

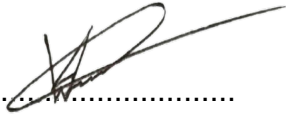
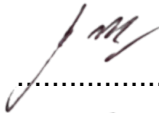


A Division of Transnet SOC Limited

Technology Management, Track Technology

BBH5065

User Requirement Specification for the manufacture and supply of Boltless Joggle Plates used on rail joints on ballasted track

Author	Engineer Track Technology Management	N. Manikam	
Reviewed by	Senior Engineer Track Technology Management	W. Swart	
	Senior Technologist Track Technology Management	J. Meyer	
Authorized and approved by	Principal Engineer Track Technology Management	D. Budhram	

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Circulation Restricted To: Transnet Freight Rail
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Restricted

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Document version

Amendment number	Section amended	Summary of amendments	Date issued

This document supersedes all documents relating to the manufacture and supply of Boltless Joggle Plates published prior to the date of this document.

1 Document scope

This specification governs the manufacture and supply of boltless Joggle Plates used to temporarily clamp welds, clamp welded rails with and without defects as well as jointed and broken rails.

This specification includes Joggle Plates manufactured according to Transnet design for use on ballasted track, commonly referred to as Joggled Fishplates. This specification does **not** cover the design, manufacture, and supply of boltless Joggle Plates intended for use on track slab or equivalent non-ballasted track structures.

2 Reference documentation

A list of the referencing documents used to develop this standard is listed below and may be referred to for further information.

- Manual for Track Maintenance, BBB0481;
- Drawing specification for Joggled fishplate for thermit welded rail joints (SAR57/60kg Rail Profile), drawing No.: E-3279;
- Drawing specification for Joggled fishplate for thermit welded rail joints (S60 Rail Profile), drawing No.: E-3333;
- Drawing specification for Joggled fishplate for thermit welded rail joints (SAR48/51kg Rail Profile), drawing No.: E-3281;
- Drawing specification for Joggled junction fishplate for thermit welded SAR57/60kg- UIC60 rail joint, drawing No.: E-322;
- Drawing specification for Joggled junction fishplate for thermit welded SAR48/51kg- SAR57/60kg rail joint, drawing No.: E-3340;
- Drawing specification for Joggled fishplate for thermit welded UIC60 rail joint, drawing No.: E-318;
- Drawing specification for Joggled fishplate for thermit welded SAR48/50kg - S60 rail joint, drawing No.: E-3336;
- Specification for fishplates for railway rails, CCE 1/65;
- Specification for the manufacturing of fishplates (Spoornet Design), CCE 1/18

- BS EN ISO 683-1:2018, Heat-treatable steels, alloy steels and free-cutting steels- Part 1: Non-alloy steels for quenching and tempering (ISO 683-1:2016);
BS EN 10293: 2015, Steel castings — Steel castings for general engineering uses;

3 Definitions

The terms used and defined in this document is referenced to Transnet Freight Rail Manual for Track Maintenance, BBB0481, version 2.

Abbreviation	Definition
TFR	'TFR' refers to Transnet Freight Rail, and is the largest operating division within Transnet SOC Ltd.
<i>TFR Track Technology Management or Track Technology Management (TTM)</i>	TFR Track Technology Management is a department within TFR, and acts as agent for TFR.
<i>Concrete Sleeper or Bearer</i>	This refers to the concrete beam that supports the rail and facilitates load transfer from superstructure to substructure. The words 'sleeper' and 'bearer' may be used interchangeably.
Boltless joggle Plates or Joggle plates	Permanent way sub-component used in conjunction with clamps to fasten rail sections together at joints in a temporary manner without drilling of the rail. This term will be used synonymously with the term joggle plate in this specification.
Fish plates	Fish plates is a permanent way sub-component used in conjunction with bolts to fasten rail sections together at joints in a temporary or permanent manner. The term fish plate in various locations including drawings, but for standardization will be referred to as joggle plates.
Functional failure	Failure of a system that inhibits the further use of the component in a specified manner.
Cast	A cast shall be considered as a group of castings poured from one ladle of finished steel.
G-Clamp or Clamp assembly	A typical clamp assembly consists of the clamp body, bolt, lock nut and anvil.

4 Manufacture and supply of boltless joggle plates according to Transnet design

4.1 Boltless Joggle Plate design

4.1.1 The rail joint assembly consists of the following components:

- a. G – Clamp assembly (including clamp body, bolt, anvil, etc.)
- b. Two boltless joggle plates

4.1.2 The different types of joggle plates must be designed and manufactured according to drawings supplied in Annexure A and in accordance with this specification. The joggle plate types covered in this specification includes:

- a. SAR48/51kg^c – Transnet Drawing: E3281;
- b. S60 – Transnet Drawing: E3333;
- c. SAR57/60kg^a - UIC60^b Junction – Transnet Drawing: E322;
- d. SAR57/60kg^a – Transnet Drawing: E3279;
- e. SAR48/51kg^c – SAR57/60kg^a Junction – Transnet Drawing: E3340
- f. UIC60^b – Transnet Drawing: E318
- g. SAR48/51kg^c – S60 – Transnet Drawing: E3336

NB: ^a SAR60/60kg/ rail profile is not the same as the S60 rail profile or the UIC60 rail profile

^b UIC60 and 60E1 rail profile term are interchangeable

^c The term SAR48 and SAR48/51 are interchangeable

4.1.3 The type of the joggle plates, as listed in clause 4.1.2, will be specified by TFR in the tender/contract documentation.

4.2 Joggle Plate body

4.2.1 Manufacturing process of the joggle plate

4.2.1.1 The joggle plate shall be manufactured through a process of forging or casting and shall be produced in accordance with current best practices.

4.2.1.2 The manufacturer must provide a description of the proposed manufacturing process and must be supplied during the approval stage.

4.2.2 Chemical composition of the Steel

4.2.2.1 The steel used to manufacture the joggle plate must conform to the material chemical properties for material type C45, as specified in BS EN ISO 683-1: 2018, in the case of forging; or alternatively GE300, as specified in BS EN 10293: 2015, in the case of casting. The required material chemical properties are specified in Table 1.

Table 1: Chemical Composition

Element	Unit	C45 (BS ISO 683-1:2018)	GE300 (BS EN 10293:2015)
Carbon (C)	%	0.42-0.50	0.45 (maximum)*
Manganese (Mn)	%	0.50-0.80	0.60 (maximum)*
Silicon (Si)	%	0.1-0.4	1.00 (maximum)*
Phosphorus (P)	%	0.05 (maximum)	0.035 (maximum)
Sulphur (S)	%	0.05 (maximum)	0.030 (maximum)
Chromium (Cr)	%	0.0.40 (maximum)	-
Molybdenum (Mo)	%	0.1 (maximum)	-
Nickel (Ni)	%	0.40 (maximum)	-

* Values sourced for equivalent material Grade A3 from BS 3100:1991. To be used for reference purposes only.

4.2.2.2 In the event of a revision of these specifications as listed in clause 4.2.2.1, suppliers may elect to use these specifications provided it satisfies the requirements of this specification.

4.2.2.3 The microstructure of the joggle plate shall contain tempered martensite.

4.2.2.4 The manufacturer shall supply TFR with a certified material chemical composition analysis report of each batch during the production phase. The report shall be verified by TTM.

4.2.3 Physical properties

4.2.3.1 The body must be manufactured according to drawings listed in clause 4.1.2 for the different rail profiles in accordance with this specification.

4.2.4 General finish

4.2.4.1 All castings shall be clean, sound, free of defects and other flaws. The casting shall be properly cleaned, fettled and dressed. Attention must be given to the removal of sharp edges and corners.

4.2.4.2 Minor surface defects, holes, etc. with depth $\leq 0.5\text{mm}$ and radius $\leq 1\text{mm}$ may be smoothed out.

4.2.4.3 TFR may request the joggle plate body castings kept separately according to their manufacturing batches until they have conducted a visual examination of each casting batch to amongst others approve the casting quality and dimensions. TFR reserves the right to select two joggle plate body castings from the total batch for laboratory testing.

4.2.4.4 The flashing formed on the body during manufacturing must be removed to prevent an injury during handling and/or installation.

4.2.5 Heat treatment

4.2.5.1 All joggle plate body castings shall be annealed, hardened and tempered to obtain the mechanical properties provided in section 4.2.6. This process must be outlined in the proposed manufacturing process, as specified in clause 4.2.1.2.

4.2.6 Material mechanical properties

4.2.6.1 The mechanical properties of the manufactured joggle plates, for material types C45 when forged; or GE300 when cast, must be in accordance with Table 2.

Table 2: Material mechanical properties

Property	Unit	C45 (BS EN ISO 683-1: 2018)	GE300 (BS EN 10293: 2015)
Tensile strength	MPa	630 - 780	600 – 750
Yield strength (0.2% Proof)	MPa	370 (minimum)	300 (minimum)
Elongation	%	17 (minimum)	15 (minimum)
Impact strength	J	-	27J (minimum)

4.2.6.2 This supplier/manufacturer will be required to supply TFR with evidence in the form of reports indicating the material mechanical properties of the steel used for the manufacturing of the joggle plates. The report shall be verified by TTM.

4.2.7 Tolerances

4.2.7.1 All tolerances not indicated shall be taken as ± 1.0 mm for dimensions up to 50.0 mm, and ± 2.0 mm for dimensions greater than 50.0 mm.

4.3 Documentation

- 4.3.1 The supplier must provide TFR with the necessary documentation as outlined in clause 14 and is inclusive of but not limited to compliance certificates, mechanical properties information, laboratory test results, quality assurance tests, technical information and any other information the bidder considers relevant free of charge during the approval phase.

5 Approval

- 5.1 Approval of the product includes two phases namely, Phase 1, and Phase 2 as outlined in clause 5.2, and 5.3 respectively

5.2 Approval Phase 1

- 5.2.1 Approval phase 1 entails a documentation-based evaluation of the technical capabilities of a supplier and adherence to the requirements as stated in this specification and is based on the returned documentation as prescribed in the tender documentation.

- 5.2.2 Approval of the proposed product must be obtained from TFR before commencing with the manufacture, and the supply of test samples for inspection and testing as part of the approval process. Approval of the proposed product for manufacturing of test samples will be granted based on the information provided to TFR as requested in clause 14, provided it meets the standards and requirements in this specification.

- 5.2.3 The supplier will not be required to obtain approval as per clause 5.2.1 if the supplier is in possession of a valid letter of approval issued by TFR and in accordance with clause 5.4.

5.3 Approval Phase 2

- 5.3.1 Approval: Phase 2 will include the inspection and physical testing of samples provided as specified in clause 7 as well as the verification of documentation as specified in clause 14.

- 5.3.2 Approval of the production or prototype product will be granted by TFR once the supplier and its product/s comply with the technical requirements of this specification, and the product passes the laboratory tests as specified in this specification.

- 5.3.3 Formal communication regarding the approval process and the outcome of approval phase 2 will be provided by TFR to the supplier.

5.3.4 Only once communication has been received by the supplier clearly indicating that the product has been approved by TFR, may the total order be supplied to TFR.

5.4 Currently approved joggle plates

5.4.1 Products that have previously been tested, approved and are currently being used by TFR will be deemed as compliant with this specification, subject to the following conditions:

5.4.1.1 The scope of previous application is appropriate for the current intended use as outlined in this specification.

5.4.1.2 The approval status has not been revoked.

5.4.1.3 Continued compliance is maintained as discussed in clause 6.

5.4.2 The supplier will not be required to go through the approval process listed in clause 5.3, if the supplier satisfies clause 5.4.1 and is in possession of a valid letter of approval issued by TFR.

6 Continued compliance and Approval

6.1.1 Approval is obtained indefinitely, as long as the requirements of this specification are complied with (including periodic re-testing). TFR may from time to time revise this specification. Approved suppliers must make sure that their products produced continue to comply with any new requirements of this specification.

6.1.2 Suppliers have two years from the date of issue of a revised specification to make sure they comply with the new requirements of the specification (unless specifically mentioned in the specification that approved suppliers are exempted).

6.1.3 Depending on the nature of the change re-approval may not be required.

6.1.4 Once an approval is revoked suppliers will have to go through the approval process again.

6.1.5 To ensure continued compliance TFR will inform approved suppliers of approved products of revisions to the specification; if implemented between tenders; and will indicate the nature of the change.

7 Inspection and testing

7.1 All inspections and tests to be conducted by TTM during the test and evaluation of the boltless joggle plate designs will be conducted at TTM's Track laboratory, situated in Johannesburg unless stated otherwise.

7.1.1 Upon the successful approval of the product as part of Approval Phase 1, and subsequent notification by Supply Chain Services, the supplier will have a timeline as agreed upon between the respective parties to supply two (2) sets of production/prototype samples of the boltless joggle plates free of charge to TFR for inspection and/or testing. These samples will be returned to the supplier upon completion of inspection and/or testing.

7.1.2 TFR will not be held liable for any damage incurred to the supplied samples during inspection and/or testing when conducted in accordance with the outlined standard inspection and testing procedure.

7.1.3 TFR reserves the right to conduct random sampling of the production batches and select samples for inspection and testing in accordance with this specification.

7.2 Inspection and Testing for the Manufacture and supply of boltless joggle plates according to TFR design

7.2.1 Inspection

7.2.1.1 The boltless joggle plates will be inspected and assessed by TFR in accordance with this specification to provide approval for the supply of the total order.

7.2.2 Testing

7.2.2.1 The manufacturer must conduct the necessary tests required to prove that the material properties meet the requirements, as specified in clause 4.2.2.1 and clause 4.2.6.1 and provide the results to TFR. TFR may request the supplier to conduct these tests in the presence of a TFR appointed representative.

7.2.2.2 Laboratory component testing will be performed by TTM on the supplied samples during the approval stage.

7.2.2.3 Laboratory testing initiated by TFR, as specified in clause 7.2.2.2 will be conducted in accordance with the laboratories standard test method TQM-TRL-STM-40 Clamps for boltless joints in permanent way.

7.2.2.4 The product must pass the testing phase to be considered for approval.

8 Surface treatment

- 8.1 The boltless joggle plates must be treated with a corrosion inhibiting coating or treatment that will not alter the performance or the handling of the product. Details of the proposed methods and alternative methods must be submitted to TFR during the approval stage.
- 8.2 The treatment of surfaces as specified in clause 8.1 must not alter the material mechanical and chemical properties and result in deviations from the prescribed properties as specified in Table 1 and Table 2 for the boltless joggle plates.
- 8.3 The boltless joggle plates shall be cleaned, dried, and coated with a corrosion inhibiting product for storage and transportation.

9 Quality Assurance and Quality Control

- 9.1 The supplier is required to provide TFR with the quality management system (manufacturing plant) that will be adhered to throughout the manufacturing and supply process.
 - 9.1.1 The minimum details to be submitted includes:
 - 9.1.1.1 Typical quality control sheets;
 - 9.1.1.2 Type and frequency of inspection and testing;
 - 9.1.1.3 Method used to handle non-conformances;
 - 9.1.1.4 Quality management organogram/staff.
- 9.2 TFR reserves the right to inspect or audit the manufacturing process as and when required, this shall also include inspection of all manufactured products prior to delivery.
- 9.3 The quality control process will be left to the discretion of the supplier with control sheets made available to TFR as part of the approval Phase 1 and approval Phase 2 of the product.
- 9.4 TFR requires the supplier to provide a quality control plan which will include the necessary tests and inspections conducted on the product as part of the continuous quality control. TFR may request to be present when quality tests and inspections are performed.
- 9.5 TFR reserves the right to conduct a quality control audit on the product. The audit may take place at the supplier/manufacturers production facility. Non-conformances may result in;

- 9.5.1 TFR suspending purchasing of the product until the deviation in quality has been addressed by the supplier;
- 9.5.2 TFR will re-assess the non-conformances and/or rectifications and if satisfied provide a recommendation to TFR to resume purchasing of the product;
- 9.5.3 TFR may revoke the approval based on the nature of the non-conformance;
- 9.6 All non-conformities will be addressed by TFR through the contract.

10 Guarantee

- 10.1 The supplier will be required to provide a guarantee for the supplied components against all defects, workmanship and quality of material for a period of two years after date of first installation with a maximum period of three years from the delivery date under normal operating conditions.
- 10.2 Components that fail in service before the expiration of the guarantee period shall be replaced by the supplier free of charge at the initial point of delivery.

11 Marking

- 11.1 The joggle plate body must be supplied with permanent markings including the manufacturer's name, date of manufacture, the TFR logo, component identification (product name/type) and the unique identification number.
- 11.2 The markings must be stamped in a position that is permanent, remain visible throughout the life cycle of the component and during track inspections.
- 11.3 The markings will be subjected to normal surface wear and must not influence the performance of the component.
- 11.4 Proposals for the marking size, position and details must be submitted to TFR for approval.

12 Packaging

- 12.1 The supplier must provide details of the proposed packaging for transportation and delivery of the total order.
- 12.2 The method of packaging must ensure the safe removal, offloading and handling of the package that will not require additional equipment to move the package.
- 12.3 The supplier/manufacturer will be allowed to palletize a batch of joggle plate sets with a maximum weight of 500.00 kilograms, and maximum permissible dimensions of 1.20 m (length) x 1.00 m (width) x 1.00 m (height).

13 Environment and safety

- 13.1 The boltless joggle plates as well as packaging must be manufactured from sustainable materials that does not pose any unnecessary negative impact to the environment.
- 13.2 The corrosion inhibiting substance must not be harmful to the environment or pose any threat to the safety and health of personnel.

14 Documentation

14.1 Approval Phase 1 documentation

14.1.1 The supplier must provide TFR with the documentation listed in clause 14.1.

14.1.2 Approval Phase 1 documents to be submitted for non-approved products for the manufacture and supply of boltless joggle plates according to TFR design includes:

- 14.1.2.1 Product offered;
- 14.1.2.2 Letter of compliance to the specification (confirmation of compliance);
- 14.1.2.3 Suppliers that use later versions of the material specification as mentioned in clause 4.2.2.1 must indicate the version used during the bid process;
- 14.1.2.4 Description of material mechanical properties of the materials to be used;
- 14.1.2.5 Detailed information on the proposed process used to manufacture the boltless joggle plates;
- 14.1.2.6 Proposed surface treatment method;
- 14.1.2.7 Details of the corrosion inhibiting substance to be used for storage and transportation of the joggle plates;
- 14.1.2.8 Proposed guarantee and terms of application;
- 14.1.2.9 Proposed method of marking of the joggle plate;
- 14.1.2.10 Proposed packaging;
- 14.1.2.11 Proposed or typical quality management system, inclusive but not limited to quality control sheets.

14.1.3 Approval Phase 1 documents to be submitted for approved joggle plates, in accordance with clause 5.4, includes:

- 14.1.3.1 A letter/certificate issued by TFR for the approval of the product;
- 14.1.3.2 Product offered.

14.2 Approval Phase 2 documentation

14.2.1 The supplier must provide TFR with the documentation listed in clause 14.2.

14.2.2 Manufacture and supply of non-approved boltless joggle plates according to TFR design

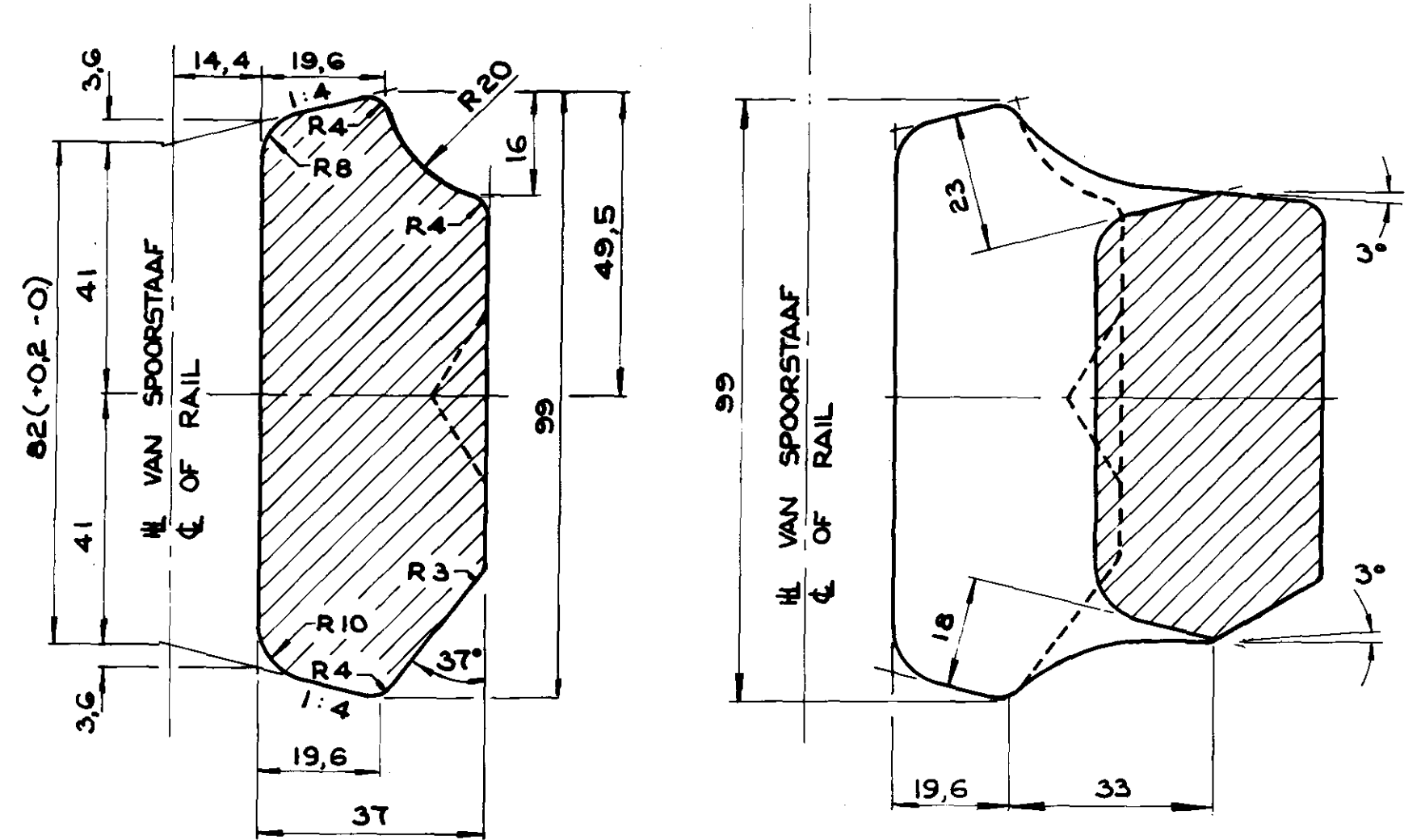
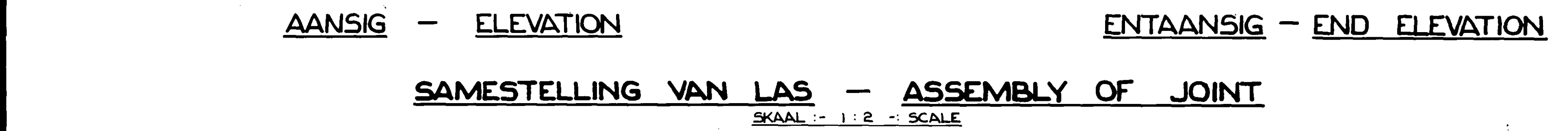
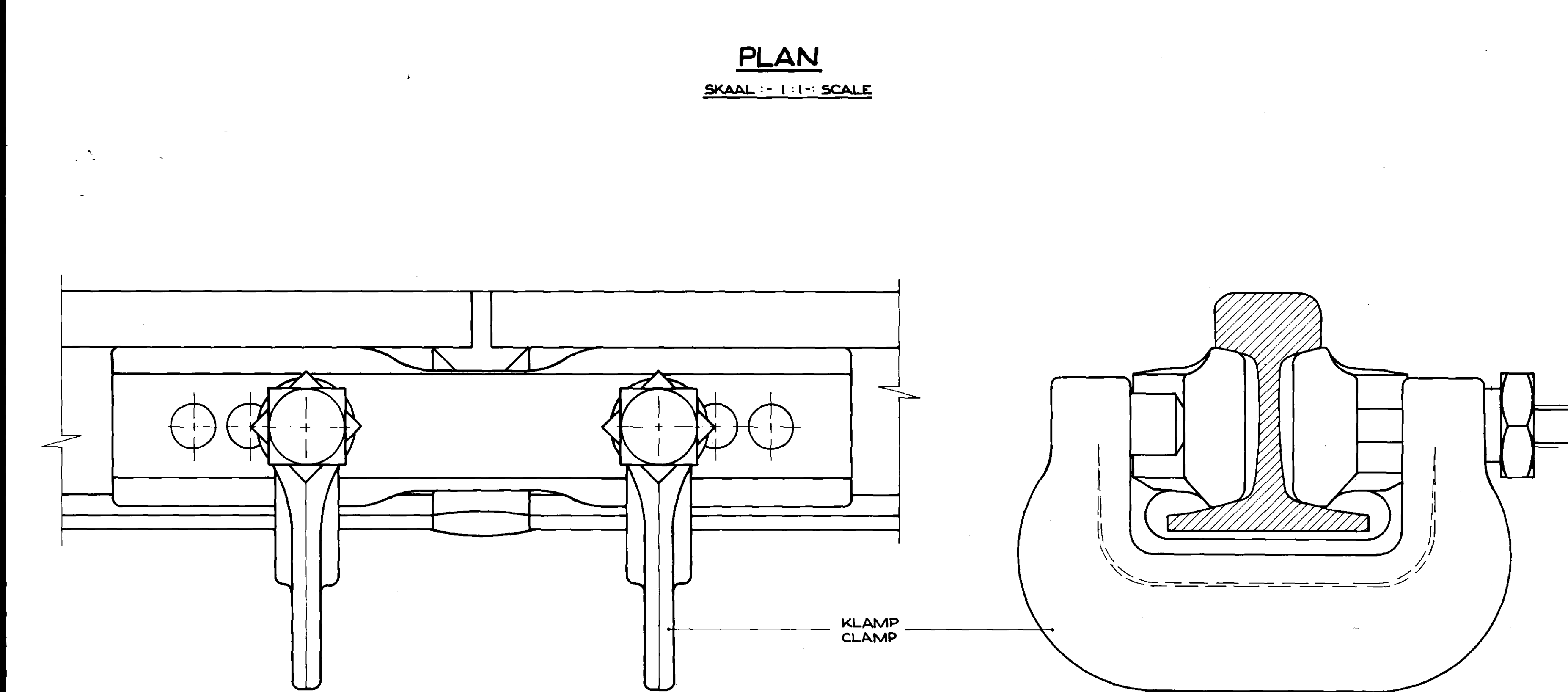
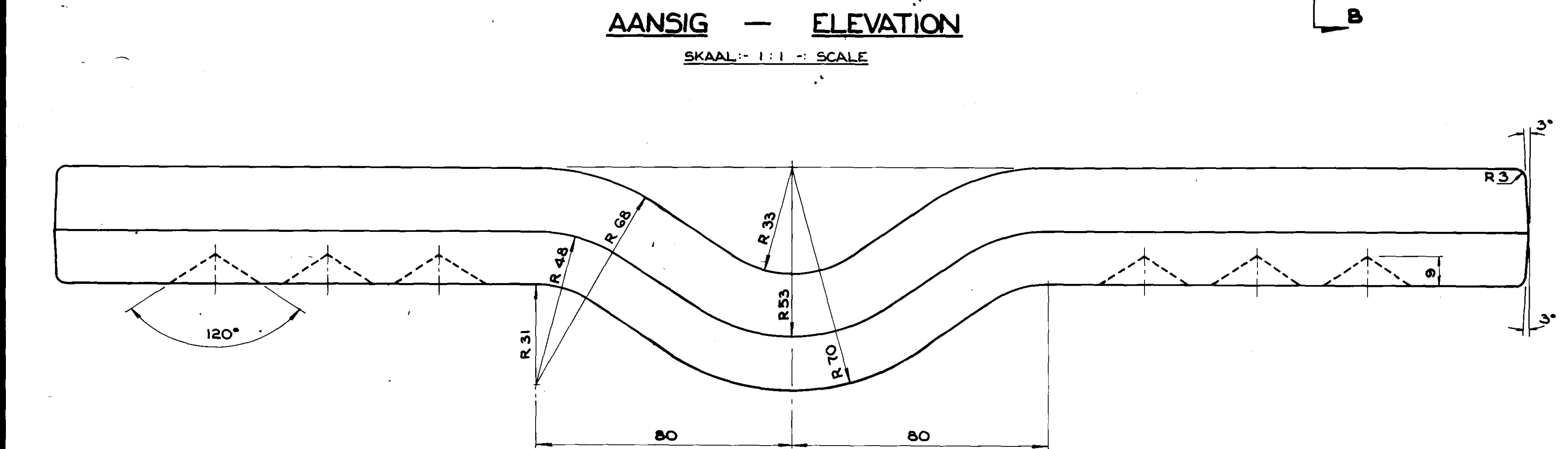
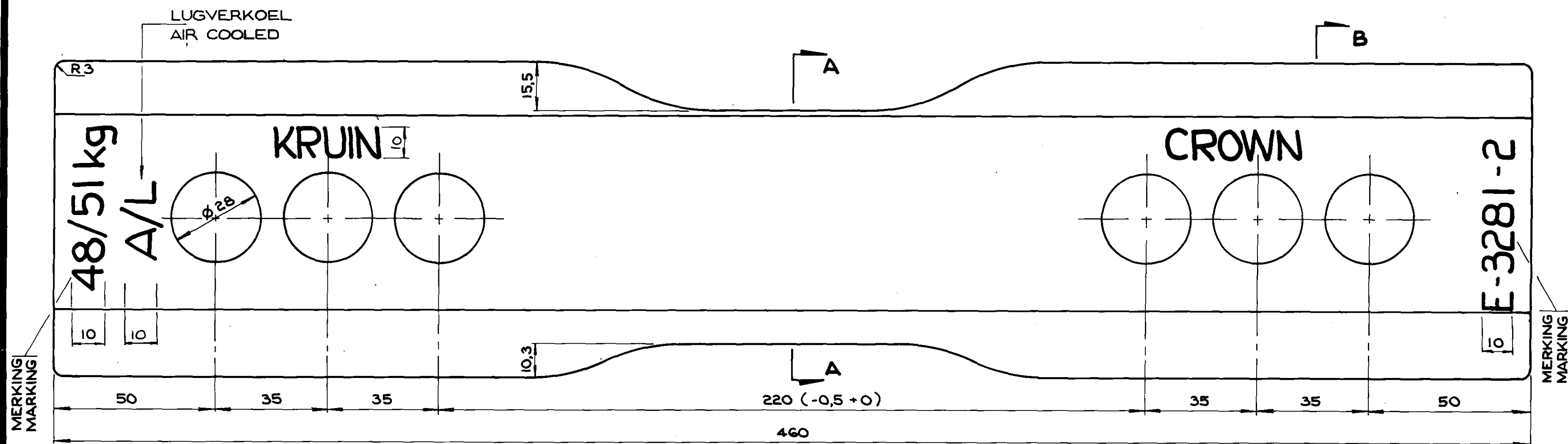
- 14.2.2.1 Mechanical properties of the materials used for the manufacture of the joggle plates;
- 14.2.2.2 Chemical composition of the joggle plates;
- 14.2.2.3 Detailed information on the process used to manufacture the joggle plates;
- 14.2.2.4 Details of quality assurance process and/or quality assurance certificate;
- 14.2.2.5 Details of surface treatment or method used;
- 14.2.2.6 Details of the corrosion inhibiting substance to be used for storage and transportation of the joggle plates;
- 14.2.2.7 Guarantee and terms of application;
- 14.2.2.8 Method of marking of the joggle plate;
- 14.2.2.9 Description of packaging used;

14.2.3 Approval Phase 2 documents to be submitted for currently approved boltless joggle plate products, in accordance with clause 5.4, includes:

- 14.2.3.1 A letter/documentation issued by TFR for the approval of the product.

END

15 Annexures



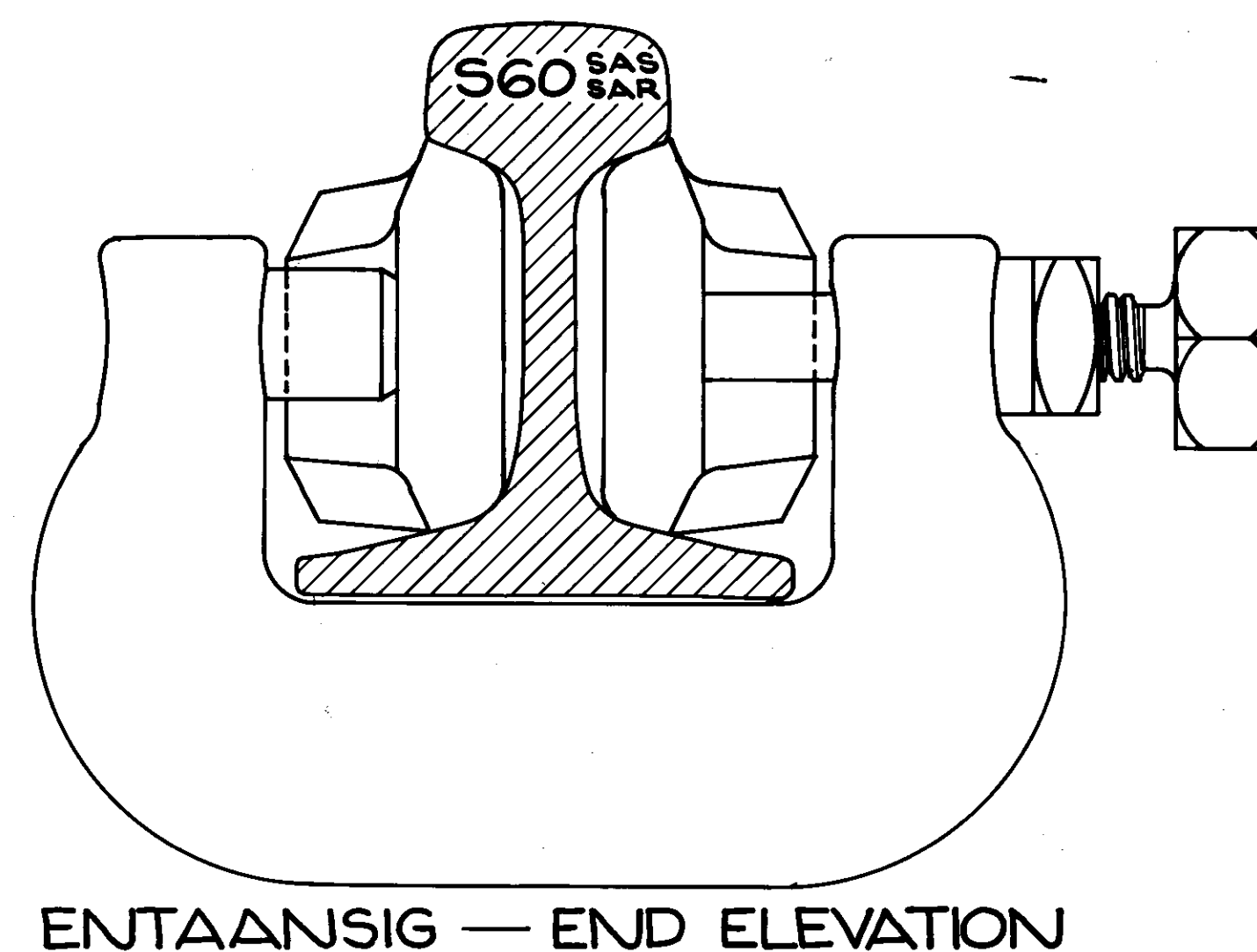
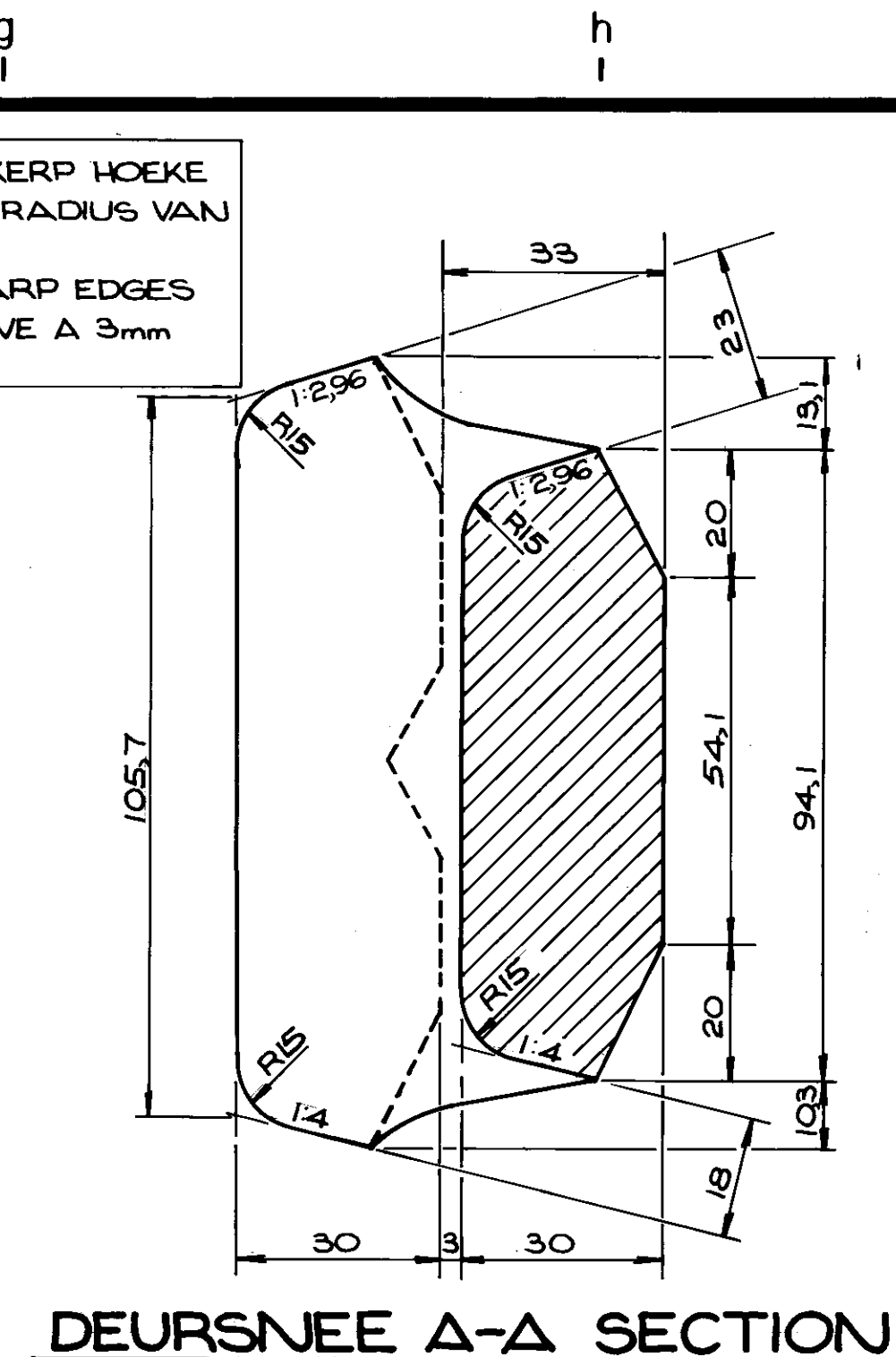
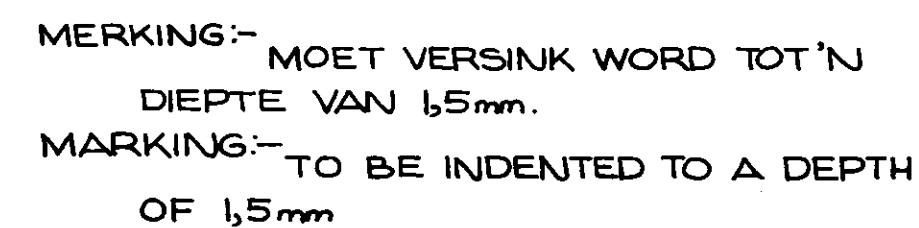
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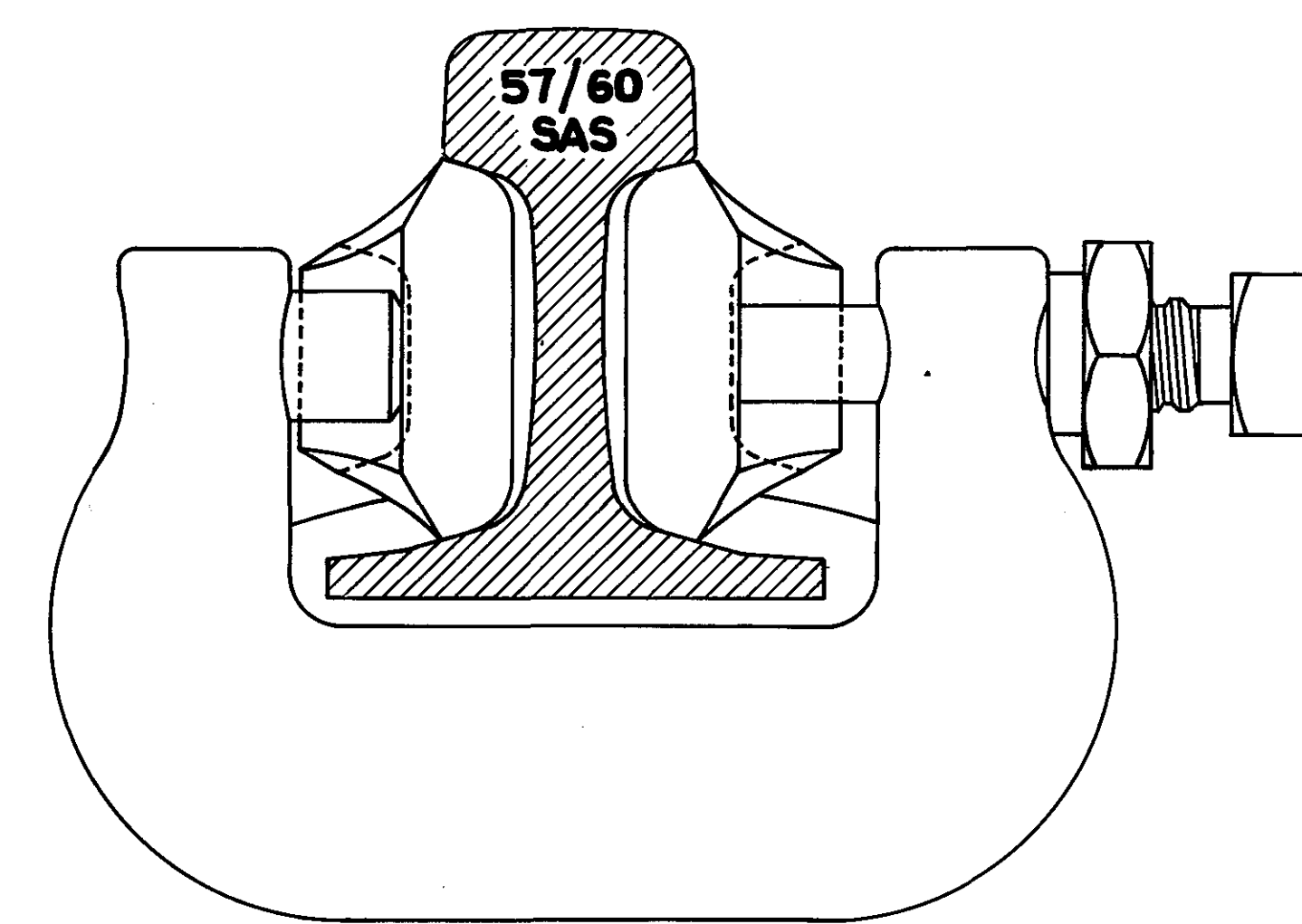
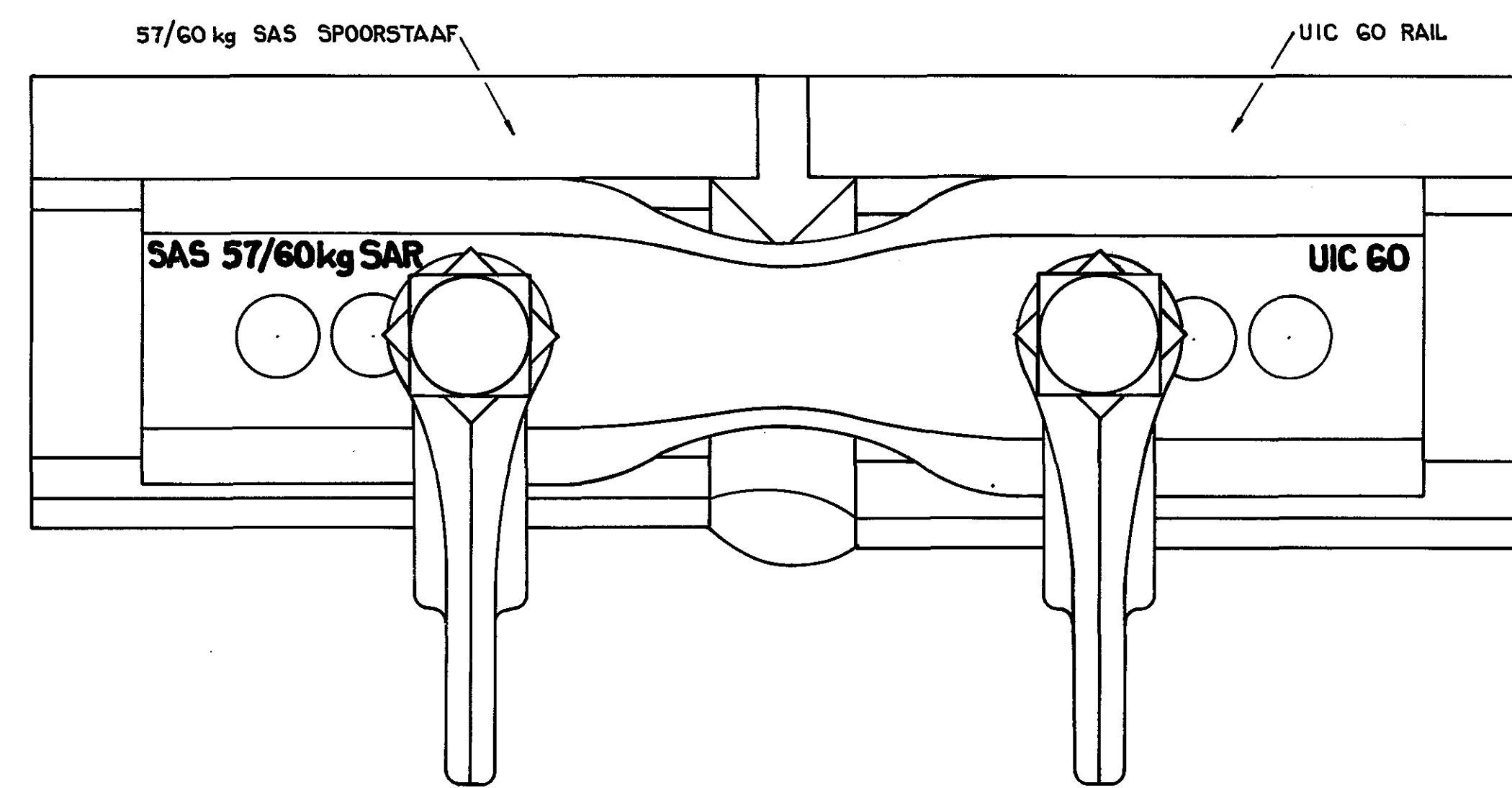
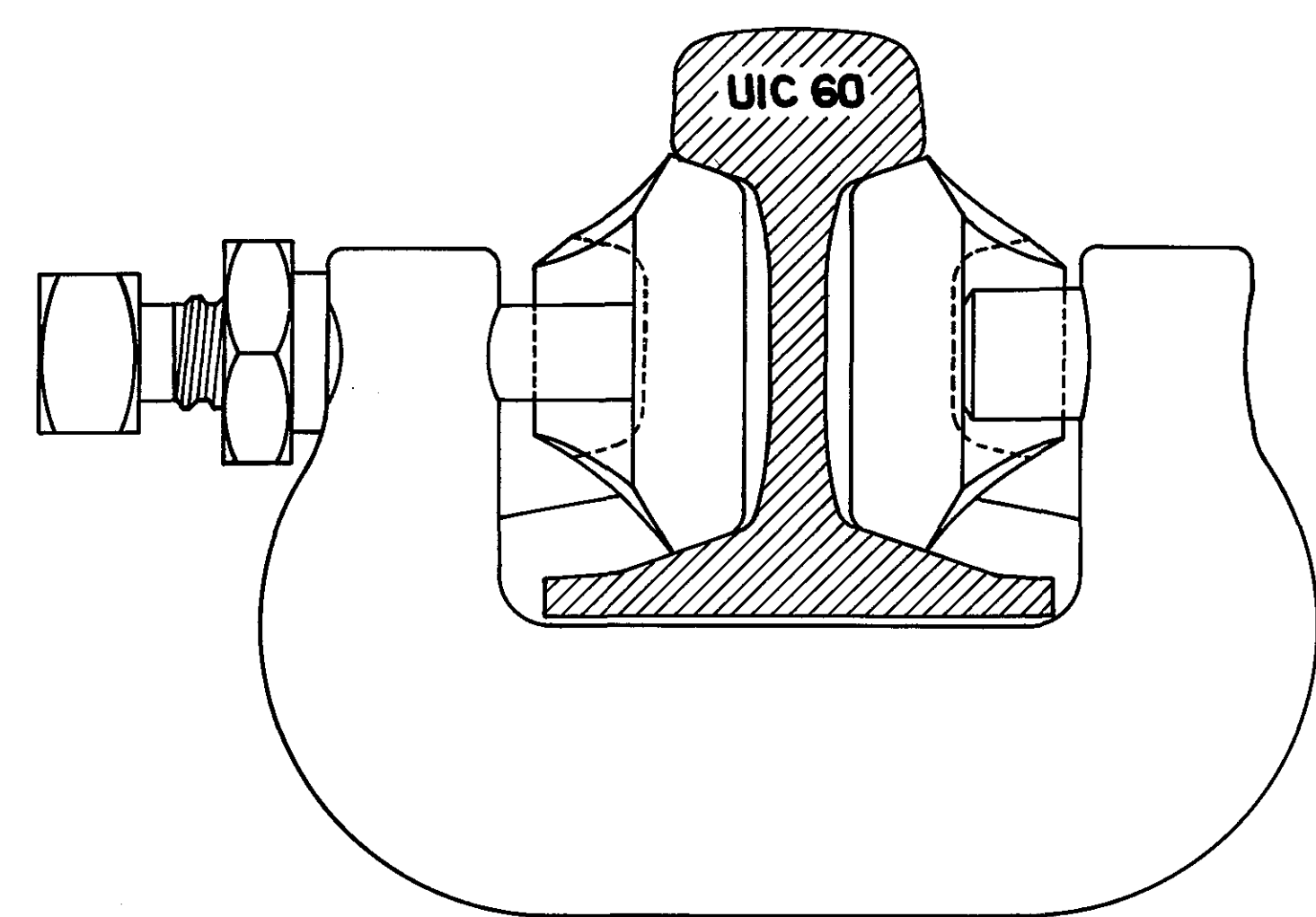
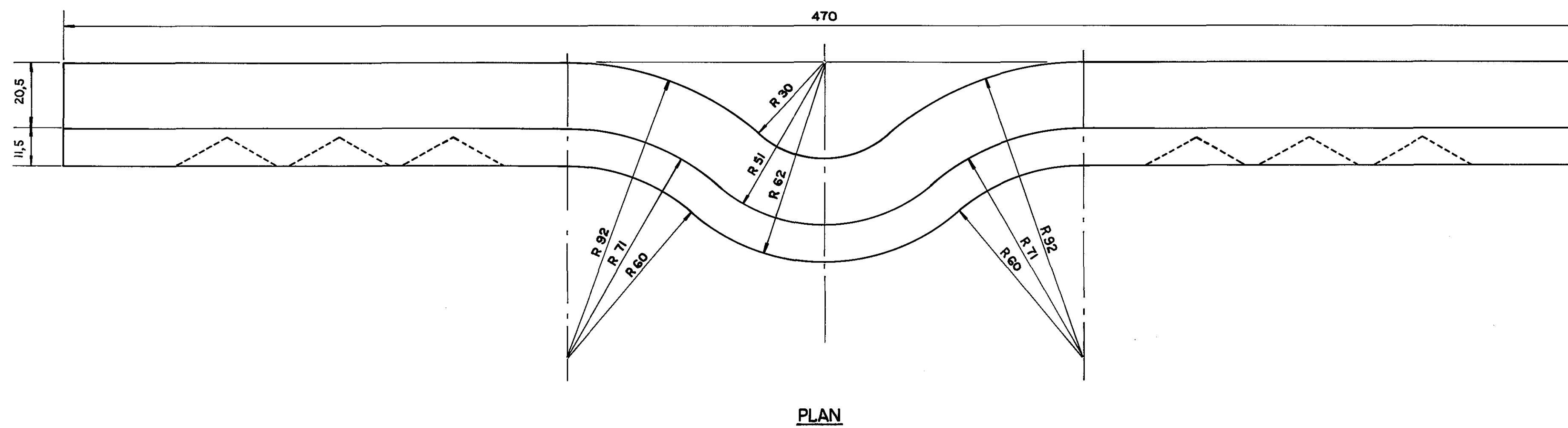
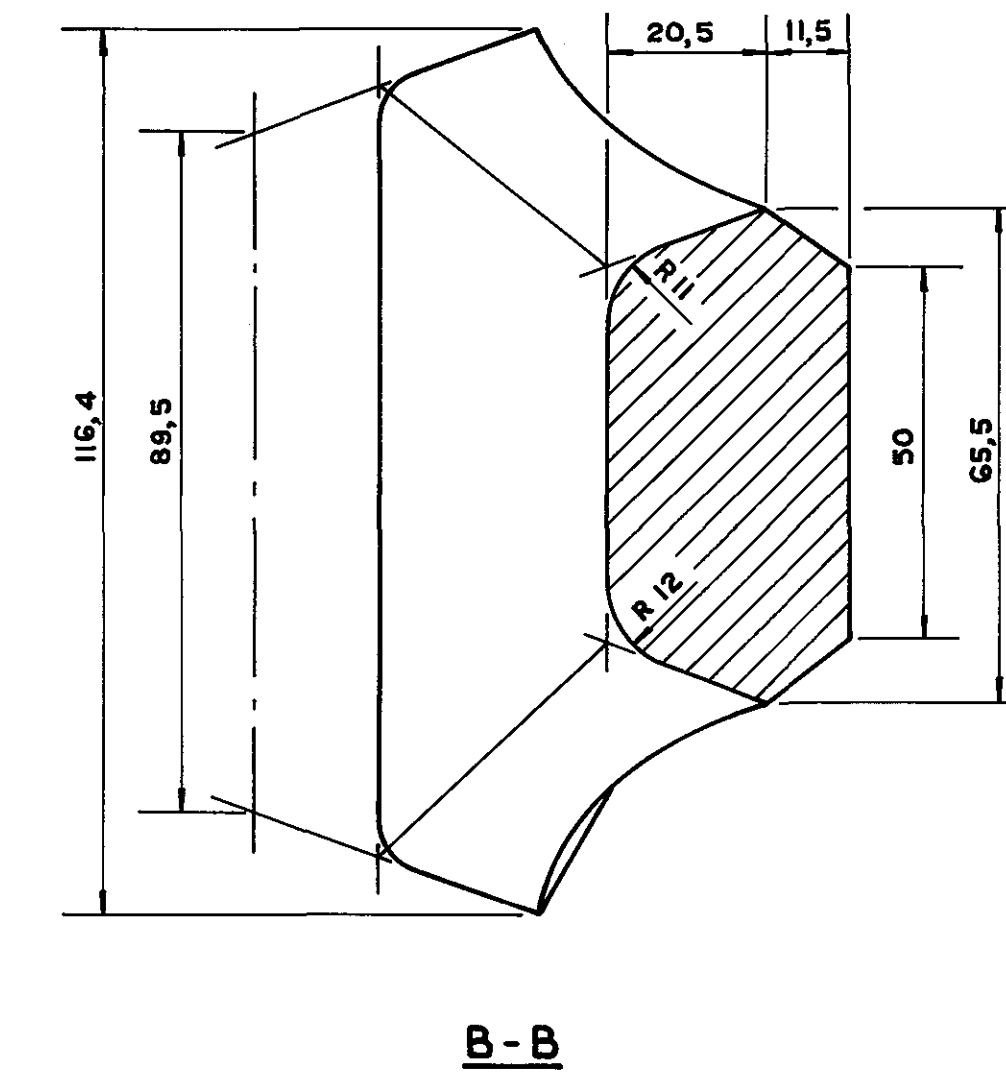
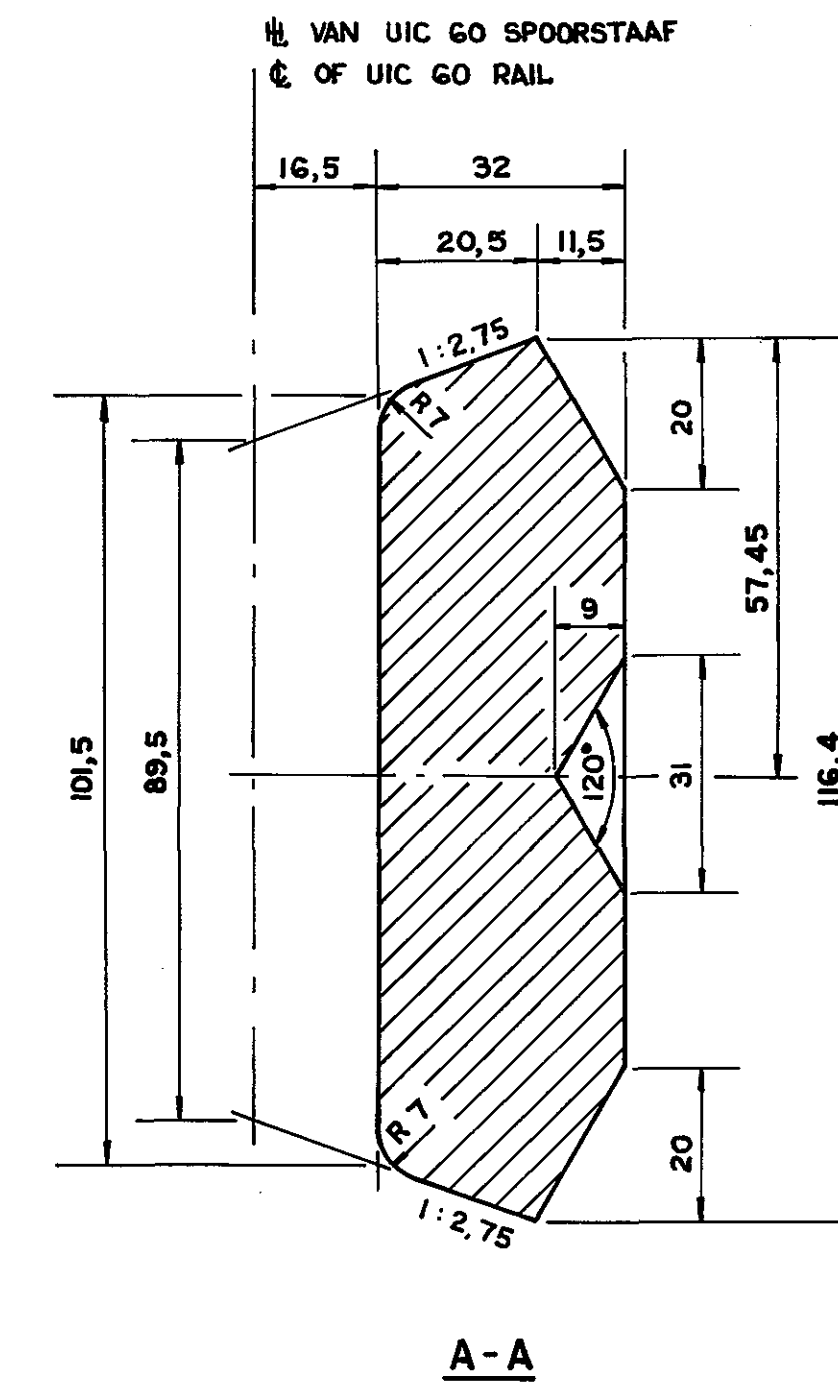
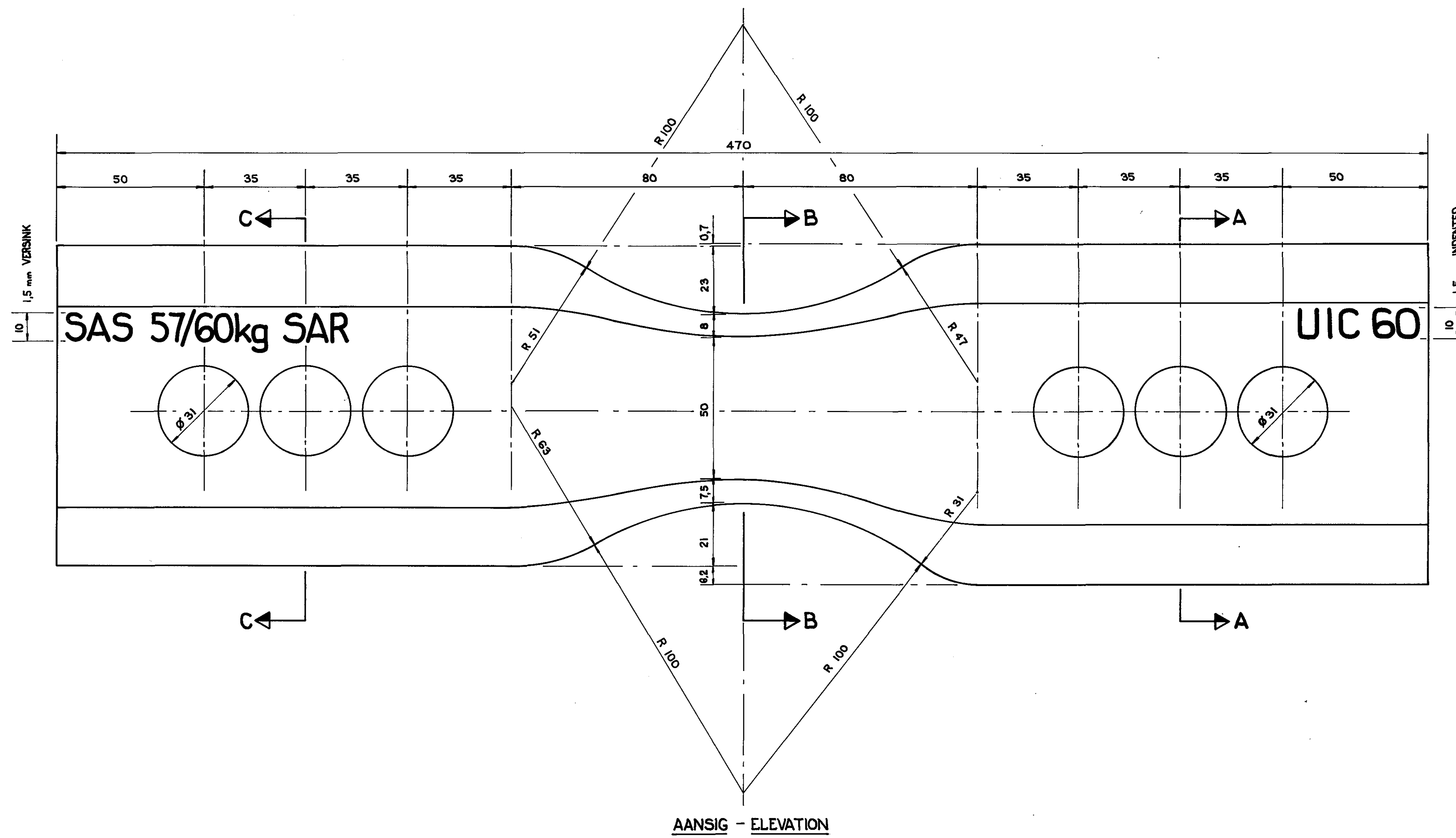
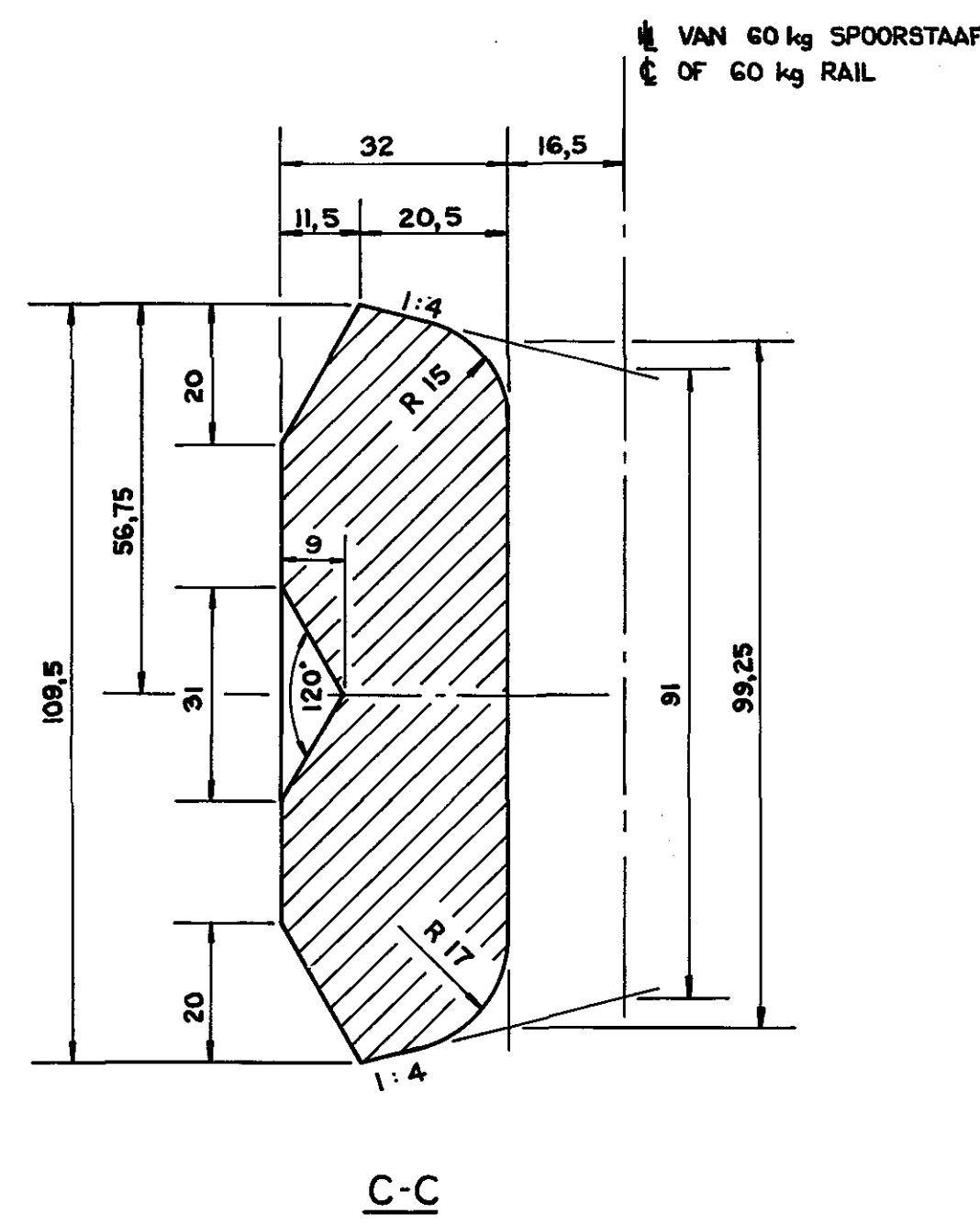
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SECTION

A-A

SKAAL: 1:1 SCALE	
MATERIAAL MATERIAL	11/15688
MERKING MARKING	5005 AANGETOON AS SHOWN
MASSA MASS	
MAGASYN ITEM N° STORES ITEM N°	211308 PER PAAR PER PAIR
SHT SPECIFIKASIE CCE SPECIFICATION	1/65 JONGSTE HERSIENING LATEST REVISION
OPMERKINGS	NOTES
1. KYK TKG. TIPE E-3280 VIR DETAIL VAN KLAMP EN TOEBEHORE. 2. HITTE BEHANDELING: LASPLATE MOET IN WINDLOSE LUG AFKOEL. 3. MATERIAAL MOET VOLDOEN AAN SHT SPECIFIKASIE 1/65 (JONGSTE HERSIENING). 4. ALLE LASPLATE SAL IN WARM GEKOOKTE LYNOLIE, OF ANDER SHT GOEDGEKEURDE SAMESTELLING, GEDOOPT WORD.	1. SEE DRG. TYPE E 3280 FOR CLAMP DETAIL AND ACCESSORIES. 2. HEAT TREATMENT: FISHPLATES TO BE COOLED IN STILL AIR. 3. MATERIAL TO COMPLY WITH CCE SPECIFICATION 1/65 (LATEST REVISION) 4. ALL FISHPLATES SHALL BE DIPPED INTO HOT BOILED LINSEED OIL OR OTHER COMPOSITION APPROVED BY CCE.
WYSIGINGS	AMENDMENTS
1. PROFIEL VAN LASPLAAT VERANDER EN TEKENING OORGETEKEN. 2. LASPLAAT PROFIEL, MATERIAAL ITEM NO. EN HITTE BEHANDELING GEWYSIG. G.W.B. 8/10/21 3. MERKING "A/L" AANGEBRING. JRG 21/10/82	1. PROFILE OF FISHPLATE ALTERED AND DRAWING REDRAWN. V.R. 25-02-81 2. FISHPLATE PROFILE, MATERIAL ITEM NO. AND HEAT TREATMENT AMENDED. 3. MARKING "A/L" ADDED JRG 21/10/82
HIERDIE TEK. VERVANG E-3281 VEL 1.	THIS DRG. SUPERSEDES E-3281 SHT. 1.
SAS SPOORBAANONTWERP	48/51 kg TRACK DESIGN SAR
GEJOGGELDE LASPLAAT VIR TERMIETGESWEISTE SPOORSTA AFLAS	JOGGLED FISHPLATE FOR THERMIT WELDED RAIL JOINT
SKALE 5005 AANGETOON	SCALES AS SHOWN
GETEKEN DRAWN	V.R.
NAGETREK TRACED	V.R.
NAGESIEN CHECKED	TEKENKANTOORGOEDKEURING DRAWING OFFICE APPROVAL
LÊER N° FILE N°	M 24/5/14
HY (SPOORBAAN) IE (TRACK)	CHIEF CIVIL ENGINEER
DATUM: 81-03-17	DATE: 81-03-17
WYSIGINGS AMENDMENTS	1 2 3
TIPE/TYPE	E 3281 VEL 2

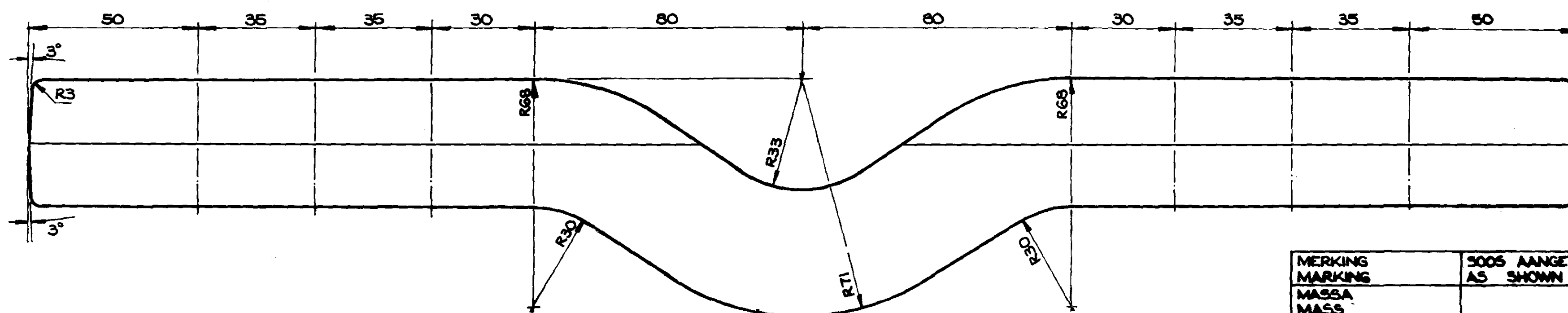
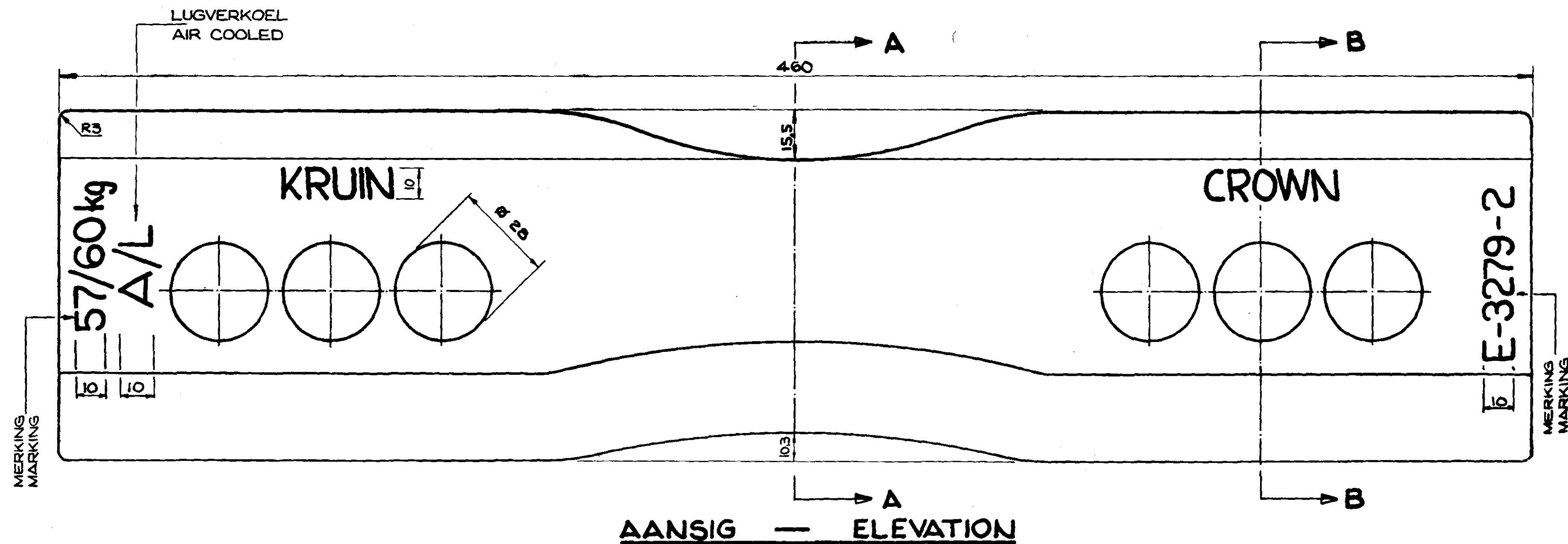


MATERIAAL MATERIAAL		MAGASYNITEMNOMMER STORES ITEM NUMBER		11/15688	
MAGASYNITEMNOMMER		211 357 PER PAAR PER PAIR		STORES ITEM NUMBER	
OPMERKINGS			NOTES		
1. KYK TEKENING TPE E-3280 VIR DETAIL VAN KLAMP EN BYBEHORE. 2. HITTE BEHANDELING:- LASPLATE MOET IN WINDLOSE LUG AFKOEL. 3. MATERIAAL MOET VOLDOEN AAN SHI SPESIFIKASIE 1/65 (JONGSTE HERSIENING). 4. ALLE LASPLATE SAL IN WARM GEKOOKTE LYNOLIE, OF ANDER SHI GOEDGEKEURDE SAMESTELLING, GEDOOP WORD. 5. JOGGEL LASPLATE MOET IN PARE PER LAS BESTEL WORD.			1. SEE DRAWING TYPE E-3280 FOR DETAIL OF CLAMP AND ACCESSORIES. 2. HEAT TREATMENT:- FISHPLATES TO BE COOLED IN STILL AIR. 3. MATERIAL TO COMPLY WITH CCE SPECIFICATION 1/65 (LATEST REVISION). 4. ALL FISHPLATES SHALL BE DIPPED INTO HOT BOILED LINSEED OIL OR OTHER COMPOSITION APPROVED BY CCE. 5. JOGGLED FISHPLATES TO BE ORDERED IN PAIRS PER JOINT.		
WYSIGINGS			AMENDMENTS		
1. S.H.I. SPESIFIKASIE N ^o GEWYSIG. <i>MB</i> EN TEKEN OM BOKANT AAN TE TOON BYGEOEG. 2. OPMERKING, MET BETREKING TOT HITTEBEHANDELING EN MATERIAAL, GEWYSIG EN HERRANGSKIK. 3. MERKING "A/L" AANGEBRING <i>SKG 21/10/82</i>			1. C.C.E. SPECIFICATION N ^o AMENDED. <i>MB 5/3/81</i> AND SIGN TO INDICATE TOP ADDED. 2. NOTE, REGARDING HEAT TREATMENT AND MATERIAL, AMENDED AND REARRANGED. <i>23-10-81 MB 21/10/82</i> 3. MARKING "A/L" ADDED.		
SAS SPOORBAANONTWERP		S-60 SAS SAR		TRACK DESIGN SAR	
GEJOGGELDE LASPLAAT		JOGGLED FISHPLATE			
VIR GEBRUIK MET		FOR USE WITH			
TERMETGESWEISTE		THERMIT - WELDED			
SPOORSTA AFLAS		RAIL JOINT			
SKALE SOOS AANGETOON		SCALES AS SHOWN			
GETEKEN DRAWN	<i>SC</i>		0-4 <i>Trem</i> SPOORBAANINGENIEUR TRACK ENGINEER		
NAGETREK TRACED	<i>SC</i>		DATUM - 80-12-02 - DATE		
NAGESIEN CHECKED	<i>gjt</i>	TEKENANTOORGOEDKEURING DRAWING OFFICE APPROVAL			
LÊR N ^o - FILE N ^o M24/5/14		<i>MB 21/10/82</i> Hr. (SPOORBAAN) I.E. (TRACK)	<i>MB 21/10/82</i> SIVIELE HOOFINGENIEUR CHIEF CIVIL ENGINEER	TIPE / TYPE E 3333	
		DATUM - 80-12-02 - DATE	DATUM - 80-12-02 - DATE	WYSIGINGS AMENDMENTS	

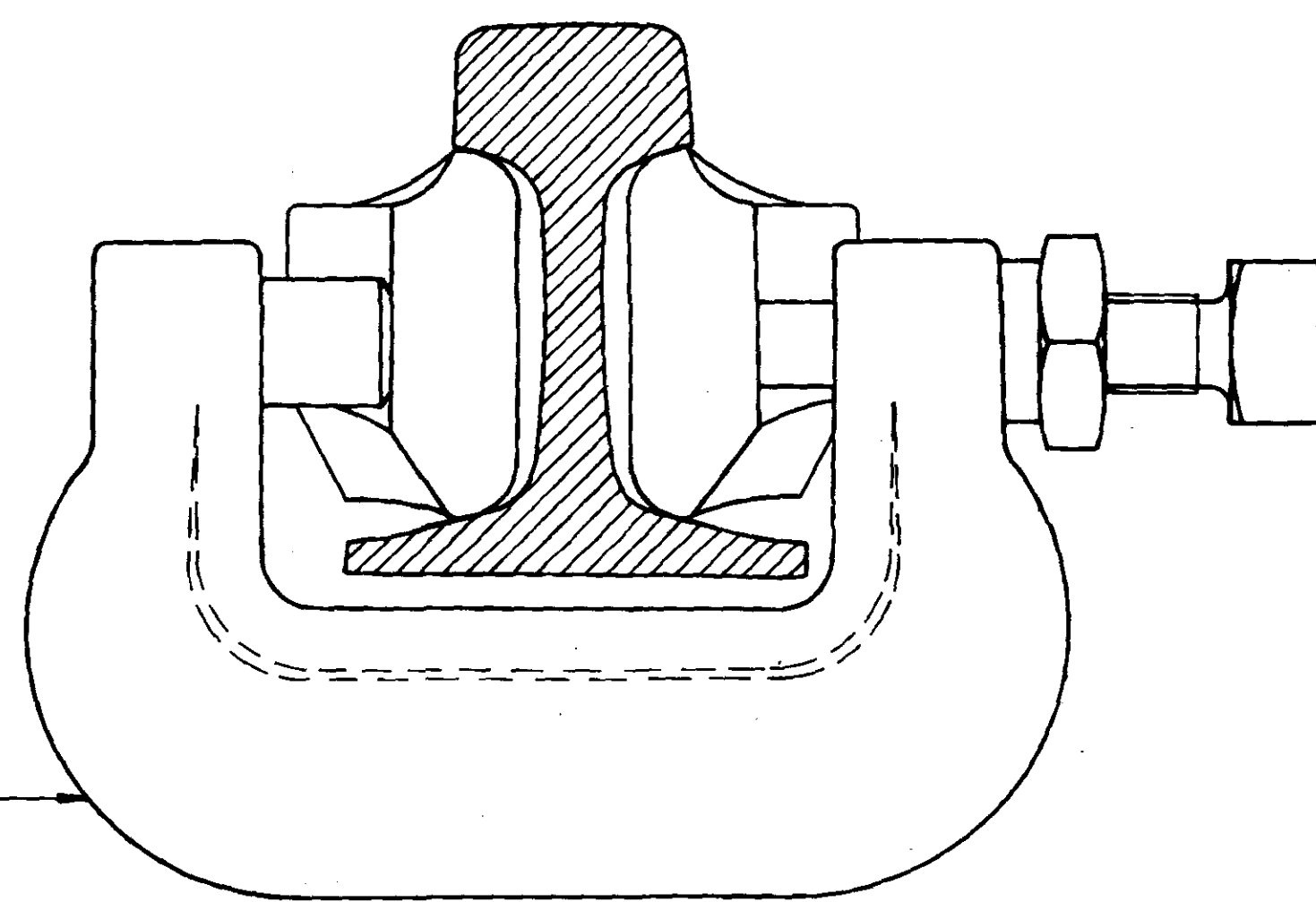
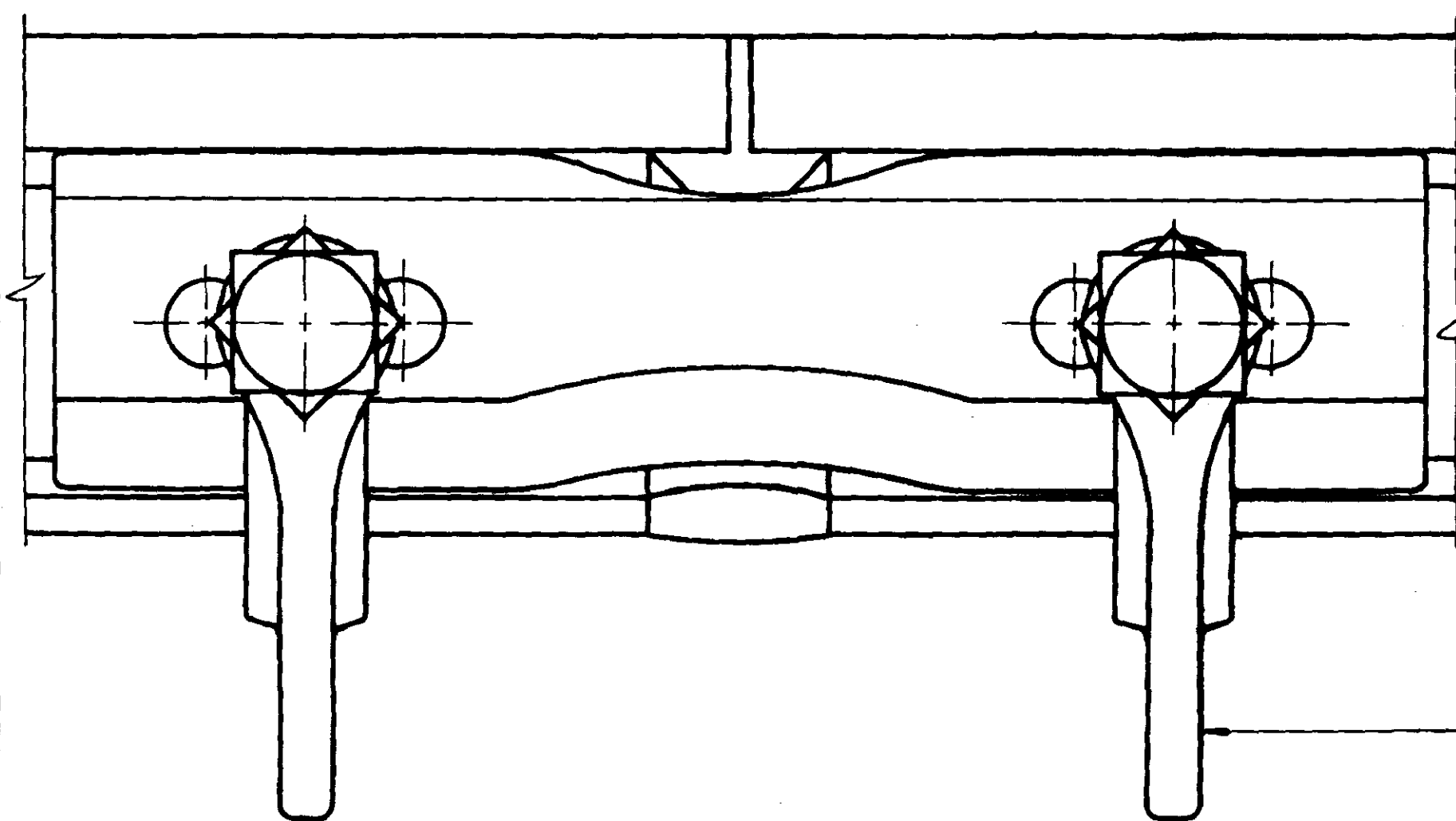


SAAMESTELLING - ASSEMBLY
SKAAL 1:2 SCALE

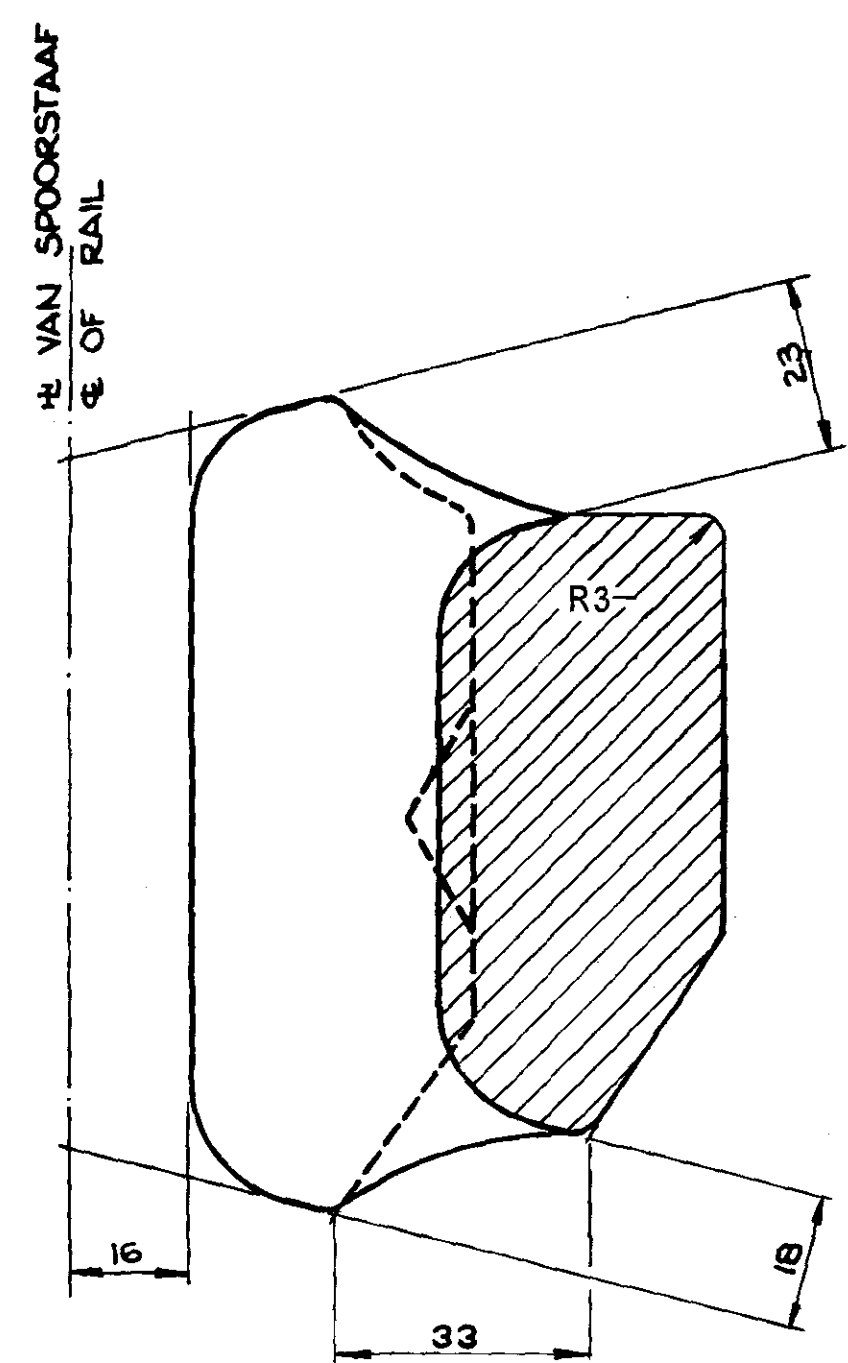
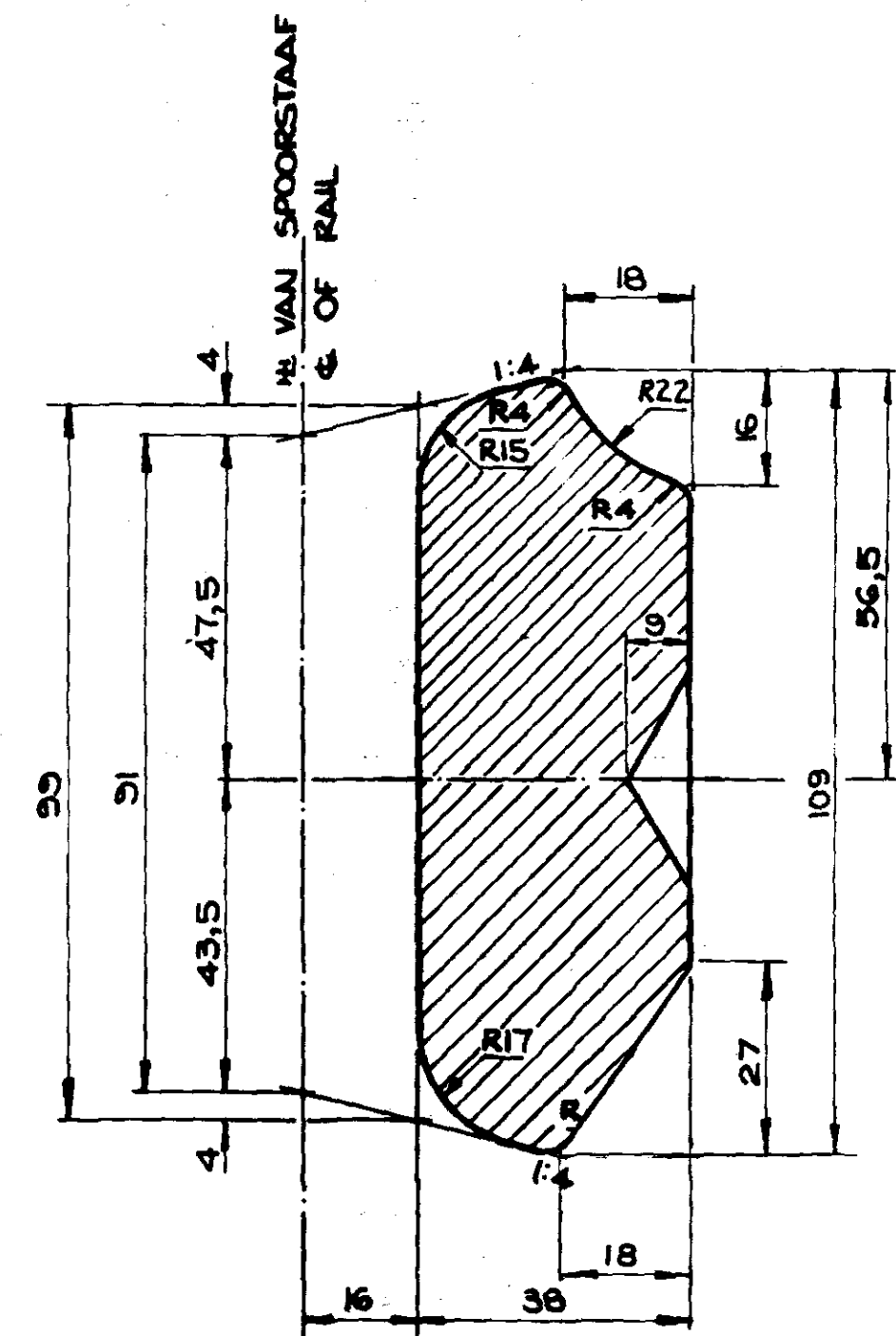
OPMERKINGS		NOTES	
1. VIR DETAIL VAN KLAMP EN BYBEHORE KYK TEK. TYPE E-3280.		1. FOR DETAIL OF CLAMP AND ACCESSORIES SEE DRG. TYPE E-3280.	
2. JOGGELAANSLUITLASPLATE MOET VAN PLATSTAALSTAVE VOLGENS B.S.-SPESIFIKASIE N° 47 KLAS B STAAL GESMEE EN DAN WIEER TOT 'N TEMPERATUUR VAN 850°C TOT 880°C VERHIT EN OLE GEBLUS WORD.		2. JOGGLED JUNCTION FISHPLATES TO BE FORGED FROM FLAT STEEL BARS TO B.S. SPECIFICATION N° 47 CLASS B STEEL, THEN REHEATED TO A TEMPERATURE OF 850°C TO 880°C AND OIL QUENCHED.	
3. JOGGELAANSLUITLASPLATE MOET IN PARE PER LAS BESTEL WORD.		3. JOGGLED JUNCTION FISHPLATES TO BE ORDERED IN PAIRS PER JOINT.	
WYSIGINGS		AMENDMENTS	
SAS SPOORBAANONTWERP 57-60 kg / UIC 60		TRACK DESIGN SAR	
JOGGELAANSLUITLASPLAAT		JOGGLED JUNCTION FISHPLATE	
VIR		FOR	
TERMIETGESWISTE 57-60kg SAS / UIC 60 SPOORSTA AFLAS		THERMIT WELDED 57-60kg SAR / UIC 60 RAIL JOINT	
GETEKEN DRAWN		TEKENKANTOORGOEDKEURING DRAWING OFFICE APPROVAL	
NAGETREK TRACED		DATUM: 29/6/65 DATE	
NAGESEN CHECKED		LÉER N° FILE N°	
M 24/5/14		Hr. (SPOORBAAN) IE (TRACK)	
DATUM: 26 08 1977 DATE		Hr. SIVIELE HOOFINGENIEUR CHIEF CIVIL ENGINEER	
DATUM: 26 08 1977 DATE		WYSIGINGS AMENDMENTS	
		700	
		E - 322	



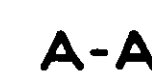
MERKING MARKING	SOOS AANGETOON AS SHOWN
MASSA MASS	
MAGASYN ITEM N°	211 321 PER PAAR
STORES ITEM N°	211 321 PER PAIR
MATERIAAL MATERIAL	11/15600
SHI SPESIFIKASIE CCE SPECIFICATION	1/65 JONGSTE HERSIENING 1/65 LATEST REVISION



SAMESTELLING VAN LAS - ASSEMBLY OF JOINT

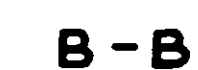


OPMERKINGS 1 KYK TKG. TYPE E-3280 VIR DETAIL VAN KLAMP EN TOEBEHORE. 2 HITTE BEHANDELING - LASPLATE MOET IN WINDLOSE LUG AFKOEL. 3 MATERIAAL MOET VOLDOEN AAN SHI SPESIFIKASIE 1/65 (JONGSTE HERSIENING). 4 ALLE LASPLATE SAL IN WARM GEKOOKTE LYNOLIE, OF ANDER SHI GOEDGEKEURDE SAMESTELLING, GEDOOPT WORD.		NOTES 1 SEE DRG. TYPE E-3280 FOR CLAMP AND ACCESSORIES. 2 HEAT TREATMENT - FISHPLATES TO BE COOLED IN STILL AIR. 3 MATERIAL TO COMPLY WITH CCE SPECIFICATION 1/65 (LATEST REVISION). 4 ALL FISHPLATES SHALL BE DIPPED INTO HOT BOILED LINSEED OIL OR OTHER COMPOSITION APPROVED BY CCE.	
WYSIGINGS 1 LASPLAAT PROFIEL EN HITTE BEHANDELING GEWYSIG. G.W.B. 81.10.21 2 MARKING "A/L" AANGEBRING Mg 21/10/92 3 DEURSNEE A-A IN LYN GEBRING MET VERVAARDIGING. 02/04/2002		AMENDMENTS 1 FISHPLATE PROFILE AND HEAT TREATMENT AMENDED 2 MARKING "A/L" ADDED 3 SECTION A-A BROUGHT IN LINE WITH MANUFACTURING CP 2001134 30/01/2002	
HIERDIE TKG. VERVANG TYPE E-3279 VEL 1.		THIS DRG. SUPERSEDES TYPE E-3279 SHT 1.	
SAS SPORBAANONTWERP GEJOGGELDE LASPLAAT VIR TERMETGESWEISTE SPOORSTAFLAS		57/60kg TRACK DESIGN SAR JOGGLED FISHPLATE FOR THERMIT WELDED RAIL JOINTS	
SKALE: 1:1 FI; F2		SCALES	
GETEKEN DRAWN NAGETREK TRACED NAGESIEN CHECKED	TEKENKANTOORGOEDKEURING DRAWING OFFICE APPROVAL LÊR N° FILE N° M24/5/14	0.4. Team SPOORBAANINGENIEUR TRACK ENGINEER DATUM: 81-03-17 - DATE	TYPE/TYPE E 3279 VEL SHT 2 WYSIGINGS AMENDMENTS 1/2/3



SKAAL:- 1:1 -SCALE

<u>MERKING:</u>	<u>MARKING</u>
OR - VIR BUITE REGTER	OR - FOR OUTER RIGHT HAND
IR - VIR BINNE REGTER	IR - FOR INNER RIGHT HAND
IL - VIR BINNE LINKER	IL - FOR INNER LEFT HAND
OL - VIR BUITE LINKER	OL - FOR OUTER LEFT HAND
ALLE MERKING MOET	ALL MARKING TO BE READ
VAN DIE 57/60 kg SAS	FROM 57/60 kg SAR END.
ENT AF GELEES WORD.	



SKAAL: 1:10 - SCALE

MAGASYNITEMNOMMERLYS	STORES	ITEM	NUMBER	LIST
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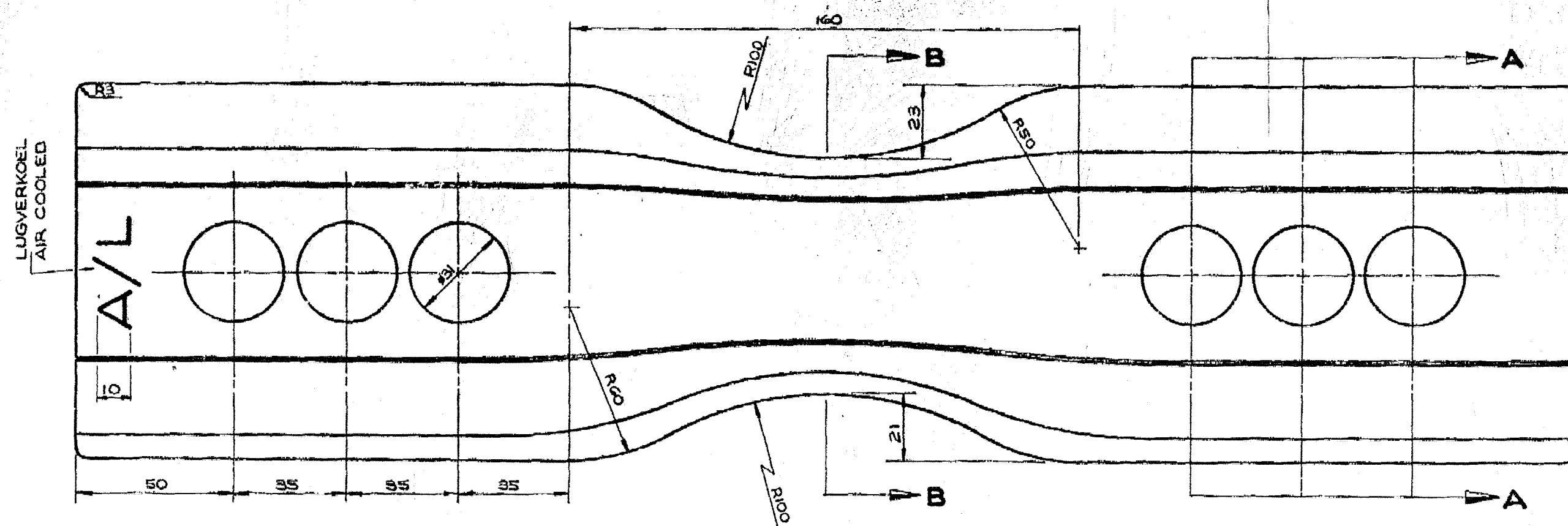
OPMERKINGS	NOTES
1. KLAMP EN TOEBEHORE KYK O-3280 2. LASPLATE MOET IN HET AKKOEL VERCOOLD AAN SHI (G'S (JONGSTE HERSIENING)) IN IN WAM GEKOOKTE ONDER SHI GOEDGEKEURDE S, GEDOOPT WORD. MOET IN PARE PER LAS	1. FOR DETAIL OF CLAMP AND ACCESSORIES SEE DRAWING TYPE O-3280 2. LAS PLATES SHALL BE COOLED IN STILL AIR 3. MATERIAL TO COMPLY WITH CCE SPECIFICATION 1/GS (LATEST REVISION) 4. ALL FISHPATES SHALL BE DIPPED INTO HOT BOILED LINSEED OIL OR OTHER COMPOSITION APPROVED BY CCE 5. JOINTED FISHPATES TO BE ORDERED IN PARS PER JOINT.

WYSIGINGS		AMENDMENTS	
1. MERKING	"A/L" AANGEBRING.	1. MARKING	"A/L" ADDED
	JRG 21/10/82		JRG 21/10/82

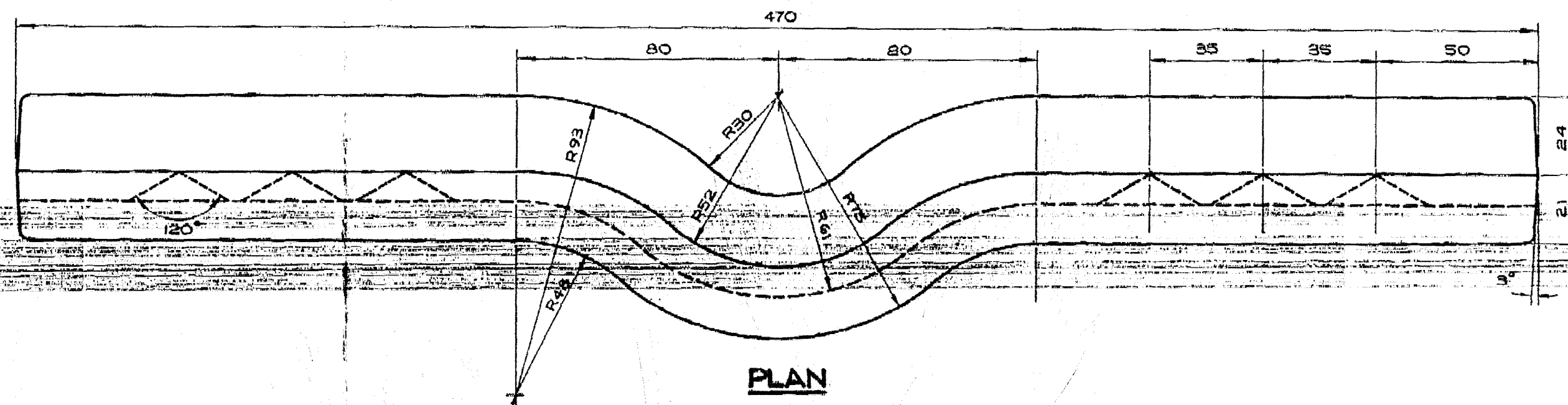
SAS SPOORBAANONTWERP 48/51 kg — 57/60 kg TRACK DESIGN SAR

JOGGELAANSLUITLASPLAAT	JOGGELD ^{LED} JUNCTION FISHPLAT
VIR	FOR
TERMIETGESWEISTE	THERMIT WELDED RAIL JOINT

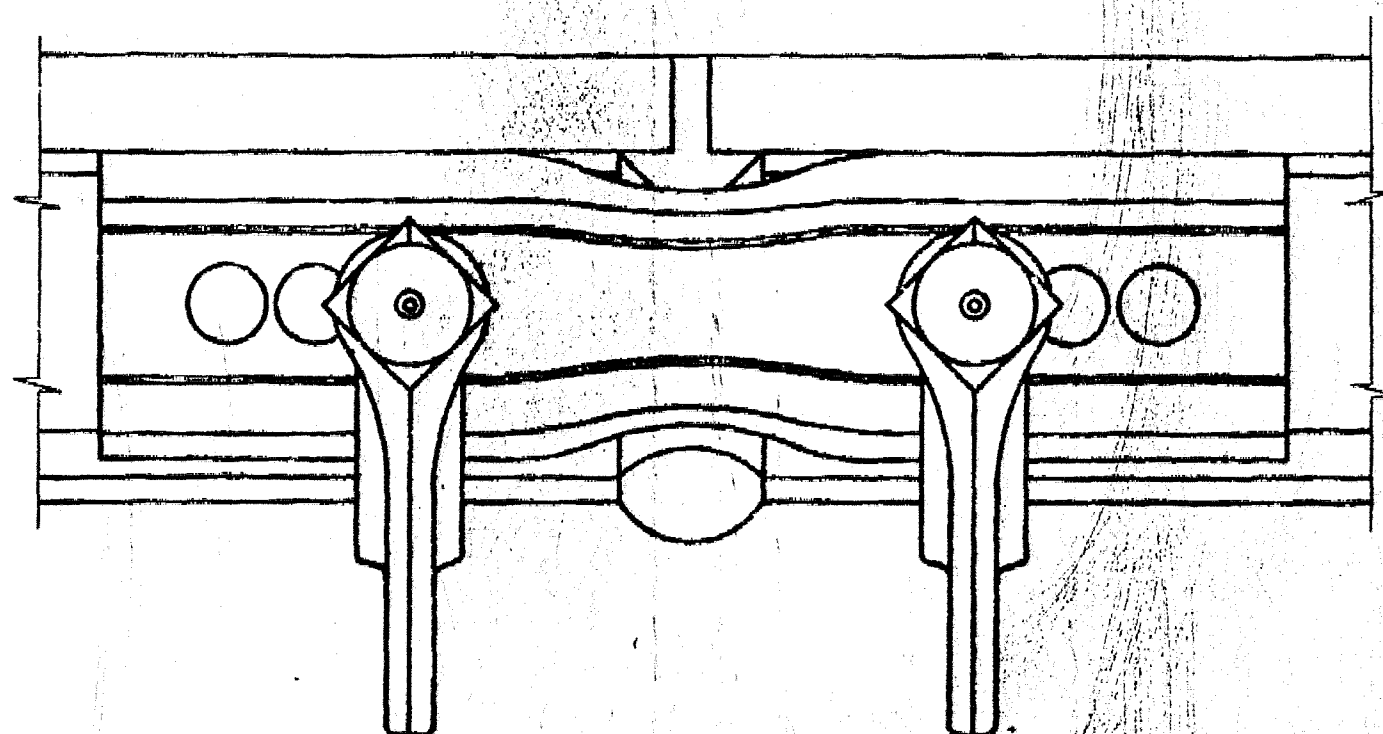
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AANSIG-ELEVATION

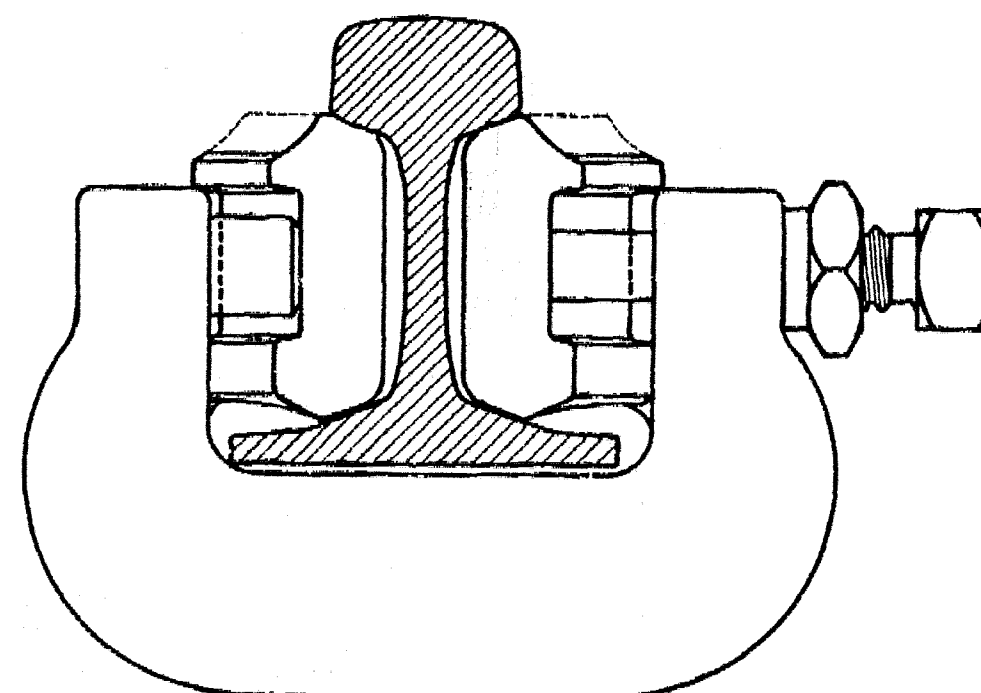


PLAN

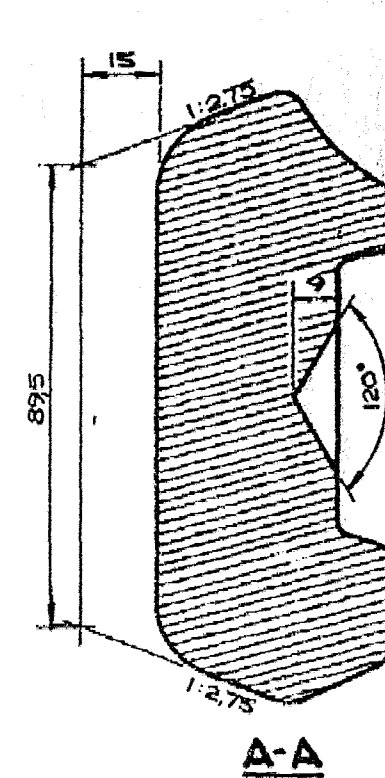


AANSIG-ELEVATION

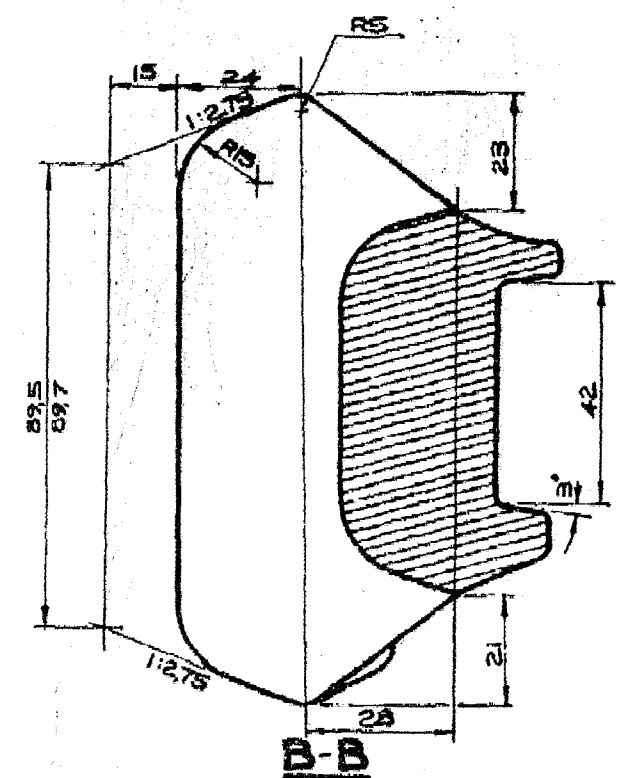
SAMESTELLING - ASSEMBLY



ENTAANSIG - SIDE ELEVATION

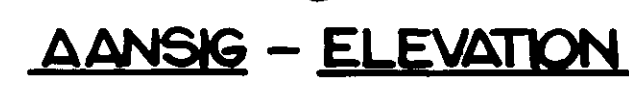


A-A



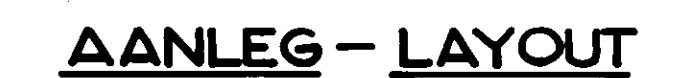
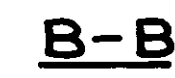
B-B

OPMERKINGS		NOTES	
1. KYK TEK TYP E-3280 VIR DETAIL VAN KLAMP EN TOEBEHORE. 2. HIERDIE LASPLAAT IS OP DIE STANDAARD TYP E-317 EN CME 3448-0-000 GERASEER. 3. HITTEBEHANDELING: 1. VERHIT TOT 830°C 2. DOMPEL IN OIL 3. TEMPER BY 200°C		1. SEE DRG TYPE E-3280 FOR CLAMP DETAIL AND ACCESSORIES. 2. THIS FISHPLATE IS BASED ON THE STANDARD TYPE 700-E-317 AND CME 3448-0-000. 3. HEAT TREATMENT: 1. HEAT TO 830°C 2. QUENCH IN OIL 3. TEMPER AT 200°C	
WYSIGINGS		AMENDMENTS	
1. TEKENING OORGETEKEN. <i>24/1/74</i> 2. MERKING "A/L" AANGEBRING.		1. DRAWING REDRAWN. <i>24/1/74</i> 2. MARKING "A/L" ADDED. <i>2/12/88</i>	
MAGASYNITEMNOMMER:- 211 281		STORES ITEM NUMBER:- 211 281	
SAS SPOORBAANONTWERP		UIC 60	
GEJOGGELDE LASPLAAT		JOGGLED FISHPLATE	
GEBRUIK BY		USED AT	
TERMIETGESWEISTE		THERMIT - WELDED	
SPOORSTAAFLAS		RAIL JOINT	
SKALE 1:1 EN 1:2		SCALES 1:1 AND 1:2	
GETEKEN DRAWN NAGETREK TRACED NAGESIEN CHECKED LÊER NR - FILE NO 4.24/5/14 4.24/6/102	<i>[Signature]</i> 4.24/5 4.24/6/102	<i>[Signature]</i> SPOORBAANINGENIEUR TRACK ENGINEER TEKENKANTOORGOEDKEURING DRAWING OFFICE APPROVAL DATUM:- 7.9.06 - 15 - DATE	TRACK DESIGN SAR USED AT THERMIT - WELDED RAIL JOINT SVELE HOOFINGENIEUR CHIEF CIVIL ENGINEER DATUM:- 7.9.06 - 15 - DATE
700		E 318	
WYBORGES		AMENDMENTS	
1/2		1/2	



SKAAL 1:1 SCALE

<u>MERKING:</u>	<u>MARKING:</u>
OR - VIR BUITE REGTER	OR - FOR OUTER RIGHT HAND
IR - VIR BINNE REGTER	IR - FOR INNER RIGHT HAND
IL - VIR BINNE LINKER	IL - FOR INNER LEFT HAND
OL - VIR BUITE LINKER	OL - FOR OUTER LEFT HAND
ALLE MERKING MOET	ALL MARKING TO BE READ
VAN DIE S-GO SAS ENT	FROM S-GO SAR END.
AF GELEES WORD.	



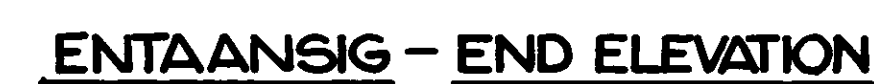
SKAAL 1:10 SCALE

OPMERKINGS	NOTES
DETAIL VAN KLAMP EN SYBHOORE KYK TYPE E-3280. E-BEHANDLING: LASPLATE MOET IN LOSSE MOET AAKOEL FRIGAL MOET VOLVOEEN AAN SHI 1/65 (LATEST REVISIONING) LASPLATE SAL IN WARM GEKOOKTE LIE, OF ANDER SHI GOEDGEKEURDE BESTELLING, GEDOOP WORD LASPLATE MOET IN PARE LAS BESTEL WORD	1. FOR DETAIL OF CLAMP AND ACCESSORIES SEE DRG TYPE E-3280 2. HEAT TREATMENT - FISHPLATES TO BE COOLED IN STILL AIR 3. MATERIAL TO COMPLY WITH CCE SPECIFICATION 1/65 (LATEST REVISIONING) 4. ALL FISHPLATES SHALL BE DIPPED INTO HOT BOILED UNSEED OIL OR OTHER COMPOSITION APPROVED BY CCE. 5. JOGGED FISHPLATES TO BE ORDERED IN PAIRS PER JOINT

OPMERKINGS	NOTES
1. VIR DETAIL VAN KLAMP EN BYSENDER KYK TIKO TIPE E-3280.	1. FOR DETAIL OF CLAMP AND ACCESSORIES SEE DRG. TYPE E-3280.
2. HITE BEHANDELING:- LASPLATE MOET IN WINDLOSE LUG AFVOEL.	2. HEAT TREATMENT:- FISHLATES TO BE COOLED IN STILL AIR.
3. MATERIAAL MOET VOLGOEN AAN SH1 SPECIFIKASIE 1/68 (GONGSTE REHSINGEN).	3. MATERIAL TO COMPLY WITH CCE SPECIFICATION 1/68 (LATEST REVISION).
4. ALLE LASPLATE SAL IN WARM GEKOOKTE LYNOLIE, OF ANDER SH1 GOEDGEKEURDE SAMESTELLING, GEDOP WARD.	4. ALL FISHLATES SHALL BE DIPPED INTO HOT BOILED UNLEADED OIL OR OTHER COMPOSITION APPROVED BY CCE.
5. JOGGE LASPLATE MOET IN PARE PARE JOEGE LASBESTE WARD.	5. JOGGED FISHLATES TO BE ORDERED IN PAIRS PER JOINT.

WYSIGINGS	AMENDMENTS
SAS SPOCRB4410NTWERP S-60 SAS SAR JOGGELAANSLUITLASPLAAT VIR TERMITGESWEISTE SPOORSTA AFLAS	48/51 kg SAS SAR JOGGLED JUNCTION FISHPLATE FOR THERMIT WELDED RAIL JOINT

SCALE 1:17.5 TO SCALES					
GETEKEN DRAWN	P.F.		<i>O. J. Traas</i>		
NAGETREK TRACED	P.F.		SPLORGAANNINGENIEUR TRACK ENGINEER		
NAGESHEN CHECKED		TEKENING AANTORGOEDKEURING DRAWING OFFICE APPROVAL	DATUM: <i>80-12-02</i> - DATE		
LEER NO FILE NO					
M24 / 5/14		<i>af Hoofding</i> HIV (SPOORBAAN) (E TRACK)	<i>af Hoofding</i> J. SIWOLE HOOFDINGENIEUR CHIEF CIVIL ENGINEER		TPE/TYPE E 3336
		DATUM: <i>80-12-02</i> - DATE	DATUM: <i>80-12-02</i> - DATE	WYSIGINGS AMENDMENTS	



SAMESTELLING-ASSEMBLY

SKAAL 1:2 SCALE

