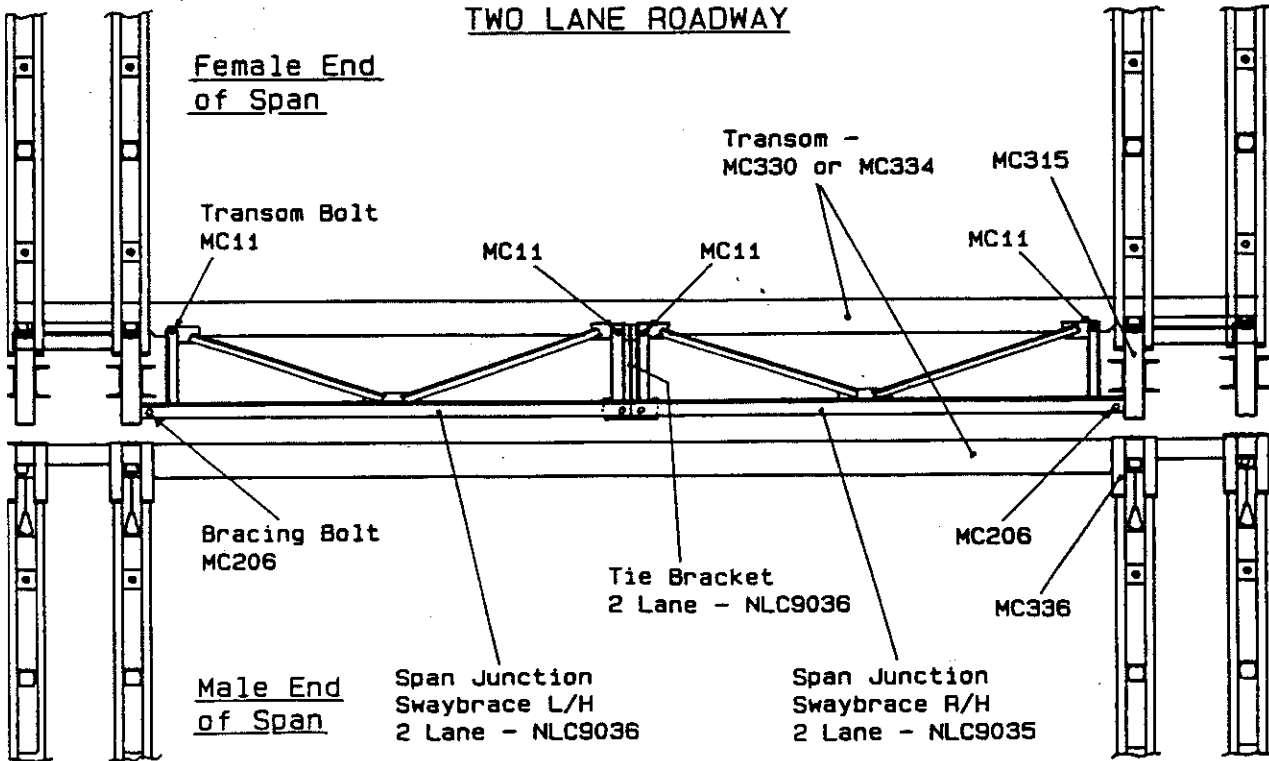
SPAN JUNCTION ASSEMBLY DETAILS

SWAYBRACING

SINGLE LANE ROADWAY



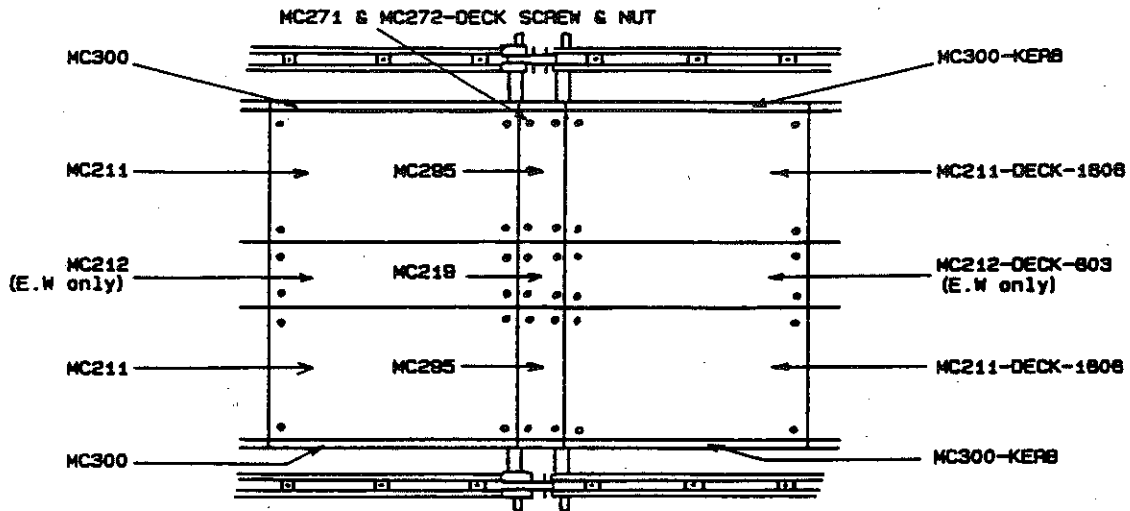
TWO LANE ROADWAY



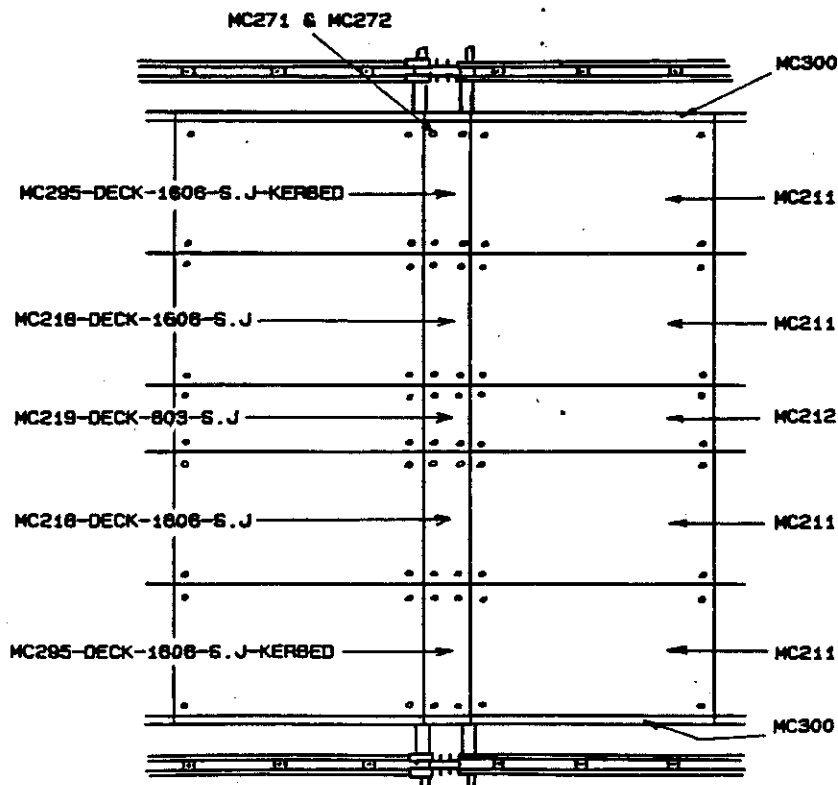
SPAN JUNCTION ASSEMBLY DETAILS

STEEL DECKING

SINGLE LANE ROADWAYS



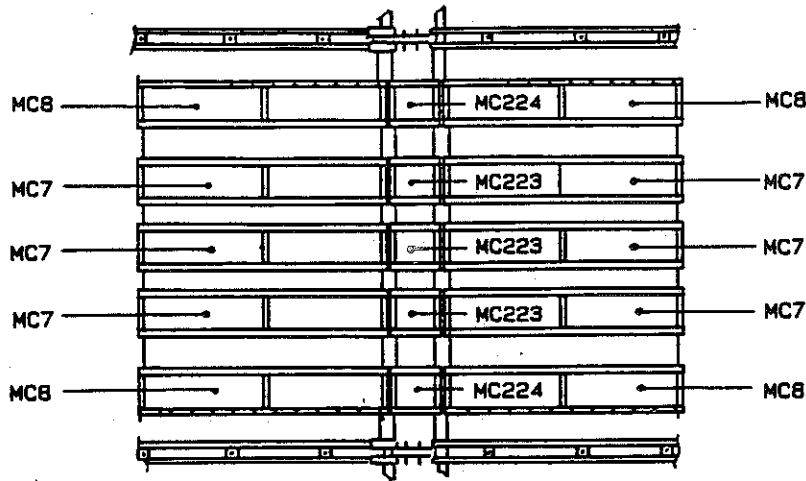
TWO LANE ROADWAY



- NOTES
- 1 2 x MC212's can be used in place of one MC211.
 - 2 Refer to Section 5 for other details

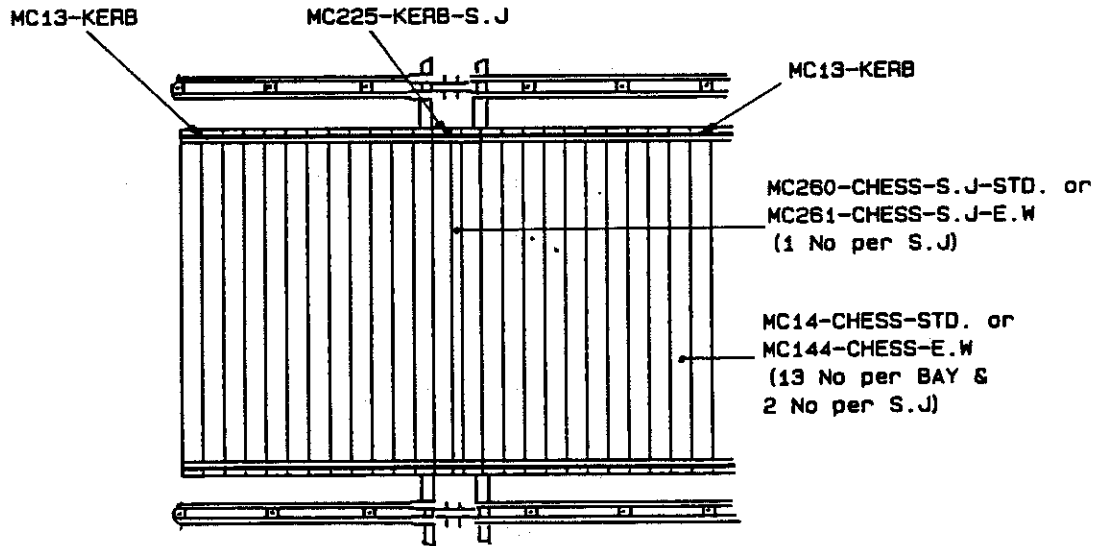
SPAN JUNCTION ASSEMBLY DETAILS

TIMBER DECKING



PLAN SHOWING STRINGERS ONLY

NOTE THE ABOVE PLAN SHOWS THE LAYOUT FOR EXTRA WIDE ROADWAY. THE LAYOUT FOR THE STANDARD ROADWAY IS SIMILAR HOWEVER, 1 PLAIN STRINGER MC7 PER BAY AND 1 PLAIN STRINGER MC223 PER SPAN JUNCTION ARE OMITTED FROM THE ROADWAY CENTRE.



PLAN SHOWING DECKING ONLY

ERECTION PROCEDURE AT SPAN JUNCTIONS

Due to the virtual infinite variability of multi-span bridge formats, it is necessary to prepare a specific launching and erection scheme for each bridge. The following procedures however, describe the basic principles involved.

1. Build all except for the last bay of the leading span following the sequences described in Section 6, but see the note below.
2. Build the last bay of the leading span as if it were the end bay of the bridge, but with the following variations:
 - a) If the leading span is of single panel truss construction, fit a Raker Frame (MC314) to the rear of each truss.
 - b) If the leading span is of a multiple panel truss construction, fit a Vertical Frame (MC312) to the rear, and a Bracing Frame (MC358 or MC359) to the top of each truss.
 - c) When Decking is fitted, whether before or after launching, fit Intermediate Bay components, not End of Bridge components.

NOTE: If any of the spans are of unreinforced construction but other spans are of reinforced construction, the bottom chords of the unreinforced spans, and span junctions, must be reinforced in the same way as those of the reinforced spans for launching.

It is also often necessary to reinforce the top chords of some of the bays, and span junctions, for launching, depending upon the exact format of the bridge. Refer to the specific erection and launching scheme for the bridge.

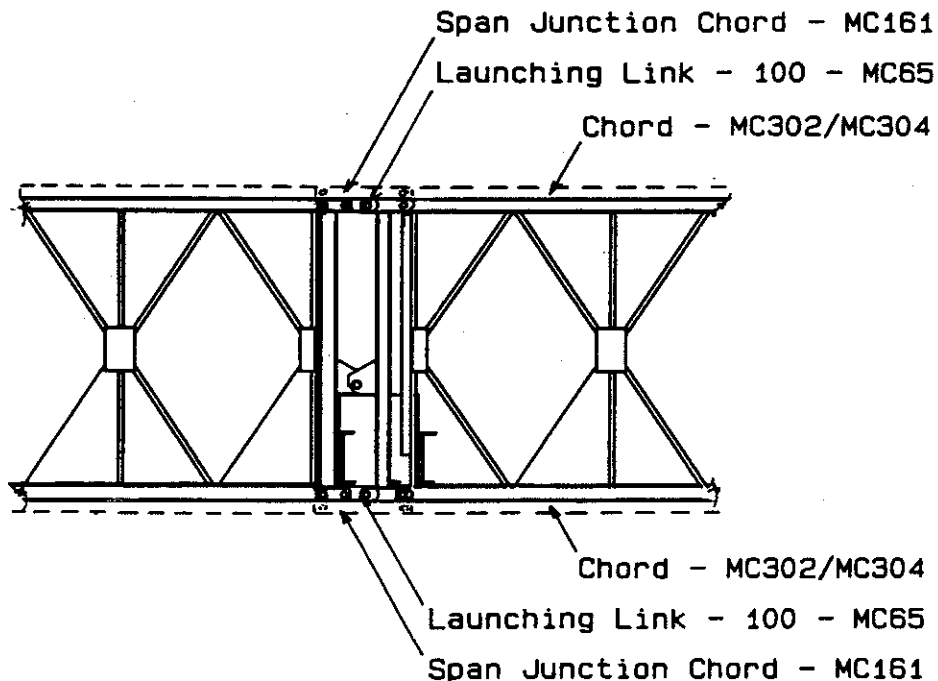
3. Pin a Male Span Junction Post (MC315) to the rear of each Panel, unless this span is of triple or quadruple truss construction in which case see the note below.
4. Connect a Female Span Junction Post (MC336) to each of the Male Span Junction Posts of the truss lines which are to continue into the next span, with a Span Junction Pin (MC234) and secure with a Safety Pin (MC4A).
5. Lock the top and bottom chords at the span junction for launching by pinning Compact 100 / Bailey Launching Links (MC65) in between both the top and bottom jaws of the Span Junction Posts.

NOTE: If the lead span is of triple or quadruple truss construction, before connecting Male Span Junction Posts to the outer panels of each truss, it is necessary to connect both Male and Female Span Junction Posts to the inner panels of each truss.

6. Fit the Span Junction Swaybracing, as shown on page 7.12.
7. Build the next span as per the sequences described in Section 6, but with the following variations:
 - a) Fit a Transom to the Female Span Junction Posts, connecting it to them in the same manner as used for Female End Posts.

ERECTION PROCEDURE AT SPAN JUNCTIONS

7.
 - b) If the span is of greater truss construction than the previous span, fit Female Span Junction Posts to the front of the extra panel lines in the first bay.
 - c) If the span is of multiple panel truss construction, connect a Bracing Frame to the top of each truss in the first bay.
 - d) When the Decking is fitted, whether before or after launching;
 - i) fit Intermediate Bay components to the first bay and not End of Bridge components.
 - ii) fit Span Junction Decking as shown on pages 7.13 & 7.14.
 - iii) if this is the last span of the Bridge, fit End of Bridge components to the last bay.
 - e) If there are subsequent Span Junctions, take account of all of the variations to normal procedure in 1 to 6 above.
8. Continue building following the same procedures until all of the spans of the Bridge have been completed.



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Publication Reference 90C2