Review of Railway Rehabilitation in Central Asia

for Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan

Tender Documents

on the rehabilitation measures for the Balykchi - Bishkek - Kazakh border railway section (Kyrgyzstan)

Lot 3.2 - Purchase of Permanent Way materials

ITALFERR

A project implemented by Italferr S.p.A.

Kyrgyz Republic

INVITATION FOR PREQUALIFICATION

[date]
[name of the Employer]
[ADB Loan number]
Rehabilitation measures for the Kazakh Border – Bishkek – Balykchi
Lot 3.2 Purchase of materials

This Invitation for Prequalification follows the General Procurement Notice for this project that appeared in the "ADB Business Opportunities", issue of [*issue date*].

[*name of Borrower*] has received a loan from the Asian Development Bank (the Bank) towards the cost of [*specify project*] and intends to apply part of the proceeds of the Loan to payments under the contract for the [*specify the contract].*

[*name of Employer]* (the Employer) intends prequalifying firms and joint ventures to tender for the following contract(s) to be funded from part of the proceeds of the loan:
Provision of PW materials, machines and plants to permit to face the most urgent necessities of the lines, allowing the acceleration of the capital maintenance of the remaining network, putting at disposal recovered materials.

Prequalification and tendering for contracts to be financed with the proceeds of a loan from the Bank is open to firms and joint ventures of firms from eligible countries.

Interested eligible firms may obtain further information from [*insert name of Employer*] and inspect Prequalification Documents at the address given below, [*insert address at end of document*] from [*insert office hours*].

Prequalification documents in English language may be obtained from the address below upon payment of a non-refundable fee of [*state currency and value*] or equivalent in a convertible currency. [*Give instructions for payment by bank transfer or the like*].

If requested, the documents will be promptly despatched by courier, but no liability can be accepted for loss or late delivery.

The prequalification documents must be duly completed and delivered to the address below, on or before [*specify time and date of deadline for submission].*

Documents which are received late may be rejected and returned unopened.

Interested firms may obtain further information from, and inspect and acquire the prequalification documents at the following office:

[*Contact name*]

[*Executing agency*]

[*Address*]

[*Tel:*]

[*Fax:*]

Date: _____

STANDARD PROCUREMENT DOCUMENT

Prequalification of Bidders

Asian Development Bank
November 2004

Foreword

This Standard Procurement Document for the Prequalification of Bidders (SPQD) has been prepared by the Asian Development Bank (ADB) and is based on the Master Procurement Document entitled "Prequalification Documents for Procurement of Works", prepared by multilateral development banks and other public international financial institutions which reflects the majority view of these institutions. This document has the structure and the provisions of the Master Procurement Document, except where ADB-specific considerations have required a change.

This SPQD facilitates prequalification of bidders for large and complex civil works contracts, turnkey contracts, and contracts for the fabrication of expensive and technically complex plant and equipment. This is to ensure that only firms with appropriate experience, a proven track record, and necessary annual turnover, which are free of any major pending litigation, will be invited to submit bids.

This SPQD is to be used for the prequalification process for contracts financed in whole or in part by ADB and to be procured through International Competitive Bidding.

An important feature of this SPQD is that it can be used with minimum changes, as it does not contain explanations, footnotes or examples. The SPQD is only available in electronic format.

This SPQD is supported by a User's Guide. The User's Guide contains detailed explanations and recommendations to Employers on how to prepare specific Prequalification Documents and how to evaluate applications. The User's Guide is not a part of the Prequalification Document.

To obtain further information on procurement under ADB-assisted projects, contact

Project Coordination and Procurement Division
Central Operations Services Office
Asian Development Bank
P.O. Box 789, 0980 Manila, Philippines
Email: procurement@adb.org
Fax: (63-2) 636 2475

PROCUREMENT DOCUMENT

Prequalification of Bidders for the Procurement of

_____

_____

_____

_____

Issued on:

Invitation for Prequalification No.:

ICB No.:

Employer:

Country:

Preface

This Prequalification Document (PQD) has been prepared by . . . . . and is based on the Standard Procurement Document for the Prequalification of Bidders (SPQD) issued by the Asian Development Bank dated . . . . . .

ADB's SPQD has the structure and the provisions of the Master Procurement Document entitled "Prequalification Documents for Procurement of Works", prepared by multilateral development banks and other public international financial institutions except where ADB-specific considerations have required a change.

Summary Description

Page No.

PART 1. APPLICATION PROCEDURES

PART 2. REQUIREMENTS

PART 1 – Prequalification Procedures

Section I. Instructions to Applicants

Table of Clauses

A. General

1. Scope of Application

1.1 In connection with the Invitation for Prequalification indicated in Section II, Application Data Sheet (ADS), the Employer, as defined in the ADS, issues this Prequalification Document to applicants interested in bidding for the works described in Section VI, Scope of Contract. The number of contracts and the name and identification of each contract as well as the International Competitive Bidding (ICB) number corresponding to this prequalification, are provided in the ADS.

2. Source of Funds

2.1 The Borrower or Recipient (hereinafter called "Borrower") indicated in the ADS has applied for or received financing (hereinafter called "funds") from the Asian Development Bank (hereinafter called "the ADB") towards the cost of the project named in the ADS. The Borrower intends to apply a portion of the funds to eligible payments under the contract resulting from the bidding for which this prequalification is conducted (hereinafter called "the Contract").

2.2 Payments by the ADB will be made only at the request of the Borrower and upon approval by the ADB in accordance with the terms and conditions of the financing agreement between the Borrower and the ADB (hereinafter called the Loan Agreement), and will be subject in all respects to the terms and conditions of that Loan Agreement. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the funds.

3. Corrupt Practices

3.1 ADB's Anticorruption Policy requires borrowers (including beneficiaries of ADB-financed activity), as well as bidders, suppliers, and contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the ADB:

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving receiving, or soliciting, directly or indirectly, of any thing of value to influence the action of any party in the procurement process or the execution of a contract;

(ii) "fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;

(iii) "collusive practices" means a scheme or arrangement between two or more bidders, with or without the knowledge of the Borrower, designed to influence the action of any party in a procurement process or the execution of a contract;

(iv) "coercive practices" means harming or threatening to harm, directly or indirectly, persons, or their property to influence their participation in a procurement process, or affect the execution of a contract;

(b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract; and

(c) will sanction a party or its successor, including declaring ineligible, either indefinitely or for a stated period of time, to participate in ADB-financed activities if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, an ADB-financed contract.

4. Eligible Applicants

4.1 An Applicant shall be a private or government-owned legal entity, subject to ITA Sub-Clause 4.6, or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the form of a Joint Venture (JV). In the case of a JV,

(a) all partners to the JV shall be jointly and severally liable; and

(b) a JV shall nominate a representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV during the prequalification process and, in the event the JV is prequalified, during the bidding process, and in the event the JV is awarded the Contract, during contract execution.

4.2 An Applicant, and all partners constituting the Applicant, shall have the nationality of an eligible country, in accordance with Section V, Eligible Countries. An Applicant shall be deemed to have the nationality of a country if the Applicant is a national of that country; or is constituted, incorporated, or registered and operates in conformity with the provisions of the laws of that country.

4.3 The above requirement shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

4.4 Applicants shall not have a conflict of interest. All Applicants found to have a conflict of interest with one or more parties in this prequalification process shall be disqualified. Applicants shall be considered to have a conflict of interest, if they

(a) have controlling shareholders in common; or

(b) receive or have received any direct or indirect subsidy from any of them; or

(c) have the same legal representative for purposes of their Application; or

(d) have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or to influence the application of another Applicant in the subsequent bidding process or influence the decisions of the Employer regarding this prequalification process; or

(e) participated as a consultant in the preparation of the design or technical specifications of the works that are the subject of this prequalification. Where a firm, or a firm from the same economic or financial group, in addition to consulting, also has the capability to manufacture or supply goods or to construct works, that firm, or a firm from the same economic or financial group, may not normally be a supplier of goods or works, if it provided consulting services for the contract corresponding to this prequalification, unless it can be demonstrated that there is no significant degree of common ownership, influence or control.

4.5 A firm that is under a declaration of ineligibility by the ADB in accordance with ITA Clause 3, at the date of submission of the application or thereafter, shall not be considered.

4.6 Government-owned enterprises in the Employer's country shall be eligible only if they can establish that they are legally and financially autonomous, and operate under commercial law, and that they are not in any way dependent agencies of the Employer.

4.7 Applicants shall provide such evidence of their continued eligibility satisfactory to the Employer, as the Employer shall reasonably request.

5. Eligible Materials, Equipment and Services

5.1 The materials, equipment and services to be supplied under the Contract and financed by ADB shall have as their country of origin an eligible country of ADB (see Section V, Eligible Countries).

B. Contents of Prequalification Document

6. Sections of the Prequalification Document

6.1 The Prequalification Document consists of Parts 1 and 2 which include all the sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITA Clause 8.

PART 1 Prequalification Procedures

- Section I. Instructions to Applicants (ITA)
- Section II. Application Data Sheet (ADS)
- Section III. Qualification Criteria
- Section IV. Application Forms
- Section V. Eligible Countries

PART 2 Requirements

- Section VI. Scope of Contract

6.2 The "Invitation for Prequalification" issued by the Employer is not part of the Prequalification Document.

6.3 The Employer accepts no responsibility for the completeness of the Prequalification Document and its addenda unless they were obtained directly from the Employer.

6.4 The Applicant is expected to examine all instructions, forms, and terms in the Prequalification Document and to furnish all information or documentation required by the Prequalification Document.

7. Clarification of Prequalification Document

7.1 A prospective Applicant requiring any clarification of the Prequalification Document shall contact the Employer in writing at the Employer's address indicated in the ADS. The Employer will respond in writing to any request for clarification provided that such request is received no later than fourteen (14) days prior to the deadline for submission of Applications. The Employer shall forward copies of its response to all Applicants who have acquired the Prequalification Document directly from the Employer including a description of the inquiry but without identifying its source. Should the Employer deem it necessary to amend the Prequalification Document as a result of a request for clarification, it shall do so following the procedure under ITA Clause 8 and in accordance with the provisions of Sub-Clause 17.2.

8. Amendment of Prequalification Document

8.1 At any time prior to the deadline for submission of Applications, the Employer may amend the Prequalification Document by issuing addenda.

8.2 Any addendum issued shall be part of the Prequalification Document and shall be communicated in writing to all who have obtained the Prequalification Document directly from the Employer.

8.3 To give prospective Applicants reasonable time in which to take an addendum into account in preparing their Applications, the Employer may, at its discretion, extend the deadline for the submission of applications.

C. Preparation of Applications

9. Cost of Applications

9.1 The Applicant shall bear all costs associated with the preparation and submission of its application, and the Employer shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the prequalification process.

10. Language of Application

10.1 The application, as well as all correspondence and documents relating to the prequalification exchanged by the Applicant and the Employer, shall be written in the English language. Supporting documents and printed literature that are part of the application may be in another language, provided they are accompanied by an accurate translation of the relevant passages into the English language, in which case, for purposes of interpretation of the application, the translation shall govern.

11. Documents Comprising the Application

11.1 The Application shall comprise the following:

(a) Application Submission Sheet, in accordance with ITA Clause 12;

(b) written confirmation authorizing the signatory of the application to commit the Applicant, in accordance with ITA Sub-Clause 15.3;

(c) documentary evidence establishing the Applicant's eligibility to prequalify, in accordance with ITA Clause 13;

(d) documentary evidence establishing the Applicant's qualifications, in accordance with ITA Clause 14; and

(e) any other document required as specified in the ADS.

12. Application Submission Sheet

12.1 The Applicant shall prepare an Application Submission Sheet using the form furnished in Section IV, Application Forms. This form must be completed without any alteration to its format.

13. Documents Establishing the Eligibility of the Applicant

13.1 To establish its eligibility in accordance with ITA Clause 4, the Applicant shall complete the eligibility declarations in the Application Submission Sheet and Forms ELI 1.1 and 1.2, included in Section IV, Application Forms.

14. Documents Establishing the Qualifications of the Applicant

14.1 To establish its qualifications to perform the contract in accordance with Section III, Qualification Criteria, the Applicant shall provide the information requested in the corresponding Information Sheets included in Section IV, Application Forms.

15. Signing of the Application and Number of Copies

15.1 The Applicant shall prepare one original of the documents comprising the application as described in ITA Clause 11 and clearly mark it "ORIGINAL". The original of the application shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Applicant.

15.2 The Applicant shall submit copies of the signed original application, in the number specified in the ADS, and clearly mark them "COPY". In the event of any discrepancy between the original and the copies, the original shall prevail.

15.3 The requirements regarding the legal instrument evidencing the authorization to represent and sign on behalf of the Applicant shall be as specified in the ADS. Applications submitted by an existing or intended JV shall include an undertaking signed by all partners

(a) stating that all partners shall be jointly and severally liable, and

(b) nominating a Representative who shall have the authority to conduct all business for and on behalf of any and all the partners of the JV during the prequalification process and, in the event the JV is prequalified, during the bidding process, and in the event the JV is awarded the Contract, during contract execution.

D. Submission of Applications

16. Sealing and Marking of Applications

16.1 The Applicant shall enclose the original and the copies of the application in a sealed envelope which shall

(a) bear the name and address of the Applicant;

(b) be addressed to the Employer, in accordance with ITA 17.1; and

(c) bear the specific identification of this prequalification process indicated in the ADS 1.1.

16.2 If the envelope is not sealed and marked as required, the Employer will assume no responsibility for the misplacement of the application.

17. Deadline for Submission of Applications

17.1 Applications shall be received by the Employer at the address and no later than the deadline indicated in the ADS.

17.2 The Employer may, at its discretion, extend the deadline for the submission of Applications by amending the Prequalification Document in accordance with ITA Clause 8, in which case all rights and obligations of the Employer and the Applicants subject to the previous deadline shall thereafter be subject to the deadline as extended.

18. Late Applications

18.1 The Employer reserves the right to accept or reject late Applications.

19. Opening of Applications

19.1 The Employer shall prepare a record of the opening of Applications that shall include, as a minimum, the name of the Applicant. A copy of the record shall be distributed to all Applicants.

E. Evaluation of Applications

20. Confidentiality

20.1 Information relating to the evaluation of Applications, and recommendation for prequalification, shall not be disclosed to Applicants or any other persons not officially concerned with such process until the notification of prequalification is made to all Applicants.

20.2 From the deadline for submission of Applications to the time of notification of the results of the prequalification in accordance with ITA Clause 28, if any Applicant wishes to contact the Employer on any matter related to the prequalification process, it may do so in writing.

21. Clarification of Applications

21.1 To assist in the evaluation of Applications, the Employer may, at its discretion, ask any Applicant for a clarification of its application which shall be submitted within a stated reasonable period of time. Any request for clarification and all clarifications shall be in writing.

21.2 If an Applicant does not provide clarifications of the information requested by the date and time set in the Employer's request for clarification, its Application may be rejected.

22. Responsiveness of Applications

22.1 The Employer may reject any Application which is not responsive to the requirements of the Prequalification Document.

23. Margin of Preference

23.1 If so indicated in the ADS, a margin of preference shall apply in the bidding process resulting from this prequalification.

24. Subcontractors

24.1 Applicants shall state in the Application Submission Sheet whether they intend to subcontract parts or elements of the Works.

24.2 If an Applicant intends to subcontract any of the key activities listed in Section III, Qualification Criteria, Criteria 4.2(b), then such key activities and the proposed subcontractors (Specialist Subcontractors) shall be clearly identified in Section IV, Application Forms, Forms ELI-1.2 and EXP-4.2(b). Such Specialist Subcontractor(s) shall meet the corresponding qualification requirements specified in Section III, Qualification Criteria. At the time of bidding, the Bidder shall use in its bid only Specialist Subcontractor(s) prequalified during the prequalification exercise.

24.3 Unless otherwise specified in the ADS, the Employer does not intend to execute certain specific parts of the Works by subcontractors selected in advance by the Employer (Nominated Subcontractors).

F. Prequalification of Applicants

25. Evaluation of Applications

25.1 The Employer shall use the criteria and methods defined in Section III, Qualification Criteria to evaluate the qualifications of the Applicants and proposed subcontractors.

25.2 Only the qualifications of proposed subcontractors that have been identified in the Application pursuant to ITA 24.2 will be considered in the evaluation of an Applicant. However, the general experience and financial resources of subcontractors may not be added to those of the Applicant for purposes of prequalification of the Applicant.

25.3 Unless otherwise indicated in the ADS, this prequalification shall be for a single contract.

26. Employer's Right to Accept or Reject Applications

26.1 The Employer reserves the right to accept or reject any Application, and to annul the prequalification process and reject all applications at any time, without thereby incurring any liability to Applicants

27. Prequalification of Applicants

27.1 All Applicants, including their proposed subcontractors, whose applications have been determined to be substantially responsive to the requirements of the Prequalification Document and who have met or exceeded the specified criteria shall be prequalified by the Employer.

28. Notification of Prequalification

28.1 Once the Employer has completed the evaluation of the Applications it shall notify all Applicants in writing of the names of those applicants who have been prequalified.

29. Invitation to Bid

29.1 Promptly after the notification of the results of the prequalification, the Employer shall invite bids from all the Applicants that have been prequalified.

29.2 Bidders may be required to provide bid security in the form of a demand guarantee or other security acceptable to the Employer for an amount as specified in the bidding document.

29.3 A qualified firm or a member of a qualified joint venture may participate in only one bid for the contract. If a firm submits more than one bid, singly or in joint venture, all bids including that firmrequest will be rejected. This rule will not apply in respect of bids that include specialist subcontractors that are used by more than one bidder.

30. Changes in Qualifications of Applicants

30.1 Any change in the qualification status of an Applicant after being prequalified in accordance with ITA Clause 27 shall be subject to the written approval of the Employer. Any such change shall be submitted to the Employer not later than fourteen (14) days after the date of the Invitation to Bid. Such approval shall be denied if as a consequence of any change,

(a) the prequalified Applicant, after the change, no longer substantially meets the qualification criteria set forth in Section III, Qualification Criteria; or

(b) a new partner that had not been prequalified as an Applicant or a Specialist Subcontractor as per ITA 24.2 is added to a prequalified Applicant.

Section II. Application Data Sheet

A. General

ITA 1.1	The identification of the Invitation for Prequalification is:
ITA 1.1	The name of the Employer is:
ITA 1.1	The names, identification and number of the contracts are:
ITA 1.1	The name and identification number of the ICB are:
ITA 2.1	The name of the Borrower is:
ITA 2.1	The name of the Project is: Rehabilitation measures for the Beyneu – Uzbek Border railway section – Lot 2.1 Telecommunications

B. Contents of the Prequalification Document

ITA 7.1	For **clarification purposes** only, the Employer's address is: Attention: Number and Street: Floor/Room Number: City: . ZIP Code: Country Telephone: Facsimile number: Electronic mail address:

C. Preparation of Applications

ITA 11.1 (e)	The Applicant shall submit with its application the following additional documents:
ITA 15.2	In addition to the original, the number of copies to be submitted with the application is:
ITA 15.3	The requirements regarding the legal instrument evidencing the authorization to represent and sign on behalf of the Applicant shall be:

D. Submission of Applications

ITA 17.1	For **application submission purposes** only, the Employer's address is: Attention: Number and Street: Floor/Room Number: City: ZIP Code: Country: Telephone: Facsimile number: Electronic mail address: **The deadline for application submission is:** Date: Time:

E. Evaluation of Applications

ITA 23.1	A margin of preference . . . . . apply in the bidding process corresponding to this prequalification. If a Margin of Preference applies, the procedure for evaluation will be specified in bidding document.
ITA 24.3	The Employer . . . . . to execute certain specific parts of the Works by subcontractors selected in advance (Nominated Subcontractors). The specific parts of the works and the respective subcontractors are:

F. Prequalification of Applicants

ITA 25.3	As stipulated in ITA 1.1, this prequalification exercise shall be for: . . . . .

Section III. Qualification Criteria

Table of Contents

1. Eligibility

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

1.1 Nationality

Nationality in accordance with ITA Sub-Clause 4.2.	must meet requirement	existing or intended JV must meet requirement	must meet requirement	not applicable	Forms ELI –1.1; ELI –1.2 with attachments

1.2 Conflict of Interest

No conflicts of interest in accordance with ITA Sub-Clause 4.4.	must meet requirement	existing or intended JV must meet requirement	must meet requirement	not applicable	Application Submission Sheet

1.3 ADB Eligibility

Not having been declared ineligible by ADB, as described in ITA Sub-Clause 4.5.	must meet requirement	existing or intended JV must meet requirement	must meet requirement	not applicable	Application Submission Sheet

1.4 Government-owned Entity

Applicant required to meet conditions of ITA Sub-Clause 4.6.	must meet requirement	must meet requirement	must meet requirement	not applicable	Forms ELI -1.1, ELI -1.2 with attachments

2. Pending Litigation

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	
2.1 Pending Litigation					
All pending litigation shall be treated as resolved against the Applicant and so shall in total not represent more than . . . . . percent of the Applicant's net worth.	must meet requirement by itself or as partner to past or existing JV	not applicable	must meet requirement by itself or as partner to past or existing JV	not applicable	Form LIT - 2

3. Financial Situation

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

3.1 Historical Financial Performance

Submission of audited balance sheets or, if not required by the law of the applicant's country, other financial statements acceptable to the Employer, for the last . . . . . years to demonstrate the current soundness of the applicants financial position and its prospective long-term profitability.	must meet requirement	not applicable	must meet requirement	not applicable	Form FIN - 3.1 with attachments

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

3.2 Average Annual Construction Turnover

Minimum average annual construction turnover of US$ . . . . . calculated as total certified payments received for contracts in progress or completed, within the last . . . . . years.	must meet requirement	must meet requirement	must meet . . . . . of the requirement	must meet . . . . . of the requirement	Form FIN - 3.2

4. Experience

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

4.1 General Construction Experience

Experience under construction contracts in the role of contractor, subcontractor, or management contractor for at least the last . . . . . years prior to the applications submission deadline.	must meet requirement	not applicable	must meet requirement	not applicable	Form EXP-4.1

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

4.2 Specific Construction Experience

(a) Contracts of Similar Size and Nature

Participation as contractor, management contractor, or subcontractor, in at least . . . . . contracts within the last . . . . . years, each with a value of at least US$ . . . . . that have been successfully or are substantially completed and that are similar to the proposed works. The similarity shall be based on the physical size, complexity, methods, technology or other characteristics as described in Section VI, Scope of Contract.	must meet requirement	must meet requirement	not applicable	not applicable	Form EXP 4.2(a)

Criteria	Compliance Requirements				Documents
Requirement	Single Entity	Joint Venture			Submission Requirements
		All Partners Combined	Each Partner	One Partner	

4.2 Specific Construction Experience

(b) Construction Experience in Key Activities

For the above or other contracts executed during the period stipulated in 4.2(a) above, a minimum construction experience in the following key activities:	must meet all requirements	must meet all requirements	not applicable	not applicable	Form EXP-4.2(b)

Section IV. Application Forms

Table of Forms

Application Submission Sheet

Date: .....
IFP No.: .....
ICB No.: .....

To: .....

We, the undersigned, apply to be prequalified for the referenced ICB and declare the following.

(a) We have examined and have no reservations to the Prequalification Document, including Addenda No(s)....., issued in accordance with ITA Clause 8.

(b) We, including all subcontractors or suppliers for any part of the contract(s) resulting from this prequalification process, if any, have nationalities of eligible countries, in accordance with ITA Sub-Clause 4.2.

(c) We, including any subcontractors or suppliers for any part of the contract(s) resulting from this prequalification, do not have any conflict of interest in accordance with ITA Sub-Clause 4.4.

(d) We, including any subcontractors or suppliers for any part of the contract(s) resulting from this prequalification, have not been declared ineligible by the ADB.

(e) We are a not government-owned entity. (1)

(f) We, in accordance with ITA Sub-clause 24.1, plan to subcontract the following key activities or parts of the works: .....

(g) We declare that the following commissions, gratuities, or fees have been paid or are to be paid with respect to the prequalification process:

Name of Recipient	Address	Reason	Amount
.....	.....	.....	.....
.....	.....	.....	.....

(If none has been paid or is to be paid, indicate "none.")

(h) We understand that you may cancel the prequalification process at any time and that you are not bound either to accept any application that you may receive or to invite the prequalified applicants to bid for the contract(s) subject of this prequalification, without incurring any liability to the Applicants, in accordance with ITA Clause 26.

Name .....

In the capacity of .....

Signed .....
.....
.....

Duly authorized to sign the Application for and on behalf of .....

Date .....
.....

(1) Government-owned entites must replace para (e) with the following statement: "We are a government-owned entity but meet the requirements of ITA Sub-Clause 4.6."

Form ELI – 1.1

Applicant Information Sheet

Date: .....
IFP No.: .....
.....
.....
ICB No.: .....
.....
Page ..... of ..... pages

Applicant Information	
Applicant's legal name	
In case of JV, legal name of each partner	
Applicant's actual or intended country of constitution	
Applicant's actual or Intended year of constitution	
Applicant's legal address in country of constitution	
Applicant's authorized representative (name, address, telephone numbers, fax numbers, e-mail address)	

Attached are copies of the following original documents.

- ☐ 1. In case of single entity, articles of incorporation or constitution of the legal entity named above, in accordance with ITA Sub-Clauses 4.1 and 4.2.
- ☐ 2. Authorization to represent the firm or JV named in above, in accordance with ITA Sub-Clause 15.3.
- ☐ 3. In case of JV, letter of intent to form JV or JV agreement, in accordance with ITA Sub-Clause 4.1.
- ☐ 4. In case of a government-owned entity, any additional documents not covered under 1 above required to comply with ITA Sub-Clause 4.6.

Form ELI – 1.2

JV Information Sheet

for JV Partners and Specialist Subcontractors as per ITA 24.2

Date: .....
IFP No.: .....
.....
.....
ICB No.: .....
.....
Page .....of .....pages

Each member of a JV and Specialist Subcontractors as per ITA 24.2 must fill in this form

JV / Specialist Subcontractor Information	
Applicant's legal name	
JV Partner's or Subcontractor's legal name	
JV Partner's or Subcontractor's country of constitution	
JV Partner's or Subcontractor's year of constitution	
JV Partner's or Subcontractor's legal address in country of constitution	
JV Partner's or Subcontractor's authorized representative information (name, address, telephone numbers, fax numbers, e-mail address)	

Attached are copies of the following original documents.

- ☐ 1. Articles of incorporation or constitution of the legal entity named above, in accordance with ITA Sub-Clauses 4.1 and 4.2.
- ☐ 2. Authorization to represent the firm named above, in accordance with ITA Sub-Clause 15.3.
- ☐ 3. In the case of government-owned entity, documents establishing legal and financial autonomy and compliance with commercial law, in accordance with ITA Sub-Clause 4.6.
- ☐ 4. In case of Specialist Subcontractors as per ITA 24.2 a formal intent to enter into an agreement.

Form LIT – 1

Pending Litigation

Applicant's Legal Name: .....
.....
JV Partner Legal Name: .....
.....

Date: .....
IFP No.: .....
ICB No.: .....
.....
Page .....of .....pages

Each Applicant or member of a JV must fill in this form

Pending Litigation			
❑ **No pending litigation in accordance with Criteria 2.1 of Section III, Qualification Criteria**			
❑ **Pending litigation in accordance with Criteria 2.1 of Section III, Qualification Criteria, as indicated below**			
Year	**Matter in Dispute**	**Value of Pending Claim in US$ Equivalent**	**Value of Pending Claim as a Percentage of Net Worth**

Form FIN – 3.1

Financial Situation

Applicant's Legal Name: .....
.....
JV Partner's Legal Name: .....
.....

Date: .....

IFP No.: .....

ICB No.: .....
.....

Page .....of .....pages

Each Applicant or member of a JV must fill in this form

	Financial Data for Previous 3 Years [US$ Equivalent]		
	Year 1:	**Year 2:**	**Year 3:**
1. Total Assets			
2. Current Assets			
3. Total Liabilities			
4. Current Liabilities			
5. Profits Before Taxes			
6. Profits After Taxes			

7. Net Worth [= 1 – 3]			
8. Working Capital [= 2 – 4]			
9. Return on Equity [= 5 / 7 of prior year]			

❑ Attached are copies of the audited balance sheets, including all related notes, and income statements for the last three years, as indicated above, complying with the following conditions.

- All such documents reflect the financial situation of the Applicant or partner to a JV, and not sister or parent companies.
- Historic financial statements must be audited by a certified accountant.
- Historic financial statements must be complete, including all notes to the financial statements.
- Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted).

Form FIN – 3.2

Average Annual Construction Turnover

Applicant's Legal Name: .....
.....
JV Partner's Legal Name: .....
.....

Date: .....
IFP No.: .....
ICB No.: .....
.....
Page .....of .....pages

Each Applicant or member of a JV must fill in this form

Annual Turnover Data for the Last 3 Years (Construction only)			
Year	**Amount Currency**	**Exchange Rate**	**US$ Equivalent**
	Average Annual Construction Turnover		

The information supplied should be the Annual Turnover of the Applicant or each member of a JV in terms of the amounts billed to clients for each year for work in progress or completed, converted to US Dollars at the rate of exchange at the end of the period reported.

Form EXP – 4.1

General Construction Experience

Applicant's Legal Name: .....
.....
JV Partner's Legal Name:.....
.....

Date: .....
IFP No.: .....
ICB No.: .....
.....
Page .....of .....pages

Each Applicant or member of a JV must fill in this form

General Construction Experience				
Starting Month Year	Ending Month Year	Years	Contract Identification and Name Name and Address of Employer Brief Description of the Works Executed by the Applicant	Role of Applicant

Form EXP – 4.2 (a)

Specific Construction Experience

Applicant's Legal Name: .....
.....
JV Partner's Legal Name: .....
.....

Date: .....
IFP No.: .....
ICB No.: .....
.....
Page .....of .....pages

Fill up one (1) form per contract.

Contract of Similar Size and Nature		
Contract No . . . . . of	**Contract Identification**	
Award Date		**Completion Date**
Role in Contract	❑ **Contractor** ❑ **Management Contractor** ❑ **Subcontractor**	
Total Contract Amount		**US$**
If partner in a JV or subcontractor, specify participation of total contract amount	**Percent of Total**	**Amount**
Employer's Name **Address** **Telephone/Fax Number** **E-mail**		
Description of the similarity in accordance with Criteria 4.2(a) of Section III		

Form EXP – 4.2(b)

Specific Construction Experience in Key Activities

Applicant's Legal Name: ..... Date: .....

JV Partner's Legal Name: ..... IFP No.: .....

Subcontractor's Legal Name (as per ITA 24.2): ..... ICB No.: .....

..... Page : .....of .....pages

Fill up one (1) form per contract

Contract with Similar Key Activities		
Contract No . . . . . of	**Contract Identification**	
Award Date		**Completion Date**
Role in Contract	❑ **Contractor** ❑ **Management Contractor** ❑ **Subcontractor**	
Total Contract Amount		**US$**
If partner in a JV or subcontractor, specify participation of total contract amount	**Percent of Total**	**Amount**
Employer's Name **Address** **Telephone Number** **Fax Number** **E-mail**		
Description of the key activities in accordance with Criteria 4.2(b) of Section III		

Section V. Eligible Countries

PART 2 – Requirements

Section VI. Scope of Contract

Table of Contents

A. Requirements

1. Brief Description of the Scope

The Scope of works refers to the conclusions of the feasibility study of the rehabilitation measures for the Balykchi – Bishkek – Kazakh Border railway section in Kyrgyzstan.
Historically the section under study belongs to the line Lugovaya – Bishkek – Balykchi as it is in the following Figure A.

Figure A - The Lugovaya – Bishkek – Balykchi railway line

After the collapse of the former Soviet Union, the line has been split into two sections because of the introduction of the national border between Kyrgyzstan and Kazakhstan: the Lugovaya - border (61 km) and the border – Bishkek – Balykchi (322 km).

The administrative change could not change so much the situation since the two sections are still working in conjunction. Furthermore services along the line are operated up to Lugovaya by the Kyrgyz Railways and so they will be up to 2007 at least.

Besides this fact, improvements along the section from Balykchi to the border should be certainly managed by the Kyrgyz Railway Administration while the section up to Lugovaya belongs to the Kazakhstan Railways but maintenance/services are operated by the Kyrgyz Railways. Consequently the issue of the competence has required to consider two different Feasibility Studies for rehabilitation measures concerning sections of the same line.

Improvements along the main line have to be financed and managed by two different Railway Administrations. Consequently the study has to consider two different Feasibility Studies for rehabilitation measures concerning sections of the same line.

The Feasibility Study carried out for the Kyrgyz side of the line (from Balykchi to the Border) has outlined just the strict need of rehabilitation of the line for the following issues:

a. permanent way (from Bishkek to the Kazakh border);
b. main structures (bridges, avalanche sheds and quarry rehabilitation);

The option promoted represents a low cost option which had to take into account severe budgetary constraints of the Kyrgyz Railways.

Consequently activities for item a. will be mainly performed by the Kyrgyz Railways using materials, machines and plants separately provided and only item b. will be implemented by a Contractor. That would permit to face the most urgent necessities of the line, as well as in building the indispensable structures that guarantee the line protection from land-slides. It would allow the acceleration of the capital maintenance of the remaining network putting at disposal recovered rails and machines to implement works with Kyrgyz railways personnel. Item a. has been consequently split into three Lots: purchase of machines, provision of PW materials, and purchase of sleeper factory while a forth Lot is for repair or new building of bridges, avalanche sheds and ballast quarry rehabilitation.

The present Lot 3.2 is for the purchase of material needed to the Kyrgyz Railway in order to maintain the permanent way along the line.

2. Major Contract Components

Code	Description	Unit	Quantity	NOTES
1B	P65 rails	t	6.200	Corresponding to 48 km of single track line
2B	Concrete sleepers	unit	100.000	100,000 sleepers corresponding to 55 km
3B	Fastenings for concrete sleepers	pairs	100.000	
4B	Ballast for rehabilitated sections	m^3	40.000	Corresponding to 22 km of single track line
9B	Switch crossing	unit	100	50 for R65 and 50 for R50
10B	Switch blades	pairs	100	50 for R65 and 50 for R50
12B	Rail Joints	each	4.100	
13B	Insulated rail joints	each	1.500	

3. Estimated Quantities of Major Components

See Section 2

4. Methods Required

No specific methods are required.

5. Contract Implementation Period

The Contract implementation period is 12 months

B. Supplementary Information

1. Project Country

2. Contract Site

C. Facilities to be Provided by the Employer

STANDARD BIDDING DOCUMENT

Procurement of Goods

Single-Stage: One-Envelope Bidding Procedure

Asian Development Bank

November 2004

Preface

This document has been based on the Master Bidding Document for Procurement of Goods, prepared by Multilateral Development Banks and International Financial Institutions, and reflects what they consider best practices in regard to Bidding Documents and contracting for the procurement of goods.

This document reflects the structure and the provisions of the Master Bidding Document for the Procurement of Goods, except where specific considerations within the respective multilateral development bank or international financial institution have required a change.

This document has been prepared by the Asian Development Bank (ADB) to facilitate a Single-Stage:One-Envelope bidding procedure. The Single-Stage:One-Envelope bidding procedure is the main bidding procedure used for most of the procurement financed by the ADB. In the Single-Stage:One-Envelope bidding procedure, Bidders submit Bids in one envelope containing both the Price Proposal and the Technical Proposal. The envelopes are opened in public at the date and time advised in the Bidding Document. The Bids are evaluated and the Contract is awarded to the Bidder whose Bid has been determined to be the lowest evaluated substantially responsive Bid.

To obtain further information on procurement under ADB assisted projects, contact:

Project Coordination and Procurement Division
Central Operations Services Office
Asian Development Bank
P.O.Box 789, 0980 Manila, Philippines
Fax: (63-2) 636 2475
Email: procurement@adb.org

Standard Bidding Document

Table of Contents

PART 1 – Bidding Procedures

Section I. Instructions to Bidders

Table of Clauses

A. General

1. Scope of Bid

1.1 In support of the Invitation for Bids indicated in the Bid Data Sheet (BDS), the Purchaser, as indicated in the BDS, issues this Bidding Document for the supply of Goods and Related Services incidental thereto as specified in Section VI, Schedule of Supply (SS). The name, identification, and number of lots of the International Competitive Bidding (ICB) are provided in the BDS.

1.2 Throughout this Bidding Document :

(a) the term "in writing" means communicated in written form with proof of receipt;

(b) if the context so requires, singular means plural and vice versa; and

(c) "day" means calendar day.

2. Source of Funds

2.1 The Borrower or Recipient (hereinafter called "Borrower") indicated in the BDS has applied for or received financing (hereinafter called "funds") from the Asian Development Bank (hereinafter called "the ADB") toward the cost of the project named in the BDS. The Borrower intends to apply a portion of the funds to eligible payments under the contract for which this Bidding Document is issued.

2.2 Payments by the ADB will be made only at the request of the Borrower and upon approval by the ADB in accordance with the terms and conditions of the financing agreement between the Borrower and the ADB (hereinafter called the Loan Agreement), and will be subject in all respects to the terms and conditions of that Loan Agreement. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the funds.

3. Corrupt Practices

3.1 ADB's Anticorruption Policy requires borrowers (including beneficiaries of ADB-financed activity), as well as bidders, suppliers, and contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the ADB:

(a) defines, for the purposes of this provision, the terms

set forth below as follows:

(i) "corrupt practice" means the offering, giving receiving, or soliciting, directly or indirectly, of any thing of value to influence the action of any party in the procurement process or the execution of a contract;

(ii) "fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;

(iii) "collusive practices" means a scheme or arrangement between two or more bidders, with or without the knowledge of the Borrower, designed to influence the action of any party in a procurement process or the execution of a contract;

(iv) "coercive practices" means harming or threatening to harm, directly or indirectly, persons, or their property to influence their participation in a procurement process, or affect the execution of a contract;

(b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract; and

(c) will sanction a party or its successor, including declaring ineligible, either indefinitely or for a stated period of time, to participate in ADB-financed activities if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, an ADB-financed contract.

3.2 Furthermore, Bidders shall be aware of the provision stated in Sub-Clause 3.2 and Sub-Clause 35.1 (c) of the General Conditions of Contract.

4. Eligible Bidders

4.1 A Bidder may be a natural person, private entity, government-owned entity (subject to ITB Sub-Clause 4.5) or any combination of them with a formal intent to enter into an agreement or under an existing agreement in the

form of a Joint Venture (JV). In the case of a JV:

(a) all parties to the JV shall be jointly and severally liable; and

(b) a JV shall nominate a Representative who shall have the authority to conduct all businesses for and on behalf of any and all the parties of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution.

4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section V, Eligible Countries. A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.

4.3 A Bidder shall not have a conflict of interest. All Bidders found to be in conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if they:

(a) have controlling shareholders in common; or

(b) receive or have received any direct or indirect subsidy from any of them; or

(c) have the same legal representative for purposes of this Bid; or

(d) have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Purchaser regarding this bidding process; or

(e) submit more than one bid in this bidding process, except for alternative offers permitted under ITB Clause 13. However, this does not limit the participation of subcontractors in more than one bid, or as Bidders and subcontractors simultaneously; or

(f) participated as a consultant in the preparation of the design or technical specifications of the goods and

related services that are the subject of the Bid.

4.4 A firm that is under a declaration of ineligibility by the ADB in accordance with ITB Clause 3, at the date of the deadline for bid submission or thereafter, shall be disqualified.

4.5 Government-owned enterprises in the Purchaser's country shall be eligible only if they can establish that they are legally and financially autonomous and operate under commercial law, and that they are not a dependent agency of the Purchaser.

4.6 Bidders shall provide such evidence of their continued eligibility satisfactory to the Purchaser, as the Purchaser shall reasonably request.

5. Eligible Goods and Related Services

5.1 All goods and related services to be supplied under the Contract and financed by the ADB, shall have as their country of origin an eligible country of the ADB (see Section V, Eligible Countries).

5.2 For purposes of this Clause, the term "goods" includes commodities, raw material, machinery, equipment, and industrial plants; and "related services" includes services such as insurance, installation, training, and initial maintenance.

5.3 The term "country of origin" means the country where the goods have been mined, grown, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components.

5.4 The nationality of the firm that produces, assembles, distributes, or sells the goods shall not determine their origin.

5.5 If so required in the BDS, a Bidder that does not manufacture or produce the Goods it offers to supply shall submit the Manufacturer's Authorization using the form included in Section V, Bidding Forms to demonstrate that it has been duly authorized by the manufacturer or producer of the Goods to supply these Goods in the

Purchaser's country.

B. Contents of Bidding Document

6. Sections of the Bidding Document

6.1 The Bidding Document consist of Parts 1, 2, and 3, which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB Clause 8.

PART 1 Bidding Procedures

- Section I. Instructions to Bidders (ITB)
- Section II. Bid Data Sheet (BDS)
- Section III. Evaluation and Qualification Criteria
- Section IV. Bidding Forms
- Section V. Eligible Countries

PART 2 Supply Requirements

- Section VI. Schedule of Supply

PART 3 Contract

- Section VII. General Conditions of Contract (GCC)
- Section VIII. Special Conditions of Contract (SCC)
- Section IX. Contract Forms

6.2 The Invitation for Bids issued by the Purchaser is not part of the Bidding Document.

6.3 The Purchaser is not responsible for the completeness of the Bidding Document and its addenda, if they were not obtained directly from the Purchaser.

6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document, may result in the rejection of the Bid.

7. Clarification of Bidding Document

7.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the Purchaser in writing at the Purchaser's address indicated in the BDS. The Purchaser will respond in writing to any request for clarification, provided that such request is received no later than twenty-one (21) days prior to the deadline for submission of Bids. The Purchaser shall forward copies of its response to all Bidders who have acquired the

Bidding Document directly from it, including a description of the inquiry but without identifying its source. Should the Purchaser deem it necessary to amend the Bidding Document as a result of a clarification, it shall do so following the procedure under ITB Clause 8 and Sub-Clause 24.2.

8. Amendment of Bidding Document

8.1 At any time prior to the deadline for submission of the Bids, the Purchaser may amend the Bidding Document by issuing addenda.

8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document directly from the Purchaser.

8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their Bids, the Purchaser may, at its discretion, extend the deadline for the submission of the Bids, pursuant to ITB Sub-Clause 24.2

C. Preparation of Bids

9. Cost of Bidding

9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the Purchaser shall not be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.

10. Language of Bid

10.1 The Bid, as well as all correspondence and documents relating to the Bid exchanged by the Bidder and the Purchaser, shall be written in the language specified in the BDS. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the BDS, in which case, for purposes of interpretation of the Bid, such translation shall govern.

11. Documents Comprising the Bid

11.1 The Bid shall comprise the following:

(a) Bid Submission Sheet and the applicable Price Schedules, in accordance with ITB Clauses 12, 14, and 15;

(b) Bid Security, in accordance with ITB Clause 21;

(c) alternative bids, if permissible, in accordance with ITB Clause 13;

(d) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB Clause 22;

(e) documentary evidence in accordance with ITB Clause 16 establishing the Bidder's eligibility to bid;

(f) documentary evidence in accordance with ITB Clause 17, that the Goods and Related Services to be supplied by the Bidder are of eligible origin;

(g) documentary evidence in accordance with ITB Clauses 18 and 30, that the Goods and Related Services conform to the Bidding Document;

(h) documentary evidence in accordance with ITB Clause 19 establishing the Bidder's qualifications to perform the contract if its Bid is accepted; and

(i) any other document required in the BDS.

12. Bid Submission Sheet and Price Schedules

12.1 The Bidder shall submit the Bid Submission Sheet using the form furnished in Section IV, Bidding Forms. This form must be completed without any alterations to its format, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.

12.2 The Bidder shall submit the Price Schedules for Goods and Related Services, according to their origin as appropriate, using the forms furnished in Section IV, Bidding Forms.

13. Alternative Bids

13.1 Unless otherwise indicated in the BDS, alternative bids shall not be considered.

14. Bid Prices and Discounts

14.1 The prices and discounts quoted by the Bidder in the Bid Submission Sheet and in the Price Schedules shall conform to the requirements specified below.

14.2 All items in the Schedule of Supply must be listed and priced separately in the Price Schedules. If a Price Schedule shows items listed but not priced, their prices shall be assumed to be included in the prices of other items. Items not listed in the Price Schedule shall be assumed not to be included in the Bid, and provided that the Bid is substantially responsive, the corresponding adjustment shall be applied in accordance with ITB Sub-

Clause 31.3

14.3 The price to be quoted in the Bid Submission Sheet shall be the total price of the Bid excluding any discounts offered.

14.4 The Bidder shall quote any unconditional discounts and the methodology for their application in the Bid Submission Sheet.

14.5 The terms EXW, CIF, CIP, and other similar terms shall be governed by the rules prescribed in the current edition of Incoterms, published by The International Chamber of Commerce, at the date of the Invitation for Bids or as specified in the BDS.

14.6 Prices proposed in the Price Schedule Forms for Goods and Related Services, shall be disaggregated, when appropriate as indicated in this sub-clause. This disaggregation shall be solely for the purpose of facilitating the comparison of Bids by the Purchaser. This shall not in any way limit the Purchaser's right to contract on any of the terms offered:

(a) For Goods offered from within the Purchaser's country :

(i) the price of the goods quoted EXW (ex works, ex factory, ex warehouse, ex showroom, or off-the-shelf, as applicable), including all customs duties and sales and other taxes already paid or payable on the components and raw material used in the manufacture or assembly of goods quoted ex works or ex factory, or on the previously imported goods of foreign origin quoted ex warehouse, ex showroom, or off-the-shelf;

(ii) sales tax and all other taxes applicable in the Purchaser's country and payable on the Goods if the Contrac1t is awarded to the Bidder; and

(iii) the total price for the item.

(b) For Goods offered from outside the Purchaser's country :

(i) the price of the goods quoted CIF(named port of destination), or CIP (border point), or CIP

(named place of destination), in the Purchaser's country, as specified in the BDS;

(ii) the price of the goods quoted FOB port of shipment (or FCA, as the case may be), if specified in the BDS.

(iii) the total price for the item.

(c) For Related Services whenever such Related Services are specified in the Schedule of Requirements:

(i) the local currency cost component of each item comprising the Related Services; and

(ii) the foreign currency cost component of each item comprising the Related Services,

inclusive of all custom duties, sales and other similar taxes applicable in the Purchaser's country, payable on the Related Services, if the Contract is awarded to the Bidder

14.7 Prices quoted by the Bidder shall be fixed during the Bidder's performance of the Contract and not subject to variation on any account, unless otherwise specified in the BDS. A Bid submitted with an adjustable price quotation shall be treated as nonresponsive and shall be rejected, pursuant to ITB Clause 30. However, if in accordance with the BDS, prices quoted by the Bidder shall be subject to adjustment during the performance of the Contract, a Bid submitted with a fixed price quotation shall not be rejected, but the price adjustment shall be treated as zero.

14.8 If so indicated in ITB Sub-Clause 1.1, Bids are being invited for individual contracts (lots) or for any combination of contracts (packages), Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their Bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB Sub-Clause 14.4, provided the Bids for all lots are submitted and opened at the same time.

15. Currencies of Bid

15.1 Bid prices shall be quoted in the following currencies:

(a) the currencies specified in the BDS;

(b) a Bidder expecting to incur a portion of its expen-

ditures in the performance of the Contract in more than one currency, and wishing to be paid accordingly, shall so indicate in its Bid; and

(c) if some of the expenditures for the Related Services are to be incurred in the borrowing country, such expenditures should be expressed in the Bid and will be payable in the borrower's currency.

16. Documents Establishing the Eligibility of the Bidder

16.1 To establish their eligibility in accordance with ITB Clause 4, Bidders shall:

(a) complete the eligibility declarations in the Bid Submission Sheet, included in Section IV, Bidding Forms; and

(b) if the Bidder is an existing or intended JV in accordance with ITB Sub-Clause 4.1, submit a copy of the JV Agreement, or a letter of intent to enter into such an Agreement. The respective document shall be signed by all legally authorized signatories of all the parties to the existing or intended JV, as appropriate.

17. Documents Establishing the Eligibility of the Goods and Related Services

17.1 To establish the eligibility of the Goods and Related Services, in accordance with ITB Clause 5, Bidders shall complete the country of origin declarations in the Price Schedule Forms, included in Section IV, Bidding Forms.

18. Documents Establishing the Conformity of the Goods and Related Services to the Bidding Document

18.1 To establish the conformity of the Goods and Related Services to the Bidding Document, the Bidder shall furnish as part of its Bid the documentary evidence specified in Section VI, Schedule of Supply.

18.2 The documentary evidence may be in the form of literature, drawings or data, and shall consist of a detailed description of the essential technical and performance characteristics of the Goods and Related Services, demonstrating substantial responsiveness of the Goods

and Related Services to those requirements, and if applicable, a statement of deviations and exceptions to the provisions of Section VI, Schedule of Supply.

18.3 Standards for workmanship, process, material, and equipment, as well as references to brand names or catalogue numbers specified by the Purchaser in the Schedule of Supply, are intended to be descriptive only and not restrictive. The Bidder may offer other standards of quality, brand names, and/or catalogue numbers, provided that it demonstrates, to the Purchaser's satisfaction, that the substitutions ensure substantial equivalence or are superior to those specified in the Schedule of Supply.

19. Documents Establishing the Qualifications of the Bidder

19.1 To establish its qualifications to perform the Contract, the Bidder shall submit the evidence indicated for each qualification criteria specified in Section III, Evaluation and Qualification Criteria.

20. Period of Validity of Bids

20.1 Bids shall remain valid for the period specified in the BDS after the bid submission deadline date prescribed by the Purchaser. A Bid valid for a shorter period shall be rejected by the Purchaser as nonresponsive.

20.2 In exceptional circumstances, prior to the expiration of the bid validity period, the Purchaser may request Bidders to extend the period of validity of their Bids. The request and the responses shall be made in writing. If a Bid Security is requested in accordance with ITB Clause 21, it shall also be extended for a corresponding period. A Bidder may refuse the request without forfeiting its Bid Security. A Bidder granting the request shall not be required or permitted to modify its Bid.

21. Bid Security

21.1 Unless otherwise specified in the BDS, the Bidder shall furnish as part of its Bid, a Bid Security in original form and in the amount and currency specified in the BDS.

21.2 The Bid Security shall be, at the Bidder's option, in any of the following forms:

(a) a bank guarantee;

(b) an irrevocable letter of credit; or

(c) a cashier's or certified check;

all from a reputable bank from an eligible country. In case of a a bank guarantee, the Bid Security shall be submitted using the Bid Security Form included in Section IV, Bidding Forms, or another form acceptable to the Purchaser. The form must include the complete name of the Bidder. The Bid Security shall be valid for twenty-eight days (28) beyond the end of the validity period of the bid. This shall also apply if the period for bid validity is extended.

21.3 If a bid Security is required in accordance with ITB Sub-Clause 21.1, any Bid not accompanied by a substantially responsive Bid Security in accordance with ITB Sub-Clause 21.2, shall be rejected by the Purchaser as nonresponsive.

21.4 The Bid Security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder furnishing the Performance Security pursuant to ITB Clause 44.

21.5 The Bid Security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required Performance Security.

21.6 The Bid Security may be forfeited :

(a) if a Bidder withdraws its Bid during the period of bid validity specified by the Bidder on the Bid Submission Sheet, except as provided in ITB Sub-Clause 20.2; or

(b) if the successful Bidder fails to:

(i) sign the Contract in accordance with ITB Clause 43;

(ii) furnish a Performance Security in accordance with ITB Clause 44; or

(iii) accept the correction of its Bid Price pursuant to ITB Sub-Clause 31.5.

21.7 The Bid Security of a JV must be in the name of the JV that submits the bid. If the JV has not been legally constituted at the time of bidding, the Bid Security shall be in the names of all future partners as named in the letter of intent mentioned in ITB Sub-Clause 16.1.

22. Format and Signing of Bid

22.1 The Bidder shall prepare one original of the documents comprising the Bid as described in ITB Clause 11 and clearly mark it "ORIGINAL." In addition, the Bidder shall submit copies of the Bid, in the number specified in the BDS and clearly mark them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.

22.2 The original and all copies of the Bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as specified in the BDS and shall be attached to the Bid. The name and position held by each person signing the authorization must be typed or printed below the signature. All pages of the Bid, except for unamended printed literature, shall be signed or initialed by the person signing the Bid.

22.3 Any interlineation, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the Bid.

D. Submission and Opening of Bids

23. Sealing and Marking of Bids

23.1 The Bidder shall enclose the original and each copy of the Bid, including alternative bids, if permitted in accordance with ITB Clause 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL" and "COPY." These envelopes containing the original and the copies shall then be enclosed in one single envelope.

23.2 The inner and outer envelopes shall:

(a) bear the name and address of the Bidder;

(b) be addressed to the Purchaser in accordance with ITB Sub-Clause 24.1;

(c) bear the specific identification of this bidding process indicated in the BDS; and

(d) bear a warning not to open before the time and date for bid opening, in accordance with ITB Sub-Clause 27.1.

23.3 If all envelopes are not sealed and marked as required, the Purchaser will assume no responsibility for the misplacement or premature opening of the bid.

24. Deadline for Submission of Bids

24.1 Bids must be received by the Purchaser at the address and no later than the date and time indicated in the BDS.

24.2 The Purchaser may, at its discretion, extend the deadline for the submission of Bids by amending the Bidding Document in accordance with ITB Clause 8, in which case all rights and obligations of the Purchaser and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

25. Late Bids

25.1 The Purchaser shall not consider any Bid that arrives after the deadline for submission of Bids, in accordance with ITB Clause 24. Any Bid received by the Purchaser after the deadline for submission of Bids shall be declared late, rejected, and returned unopened to the Bidder.

26. Withdrawal, Substitution, and Modification of Bids

26.1 A Bidder may withdraw, substitute, or modify its Bid after it has been submitted by sending a written Notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB Sub-Clause 22.2 (except that Withdrawal Notices do not require copies). The corresponding substitution or modification of the Bid must accompany the respective written Notice. All Notices must be:

(a) submitted in accordance with ITB Clauses 22 and 23 (except that Withdrawal Notices do not require copies), and in addition, the respective envelopes shall be clearly marked "Withdrawal," "Substitution," "Modification"; and

(b) received by the Purchaser prior to the deadline prescribed for submission of bids, in accordance with ITB Clause 24.

26.2 Bids requested to be withdrawn in accordance with ITB Sub-Clause 26.1 shall be returned unopened to the Bidders.

26.3 No Bid shall be withdrawn, substituted, or modified in the

interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Bid Submission Sheet or any extension thereof.

27. Bid Opening

27.1 The Purchaser shall conduct the bid opening in the presence of Bidders` designated representatives who choose to attend, and at the address, date and time specified in the BDS.

27.2 First, envelopes marked "WITHDRAWAL" shall be opened, read out, and recorded, and the envelope containing the corresponding Bid shall not be opened, but returned to the Bidder. No Bid shall be withdrawn unless the corresponding Withdrawal Notice contains a valid authorization to request the withdrawal and is read out and recorded at bid opening. Next, envelopes marked "SUBSTITUTION" shall be opened, read out, recorded, and exchanged for the corresponding Bid being substituted, and the substituted Bid shall not be opened, but returned to the Bidder. No Bid shall be substituted unless the corresponding Substitution Notice contains a valid authorization to request the substitution and is read out and recorded at bid opening. Envelopes marked "MODIFICATION" shall be opened, read out, and recorded with the corresponding Bid. No Bid shall be modified unless the corresponding Modification Notice contains a valid authorization to request the modification and is read out and recorded at bid opening. Only envelopes that are opened, read out, and recorded at bid opening shall be considered further.

27.3 All other envelopes shall be opened one at a time, and the following read out and recorded: the name of the Bidder and whether there is a modification; the Bid Prices (per lot if applicable), any discounts and alternative offers; the presence of a Bid Security, if required; and any other details as the Purchaser may consider appropriate. Only discounts and alternative offers read out and recorded at bid opening shall be considered for evaluation. No Bid shall be rejected at bid opening except for late bids, in accordance with ITB Sub-Clause 25.1.

27.4 The Purchaser shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per lot if applicable, any

discounts and alternative offers; and the presence or absence of a Bid Security, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

E. Evaluation and Comparison of Bids

28. Confidentiality

28.1 Information relating to the examination, evaluation, comparison, and postqualification of Bids, and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.

28.2 Any attempt by a Bidder to influence the Purchaser in the examination, evaluation, comparison, and postqualification of the Bids or Contract award decisions may result in the rejection of its Bid.

28.3 Notwithstanding ITB Sub-Clause 28.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the Purchaser on any matter related to the bidding process, it should do so in writing.

29. Clarification of Bids

29.1 To assist in the examination, evaluation, comparison and post-qualification of the Bids, the Purchaser may, at its discretion, ask any Bidder for a clarification of its Bid. Any clarification submitted by a Bidder that is not in response to a request by the Purchaser shall not be considered. The Purchaser's request for clarification and the response shall be in writing. No change in the prices or substance of the Bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the Purchaser in the evaluation of the Bids, in accordance with ITB Clause 31.

30. Responsiveness of Bids

30.1 The Purchaser's determination of the responsiveness of a Bid is to be based on the contents of the Bid itself.

30.2 A substantially responsive Bid is one that conforms to all the terms, conditions, and specifications of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is

one that:

(a) affects in any substantial way the scope, quality, or performance of the Goods and Related Services specified in the Contract; or

(b) limits in any substantial way, inconsistent with the Bidding Document, the Purchaser's rights or the Bidder's obligations under the Contract; or

(c) if rectified would unfairly affect the competitive position of other Bidders presenting substantially responsive Bids.

30.3 If a Bid is not substantially responsive to the Bidding Document, it shall be rejected by the Purchaser and may not subsequently be made responsive by the Bidder by correction of the material deviation, reservation, or omission.

31. Nonconformi-ties, Errors, and Omissions

31.1 Provided that a Bid is substantially responsive, the Purchaser may waive any non-conformity or omission in the Bid that does not constitute a material deviation.

31.2 Provided that a Bid is substantially responsive, the Purchaser may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities or omissions in the Bid related to documentation requirements. Such omission shall not be related to any aspect of the price of the Bid. Failure of the Bidder to comply with the request may result in the rejection of its Bid.

31.3 Provided that a Bid is substantially responsive, the Purchaser shall rectify nonmaterial nonconformities or omissions. To this effect, the Bid Price shall be adjusted, for comparison purposes only, to reflect the price of the missing or non-conforming item or component. The adjustment shall be made using the method indicated in Section III, Evaluation and Qualification Criteria.

31.4 Provided that the Bid is substantially responsive, the Purchaser shall correct arithmetical errors on the following basis:

(a) if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit

price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Purchaser there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;

(b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and

(c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.

31.5 If the Bidder that submitted the lowest evaluated Bid does not accept the correction of errors, its Bid shall be disqualified and its Bid Security may be forfeited.

32. Preliminary Examination of Bids

32.1 The Purchaser shall examine the Bids to confirm that all documents and technical documentation requested in ITB Clause 11 have been provided, and to determine the completeness of each document submitted.

32.2 The Purchaser shall confirm that the following documents and information have been provided in the Bid:

(a) Bid Submission Sheet, in accordance with ITB Sub-Clause 12.1;

(b) Price Schedules, in accordance with ITB Sub-Clause 12.2;

(c) Written confirmation of authorization to commit the Bidder, in accordance with ITB Sub-Clause 22.2; and

(d) Bid Security, in accordance with ITB Clause 21, if applicable.

If any of these documents or information is missing, the offer shall be rejected.

33. Examination of Terms and Conditions; Technical

33.1 The Purchaser shall examine the Bid to confirm that all terms and conditions specified in the GCC and the SCC have been accepted by the Bidder without any material deviation or reservation.

Evaluation

33.2 The Purchaser shall evaluate the technical aspects of the Bid submitted in accordance with ITB Clause 18, to confirm that all requirements specified in Section VI, Schedule of Supply of the Bidding Document have been met without any material deviation or reservation.

33.3 If, after the examination of the terms and conditions and the technical evaluation, the Purchaser determines that the Bid is not substantially responsive in accordance with ITB Clause 30, it shall reject the Bid.

34. Conversion to Single Currency

34.1 For evaluation and comparison purposes, the Purchaser shall convert all bid prices expressed in the amounts in various currencies into a single currency, using the selling exchange rates established by the source and on the date specified in the BDS.

35. Margin of Preference

35.1 Unless otherwise specified in the BDS, a margin of preference shall not apply.

36. Evaluation of Bids

36.1 The Purchaser shall evaluate each Bid that has been determined, up to this stage of the evaluation, to be substantially responsive.

36.2 To evaluate a Bid, the Purchaser shall only use all the criteria and methodologies defined in this Clause and in Section III, Evaluation and Qualification Criteria. No other criteria or methodology shall be permitted.

36.3 To evaluate a Bid, the Purchaser shall consider the following:

(a) the Bid Price;

(b) price adjustment for correction of arithmetic errors in accordance with ITB Sub-Clause 31.4;

(c) price adjustment due to discounts offered in accordance with ITB Sub-Clause 14.4;

(d) application of all the evaluation factors indicated in Section III, Evaluation and Qualification Criteria.

36.4 In the calculation of the evaluated cost of the Bids, the Purchaser shall exclude and not take into account:

(a) in the case of Goods offered from within the Purchaser's country, all sales tax and all other

taxes, applicable in the Purchaser's country and payable on the Goods if the Contract is awarded to the Bidder;

(b) in the case of Goods offered from outside the Purchaser's country, all customs duties, sales tax, and other taxes, applicable in the Purchaser's country and payable on the Goods if the Contract is awarded to the Bidder; and

(c) any allowance for price adjustment during the period of performance of the Contract, if provided in the Bid.

36.5 The Purchaser's cost evaluation of a Bid may require the consideration of other factors, in addition to the Bid Price quoted in accordance with ITB Clause 14. These factors may be related to the characteristics, performance, and terms and conditions of purchase of the Goods and Related Services. The factors selected, if any, shall be expressed in monetary terms to facilitate comparison of the Bids, unless otherwise specified in Section III, Evaluation and Qualification Criteria. The factors to be used and the methodology of application shall be as indicated in Section III, Evaluation and Qualification Criteria.

36.6 If this Bidding Document allows Bidders to quote separate prices for different lots, and the award to a single Bidder of multiple lots, the methodology of evaluation to determine the lowest evaluated lot combinations, including any discounts offered in the Bid Submission Sheet, is as specified in Section III, Evaluation and Qualification Criteria.

37. Comparison of Bids

37.1 The Purchaser shall compare all substantially responsive bids to determine the lowest-evaluated bid, in accordance with ITB Clause 36.

38. Postqualification of the Bidder

38.1 The Purchaser shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive Bid is qualified to perform the Contract satisfactorily.

38.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB Clause 19, to clarifications in accordance with ITB Clause 29 and the

qualification criteria indicated in Section III, Evaluation and Qualification Criteria. Factors not included in Section III, Evaluation and Qualification Criteria shall not be used in the evaluation of the Bidder's qualification.

38.3 An affirmative determination shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the Bid, in which event the Purchaser shall proceed to the next lowest evaluated bid to make a similar determination of that Bidder's capabilities to perform satisfactorily.

39. Purchaser's Right to Accept Any Bid, and to Reject Any or All Bids

39.1 The Purchaser reserves the right to accept or reject any Bid, and to annul the bidding process and reject all Bids at any time prior to Contract award, without thereby incurring any liability to the Bidders.

F. Award of Contract

40. Award Criteria

40.1 The Purchaser shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated Bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.

41. Purchaser's Right to Vary Quantities at Time of Award

41.1 At the time the Contract is awarded, the Purchaser reserves the right to increase or decrease the quantity of Goods and Related Services originally specified in Section VI, Schedule of Supply, provided this does not exceed the percentages indicated in the BDS, and without any change in the unit prices or other terms and conditions of the Bid and the Bidding Document.

42. Notification of Award

42.1 Prior to the expiration of the period of bid validity, the Purchaser shall notify the successful Bidder, in writing, that its Bid has been accepted. At the same time, the Purchaser shall also notify all other Bidders of the results of the bidding.

42.2 Until a formal Contract is prepared and executed, the notification of award shall constitute a binding Contract.

43. Signing of Contract

43.1 Promptly after notification, the Purchaser shall send to the successful Bidder the Agreement and the Special Conditions of Contract.

43.2 Within twenty-eight (28) days of receipt of the Agreement, the successful Bidder shall sign, date, and return it to the Purchaser.

44. Performance Security

44.1 Within twenty-eight (28) days of the receipt of notification of award from the Purchaser, the successful Bidder shall furnish the Performance Security in accordance with the GCC, using for that purpose the Performance Security Form included in Section IX, Contract Forms, or another form acceptable to the Purchaser.

44.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or sign the Contract shall constitute sufficient grounds for the annulment of the award and forfeiture of the Bid Security. In that event the Purchaser may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the Purchaser to be qualified to perform the Contract satisfactorily.

Section II. Bid Data Sheet

A. Introduction	
ITB 1.1	The number of the Invitation for Bids is : _____
ITB 1.1	The Purchaser is: _____
ITB 1.1	The name of the ICB is:_____ The identification number of the ICB is: _____ The number and identification of lots comprising this ICB is: _____
ITB 2.1	The Borrower is: _____
ITB 2.1	The name of the Project is: Rehabilitation measures for the Beyneu – Uzbek Border railway section – Lot 2.1 telecommunications
ITB 5.5	The Bidder _____ required to include with its Bid, documentation from the Manufacturer of the Goods, that it has been duly authorized to supply, in the Purchaser's country, the Goods indicated in its Bid.

B. Bidding Document	
ITB 7.1	For **clarification purposes** only, the Purchaser's address is: Attention: _____ Street Address: _____ Floor/Room number: _____ City: _____ ZIP Code: _____ Country: _____ Telephone: _____ Facsimile number: _____ Electronic mail address: _____
C. Preparation of Bids	
ITB 10.1	The language of the Bid is: _____ _____
ITB 11.1 (i)	The Bidder shall submit with its Bid the following additional documents: _____ _____
ITB 13.1	Alternative Bids _____ permitted
ITB 14.5	The Incoterms edition is: _____
ITB 14.6 (b) (i)	For Goods offered from outside the Purchaser's country, the Bidder shall quote prices using the following Incoterms:_____ _____
ITB 14.6 (b) (ii)	In addition to the above, the Bidder shall quote prices for Goods offered from outside the Purchaser's country using the following Incoterms: _____ _____

ITB 14.7	The prices quoted by the Bidder shall be: _____
ITB 15.1 (a)	The currency of the Bid shall be: _____
ITB 20.1	The bid validity period shall be _____ days.
ITB 21.1	A Bid Security _____ required. If a Bid Security shall be required, the amount and currency of the Bid Security shall be _____ _____
D. Submission and Opening of Bids	
ITB 22.1	In addition to the original of the Bid, the number of copies is: _____ _____
ITB 22.2	The written confirmation of Authorization to sign on behalf of the Bidder shall consist of: _____ _____
ITB 23.2 (c)	The identification of this bidding process is: _____ _____
ITB 24.1	For **bid submission purposes** only, the Purchaser's address is : Attention: _____ Street Address: _____ Floor/Room number: _____ City: _____ ZIP Code: _____ Country: _____

ITB 24.1	**The deadline for bid submission is:** Date: _____ Time: _____
ITB 27.1	**The bid opening shall take place at:** Street Address: _____ Floor/Room number: _____ City : _____ Country:_____ Date: _____ Time: _____
E. Evaluation, and Comparison of Bids	
ITB 34.1	The currency that shall be used for bid evaluation and comparison purposes to convert all bid prices expressed in various currencies into a single currency is: _____ The source of exchange rate shall be: _____ The date for the exchange rate shall be: _____
ITB 35.1	A margin of preference _____ apply. If a margin of preference applies, the application methodology shall be as stipulated in Section III, Evaluation and Qualification Criteria.
F. Award of Contract	
ITB 41.1	The percentage by which quantities may be increased is: _____ _____ The percentage by which quantities may be decreased is: _____ _____

Section III. Evaluation and Qualification Criteria

Table of Criteria

Evaluation Criteria

Scope

Multiple Contracts

Technical Criteria

Economic Criteria

Margin of Preference

Qualification Criteria

Financial Criteria

Experience Criteria

Supply Capacity

Litigation History

Section IV. Bidding Forms

Table of Forms

Bid Submission Sheet

Date: _____
ICB No.: _____
Invitation for Bid No.: _____
Alternative No.: _____

To:

_____

We, the undersigned, declare that:

(a) We have examined and have no reservations to the Bidding Document, including Addenda No.: _____;

(b) We offer to supply in conformity with the Bidding Document and in accordance with the delivery schedule specified in the Schedule of Supply, the following Goods and Related Services: _____
_____;

(c) The total price of our Bid, excluding any discounts offered in item (d) below is: _____
_____;

(d) The discounts offered and the methodology for their application are: _____
_____
_____
_____
_____;

(e) Our Bid shall be valid for a period of _____ days from the date fixed for the bid submission deadline in accordance with the Bidding Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(f) If our Bid is accepted, we commit to obtain a Performance Security in the amount of _____percent of the Contract Price for the due performance of the Contract;

(g) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from the following eligible countries _____;

(h) We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Document;

(i) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the ADB;

(j) The following commissions, gratuities, or fees have been paid or are to be paid with respect to the bidding process or execution of the Contract:

Name of Recipient	Address	Reason	Amount

(If none has been paid or is to be paid, indicate "none.")

(k) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed.

(l) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Price Schedule For Goods
To Be Offered From Within The Purchaser's Country

Name of Bidder _____ IFB Number _____ Page ___ of ___

1	2	3	4	5	6	7	8	9
Item	Description	Country of Origin	Domestic Value Added in Percent	Quantity and Unit of Measurement	Unit Price EXW	Total EXW Price per item	Sales and Other Taxes Per Item	Total Price per Item including Taxes
						5 x 6		**7 + 8**
					Total Amount			

Notes:

Column 4: In accordance with margin of preference ITB Clause 35, if applicable.
Domestic Value Added comprises domestic labor, the domestic content of materials, domestic overheads and profits from the stage of mining the raw material until final assembly.

Column 6: Incoterm in accordance with ITB Clause 14
Currency in accordance with ITB Clause 15
Price shall include all customs duties and sales and other taxes already paid or payable on the components and raw materials used in the manufacture or assembly of the item or the custom duties and sales and other taxes already paid on previously imported items.

Column 8: Payable in the Purchaser's country if Contract is awarded

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Price Schedule For Goods To Be Offered From Outside The Purchaser's Country

Name of Bidder _____ IFB Number _____ Page ___ of ___

1	2	3	4	5	6	7	8
Item	Description	Country of Origin	Quantity and Unit of Measurement	Unit Price CIF (...) or CIP (...)	Unit Price FOB (...) or FCA (...)	Total Price CIF or CIP per Item	Total Price FOB or FCA per Item
						4 x 5	4 x 6
					Total Amount		

Notes:

Column 5 and 6 : Incoterm in accordance with ITB Clause 14
Currency in accordance with ITB Clause 15

Column 6: Only to be used if the Purchaser wishes to reserve transportation and insurance to domestic companies or other designated sources. Identification of the lowest evaluated bid must be on the basis of the CIF or CIP price, but the Purchaser may sign the contract on FOB or FCA terms and make its own arrangement for transportation and/or insurance.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Price Schedule For Related Services To Be Offered From Outside And Within The Purchaser's Country

Name of Bidder _____ IFB Number _____ Page ___ of ___

1	2	3	4	5		6	
				Unit Price		Total Price per Item	
Item No.	Description	Country of Origin	Quantity and Unit of Measure-ment	(a) Foreign Currency	(b) Local Currency	(a) Foreign Currency	(b) Local Currency
						4 x 5(a)	4 x 5(b)
					Total Amount		

Notes :

Column 5 and 6: Currencies in accordance with ITB Clause 15

Prices are to be quoted inclusive of all custom duties, sales and other similar taxes applicable in the Purchaser's country and payable on the Related Services, if the Contract is awarded to the Bidder

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid for and on behalf of _____

Date _____

Bid Security

Date: _____
ICB No.: _____
Invitation for Bid No.: _____

To: _____

Whereas

_____

_____

(hereinafter "the Bidder") has submitted its Bid dated _____ for ICB No. _____ for the supply of _____ _____hereinafter called "the Bid."

KNOW ALL PEOPLE by these presents that WE _____ of _____ having our registered office at _____ (hereinafter "the Guarantor"), are bound unto _____

_____

(hereinafter "the Purchaser") in the sum of _____ for which payment well and truly to be made to the aforementioned Purchaser, the Guarantor binds itself, its successors, or assignees by these presents. Sealed with the Common Seal of this Guarantor this _____day of _____, _____.

THE CONDITIONS of this obligation are the following:

1. If the Bidder withdraws its Bid during the period of bid validity specified by the Bidder in the Bid Submission Sheet, except as provided in ITB Sub-Clause 20.2; or

2. If the Bidder, having been notified of the acceptance of its Bid by the Purchaser, during the period of bid validity, fails or refuses to:
   (a) execute the Contract; or
   (b) furnish the Performance Security, in accordance with the ITB Clause 44; or
   (c) accept the correction of its Bid by the Purchaser, pursuant to ITB Clause 31.

We undertake to pay the Purchaser up to the above amount upon receipt of its first written demand, without the Purchaser having to substantiate its demand, provided that in its demand the Purchaser states that the amount claimed by it is due to it, owing to the occurrence of one or more of the above conditions, specifying the occurred conditions.

This security shall remain in force up to and including twenty-eight (28) days after the period of bid validity, and any demand in respect thereof should be received by the Guarantor no later than the above date.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the Bid Security for and on behalf of _____

Date _____

Manufacturer's Authorization

Date: _____

ICB No.: _____

Invitation for Bid No.: _____

Alternative No.: _____

To: _____

WHEREAS _____ who are official manufacturers of _____ having factories at _____ do hereby authorize _____ to submit a Bid in relation to the Invitation for Bids indicated above, the purpose of which is to provide the following Goods, manufactured by us _____ and to subsequently negotiate and sign the Contract.

We hereby extend our full guarantee and warranty in accordance with Clause 28 of the General Conditions of Contract, with respect to the Goods offered by the above firm in reply to this Invitation for Bids.

Name _____

In the capacity of: _____

Signed _____

Duly authorized to sign the Authorization for and on behalf of _____

Date _____

Section V. Eligible Countries

List of Eligible Countries of the Asian Development Bank

PART 2 – Supply Requirements

Section VI. Schedule of Supply

Contents

1. List of Goods and Related Services

Lot No. : [if applicable]				
Lot Name : [if applicable]				
Item No.	**Name of Goods or Related Services**	**Description**	**Unit of Measurement**	**Quantity**
1B	P65 rails	Corresponding to 48 km of single track line	t	6.200
2B	Concrete sleepers	100,000 sleepers corresponding to 55 km	unit	100.000
3B	Fastenings for concrete sleepers		pairs	100.000
4B	Ballast for rehabilitated sections	Corresponding to 22 km of single track line	m^3	40.000
9B	Switch crossing	50 for R65 and 50 for R50	unit	100
10B	Switch blades	50 for R65 and 50 for R50	pairs	100
12B	Rail Joints		each	4.100
13B	Insulated rail joints		each	1.500

2. Delivery and Completion Schedule

The delivery period shall start as of _____.

Item No.	Description of Goods or Related Services	Delivery Schedule (Duration)	Location	Required Arrival Date of Goods or Completion Date for Related Services

3. Technical Specifications

ITEM 1B
P65 RAILS

a) Structure and dimensions

Structure and dimensions have to comply with Standard GOST 8161-75 (see annex TS01)
The geometrical and physical characteristics of P65 rail are the following:

Height, mm	180
Width, mm	
- of head	75
- of foot	150
Rail's cross section area, cm^2	82,65
Distance from the centre of gravity, mm:	
- to the foot bottom	81,3
- to upper part of the head	98,7
Moment of inertia relating axes, cm^4	3540
- on the lower part of the foot	435
- on the upper part of the head	358
- on the lateral edge of the foot	75
Theoretical mass of one meter of rail	
- (Steel density – 7830 kg/cm^3), kg_m	64,72
Metal distribution on the rail cross section area, % of the whole area	
- in the head	34,11
- in the web	28,52
- in the foot	37,37

Drawing L3.2-1 shows a detailed section of this type of rail.

b) Specifications and rules of acceptance

Specifications and rules of acceptance have to comply with Standard GOST 24182-80 (see annex TS02) and Standard GOST 18267-82 (see annex TS03) for heat treated rails.

c) Method of Measurement and Payment

The rails shall be weighted and paid for by ton (t) of supplied material. Certificate of the total weight, as well as certificates of acceptance tests and checks of the lot, signed by the expert appointed by the Buyer, has to be annexed to the authorization of payment.
Every bar shall be marked with the stamp of the buyer expert.
The payment includes all manufacturing and tests expenses, transportation, the correct stacking of rails, the guarantee of compliance of them with the requirements of the above mentioned Standards for three years from the date of their laying on the track. Warranty period starts not later than 9 months from the date of delivery to the customer.

ITEM 2B
CONCRETE SLEEPERS Ш1-1 TYPE

a) Structure and dimensions

Structure and dimensions have to comply with Standard GOST 10629 - 88 (see annex TS04)

The main characteristics of a sleeper Ш1-1 are the following:

Length, mm	2700
Height in correspondence of rail, mm	217
Volume of concrete, m^3	0,108
Weight of steel reinforcement, included washers, kg (44 wires of diameter 3mm)	8,5
Initial tension of all reinforcing wires, Kn	358
Transmitted strength of concrete, MPa	32

Drawing L3.2-3 shows in details the Ш1-1 type of previously tensed reinforced concrete sleepers for 1520 mm gauge tracks and P65 rails

Weight of 1 sleeper, KN about 2400

b) Specifications and rules of acceptance

Specifications and rule of acceptance have to comply with the above mentioned Standard.

The acceptance is carried out by lots of sleepers under results of sampling tests about

- concrete frost resistance
- exactness of geometrical parameters
- values of breaking load
- values of admissible load without breaking
- concrete breaking load
- state of the holes for bolts
- quality of concrete surfaces

For the breaking test 0,3% sleepers are selected, but not less than 3 pieces.

c) Method of Measurement and Payment

The payment shall be made per unit of sleepers and includes all manufacturing and tests expenses, transportation, the correct stacking of the sleepers, the guarantee of compliance of sleepers with the requirements of the above mentioned Standard for three years from the date of their laying on the track. Warranty period starts not later than 9 months from the date of delivery to the customer.

ITEM 3 B
FASTENINGS FOR CONCRETE Ш1-1 SLEEPERS

a) Description

Two insulated rail fastenings for each concrete sleeper are to be installed on the lines equipped with Automatic Block Line System (ABLS). Every one is formed by several components:

- the base-plate, bolts, elastic washers, nuts to fix the first one to the sleeper
- clamps, bolts, elastic washers, insulated bushings, nuts
- metallic and plastic pads beneath the foot of the rail and the base-plate

Drawing L3.2-2 shows a complete fastening in which all the components are assembled, and every single component.

b) Specifications and rules of acceptance

Every component is object of standard specifications and has to comply with them: GOST 16279-78 for base-plates, GOST 16016-79 and GOST 16017-79 for bolts, GOST 16018-79 for nuts, GOST 19115-91 and GOST 21797-90 for elastic washers, GOST 22343-90 for clamps, (see annex from TS05 to TS11).

c) Method of measurement and payment

The payment shall be made per unity of complete fastening and includes all manufacturing and tests expenses, transportation, the correct stacking of materials, the guarantee of compliance of them with the requirements of the above mentioned Standard for three years from the date of their laying on the track. Warranty period starts not later than 9 months from the date of delivery to the customer.

ITEM 4 B
BALLAST

Technical specifications for ballast supplying have to comply with Standard GOST 7392-85 (see Annex TS12)

a) Technical requirements

The ballast shall be obtained by mechanical crushing of rocks, detritus, gravel.

Ballast from crushed stone is characterized by the following requirements: kernel composition, particle content with the sizes of less than 0,16mm, crushed kernels (granular) content (in the crushed stone from boulders and gravel), durability, content of kernels (granular) of soft rocks, content of clay in lumps; frost resistance, electro insulation properties.

I. Depending on the fineness of the kernels (granular) the crushed stone (ballast) is divided into fractions, kernels' (granular) sizes of which should be in compliance with the indicated ones in table 1.

Table 1

Kernels (granular)size fraction, mm	Number of kernels (granular)				Full residue on the sieve with the holes of diameter 40 mm, % by mass
	larger than upper nominal size		smaller than the lower nominal size		
	In the limits of sizes , mm		% by mass , not more		
			total	including the particles by size less 0,16 mm	
From 25 to 60	From 60 to 70	5	5	1,5	From 25 to 75
	Over 70	0	-	-	
From 5 to 25	From 25 to 40	10	5	2	-
	Over 40	0	-	-	-

On the railways of public usage ballast of fraction from 25 to 60 mm and from 25 to 70 mm is intended for re- ballasting of main lines.

Ballast from detritus (boulders) and gravel fractions of size 25 to 60 mm should contain crushed kernels (granular) in the amount of 50% by mass.

II. Ballast durability is characterized by its abradability while tested in the shelf drum or its resistance to hammering while tested at the end of ПМ. Depending on the indications of mechanical strength ballast is divided into marks indicated in tables 2 and 3.

Table 2

Ballast mark	Abradability (loss in mass), %
Ballast of fractions from 5 to 40mm, from 25 to 60mm and from 25 to 70 mm	
И20 И40 И50	To 20 Over 20 to 40 Over 40 to 50
Ballast of fraction from 5 to 25 mm	
И20м И40м И50м	To 20 Over 25 to 50 Over 50 to 65

Table 3

Ballast mark	Resistance to hammering
Y 75 Y50 Y40	Over 75 Over 50 to 75 Over 40 to 50
Note: All fractions of the ballast except fractions from 5 to 20 mm are subject to test for hammering resistance	

For ballast layer of the railway main lines the ballast of the following marks due to strength should be used: и20, or У75.

III. Ballast should not contain kernels (granular) of weak rocks in the amount of 10% by mass.

To the weak rocks one can refer the rocks with the limit of strength at compression in saturated by the water condition up to 18,6 MPa (200 kg/cm^2).

IV. In the ballast of fractions from 25 to 60 mm, from 25 to 70mm and from 5 to 40 mm there should not be clay lumps, soil of the vegetative and other organic particles.

V. Due to frost resistance ballast can be divided into marks under GOST 8267 -82.

Ballast of fractions from 25 to 60 and from 25 to 70 should have mark for frost resistance not lower Mpz (frost resistance) 50.

Frost resistance is determined by alternate freezing and thawing of ballast specimen. It is allowed testing in sulfuric sodium.

VI. Electro insulation properties of the ballast are characterized by electric conductivity of fat solution, formed from ballast solubility in distilled water. Its value should not be more than 0,06 S/m. When the volume of fat solution is decreased by evaporation 10 times electric conductivity of received solution should be not more than 0,35 S/m.

b) Acceptance rules

Ballast acceptance is done by lot (batches). The lot is considered to be the amount of ballast of one fraction simultaneously shipped to one consumer in one railway train. When ballast is transported by cars the lot is considered to be the amount of ballast of one fraction shipped to one consumer during a day.

The amount of the delivered ballast is determined by measurement of it in the wagons, cars or other transport vehicles on the place of its shipment. When control measurements of the ballast is done on the place of unloading, its volume is re-measured taking into consideration coefficient of ballast consolidation while transported, established before the delivery under the agreement between the producer

and the consumer depending on the transportation distance, kernel (granular) content and other local peculiarities. Coefficient of ballast consolidation should not be more than 1.10

The amount of the ballast delivered in weight units the consumer determines, if necessary, by the adjustment of the material volume due to its packed density. Packed density of the ballast is determined under GOST 8269 -76.

Acceptance quality control of the ballast at the enterprise (quarry)-producer is done in its laboratory within the period indicated in table 4.

For acceptance quality control of produced ballast the samples are taken from the production line (belt) transporting the ballast to the store house of ready production or the loading bunker (or from the open store house of ready production to the loading bunker in accordance with GOST 8269 -76. Total mass of a sample intended for one testing should not be less than four time exceeding one indicated in table 5.

Average thoroughly mixed sample before being sent to the laboratory is reduced by quartering or with the help of chute deviser under the methodology given in GOST 8269 – 76 until the mass two time exceeding the one indicated in table 5

Table 4

Test description	Period of test conduction	Number of samples for one testing
Determination of kernel in ballast content and particles content in it by the size less than 0,16mm.	Every day Every day	1 1
Determination of crushed kernel (granular0 content in the ballast from detritus and gravel	Every day	1
Determination of clay in lumps, vegetative soil and other organic admixtures in the ballast content.	Once a quarter Every day	2 1
Determination of abradability in the shelf drum or hammering resistance on pneumatic pile-driver.	Once a year When geological exploration of the deposits and once a year	2 3
Determination of kernels (granular) of weak rocks in the ballast content.		
Determination of frost resistance.		
Determination of electric insulation properties of the ballast		

Table 5

Test description	Minimum mass of the ballast sample to carry out one testing, kg			
	ballast of fractions from 25 to 60, from 25 to 70 mm.	ballast of fractions from 5 to 40mm.	ballast of fractions from 25 to 60, from 25 to 70 mm.	Ballast sample with the size of kernels (granular)from 25 to 40 mm
Determination of kernel (granular) composition and content of particles by the size less than 0,16mm.	30	20	10	-
	15	5	1	-
Determination of clay lumps, soil of the vegetative layer and other organic admixture in the ballast content	15	5	1	-
	-	-	10 (2 samples per 5 kg)	20 (2 samples per 10 kg)
Determination of crushed granular in the content of the ballast from boulders and gravel				
Determination of abradability in the shelf drum				

Test description	Minimum mass of the ballast sample to carry out one testing, kg			
	ballast of fractions from 25 to 60, from 25 to 70 mm.	ballast of fractions from 5 to 40mm.	ballast of fractions from 25 to 60, from 25 to 70 mm.	Ballast sample with the size of kernels (granular)from 25 to 40 mm

Determination hammering resistance on ПМ.	- 15	- 5	- 1	3 (2 samples per 1,5 kg) -
Determination of granular content of soft rocks	-	-	3 (2 samples per 1,5 kg)	5 (2 samples per 2,5 kg)
Determination of frost resistance		-	18 (3 samples per 6 kg)	-
Determination of electric insulation of ballast properties				

Note: Ballast samples with granular size from 25 to 40 are prepared only for testing by screenings from the ballast fractions of 25-60 and 25-70 mm. To prepare these samples the selected from the conveyer ballast mass is sent to the laboratory without its preliminary reduction.

The consumer carries out control checking of compliance of the shipped ballast with the requirements of this standard, observing the following order:

- for ballast testing the selection of point samplings is carried out from which by means of integration one can receive control sample;
- at control checking of ballast quality transported by railway transport point samples are selected when the lot's volume if three wagons – from each wagon, when large volume – from any of these three wagons. Each sample is selected from five different places of the wagon (in four corners and in the centre);
- at control checking of ballast quality transported by cars, from each lot with the volume not more than 35 m3 point samples are selected at least from five cars. Each point sample is selected in the centre of car body;
- mass of control sample selected for checking of the lot should be at least t time exceed summary mass of samples for testing indicated in table 5. Reduction of samples to the size required for testing is done by the method of quartering or with the help of chute divisor under the methodology given in GOST 8269 - 76;
- as a result of tests arithmetic mean of parallel determinations, which are provided for the corresponding method, is taken . Granular content is evaluated due to the mean value of results of three parallel tests;
- when the results are unsatisfactory at least on one of indications the test is carried out again. The result of the repeated test is final.

Test methods are fixed by the above mentioned Standard .

c) Transportation and storage

The documents on quality is attached to each lot (batch) of shipped ballast, where it is indicated:

- name of the producer and its address;
- number and date of the document issuing;
- name of the addressee and its address;
- numbers of the wagons, invoices and the amount of the shipped ballast;
- sort of ballast (ballast from rocks or from boulders and gravel) and the name of initial rock;
- fraction of the ballast, granular content, particles availability with the size of less than 0,16mm, availability of granular of soft rock as well as strength and frost resistance of the ballast, content of clay in lumps;
- indicator of electrical insulation properties of the ballast;
- marking of this standard.

Ballast is kept and transported separately due to fractions, moreover it should be protected from dirtying.
The ballast is transported by all kinds of transport.
While being transported the requirements of the Rules of transportation for cargoes and Specifications of loading and strengthening of cargo approved by the Ministry of railways should be observed and also the corresponding rules established by the entities of inland water transport and automobile transport.
The supplier should follow the measures providing full services.

d) Method of measurement and payment

The ballast shall be measured for the payment in m^3.

The payable quantity of the delivered ballast is determined by measurement of it in the wagons, cars or other transport vehicles on the place of its shipment. In order to avoid mistakes, the vehicles are to be loaded with the upper surface of the ballast levelled.
The rate for ballast supplies includes all the costs for producing/purchasing the material, for testing, loading, transporting from quarries to work sites, unloading, as well as overhead and Contractor's profit.

ITEM 9B
P65 TG1/11 SWITCH CROSSING

a) Description
The dimensions and drawing of the P65 tg1/11switch crossing shall comply with GOST 28370 -89 (see annex TS18)

b) Technical specifications
Technical requirements, acceptance rules, test methods and marking shall comply with the GOST 7370-98 (see annex TS19)

c) Method of measurement and payment
The payment shall be made per unity of complete switch crossing (included all minor related devices) and includes all manufacturing and tests expenses, transportation, the correct stacking of materials, the guarantee of compliance of them with the requirements of the above mentioned Standard for three years from the date of their laying on the track. Warranty period starts not later than 9 months from the date of delivery to the customer.

ITEM 10B
P65 TG1/11 SWITCH BLADES

a) Description
The dimensions and drawing of the P65 switch blade cross section shall comply with GOST 17507-85 (see annex TS20)

b) Technical specifications
Technical requirements, acceptance rules, test methods and marking shall comply with the GOST 9960-85 (see annex TS21)

c) Method of measurement and payment
The payment shall be made per unity of complete point switch (included all related devices) and includes all manufacturing and tests expenses, transportation, the correct stacking of materials, the guarantee of compliance of them with the requirements of the above mentioned Standard for three years from the date of their laying on the track. Warranty period starts not later than 9 months from the date of delivery to the customer.

ITEM 12 B
P65 RAIL JOINTS

a) Description
The joint for P65 rail is formed

- by two fish-plates 1000 mm long with 6 holes for bolts, three of them ovalized, six bolts, nuts, washers (I performance: 1P65 GOST 8193 – 73, see Annex TS14)
- by two fish-plates 800 mm long with 4 holes for bolts, two of them ovalized, six bolts, nuts, washers (II performance: 2P65 GOST 8193 – 73)

The ovalization of the holes allows a displacement from 0 mm to 16 mm of the jointed bars when their lengths vary in function of the temperature
Drawing L3.2-1 shows the assembled joint and every single component.

b) Specifications and rules of acceptance

Every component is object of standard specifications and has to comply with them:
GOST 8193-73 (GOST 19127-73) (see Annex TS14) and GOST 4133-73 (see Annex TS15) for P65 rail fish-plates, GOST 11530-939 (see Annex TS16) for bolts, GOST 11532-93 (see Annex TS 17) for bolt nuts .
Plates should be accepted by lots and in the amount of not more than 3000 pieces. The lot should consist of the plates of one type, one sort and made of metal of one melting.
At quality control acceptance of the ready plates the following amount of plates and samples should be selected:

- for visual examination, sizes checking, straightness and location of bolts' holes – not less than 1, 0% of plates from a lot,
- for tension test – 1 sample from a lot
- for determination of hardness – 5 plates from a lot,
- for determination of chemical steel content of plates – 1 sample from a melting. For control checking of chemical content of steel one sample from tree plates of the checked lot is prepared.
-

c) Method of measurement and payment

The payment shall be made per unity of complete joint and includes all manufacturing and tests expenses, transportation, the correct stacking of materials, the guarantee of compliance of them with the requirements of the above mentioned Standard for three years from the date of their laying on the track. Warranty period starts not later than 9 months from the date of delivery to the customer.

ITEM 13 B
INSULATED RAIL JOINTS

a) Description

See 13B. Moreover these joints have an insulated shaped sheet between the fish plates and rails, an insulated cylinder between bolts and rails and an insulated plate, shaped as the section of P65 rails, inserted between the ends of the jointed rails (see drawing L3.2-1).

b) Method of measurement and payment

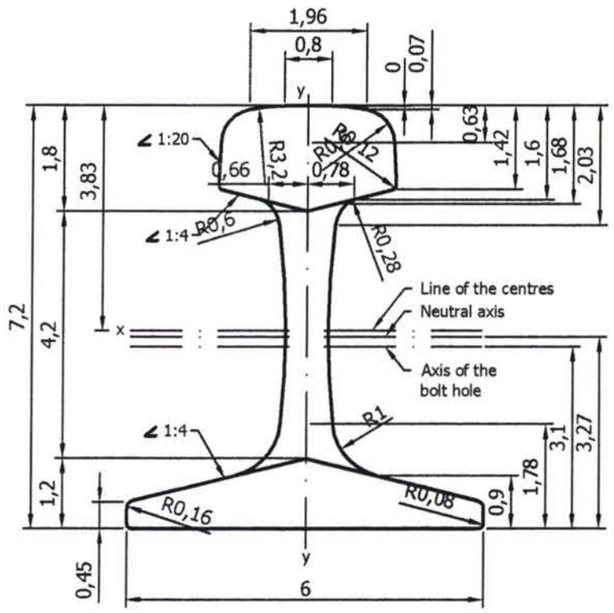
The payment shall be made per unity of complete joint and includes all manufacturing and tests expenses, transportation, the correct stacking of materials, the guarantee of compliance of them with the requirements of the above mentioned Standard for three years from the date of their laying on the track. Warranty period starts not later than 9 months from the date of delivery to the customer.

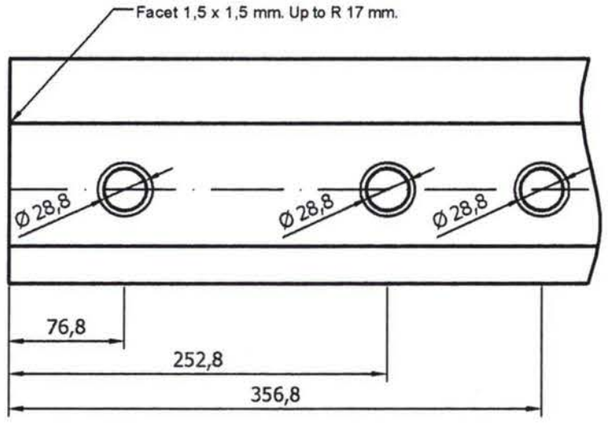
4. Drawings

List of Drawings

Coding	Title
L3.2-1	P65 rail - joints, insulated joints, bolts, nuts, washers
L3.2-2	Fastening and insulated fastenings
L3.2-3/1	Reinforced concrete sleepers
L3.2-3/2	Reinforced concrete sleepers

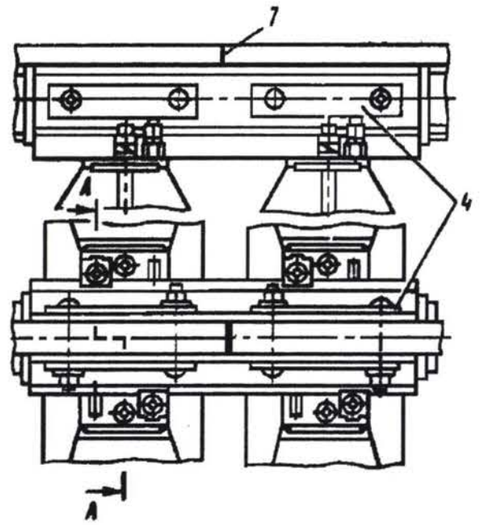
R 65

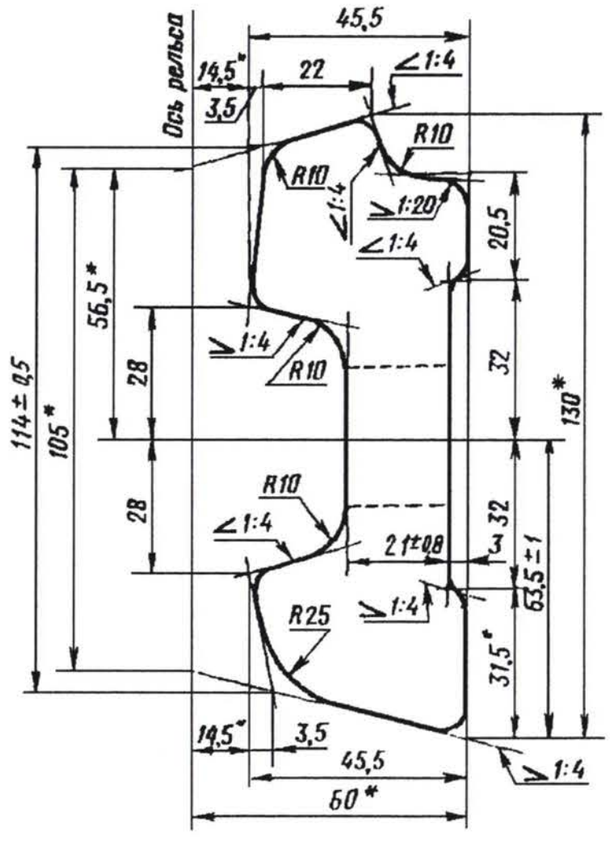




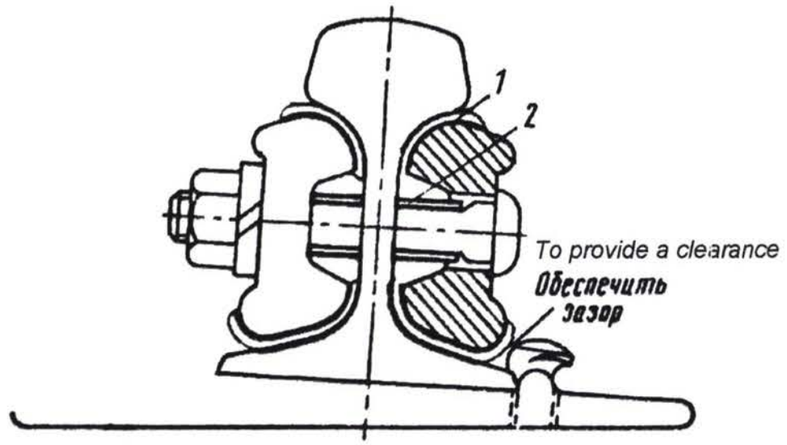
Cross profiles of standard rails (R65)

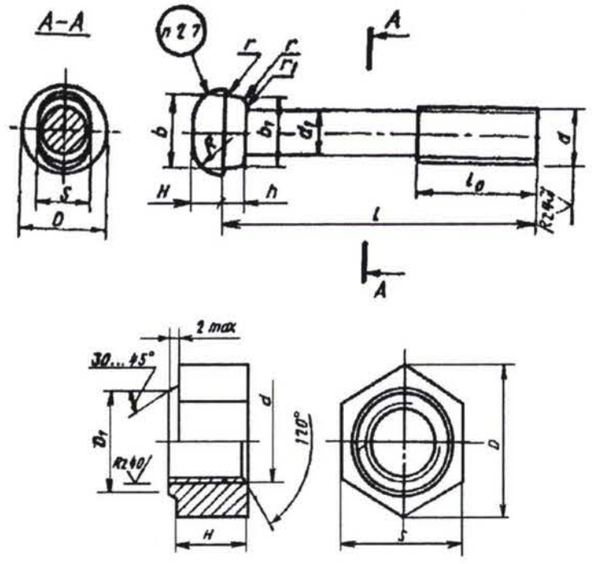
JOINT





INSULATED JOINT





EUROPEAID CO-OPERATION OFFICE	Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116151/C/SV/MULTI)					A project implemented by: ITALFERR		
TYPICAL DRAWINGS: PERMANENT WAY. ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ								
P65 rail - joints, insulated joints, bolts, nuts, washers - Стыки Р65, изостыки, болты, гайки, шайбы						L3.2-1		
						Scale: 1:2		
Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorizated
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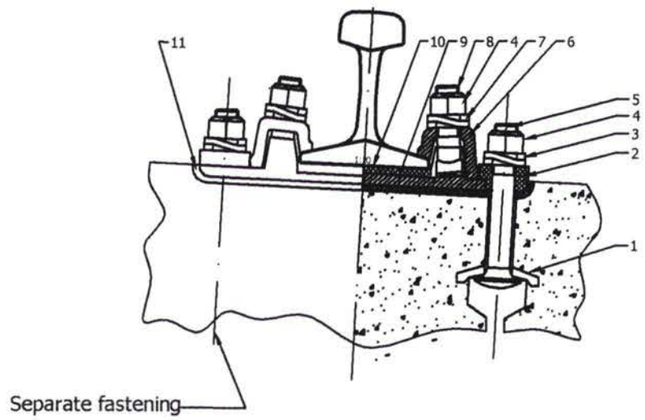

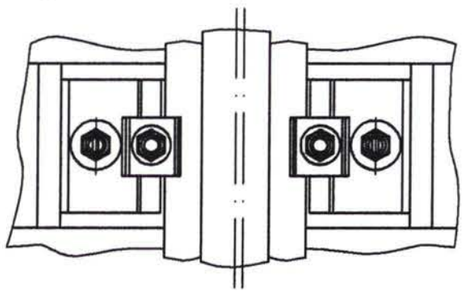

1-basic washer; 2-insulating bush; 3,7- coil-double spring collar; 4-screw nut; 5-mortgage bolt; 6-the terminal clamp rigid; 8-clamp bolt; 9-laying under abase of rail; 10-metal laying; 11-laying under the baseplate.

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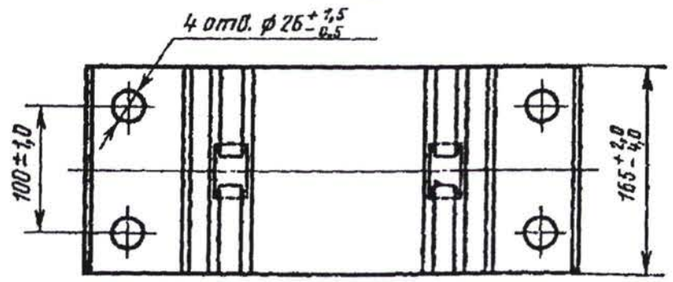

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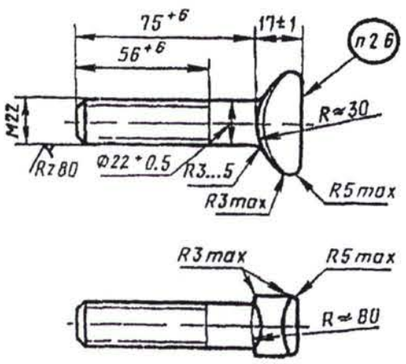

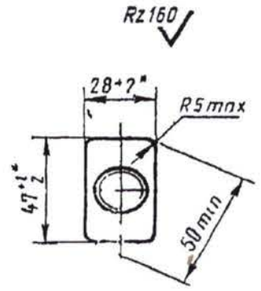

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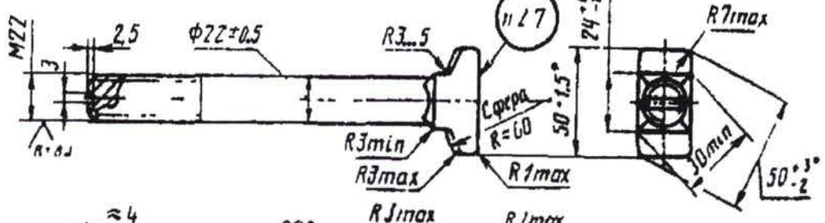

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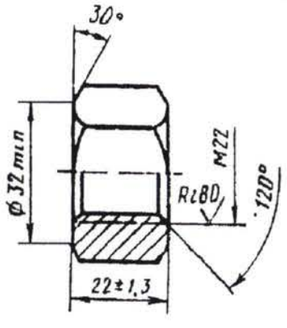

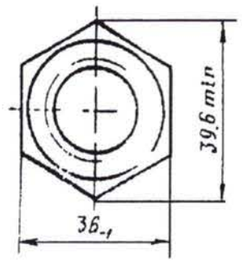

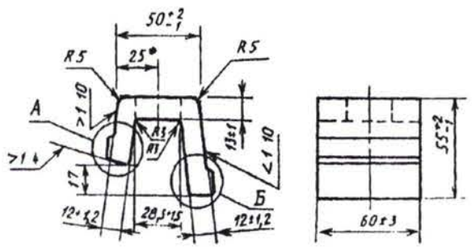

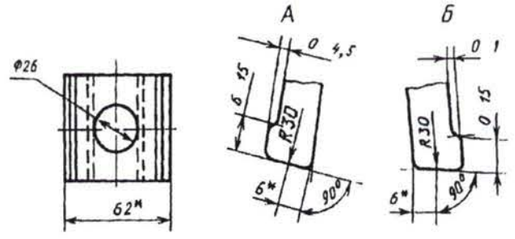

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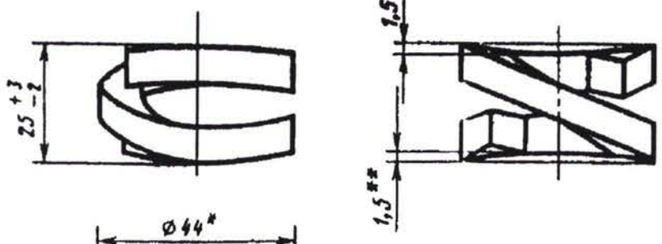

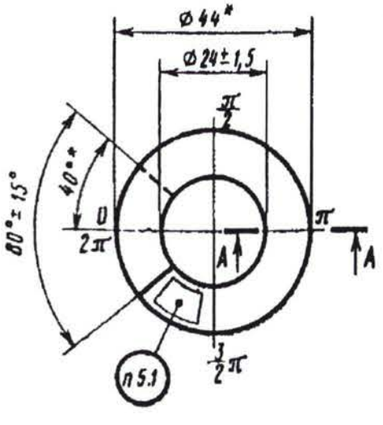

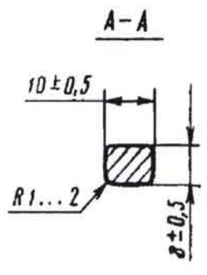

EUROPEAID CO-OPERATION OFFICE	Review of Railways Rehabilitation in Central Asia - Module B (Phase2) (EUROPEAID/116151/C/SV/MULTI)					A project implemented by: ITALFERR		
TYPICAL DRAWINGS: PERMANENT WAY. ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ								
Fastening and insulated fastenings - Стыки и изолированные стыки						L3.2-2		
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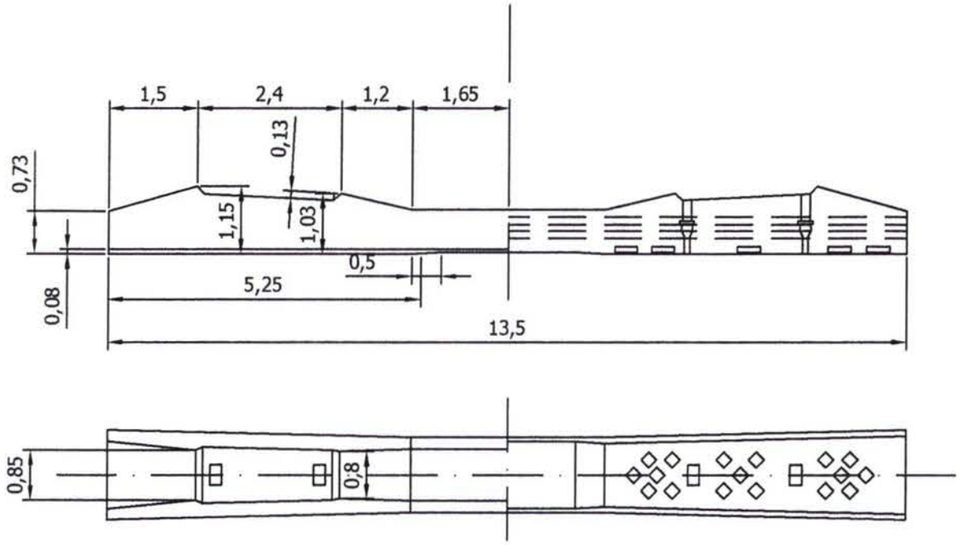
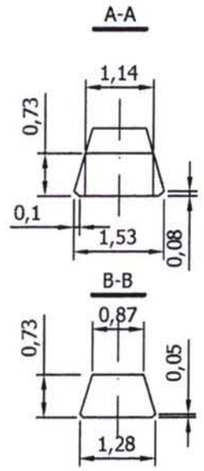
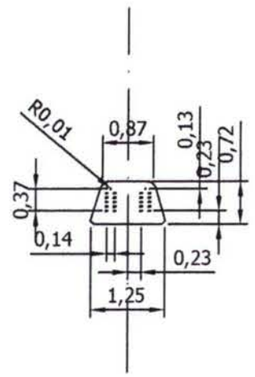
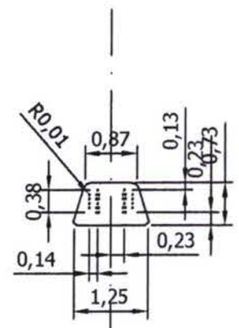
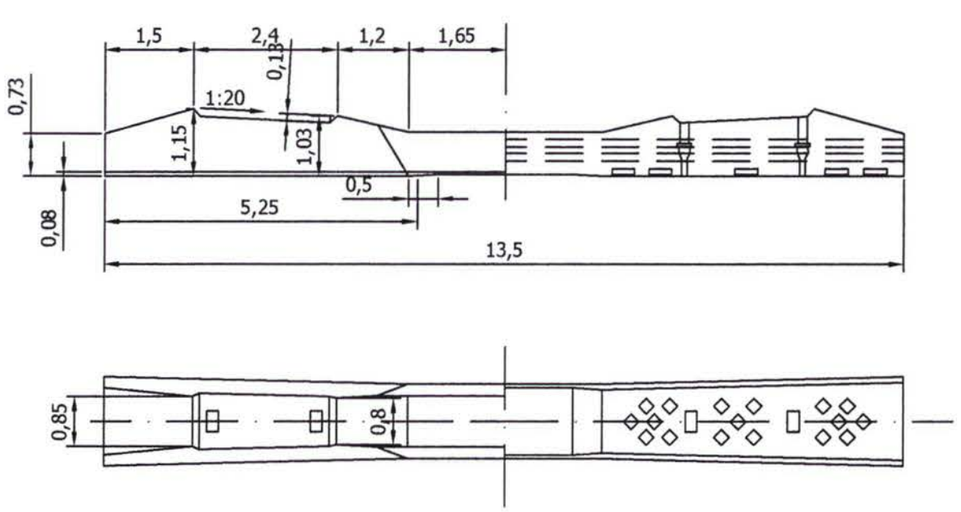
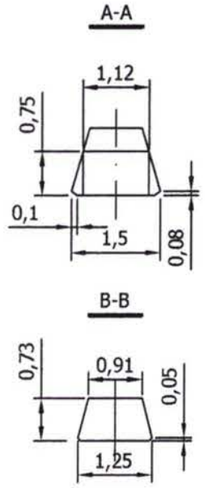


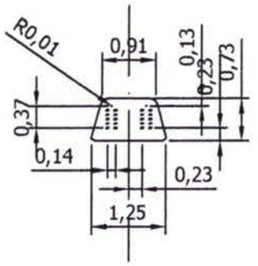


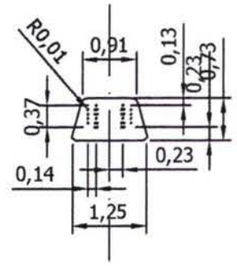












Design of ferroconcrete sleepers
a - such as C-73-1; b - such as C-73-2; c - cross sections and reinforcing of sleepers C-73-1; d - cross sections and reinforcing of sleepers such as C-73-2.

EUROPEAID CO-OPERATION OFFICE

Review of Railways Rehabilitation in Central Asia - Module B (Phase2)
(EUROPEAID/116151/C/SV/MULTI)

A project implemented by: ITALFERR

TYPICAL DRAWINGS: PERMANENT WAY.
ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ

Reinforced concrete sleepers - Железобетонные шпалы

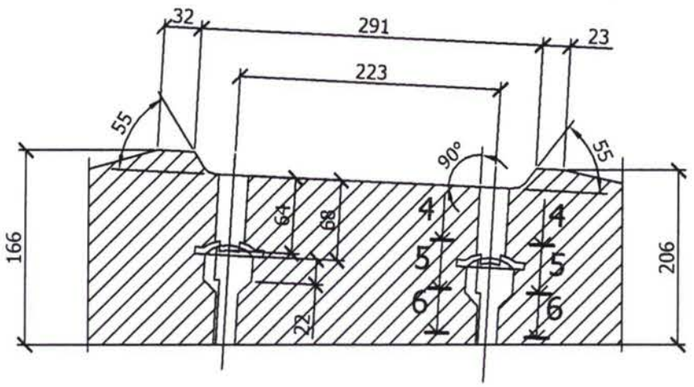
L3.2-3/1

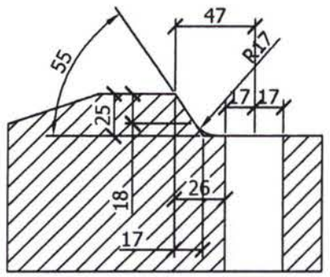
Scale: 1:2

Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorizated

File: Refered Tables

Under rail part of the sleeper S1-1





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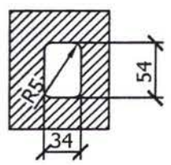

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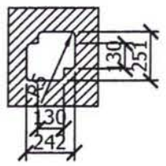

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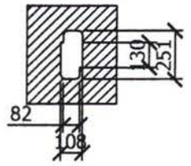
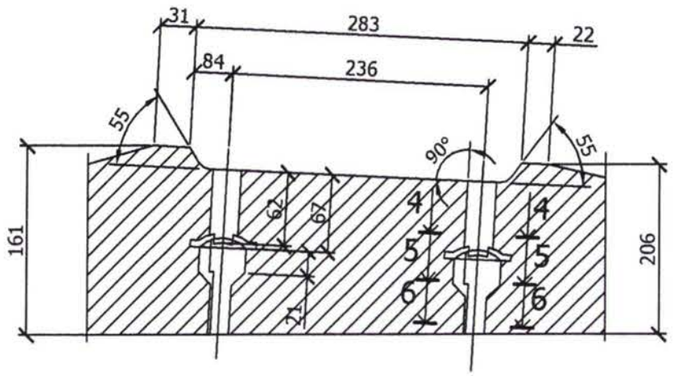
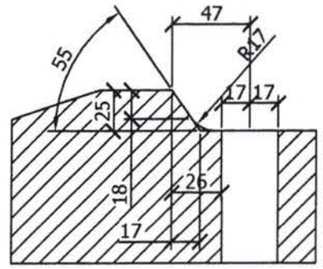


Under rail part of the sleeper S2-1





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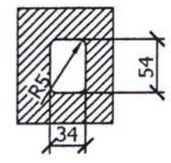

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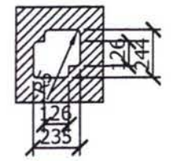

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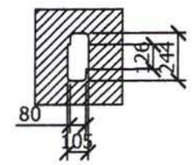
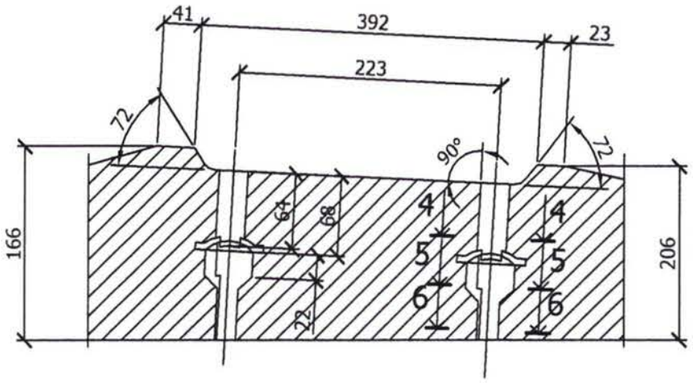
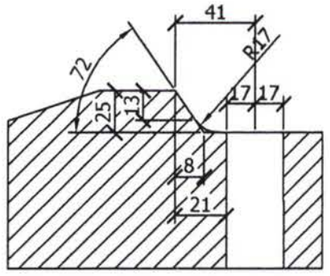


Under rail part of the sleeper S1-2





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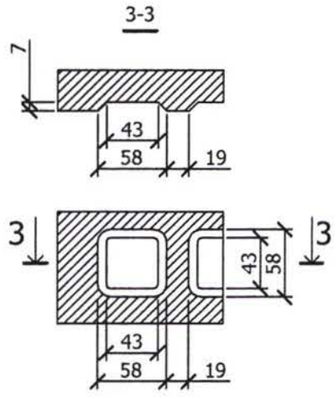
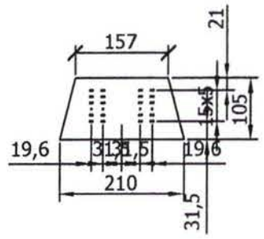
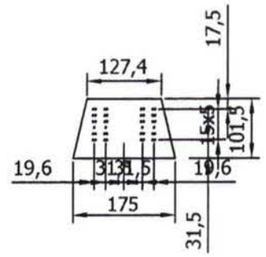






EUROPEAID CO-OPERATION OFFICE

Review of Railways Rehabilitation in Central Asia - Module B (Phase2)
(EUROPEAID/116151/C/SV/MULTI)

A project implemented by: ITALFERR

TYPICAL DRAWINGS: PERMANENT WAY.
ТИПОВОЙ ЧЕРТЕЖ: ВЕРХНЕЕ СТРОЕНИЕ ПУТИ

Reinforced concrete sleepers - Железобетонные шпалы

L3.2-3/2

Scale: 1:2

Rev.	Description	Designed	Date	Verified	Date	Approved	Date	Authorizated

File: Refered Tables

PART 3 – Contract

Section VII. General Conditions of Contract

Table of Clauses

1. Definitions 1.1 The following words and expressions shall have the meanings hereby assigned to them:

(a) "Contract" means the Agreement entered into between the Purchaser and the Supplier, together with the Contract Documents referred to therein, including all attachments, appendices, and all documents incorporated by reference therein.

(b) "Contract Documents" means the documents listed in the Agreement, including any amendments thereto.

(c) "Contract Price" means the price payable to the Supplier as specified in the Agreement, subject to such additions and adjustments thereto or deductions therefrom, as may be made pursuant to the Contract.

(d) "Day" means calendar day.

(e) "Delivery" means the transfer of the Goods from the Supplier to the Purchaser in accordance with the terms and conditions set forth in the Contract.

(f) "Completion" means the fulfillment of the Related Services by the Supplier in accordance with the terms and conditions set forth in the Contract.

(g) "Eligible Countries" means the countries and territories eligible as listed in Section V.

(h) "GCC" means the General Conditions of Contract.

(i) "Goods" means all of the commodities, raw material, machinery and equipment, and/or other materials that the Supplier is required to supply to the Purchaser under the Contract.

(j) "Purchaser's Country" is the country specified in the Special Conditions of Contract (SCC).

(k) "Purchaser" means the entity purchasing the Goods and Related Services, as specified in the SCC.

(l) "Related Services" means the services incidental to the supply of the goods, such as insurance, installation, training and initial maintenance and other similar obligations of the Supplier under the

Contract.

(m) "SCC" means the Special Conditions of Contract.

(n) "Subcontractor" means any natural person, private or government entity, or a combination of the above, including its legal successors or permitted assigns, to whom any part of the Goods to be supplied or execution of any part of the Related Services is subcontracted by the Supplier.

(o) "Supplier" means the natural person, private or government entity, or a combination of the above, whose bid to perform the Contract has been accepted by the Purchaser and is named as such in the Agreement, and includes the legal successors or permitted assigns of the Supplier.

(p) "The ADB" is the Asian Development Bank.

(q) "The Site," where applicable, means the place named in the SCC.

2. Contract Documents

2.1 Subject to the order of precedence set forth in the Agreement, all documents forming the Contract (and all parts thereof) are intended to be correlative, complementary, and mutually explanatory.

3. Corrupt Practices

3.1 ADB's Anticorruption Policy requires borrowers (including beneficiaries of ADB-financed activity), as well as bidders, suppliers, and contractors under ADB-financed contracts, observe the highest standard of ethics during the procurement and execution of such contracts. In pursuance of this policy, the ADB:

(a) defines, for the purposes of this provision, the terms set forth below as follows:

(i) "corrupt practice" means the offering, giving receiving, or soliciting, directly or indirectly, of any thing of value to influence the action of any party in the procurement process or the execution of a contract;

(ii) "fraudulent practice" means a misrepresentation or omission of facts in order to influence a procurement process or the execution of a contract;

(iii) "collusive practices" means a scheme or arrangement between two or more bidders, with or without the knowledge of the Borrower, designed to influence the action of any party in a procurement process or the execution of a contract;

(iv) "coercive practices" means harming or threatening to harm, directly or indirectly, persons, or their property to influence their participation in a procurement process, or affect the execution of a contract;

(b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract; and

(c) will sanction a party or its successor, including declaring ineligible, either indefinitely or for a stated period of time, to participate in ADB-financed activities if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, or coercive practices in competing for, or in executing, an ADB-financed contract.

3.2 The Supplier shall permit the ADB to inspect the Supplier's accounts and records relating to the performance of the Supplier and to have them audited by auditors appointed by the ADB, if so required by the ADB.

4. Interpretation 4.1 If the context so requires it, singular means plural and vice versa.

4.2 Incoterms

(a) The meaning of any trade term and the rights and obligations of parties thereunder shall be as prescribed by Incoterms.

(b) EXW, CIF, CIP, and other similar terms, shall be governed by the rules prescribed in the current edition of Incoterms, published by the International Chamber of Commerce at the date of the Invitation

for Bids or as specified in the SCC.

4.3 Entire Agreement

The Contract constitutes the entire agreement between the Purchaser and the Supplier and supersedes all communications, negotiations and agreements (whether written or oral) of parties with respect thereto made prior to the date of Contract.

4.4 Amendment

No amendment or other variation of the Contract shall be valid unless it is in writing, is dated, expressly refers to the Contract, and is signed by a duly authorized representative of each party thereto.

4.5 Nonwaiver

(a) Subject to GCC Sub-Clause 4.5(b) below, no relaxation, forbearance, delay, or indulgence by either party in enforcing any of the terms and conditions of the Contract or the granting of time by either party to the other shall prejudice, affect, or restrict the rights of that party under the Contract, neither shall any waiver by either party of any breach of Contract operate as waiver of any subsequent or continuing breach of Contract.

(b) Any waiver of a party's rights, powers, or remedies under the Contract must be in writing, dated, and signed by an authorized representative of the party granting such waiver, and must specify the right and the extent to which it is being waived.

4.6 Severability

If any provision or condition of the Contract is prohibited or rendered invalid or unenforceable, such prohibition, invalidity or unenforceability shall not affect the validity or enforceability of any other provisions and conditions of the Contract.

5. Language

5.1 The Contract as well as all correspondence and documents relating to the Contract exchanged by the Supplier and the Purchaser, shall be written in the

language specified in the SCC. Supporting documents and printed literature that are part of the Contract may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language specified in the SCC, in which case, for purposes of interpretation of the Contract, this translation shall govern.

5.2 The Supplier shall bear all costs of translation to the governing language and all risks of the accuracy of such translation.

6. Joint Venture, Consortium or Association

6.1 Unless otherwise specified in the SCC, if the Supplier is a joint venture, consortium, or association, all of the parties shall be jointly and severally liable to the Purchaser for the fulfillment of the provisions of the Contract and shall designate one party to act as a leader with authority to bind the joint venture, consortium, or association. The composition or the constitution of the joint venture, consortium, or association shall not be altered without the prior consent of the Purchaser.

7. Eligibility

7.1 The Supplier and its Subcontractors shall have the nationality of an eligible country. A Supplier or Subcontractor shall be deemed to have the nationality of a country if it is a citizen or constituted or incorporated, and operates in conformity with the provisions of the laws of that country.

7.2 All Goods and Related Services to be supplied under the Contract and financed by the ADB shall have their origin in Eligible Countries. For the purpose of this Clause, origin means the country where the goods have been grown, mined, cultivated, produced, manufactured, or processed; or through manufacture, processing, or assembly, another commercially recognized article results that differs substantially in its basic characteristics from its imported components.

8. Notices

8.1 Any Notice given by one party to the other pursuant to the Contract shall be in writing to the address specified in the SCC. The term "in writing" means communicated in written form with proof of receipt.

8.2 A Notice shall be effective when delivered or on the Notice's effective date, whichever is later.

9. Governing Law

9.1 The Contract shall be governed by and interpreted in accordance with the laws of the Purchaser's country, unless otherwise specified in the SCC.

10. Settlement of Disputes

10.1 The Purchaser and the Supplier shall make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the Contract.

10.2 If the parties fail to resolve such a dispute or difference by mutual consultation within twenty-eight (28) days from the commencement of such consultation, either party may require that the dispute be referred for resolution to the formal mechanisms specified in the SCC.

11. Scope of Supply

11.1 Subject to the SCC, the Goods and Related Services to be supplied shall be as specified in Section VI, Schedule of Supply.

11.2 Unless otherwise stipulated in the Contract, the Scope of Supply shall include all such items not specifically mentioned in the Contract but that can be reasonably inferred from the Contract as being required for attaining Delivery and Completion of the Goods and Related Services as if such items were expressly mentioned in the Contract.

12. Delivery

12.1 Subject to GCC Sub-Clause 33.1, the Delivery of the Goods and Completion of the Related Services shall be in accordance with the Delivery and Completion Schedule specified in the Section VI, Schedule of Supply. The details of shipping and other documents to be furnished by the Supplier are specified in the SCC.

13. Supplier's Responsibilities

13.1 The Supplier shall supply all the Goods and Related Services included in the Scope of Supply in accordance with GCC Clause 11, and the Delivery and Completion Schedule, as per GCC Clause 12.

14. Purchaser's Responsibilities

14.1 Whenever the supply of Goods and Related Services requires that the Supplier obtain permits, approvals, and import and other licenses from local public authorities, the Purchaser shall, if so required by the Supplier, make its best effort to assist the Supplier in complying with such requirements in a timely and expeditious manner.

14.2 The Purchaser shall pay all costs involved in the performance of its responsibilities, in accordance with GCC Sub-Clause 14.1.

15. Contract Price

15.1 The Contract Price shall be as specified in the Agreement subject to any additions and adjustments thereto, or deductions therefrom, as may be made pursuant to the Contract.

15.2 Prices charged by the Supplier for the Goods delivered and the Related Services performed under the Contract shall not vary from the prices quoted by the Supplier in its bid, with the exception of any price adjustments authorized in the SCC.

16. Terms of Payment

16.1 The Contract Price shall be paid as specified in the SCC.

16.2 The Supplier's request for payment shall be made to the Purchaser in writing, accompanied by invoices describing, as appropriate, the Goods delivered and Related Services performed, and by the documents submitted pursuant to GCC Clause 12 and upon fulfillment of all the obligations stipulated in the Contract.

16.3 Payments shall be made promptly by the Purchaser, no later than sixty (60) days after submission of an invoice or request for payment by the Supplier, and the Purchaser has accepted it.

16.4 The currency or currencies in which payments shall be made to the Supplier under this Contract shall be specified in the SCC.

17. Taxes and Duties

17.1 For goods supplied from outside the Purchaser's country, the Supplier shall be entirely responsible for all taxes, stamp duties, license fees, and other such levies imposed outside the Purchaser's country.

17.2 For goods supplied from within the Purchaser's country, the Supplier shall be entirely responsible for all taxes, duties, license fees, etc., incurred until delivery of the contracted Goods to the Purchaser.

17.3 If any tax exemptions, reductions, allowances or privileges may be available to the Supplier in the Purchaser's Country, the Purchaser shall use its best efforts to enable the Supplier to benefit from any such tax

savings to the maximum allowable extent.

18. Performance Security

18.1 The Supplier shall, within twenty-eight (28) days of the notification of Contract award, provide a Performance Security for the due performance of the Contract in the amounts and currencies specified in the SCC.

18.2 The proceeds of the Performance Security shall be payable to the Purchaser as compensation for any loss resulting from the Supplier's failure to complete its obligations under the Contract.

18.3 The Performance Security shall be denominated in the currencies of the Contract, or in a freely convertible currency acceptable to the Purchaser, and shall be in one of the forms stipulated by the Purchaser in the SCC, or in another form acceptable to the Purchaser.

18.4 The Performance Security shall be discharged by the Purchaser and returned to the Supplier not later than twenty-eight (28) days following the date of completion of the Supplier's performance obligations under the Contract, including any warranty obligations, unless specified otherwise in the SCC.

19. Copyright

19.1 The copyright in all drawings, documents, and other materials containing data and information furnished to the Purchaser by the Supplier herein shall remain vested in the Supplier, or, if they are furnished to the Purchaser directly or through the Supplier by any third party, including suppliers of materials, the copyright in such materials shall remain vested in such third party.

20. Confidential Information

20.1 The Purchaser and the Supplier shall keep confidential and shall not, without the written consent of the other party hereto, divulge to any third party any documents, data, or other information furnished directly or indirectly by the other party hereto in connection with the Contract, whether such information has been furnished prior to, during or following completion or termination of the Contract. Notwithstanding the above, the Supplier may furnish to its Subcontractor such documents, data, and other information it receives from the Purchaser to the extent required for the Subcontractor to perform its work under the Contract, in which event the Supplier shall obtain from such Subcontractor an undertaking of confidentiality similar to that imposed on the Supplier under GCC Clause 20.

20.2 The Purchaser shall not use such documents, data, and other information received from the Supplier for any purposes unrelated to the Contract. Similarly, the Supplier shall not use such documents, data, and other information received from the Purchaser for any purpose other than the design, procurement, or other work and services required for the performance of the Contract.

20.3 The obligation of a party under GCC Sub-Clauses 20.1 and 20.2 above, however, shall not apply to information that:

(a) the Purchaser or Supplier need to share with the ADB or other institutions participating in the financing of the Contract;

(b) now or hereafter enters the public domain through no fault of that party;

(c) can be proven to have been possessed by that party at the time of disclosure and which was not previously obtained, directly or indirectly, from the other party; or

(d) otherwise lawfully becomes available to that party from a third party that has no obligation of confidentiality.

20.4 The above provisions of GCC Clause 20 shall not in any way modify any undertaking of confidentiality given by either of the parties hereto prior to the date of the Contract in respect of the Supply or any part thereof.

20.5 The provisions of GCC Clause 20 shall survive completion or termination, for whatever reason, of the Contract.

21. Subcontracting

21.1 The Supplier shall notify the Purchaser in writing of all subcontracts awarded under the Contract if not already specified in the Bid. Subcontracting shall in no event relieve the Supplier from any of its obligations, duties, responsibilities, or liability under the Contract.

21.2 Subcontracts shall comply with the provisions of GCC Clauses 3 and 7.

22. Specifications and Standards

22.1 Technical Specifications and Drawings

(a) The Supplier shall ensure that the Goods and Related Services comply with the technical specifications and other provisions of the Contract.

(b) The Supplier shall be entitled to disclaim responsibility for any design, data, drawing, specification or other document, or any modification thereof provided or designed by or on behalf of the Purchaser, by giving a notice of such disclaimer to the Purchaser.

(c) The Goods and Related Services supplied under this Contract shall conform to the standards mentioned in Section VI, Schedule of Supply and, when no applicable standard is mentioned, the standard shall be equivalent or superior to the official standards whose application is appropriate to the country of origin of the Goods.

22.2 Wherever references are made in the Contract to codes and standards in accordance with which it shall be executed, the edition or the revised version of such codes and standards shall be those specified in the Section VI, Schedule of Supply. During Contract execution, any changes in any such codes and standards shall be applied only after approval by the Purchaser and shall be treated in accordance with GCC Clause 33.

23. Packing and Documents

23.1 The Supplier shall provide such packing of the Goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the Contract. During transit, the packing shall be sufficient to withstand, without limitation, rough handling and exposure to extreme temperatures, salt and precipitation, and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the final destination of the Goods and the absence of heavy handling facilities at all points in transit.

23.2 The packing, marking, and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for

in the Contract, including additional requirements, if any, specified in the SCC, and in any other instructions ordered by the Purchaser.

24. Insurance

24.1 Unless otherwise specified in the SCC, the Goods supplied under the Contract shall be fully insured, in a freely convertible currency from an eligible country, against loss or damage incidental to manufacture or acquisition, transportation, storage, and delivery, in accordance with the applicable Incoterms or in the manner specified in the SCC.

25. Transportation

25.1 Unless otherwise specified in the SCC, obligations for transportation of the Goods shall be in accordance with the Incoterms specified in Sections VI, Schedule of Supply.

26. Inspections and Tests

26.1 The Supplier shall at its own expense and at no cost to the Purchaser carry out all such tests and/or inspections of the Goods and Related Services as are specified in Sections VI, Schedule of Supply.

26.2 The inspections and tests may be conducted on the premises of the Supplier or its Subcontractor, at point of delivery, and/or at the final destination of the Goods, or in another place in the Purchaser's country as specified in the SCC. Subject to GCC Sub-Clause 26.3, if conducted on the premises of the Supplier or its Subcontractor, all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to the Purchaser.

26.3 The Purchaser or its designated representative shall be entitled to attend the tests and/or inspections referred to in GCC Sub-Clause 26.2, provided that the Purchaser bear all of its own costs and expenses incurred in connection with such attendance including, but not limited to, all traveling and board and lodging expenses.

26.4 Whenever the Supplier is ready to carry out any such test and inspection, it shall give a reasonable advance notice, including the place and time, to the Purchaser. The Supplier shall obtain from any relevant third party or manufacturer any necessary permission or consent to enable the Purchaser or its designated representative to attend the test and/or inspection.

26.5 The Purchaser may require the Supplier to carry out any test and/or inspection not required by the Contract but

deemed necessary to verify that the characteristics and performance of the Goods comply with the technical specifications, codes and standards under the Contract, provided that the Supplier's reasonable costs and expenses incurred in the carrying out of such test and/or inspection shall be added to the Contract Price. Further, if such test and/or inspection impedes the progress of manufacturing and/or the Supplier's performance of its other obligations under the Contract, due allowance will be made in respect of the Delivery Dates and Completion Dates and the other obligations so affected.

26.6 The Supplier shall provide the Purchaser with a report of the results of any such test and/or inspection.

26.7 The Purchaser may reject any Goods or any part thereof that fail to pass any test and/or inspection or do not conform to the specifications. The Supplier shall either rectify or replace such rejected Goods or parts thereof or make alterations necessary to meet the specifications at no cost to the Purchaser, and shall repeat the test and/or inspection, at no cost to the Purchaser, upon giving a notice pursuant to GCC Sub-Clause 26.4.

26.8 The Supplier agrees that neither the execution of a test and/or inspection of the Goods or any part thereof, nor the attendance by the Purchaser or its representative, nor the issue of any report pursuant to GCC Sub-Clause 26.6, shall release the Supplier from any warranties or other obligations under the Contract.

27. Liquidated Damages

27.1 Except as provided under GCC Clause 32, if the Supplier fails to deliver any or all of the Goods or perform the Related Services within the period specified in the Contract, the Purchaser may without prejudice to all its other remedies under the Contract, deduct from the Contract Price, as liquidated damages, a sum equivalent to the percentage specified in the SCC of the Contract Price for each week or part thereof of delay until actual delivery or performance, up to a maximum deduction of the percentage specified in the SCC. Once the maximum is reached, the Purchaser may terminate the Contract pursuant to GCC Clause 35.

28. Warranty

28.1 The Supplier warrants that all the Goods are new, unused, and of the most recent or current models, and that they incorporate all recent improvements in design and materials, unless provided otherwise in the Contract.

28.2 Subject to GCC Sub-Clause 22.1, the Supplier further warrants that the Goods shall be free from defects arising from any act or omission of the Supplier or arising from design, materials, and workmanship, under normal use in the conditions prevailing in the country of final destination.

28.3 Unless otherwise specified in the SCC, the warranty shall remain valid for twelve (12) months after the Goods, or any portion thereof as the case may be, have been delivered to and accepted at the final destination indicated in the SCC, or for eighteen (18) months after the date of shipment or loading in the country of origin, whichever period concludes earlier.

28.4 The Purchaser shall give Notice to the Supplier stating the nature of any such defects together with all available evidence thereof, promptly following the discovery thereof. The Purchaser shall afford all reasonable opportunity for the Supplier to inspect such defects.

28.5 Upon receipt of such Notice, the Supplier shall, within the period specified in the SCC, expeditiously repair or replace the defective Goods or parts thereof, at no cost to the Purchaser.

28.6 If having been notified, the Supplier fails to remedy the defect within the period specified in the SCC, the Purchaser may proceed to take within a reasonable period such remedial action as may be necessary, at the Supplier's risk and expense and without prejudice to any other rights which the Purchaser may have against the Supplier under the Contract.

29. Patent Indemnity

29.1 The Supplier shall, subject to the Purchaser's compliance with GCC Sub-Clause 29.2, indemnify and hold harmless the Purchaser and its employees and officers from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Purchaser may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract by reason of:

(a) the installation of the Goods by the Supplier or the use of the Goods in the country where the Site is located; and

(b) the sale in any country of the products produced by the Goods.

Such indemnity shall not cover any use of the Goods or any part thereof other than for the purpose indicated by or to be reasonably inferred from the Contract, neither any infringement resulting from the use of the Goods or any part thereof, or any products produced thereby in association or combination with any other equipment, plant, or materials not supplied by the Supplier, pursuant to the Contract.

29.2 If any proceedings are brought or any claim is made against the Purchaser arising out of the matters referred to in GCC Sub-Clause 29.1, the Purchaser shall promptly give the Supplier a notice thereof, and the Supplier may at its own expense and in the Purchaser's name conduct such proceedings or claim and any negotiations for the settlement of any such proceedings or claim.

29.3 If the Supplier fails to notify the Purchaser within twenty-eight (28) days after receipt of such notice that it intends to conduct any such proceedings or claim, then the Purchaser shall be free to conduct the same on its own behalf.

29.4 The Purchaser shall, at the Supplier's request, afford all available assistance to the Supplier in conducting such proceedings or claim, and shall be reimbursed by the Supplier for all reasonable expenses incurred in so doing.

29.5 The Purchaser shall indemnify and hold harmless the Supplier and its employees, officers, and Subcontractors from and against any and all suits, actions or administrative proceedings, claims, demands, losses, damages, costs, and expenses of any nature, including attorney's fees and expenses, which the Supplier may suffer as a result of any infringement or alleged infringement of any patent, utility model, registered design, trademark, copyright, or other intellectual property right registered or otherwise existing at the date of the Contract arising out of or in connection with any

design, data, drawing, specification, or other documents or materials provided or designed by or on behalf of the Purchaser.

30. Limitation of Liability

30.1 Except in cases of gross negligence or willful misconduct :

(a) neither party shall be liable to the other party for any indirect or consequential loss or damage, loss of use, loss of production, or loss of profits or interest costs, provided that this exclusion shall not apply to any obligation of the Supplier to pay liquidated damages to the Purchaser; and

(b) the aggregate liability of the Supplier to the Purchaser, whether under the Contract, in tort, or otherwise, shall not exceed the amount specified in the SCC, provided that this limitation shall not apply to the cost of repairing or replacing defective equipment, or to any obligation of the Supplier to indemnify the Purchaser with respect to patent infringement.

31. Change in Laws and Regulations

31.1 Unless otherwise specified in the Contract, if after the date of the Invitation for Bids, any law, regulation, ordinance, order or bylaw having the force of law is enacted, promulgated, abrogated, or changed in the place of the Purchaser's country where the Site is located (which shall be deemed to include any change in interpretation or application by the competent authorities) that subsequently affects the Delivery Date and/or the Contract Price, then such Delivery Date and/or Contract Price shall be correspondingly increased or decreased, to the extent that the Supplier has thereby been affected in the performance of any of its obligations under the Contract. Notwithstanding the foregoing, such additional or reduced cost shall not be separately paid or credited if the same has already been accounted for in the price adjustment provisions where applicable, in accordance with GCC Clause 15.

32. Force Majeure

32.1 The Supplier shall not be liable for forfeiture of its Performance Security, liquidated damages, or termination for default if and to the extent that its delay in performance or other failure to perform its obligations under the Contract is the result of an event of Force

Majeure.

32.2 For purposes of this Clause, "Force Majeure" means an event or situation beyond the control of the Supplier that is not foreseeable, is unavoidable, and its origin is not due to negligence or lack of care on the part of the Supplier. Such events may include, but not be limited to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics, quarantine restrictions, and freight embargoes.

32.3 If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

33. Change Orders and Contract Amend-ments

33.1 The Purchaser may at any time order the Supplier through Notice in accordance GCC Clause 8, to make changes within the general scope of the Contract in any one or more of the following:

(a) drawings, designs, or specifications, where Goods to be furnished under the Contract are to be specifically manufactured for the Purchaser;

(b) the method of shipment or packing;

(c) the place of delivery; and

(d) the Related Services to be provided by the Supplier.

33.2 If any such change causes an increase or decrease in the cost of, or the time required for, the Supplier's performance of any provisions under the Contract, an equitable adjustment shall be made in the Contract Price or in the Delivery and Completion Schedule, or both, and the Contract shall accordingly be amended. Any claims by the Supplier for adjustment under this Clause must be asserted within twenty-eight (28) days from the date of the Supplier's receipt of the Purchaser's change order.

33.3 Prices to be charged by the Supplier for any Related Services that might be needed but which were not included in the Contract shall be agreed upon in advance by the parties and shall not exceed the prevailing rates

charged to other parties by the Supplier for similar services.

34. Extensions of Time

34.1 If at any time during performance of the Contract, the Supplier or its Subcontractors should encounter conditions impeding timely delivery of the Goods or completion of Related Services pursuant to GCC Clause 12, the Supplier shall promptly notify the Purchaser in writing of the delay, its likely duration, and its cause. As soon as practicable after receipt of the Supplier's notice, the Purchaser shall evaluate the situation and may at its discretion extend the Supplier's time for performance, in which case the extension shall be ratified by the parties by amendment of the Contract.

34.2 Except in case of Force Majeure, as provided under GCC Clause 32, a delay by the Supplier in the performance of its Delivery and Completion obligations shall render the Supplier liable to the imposition of liquidated damages pursuant to GCC Clause 27, unless an extension of time is agreed upon, pursuant to GCC Sub-Clause 34.1.

35. Termination

35.1 Termination for Default

(a) The Purchaser, without prejudice to any other remedy for breach of Contract, by Notice of default sent to the Supplier, may terminate the Contract in whole or in part:

(i) if the Supplier fails to deliver any or all of the Goods within the period specified in the Contract, or within any extension thereof granted by the Purchaser pursuant to GCC Clause 34; or

(ii) if the Supplier fails to perform any other obligation under the Contract.

(b) In the event the Purchaser terminates the Contract in whole or in part, pursuant to GCC Clause 35.1(a), the Purchaser may procure, upon such terms and in such manner as it deems appropriate, Goods or Related Services similar to those undelivered or not performed, and the Supplier shall be liable to the Purchaser for any additional costs for such similar Goods or Related Services. However, the Supplier shall continue performance

of the Contract to the extent not terminated.

(c) if the Supplier, in the judgment of the Purchaser has engaged in corrupt, fraudulent, collusive, or coercive practices, as defined in GCC Clause 3, in competing for or in executing the Contract.

35.2 Termination for Insolvency

The Purchaser may at any time terminate the Contract by giving Notice to the Supplier if the Supplier becomes bankrupt or otherwise insolvent. In such event, termination will be without compensation to the Supplier, provided that such termination will not prejudice or affect any right of action or remedy that has accrued or will accrue thereafter to the Purchaser.

35.3 Termination for Convenience

(a) The Purchaser, by Notice sent to the Supplier, may terminate the Contract, in whole or in part, at any time for its convenience. The Notice of termination shall specify that termination is for the Purchaser's convenience, the extent to which performance of the Supplier under the Contract is terminated, and the date upon which such termination becomes effective.

(b) The Goods that are complete and ready for shipment within twenty-eight (28) days after the Supplier's receipt of the Notice of termination shall be accepted by the Purchaser at the Contract terms and prices. For the remaining Goods, the Purchaser may elect:

(i) To have any portion completed and delivered at the Contract terms and prices; and/or

(ii) to cancel the remainder and pay to the Supplier an agreed amount for partially completed Goods and Related Services and for materials and parts previously procured by the Supplier.

36. Assignment 36.1 Neither the Purchaser nor the Supplier shall assign, in whole or in part, their obligations under this Contract, except with prior written consent of the other party.

Section VIII. Special Conditions of Contract

The following Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

GCC 1.1(j)	The Purchaser's country is: _____
GCC 1.1(k)	The Purchaser is: _____
GCC 1.1 (q)	The Site is: _____
GCC 4.2 (b)	The version of Incoterms shall be: _____
GCC 5.1	The language shall be: _____
GCC 6.1	The individuals or firms in a joint venture, consortium or association _____ jointly and severally liable.
GCC 8.1	For **notices**, the Purchaser's address shall be: Attention: _____ Street Address: _____ Floor/ Room number: _____ City: _____ ZIP Code: _____ Country: _____ Telephone: _____ Facsimile number: _____ Electronic mail address: _____
GCC 9.1	The governing law shall be: _____
GCC 10.2	The formal mechanism for the resolution of disputes shall be:_____ _____
GCC 11.1	The scope of supply shall be defined in :_____ _____
GCC 12.1	Details of shipping and documents to be furnished by the Supplier shall be::_____
GCC 15.2	The price adjustment shall be: _____
GCC 16.1	The terms of payment shall be: _____

GCC 16.4	The currencies for payments shall be: _____
GCC 18.1	The Supplier shall provide a Performance Security of _____ percent of the Contract Price. The Performance Security shall be denominated in the following amounts and currencies:_____ _____
GCC 18.3	The types of acceptable Performance Securities are: _____ _____
GCC 18.4	Discharge of Performance Security shall take place: _____ _____
GCC 23.2	The packing, marking and documentation within and outside the packages shall be: _____ _____
GCC 24.1	The insurance coverage shall be in accordance with:_____ _____
GCC 25.1	Obligations for transportation of the Goods shall be in accordance with: _____
GCC 26.2	Tests and Inspections specified in Section VI, Schedule of Supply, shall be carried out at the following times or milestones, and places : _____ _____
GCC 27.1	The liquidated damage shall be: _____ % per week or part thereof
GCC 27.1	The maximum amount of liquidated damages shall be: _____
GCC 28.3	The period of validity of the Warranty shall be: _____
GCC 28.5	The Supplier shall correct any defects covered by the Warranty within : _____ of being notified by the Purchaser of the occurrence of such defects
GCC 30.1	The amount of aggregate liability shall be: _____

Section IX. Contract Forms

Table of Forms

Agreement

THIS AGREEMENT made the _____ day of _____, _____, between _____ of _____ (hereinafter "the Purchaser"), of the one part, and _____ of _____ (hereinafter "the Supplier"), of the other part:

WHEREAS the Purchaser invited bids for certain Goods and Related Services, viz., _____ and has accepted a Bid by the Supplier for the supply of those Goods and Related Services in the sum of _____ (hereinafter "the Contract Price").

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract referred to.

2. The following documents shall be deemed to form and be read and construed as part of this Agreement, viz.:

(a) the Purchaser's Notification to the Supplier of Award of Contract;
(b) the Bid Submission Sheet and the Price Schedules submitted by the Supplier;
(c) the Special Conditions of Contract;
(d) the General Conditions of Contract;
(e) the Schedule of Supply; and
(f) _____.

This Contract shall prevail over all other Contract documents. In the event of any discrepancy or inconsistency within the Contract documents, then the documents shall prevail in the order listed above.

3. In consideration of the payments to be made by the Purchaser to the Supplier as indicated in this Agreement, the Supplier hereby covenants with the Purchaser to provide the Goods and Related Services and to remedy defects therein in conformity in all respects with the provisions of the Contract.

4. The Purchaser hereby covenants to pay the Supplier in consideration of the provision of the Goods and Related Services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of _____ on the day, month and year indicated above.

Signed by _____ (for the Purchaser)

Signed by _____ (for the Supplier)

Performance Security

Date: _____

Contract Name and No. :_____
_____

To: _____

WHEREAS _____ (hereinafter "the Supplier") has undertaken, pursuant to Contract No. _____ dated _____, _____ to supply _____ (hereinafter "the Contract").

AND WHEREAS it has been stipulated by you in the aforementioned Contract that the Supplier shall furnish you with a security _____ issued by a reputable guarantor for the sum specified therein as security for compliance with the Supplier's performance obligations in accordance with the Contract.

AND WHEREAS the undersigned _____ _____, legally domiciled in _____ _____, (hereinafter "the Guarantor"), have agreed to give the Supplier a security:

THEREFORE WE hereby affirm that we are Guarantors and responsible to you, on behalf of the Supplier, up to a total of _____ and we undertake to pay you, upon your first written demand declaring the Supplier to be in default under the Contract, without cavil or argument, any sum or sums within the limits of _____ _____ as aforesaid, without your needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This security is valid until the _____ day of _____, _____.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the security for and on behalf of _____

Date _____

Advance Payment Security

Date: _____

Contract Name and No. :_____
_____

To: _____

In accordance with the payment provision included in the Contract, in relation to advance payments, _____ (hereinafter called "the Supplier") shall deposit with the Purchaser a security consisting of _____, to guarantee its proper and faithful performance of the obligations imposed by said Clause of the Contract, in the amount of _____.

We, the undersigned _____, legally domiciled in _____ (hereinafter "the Guarantor"), as instructed by the Supplier, agree unconditionally and irrevocably to guarantee as primary obligor and not as surety merely, the payment to the Purchaser on its first demand without whatsoever right of objection on our part and without its first claim to the Supplier, in the amount not exceeding _____
_____.

This security shall remain valid and in full effect from the date of the advance payment received by the Supplier under the Contract until _____, _____.

Name _____

In the capacity of _____

Signed _____

Duly authorized to sign the security for and on behalf of _____

Date _____

APPENDIX

to Section IV. Employer's Requirements

Design-Build and Turnkey Contracts

ITALFERR
A project implemented by Italferr S.p.A.

GOST 8161-75
Rails of R65 type
Structure and Dimensions

Standard non-observance is prosecuted under the Law.

1. This standard covers hardened and non-hardened railway rails R65 type and set up their structure and dimensions.

This standard is in compliance with CMEA(Council for Mutual Economic Assistance) under standardization of PC 1936-69.

2. Structure and dimensions of the cross section of the rails should be in compliance with accordance the drawing 1, and location and the dimensions of holes in the web at the end of the rails in the drawing 2.

Due to the order of the Customer the rails can be made without the holes in the web and without hardening the surface of rolling of the head on the one or both ends.

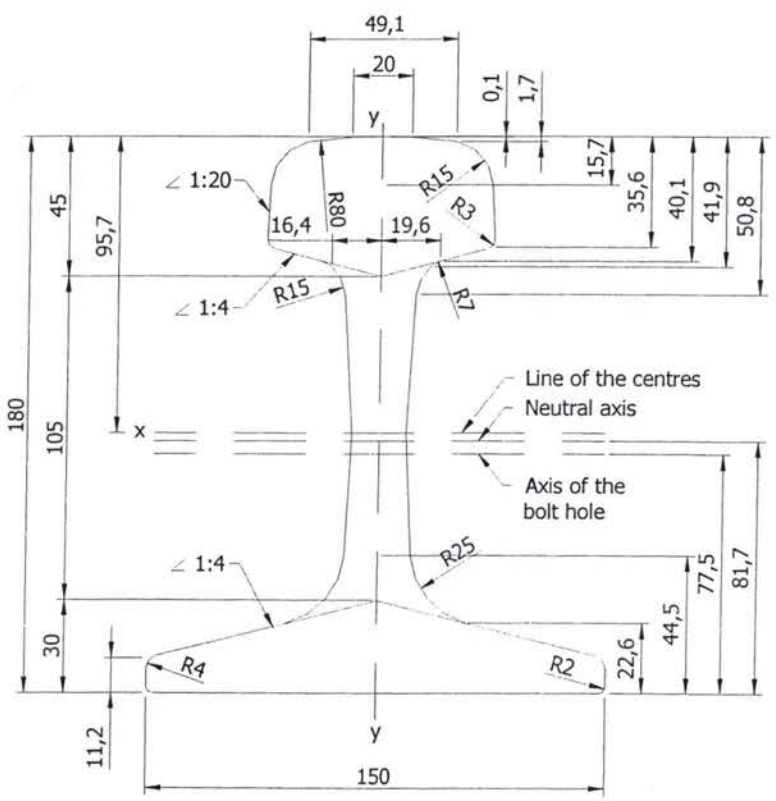
It is allowed due to the agreement between the manufacturer and the Customer the amendments (changes) of the holes at the ends of the rails

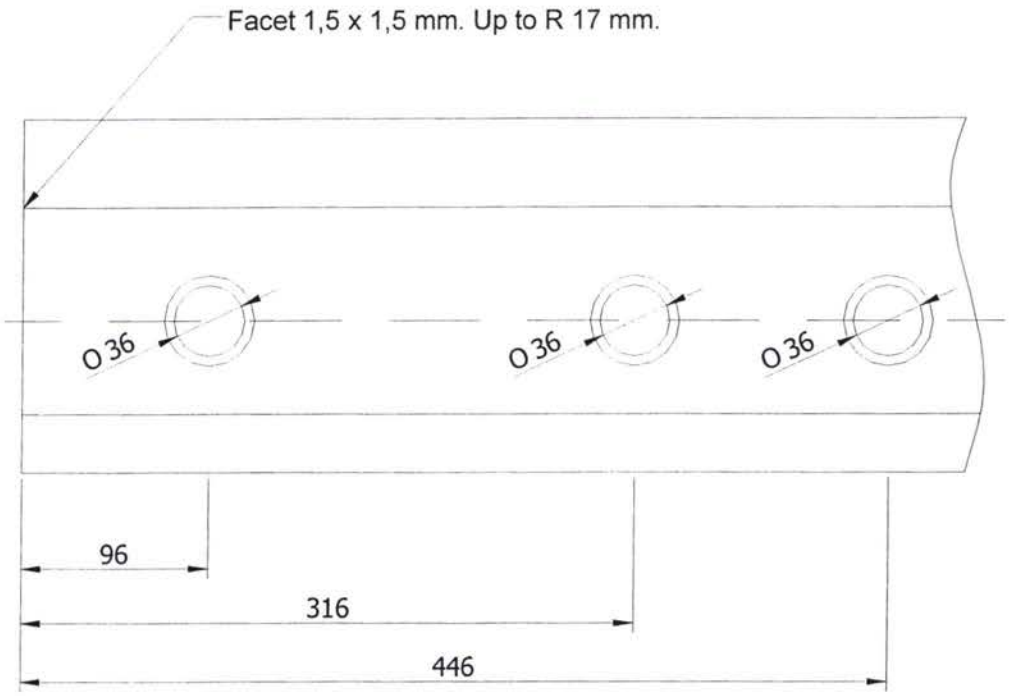
3. The utmost deviation on the head convexity (camber) when measured along the symmetry axis of the cross section of the rail should be ± 0,5 mm, and on the uniform rail foot convexity- 05 mm. Concavity of the rail foot is not allowed.

Drawing 1

The dimensions are provided with the tool

R 65





Drawing 2 *Bolts holes locations*

Legend of the railway rail R65 type.

Rail R65 type GOST 8161 -75.

4. Dissymmetry of the profile of the rail cross section concerning its vertical axis is not allowed: on the foot – more than 1mm and on the head – more than 0,3 mm.

5. On holes edges in the rail web beveling should be done with the dimension from 1 to 2 mm under the angle about 45 degrees and in the end and lower edges of the head of three-dimensional hardened rails -0 facet(face) with the height and length of about 1,5 mm.

6. Rails length should be as indicated in the table:

Length, m	**Allowed deviations on the length, mm, for rails**		**Holes availability in the web at the rails ends**
	hardened*	not hardened	
25,00	± 9	± 6	On both ends
24,92	± 9	± 6	ditto
24,84	± 9	± 6	ditto
25,00	+10; -20	± 6	Without holes
12,5	± 7	± 6	On both ends
12,52	± 7	± 6	On both ends
12,46	± 7	± 6	On both ends
12,42	± 7	± 6	ditto
12,38	± 7	± 6	ditto

* For surface- hardened rails along its whole length with high frequency current heating , tolerances for the length should be set up with the same tolerances as for the non hardened rails.

Annex to GOST 8161 – 75

CALCULATED DATA

Rail's cross section floor area, cm2	82,65
Distance from the centre of gravity(weight), mm:	
to the foot bottom	81,3
to upper part of the head	98,7
Moment of inertia relating axes, sm4	3540
on the lower part of the foot	435
on the upper part of the head	358
on the lateral edge of the foot	75
Theoretical linear density of one meter of the rail Steel density – 7830 kg/sm3), kg	64,72
Metal distribution on the rail cross section area, % of the whole area	
in the head	34,11
in the web	28,52
in the foot	37,37

GOST 24 182 -80
Martencite steel rails P 75, P 65 and P 50 types, for wide gauge track

(Instead of GOST 8160 -63, GOST 6944 -63)

Standard nonobservance is persecuted by the Law

This standard covers non hardened on the whole length rails P75, P65 and P50 types (hereinafter – rails) made of matrtencite steel and intended for laying on the wide gauge tracks.

1. Specifications

1.1 Rails should be done in accordance with the requirements of this standard under the working drawings approved in the established order.
Rails design and dimensions in accordance with GOST 7174-75, GOST 8161-75 and GOST 16210-77

1.1.1 Rail should be group I and II

Rail group I should be martencite steel deoxidized in the ladle by complex deoxidizers without use of aluminum or other deoxidizers, forming in steel harmful non-metallic inclusions.

1.1.2 Rail group II should be made from calm martencite steel deoxidized by aluminum or marganese-aluminum alloy.

1.2 Chemical content of steel should be in compliance with the norms indicated in Table 1

Notes:

1. In marking steel the letter "M" indicates the method of steel smelting (open-hearth), figures – average content of carbon in hundredth portion of %.
2. In rails made from Kerch ores, it is allowed the content phosphorus content not more than 0,040 %, sulfur not more than 0,050%, arsenic not more than 0,15%

Table 1

Rails Group	Rail type	Steel brand (mark)	Mass portion, %							
			carbon	manganese	silicon	Vanadium	titanium	zirconium	Phosphorus	sulfur
									Not more	
I.	P75, P65	M76B	0,71-0,82	0,75-1,05	0,25-0,45	0,03-0,07	-	-	0,035	0,045
		M76T			0,18-0,40	-	0,007-0,025			
		M76BT				0,01-0,02	0,005-0,025			
		M76Ц				-	-	0,001-0,050		
	P50	M74T	0,69-0,80				0,007-0,025	-		
		M74Ц					-	0,001-0,050		
II.		M76	0,71-0,82		o		-	-		
		M74	0,69-0,80							

1.3 Steel mechanical properties for rail group I and II while tested for tension should be complied with norms. Indicated in Table 2.

Table 2

Rails type	Steel brand(mark)	Ultimate strength	Elongation, %
		not less	
P75, P65	M76	90,0	4.0
P50	M74	50.0	5.0

1.4 Steel rails with carbon content more than average can be referred to hard ones. Steel rails the carbon content of which is equal or lower than average value can be referred to normal.

1.5 Technology of rail production should guarantee the absence of flakes in them as well as local non-metallic inclusions (alumina, carbide and nitrides alumina cemented by silicate) elongated along rolling direction as truck lines(rows) more than 2mm for the rails group I and with the length of more than 8 mm for the rails group II.

Note. Alumina, cemented by silicates are to be alumina lines , 2mm length for the rails group I and to 8 mm for the rails group II which are in the limits of silicates lines(rows) The length of silicates lines is not taken into consideration.

1.6 Total drawing (stretching) when roll rails from an ingot should be not less 35. Reduced ingot (blooms) and rolled out of it rail bar should be cut until full removal of shrink hole, sub-shrinkage pipe and harmful liquation.

There should not be also other harmful heterogeneity of macrostructure (spot liquation, rippled surface, white and dark spots, blackness, flaws (gas pockets), foreign metallic and slag inclusions and so on).

1.7 The surface of the rail head at its end should not be subjected to hardening from roll heating or induction heating by the currents of high frequency.

Rails intended for welding or other special purposes due to the Consumer's requirement it is allowed to make with length of not less than 6,0 m without hardening of one or both ends.

When hardening of rails ends the following should be provided:

- hardness on the surface of the harden layer HB 311...401, length of the harden layer is 50-80 mm;
- depth of harden layer, determined due to hardness not less than 5,0 mm; hardness on the depth of 5,8 mm must be HB 300;
- absence in harden layer structures of overheating, areas of martensite, hardening cracks; correct configuration of metal harden layer along cross-section and rails length. Harden layer should start at the distance not more than 4,0 mm from the end and cross section should not be expanded lower than the beginning of roundness of vertical lateral edges of the head of head rolling;
- gradual transition from harden metal layer to non-harden both on cross-section and on the surface of head rolling.

1.8 Rails after complete cooling down can undergo cool straightening on mangle machines and pad presses.

Before cold straightening it is allowed even common along the whole length the rails curvature in vertical and horizontal planes with camber (deflection) not more than 1/60 of the rail length.

1.9 After cold strengthening it is allowed:

- Even rail curvature in horizontal and vertical plane along the whole length of the rail with camber (deflection) not more than 1/2200 of the rail length;
- Single local deformation (sags) not more than 0, 5 mm measured relating to the edge of the ruler with the length of 1 m. and the surface of the rail;
- End curves in vertical and horizontal planes of the rails without bolt holes (for welding) not more than 0, 5 mm and the rails with bolt holes in horizontal plane not more than 1, 0 mm and in vertical plane not more than 0,5 mm, when determining them by applying the ruler with the length of 1,0 m along at a tangent to the straight part of the rail.

It is not allowed:

- repeated cold strengthening of the rails on roll-driving machines in one and the same plane;
- cold pad strengthening of the rails ends, if the curvature of the ends in the limits of bolt holes locations;
- rails dropping down from the height of 1,0 m;
- corrugation and twisting of rails. Rail is considered to be twisted if being measured on the control rack it has clearances at the ends between the edge of the base and rack (cornerwise) more than 1/10000 of its length.

1.10 The rail's surface should be without expanded contamination, pockets (cavity), cracks, flaws, skins, nestling boxes, blisters, rolling marks, wrinkles, rolled kinks, ripple markings, marks.

It is not allowed on the surface of the rails:

- Individual rolled blisters(bubble) and wrinkles with the length not more than 1m and depth not more than 1,00 mm, and in the middle third part of the base bottom width with the depth not more than 0,3 mm;
- longitudinal marks and scratches with the depth not more than 0, 5 mm and in the middle third part of the base bottom width and on the surface of the head with depth not more than 0,5 mm, and in other places – not more than 1,0 mm;
- mark (print) of to 5,0mm height on the rail neck outside of the surfaces of the connections with baseplates;
- stamping with scraping bright by abrasive tool of the marks on the surface of neck connection with baseplates with observance of the rails dimensions and allowable tolerances.

1.11 Rails ends should be cut perpendicularly longitudinal axis of the rail.
Skewing of ends should not be more than 1,00mm when measured in any direction. To cut and break defective ends of the rails is not allowed.
Bolt holes at the rails ends should be drilled perpendicular to the vertical longitudinal plane of the rail. The surfaces of bolt holes and rails ends should be without flaws, burrs and traces of shrinkage as separations and cracks. Burrs and metal rolls near bolts' holes and on the ends of the rails should be removed by cleaning.

1.12 Sample part of the rail for pile-driver test should go through the test at the temperature from 0 degree to plus 40 degrees C for hammering without fracture, cracks and indents of the base(both in spans and in supports).

1.13 Sample part of the rail to test for base durability should stand static load without cracks or fractures before sag 4, 00 mm.

1.14 Rails in conformity with all requirements para. 1.1-1.12 can be referred to the first grade.

1.15 To the second grade one can refer the rails which have at least one of the following deviations from the requirements para. 1.1 -1.12:

- By the content in steel: carbon – up to minus 0,03 %, manganese – up to ± 0,1%, silicon – up to ±0,03 %; phosphorus- up to plus 0,005%, sulfur – up to minus 0.01%, arsenic – up to plus 0,05%.
- By the length of track lines of non metallic inclusions (para.1.5) by the length more than 8,0mm;
- By temporary resistance – up to minus 100 мп;
- By relative expansion (length) – up to minus 1,0 abs. %;
- By sag until cold straightening – exceeding not more than twice indicated in para 1.8;
- By dimension, exceeding not more than twice allowable under GOST 7174-75, GOST 8161 -75, GOST 16210-77 ultimate deviation for the rails of the first grade except the width of the base where allowable deviations can be not more minus 3,0 and plus 1,0 mm;
- By individual rolled wrinkles, blisters(pockets), marks and pitted surface with the depth not more than 3,0 mm and in the middle third of the base – not more than 1,00mm;
- With gently sloping cleaning of rolled impurities, blisters, crusts, rolling skin and fissures at the depth not more than 3,0 mm, except edges and middle third of the width of the base as well as top surface of the rail head where the depth of gently sloping cleaning should not exceed 1mm.

1.16 For laying on the main lines of the Ministry of the Railways the rails of the second grade P75 and P65 types with the rolled impurities, blisters and cracks on the middle third of the base bottom with the depth more than 0,3 mm are not allowed; rails of the second grade P50

2. Rules of Acceptance

2.1. At commissioning and acceptance for checking of produced rails conformity to the requirements of this standard control should be carried out;
- surface condition, linearity, rails and bolt dimensions (para. 1.1, 1.8 – 1.11);
- chemical content of steel (para 1.2);
- mechanical properties of steel (para 1.6);
- impact durability of rails (para 1.12);
- macrostructure of rails (para 1.6)
- impurity of rails by line non-metallic inclusions;
- absence of flakes in rails (para. 1.5);
- hardening of rails ends (para. 1.7)
- durability of rail base (para 1.13)

2.2. Commissioning-acceptance testing of the rails is carried out by each melting. If steel is melted in the furnace of big volume and pour into two and more ladles, each ladle is considered to be individual melting. Rails from bars of one and the same melting, rolled at different time, are subject to commissioning-acceptance testing as the rails of different melting.

2.3. Each rail should be subject to control of the surface condition, straightness, rails and bolt holes dimensions. Rails dropped from the height of more than 1, 0 m considered to be not appropriate the requirements of this standard.

2.4. When non-conformity of the chemical content of steel by at least one element of the requirements of para. 1.2 and 1.15 all the rails of such melting are considered to be not appropriate the requirements of this standard.

2.5. When satisfactory results of the primary or repeated testing for tension (para 1.3 and 1.15) all the rails of controlled melting are considered to meet the requirements of this standard.
When non-conformity of the results of repeated testing for tension at least of one of the sample to the requirements para 1.3 and 1.15 all the rails of the controlled melting should be recognized as not in conformity with the requirements of this standard.

2.6. When satisfactory results of the primary or repeated testing for hammering under impact (para 1.12) all the rails of one melting are considered to be in conformity to the requirements of this standard. When receiving unsatisfactory results of the repeated testing for the hammering under impact relating to at least one sample length the head(shrinking) part of 12,5 m length of all first head rails(with mark "1") is considered to be non compliant with the relating requirements of this standard.

At satisfactory results of the third testing for hammering under impact (para. 1.12) all rails of such melting except the head part (shrinking) of 12,5 m of length all the first head rails (with mark "1") are considered to be in compliance with the requirement of this standard. At unsatisfactory results of the third testing for hammering under impact in relation with at least one sample length all rail of this melting considered to be non compliant to the requirements of this standard. Due to the requirement of the inspector of the Ministry of railways there should be the study of broken under impact testing of the sample lengths to find out the reasons of fragility of the rails.

2.7. Each melting of macro control subjects to sampling chosen by the inspector of the Ministry of Railways – one rail from bottom (with mark "X") and head (with mark "1") of each melting. When there are stable satisfactory results and macro control can test only the rails of each tenth melting.
Stable satisfactory results are those results where four tested meltings in succession no defects of macrostructure have been found.

2.8 In case if remnants of shrinking cavity, sub-shrinking porosity , harmful liquation, rippled surface, impurities, separations, spot liquation are found at each melting of macro control (para. 3.6 -3.10) in the head rails (with mark "1"), all first head rails of controlled melting are considered to be non compliant with the requirement of this standard.

In case foreign metallic and non metallic inclusions (choking up), sub rippled surface blisters, dragging off, white and dark sport(rippled surface) are found at macro control of bottom rails (with mark "X"), all the bottom rails of the controlled melting should be recognized non compliant to the requirements of this standard. It is allowed to subject the head and bottom rails by the piece to macro control and sorting.

When sport liquation in other rails (not head with mark "1") are found, all rails of controlled melting should be recognized non compliant with the requirements of this standard.

2.9 Head (with mark "1") and bottom (with mark "X") rails when controlled by piece the macrostructure which do not meet the requirements of para. 1.6 is found, should be recognized as non compliant to the requirement of this standard.

2.10 Chosen by the inspector of the Ministry of Railways 6 samples from head and bottom rails of any melting out of each thirty rolled melting should subject to control for the absence in the rails local concentrations of non metallic inclusions as lines. (para 1.5).

2.11 Rails of group I of those meltings at control of which local accumulations of non metallic inclusions as lines(para 1.5) of length more than 2,0 mm but not more than 8,0 mm can

be found at least on one of the micro section metallographic specimen are to be referred to the rails of the first grade group II.

2.12 Rails group I and II of those melting when local accumulation of non-metallic inclusions as lines (para 1.5) of 8,0 mm of length can be found at least on one the micro section metallographic specimen should be referred to the rails of the second grade.

2.13 Rails which did not go slow cooling or isothermal treatment to prevent flakes formation as well as those which were treated with violation of the regimes which provide the absence of flakes are to be considered non compliant with the requirements of this standard. When flakes are found in the rails which undergone slower cooling or isothermal treatment, all the rails of this melting are considered to be non compliant to the requirements of this standard.

2.14 If results of hardness control of the rails ends do not meet the requirements of para 1.7, it is allowed:

2.15 If at the control for hardened layer at least at one of the templates(para. 3.13 -3.17) or outer examination of the hardened rails ends the structure of overheating area of martensite, hardening cracks or hardening of other elements of the profile, except the head surface are to be found, the rails of this melting or part of the melting which undergone the hardening on this hardening facility, the cutting of the ends can be done and per smelting control of the rails ends are carried out until the receiving the stable satisfactory results after which the control is introduces in accordance with para 3.13 – 3.17.

Stable satisfactory results are the results when during the day at per melting control of the hardened rails ends no deviation from the requirements para 1.7 is not found.

2.16 In case of deviations from the right configuration of the hardened area not dangerous for the work of the rails, these rails are allowed to be accepted in accordance with para 1.7 as the rails with the not hardened ends. Non dangerous deviation for the work rails from the right configuration of the hardened area are to be considered the following:

- Insufficient length and depth of the hardened layer;
- Asymmetric location of the hardened layer in cross section without its transition lower the round place of vertical lateral edges to the surface of rolling;
- Deviation of the hardened zone from the end of the rail more than 4,0 mm.

2.17 Testing for durability of the base by static load (para 1.13) is optional.

2.18 Rails quality control and their commissioning is done by the technical control department of the manufacturer. Technical acceptance of the rails is done by the inspector of the Ministry of the Railways.

2.19 An inspector of the Ministry of Railways is entitles by the right to control at random the technology of rails manufacturing, make samplings of any melting and to do jointly with rails quality control department necessary additional testing and checking the quality of produced rails.

2.20 Standard technological instruction on all the stages of manufacturing of the rails should be approved by the Ministry of the USSR and and to inform the Ministry of the Railways.

3. Testing methods.

3.1 Linearity (para.1.9), dimensions and bolt holes (para. 1.1, 1.11) of each rail should be checked with the relating tools and templates of the manufacturer, agreed with the inspectors of the Ministry of Railways. If necessary linearity of the rails should be measured on the testing rack when the rail rests on the base.
Control of the surface conditions and ends of each rail (para 1.10 -1.11) should be carried out by visual inspection. If necessary the availability and depth of surface defects and separations in the ends are checked by testing chipping out or other way which guarantee the correctness of the determination.
Separation or splitting of the chips when being chipped can be considered as the sign of defect.

3.2 To determine in steel the content(para. 1.1) carbon – due to GOST 22536.1 -77, manganese due to GOST 22536.5 -77, silicon – due to GOST 22536.4 -77, phosphorus due to GOST 22536.3 -77, sulfur due to GOST 22536.2 -77, arsenic due to GOST 22536.6 -77.
Selection of tests to define chemical content of the rail steel are done under GOST 7565 – 81. Due to the requirement of the inspector of the Ministry of Railways the control chemical analyses of the selected by him rail should be done, and for analyses the chips which were received due to the chipping out of the rail end along the cross section.

3.3 Testing for tension (para 1.3) should be carried out under GOST 1497-73) on proportional cylindrical samples by the diameter of do = 15 mm with the estimated length lo = 150 mm, which should be turned along the direction of rolling probable close to the surface from the upper angle of the head of the rail bar.
One sample should subject to initial testing, for which the rail bar under the choice of the inspector of the Railways Ministry is selected in hot state from ten smelting rolled for the rails or from the head end of the head rail with the mark "1" after the removal of the hardened end. If the result of the initial testing does not comply with the requirements of para 1.3 retesting is carried out of two samples from two other bars chosen by the inspector of the Railways Ministry, from two rails with the mark "1" of the same smelting after the removal their hardened ends. Rail bars should be marked by the number of a smelting and the mark of the inspector.

3.4 For initial testing of the rails for hammering under impact (para 1.12) of one of the rail bars of each smelting under the choice of the inspector of the Ministry of the Railways followed the normal cutting of the shrinking end of the bar or from the head rail with the mark "1" after removal of the hardened end one should cut testing bar 1,3m of length which marked by the number of the smelting and the mark of the inspector of the Ministry of the Railways.

3.5 Testing rail bar is laid by the head upward on the supports with radius of 125 mm and the distance between then 1m and hammer if once with the ram with the mass of 1000 kg(with round block head of a hammer with the radius of 125 mm), falling from the height:

8,2 m – for the rails P75 type;
7,3 m – for the rails P65 type;
6,1 m – for the rails P50 type;

After hammering it is necessary to measure sag relating to the ruler of the edge 1 m of length, which attached to the surface of rail head rolling, at this it should be taken into consideration the sag of the bar before testing.

Results of the sag measuring are not the reason to reject the rails but can be the base for testing of the steel for tension.

If the results of the initial testing for hammering do not meet the requirements of para 1.12 then from the shrinking end of the rail from which the sample was taken for the initial testing and from shrinking end of other head rail of the same smelting one testing bar is taken for another hammering testing. In case of unsatisfactory results of the second testing concerning at least of one of these bars, then two more testing bars taken from the same rails at the distance from their shrinking ends not more than 12,5 m should be subject to the third testing.

3.6 Samples for each smelting macro control of the rails (para 1.6) should be cut from the head and bottom rail bars in hot condition followed the normal cut of their shrinking and bottom ends or from shrinking end of the first head rail with the mark"1" and from the bottom end of the last rail from the ingot with the mark "X".

3.7 To discover macrostructure from the selected samples (para 3.6) by the methods of cold treatment (gouging, grinding) in accordance with GOST 10243-75 transverse macro templates of full section of the rail are made.

3.8 Macrostructure of the rails (para 1.6) should be revealed deep pickling in hot (60-80 degrees C) water(50%) solution of hydrochloric acid with the density of 1,19kg/m3. Macro templates for deep pickling are submerged into the water solution of the acid on heated state (up to 60-80 degrees C) of the controlled surface upward. The water of the acid solution of the controlled surface of a macro template should be at least 2 cm. pickling of macro templates should be done before full revealing the macro structure but at least 20 min.

3.9 When each piece of the macro structure of the rails is controlled, selection of samples, production of macro templates, revealing of macro structure should be done in compliance with para. 2.8, 3.6 -3.8.
It is allowed to do the revealing of macro structure by making sulfur mark under Bauman directly from the ends of the controlled rails after the corresponding preparation.

3.10 Evaluation of macro defects and structures of overheating of the hardened layer at the rail ends should be done according to the specimen agreed by the manufacturer with the Railways Ministry.
(Changed edition, Change # 1)

3.11 Samples for control to reveal the absence of accumulation of non metallic inclusions, elongated along the direction of rolling as lines (para 1.5) can be taken from the rails or rail bars in hot state after their normal cutting from the head and bottom ends. Selected samples should be marked by the number of the smelting and the mark of the inspector from the Railways Ministry. From each sample selected by means of cold treatment or any other method which does not change the structure, micro section metallographic specimen with the length at least 35 mm should be produces in accordance with the drawing. Polished plane of micro section metallographic specimen must be strictly parallel to the direction of the rolling and removed from the lateral edge of the rail head for 15 mm.

3.12 For local accumulation of non-metallic inclusion as lines (para1.5) one can take the visible on the polished surface of the micro section metallographic specimen a group of dotted or continuous inclusions elongated along the direction of the rolling.

When evaluating the length of the lines under the metallographic microscope (enlargement 90 110x) or binocular microscope (at small enlargements) broken line is evaluated as a continuous one if:

Total distance between individual groups of inclusions located on the same line does not exceed the total length of these groups;

Parallel located groups of inclusions mixed relating each other at the distance of not more than 0,5mm.

3.13 Hardness of the surface of hardened ends (para 1.7) of the rails should be determined under GOST 9012-59 on the middle longitudinal line of the rolled surface and at the distance at least 20 mm from the rail ends. It is allowed to determine hardness by indestructible control methods.

Hardness of the hardened rails ends when hardened with smelting heating one should determine at each end of three rails or one end of six rails from each smelting selected by the inspector of the Railways Ministry.

When hardening the rail ends with induction heating by the current of high frequency the hardness is determined on the both ends of the three rails from each smelting selected by the inspector of the Railways ministry.

The place to determine hardness should be hollow scraping bright without burns and scales at the depth of to 0,8mm. When having unsatisfactory mark it is allowed to do repeated hardness determination on the same rail by two marks at that the values of their hardness should be I within the limits provided in para 1.7.

3.14 For control of correctness of configuration for the hardened zone, the structures of hardened ends and absence of hardened cracks on one and the same rail of one smelting from fifty under the selection of the inspector of the Railways Ministry two samples are selected with the length 100-200 mm which are marked by the number of the smelting and the mark of the inspector.. From selected specimen by the method of cold treatment (gouging, grinding) in compliance with GOST 10243-75 one longitudinal template of the rail head is made, the surface of which coincide with the symmetry plane and one transverse template of full section.

For cutting templates on the surface of the rail head for the selected samples hardness under Brinell under GOST 9012-59 is measured. Marks for hardness measurements should be located in three rows in checkerboard fashion in each 200mm by length at least 100 mm.

Note. It is allowed for the manufacturer where more than 70% of produced rails are subject to hardening along the whole length to make control of hardened ends without thermal treatment along the whole length of the rails not less than two times a month irrespective of a number of smelting.

3.15 Control for length, depth and location along the whole length of hardened zone, gradual transition of hardened metal to un hardened area (para 1.7) is made by the measurement of hardness under Rockwell under GOST 9013-59, scale C:

- in longitudinal direction on longitudinal template, at the distance of 5 mm from the surface of the hardened layer in each 3mm by length at least 100mm;
- in transverse direction at the distance of 20, 40, 60 and 80 mm from the end of the rail on the symmetry axis of the transverse template in 2 mm (in checkerboard fashion) on all the depth of the hardened layer and transition zone of the hardened metal toward unhardened one.

3.16 Configuration of the hardened zone and hardening cracks (para 1.17) should be checked after hardness measurement (para 3.15, 3.16) by pickling of longitudinal and traverse templates in 15% water solution of nitric acid.

3.17 For macro structure control and absence of overheating of the hardened layer on the rail ends) para 1.17) one should select one micro section metallographic specimen from the same sample from which the transversal template is cut (para 3.14). Micro section metallographic specimen should be cut along the symmetry axis of the rail head on the whole depth of the hardened layer and the zone of transition of the hardened metal toward unhardened one .

3.18 Control of rails for flakes (para 1.5) should be done by ultrasound flaw detector or by deep pickling of longitudinal templates of the length 200 ±20 mm cut on the vertical plane of the rail symmetry. The order of samples selection. Method of revealing of flakes and frequency of rails control for flakes is due to the instructions agreed by the manufacturer and the railways Ministry.

3.19 Testing for static sagging of the base (para 1.13) should be done on one of the specimen rail bar with the length of 100 ±10 mm, selected under the instruction of the inspector of the Railway Ministry from the bottom end of the last rail from the ingot of the ten-th smelting. When enough powerful; presses are not available it is allowed to test two bars of the length up to 50 ±5 mm.

While testing specimen of the rail bar, marked by the number of the smelting and the inspector's mark one should set up the edges of the base on two roll supports. The distance between the supports' axes should be:

- 120 mm for the rails P75 and P65 types;
- 100mm for the rails P50 type.

The load on the rail head should grow smoothly until receiving the base sagging for 4mm. In the test certificate one should indicate; dimension of the testing, unit load for 1 cm of the sample length when the required sagging was received or the sample was broke down; nature of the sample destruction, type and dimensions of visible defects on the surfaces of the base destruction.

3.20 The results of the acceptance quality control for the rails should be included into the ACTs(certificates) signed by the representative of the manufacturer And inspector of the Railways Ministry.

4. Marking

4.1 On one side on the middle line of the web of each rail there should be embossed(not less than 1mm) with smooth transition figures and letters with the height from 30 to 40 mm in the following order:

- marking of the manufacturer, agreed with the Customer;
- month(by Latin figures) and two last figures of the year for rails
- production;
- type of the rails;
- marking with an arrow the head end.
-

In addition to it is allowed to make not more than 4 marks as embossed dots with the diameter from 2,0 to 3,0 mm, with the height of about 1mm.

4.2 On the web along each rail axis (on the same side, where embossed marks are situated) should be put in hot state the following:

- number of the smelting, in 2-6 places along the rail length at the distance not less than 1,0 m from its ends (number of smelting of the rails group I should begin with the letter "П");
- marking of the ordinal number of the rail;
- figure "1" at the distance of 1-2 m from the ends of the first head rails rolled from the shrinking part of the ingot;
- figure "2" at the distance of at least 1,0 m from the ends of the second head rails;
- mark "X" at the distance of at least 1,0 from the bottom ends of the rails rolled from the bottom part of ingot.

4.3 Marks, put on the neck of the hot rail should be of the height of 12,0 mm and deepened into the body for 0,8 -1,5 mm. They should be clear without sharp forms of the marks contours and their tops. The distance between the marks should be 20-40 mm.

It is not allowed:

- to put or correct the marks and markings in cold condition;
- to put additional marks and markings on the lateral surfaces of the rails and in the places which were not specified by this standard.

4.4 After finishing the rails on one end of the rails through marking in cold condition should be put the following:

- number of the smelting on the end of the base;
- marks of the head and bottom rails on the end of the upper quarter of the web.

4.5 On each accepted rail of the first and second kind(grades) there should be put in cold condition the following:

- Marks of acceptance by the inspector of the Railways ministry and technical control of the manufacturer on the end of the rail head;
- Mark on the hardening of the rail "K" on the end of the lower quarter of the rail web.

4.6 Accepted first grade(kind)rails should be marked by contour of acceptance marks on the head contour by washfast paint;

- blue color - the rails of group I;
- white color – the rails of group II;

Accepted rails of the first grade additionally should be marked:

With hardened ends by the transverse band with the width about 20mm, put on the surface of the rail head at the distance about 0,5 m from the ends with acceptance marks by washfast paint;

- blue color - the rails of group I;
- white color – the rails of group II;
- hard (para 1.4) by yellow washfast paint at the ends width the acceptance marks of upper surfaces of the base at the length of 100 mm.

Shortened rails of the first grade for the laying in the curve parts of the line should be marked by white paint(blue paint for the rails of group I);

- rails with the length of 24,92 and 12,46 m by painting portion of the ends of both edges of the base;
- rails with the length of 24,84 and 12,42 m by painting of the portion of the ends of the edges of the base.

4.7 The end of the base and half of the end of the web of accepted rails of the second grade should be painted by the washfast paint and on both ends of these rails two bases (pivot) should be embossed.

4.8 On both ends of the rail head which do not meet the requirements of this standard three center-pops (pivots) should be embossed and the ends should be painted by dark blue washfast paint.

4.9 It is allowed additional marking by washfast paint the rails of different length ordered for switches and other purposes.
The form of such marking, colors of paints and places on the rails are agreed due to the agreement between the Customer and manufacturer.

4.10 Shipped to Customer rails should be accompanied with the documents (Certificate of technical fitness(worthiness of the rails) signed by the representative of the manufacturer and inspector of the Railway Ministry, proving the compliance of the rails with the requirements of this standard in which it should be indicated:

- mark of the manufacturer ;
- numbers of standard in compliance with which the rails were manufactured and accepted and number of the order;
- grade and type of rails;
- marks or description of acceptance marks and marking of rails by paints;
- number of rails with indication of their length and weight;
- name and address of addressee (recipient)

GOST 18267-82
Rails P50, P65 and P75 types for wide gauge, heat treated through oil quenching.

Non-observance of the standard is persecuted under the Law.

This standard covers rail R50, R65 and R75, made of martencite high carbon steel subject to heat treatment on all the length by three dimension hardening in oil quenching with further tempering.

1 Technical requirement

1.1 Rails for heat treatment should meet the requirements for the rail of the first sort(grade0 made under GOST 24182-80(except the ends hardening); GOST 8161-75, GOST 7174-75, GOST 16210- 77(except the dimensions along the length in each of the standards)
It is allowed to subject to hear treatment the rails of the second sort(grade) made under GOST 24182-80 under the agreement between the manufacturer and the Customer. Hardened rails referred into the second sort due to surface defects are intended only for the laying on the railways which do not belong to the Ministry of Railways.

1.2 Chemical content of the rail steel should be in compliance with GOST 24182-80.

1.3 Rails after heat treatment should meet the requirements of GOST 24182-8-, GOST 7174-75, GOST 8161-75 and GOST 16210-77.

1.10 Faces with the dimension not more than 3x3 mm along the contour of the head and the web and not more than 5 x 5 mm on the contour of the foot through edge dressing of the rails ends . On the rails with the bolt holes beveling on the top and bellow of the head is required.

1.11 Hardened rails should be divided into the rails of the first and second sorts. First sort rails are divided into the rails of first group of the first and second class and the second group of the first and second class. Rails division into the groups and sorts are under GOST 24182-80.

1.12 Heat treated hardened rails cab be referred to the rails of the first class which meet the requirements of para 1.1-1.9.

1.13 Rails can be referred to the second class when being accepted and commissioned the following deviation were found:

- reduction of hardness on the rolled surface up to HB 311;
- variations of hardness along the length of the rail up to HB 50;
- reduction of temporary resistance on the longitudinal samples to 1098 MPa (112 kgm/mm2);
- reduction of impact elasticity to 0,15 MDj/m3 (1,5 kgc.m/sm2);
- for the rails with the length of 25 m: with the bolt holes ±15 mm;
- for the rails with the length of 25 m: without the bolt holes +15 - 20mm;
- for the rails with the length of 12, 5 m: to ±1o mm ;
- ends contortion(curvature) in horizontal plane, the rails with bolt holes to 1,0mm.

1.14 Rails which meet the requirements for the rails of the first class can be referred to the highest quality category and it is allowed to attest them for the State Quality Mark.

2. ACCEPTANCE RULES AND METHODS OF TESTING

2.1 Acceptance tests and acceptance control for hardened rails should be done for each smelting (fusion). Rails of the fusion heat treated under one regime during 10 days are taken as rail of one and the same fusion. Rails heat treated with big time lag are taken as the rail of different smelting(fusions). Under the agreement between the manufacturer and the Consumer it is allowed to form for the heat treatment a lot(batch) of rails of different smelting in the volume not mere than 100 pieces. The volume and the procedure of acceptance control of such lot is in compliance with the smelting.

Note: In accordance with GOST 24182-80 each ladle is considered to be independent smelting. Two ladles from one and the same furnace - related smelting(fusions).

2.2 All hardened rails undergo visual examination to detect outer(visual) defects and measurement under GOST 24182 -80, GOST 7174-75, GOST 8161-75 and GOST 16210-77.

2.3 All hardened rails intended for the laying on the railways of the Ministry of the Railways subject to nondestructive check to find inadmissible inner defects under GOST 24182-80 in accordance with GOST 18576-80. Norms of admissible defects should meet the requirements of the control documentation approved in the established order.

2.4 Acceptance tests are carried out I as follows:

- in compliance with the requirements of para 1.4 to determine hardness on the rolling surface – 5% of hardened rails from two related smelting but not less than 3 pieces; it is allowed to determine the hardness of each 20-th rails during the technological process;
- in compliance with the requirements of para 1.4 to determine hardness along the cross section – one rail from one of the related(adjacent) smelting;
- in compliance with the requirements of para 1.5 when controlling the micro structure- one rail from each 20-th smelting. When in the smelting head rails are not available it is allowed to test any rail of such smelting;
- in compliance with the requirements of para 1.6 when testing for the tension- 2 samples cut in longitudinal direction, second in transverse direction concerning the longitudinal rail axis, per rail from each 20-th smelting;
- in compliance with the requirements of para 1.7 for hammering test – one sample bar from the head rail from two adjacent smelting which underwent heat treatment and straightening;
- in compliance with the requirements of para 1.8 when controlling residual tensions – one sample rail bar selected from one of the ready(finished) (hardened or straighten) rails of each 40-th smelting, but at least one time a whole day.

2.5 Technical acceptance of the rails is carried out by the inspection pf the Ministry of the Railways under the relating technical documentation approved in the established order.

2.6 Control over chemical content of the rails is under GOST 22536.0-77 – GOST 22536.6-77 and other methods which underwent metrological attestation under GOST 8.010 -72. Selection of the specimen for chemical content control is under GOST 7565-81.

2.7 Hardness on the rolling surface and on the cross section of the rails (para 1.4) are under GOST 9012-59.

Peculiarities of hardness control on the rolling surface of the rail in the condition of the plant is determined by the method agreed between Ministry of Ferrous Metals of the USSR and the Ministry of Railways. It is allowed to measure the rails hardness by magnetic method.

Hardness on the rolling surface is determined along the middle line of the head on both ends at the distance of not more than 1m from the ends and middle part of the rail. The place for hardness determination should be cleaned from scales (calx) and without carbon layer of metal.

Hardness on section of the head, web and foot is controlled on transverse template. Template with the width of 30-50 mm is cut at the distance of not less than 150 mm from the end of the hardened rail. Hardness on template is determined in five points; in the head at the distance from the rolling surface 8 and 16 mm, in the middle of the web, on the blade of foot at the distance of 8 mm from its edge and on the rolling surface. Rolling surface of the template should be cleaned to remove the layer without carbon.

If the results of hardness measurement do not meet the requirements of para 1.4, then it is allowed to carry out the repeated test of hardness on the same rail by two prints.

When there are unsatisfactory results at the second hardness test it is allowed at least one printing:

- per piece to sort due to hardness all the rails of the given smelting(at smelting control) or 10 rails before and 10 after the 20-th number of rail(at the control over each 20-th rails);
- to submit as the rails of second class or to make another single heat treatment (hardening and tempering) with the subsequent control under para. 1.4 – 1.9 on the doubled number of specimen of the rail the hardness of which on the rolling surface is lower then minimal norm;
- to subject to the repeated tempering with the subsequent hardness control the rails the hardness of which is higher of the maximum norm;
- to hand over under GOST 24182 – 80 the rails the hardness of which is lower than minimum norm for the second class.

2.8 Micro structure (para 1.5) is tested on micro section metallographic specimen cut from the upper part of the rail head.

2.9. Tests for tension (para 1.6) are under GOST 1197-73 on cylindrical samples by the diameter do =6 mm and calculated length lo = 5do or on the samples lo = 10 do, the first type of the sample is more preferable. The specimen are turned in the direction of smelting from the upper angles of the head and crosswise the rolling direction of the end of the finished rail with the mark "1" which nore nearer to the surface and at the distance not less than 150 mm from the end of the rail. If the rails after testing for tension do not meet the requirements of para 16, then repeated test should be carried out on the double number of the samples of this smelting.

When there are unsatisfactory results of the second test(at least of one of the samples) all the rails of this smelting are allowed to be subject:

- single full heat treatment(hardening and tempering) with the subsequent control of all the parameters(properties) under para 1.4-1.6)
- single additional tempering with the subsequent control for hardness and mechanical properties under para 1.4 and 1.6.

Rails of the smelting which have unsatisfactory results of the tension test of reduced hardness, are allowed to submit as non hardened rails under GOST 24182-80.

1.10 Samples for impact elasticity test (para 1.6) are to be cut along the direction of the rolling from the upper angles of the head crosswise the direction of rolling the most close areas to

the surface. Tests are under GOST 9454-78 on the samples of the dimension 10x 10 x 55 mm with the cut R=5,0 mm with the depth of 2,0 mm of transverse. The cut on the samples are done on the surface of head of the rail rolling. If the rails after impact elasticity tests do not meet the requirements of para 1.6, then the repeated tests should be done on the double number of the samples for the checked smelting on the two specimen for the adjacent one. Each adjacent smelting is attested separately when tested repeatedly. When there unsatisfactory results of the second test(at least on one of the specimen) the rails of this smelting are allowed to be subject to:

- Additional furnace tempering with the subsequent control for hardness and impact elasticity under the para 1.4 and 1.6.
- Single full heat treatment (hardening and tempering) with the subsequent control of all the parameters under the para 1.4 – 1.6 on the double number of the samples.

The rails of the smelting which have the impact elasticity lower than the norm o,15 MJ/m2 it is allowed to subject to high tempering and hand them over after control for hardness (hardness should be YB 255... 302) as non hardened rails under GOST 24182 -80.

2.11 One specimen of the rail bar with the length of 1,3 m should be subject to hammering test (para 1.7), selected from the head end of one of the head rail from two adjacent smelting.

The width of groove should be 5-7 mm. Difference of the groove is determined due to the change of the height of the sample rail bar at the cut end before and after cutting. When there are unsatisfactory results of the test 20 rails are subject to the repeated tempering before taking specimen and 80 rails after with the subsequent hardness control and residual tension of this rails (para 1.4 – 1.8)

When the results do not meet the requirements of para 1.4 and 1.8, the rails should be subject to high tempering for hardness HB 255... 302 and be accepted under GOST 24182 - 80.

2.13 End curvature of the rails and vertical planes downward and in horizontal (para 1.9) are measured through applying the ruler of the length of 2 m to the straight part of the rail at a tangent and to determine clearance between the ruler and the end of the rail.
When there is curvature at the end in vertical plane upward the value of curvature is measured by the determination of the clearance between the ruler and the head of the rail at the distance of 350 -400 mm from the end.

3. MARKING

3.1 Additionally to the marking under GOST 24182 -80 on the hardened rails along the web on hot state the conventional sign is being put which differ the hardened rails from non hardened. This mark represent by itself the ring with the outer diameter 15-20 and inner diameter 12-15 mm. The mark is put in the middle part of the web at the distance of 1-3 m from each end of the rail from the place where number of smelting is put and at the depth os about 1mm. The rails underwent high tempering and handed over as non hardened, this mark should be removed.

3.2 On the end of each accepted hardened rail through the cold marking there should be put:
Marks of the inspector of the Ministry of Railways and Quality Control
Section of the manufacturer;

3.3 At the distance of 0,7 -1,0 m from the end of the rail where the acceptance marking was put, transverse strip of the width about 20 mm should be done by the oil paint of pistachio color

(light- green) on the web of all the hardened rails. Character image of the state Quality Mark under GOST 1.9-67 is put by washfast paint on the web of the rails near the marking strip. Acceptance marking being put on the end of the head of the rails accepted by the inspection are painted :

- on the rails of the first group by the blue paint, additionally the transverse strip of the pistachio color(light green) is put on the web of the end of the rail of the first class, the second class – transverse strip of the yellow color.
- On the rail of the second group – by white paint, additionally the transverse strip of pistachio color (light green) paint on the web of the end of the first class rails, the second class by the transverse strip of the yellow color.

The foot and half part of the web of rails ends for the second class are painted by the pistachio color(light green) paint.

3.4 The rails should be accompanied with the documents signed by the representatives of the manufacturer and the inspector of the Ministry of the Railways certifying the compliance to the requirements of this standard and contain:

- the name of manufacturer;
- the name of production and way of heat treatment;
- type, class and group of rails;
- steel brand, from which the rails were manufactured;
- indication of this GOST;
- printing or description of the acceptance marks as well as the description of marking the rails by paints;
- number of rails with indication of their length;
- name and address of the Consumer;
- image of the state Quality Mark under GOST 1.9 -67

Due to the requirement of the Consumer he should be given additionally number of smelting, results of chemical analysis and acceptance tests.

GOST 10629 -88

Prestressed reinforced concrete sleepers for 1520 mm gauge railways.

Standard non-observance is prosecuted under the Law.

This standard covers prestressed reinforced concrete sleepers for 1520 mm gauge railways and rails R75,R65 and R50 on which standard rolling stock of the general railways network of the USSR is running.

1. Technical Requirements

1.1 Sleepers should be made in accordance with the requirements of this standard under the technological documentation approved in the established order.

1.2 Basic parameters and dimensions.

1.2.1. Sleepers depending on the type of the rail fastening are divided into:
Ш1 - for the separate fastening (type КБ) with bolt fastening of the baseplate to the sleeper;
Ш2 - for clip-bolt rail direct fixation fastening (БПУ type) with bolt fastening of the baseplate or rail to the sleeper.

1.2.2. Form and dimensions of sleepers should be in compliance with the indicated in Table 1 and on the drawing 1-4. Performance of sleepers material capacity are shown in Annex 1.

Table1

Sleeper's grade	Distance between supporting edges of both ends of the sleeper a, mm	Distance between supporting edges of one end of the sleeper a1, mm	Distance between axes of holes for bolts, a2,mm	Distance between the axis of holes and supporting edge , a3, mm	Tilt angle of the supporting edges	Direction of bigger side of the hole for the bolt concerning longitudinal axes of the sleeper
Ш1-1	2012	404	310	47	55	Transverse
Ш1-2	2000	392	310	41	72	Ditto
Ш2-1	2012	404	236	84	55	longitudinal

Note:

1. On the edges, adjusting to foot and ends of the sleeper, faces are allowed with the width of not more than 15 mm.

2. Due to the agreement of the manufacturer and the customer it is allowed to produce the sleepers the dimension and locations of recesses on the foot are different from those on the drawing 1, and the form and dimensions of vertical grooves for bolts plates are different from those indicated on the drawing 2-4.

3.
1.2.3 Sleepers are marked by the marks in compliance with the requirements of GOST 23009, Mark of the sleeper consists of two letter-figure groups divided by dash.

The first group contains the designation of the sleeper type (para 1.2.1)/ In he second group the option of sub-rail area performance is indicated (Table 1).

The example of the legend (mark) of Ш1 type sleeper, first option of sub-rail area:

Ш1 – 1

1.2.4. Depending on crack resistance, precision of geometrical parameters, quality of concrete sleepers surfaces are subdivided into two types (sorts): first and second.

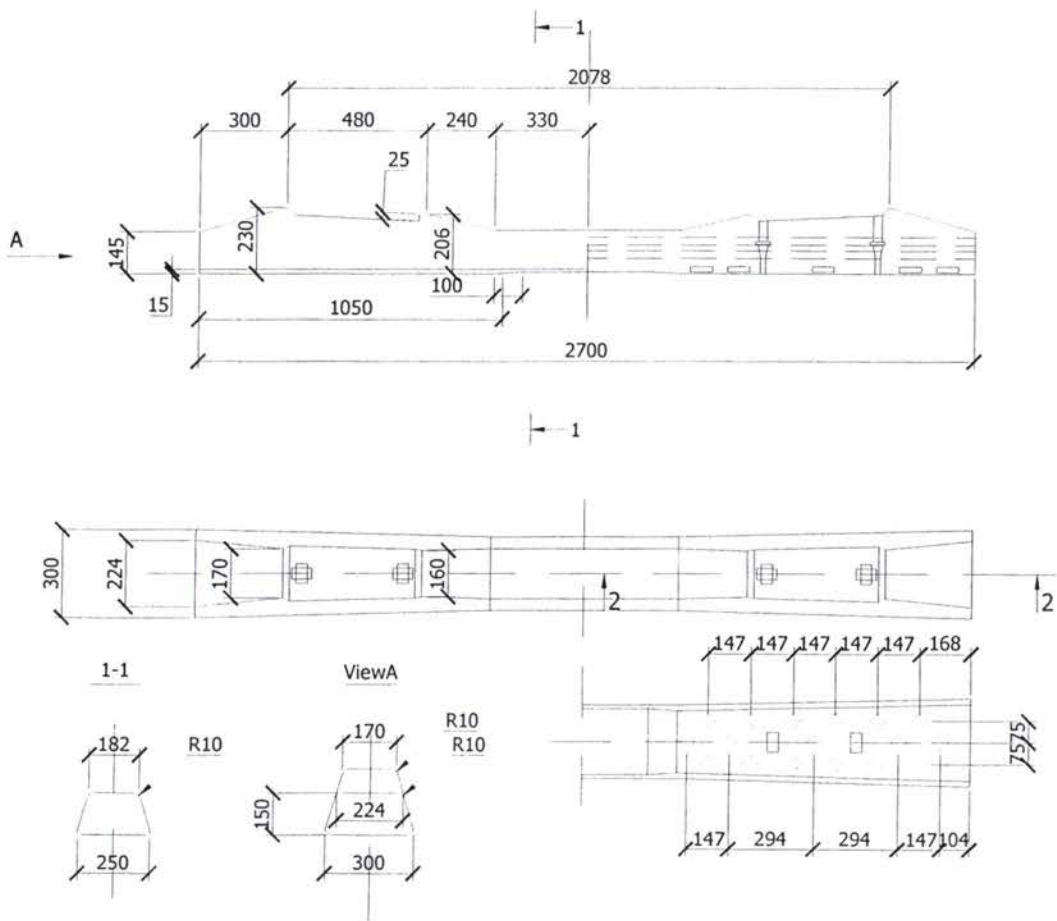
Sleepers of the second sort are intended for the laying on the line carrying little traffic, station and siding lines. Second sort sleepers are produced only due to the customers consent.

1.3. Characteristics

1.3.1. Sleepers should meet the requirement for crack resistance adopted when designing, and take test control loads indicated in table 2.

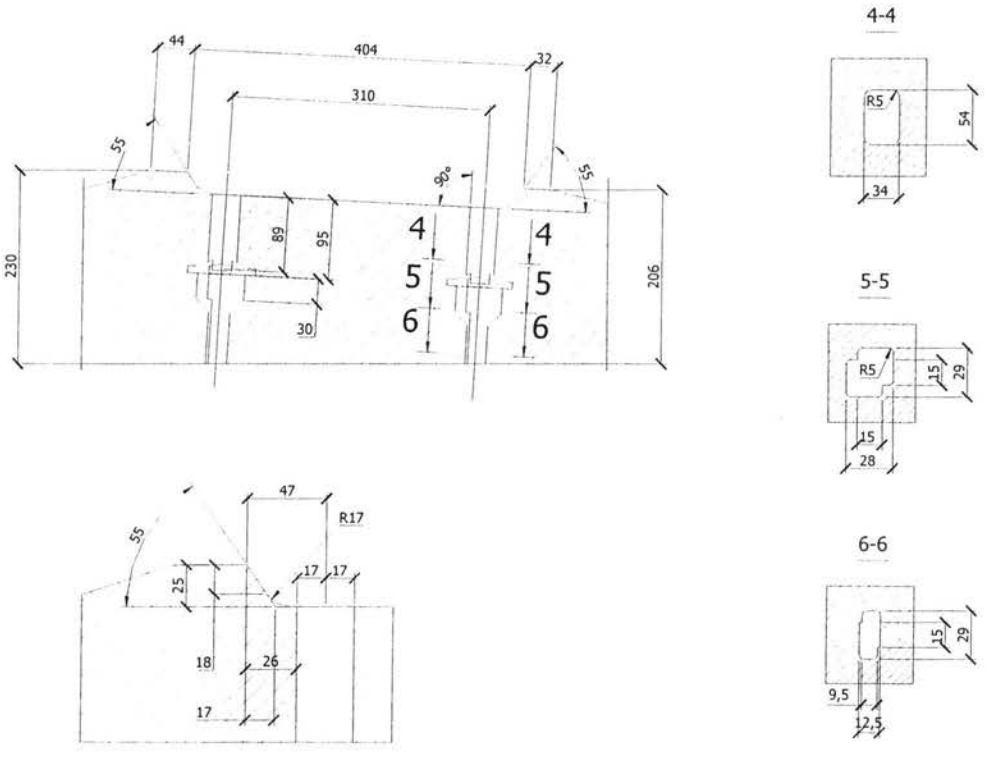
Table 2

Tested cross section of the sleeper	Control load, kH (тс), for sleepers	
	the first sort	the second sort
Sub-rail	130(13,2)	120(12,2)
Average(middle)	98(10,0)	88(9,0)



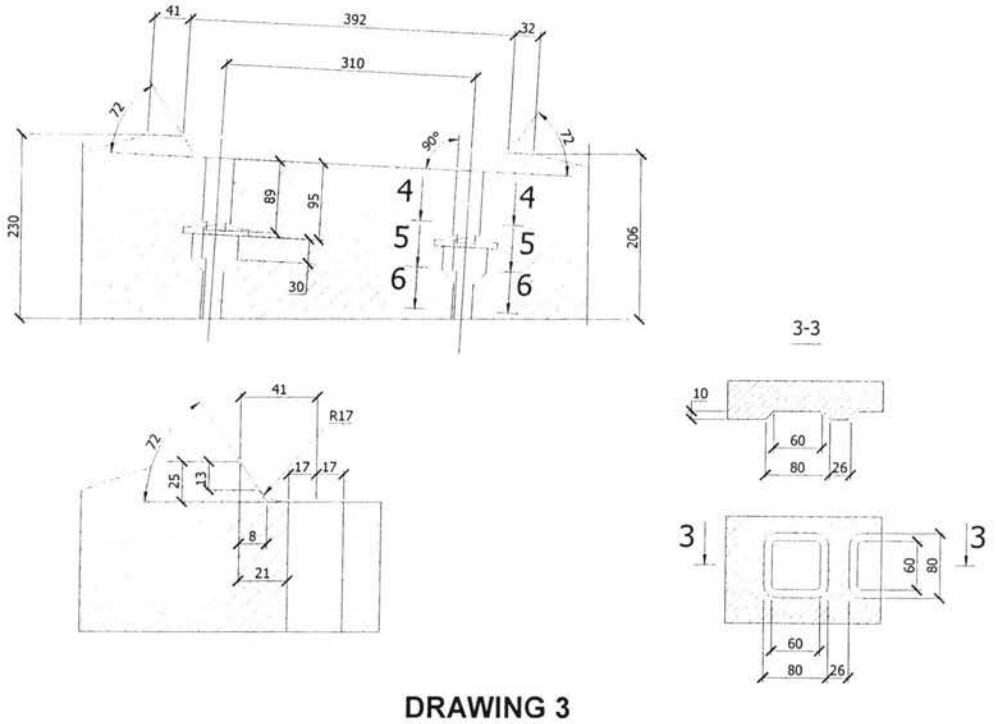
DRAWING 1

Under rail part of the sleeper



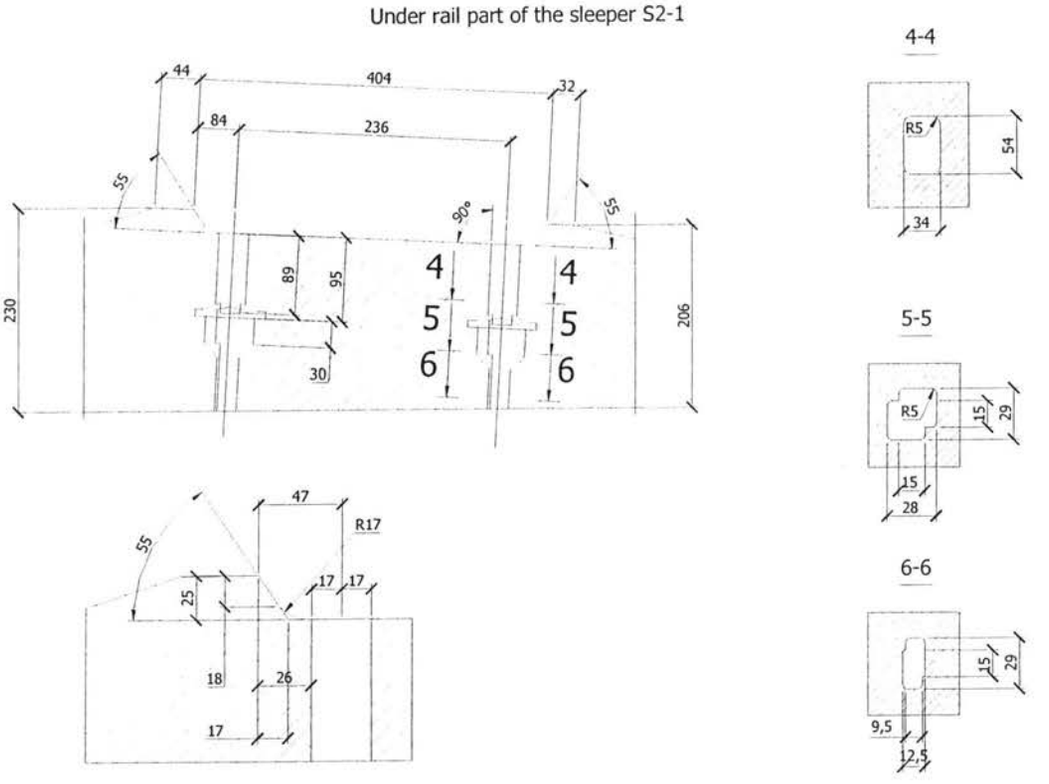
DRAWING 2

Under rail part of the sleeper S1-2

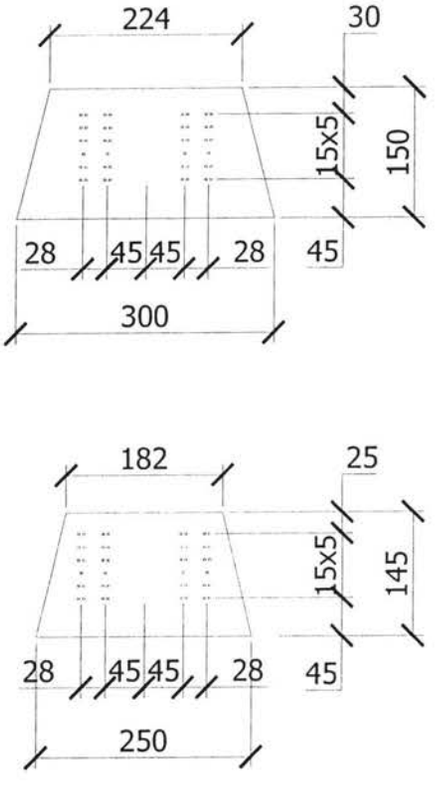


DRAWING 3

Under rail part of the sleeper S2-1



DRAWING 4



DRAWING 5

1.3.2. Sleepers should be made of hard concrete under GOST 26633 class of durability(strength) for pressure test B40.

1.3.3. Actual durability(strength) of concrete (design age, transmitted and handling) should be in compliance with the requirements of GOST 13015.0.

1.3.4. Normalizable handling strength of concrete should be equal to 32 MPa (326 kgs/sm2)

1.3.5. Handling strength of concrete is equal to transmitted strength of concrete.

1.3.6. Mark of the concrete for frost resistance should be not lower F200.

1.3.7. For concrete of the sleepers ballast of natural stone or gravel ballast of fraction 5-20 mm under GOST 10268 should be used. It is allowed with the agreement between the manufacturer and the customer to use:

- ballast with fraction 20-40mm in the amount of 10% from the ballast mass of fraction 5-20mm under GOST 10268;
- ballast from the natural stone of fraction 2-25 mm under GOST 7392 being in compliance to all other of its requirements of GOST 10268.

1.3.8. As reinforcement of the sleepers steel wire of die-rolled section class Bp with 3mm of diameter should be used under GOST 7348 and TY 14-4-1471-87.

1.3.9. Nominal number of reinforced wire in the sleeper 44. Distribution(placement) of wires, controlled at the ends of a sleeper should be in compliance indicated on the drawing 5. The distance on vertical line in the light between pairs and separate wires, in case of their deviation from the design location should not be less than 8 mm. Wires pairs turn for 90 degrees is allowed when the indicated above distance is kept.
To provide design location of the wires separating spacers can be used which were left in the concrete body of the sleeper(see Annex 2) Due to the agreement between the manufacturer and the customer it is allowed to use spacers different from the indicated in Annex 2.

1.3.10. General strength of the initial tension of all reinforced wires in the packet should be not less than 358 kH (36,4 tc). Average value of strength of one wire initial tension at their nominal number should be 8,12 kH (827 kgc) Tension strength of separate wires should not be different from the average value more than 10%.
Reduction of tension strength of separate wires over 10% due to slippage of the wire in seizure should not be more than at one wire in the sleepers of the first sort and at two wires in the sleepers of the second sort.

1.3.11. Deviations from the nominal number of the reinforced wires are allowed provided their common strength of tension of the wires available is not less than indicated in para 1.3.10. At this the extreme deviations due to the number of the wires should not exceed ±2 pieces.

1.3.12. Ends of stressed reinforcement should not be protruded over the ends of the first sort sleepers surfaces more than 15 mm and the second sort sleepers – more than 20 mm.

1.3.13. Washers should be in compliance with GOST 23157.

1.3.14. Values of actual deviations of sleepers geometrical parameters should not exceed the maximum shown in table 3 .

Table 3

Description of the geometrical parameter deviation	Description of the geometrical parameter	Indicated deviation for sleepers	
		first sort	second sort
Deviation from linear dimension	Distance a	±2	+3; -2
	Distance a1	+2; -1	+3; -1
	Distance a2 and a3	±1	±1
	Depth of washer embedment into concrete	+6; -2	+6; -2
	Sleeper's length	±10	±20
	Sleeper's width	+10; - 5	+20; -5
	Sleeper's height	+8; -3	+15; -5
Deviation from linearity of the profile sub-rail area along the whole length or width	-	1	1

Note: Dimensions, for which the utmost deviation were not indicated, are the reference ones

1.3.15. Gradient of sub-rails areas toward the longitudinal axis of the sleeper in vertical plane running through axis (sub- gradient) should be within the limits 1: 18 – 1: 22 for the sleepers of the first sort and 1: 16 – 1: 24 for the sleepers of the second sort.

1.3.16. The difference of gradients of sub-rail areas of different end of the sleepers in transverse to the sleeper's axis direction (propellerness) should not exceed 1: 80.

1.3.17. Values of actual deviations of the width protective layer of the concrete until the reinforcement upper row should not exceed, mm:

+7 for the sleepers
- 5 of the first sort
+10 for the sleepers
- 5 of the second sort

1.3.18. Dimensions of blisters on the concrete surfaces and concrete chipping of the sleepers edges should not exceed the values indicated in table 4.

Table 4

View of the sleeper's surface	Utmost dimensions, mm							
	blisters				chippings of concrete edges			
	Depth		diameter (the most dimension)		Depth		Length along the edge	
	sleepers of the first sort	sleepers of the second sort	sleepers of the first sort	sleepers of the second sort	sleepers of the first sort	sleepers of the second sort	sleepers of the first sort	sleepers of the second sort
Sub-rails areas	10	15	10*	15*	15	30	30	60
Support edges of sub-rails areas	10	15	10**	15**	10	10	20	40
Upper surface of the middle part of the sleeper	10	15	30	45	15	30	30	60
Other parts of the upper surface	15	25	60	90	15	30	not regulated	not regulated
Lateral and end surfaces	15	25	60	90	30	60	ditto	ditto

* Not more than tree blisters on the same area
** Not more than a blister

Notes:

1. Marks from joint weld availability on the longitudinal edges of the sub- rails area between stationary sub-rails plates and form are allowed
2. Marks of diaphragms rigidity elements availability with the depth of not more than 5 mm is allowed

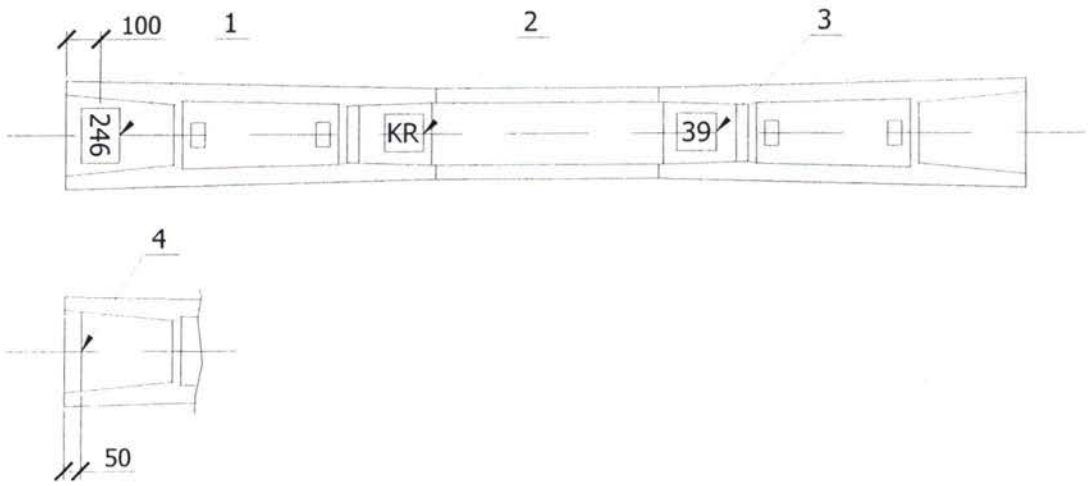
1.3.19. The depth of gaps (clearance) between the wires and concrete on the sleepers' ends should not exceed 45 mm for the sleepers of the first sort and 30 mm for the sleepers of the second sort.

1.3.20. It is not allowed in the sleepers:

- local overflow of concrete in the bolts holes, preventing from free fixation and turning these bolts into the working position;
- local overflow of concrete on sub-rails areas;
- turning of bolts of he rail fastening in grooves of the sleeper when the nuts are screwed up;
- cracks in concrete.

To form grooves(holes) for bolts the setting up of inner elements, construction are allowed and material of which are agreed with the customer.

Marking of the sleeper



DRAWING 6

1.4. Marking

1.4.1. Marking of the sleepers should meet the requirements of GOST 13015.2 and this standard.

1..4.2. When forming the following should put on the upper surface of the sleepers by punching:

trademark or short name of the manufacturer on each sleeper; year of manufacturing(two last figures) – not less than 20% of sleepers of each lot.

At the end part of each sleeper by red paint it is put:

- the mark of the Production Control Department;
- number of the lot.

1.4.3. The places of marking signs are indicated on drawing 6.

1.4.4. Marking signs should be done by the print with the height not less than 50 mm.

1.4.5. On the both ends of the second sort sleeper a transverse band with the width of 15 -20 mm(see drawing 6) is painted.

2. ACCEPTANCE

3.1. Acceptance of sleepers is carried out by lots in accordance with the requirements of GOST 13015.1 and this standard.

3.2. Sleepers are accepted;

- under the results of sampling tests – for the indices of concrete frost resistance and exactness of geometrical parameters of sleepers except the dimension a of sleepers Ш1-2;
- under the results of acceptance tests – for the indices of crack resistance of sleepers, concrete durability(concrete class for pressure durability, transmission and handling strength), condition of grooves for bolts, accuracy of dimension for sleepers of Ш1-2 type, quality of concrete surfaces of sleepers.

3.3. Sampling tests of sleepers for the indices of concrete of frost resistance are done once a year, for exactness of geometrical parameters – once a month.

3.4. Due to precision of geometrical parameters sleepers are accepted under the results of test sampling. When the volume of sleepers is 3200 pieces plan of test sampling should be under GOST 23616.

2.5 For the crack resistance test from each lot the control sleepers are selected in a number of 0, 3% but not less than 3 pieces. The lot is accepted for crack resistance if selected sleepers for the test stand for control loading. The sleepers is considered to withstand the crack resistance test if under the control loading one can not find visible cracks in sun- rail and middle cross sections. Visible transverse crack in concrete is considered to be that one which is with the length of more than 30mm from the edge of a sleeper and the opening at the base of more than 0,05 mm.
When there is an unsatisfactory test result for the crack resistance it is allowed to divide the lot for more small parts and subject them to the repeated test for the crack resistance. At the unsatisfactory result of the repeated test it is allowed to carry out the complete test of all the sleepers of the lot.

2.6 Sleepers' acceptance for the condition of the grooves for bolts and quality of concrete surfaces are carried out due to results of complete control.

3. CONTROL METHODS

3.1. Concrete strength for pressure is under GOST 10180 on the samples series made from the concrete mix of working composition, kept in the conditions established under GOST 18105.

3.2. Frost resistance of concrete is under GOST 10060.

3.3. Common strength of reinforcement tension is controlled under the manometer registration in accordance with GOST 22362 with parallel switching on the self-registering device to record tension efforts.
Tension strength of separate reinforcement wires are measured by the method of transverse ambages under GOST 22362.

3.4. For the measurement of linear dimensions of sleepers as well as blisters and chippings of concrete metallic measurement instruments are used under GOST 13015. The depth of blisters as well as clearances(gaps) between wires and concrete on the ends of sleepers are measured with sliding calipers with the pointed bar.

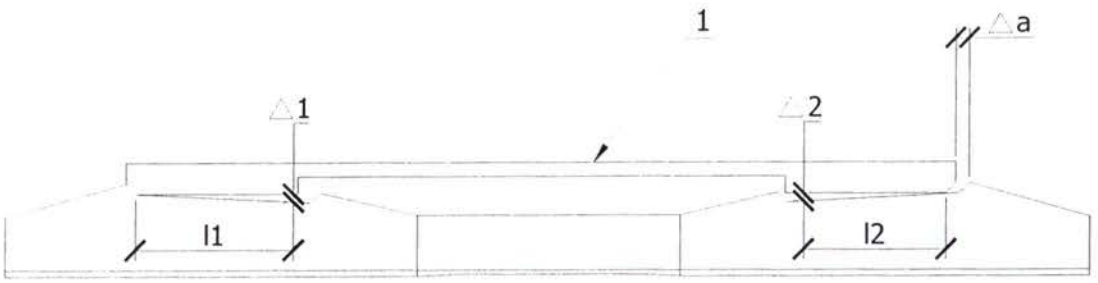
3.5. The distance between support edges of the deepening sub-rail areas of different sleepers' ends *a* are measured by template put simultaneously on both sub-rails areas of the sleeper (drawing 7).

Distances between edges of deepening of one end of the sleeper *a1* between the holes axes for bolts *a2* and from holes axes to the support edge *a3* provide with the check of these dimensions on the form at metallic plates formed the deepening in sub-rail areas when forming sleepers.

3.6. Gradient of sub-rail areas in longitudinal and transverse direction to the axis of the sleeper (syb0gradient and propellerness) is measured by the indicator put simultaneously on both sub-rail areas of the sleeper (drawing 7 and 8).

3.7. Deviation from straightforwardness of sub-rail areas are under GOST 13015 by measurement of the most clearance between the surface of the area and the edge of metallic surface of the ruler.

The scheme of the control of accuracy of the size a (△a)
and under rail cant platforms (l1 and l2)

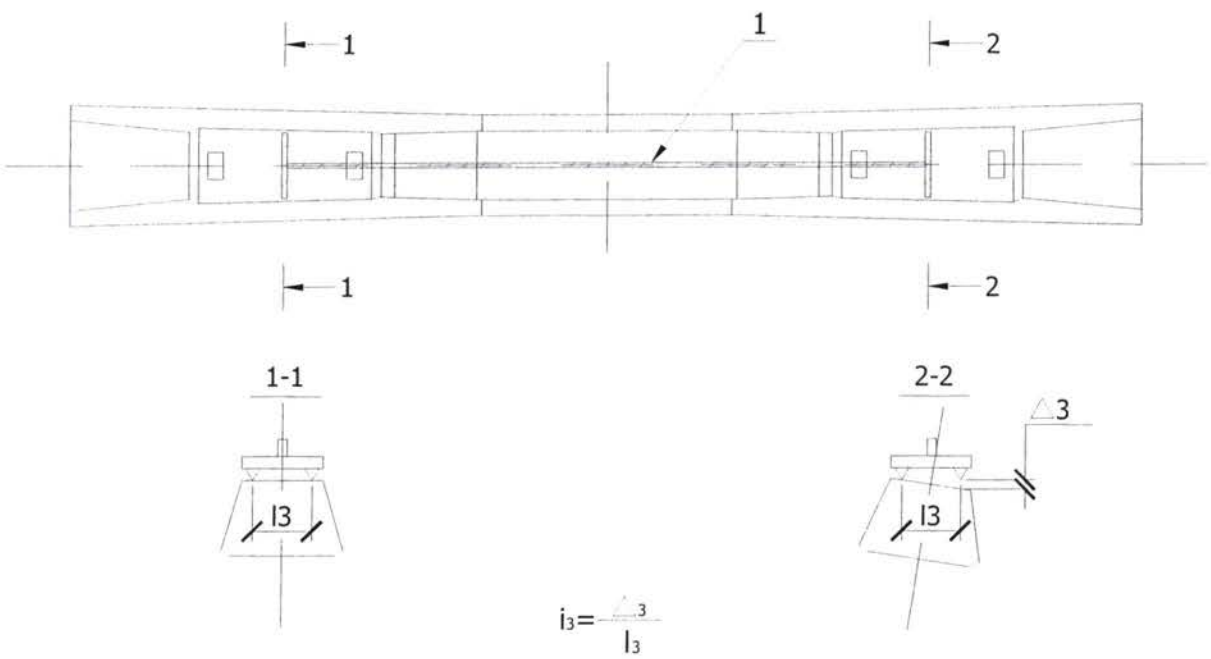


$i_1 = \frac{\triangle 1}{l_1}$ $i_2 = \frac{\triangle 2}{l_2}$

1-template or indicator device

DRAWING 7

The scheme of the control of propeller of the sleeper



$i_3 = \frac{\triangle 3}{l_3}$

1-measuring device

DRAWING 8

3.8. The depth of the washers inserting into concrete is controlled by the facility put into the groove of the sleeper and turned on 90 degrees (drawing 9).

Absence in the grooves of the sleeper of concrete influx which prevent the setting and turning of the bolt in the working position as well as turning of the bolt when screwing up the nut is checked by baseplate bolt under GOST 16017 with maximum plus deviations of the head dimensions. All the four grooves of the controlled sleeper are checked.

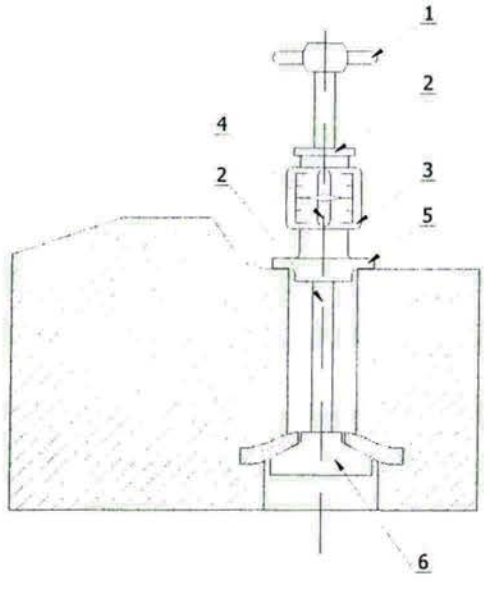
3.9. The width of the protective layer of concrete over the upper row of reinforcement is controlled in the middle of the sleeper by the method shown in drawing 10. It is allowed

3.10. under the agreement of the manufacturer with the customer to control the width on the ends of the sleeper by metallic ruler.

3.11. The height of the sleeper is checked by a sliding calipers in cross sections in the middle of each sub-rail are and in the middle of the sleeper.

3.12. Each sleeper, selected for the tests for crack resistance, is tested by dead load in series in sub-rail and middle cross section under the schemes given in drawing 11.
The load is increased evenly with the intensity not more than 1 kH/c (100kgc/c) and bring it to control one indicated in table 2. This load is kept to be constant during 2 min, after which the lateral surfaces of two sides of the sleepers should be looked at tested cross-section to find visible cracks in the tensile concrete zone.. The surface of the concrete is not watered at this. Light of the concrete surface is not less than 3000 лк. To measure the length of cracks metallic ruler is used and for the width of the cracks opening – measuring magnifier is used under GOST 25706 with partition of 0,05 mm.

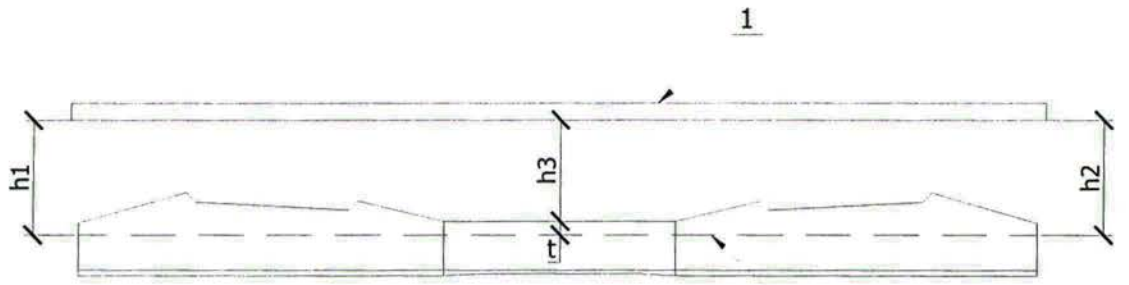
THE SCHEME OF THE DEVICE FOR MEASUREMENT
OF DEPTH OF TERMINATION OF WASHERS



1-handle; 2-stock; 3-scale; 4-arrow; 5-case; 6-head.

Drawing 9

The scheme of gauging the thickness of a blanket of beton above the overhead row of the armature in the middle of the sleeper



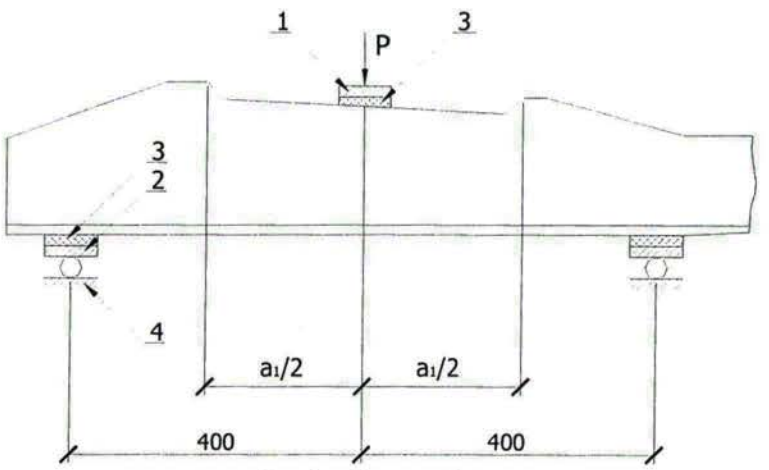
$$t = \frac{h_1+h_2}{2} - h_3$$

1-measuring rod; 2-Wire of the overhead lines of the armature

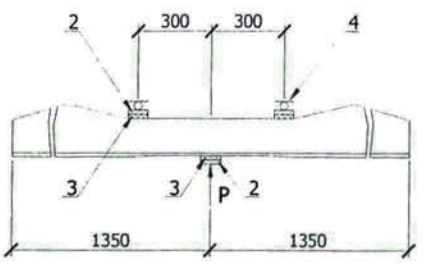
Drawing 10

The scheme of test of the sleeper on crack resistance

In under rail cross-section



In under rail cross-section



1-the 250x100 mm size steel plate with a grade of the bottom basis 1:20, average of thickness 25 mm; 2-the steel plate size 250x100x25 mm; 3-rubber laing a size 25x100x10 mm; 4-the steel beading fillet diameter 40 and length 250 mm.

Drawing 11

3.13. The list of the devices, indicators and templates for the control of geometrical parameters of the sleepers is given in Annex 3.

3.14. All no standard facilities for measurements and tests should go through metrological attestation in accordance with GOST 8.326.

4. TRANSPORTATION AND STORAGE

4.1. Transportation and storage of the sleepers should meet the requirements of GOST 13015.4 and under this standard.

4.2. Sleepers should be transported and kept in stacks in horizontal row in the working position (foots downwards). The stack's height should be not more than 16 rows.
Baseplates for the sleepers and plates between the sleepers in the stack should be placed in the deepening of the sub-rail areas of the sleepers. The width of wooden plates and rail pads should be not less than 50mm. It is allowed under the agreement between the manufacturer and the customer to use wooden pads with cross section not less than 40x40 mm. placing them at the distance of 30-40 mm from impact edges of the deepening and sub-rails areas of the sleepers.

4.3. The sleepers are transported in open wagon or cars. Transportation of sleepers of different marks (brand) and sorts in one open wagon or car is not allowed.

5. MNAFACTURER'S GUARANTEES

5.1. The manufacturer guarantees the compliance of the sleepers with the requirements of this standard under the observance by the Customer the rules of their operation, transportation and storage.

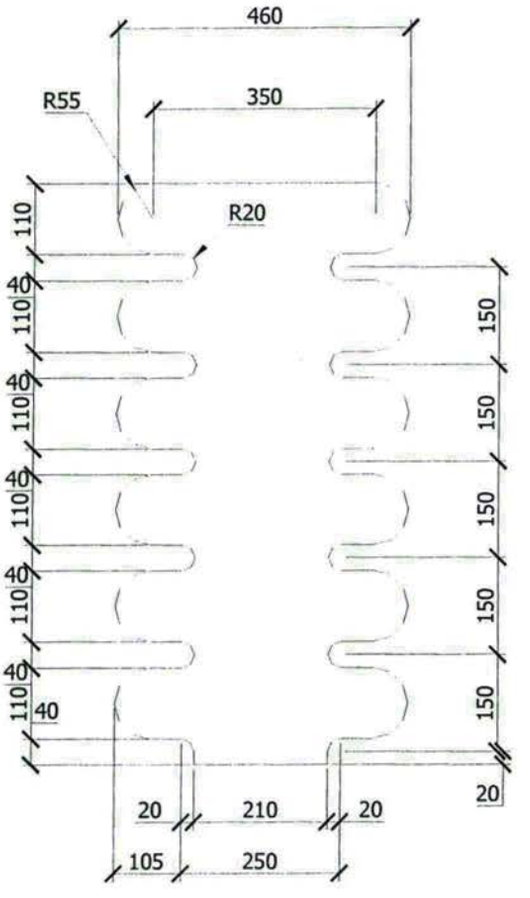
5.2. Warranty period of the sleepers operation is three years from the date of their laying on the track. Warranty period itself starts not later than 9 months from the date of delivery of the sleepers to the customer.

Indices of sleepers' material capacity

Indices of sleepers' material capacity made under typical mass line aggregate production in deca (ten)-nests forms (without taking into consideration technological and production losses outside the boundaries of the form):

volume of concrete for one sleeper 0,108 m3
steel consumption for 1m3 of concrete:
stressed wire with diameter 3mm 67,2kg
washers fastenings ..... 11,8 kg

THE DIVIDING SPASER



Material - St-3
Thickness - 1 mm
Weight - 0.037

DRAWING 12

Annex 3
Reference

LIST OF ACCESSORIES< INDICATORS AND TEPMLATES FOR CONTROLLING OF GEOMETRICAL PARAMETERS OF SLEEPERS

For control of geometrical parameters of reinforces sleepers it is recommended to use the set of devices, indicators and templates developed by the Institute "Industroyproekt" and approved by the Ministry of Industrial amterials of the USSR.

Description of geometrical parameter	Description of the device, indicator or template	Code of the project
The distance between trust edges of the deepening in sub-rail areas of both ends of the sleeper a	Template of measurement control a at railway sleepers with the an gradient angle of the edges 55 degrees	3477/10
Gradient of sub-rail areas in longitudinal and transverse direction to the sleeper's axis.	Indicator of control for gradients and propellerness of sub-rail areas of the railway sleepers.	3477/4-A
The depth of inserting washers' plates into concrete	Device for control of the depth of washers' plates insertion.	3633/4
The width of protective layer of concrete in the middle part of the sleeper	Device for control of width for concrete protective layer.	3633/3
The depth of blisters and gaps between the wire and concrete	Device for measurement	3633/5

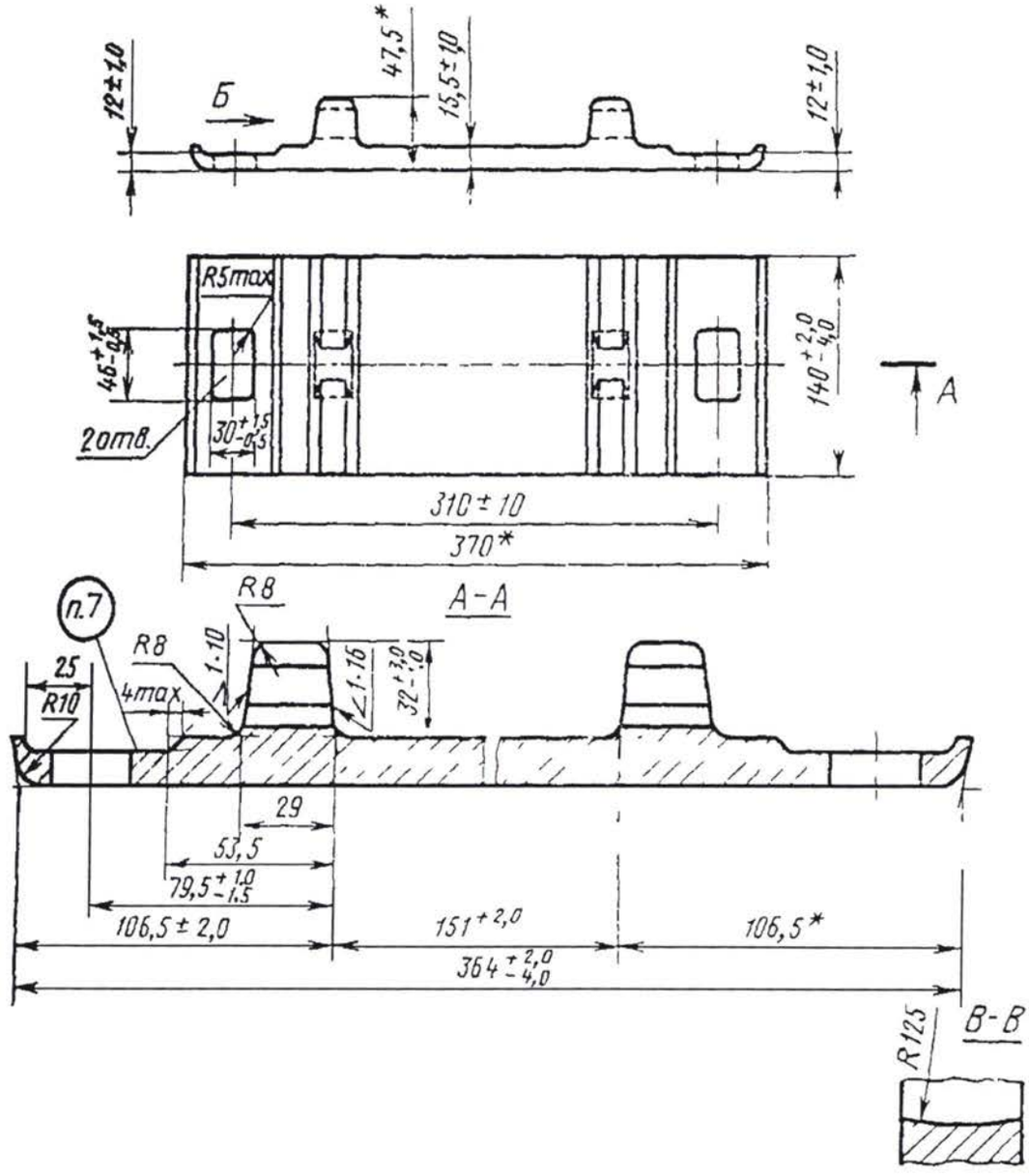
GOST 16279-78

The plates of separate fastening for railway P65 and P75 types Design and dimensions.

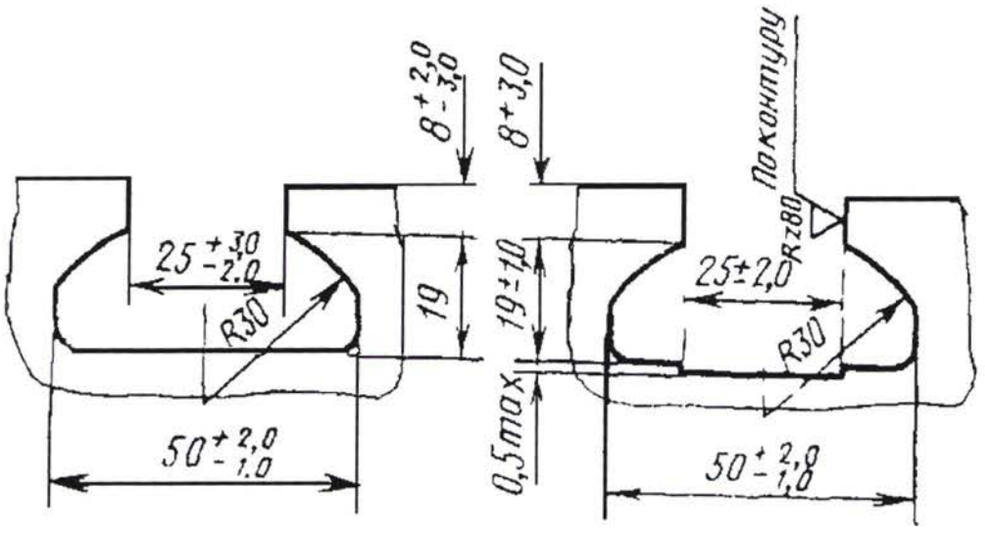
Non-observance of the standard is prosecuted under the Law.

1. This standard covers flat plates of separate fastening КБ фтв СК types(hereinafter – plates to the railway rails R65 and R75 types).
   Plates КИ type are intended for laying on reinforced sub-rail foundations, and plates of СК type – for joints and crossing of lines on wooden bars and sleepers.

2. Design and dimensions of the plates КБ type should be in compliance with those indicated on the drawing 1.



Performance I Performance II



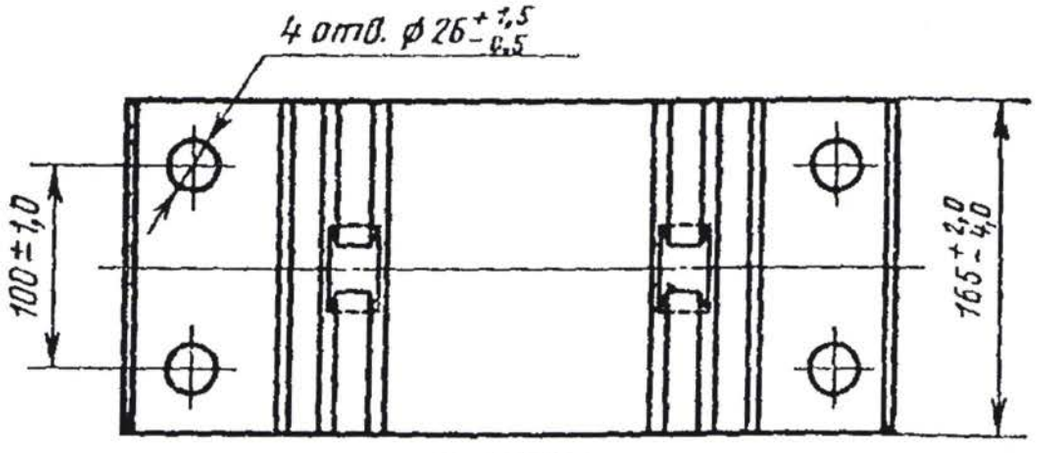
DRAWING 1

* Dimensions for reference

NOTES:

1. Dimensions with not indicated limit tolerances are provided by the tool.

2.1 Plates СК type should be made from profile bars as well as the plates of КБ type. Dimensions which differ them from КБ type plates should correspond to the indicated ones on Drawing 2



DRAWING 2

Example for the legend of КБ type plate for the rails R65 type with groove of performance 1:

Plate 1 КБ 65 GOST 16279 -78

The same with the increased width of sub-rail area, for example 18mm:

Plate 1 КБ 65 x 18 GOST 16279 -78

The same for СК type plate:

Plate 1 СК 65 x 18 GOST 16279 -78

In case when it is possible to use plates with groove by both -performance 1and performance 2, the performance is not indicated.
2.2.1 (Changed edition, Change №1)

3. (Excluded, Changed № 1).

4. Asymmetry of holes axes location relating to transverse plate axis – not more than 2,0 mm, grooves axes in ledges – not more than 3,0 mm.

5. Dimensions of curving radius which are not indicated in the drawings should not exceed 3mm. It is allowed to do couplings inside of the groove by facets of dimension not more than 3 x 45o.

6. Not indicated extreme deviations are ±1,0 mm.

7. Technical requirements, marking and material are under GOST 16277 – 84.

8. Mass of plates is indicated in Reference Annex.

ANNEX

Reference

Area of rolling cross section and mass of plates

Legend of plates	**Area of profile cross section, sm2**	**Mass, kg**	
		1m of rolling	**of one plate**
1КБ65б, 2КБ65 !СК65б, 2СК65	70,07	55,0	7,0 8,45

Note:

1. Mass of plates is determined out of nominal dimensions and with steel density of 7850 kg/m3.
2. **(Excluded, Change №1).**

GOST 16016 -79
Clamp bolts for rail track fastening
Design and dimension
Technical requirements

Non-observance of the standard is prosecuted under the Law.

This standard covers clamp bolts of normal and rough accuracy used for fastening of the rail to the plate in separate rails fastening

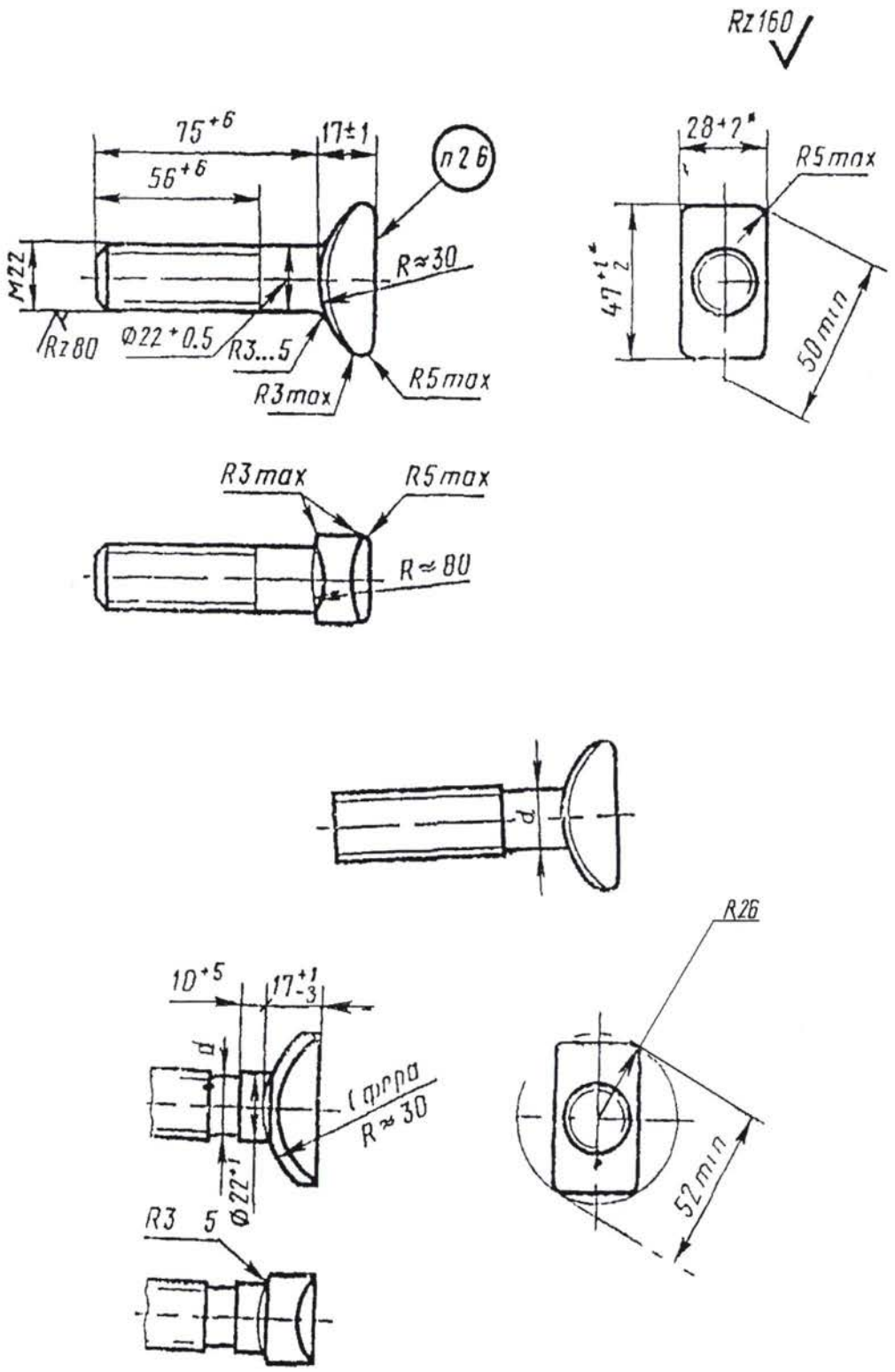
1. DESING AND DIMENSIONS

1.1 Design and dimensions of clamp bolts should be complied with those indicated on the drawing.

1.2 It is allowed to make bolts with the length from 65 to 105 mm and the length of thread from 40 to 72 mm under the agreement between the Customer and the manufacturer. At this the length of the bolt should be done divisible 10mm, and the length of thread divisible:

4mm – at the length of thread to 60mm including;
6mm - -"- "-" over 60 mm.

1.3 Option of production of the bolt head is established by the manufacturer.



Example of the legend of clamp bolt in performance 1, with the length 75mm, class of strength 4.8, without coating

Bolt M22 X 75.48 GOST 16016 – 79

The same, from finished steel with zinc coating with chromium plating with the width of 9 mkm:

Bolt M22 X 75.48 C.019 GOST 16016 – 79

The same in performance 2, without coating:

Bolt M22 X 75.48 C GOST 16016 – 79

2. *TECHNICAL REQUIREMENTS*

2.1 Clamp bolts should be made according the requirements of this standard and GOST 1759 -70 due to the working drawings approved in the established order.

2.2 Mechanical properties of the bolts should be in compliance of class of strength 3.5 or 4.8 under GOST 1759 -70

2.3 Clamp bolts should be made without coating. Under the agreement between the Customer and the manufacturer the clamp bolts can have zinc with chromium plating coating with the width of 9-15 mkm. Requirements to coating are under GOST 9.301 - 78.

2.4 Tread are under ST CMEA 182-75. Tolerance range 8g under GOST 16093 -81.

2.5 Displacement of the head axis concerning the core axis of the bolt should not be more than 0,9 mm.

2.6 To mark: trademark or the legend of the manufacturer and the year of production (two last figures).
The height of markings is not less than 8mm, width – not less than 1mm, salience – not less than 0,5 mm.

2.7 Mass of 1000 bolts (reference):
345 kg – performance 1;
335 kg – performance 2.

Notes:
1. When it possible to use bolt of performance 1, as well of performance 1, in the design documentation the mass of performance 1 should be indicated.

2. Change of mass of 1000 bolts while changing their length by 10 mm should not be more:
29,8 kg – for performance 1;
25,7 kg – for performance 2.

2.8 Acceptance rules are under GOST 17769-72.

2.9 Testing methods are under GOST 1750 -70.

2.10 Control of quality of zinc coating is under GOST 9.302 -79.

2.11 Zinc coating on clamp bolts should be controlled by appearance and width under GOST 9.301 -78.

2.12 Bolts packing and marking of tare is under GOST 18160 – 72.

2.13 Bolts should be completed with nuts under GOST 16018 – 79.
Bolts and nuts without packing are allowed, at this there should not be the possibility of their mixing.

2.14 Bolts transportation without packing on railways platforms(flat wagons) is not allowed.

GOST 16017 -79
Inserted bolts for rail track fastening
Design and dimension
Technical requirements

Non-observance of the standard is prosecuted under the Law.

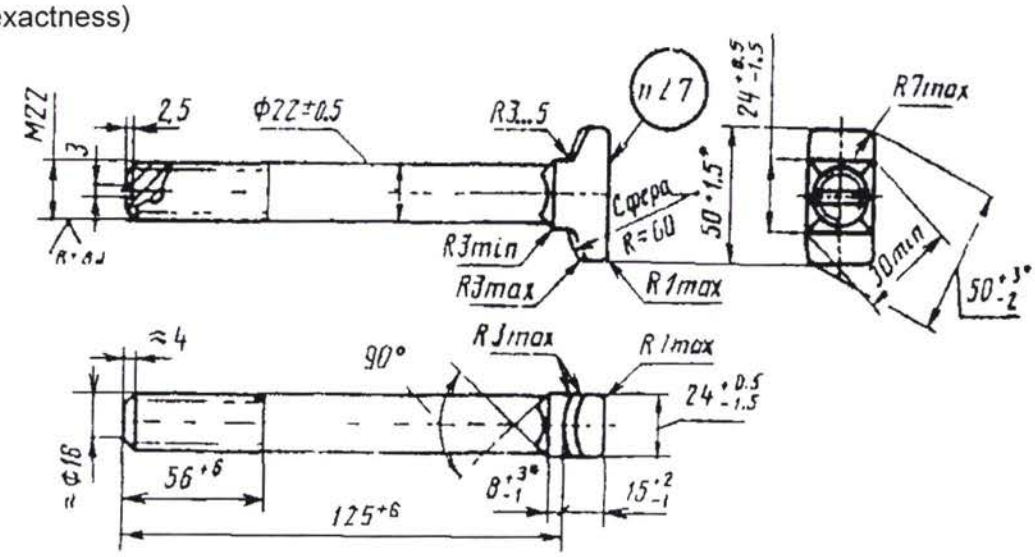
This standard covers inserted bolts of normal and rough accuracy used for fastening of metal plates or rails to reinforced sub-rail base in rail fastening.

1. DESING AND DIMENSIONS

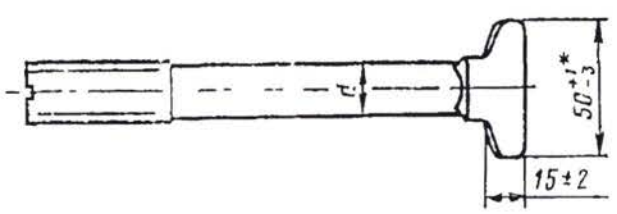
a. Design and dimensions of inserted bolts should be complied with those indicated on the drawing.

Performance I

Performance I
(normal exactness)

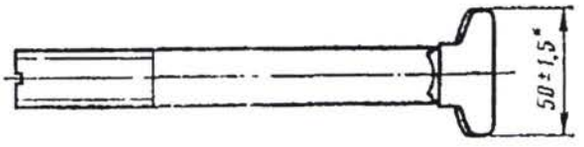


Performance II
(rough exactness)

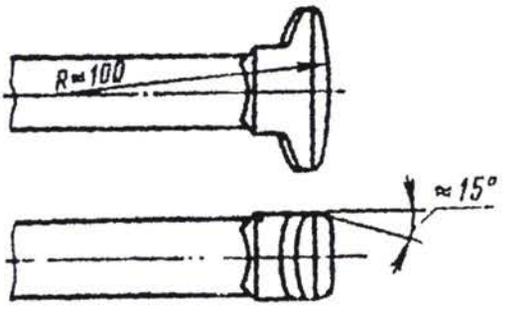


* Dimensions are indicated taking in to consideration joint height, from matrix cut-off point, metal building up in subhead angle and burrs from fin (flash) punching.

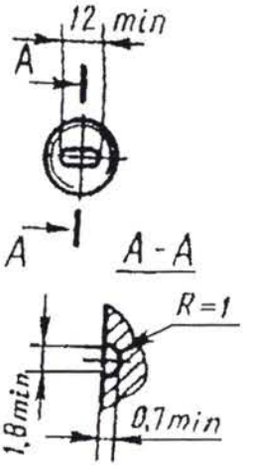
Performance II
(rough exactness)



Variant of the head



Variant of the indicating groove



Example of the legend of inserted bolt in performance 1, with the length of 175mm, class of strength 4.8, zinc coating with chromium plating of width of 15 mkm

Bolt M22 X175.48.0115 GOST 16017 – 79

The same in performance 2, from finished steel of the length 225mm:

Bolt M22 X 175.48 C 0115 GOST 16017 – 79

b. It is allowed to make bolts of the length from 145 to 225 mm and with the tread length within 40-84 mm under the agreement between the Customer and the Manufacturer. At this the length the bolt length should be multiplied by 10 mm, and the length of tread should be multiplied by:
   4mm – when the length of tread to 60 mm including;
   6 mm " - " " – " over 60mm
c. Option of head performance and indicating groove is chosen by the manufacturer.

2. TECHNICAL REQUIREMENTS

a. Clamp bolts should be made according the requirements of this standard and GOST 1759 -70 due to the working drawings approved in the established order.
b. Mechanical properties of the bolts should be in compliance of class of strength 3.5 or 4.8 under GOST 1759 -70
c. Clamp bolts should be made without coating. Under the agreement between the Customer and the manufacturer the clamp bolts can have zinc with chromium plating coating with the width of 9-15 mkm. Requirements to coating are under GOST 9.301 -78.
d. Tread is under ST CMEA 182-75. Tolerance range 8g under GOST 16093 -81.
e. Displacement of the head axis concerning the core axis of the bolt should not be more than 0,9 mm.
f. To mark: trademark or the legend of the manufacturer and the year of production (two last figures).

The height of markings is not less than 8mm, width – not less than 1mm, salience – not less than 0,5 mm.

g. Mass of 1000 bolts (reference):
   345 kg – performance 1;
   335 kg – performance 2.

Notes:

1. When it possible to use bolt of performance 1, as well of performance 1, in the design documentation the mass of performance 1 should be indicated.

2. Change of mass of 1000 bolts while changing their length by 10 mm should not be more:
   29,8 kg – for performance 1;
   25,7 kg – for performance 2

h. Acceptance rules are under GOST 17769-72
i. Testing methods are under GOST 1759 -70
j. Control of quality of zinc coating is under GOST 9.302 -79.
k. Zinc coating on clamp bolts should be controlled by appearance and width under GOST 9.301 -78.
l. Bolts packing and marking of tare is under GOST 18160 – 72.
m. Bolts should be completed with nuts under GOST 16018 – 79.

n. Bolts transportation without packing on railways platforms (flat wagons) is not allowed. Bolts and nuts without packing are allowed, at this there should not be the possibility of their mixing.
o. Transportation of bolts on railway flat wagons without packing is not allowed.

GOST 16018 -79
Nuts for clamps and inserted bolts of rail track fastening
Design and dimensions
Technical requirements

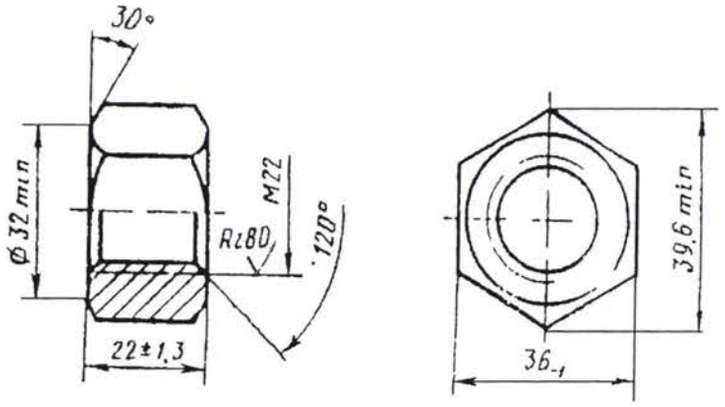
Non-observance of the standard is prosecuted under the Law.

This standard covers nuts of normal and rough accuracy used for rail track fastenings .

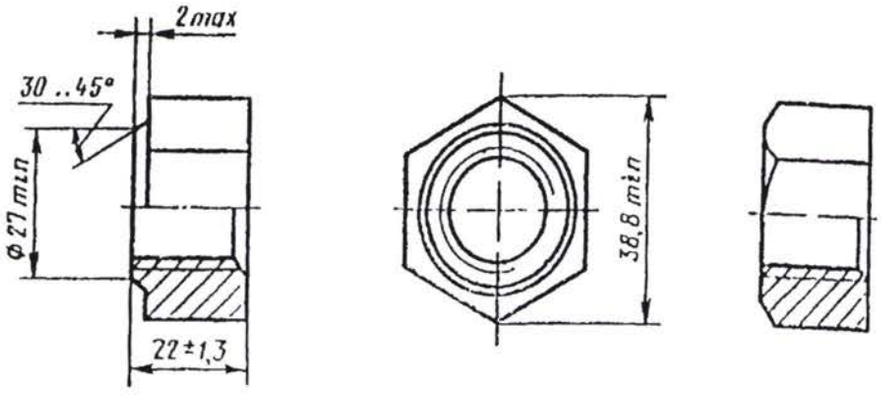
1. DESING AND DIMENSIONS

1.1 Design and dimensions of nuts should be complied with those indicated on the drawing.

Performance I
(normal exactness)



Performance II
(rough exactness)



Example of the legend of the nut in performance 1, with the height of 22 mm, class of strength 5, without coating

Nut M22 X 22,5 GOST 16018 – 79

The same , with zinc coating of chromium-plating of width 9 mkm:

Nut M22 X 22,5 GOST 16018 – 79

The same in performance 2, without coating:

Nut 2 M22 X 22,5 GOST 16018 – 79

1.2 It is allowed to make nuts in performance 1, of height 18 and 20 mm under the agreement of the Customer and the Manufacturer

1.3 Option of nut end in performance 2 is chosen by the manufacturer.

2. TECHNICAL REQUIREMENTS

2.1 Nuts should be made according the requirements of this standard and GOST 1759 -70 due to the working drawings approved in the established order.

2.2 Mechanical properties of the nuts should be in compliance with strength class of 5 or 6 under GOST 1759 -70.

2.3 Nuts should have the same coating as component bolts. The width of coating should be 9 -15 mkm. Requirements to the coating is under GOST 9.301 – 78. Under the agreement between the Customer and the Manufacturer nut can be done without coating.

2.4 Tread is under ST CMEA 182-75. Tolerance range 7H under GOST 16093 -81. Faces on the end of nuts' tread are under GOST 10549 -80.

2.5 Displacement of nut hole axis concerning symmetry axis should not be more than 0,9 mm.

2.6 In nuts in performance 2 it is allowed metal tightening which can bring to local lessening of the edges height not more than 3mm.

2.7 Mass of 1000 nuts (reference):
114 kg – performance 1;
126 kg – performance 2.

Notes:

1. When it possible to use nuts of performance 1, as well of performance 1, in the design documentation the mass of performance 1 should be indicated.

2. Change of mass of 1000 nuts while changing their height by 1mm should not be more than 6,5 kg.

2.8 Acceptance rules are under GOST 17769-72.

2.9 Testing methods are under GOST 1759 -70.

2.10 Control of quality of zinc coating is under GOST 9.302 -79.

2.11 Zinc coating on nuts should be controlled by appearance and width under GOST 9.301 -78.

2.12 Nuts should be shipped in complete with bolts for rail fastening
It is allowed the transportation of nuts as separate articles. In this case the packing of nuts and tare marking is under GOST 18160-72.

GOST 19115 -91

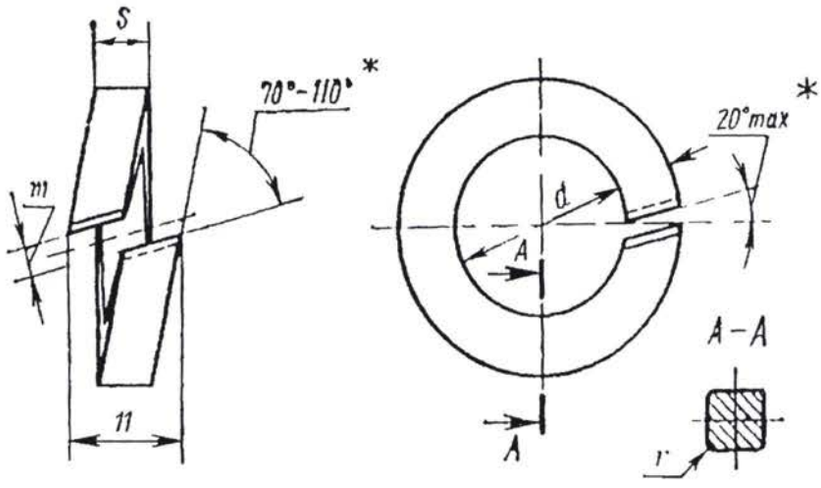
Railway spring washers.

This standard covers single- turn spring washers accuracy class C, used in construction of permanent way of railway lines

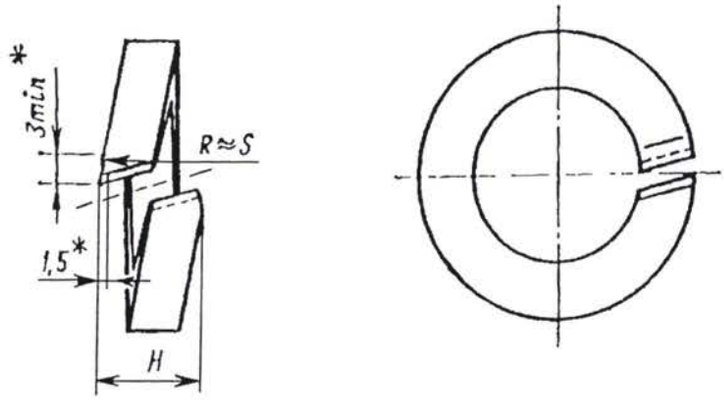
1. DESIGN AND DIMENSIONS

1.1 Designs and dimensions of spring washers should be in compliance with those indicated on drawing and in table

Performance I



Performance II



$$m \leq 0,7(s^{+1,05})$$

* Dimensions are provided by the tools
Legends on the drawing: d-washer diameter; s-washer depth; b-washer width.

Rated diameter of the bolt tread			22	24	27
d (supposed deviation ± 1,05)			24	26	29
Cross section (supposed deviation ± 0,45)		s	8	9	10
		b			
r, not more			2,0		
H for performance	1	Not less	13,5	15,0	16,5
		Not less	18,5	20,0	23,0
	2	Not less	12,5	14,0	15,5
		Not less	17,5	19,5	22,0

Example of the spring washer's legend by performance 1 for the bolt by diameter 22mm, from steel of mark 65Г, without protective coating:

Washer 22 GOST 19115 -91

The same, performance 2:

Washer2. 22 GOST 19115 -91

The same, from steel of grade 60C2A:

Washer 2.60C2A2 GOST 19115 -91

Washers of performance 2 are made under the agreement between the Manufacturer and the Customer

2. TECHNICAL REQUIREMENTS

2.1 Main technical requirements are under GOST 6402.

2.2 Spring washers should be made from the wire under GOST 11850, from steel of grade 65 Г, 60 C2A or other grade of steel with mechanical properties not lower than for steel of grade 65 Г under GOST 14959. In case of use of steel of grade 60C2A or other steel, the grade of steel is indicated in legend.

2.3 Under the requirement of the Customer each washer after the thermal treatment should be subject to trice-repeated reduction until the flat condition.

2.4 At control checking of elastic properties after the reduction of washers until the flat condition during 24 hours the reduction of H size should not exceed 0,8 mm.

2.5 Theoretical mass of washers is indicated in Annex.

2.6 Temporary anticorrosion protection, washers package and tare marking are under GOST 18160.

3. ACCEPTANCE

Rules of acceptance are under GOST 17769 for the goods of accuracy class C.
The volume of the lot from 10001 to 35000 pieces

4. CONTROL METHODS

Control methods are under GOST 6402, except checking viscosity

5. MARKING, PACKING AND TRANSPORTATION

Washers transportation is carried out by any type of transport in accordance with the transportation rules existing for this type of transport.

Annex Reference

Rated diameters of the bolt tread, mm	**Theoretical mass 1000 washers, kg**
22	49,1
24	67,9
27	93,4

GOST 21797 -76

Two-turn spring washers for railway track

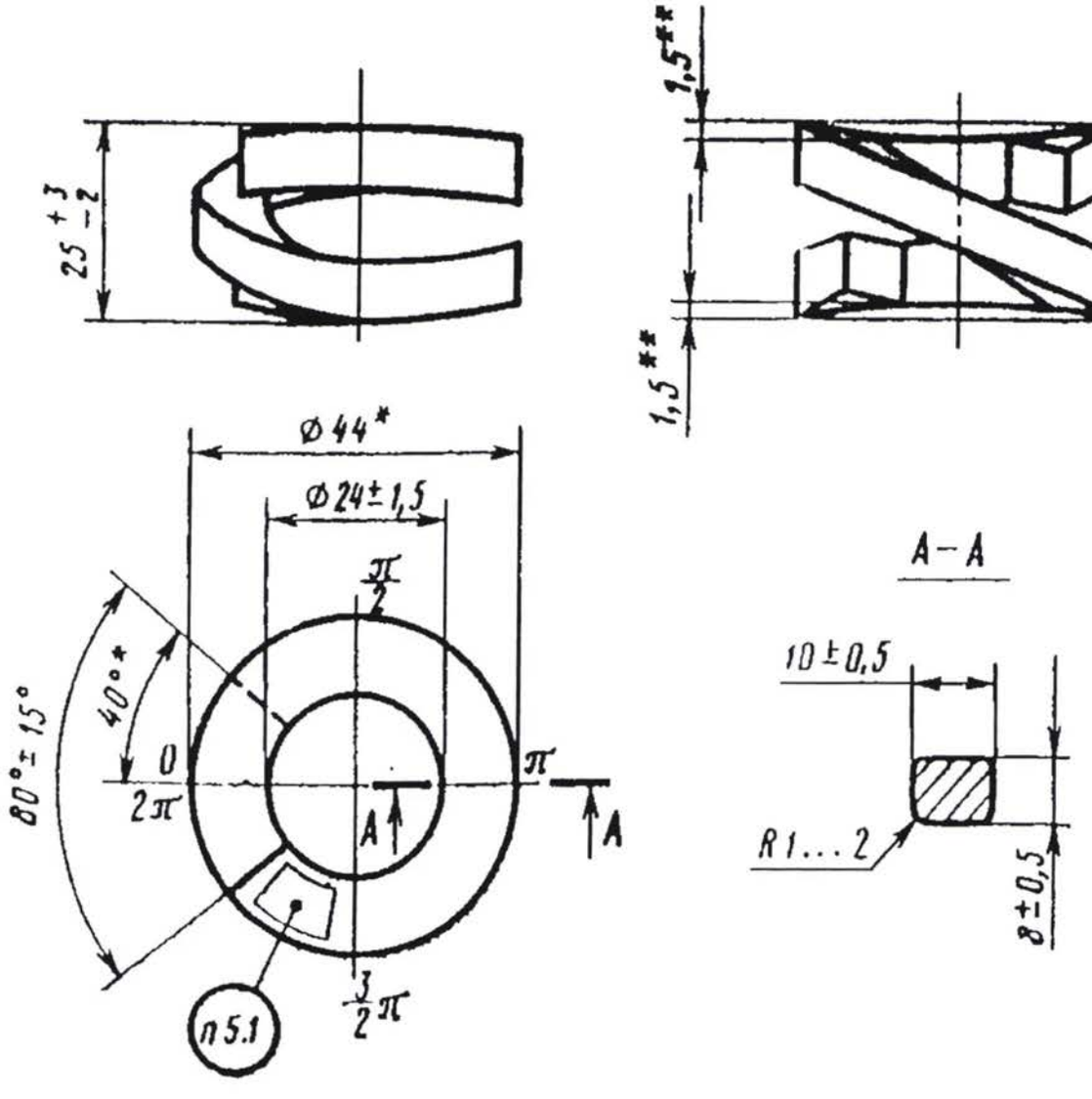
Standard non-observance is prosecuted under the Law.

This standard covers two- turn spring washers intended to be used with bolts of diameter 22mm in constructions of the permanent way of the railway track

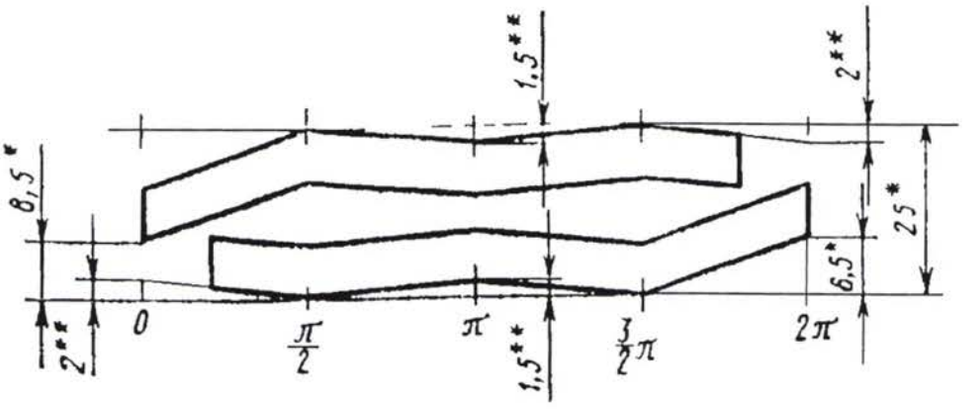
1. DESIGN AND DIMENSIONS

1.1 Designs and dimensions of spring washers should be in compliance with those indicated on drawing 1 and 2

Performance I

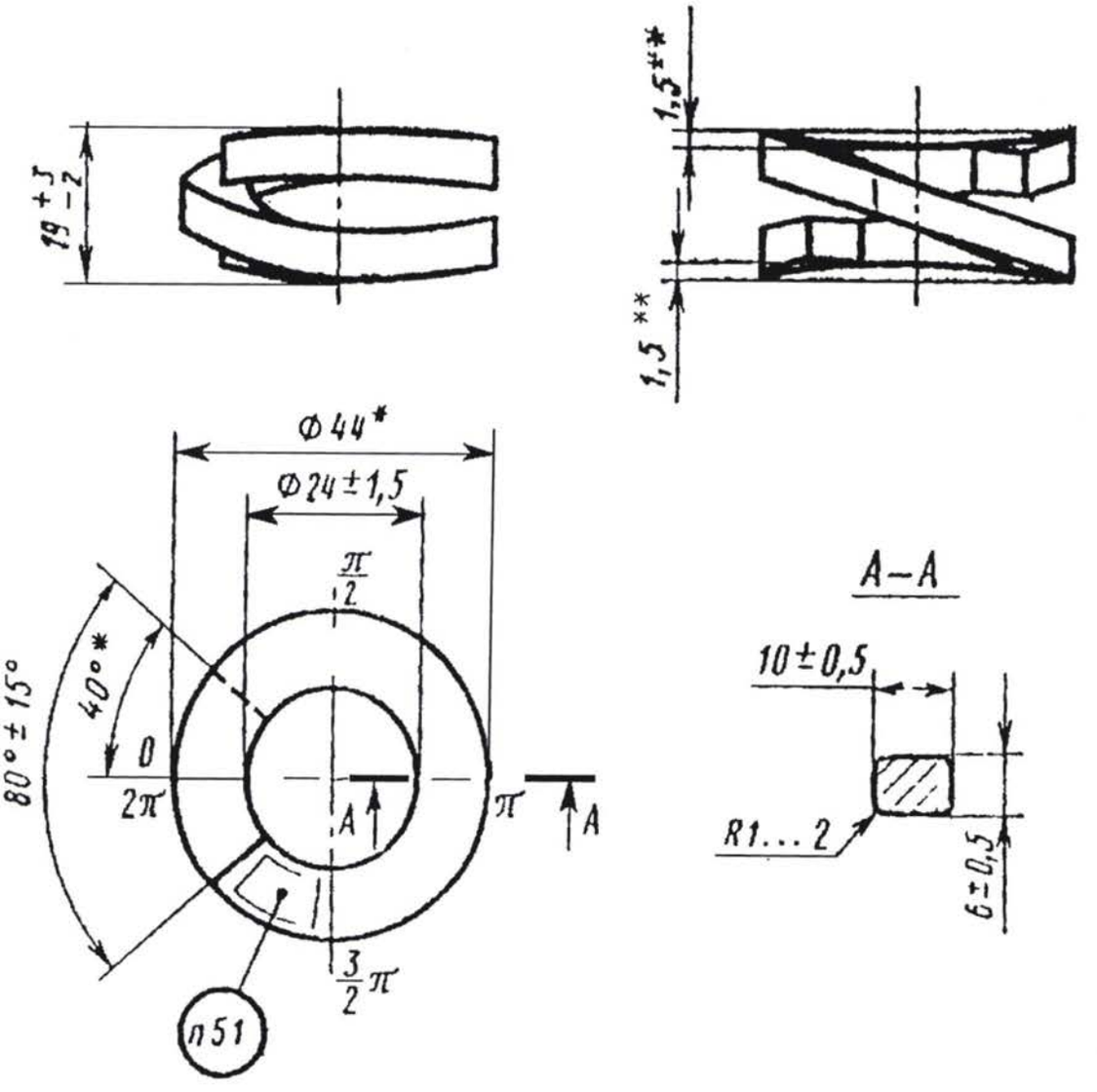


Detailed position for tool's structure

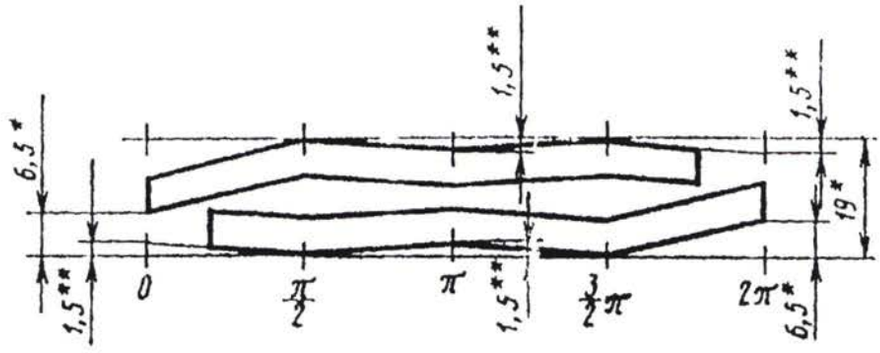


* Reference dimensions
** Dimensions are provided by the tools

Performance II



Detailed position for tool's structure



* Reference dimensions
** Dimensions are provided by the tools

Example of two-turn spring washer's legend by performance 1 from steel of grade 69C2A without protective coating:

Two-turn washer 24 GOST 21797 -76

The same, performance 2:

Two-turn washer 2. 24 GOST 21797 -76

The same, zinc coating with chromate treatment with width 12mkm:

Two-turn washer 2. 24.01.12 GOST 21797 -76

The same, from steel of grade 60C2:

Two-turn washer 2. 24.01.60C2.01.12 GOST 21797 -76

Note. Graphic legend of the two-turn washer in design documentation should correspond to drawing 3.

2. TECHNICAL REQUIREMENTS

2.1 Two-turn spring washers should be made from steel of grade 60C2A under GOST 6402.
It is allowed to make washers from steel of grade 60C2 under GOST 14959-69 or from steel of other grades with mechanical properties not lower than the above-said steel. In this case steel grade is indicated by legend.
Note: It is allowed to mage two-turn spring washers from steel of grade 65Г under GOST 14959 -79 or GOST 1050-74.
(Changed edition, Changed № 1)

2.2 Washers should be made without metallic coating.
Under the agreement of the Manufacturer with the Customer spring washers are allowed to be made with zinc coating with chromate treatment. Hydrogen brittleness of washers which appeared in the process of coating should be taken away.

2.3 On the surface of the washers there should not be blisters, cracks, bubbles, exfoliations and collar marks. Calx availability on the surface of the washers and torsion (propellerness of turns) are not considered to be defects.

2.4 On the surface of the washers it is allowed the marks like dent and burrs by the depth not more than 0,5 and by width to 5mm from falling, winding and molding instrument. Under the requirement of the Customer each washer after the thermal treatment should be subject to trice-repeated reduction until the flat condition.

2.5 On the surface of cut ends it is allowed chips of metal by depth not more than 1,5 mm and burrs by height not more than 1,5 mm.

2.6 Outside diameter of the washer in compressed condition should not exceed 48,5 mm.

2.7 Thermally treated two-turn spring washers should have hardness HRC 40... 50.

2.8 Each washer after thermal treatment should be subject to thrice-repeated reduction until the height:

- 18 ± 0,5mm or by effort of 5000 kgs – for the washers of performance 1;
- 14 ± 0,5mm or by effort of 4000 kgs – for the washers of performance 2;

After the trice-repeated reduction washers height should be within the limits indicated in drawings 1 and 2.

2.9 At control checking of washers elastic properties for lengthy placing under tension the washers height (after keeping trice-repeated washers reduction in reduced condition during 24 hours) should not be reduced more than , mm

- 1,8 – for the washers of performance 1;
- 2,0 for the washers of performance 2.
-

Washers height after trice-repeated reduction is taken as the initial one.

2.10 After trice-repeated reduction (P.2.8) and control checking of elastic properties (P.2.9) washers should not have breakages and cracks..

2.11 Mass (reference) of one washer, kg:

- 0,120 of performance 1;
- 0,090 of performance 2.

3. ACCEPTANCE RULES

3.1 The manufacturer should carry out acceptance tests to check the compliance of two-turn washers to the requirements of this standard.
Each lot of two-turn spring washers should be tested for their compliance with the requirements of p.p. 1.1, 2.1 -2.10.

3.2 Two-turn spring washers should be subject to acceptance by lots under GOST 17769 -72 for the goods of rough accuracy. Number of washers in a lot should not exceed 50 000 pieces.

4. CONTROL METHODS

4.1 It is necessary to check dimensions of two-turn spring washers (p.p. 1.1 and 2.6) by gages and universal measurement tools. Design and dimensions of gages are given in recommended Annex.

4.2 Appearance of two-turn spring washers (p.p. 2.2 - 2,5, 2.10) should be checked visually without use of magnifying devices.

4.3 While checking outer diameter (p.2.6) washers are reduced until the height, mm:

- 20 ± 1 for performance 1;
- 16 ± 1 for performance 2;

4.4 Hardness of spring washers (p.2.7) is checked under GOST 9013 -59 after the removal of the surface layer in the place of measurement at the depth of not less than 0,2 mm.

4.5 For lengthy placing under tension test (p.2.9) spring washers separated from each other by flat washers are put on the bolt's core of diameter not less than 16mm and reduced until the height, mm:

- 18,7 ± 0,2 for performance 1;
- 14,7 ± 0,2 for performance 2;

In such state the washers are fixed and kept during 24 hours.
It is allowed to carry out testing of each washer separately.

5. MARKING, PACKING AND TRANSPORTATION

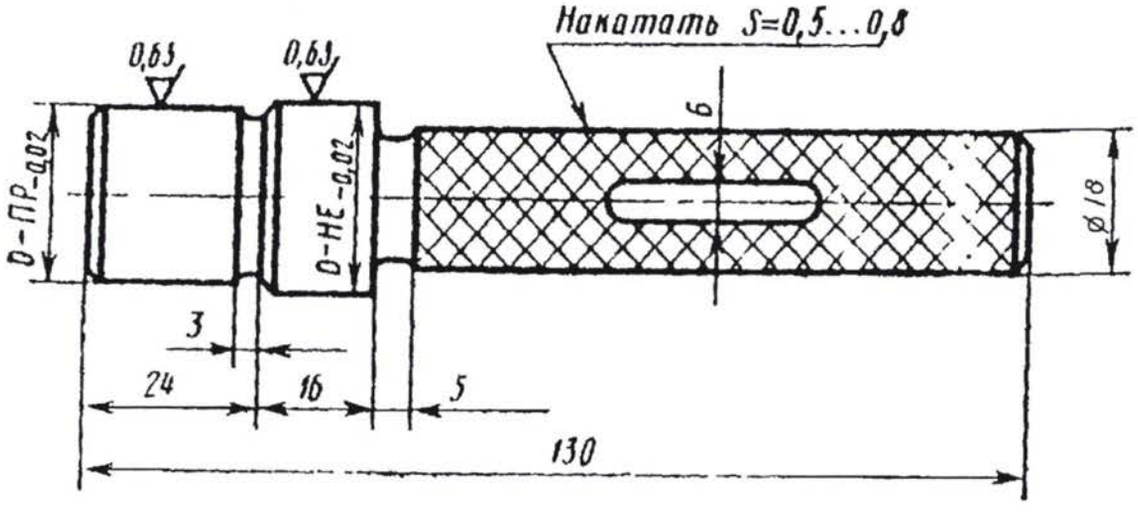
5.1 On each washer in the place indicated in drawings 1 and 2 there should be the following marking:

- legend (figures and letters) or trademark of the manufacturer;
- year of production (two last figures)

Note. It is allowed not to mark washers if they are produced on the equipment which do not provide its marking.

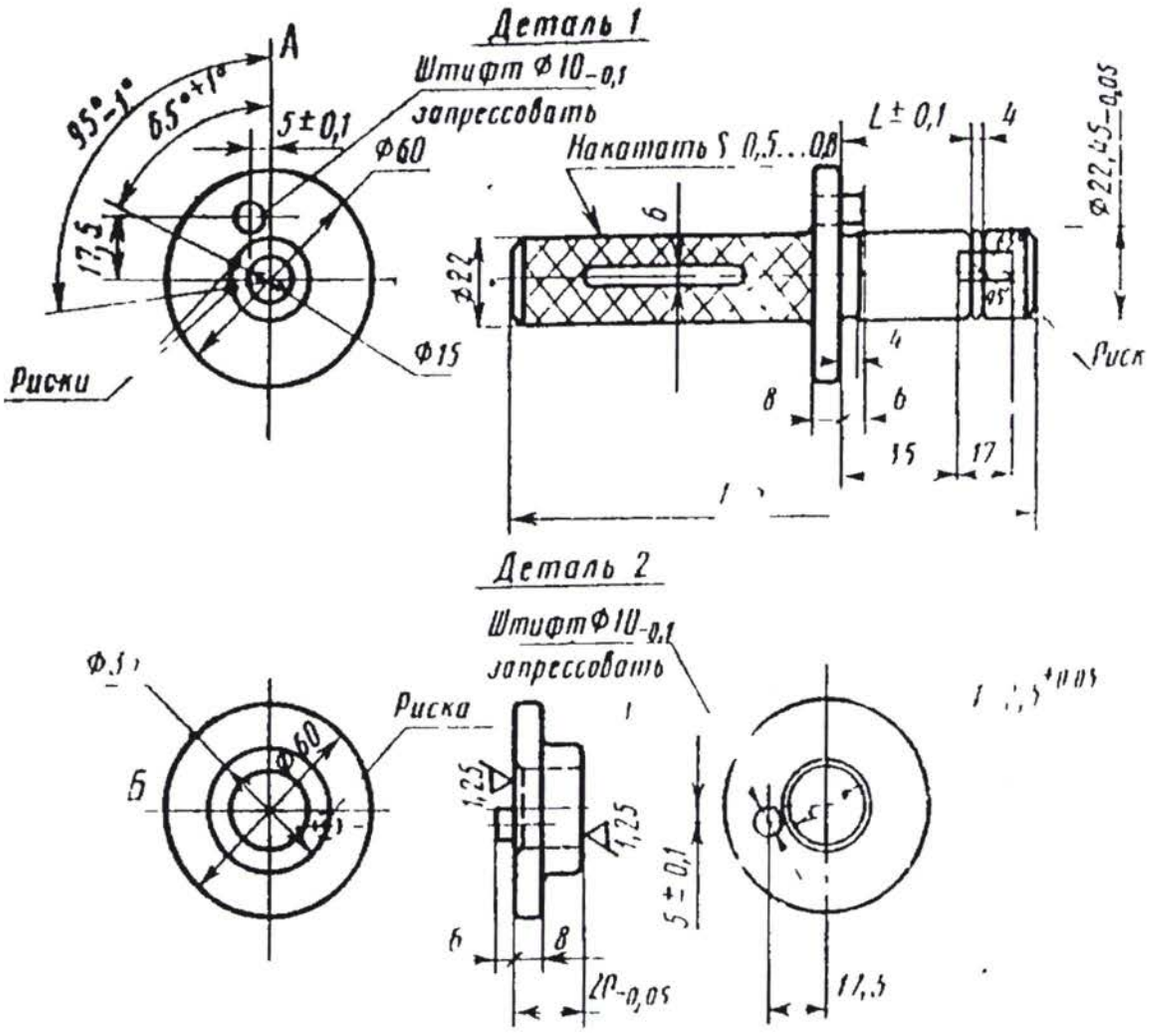
5.2 Washers packing and tare marking is under GOST 18160 -72.
Washers are allowed to be packed into tare of mass net to 2, 5 ton.
Under the agreement with the customer it is allowed not to pack spring washers.
Under the agreement with the customer it is allowed to transport spring two-turn washers without packaging by any type of transport except the railway transport.

Annex



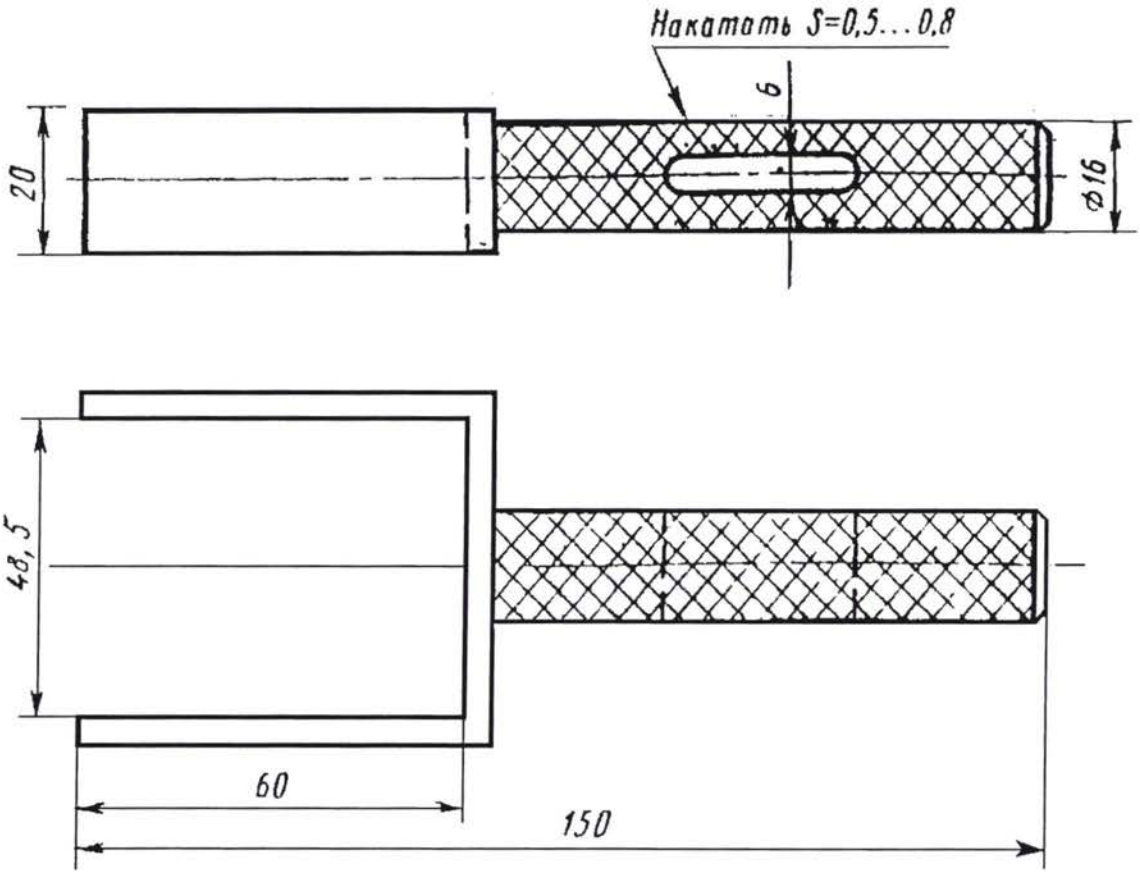
mm

Washers inner diameter f		D-ПР	D-НЕ
Rated	Supposed deviations		
24	±1,5	22,54	25,5



mm

Washers cross section dimension	1
6X 10	38
8X10	44


Накатать S=0,5...0,8
6
20
ф16

48,5
60
150

GOST 22343 -90

Clamps of individual rail fastening of railway.

This standard covers rigid clamps ПК (hereinafter clamps) used for rails fastening in individual rail fastenings on reinforced and wooden sleepers.

1. DESIGN AND DIMENSIONS

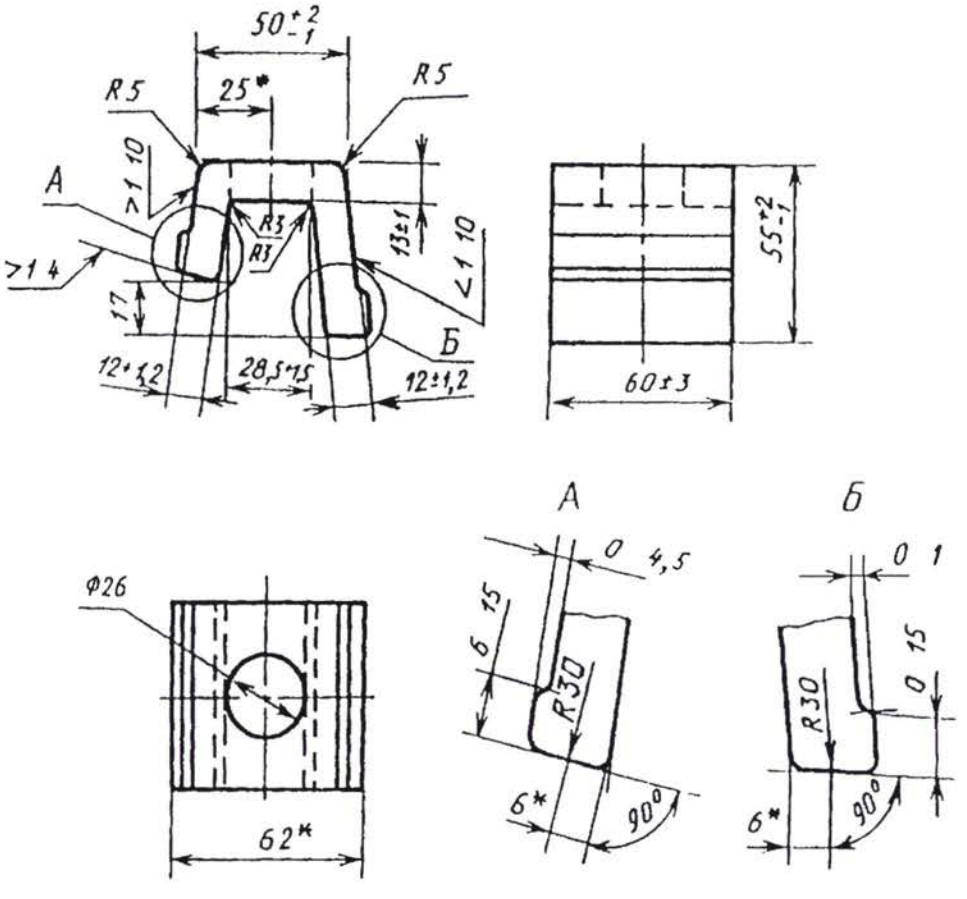
1.1 Clamp design and dimensions should be in compliance with those indicated on drawing 1.

Example of clamp's legend:
Clamp ПК GOST 22343 -90

1.2 Not indicated limit deviations ± 1,0 mm serve for profile construction and in ready clamps are not controlled. Limit deviations of holes dimensions from the side of punching are ± 1,0 mm.

1.3 Sectional area of profile and clamp's mass are indicated in Annex 1.

PK clamp



* Dimensions for reference

2. TECHNICAL REQUIREMENTS

2.1 Clamps should be made from bars rolled from steel of grade Ст4кп, Ст4пс, Ст4сп under GOST 380, categories 1 or 2 under GOST 535.

2.2 Surface of abutment of the clamp to the rail foot and plate should be even. It is allowed uniform longitudinal convexity of clamps surface abutment to the rail base and plate not more than 1,0 mm.
Concavity of the surface of clamp abutment to the rail base is not allowed.

2.3 Cracks, rolling marks and other surface defects with the depth of more than 1,0 mm are not allowed.
Mark from chisel on the crossing of vertical and horizontal planes of the clamp near the hole from the side of punching is not allowed.

2.4 Surfaces of the clamp ends and holes for clamp bolts should not have the marks of shrinkage like cracks- splitting.

2.5 Surfaces of the clamp's ends should be perpendicular to the longitudinal axis. It is allowed obliquity of cut in horizontal and vertical planes of the clamp not more than 3,0 mm.
It is allowed wave, chip of metal on the end surface of the clamp in vertical plane not more than 4,0mm, dents from mould (stencil) with the depth of not more than 1,5 mm. It is allowed on the supportive surfaces of the clamp dents from knife not more than 3,00 mm and metal tightening not more than 3,00 mm with smooth transition to basic surface at the distance of not more than 15 mm from the end.

2.6 At insertion of the holes for clamp bolts replacement of the hole from the central location in longitudinal direction is allowed, at this minimum size from the edge of the hole to the clamp end should be not less than 15 mm.

2.7 Burrs on the clamp's ends near holes for clamp bolts and on the outer not working surfaces of the clamp with the height of not more than 1,00mm are allowed.
On the working surface of the clamp's legs in the place of metal tightening the burrs with the height of not more than 1,5 mm which do not come out of the limits of the working surfaces are allowed.

2.8 In the places of rollers cutoff points nib not more than 1,5 mm is allowed.

3. ACCEPTANCE

3.1 For quality control of clamps production acceptance tests should be carried out at which one should check:

- appearance and basic sizes (points 1.1, 2.2 – 2.8):
- mechanical properties (point 2.1)

3.2 Technical acceptance of ready clamps is done by the inspector of the Ministry of Railways in accordance with the requirements of this standard.

3.3 Clam[s should be prepare for acceptance by lots, by mass not more than 20 ton.

3.4 For visual inspection and checking of basic dimensions (points 1.1, 2.2 -2.8) not less than 1% of clamps from each lot are selected.

3.5 Samples to determine mechanical properties of steel (point 2.1) should be cut along the rolling direction from the support angle of clamp's profile. Two samples from each melting are tested.

3.6 When in the sampling at least one clamps can be found with concavity of the surface of abutment to the rail's base and to plate or deviations in sizes in five or more clamps then the lo should be subject to regarding and to be prepared for acceptance again. When the results of tension test are not satisfactory then repeated testing of the double amount of samplings are to be carried out. Results of repeated test are considered to be final and cover the whole lot.

3.7 At acceptance of clamps which went through acceptance tests the document is made up which verifies the compliance of clamps with the requirements of this standard in which the following should be indicated:

- name of the manufacturer and its address;
- clamp's legend;
- designation of the standard due to which clamps were made and
- accepted;
- number of the lot;
- number of clamps in pieces and mass of the lot.

Above said document should be signed by technical control department of the manufacturer and by the inspector of the Ministry of Railways.

4. CONTROL METHODS

4.1 Quality of the clamp's surface is controlled visually. Defects availability and their depth are checked by trial cutting or other method which can provide the correctness of determination.

4.2 Geometrical sizes and straightforwardness of the clamp are checked with the help of measurement tools under GOST 8326, GOST 166, GOST 2216 or by templates given in Annex 2.

4.3 Test for tension (point 3.5) is carried out under GOST 1497 on round samples of fivefold length by diameter 10 mm. At relative lengthening compliant with norms indicated in GOST 535, upper value of resistance is not limited.

5. MARKING, PACKING AND TRANSPORTATION

5.1 For each lot of the clamps two metallic tags(labels) are hanged on which the following should be indicated:

- trademark or legend of the manufacturer;
- number of the lot;
- mass of the lot;
- mark of the technical control of the manufacturer and inspector of the Ministry of railways.
- Tags(labels) should be securely tied by the wire to two clamps of each accepted lots.

5.2 Clamps should be with attached document, verifying the compliance of clamps with the requirements of this standard made up in accordance with point 3.7.

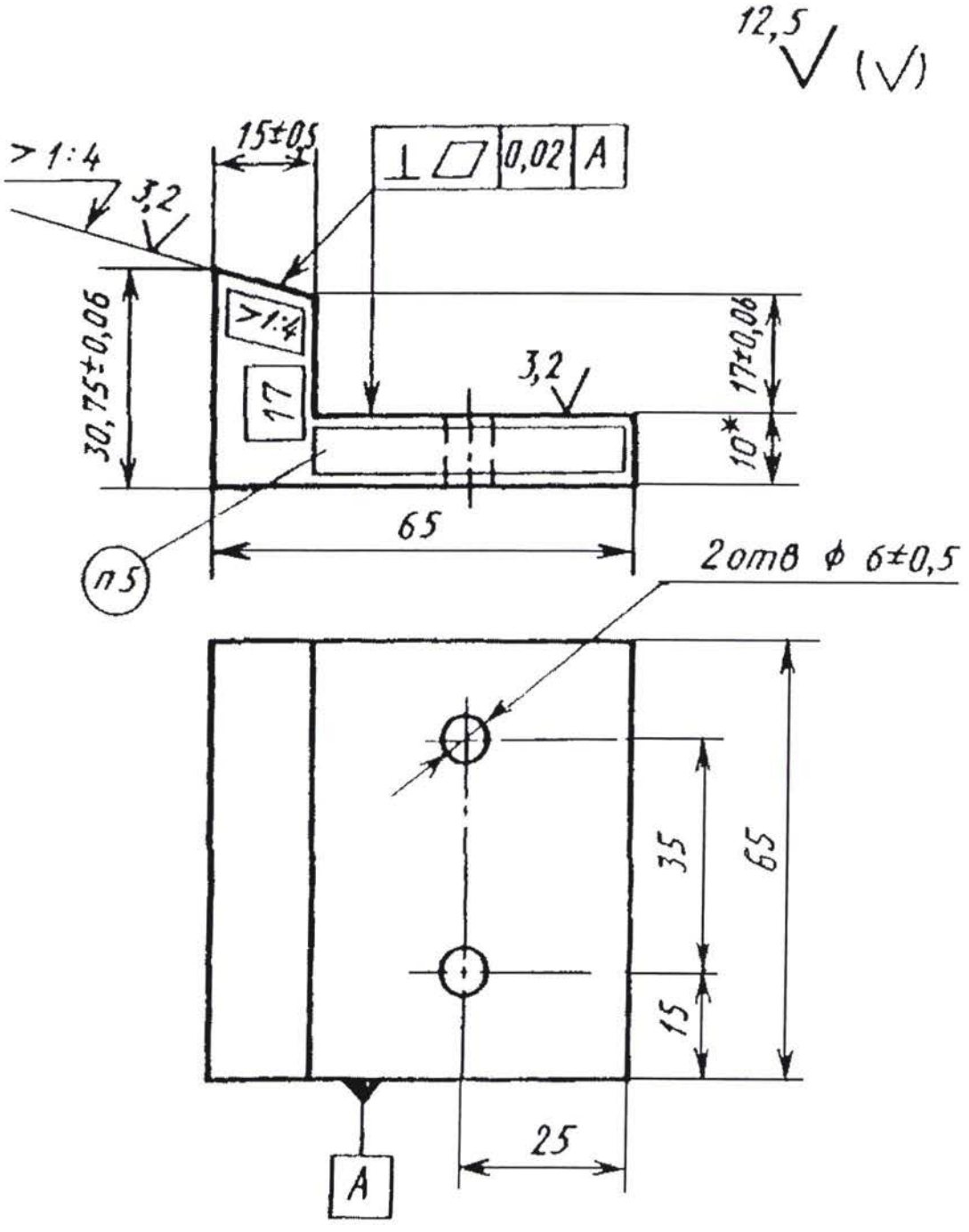
5.3 Clamps transportation is carried out without packing by any type of transport in accordance with the existing rules of cargo transportation.

Annex 1
Reference

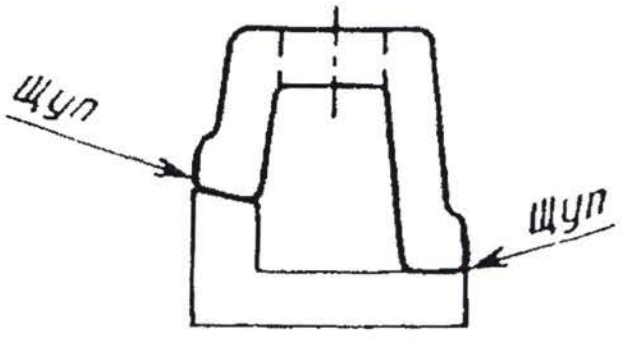
Sectional area of the profile, sm2	**Mass. kg**	
	1 m of roll	**One clamp**
14,7	11,5	O,64

Note: Mass of clamps is determined due to rated dimensions and steel solidity 7850 kg/m3

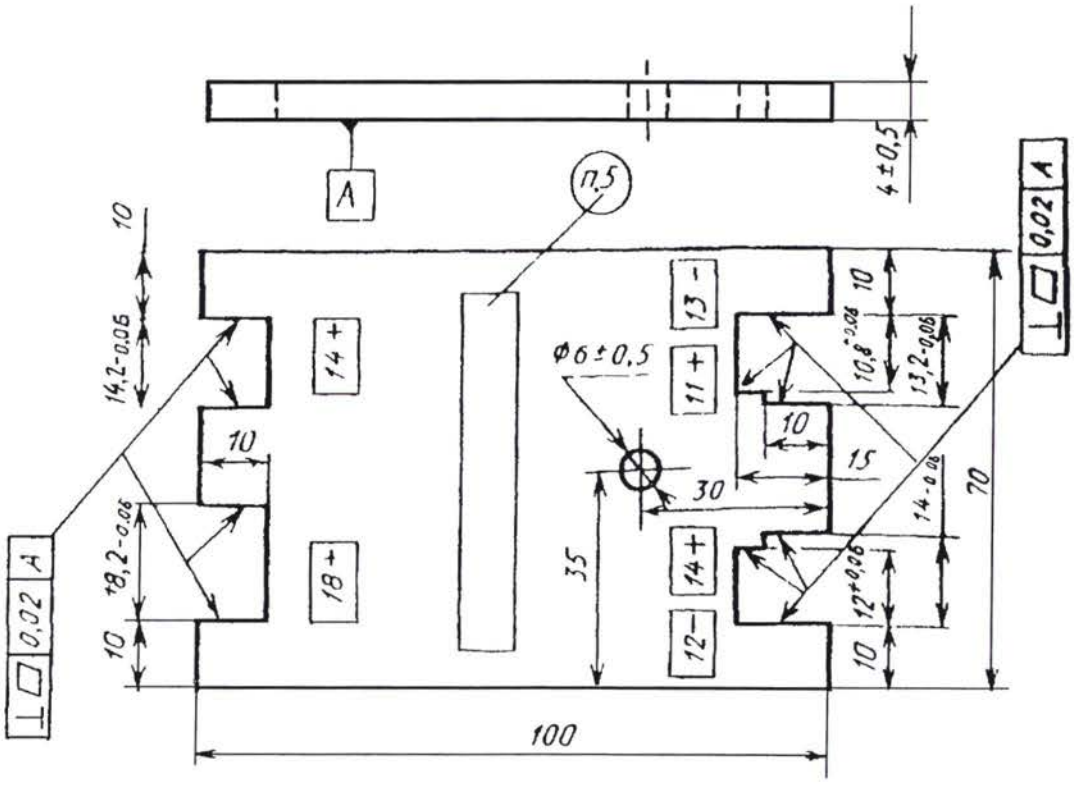
Device for measurement of the dent and metal tightening on support surfaces



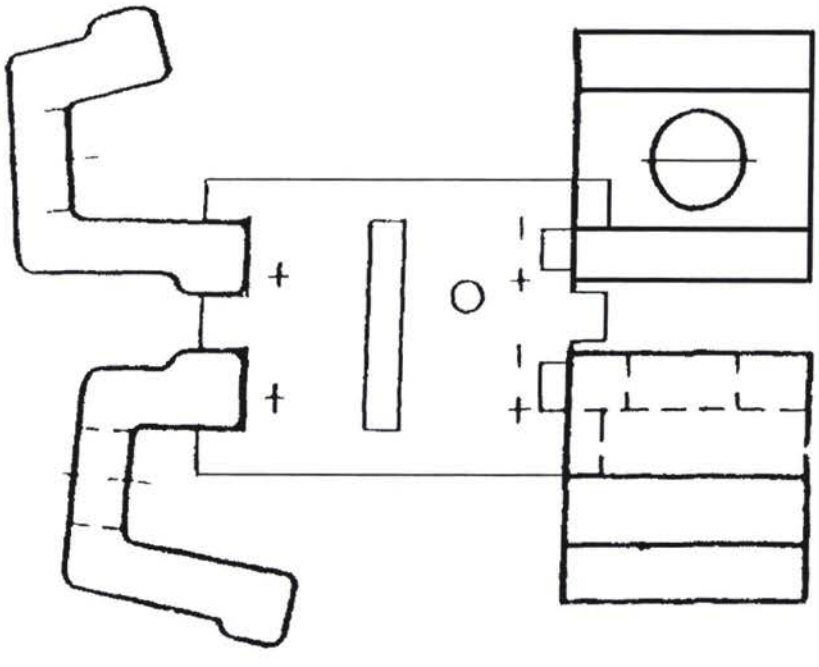
Метод контроля

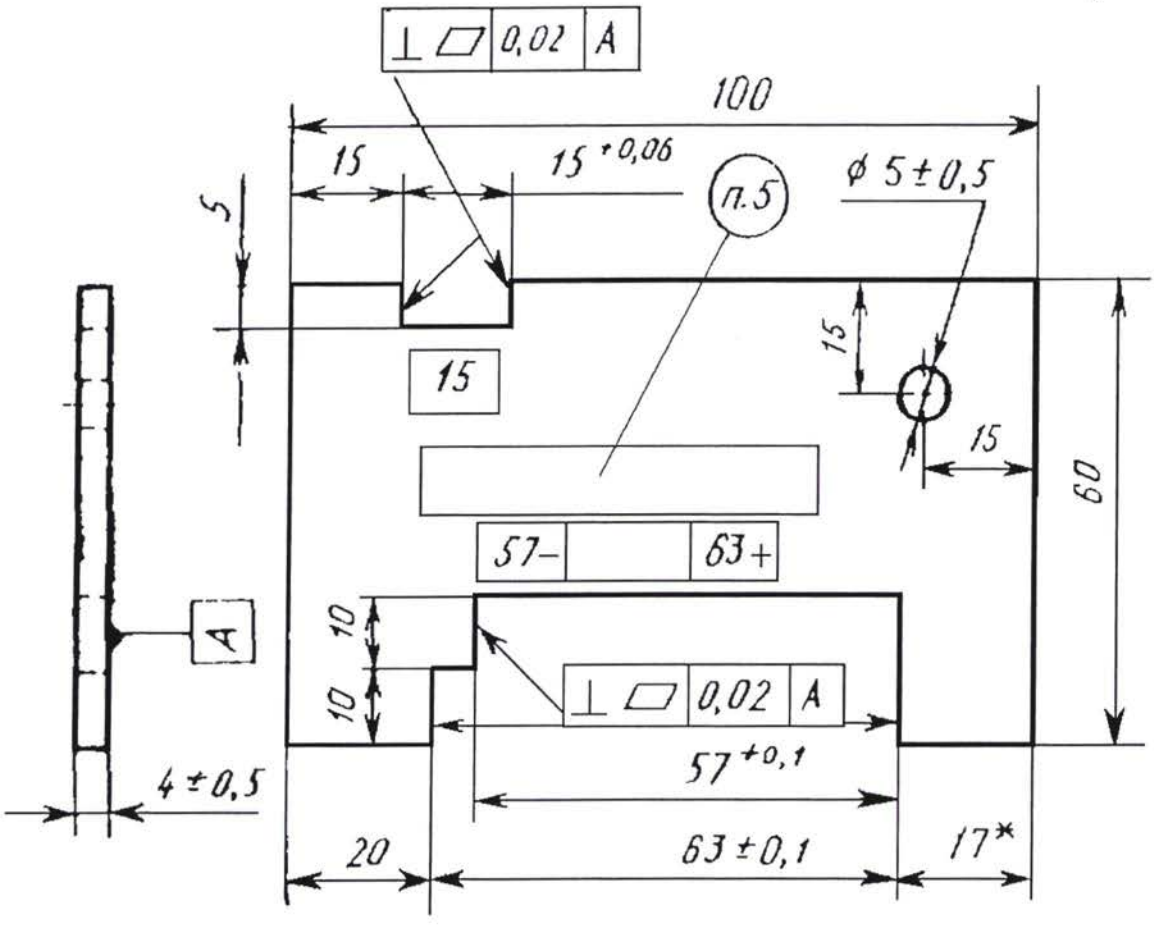


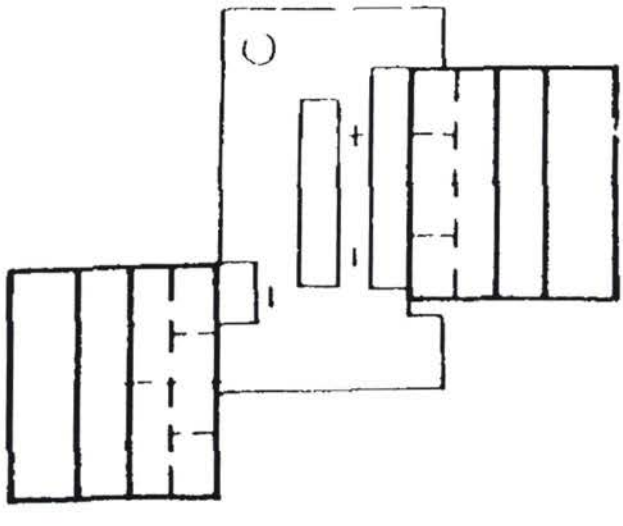
The template to measure clamp's sheet width (plus and minus) height of the not more then 2,0 mm



Control method







* Dimensions for reference

NOTES:

1. Not indicated tolerances of dimensions ± 1mm.
2. Hardnes59…65 HRSa.
3. Cemented, depth of not cemented layer 6.0…1.0mm.
4. Sharp edges.
5. Mark: clamp PK GOST 22343, shop's number of the pattern.

GOST 7392-85

Crushed natural stone for railway ballast.

Non-observance of the standard is prosecuted under the Law.

This standard covers crushed natural stone received by crushing of rocks and used for public railway ballast, as well as for the railways of the entities and organizations of the Soviet Union. Crushed stone should be used in accordance with the building norms and rules and other normative documents, approved in the established order.

1 Technical requirement

1.1 Crushed stone should be prepared to meet the requirements of this standard.

1.2 Depending on the type of initial rock the crushed stone can be done: from rocks; detritus and gravel.

1.3 There are the following indications requirements to the crushed stone; kernel composition; particle content with the sizes of less than 0,16mm; crushed kernels (granular) content (in the crushed stone from boulders and gravel); durability; content of kernels (granular) of soft rocks, content of clay in lumps; frost resistance, electro insulation properties.

1.4 Depending on the fineness of the kernels (granular) the crushed stone (ballast) is divided into fractions, kernels' (granular) sizes of which should be in compliance with the indicated ones in table 1.

Table 1

Kernels (granular)size fraction, mm	**Number of kernels (granular)**				**Full residue on the sieve with the holes of diameter 40 mm, % by mass**
	larger than upper nominal size		smaller than the lower nominal size		
	In the limits of sizes , mm		% by mass , not more		
			total	including the particles by size less 0,16 mm	
From 25 to 60	From 60 to 70	5	5	1,5	From 25 to 75
	Over 70	0	-	-	
From 5 to 25	From 25 to 40	10	5	2	-
	Over 40	0	-	-	-

Note:

1. At operating plants when there available the activities on transition to produce standard ballast of fraction 25-60 mm for the period of reconstruction but not later than 1991 it is allowed the production of ballast of fraction 25-70 mm. At this the number of kernels (granular) by size from 70 to 90, should not exceed 5% of total mass of ballast. Due to

other indications kernel (granular) content of fraction 25 to 70 mm. should be in compliance with the values established for fractions from 25 to 60 mm.

2. At the plants operating on the base of gravel-boulder deposits with the content in rock mass of large fractions which do not provide necessary number of crushed kernels (granular) in the ballast is allowed under the permission of the Ministry of Railways to produce the ballast with kernels (granular0 of the size from 5 to 40 mm, at this the number kernels(granular) in such ballast with the size of 40 to 70 mm should not exceed 5% of total ballast mass and kernels (granular)with the size of less than 5mm – not more than 5% of total mass including the particles with the size less than 0,16 mm – not more than 2%.

3. Under the agreement with the consumer the ballast with kernels of size from 5 to 25 mm can be used in construction, At this due to kernel (granular)content it should be in compliance with the requirements of this standard and due to other indications to be complied with the requirements of GOST 8267-82, GOST 10260-82.

On the railways of public usage ballast of fraction from 25 to 60 mm and from 25 to 70 mm is intended for re- ballasting of main lines, ballast of fractions from 5 to 25 mm for re-ballasting of stations and approach tracks.
On the railways of industrial railway transport the usage of ballast of different fractions is regulated by the branches rules for repair and maintenance of enterprises railways.

1.5 Ballast from detritus (boulders) and gravel fractions of size 25 to 60 mm should contain crushed kernels (granular) in the amount of 50% by mass. Kernels (granular) are to be considered crushed when their surface is broken by half. In ballast of fraction from 5 to 40 mm crushed kernels (granular) should not be more than 40% and fractions from 5 to 25 mm – not less than 35 %.

1.6 Ballast durability (strength) is characterized by its abradability while tested in the shelf drum or its resistance to hammering while tested at the end of ПМ. Depending on the indications of mechanical strength ballast is divided into marks indicated in tables 2 and 3.

Table 2

Ballast mark	Abradability (loss in mass), %
Ballast of fractions from 5 to 40mm, from 25 to 60mm and from 25 to 70 mm	
И20 И40 И50	To 20 Over 20 to 40 Over 40 to 50
Ballast of fraction from 5 to 25 mm	
И20м И40м И50м	To 20 Over 25 to 50 Over 50 to 65

Table 3

Ballast mark	Resistance to hammering
Y 75	Over 75
Y50	Over 50 to 75
Y40	Over 40 to 50
Note: All fractions of the ballast except fractions from 5 to 20 mm are subject to test for hammering resistance	

1.7 For ballast layer of the railway the ballast of the following marks due to strength should be used: и20, И20мб И40, И40м or У75, У50. Production of ballast marks И50, И50м and Y40 is allowed only on operation ballast plants, and its usage for the ballast layer of the railways under the permission of the Ministry of railways – when there available special feasibility studies.

1.8 Ballast should not contain kernels (granular) of weak rocks in the amount of 10% by mass. To the weak rocks one can refer the rocks with the limit of strength at compression in saturated by the water condition up to MPa (200 kg/sm2).

1.9 In the ballast of fractions from 25 to 60 mm, from 25 to 70mm and from 5 to 40 mm there should not be clay lumps, soil of the vegetative and other organic particles. In the ballast of fraction from 5 to 25mm the content of clay lumps should not be more than 0,25 % by mass with total amount of particles less than 0,16mm.

1.10 Due to frost resistance ballast can be divided into marks under GOST 8267 -82. Ballast of fractions from 25 to 60 and from 25 to 70 should have mark for frost resistance not lower Mpz (frost resistance) 50 of fractions from 5 to 25 and from 5 to 40 mm – not less Mpz (frost resistance)25. It is allowed at the operating plants under the permission of the Ministry of Railways to produce ballast of fractions from 25 to 60 and from 25 to 70 mm with mark for frost resistance Mpz (frost resistance)25. Frost resistance is determined by alternate freezing and thawing of ballast specimen. It is allowed testing in sulfuric sodium.

1.11 Electro insulation properties of the ballast are characterized by electric conductivity of fat solution, formed from ballast solubility in distilled water. Its value should not be more than 0,06 Cm/m. When the volume of fat solution is decreased by evaporation 10 times electric conductivity of received solution should be not more than 0,35 Cm/m.

2. ACCEPTANCE RULES

2.1 Ballast acceptance is done by lot (batches). The lot is considered to be the amount of ballast of one fraction simultaneously shipped to one consumer in one railway train. When ballast is transported by cars the lot is considered to be the amount of ballast of one fraction shipped to one consumer during a day.

2.2 The amount of the delivered ballast is determined by measurement of it in the wagons, cars or other transport vehicles on the place of its shipment. When control measurements of the ballast on the place of unloading its volume is re- measured taking into consideration coefficient of ballast consolidation while transported, established before the delivery under the agreement between the producer and the consumer depending on the transportation distance, kernel (granular) content and

other local peculiarities. Coefficient of ballast consolidation should not be more than 1, 10. The amount of the ballast delivered in weight units the consumer determines, if necessary, by the adjustment of the material volume due to its packed density. Packed density of the ballast is determined under GOST 8269 -76.

2.3 Acceptance quality control of the ballast at the enterprise (quarry)-producer is done in its laboratory within the period indicated in table 4.

2.4 For acceptance quality control of produced ballast the samples are taken from the production line (belt) transporting the ballast to the store house of ready production or the loading bunker (or from the open store house of ready production to the loading bunker in accordance with GOST 8269 -76. Total mass of a sample intended for one testing should not be less than four time exceeding one indicated in table 5.

Average thoroughly mixed sample before being sent to the laboratory is reduced by quartering or with the help of chute deviser under the methodology given in GOST 8269 – 76 until the mass two time exceeding the one indicated in table 5

Table 4

Test description	Period of test conduction	Number of samples for one testing
Determination of kernel in ballast content and particles content in it by the size less than 0,16mm.	Every day	1
Determination of crushed kernel (granular0 content in the ballast from detritus and gravel	Every day	1
Determination of clay in lumps, vegetative soil and other organic admixtures in the ballast content.	Every day	1
Determination of abradability in the shelf drum or hammering resistance on pneumatic pile-driver.	Once a quarter	2
Determination of kernels (granular) of weak rocks in the ballast content.	Every day	1
Determination of frost resistance.	Once a year	2
Determination of electric insulation properties of the ballast	When geological exploration of the deposits and once a year	3

Table 5

Test description	Minimum mass of the ballast sample to carry out one testing, kg			
	ballast of fractions from 25 to 60, from 25 to 70 mm.	**ballast of fractions from 5 to 40mm.**	**ballast of fractions from 25 to 60, from 25 to 70 mm.**	**Ballast sample with the size of kernels (granular)from 25 to 40 mm**
Determination of kernel (granular) composition and content of particles by the size less than 0,16mm.	30	20	10	-
Determination of clay lumps, soil of the vegetative layer and other organic admixture in the ballast content	15	5	1	-
Determination of crushed granular in the content of the ballast from boulders and gravel	15	5	1	-
Determination of abradability in the shelf drum	-	-	10 (2 samples per 5 kg)	20 (2 samples per 10 kg)

Continuation of Table 5

Table 5

Test description	Minimum mass of the ballast sample to carry out one testing, kg			
	ballast of fractions from 25 to 60, from 25 to 70 mm.	**ballast of fractions from 5 to 40mm.**	**ballast of fractions from 25 to 60, from 25 to 70 mm.**	**Ballast sample with the size of kernels (granular)from 25 to 40 mm**
Determination hammering resistance on ПМ.	-	-	-	3 (2 samples per 1,5 kg)
Determination of granular content of soft rocks	15	5	1	-
Determination of frost resistance	-	-	3 (2 samples per 1,5 kg)	5 (2 samples per 2,5 kg)
Determination of electric insulation of ballast properties		-	18 (3 samples per 6 kg)	-

Note: Ballast samples with granular size from 25 to 40 are prepared only for testing by screenings from the ballast fractions of 25-60 and 25-70 mm. To prepare these samples the selected from the conveyer ballast mass is sent to the laboratory without its preliminary reduction.

2.5 The consumer carries out control checking of compliance of the shipped ballast with the requirements of this standard, observing the following order:

- for ballast testing the selection of point samplings is carried out from which by means of integration one can receive control sample;
- at control checking of ballast quality transported by railway transport point samples are selected when the lot's volume if three wagons – from each wagon, when large volume – from any of these three wagons. Each sample is selected from five different places of the wagon (in four corners and in the centre);
- at control checking of ballast quality transported by cars, from each lot with the volume not more than 35 m3 point samples are selected at least from five cars. Each point sample is selected in the centre of car body;

- mass of control sample selected for checking of the lot should be at least t time exceed summary mass of samples for testing indicated in table 5. Reduction of samples to the size required for testing is done by the method of quartering or with the help of chute divisor under the methodology given in GOST 8269 - 76;
- as a result of tests arithmetic mean of parallel determinations, which are provided for the corresponding method, is taken . Granular content is evaluated due to the mean value of results of three parallel tests;
- when the results are unsatisfactory at least on one of indications the test is carried out again. The result of the repeated test is final.

3 TEST"S METODS

3.1 Ballast testing to determine the content of crushed granular in the ballast from boulders and gravel, content of clay in lumps, soil of vegetative layer and other admixtures, abradability in the shelf drum, hammering resistance on pneumatic pile-driver, content of soft rock granular, frost resistance is carried out under GOST 8269 -76. At this the ballast of fraction from 25 to 40 or from 5 to 25 mm is subject to testing in the shelf drum and on frost resistance, the ballast of fraction from 25 to 40 mm is subject to testing in pneumatic pile-driver, and other testing – the ballast of fraction from 25 to 60, from 25 to 70, from 5 to 40 or from 5 to 25 mm correspondingly without dispersing them into fractions provided by GOST 8269 -76.

3.2 Determination of granular content of the ballast and content in it of particles with the size less than 0,16mm.

3.2.1 Equipment

Table cup-shaped scales under GOST 24104-80 or platform one under GOST 23711 -79, drying chamber.
Sieves with round holes of diameter 70; 60; 40; 25; and 5 mm.
Ring caliber of diameter 90mm.
Sieves with mesh № 1 and 0,16 under GOST 3584 – 73.

3.2.2 Testing procedure

Ballast sample by mass indicated in table 5 is dried in the dry chamber until steady mass (G)

The dried sample of ballast pours out into the vessel pour out water and mix energetically. After mixing the received turoid (muddy) water is dumped through protective sieves with the holes of diameter 5 mm, with mesh of 1 and 0,16 mm, and ballast pour out on the upper sieve and washed by clean water until the flowing water is clear. Washed in such a manner ballast remained on the sieves with the holes of diameter 5mm and cells 1 and 0,16 mm, is combined and dried in the dry chamber until steady mass (Go). The dried sample of the ballast is bolted (sift) through a set of sieves with the holes of size:

- 70; 60; 40; and 25 mm – when ballast of fraction from 25 to 69 mm;
- 40; 25 and 5 mm – when ballast of fraction from 5 to 25mm;
- 60; 40 and 25 mm, as well as ring caliber by diameter of 90mm – when ballast of fraction from 25 to 70 mm;
- 70; 40 and 5 – when ballast of fraction from 5 to 40mm.

Ballast granular which do not go through the ring-caliber, remainder on each sieve and the ballast which went through the sieve with the holes of diameter 25 mm (or 5 mm when the ballast of fraction from 5 to 25) are weighed separately.

3.2.3 Results treatment

Granular content of the size more than 70mm (X70); 60mm (X60);

40mm (X40); 25mm (X25); 5mm (X5) and of size less than 25 mm (X-25); 5mm (X-5); 0,16mm (X-16) in per cent is calculated under the equations:

$$X70 = \frac{G70}{G} \times 100 ; \qquad X40 = \frac{G40}{G} \times 100 ;$$

$$X60 = \frac{G60}{G} \times 100 ; \qquad X25 = \frac{G25}{G} \times 100 ;$$

$$X5 = \frac{G5}{G} \times 100 ;$$

$$X\text{-}25 = \frac{G\text{-}25}{G} \times 100 ;$$

$$X\text{-}5 = \frac{G\text{-}5}{G} \times 100 ;$$

$$X\text{-}0{,}16 = \frac{G - Go}{G} \times 100$$

Where G70, G60, G40, G25, G5 – remainders on the sieves with the holes of diameter, correspondingly, 70; 60; 40; 25, and when analyzing the ballast of fraction from 5 to 25 mm on the sieve with the holes of diameter 5mm;

G-25, G-5, G -0,16 – the ballast mass which went through the sieve with the holes of diameters 25; 5 and 0,16 mm.

Full content of the particles with the size of less than 25 mm (X-25n) or, correspondingly, less than 5 mm (X-5n) for the ballast of fraction from 5 to 25 mm in per cents is calculated under the equations:

$$X\text{-}25n = X\text{-}25 + X\text{-}0{,}16;$$

$$X\text{-}5n = X\text{-}5 + X\text{-}0{,}16.$$

Checking of granular availability with the size of more than 90 mm in the ballast of fractions 25 – 70 mm is carried out with help of ring-caliber of diameter 90mm.

3.3 Determination of electric insulation properties of the ballast

Electric insulation properties of the ballast is determined due to electric conductivity of fat solution which received at the ballast dilution in distilled water.

3.3.1. Equipment

Amperemeter of AC, class 1,0 with the scale to 300 mA under GOST 8711-78.
Voltmeter of AC, class1,0 with the scale to 300 V under GOST 8711-78.
Laboratory regulating transformer 250 V x 2A (ЛАТР) .
Transformer 220/24V
Measuring cube made of insulated material (Plexiglas) with internal sizes of 50 x 50 x 50 mm.
Two electrodes with the size of 50x50x1mm.
Sieves with round holes.
A dry chamber.
Table cup=shaped scales under GOST 24104-80.
Cylindrical zinc bucket without markings of volume 10l.

Cylindrical bucket with two markings (belts) on inner wall corresponding to the volume of 3,5 and 4 l.

Vessel for evaporation of the solution with two markings corresponding to the volume of 0,2 and 2l.

A funnel.

3.3.2. Tests' procedure

The sample of the ballast of mass 6 kg is ground in laboratory crusher and sifted through the sieve with the holes of diameter 3mm.

The mixture gone through the sieve is put into cylindrical bucket until the marking 4l with equal layers compacting until the steady volume.

Measured in such a manner the volume of mixture is poured out into cylindrical zinc bucket of volume 10 liter, pour out 3,5 l of distilled water and carefully mixed until receiving fat solution,

Solubility of the solution is determined through periodic measurement of its electric conductivity in the measuring cube. After measurement the solution is poured out back into the bucket without markings.

Mixing the solution and determination of its electrical conductivity is carried out until electrical conductivity is stabilized. Stable electric conductivity of the solution testifies that the solution became fat.

Then the fat solution with the volume of 3 liters into the vessel for evaporation and evaporated it until the volume of 0,2 liters. Cooled the received solution up to room temperature, the solution is poured out into the measuring cube and determine its electrical conductivity.

3.3.3 *Determination of electrical conductivity of the solution.*

Electrode are cleaned until lustre and set up on two opposite lateral walls of the measuring cube. The cube is washed by distilled water and pour out into it received fat solution the electrical conductivity of which is to be determined. The level of poured solution should coincide with upper edges of the electrodes. Leads of electrodes are connected with measurement scheme.

The voltage between electrodes to be equal to 5 – 10 V is set by rotation of the handle of the laboratory regulating transformer, and the current which runs through the measuring cube is measured at one and the same voltage between electrodes.

Drawing of the procedure

Electrical conductivity Y is determined under the equation

$$Y = \frac{I}{U},$$

Where I is the strength of the current at fixed voltage, A;

U is the voltage between the electrodes , B

3.3.4 To receive the values of electrical conductivity of the solution it is necessary calculated values of electrical conductivity in compliance with para. 3.3.3 to multiply on constant coefficient 20 for the measuring cube.

4 TRASPORTATION AND STORAGE

4.1. The documents on quality is attached to each lot (batch) of shipped ballast, where it is indicated:

- name of the producer and its address;
- number and date of the document issuing;
- name of the addressee and its address;

- numbers of the wagons, invoices and the amount of the shipped ballast;
- sort of ballast (ballast from rocks or from boulders and gravel) and the name of initial rock;
- fraction of the ballast, granular content, particles availability with the size of less than 0,16mm, availability of granular of soft rock as well as strength and frost resistance of the ballast, content of clay in lumps;
- indicator of electrical insulation properties of the ballast;
- marking of this standard.

4.2. Ballast is kept and transported separately due to fractions, moreover it should be protected from dirtying.

4.3. The ballast is transported by all kinds of transport.

4.4. While being transported the requirements of the Rules of transportation for cargoes and Specifications of loading and strengthening of cargo approved by the Ministry of railways should be observed and also the corresponding rules established by the entities of inland water transport and automobile transport.

4.5. The supplier should follow the measures providing full usage.

GOST 7394 -85
Gravel and sandy-gravel ballast for railway track.

Non-observance of the standard is prosecuted under the Law.

This standard covers gravel and sandy-gravel ballast which is the natural mixture formed as the result of natural destruction of rocks and used as ballast layer of the tracks as well as the roads of enterprises and organization.

Gravel ballast should be used on destination and departure and other station tracks as well as to be used as a pad under the crushed stone and asbestos ballasts; sandy-gravel for small activity station, sidings and connection tracks and as a pad for all kinds of ballasts.

1. Technical requirements

1.1. Gravel and sandy-gravel ballast should be produced in accordance with the requirements of this standard under the technological documentation approved in the established order.

1.2. Depending on granular content of natural sandy-gravel mixture the ballast is divided into the following types:
- gravel;
- sandy-gravel.

1.3. Gravel and sandy-gravel ballast should be characterized due to the following indications:
- granular content;
- content of quartz granular of solid volcanic and isomorphic rocks;
- content of granular of soft rocks;
- content of dusty and clayey particles.

1.4. Granular content of gravel and sandy-gravel ballast should meet the requirements indicated in Table 1.

Table1

Sieve's holes size, mm	**Full remainders on the sieves, % by mass in the ballast**	
	gravel	**sandy-gravel**
100 60 25 5 0,63 0,16	0 To 10 - From 40 to 80 From 70 to 100 From 90 to 100	0 0 To 20 To 50 From 35 to 100 From 85 to 100
Passage through the sieve 0,16mm, %: total including dusty and clayey particles	To 10 To 2	To 15 To 3

1.5. Content of quartz granular and granular of solid volcanic and metamorphic rocks in sandy part of the ballast (fractions with the size less than 5mm) should make up not less than 50% of granular mass with the size from 0,16 to 5mm.

1.6. Content of granular of soft rocks in gravel part of the ballast should not exceed 10% of granular mass with the size more than 5mm. To the granular of soft rock can be referred the granular with the limits of strength at compression in the saturated by water condition less than 20 MPa (200 kgc/sm2).

1.7. Ballast is not subject to quality category attestation.

2. Acceptance rules

2.1 Delivery and acceptance of the ballast is carried out by lot (batches). The lot is considered to be the amount of ballast simultaneously shipped to one customer in one railway train.
When transporting the ballast by cars the lot is considered to be the amount of ballast shipped to one customer during a day.

2.2 The amount of delivered ballast is determined by volume with the help of its metering in the wagons, cars and other transport vehicles on the place of shipment. At control metering of the ballast at the place of its unloading its volume is recalculated with the account of coefficient of compaction at the transportation, set up due tot the agreement of the manufacturer and the customer depending on transportation distance. Compaction coefficient is taken not more than 1,20 for gravel and 1,15 fro sandy ballast.
The amount of delivered ballast can be determined in weight units with the help of recalculation of the material volume by its packed density. Packed density of the ballast is determined under GOST 8735 – 75.

2.3 Acceptance control of ballast quality at the enterprises (quarry) – manufacturer is carried out in his laboratory during the period indicated in Table 2.

Table 2

Test description	Period of testing	Minimum mass of the ballast sample for carrying out of one test, kg
Determination of granular content and particle content of the size less than 0,16mm.	Daily	30
Determination of the content of dust and clay particles by fractional precipitation	Once a quarter and in each case of change geological conditions of pit face	10
Determination of content of soft rocks granular in gravel part of the ballast	Once a year and in each case of change geological conditions of pit face	15
Determination of the quartz granular and granular of solid volcanic and metamorphic mountainous rock content in the sand part of the ballast	At geological exploration works	0,5

2.4 For the acceptance control of ballast quality in the quarry the point sample are selected from the furrow made in the pit face vertically from the edge up to its foundation Cross section of the furrow is 10 x 20 or 15 x 20 sm depending on the size of the material. In the furrow t point samples are selected evenly along the height of the pit face from the edge to it foot. Selected from the furrow point samples are united into middle sample and mixed properly. Middle sample should be not less than four times exceed the mass indicated in table 2.

When determining the ballast quality extracted and laid by the method of hydromechanization, the map of inwash is divided for uniformity in sizes and due to the conditions of inwash of the area with the volume not more than 500m3 each. From each area at least five point samples from different places are selected.The mass of a point sample should be not less than 50 kg. Ballast quality is evaluated for each area separately under the results of testing on selected middle sample. Ballast middle sample before sending to the laboratory is reduced until the mass of 2 time exceeding the indicated in table 2. Reduction of the middle sample is carried out by the method of quartering under GOST 8735-75.

2.5 The customer carries out the control checking for compliance of the shipped ballast to the requirements of this standard observing at this the order given below:

- for ballast testing one should carry out selection of point samples from which by joining up the control sample is received;
- when control checking of ballast quality delivered by railway transport, point samples are selected from each wagon when the size of the lot is three wagons; when the lot is large – from any three wagons. Each point sample is selected from five different places of the wagon(in four corners and in the centre);
- when control checking of ballast quality delivered by cars, from each lot of the volume not more than 350 m3 point samples are selected at least from five cars. Each point sample is selected in the centre of the car body.

Mass of the control sample selected for the checking of the lot should at least 5 times exceed the summary mass of test samples indicated in table 2.
Reduction of samples until the size required for testing is carried out by quartering method or with the help of chute divisor under the methodology given in GOST 8269 - 76. Mean arithmetic value of parallel testing provided for the corresponding method I taken as the result. Granular content is evaluated due to the mean values of three parallel testing results. When testing results are not satisfactory at least for one of the indications the repeated testing for this indication is carried out. The result of the repeated testing is final.

3. Test methods

3.1 Ballast testing to determine granular content and particle content of size less than 0,16mm, content of granular of soft rocks, dusty and clayey particles is carried out under GOST 8269-76. Samples to determine granular content is sifted on the sieves with the holes of size 0,16; 0,63; 5,0; 25,0; 60,0 mm, granular content of size more than 100mm is determined with the help of ring-caliber of diameter 100mm.; Determination of amount of dusty and clayey particles in ballast is carried out by the method of fractional precipitation.

3.2 Content of quartz granular and granular of other volcanic and metamorphic mountainous rock is determined under GOST 8735-75.

4. Transportation and Storage

4.1 Each lot of shipped ballast should be accompanied with the document on quality in which the following is indicated:

- number and date of issuing the passport;
- name of the quarry- supplier and his address;
- name of the addressee and his address;
- number o wagons, invoices and a number of shipped ballast;
- type of ballast (gravel or sandy-gravel);
- granular content;
- content of granular of soft rocks;
- content of quartz granular and granular of solid volcanic and metamorphic rocks;
- content of dusty and clayey particles;
- number of this standard.

4.2 Ballast is transported in the open railway wagons as well as in the cars in compliance with approved in the established order rules of cargo transportation by corresponding type of transport. While transporting by railway transport Specifications of loading and strengthening of cargo approved by the Ministry of railway Infrastructure should be observed.

4.3 While transporting the measures which provide ballast protection from dirtying(pollution) should be observed

4.4 Gravel and sandy-gravel ballast is transported and kept in the conditions preventing the ballast from pollution.

GOST 8193-73

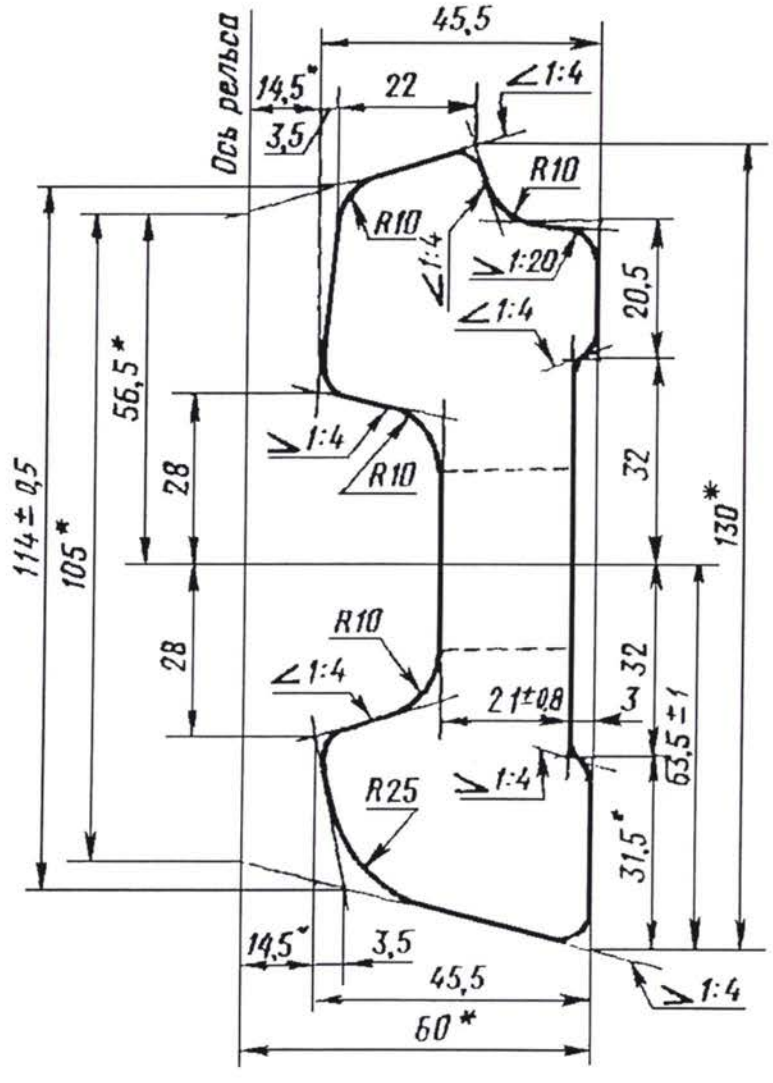
Bull-headed (two-headed) fishplates for rails R65, R75 types. Design(construction) and dimensions.

Non-observance of the standard is prosecuted under the Law.

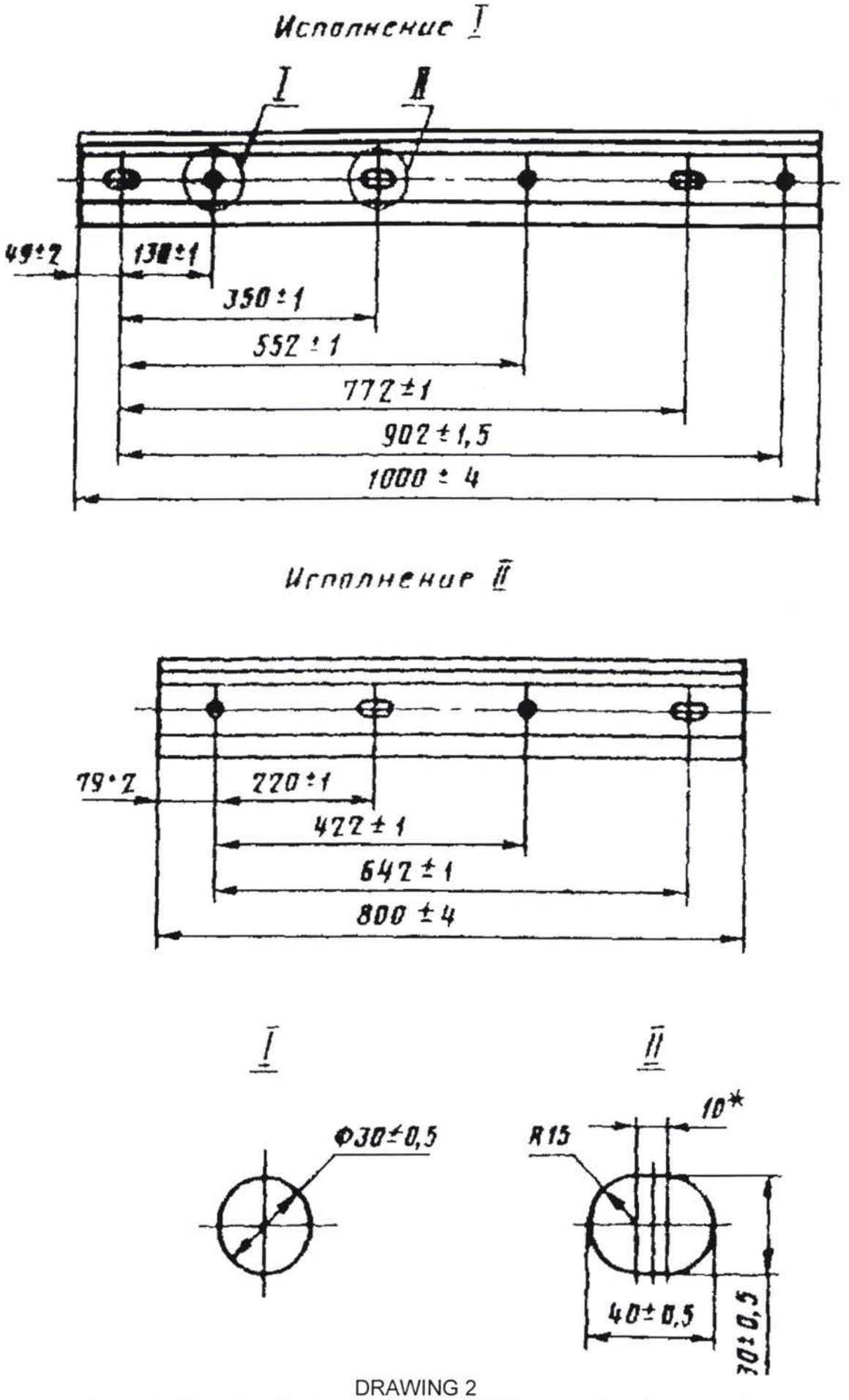
1. This standard covers bull headed fishplates for the railway rails R65, R75 types. The requirements of CMEA recommendations on standardization of PC 1940-69 were taken into account in the standard.

2. Design (construction) and dimensions of the plates should be in compliance with those indicated on drawing 1 (design data are indicated in Reference Annex).

3. Performance of plates and location of bolt holes from exterior side should be in compliance with those indicated on drawing 2.
   Choice of plates performance is established under the agreement of parties.



DRAWING 1



DRAWING 2
Legend of the plate for the rails R65 and R&5 types of performance 1

Plate 1P65 GOST 8193 – 73

The same, performance 2:

Plate 2P65 GOST 8193 – 73

2,3. (Changed, Ch. №1)
4-6. (Excluded. Ch.№1)

7. Technical requirements under GOST 4133-73

ANNEX

Reference

Design data

Area of cross section of the rolling, sm2	38,75
Distance to the centre of gravity, sm:	
- from upper part of the plate	6,42
- from bottom part of the plate	6,33
- from exterior edge	2,01
Inclination angle of the axes to horizon:	
- main	- 3o22'
- neutral	27o46'
Moment of inertia, sm4:	
- horizontal	528,0
- vertical	53,3
- centrifugal	-28,05
concerning main axes:	
- the most	530,0
- the least	51,6
Drag torque, sm3	
-over top	82,5
- over bottom	83,8
- over exterior edge (the most)	26,5
Mass, kg:	
1 m of rolling	30.42
- plate of performance 1	29,50
- plate of performance 2	23,78

Note. Mass is determined out of nominal dimensions and relative steel density 7,85.

GOST 4133-73

Bull-headed (two-headed) rail plates for broad gauge tracks. Technical requirements

Non-observance of the standard is prosecuted under the Law.

This standard cover bull-headed plates volume-hardened through oil quenching, used for butt joint of rails for broad gauge tracks.

The standard is in compliance with CT CMEA 1669-79 relating to technical requirements concerning the plates.

(Changed edition, Change №2)

1. Technical requirements

1.1 Plates should be made from profile bars rolled from fully deoxidize calm marten cite steel. Chemical content should be in compliance with the indicated one in table 1

Table 1

Elements content						
Description of the mark	Carbon	Manganese	Silicon	Phosphorus not more than	Sulfur	Arsenic
M 54	From 0,45 to 0,62	From 0,50 to 0,85	From 0,15 to 0,35	0,04	0,05	0,08

Note: In the steel for plates made from Kerch high phosphorus ore, it is allowed the content of arsenic to 0,15%, phosphorus to 0,05 %.

(Changed edition, Change. №2)

1.2 Total draft at profile bar rolling should be not less than 20. Pressed ingot and rolled from it profile bar should be cut until full removal of shrink blister and harmful segregate zone. It is not allowed feckless and foreign inclusions –choking-ups

1.3 Cutting of profile bars into measured sections of the plates can be done both in hot and cold condition. Gas flame and electroarc is not allowed cutting.

(Changed edition, Change. №2)

1.4 Holes for bolts on plates should be done in hot condition perpendicular to the surface of plate's web.

1.5 Due to the request of the Customer it is allowed to make the plates without bolt holes and without the hardening in oil quenching. It is allowed to make holes for bolts by methods of cold mechanical treatment.

1.6 On the ends of the plates and around bolt holes should not have burrs and roughness as bulges; it is allowed cleaning of these defects observing the established sizes for the plates and allowable deviations. It is not allowed roughening of the metal, which might arise at cutting the plates from profile bar or at insertion the bolt holes.

1.5, 1, 6 **(Changed edition, Change. №2)**

1.7 On the surface of the plates it is not allowed cracks, rolling marks, flaws, and slag shots. It is allowed single blisters, microflaws, longitudinal hairlines with the depth of more than 0,5mm. Blisters should be cleaned.

1.8 On area of bearing of the plates faced the rails it is not allowed projections and bulges with height of more than 0,5 mm.
It is allowed abrasive cleaning of projections and bulges observing the established for the plates sizes and allowable deviations.

(Changed edition, Change. №2)

1.9 It is not allowed welding or sealing of any defects on the profile bar or on the plates.

1.10 Plates should be upright. It is allowed even curvature along the whole length of the plate which does not exceed the values indicated in table 2.

Table 2

Value of curvature in mm for the plate with length		**Curvature type**
less than 1 m	1 m and more	
1	1,6	Relief (protuberance) in the direction of the rail head in vertical plane.
0,5	0,8	Relief (protuberance) in the direction of the rail foot in vertical plane.
2	3	Relief (protuberance) in the direction of the rail web in horizontal plane.
1,5	2,4	Relief (protuberance) in the direction of the rail web in vertical plane.

Note. **(Changed edition, Change. №2)**

1.11 It is allowed correcting of the plates in cold condition. The efforts at correcting should be smooth without hammering.

1.12 Mechanical properties of the plates ready hardened in oil quenching should be in compliance with the indicated in table 3.

Table 3

Tens. str.(point of maximum load), H/mm2 (kgc/mm2)	**Yield point, H/mm2 (kgc/mm2)**	**Extension strain after rupture, %**	**Contraction after rupture, %**	**Brinell hardness - HB**
not less				
844 (86,0)	530 (54,0)	10,0	30,0	235 - 388

(Changed edition, Change. №2)

1.13 Samples cut from the ready plates should stand curve in cold condition by angle 20o (external) without fracture, cracks and tears.

1.14 Plates corresponding to the requirements para. 1.1 – 1.13 can be referred to the first sort.

1.15 The plates which have at least one of the following deviations from the norm provided by this standard for the plates of the first sort can be referred to the second sort:

- by breaking point - to minus 1,0 Mpa (10,0 kgc/mm2);
- by yield point - to minus 0,7 Mpa (7,0 kgc/mm2);
- by extension strain - to minus 4,0 % (absolute):
- by contraction - to minus 10,0% (absolute);
- by hardness – to minus HB 34;
- by content in steel:
- carbon - to plus 0,03%
- manganese – to plus 0,05 %, minus 0,10%;
- phosphorus – to plus 0,005 %;
- sulfur – to plus 0,005 %;
- by sizes exceeding not more than twice utmost deviations provided for this type of plates except the height of the plate;
- by bulges on area of bearing to 0,75 mm, and on other surfaces to 1,0 mm;
- by exceeding not more than twice utmost deviations on external defects and by plates curvature.

1.16 Laying the plates of the second sort on the railways of the Ministry of railways is not allowed. Plates of the second sort can be used on the industrial ways.

1.17 Plates' transportation to the Customer should be done with the indication of plates units in the shipped lot. At this theoretical mass is determined by its nominal sizes and relative density of steel 7,85.
(Introduced additionally, Change № 2).

2. Acceptance rules

2.1 Quality control of plates' production if done by technical control of the manufacturer. Technical acceptance of ready plates is made by the inspector of the Ministry of Railways. The results are legalized by Acts (Certificate) signed by him(her) and by the representative of technical control of the manufacturer.

2.2 Plates should be accepted by lots and in the amount of not more than 3000 pieces. The lot should consist of the plates of one type, one sort and made of metal of one melting. The remainder of the plates less than 100 pieces should be added to one of the lot of this melting or can be accepted by a separate lot.

Note. If steel for plates is melted in furnaces of large capacity and pout out into two ladles, then each ladle is considered to be a separate melting.

2.3 At quality control acceptance of the ready plates the following amount of plates and samples should be selected:
a) for visual examination, sizes checking, straightness and location of bolts' holes – not less than 1, 0% of plates from a lot;
b) for tension test – 1 sample from a lot;
c) for determination of hardness – 5 plates from a lot;
d) for determination of chemical steel content of plates – 1 sample from a melting. For control checking of chemical content of steel one sample from tree plates of the checked lot is prepared.

2.3, 2.3 **(Introduced additionally, Change № 2).**

2.4 In case if there are unsatisfactory results of visual examination of the plates after their regarding (para 3.9) all the plates of such lot are considered not to meet the requirements of this standard or the plates of the second sort, if they meet the requirements para 1.15.
In case of unsatisfactory results of some repeated test (para 3.8) all plates of such lot if did not subject to additional thermal treatment (para 3.9) is considered not to be in compliance with this standard or the plates of the second sort if the meet the requirements of para 1.15.

2.5 After repeated thermal treatment (para 3.9) the lot of plates should be subject to all acceptance tests as a new lot. In case of unsatisfactory results of these tests all plates of such lot are considered not to meet unsatisfactory to the requirements of this standard or plates of the second sort if they meet the requirements of para 1.15.

2.6 (**Excluded , Change. №2)**

3. Test methods

3.1 Control of the condition of plates' surfaces should be done through its visual checking.
In necessary cases the availability and depth of defects are checked by sample cutting of by another way which guarantee the correctness of definition. When cutting exfoliation and bifurcation of the chips is considered to be the sign of defect.

(Changed edition, Change. №2)

3.2 Sizes and straightness of plates, sizes and location of bolts' holes should be checked with the help of measurement tools or templates.

3.3 Tension test of samples under GOST 1497-73.
For tension testing a round sample should be cut with diameter 15mm with fivefold design length from the top angle of the upper head of the plate close to its bearing surface.
To determine the yield point tension test of samples is allowed under the agreement between manufacturer and the customer with fivefold design length of another diameter provided by GOST 1497 -73.

3.4 Bending test of samples under GOST 14019-80. For bending test flat sample from the plate should be cut with the width of a = 15± 20 mm and with length l =5a+ 150 mm with the keeping of the rolling surface from one side. Cutting of samples should be done in cold condition so that the plane of the cutting should be parallel to the lower bearing surface of the plate. Rolling surface when testing for bending should be from the inner side in the zone of tension. Diameter of support and mandrel should be equal of trice repeated width of a sample. Load at testing for curve should grow smoothly without jerks and hammering.

3.5 Determination of hardness under GOST 9012 -59.
Place for hardness determination should be in middle line of external surface of plate web and should be cleaned at the depth of 0,5mm.

3.6 Selection of samples for chemical analysis of steel is under GOST 7565 -73 when pouring out steel, and in necessary cases from ready plates.

3.7 Determination in steel carbon content is under GOST 22536.1 -77, manganese under GOST 22536.5-77, silicon under GOST 22536.4 -77, phosphorus under GOST 22536.3-77, sulfur under GOST 22536.2 -77, arsenic under GOST 22536.6-77.
(Changed edition, Change. №2)

3.8 In case of unsatisfactory results of visual examination (para 2.3a) or some other test (para 23 б, в, г) the repeated visual examination is allowed or that type of the test resulted unsatisfactorily, for this purpose double plates or samples should be selected from the lot.

3.9 In case of unsatisfactory results of the repeated tests of visual examination (para 3.8) the manufacturer is entitled to subject this lot of plates pieces regrading and new round of acceptance in accordance with para 2.3a. In case of unsatisfactory results of the repeated tests (para 3.8) the manufacturer is entitled to subject such lot of plates to additional thermal treatment- tempering and hardening.

3.10 **(Changed edition, Change. №2)**

3.11 Norms and the procedure of samples selection as well as the method of control of macrostructure of plates are established under the agreement of the Ministry of railways with the manufacturer

4. Marking

4.1 On each profile bar on the exterior side of the plate web in each 500-600 mm embossed letters and figures with the height of not less than 0,5mm in the following order:
designation of the manufacturer:
A – metallurgical plant "Azovstal"
K – Kuznetsky metallurgical industrial complex
Month (Roman figures) and two last figures the year of plate production;
Designation of the plate type(type of the rail for which the plates is intended).
Embossed letters and figures should be with the height of 15-20 mm and to have transition to the surface of the plate.

4.2 Plates accepted as the second sort one end should be marked (by the band not less than 20mm) by indelible red paint. The plates which do not meet the requirements of this standard should be stained with lime.

4.3 On each accepted lot of the plates four metallic labels should be hanged in which there should be indicated:
- the name of the manufacturer;
- year and month of plates production;
- type of plates;
- sort of plates and designation of this standard;
- number of plates in the lot in pieces and number of the lot;
- acceptance marking of the inspector of the Ministry of railways and technical control of the manufacturer.

Labels should be reliably tied by the wire to the four plates of each accepted lot.

4.4 Shipped plates' lots should be accompanied with the Act testifying the compliance of the plates to the requirements of this standard in which there should be indicated:
- name of the manufacturer;
- number and amount of lots;
- number of plates in each lot in pieces and total amount of plates in pieces;
- type and sort of plates;
- type of thermal treatment;
- results of chemical analysis;
- designation of this standard.

Indicated document should be signed by the representative of technical control of the manufacturer and the inspector of the Ministry of railways.

GOST 11530 - 76
Rail joint bolts

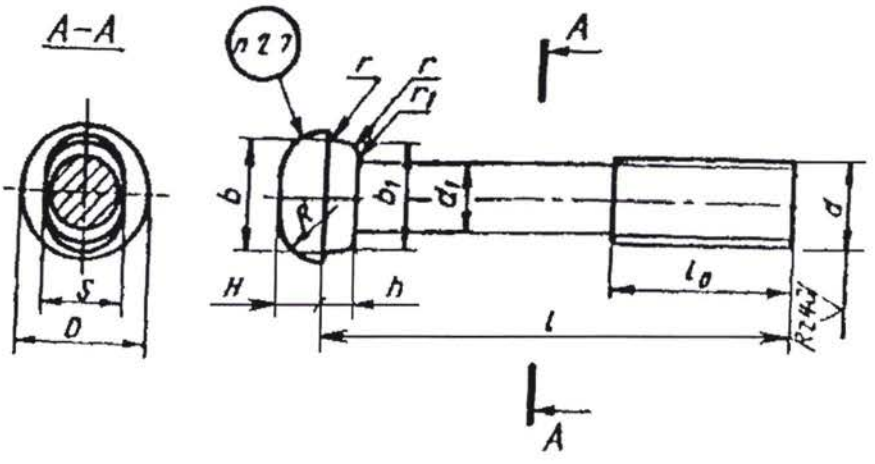
Standard non-observance is prosecuted under the Law.

This standard covers the bolts with round head and oval sub-head (side- head rest) used for fastening by two-head plates of rail joints type R38, R43, R50, R65, R75 and also on the bolts with reduced height of oval side-head rest(sub-head) for isolating joints of above-said rails. This standard provides bolts production of rough accuracy, normal and enhanced durability. The standard is in compliance with ST CMEA 4092 -83 concerning bolt M27 design and dimensions of performance 1(see reference annex 2) **(Changed edition, Changed № 2)**

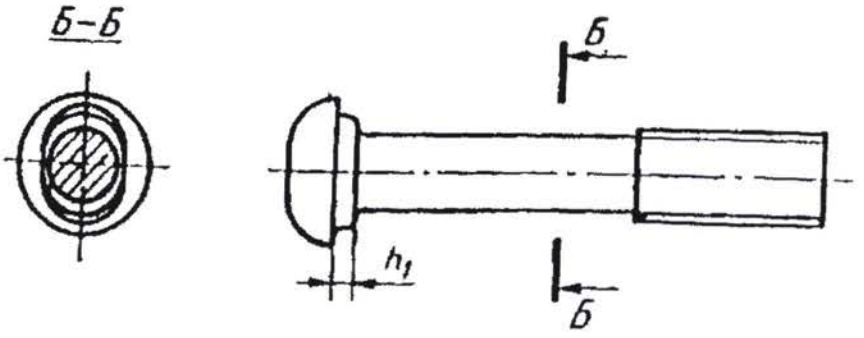
1. DESIGN AND DIMENSIONS

1.1 Designs and dimensions of bolts should be in compliance with those indicated on the drawing and in table.

Performance I



Performance II



R=H; d1¬da; da -average thread diametr

mm

Rated diameter of thread *d*		M22	M24	M27
Diameter of the head D (supposed deviation ± IT17/2)		37	40	46
Head height, H (supposed deviation ± IT17/2)		13	14	17
Axis misalignment of the head axis concerning the core axis, not more		0,9		
Dimensions of Head rest	h(supposed deviation h16)	31	33	38
	h1 (supposed deviation h15)	30	32	37
	S(supposed deviation h17)	22	24	27
	h(supposed deviation h17)	12		
	h1(supposed deviation h17)	6		
Radii of transitions	r	From 1 to 2		
	r1	Not less than 3		
Tread length, lo (supposed deviation + 6)		56	66	
Bolt length l (supposed deviation + 6) for rails of type: R38; R43	performance 1	135	-	-
	performance 2	140	-	-
R50	performance 1	-	150	-
	performance 2	-	160	-
		-	140	-
R65, R75	performance 1	-	-	160
	performance 2	-	-	180
		-	-	170

Example of the bolt legend by performance 1, tread diameter 24mm length 150mm, normal durability:

Bolt M24 X 150.8.8 GOST 11530 - 76

The same, of improved durability:

Bolt M24 X 150.109.40 X GOST 11530 - 76

The same, performance 2:

Bolt 2 M24 X 150.109.40 X GOST 11530 - 76

(Changed edition, Changed № 1, 2)

2. TECHNICAL REQUIREMENTS

2.1 Bolts for rail joints should be made in compliance with the requirements of this standard, under GOST 1759 -70 and under the working drawings approved in the established order.
(Changed edition, Changed № 1)

2.2 Bolts of normal durability should be made of class 8.8 durability under GOST 1759 – 70 from steel grade 35 or from steel grade 35P of microalloyed by boron or other grades of steel of this durability class,

Bolts of improved durability should be made of durability class 10.9 under GOST 1759-70 from steel of grade 40X or other steel grades of this durability class.

2.3 Tread is under GOST 24705 -81
(Changed edition, Changed № 1)

2.4 Tolerance range 8g - under GOST 16093 -81, it is allowed tolerance range 8h.

2.5 It is allowed:

a) round-up of the head ends with radius to 1,5mm, which do not bring out the head diameter out of the limit deviations;
b) a burr or a fin of size to 1,5 mm located along the perimeter of the bolt head perpendicular to its axis.

2.6 Bolts should be subject to all types of testing corresponding to durability class of the article(good) under GOST 1759-70 except tests for durability of the head connection with the core (rod) and test for long -time strength. Test for tensile strength on taper washer and measurement of the value coaly less layer should be carried out due to the customer demand (request).
(Changed edition, Changed № 1)

2.7 On each bolt in the place indicated on the drawing there should be marking which indicate the trademark or the legend of the manufacturer. On the bolts of improved durability there should be additional letter –П.)

2.8 Bolts should be complete by nuts under GOST 11532 -76. Bolts M22 are allowed to be complete with nuts under GOST 16018 -79. Packaging in one tare of the bolts together with nuts of one and the same size type is allowed. Under the agreement with the customer it is allowed the transportation of bolts without packaging with nuts which screwed on them or packed in tare.

2.9 Transportation of bolts and nuts should be done together. Under the agreement with the customer it is allowed to transport the bolts without packaging by any type of transport except railway platforms.

2.10 Mass of bolts is indicated in the reference annex.

Annex 1

Reference

Theoretical mass of 1000 bolts, kg

Bolts description	Mass
M22 X 135	448
M24 X 150	585
M27 X 160	818
2M22 X 140	449
2M24 X 160	592
2M27 X 180	872
2M24 X 40	522
2M27 X 170	827

Note. Mass of bolts is determined due to rated dimensions and steel density 7850 kg/m.
(Changed edition, Changed № 1)

Annex 2

Reference

Information data about the compliance to GOST 11530 – 76
ST CMEA 4092 – 83

GOST 11530 -76	ST CMEA 4092 - 83
Performance 1 Design and dimensions of bolt M27	Performance 2 Design and dimensions of bolt M27

(Introduced additionally, Change. № 2)

GOST 11532 - 93
Nuts for rail joints

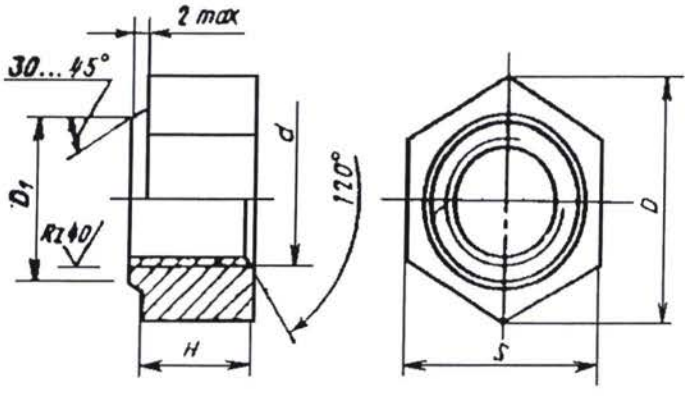
Standard non-observance is prosecuted under the Law.

This standard covers the nuts for the bolts of diameter M22, M24 and M27 used for rail joints fastening. This standard provides nuts production of rough and normal accuracy. The standard is in compliance with ST CMEA 4093 -83 concerning the design and dimensions (see reference Annex 2)
(Changed edition, Changed № 1)

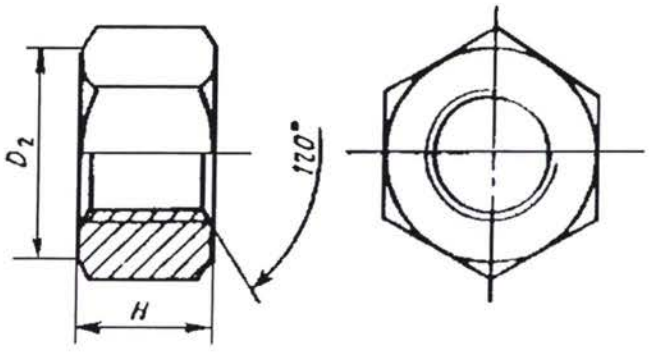
1. DESIGN AND DIMENSIONS

1.1 Designs and dimensions of nuts should be in compliance with those indicated on the drawing and in table.

Performance I
(nuts of round exactness)



Performance II
(nuts of rated exactness)



$$D_2 = (0{,}90 \ . \ . \ . \ 0{,}95)\,S$$

mm

Rated diameter of thread *d*			M22	M24	M27
Dimension for "turnkey" S (supposed deviations h15			36		41
Height H	Rated		25	27	30
	Supposed deviation	Performance 1	± 1,3	± 1,5	± 2,0
		Performance 2	$\pm \frac{IT17}{2}$		
Diameter of described circumference *D*, not less than		Performance 1	38,8		44,4
		Performance 1	39,6		45,2
Displacement of holes axis relating to edges, not more than			1		

Example of the nut legend by performance 1, tread diameter 24mm:

Nut M24 GOST 11532 - 76

The same, performance 2:

Nut 2M24 GOST 11532 - 76

(Changed edition, Changed № 1,)

2. TECHNICAL REQUIREMENTS

2.1 Technical requirements, methods of tests, marking and packing - under GOST 1759 - 70.

2.2 Nut for bolts of normal durability should be made of class 5 durability and nuts for bolts of improved durability – class 8 durability under GOST 1759 – 70.

2.3 It is allowed the production of nuts performance 2 without facets at angle 30 degrees on of its ends.

2.4 Tread is under GOST 24705 -81.

2.5 Tolerance range 7H – under GOST 16093 -81, it is allowed tolerance range 7 g.

2.6 Facets at the end of nut tread – under GOST 10549 – 80.

2.7 In nuts of performance 1 it is allowed metal tightening, which can bring to local reduction of the ribs height not more than 3mm.

2.8 Letter П should be put on one of the bearing area of nuts of improved durability.

2.9 Nuts should be transported in complete with bolts under GOST 11530 -76
Under the customer's request it is allowed not to complete nuts with bolts and transport them as separate articles.

2.10 Mass of nuts is given in reference Annex 1

Annex 1

Reference

Theoretical mass of 1000 nuts, kg

Diameter of a nut	Mass of nuts	
	performance 1	performance 2
M22 M24 M27	154 155 222	152 153 220

Notes:

1. Mass of nuts due to the rated dimensions and density of steel 7850 kg/m3.
2. In case, when it is possible to use nuts of performance 1 also of performance 2, in design documentation the mass of nuts of performance 2 should be indicated

Annex 2

Reference

Information data about the compliance to GOST 11532 – 76
ST CMEA 4093 – 83

GOST 11532 -76	ST CMEA 4093 - 83
Performance 1,2 Design and dimensions	Performance 1, 2 Design and dimensions

(Introduced additionally, Change. № 1)

GOST 28370 -89
Railbound frogs of 1/11 and 1/9 marks
Basic dimensions.

(Valid time of operation from 01.07.90 up to 01.07.95)

1. This standard covers built-up common crossing of switches of 1/11 and 1/9 marks for rails of R75, R65, R50 type with cast frogs in common molding with the most wearing member of wing rails used on the railway tracks of the USSR.

2. Crossings should be made under the drawings approved in the established order. Basic dimensions of crossing and relating to them check rails should be in compliance with those ones indicated on drawing 1-4 and in the table. Jointing of cast part of the crossing with wing rails should be done under the drawings approved in the established order. It is allowed under the agreement with the customer the usage of other options of jointing of cast part of the crossing with the wing rails.

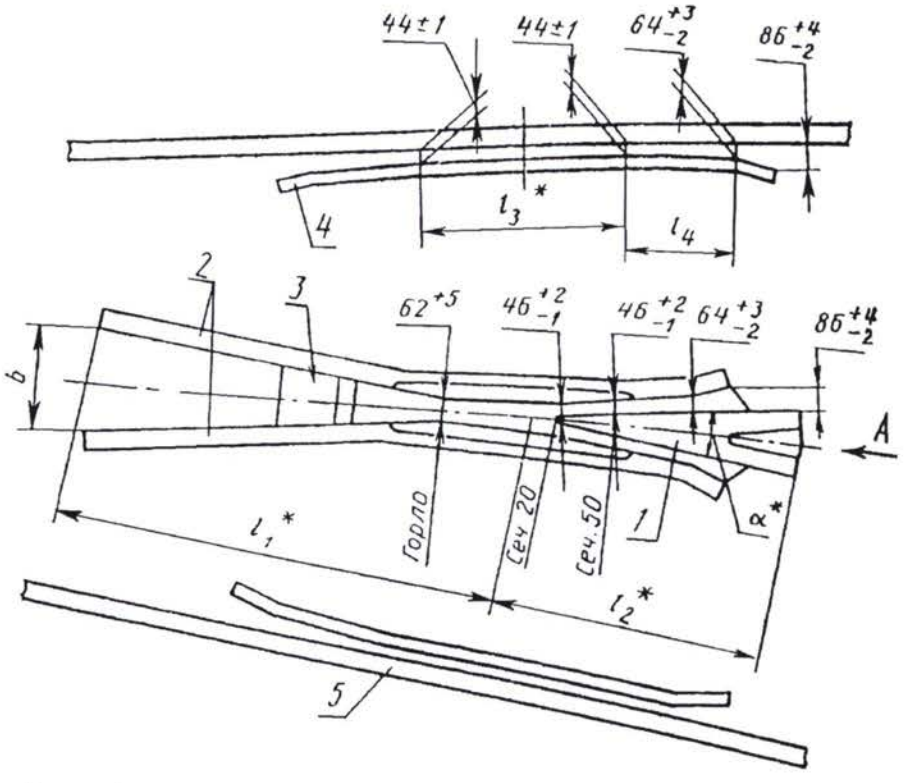
Rolling surfaces and side working edges of the frog should be connected by rail shoulders or faces (facet) radius of rounding or dimensions of faces are stipulated by the design documentation approved in the established order.

Frog's width on the top between the rail shoulders should be not less than 3mm – in cross section A-A, 40-23 mm in cross section of the frog (see drawing 3,4).

Rolling planes of wing rails and frogs should have gradient within the limits from 1:18 to 1:22.

The width of channel of the crossing of the check rails and also the distance between the working edges in the front end of the crossing (see drawing 1) should be controlled on the level of measurement (see the table and drawing 2).

Crossing with check rails

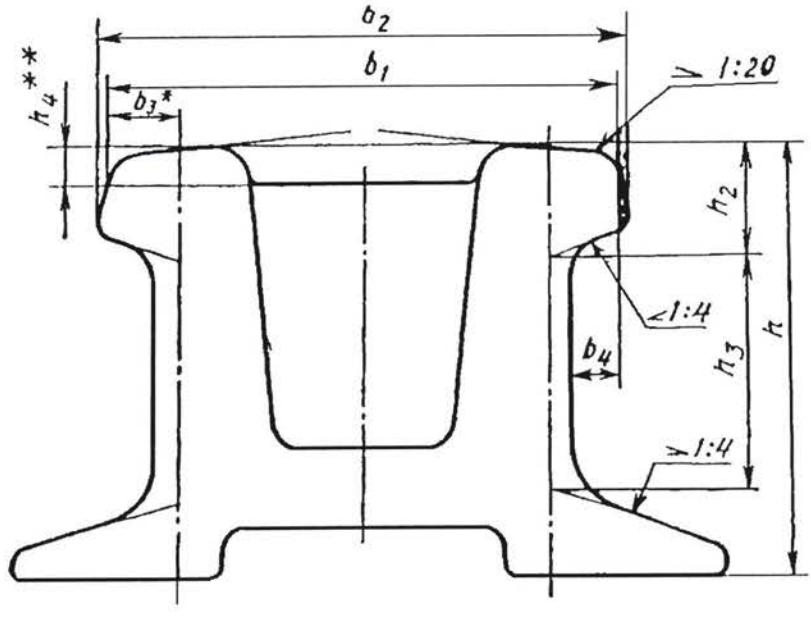


* Preference dimensions

1-common crossing; 2-wing rail; 3-the front bush of the common crossing; 4-check rail; 5-running rail of the common crossing.

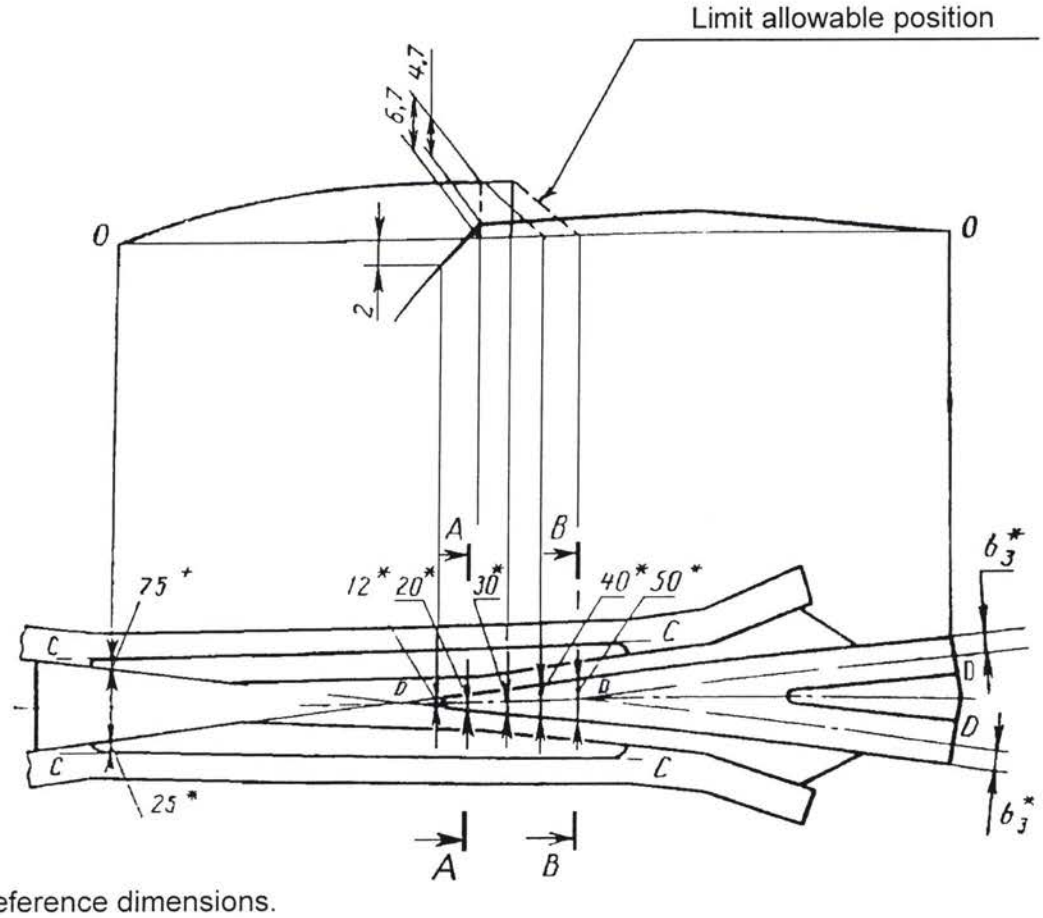
Note: Rated dimensions and limit tolerances of troughs are given for gauge 1520mm.

View A-A



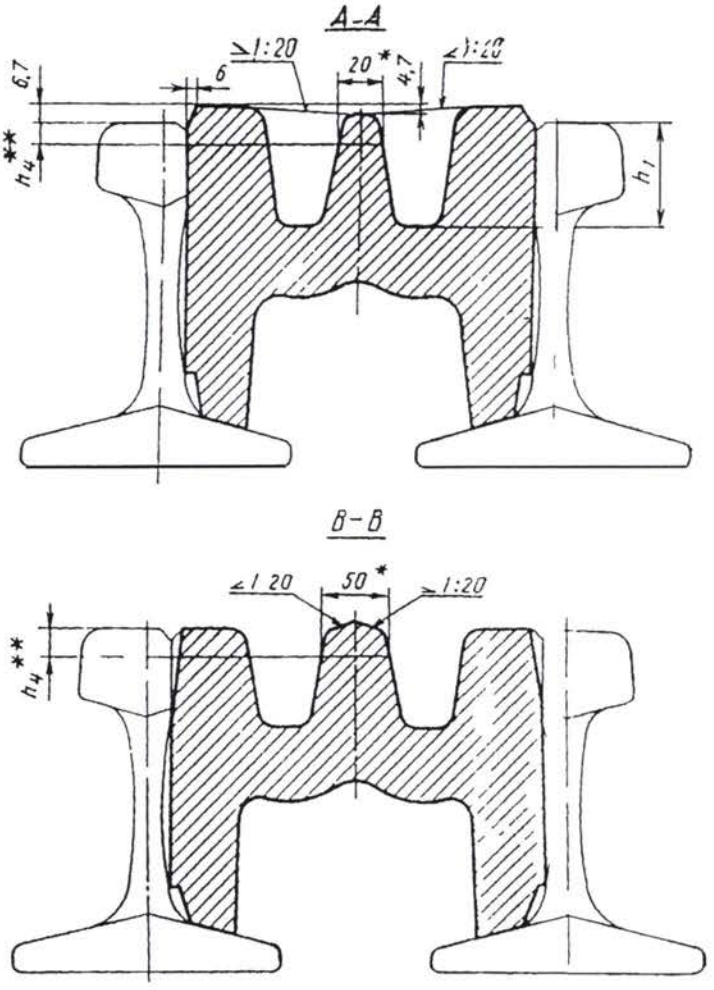
* Preference dimensions.
** Measurement level.

Longitudinal profile of crossing



* Preference dimensions.

Note: Longitudinal profile of wing rail is given on C-C line (crown of the wing rail), straight common crossing – on the D-D line.



* Preference dimensions.
** Measurement level.

Parameters	Rated dimensions of crossing for the rail of types					Max. Devia -tions
	R75	R65		R50		
	grades					
	1/11	1/11	1/9	1/11	1/9	
Length of :						
crossing in assembled type		5500	4590	4950	3965	+/- 5
L 1 +L 2	5500	2950	2500	2659	2085	-
fore part of crossing L 1	2950	2550	2090	2300	1880	-
tail-end of crossing L 2	2550	1410	1250	1350	1350	-
middle part of check rail L 3	1410	1476	972	1200	800	+40
tap of the check rail L 4	1476					
Distance between working edges, mm;						
on fore end of the crossing b*	267	267	277	210	231	+/-2
in tail -end of the crossing at the level h4 from the surface of rolling b1	231	231	231	208	208	+/-1
in tail-end of the crossing along the lower part of the head b2	233	233	233	210	210	+/-1
Height of the frog in tail-end part h	192	180	180	152	152	+/-1
Distance from the working edge to the rail axle b3*, mm	36	36,4	36,4	35	35	-
Depth of slot b4, mm	30	30	30	32	32	+4
Height of the head h2 , mm	55,3	45	45	42	42	+/-5
Depth of channels h1, mm	104,4	105	105	83	83	+/-3
Angle of the crossing α	62	60	60	52	52	-1,2
Level of measurement h4, mm	5o11'40"	5o11'40"	6o20'25"	5o11'40"	6o20'25"	+6
	14,5	14,5	14,5	14,2	14,2	-
						-

* In crossing made without plates, dimension b should be provided on inventory plate

3. Deviations on the height of rolling surface of the frog and cast part of wing rails relating to the top of the head of wing rails on the area from fore joint of incut to the cross section of the frog 50 mm including, should not exceed +1,5 mm.
-0,5

These deviations are controlled in section 12 mm on the frog and in the section of the frog 20mm on the wing rails (see drawing 3 and 4).

Difference of heights on the level of ends of the rail and cast part of the wing rail in fore joint of incut should be not more than 0,5 mm. Deviation from mutual location of cast part of the wing rail and frog in section A-A (see drawing 4) should not be more than 0,8 mm.

Allowable deviations of the top of the cast part of the wing rail from the upper part of rail area on the place from section of the frog 50 mm to the tail-end joint of incut should not be more than +1,5 mm.
-6,0

4. Fore ends of wing rails should be cur perpendicularly to the longitudinal axis of the rail. Allowable deviations from perpendicularity of the ends should not exceed more than 1mm while measured in vertical and horizontal directions. Tail-end of the frog in upper part at the distance of 40 mm from the rolling surface should be perpendicular to this surface and lateral working edge. Allowable deviations from perpendicularity should not exceed 1mm when measured in vertical direction and 2mm – in horizontal direction.
At the distance lower than 40 mm from the rolling surface tail end should have extension in the direction of the switch toe.

5. Rolling surfaces of frogs and wing rails should be smooth curves with maximum elevation in section of the frog 20 and 30 mm. Form of the surface of crossing rolling is provided by

production technology. Lateral working edges of the frog and relating wing rail should be rectilinear. Deviations from straightforwardness on the length from tail-end of the frog to the fore pad except the zone of fore joint of incut on the length 20 mm for grade 1/11 and 100 mm for the grade 1/9 in the direction of switch diamond and 40 mm for both grades in the direction of fore end of the crossing, should not be more than 1,5 mm. Nonalignment of lateral working edges in the fore joint of incut should not exceed 0,5 mm, in back joint of incut should not exceed 1 mm with tap from the back joint of incut on the length not less than 150 mm.

6. Cast part of wing rails in place of incut of it into the wing rails should be fit against them tightly. Local longitudinal gaps between technological cuts on the wing rail on the length 125 mm from the fore and back joint of incut should not be more than 2mm. Transverse gap in the fore joint of incut should not be more than 2mm, in tail-end joint – 3 mm. Cast part of the wing rail under the design documentation for the surfaces should be adjusted tightly to the wing rail.

7. Dimension control under p. 2-6 should be given due to the branch methods.
Technical requirements to the crossing are under GOST 73-70.

GOST 7370 -86
Crossings types R75, R65 and R50

Standard non-observance is prosecuted under the Law

This standard covers crossings types R75, R65 and R50, sharp and blunt monoblock and prefabricated with molded frog used on the tracks of wide gauge of the Ministry of railways and their details. These crossings can be referred to the goods of particularly crucial importance .

1. TECHNICAL REQUIREMENTS

1.1 Crossing and their components should be made in compliance with the requirements of this standard, under normative- technical and technical documentation approved in the established order.

1.2 Straight common crossing and all cast crossings should be made from high manganese steel austenitic class of mark 110Г13Л, chemical content of which in percentage should correspond:

- carbon 1,00 – 1,30
- manganese 11,50 – 16,50
- silicon 0,3 –0,9
- phosphorus not more than 0,09
- sulfur not more than 0,020

Deviations are allowed in content of carbon ± 0,05%. Manganese + 1,00% - 0,5%, silicon +0,15% - 0,10%, phosphorus + 0,01% provided the positive results of control of macrostructure and compliance with the level of stipulated lower the limits of metal mechanical characteristics.

It is allowed under the agreement between the manufacturer and the customer to introduced into steel alloying and modifying additions.

1.3 Cores (common crossing) casting should be thermally treated under the conditions which can provide in working zones of the components austenite microstructure without carbides. The working zone is to be considered that one which located at the depth of not less than 30 mm from the rolling surface (without the value of machining allowance. Recommended condition of thermal treatment is hardening from the temperature 1050 – 1150 degrees C by cooling in water.

1.4 Depending on mechanical properties of high- manganese steel for cores(frog) casting and casted (solid) crossings, the group by the least from the indicators of mechanical properties due to the table is determined:

Mechanical properties	Limits of mechanical properties for the group			
	I	II	III	IV*
Tens str σ в, MPa (kgc/mm2)	883(90,1) and more	785 882 (80,1 90,0)	686-781 (70,0-80,0)	637-685 (65,0-69,9)
Conditional yield point σв2, MPa, (kgc/mm2) not less	353 (36,0)	353 (36,0)	353 (36,0)	353 (36,0)
Percent elongation σ, %	30,1 and more	25,1-30,0	16,0-25,0	16,0-25,0
Contraction ψ, %	27,1 and more	22,1 27,0	16,0- 22,0	16,0-22,0
Impact elasticity KCU, МДж/m2 (kgc-m/sm2)	2,46(25,1) and more	1,97 2,45 (20,1 25,0)	1,67-1,96 (17,0-20,0)	1,62- 1,96 (16,5–20,0)

- Should be used before January, 1, 1991

Molding for crossings of R75 and R65 type should be I, II or III group
Molding with allowable deviations in chemical content under p. 1.2 should have mechanical properties of steel not less:

o Tens str σ в, MPa (kgc/mm2)	735 (75,0)
o Conditional yield point σв2, MPa, (kgc/mm2)	353 (36,0)
o Percent elongation σ, %	25,0
o Contraction ψ, %	22,0
o Impact elasticity KCU, МДж/m2 (kgc-m/sm2)	1,76 (18,0)

1.5 Cores(frog) casting and casted crossings should be cleaned from sand blend and burning-in, gating system removed.

Burn-in availability in casting out-of-the-way places for treatment should be in compliance with the requirements of technical documentation, approved in the established order.

Removal of gating systems should be done after thermal treatment of arc, air-arc or air-plasma cutting with subsequent abrasive cleaning of metal. It is allowed the removal of risers before thermal treatment by mechanical spacing with subsequent metal cleaning by abrasive after thermal treatment.

1.6 It is allowed to carry out strengthening of the surface of crossing rolling by explosion method due to normative-technical documentation approved in the established order.

1.7 Correcting of the cores(frogs) and casted crossings after thermal treatment and strengthening (for strengthened by explosion) should be done in cold state.

1.8 Cores(frogs) and casted crossings should not have defects which prevent from normal operation.

1.9 Rail's components of crossings should be made from the rails of R75, r65 and R50 type, first sort group I and II from Siemens-Martin or basic oxygen steel under GOST 1412 -85 for wing rail and under GOST 18232-83 for check-rail support.

1.10 Head surface of the working ends of wing rails should be hardened under GOST 24182 -80.

1.11 Cast iron shims(linings) of check-rail supports should be made from the grey cast iron of grades СЧ (grey cast iron) 15 – СЧ 20 under GOST 1412 -85 and meet the requirements of quality under GOST 26358 -84.

Exactness of molding should meet the requirements of GOST 26645 -85 and should be indicated in drawings and technical documentation approved in the established order, Shims molded in chill mold should not have chilling effect with the depth of more than 1mm.

1.12 Moldings of common purpose should be made from steel I group of grades 15Л -45Л, 20ГЛб 20 ФЛ, 20Г1ФЛ under GOST 977-75 and be subject to thermal treatment. The manufacturer sets up appearance and condition of thermal treatment. Characteristics of performance exactness of moldings should meet the requirements of GOST 26645 -85 and should be indicated in drawings and technical documentation approved in the established order.

1.13 Bolts thread should be oiled with the mixture of axle oil under GOST 610-72 with graphite under GOST 5279-74 or GOST 5420-74.

1.14 Accepted crossings with molded components from high-manganese steel of I group are recommended to be used on the main highly busy lines.

2. ACCEPTANCE RULES

2.1 To check the compliance of the crossing when built-up and their components with the requirements of these standard and technical documents approved in the established order, the manufacturer should carry out acceptance, sampling and routine (conventional) tests.

2.2 Each crossing should be subject to acceptance test for checking of the crossings and their components to be in compliance with he requirements of this standard, normative-technical and technical documentation approved in the established order and GOST. 26358 -84.

2.3 The acceptance of cores molding and casted crossings should be done by piece and other steel and cast iron moldings by lots under GOST 977 -75 and GOST 26358-84.

2.4 Molding quality (except moldings from high-manganese steel) is checked under GOST 977-75, GOST 1412-85 and GOST 26358-84.

Dimensions, subject to check, methods of measurement and volume of sampling control, are determined under technical documentation approved in the established order.

2.5 At acceptance test for moldings from high-manganese steel one should control outer appearance, dimensions, chemical content and mechanical properties of steel, steel microstructure after thermal treatment, solidity of rolling surface after strengthening by explosion.

2.5.1 Control of dimension of moldings from high-manganese steel should be done on each molding. Dimensions subject to control and method of measurement are determined under technical documentation approved in the established order.

Control of all the sized of moldings is carried out at commissioning into operation of a new model rigging up.

2.5.2 Chemical content of steel should be determined from each melting.

2.5.3 Mechanical properties of metal should be checked for each melting at each charge of the heating furnace for thermal treatment.

In case of unsatisfactory value of any of the mechanical properties the test under which the unsatisfactory results have been got should be repeated on double amount of samples taken from the same melting and charge of thermal treatment. When the samples are not available the repeated tests are allowed to be done on the double amount of samples made from half-finished products cut directly from the body of the melting and load in the places determined by technical documentation of the manufacturer.

Sample test results which have in the fracture macro-defect are not taken into account. Such defective sample should be replaced by a reserve one from the same melting and charge of thermal treatment.

In case of unsatisfactory values of mechanical properties of steel during the repeated testing it is allowed molding of this melting jointly with sample bars (or parts left after the previous tests) to be subject to repeated thermal treatment and to carry out test of mechanical properties. When sample bars are not available it is allowed to make samples from the molding (foundry) body. Results of these tests are final for all the components of this melting in the given charge.

2.5.4 Steel micro structure should be controlled for each samples-lugs for each melting at each load of the furnace of thermal treatment.

2.6 At sampling and routine tests of cores(frogs) moldings and casted crossings under GOST 16504-81 one should test them for break and check inner defects in the fractures and microstructure.

Allowable dimensions, amount and location of defects are determined under technical documentation approved in the established order.

For sampling and routine tests at least one molding of each type and grade is selected.
When defects the sizes of which exceed the allowable ones are found in the fracture of a core(frog) or casted crossings, then breaking test should be carried out again on the double amount of moldings. In case of unsatisfactory results of repeated testing the breaking tests should be continued until receiving positive results.

2.7 Sampling tests of core(frog) molding are carried out at least once a month, and casted crossings molding – at least once during three months.

Routine tests of core and casted crossing moldings are done when putting into operation of anew model of rigging-up when the technological process of molding performance is changed or under the demand of the technical control departments of the manufacturer.

3. METHODS OF TESTING

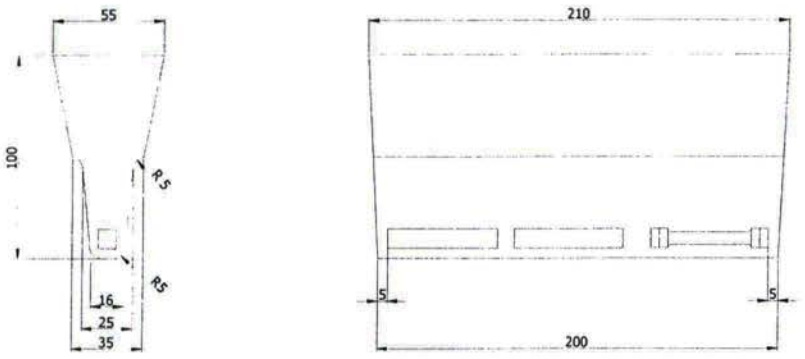
3.1 Samples to determine chemical content of steel and cast iron should be done under GOST 7565-81.

For determining chemical content it is allowed to use chips, taken from sampling bar for mechanical tests or from the special pouring for molding as well as directly from molding.

It is allowed for high-manganese steel the sample to be selected from the flow of molten metal in the middle of melting at ladling sample bars to determine mechanical properties of metal.

3.2 Sample bars for determining mechanical properties of high-manganese steel should be poured in the middle of melting pouring into dry sand forms and be subject to thermal treatment together with the components of this melting.

Configuration and dimensions of the sample bar and position of samples are given in the drawing. Position of samples for tension test and determination of impact elasticity in sample bars is not regulated and on the drawing it is given conditionally. Shown on the drawing dimensions of increase are considered minimal and can be extended depending on the production conditions. Number of the sample bars is determined by technical documentation of the manufacturer.



To determine mechanical properties when the sample bars are not available it is allowed to cut the samples directly from the detail of the same melting and charge of the thermal treatment in the places indicated by the manufacturer.

3.3 Structure control should be done on one micro- section prepared on special sample-lug which should be separated from one of the molding after thermal treatment.

Lugs (boss) should be placed at the most massive part of the molding or near the place of molten metal supply into molding form. The place of pouring into molding form is indicated in technical documentation of the manufacturer. It is allowed to do the sample as poring to pour (gate)system.

Dimensions of sample –pouring should be not less than 30 X 40 X 50 mm for metallographic control of microstructure and diameter not less than 40 mm at the length not less than 50 mm - for magnet control.

When there is no pouring the samples for micro sections are allowed to be cut from the details and places indicated by the manufacturer.

3.4 Chemical content of high manganese steel should be determined under GOST 12344-88, GOST 12345-88, GOST 12346-78, GOST 12347-77, GOST 12348-78, and carbon and low alloyed steel and cast iron – under GOST 22536.0-87- GOST 22536.5-87, GOST 22536.7-88 - GOST 22536.9-88, GOST 22536.13-77 or under other methods which can provide the exactness of determination not lower than provided by indicated above standards.

3.5 Tension test of the samples from high manganese steel should be carried out under GOST 1497 -81 on the samples type II № 6 diameter 6 mm with fivefold calculated length.

3.6 Impact curve test to determine impact strength (elasticity) of high manganese steel should be carried out at room temperature on the samples type I with U-type thickener under GOST 9154-78 at pendulum hammer with maximum hammering strength not less than 294,0 Joule (30kgcm).

3.7 Mechanical properties at tension and impact strength should be tested on one sample at each type of testing.

3.8 Mechanical testing of samples from cast iron and steel (except high manganese steel) is under GOST 1412 -85 and GOST 977-75.

3.9 Metal structure is controlled on metallographic sections which prepared under the technology of manufacturer with the help metallographic microscopes visually with 100 grades of magnifying. Micro section plane prepared from the lug should be

placed at the distance not less than 10 mm from lower (on pouring of the detail into casting form) plane of the lug.

It is allowed to carry out the control of metal structure molding by magnetic or other physical methods with the help of equipment and under the methodology attested and approved in the established order.

3.10 Dimensions of crossings and components are checked by universal measurement tool, templates and facilities in accordance with the technical documentation.

3.11 Defects of molding are controlled visually.

Control of inner defects should be carried out without use of magnifying facilities by the fracture of the core and casted crossing.

For the control of the sizes of inner defects it is allowed to use cores and casted crossings which were rejected due to their dimensions and(or) surface defects.

4. MARKING, PACKING, TRANSPORTATION

4.1 Each molding of the core and casted crossing, crossing in assembling and also component parts of crossings shipped separately should have marking indicated by the technical documentation approved in the established order.

Number of the goods start from the beginning of the year separately for each type and mark.

4.2 Marking consisting of number of side rail or crossing, trademark or legend of the manufacturer and the year of production(last two figures) should be clearly stamped on the upper (top) surface of the side rails heads and wing rails of assembled crossing at the distance of 50 mm from the tail end and put by indelible by water white paint on the web of each wing rail on outer side at such distance from the joint so that it can not be covering over by joint plate. On casted crossing the marking is put by indelible by water white paint from both sides in the middle of side surfaces.

Marking of metal group should be done by painting of the lower half of the upper part of the core and casted crossing back end by the oil blue color for group I, white color for group II and red color for group III.

Marking of metal group IV should be done by inking of oil red color on the whole contour of the crossing core back end.

Crossing with strengthened by explosion rolling surface are marked with the additional index "BB" which is put by oil color on the outer side surfaces of wing rails.

Marking of technical control of the manufacturer should be embossed on the wing rail and check rail next to the trademark or the legend of the manufacturer.

4.3 In the nick from the switch in the direction of the neck of each molding of core(frog) and casted crossing or in other indicated places in the detail drawing there should be clearly molded : number of the core(frog) or casted crossing, trademark or legend of the manufacturer, production year (last two figures).

Mark of technical control of the manufacturer should be done on the core(frog) or cast crossing back end.

4.4 On the neck of each check rail in the direction of the track there should be put by indelible by water white color: number of the check rail, trademark or legend of the manufacturer, crossing mark for which this check rail is intended, year of production (two last figures).

4.5 On each component made from the rail by their transverse cutting on one end of the base there should be the number of rail's melting.

It is allowed not to transfer melting number on the base of the component from the rail when it is available on the web.

4.6 Plates shipped in packages or bunches and other shipped separately part of the crossing should have marking by indelible by water white color in compliance with the requirements of technical documentation approved in the established order.

4.7 The height of marking put by the color should be not less than 40 mm, the height of casted marking – not less than 15 mm, convexity – 2-3mm; the height of stamped marks – not more than 5 mm.

4.8 Marking on the boxes and plywood labels are done by indelible by water black color with the indication of the manufacturer, type of good and the year of production.

4.9 Each crossing should be with document and water proof packaging in compliance with the technical documentation which verifies its compliance with the requirements of this standard.

In the document the following should be indicated:

- name of the manufacturer;
- type, mark, number of crossing and number of the drawing under which it was
- produced the year of production;
- test results conclusion;
- group of metal;
- legend (for crossing with strengthened rolling surface by explosion);
- number of melting, number of the core(frog) or casted crossing, year of production;
- scheme of crossing laying;
- index, number and amount of basic and separately shipped components of the crossing with the indication of numbers on the schemes of laying.

4.10 Arrangement and means of storage, packing and transportation of crossing and their assembling components should meet the requirements of GOST 15150- 69 group ОЖ1 and GOST 9.014 -78, option В3-0 and technical documentation approved in the established order.

4.11 Finished goods should be kept under the shed or on the open areas in compliance with the requirements of technical documentation approved in the established order.

Storage of crossing at the manufacturer plant and their shipment to the customer is done jointly irrespective of metal group.

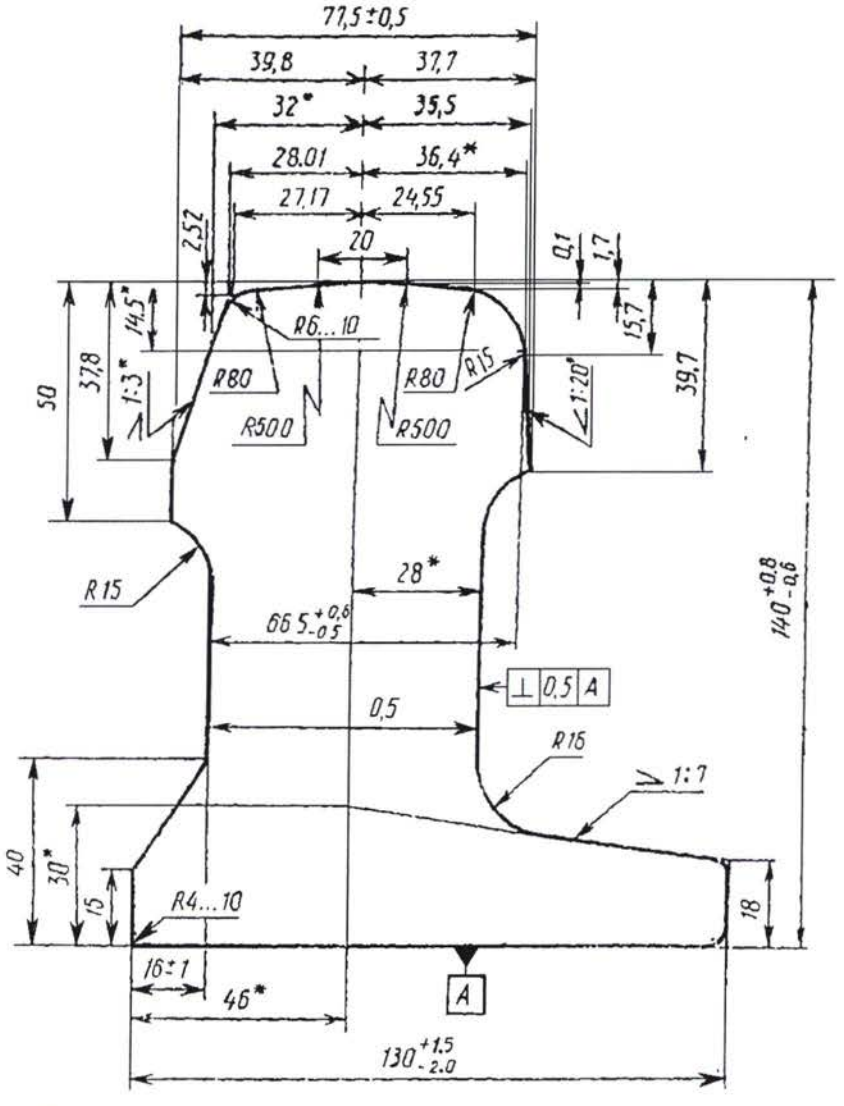
4.12 Transportation of crossing in assembly and their components and units should be done on the open rolling stock of the railways in compliance with the requirements of technical documentation. For each unit of the rolling stock it is necessary to load the goods of one type.

GOST 17507 -85
Switch point rails OP65
Dimensions

Non-observance of the standard is prosecuted under the Law.

1. This standard covers switch point rails OP 65 (hereinafter rails), used for the permanent way of the railway track.

2. Dimensions of the cross section of rails should be in compliance with those ones indicated on the drawing.
   Calculated data of the rails are given in the attached reference.



* Preference dimensions

Legend of the switch point rail OP65:

Rail OP65 GOST 17507 -85

3. All profile couplings should be done on the radius. Radii of shoulders which are not indicated on the drawing should be within 2-6 mm.

4. Dimensions where the maximum (limit) deviations are not indicated should be provided by the tool and in ready rails are not controlled.

5. Limit deviations of convexity of the rail's head when measured on the axis of symmetry (basic axis) of the rail head area, done with radius of 500mm should not exceed ±0,5 mm.

6. It is allowed even convexity of the base relating to its ends not more than 0,5 mm. Convexity of the rail base is not allowed.

7. Rails length should be in compliance with the one indicated in the order or to be multiply to it, but should not exceed 25 m.

   Limit deviations on the rails length with two milled ends on each multiply section of the rail:

   - ± 4 mm – for the rails by the length to 10 m including;
   - ± 6 mm - ditto.

   For the rails with not milled ends the limit deviations on the length should not exceed plus 0,8 % of the rated value of the length.

8. Compliance of the profile of the rails cross section to the dimensions indicated by this standard should be determined by templates agreed with the Inspection of the Ministry of railways.

9. Technical requirements are under GOST 9960-74

ANNEX
Reference

Calculated Data for Rails

Area of cross section of the rail, sm2	103,9
Distance to the center of gravity, sm.:	
- from the bottom of the base	6,2
- from basic axis (in the direction of the big shoulder of the base)	0,5
Moment of inertia relating to the axis, sm4:	
- horizontal	1861
- vertical	705
Drag torque, sm. 3:	
- on the bottom of the base	301
- on the top of the head	239
- on the lateral edge of the base, the most distant from the center of gravity	85
Theoretical mass of 1 m of the rail, kg *	81,35

Note: Theoretical mass of the rail is determined due to the rated dimensions of the cross section of the rail and strength of steel 7830 kg/m3.

GOST 9960 -85
Switch point rails

Standard non-observance is prosecuted under the Law.

This standard covers switch point rails (hereinafter – rails) of OP75, OP65 and OP50 types used for permanent ways of the railway track.

1. DESIGN AND DIMENSIONS

1.1 Design and dimension of the rails – under GOST 26168 -84, GOST 17507 -80 and GOST 17508 -80

2. TECHNICAL REQUIREMENTS

2.1 Rails should be made in compliance with requirements of this standard.

2.2 Rails should be made from finishes Siemens-Martin steel deoxidized in the ladle by complex deoxidizing agents without use of aluminum or other agents forming in steel deleterious streak non metallic inclusions.

2.3 Chemical content of steel should be in compliance with the indicated in the table.

Steel grade	Content of elements, %							
	Carbon	Manganese	Silicon	Vanadium	titanium	zirconium	Phos-phorus	Sulfur
							Not more	
M73B	0,67-,78	0,75-1,05	0,18-0,45	0,03-,06	-	-	0,035	0,040
M73T	0,67-,78	0,75-1,05	0,18-0,45	-	0,007-0,015	-	0,035	0,040
M73Ц	0,67-,78	0,75-1,05	0,18-0,45	-	-	0,001-0,05	0,035	0,040

Notes:

1. Letter M indicated the way of steel melting (Siemens-Martin), figure – to average content of carbon in hundredth part of %.

2. Content of zirconium from 0.001 to 0.01 % in steel is determined due to not less than 80 gr. for ton of steel on introduction.

2.4 Rails made from the steel with carbon content higher than average one can be referred to hard ones, rails from steel with the content of carbon which equal to average and less – to the normal ones.

2.5 Rails should have the following mechanical properties:
- tens. str. to rupture – not less than 900 MPa (90kgc/mm2);
- extension strain – not less than 5%.

2.6 Sample section of the rail should withstand impact test at the temperature from 0 to 40oC under pile-driver without breaks, cracks and indents of the base (as in spans and on the poles).

2.7 Technology of rails production should guarantee snowflakes absence in them and also local non-metallic inclusions (impurities) (alumina, carbide, nitrides of titanium or

alumina, cemented by silicates) elongated along the rolling direction as lines by the length of more than 2mm.

2.8 A group of dotty or continuous impurities elongated along the rolling direction is considered to be as local accumulation n of non-metallic inclusions as lines(p.2.7) which is seen on the polished surface of the section when looking at the whole surface through metallographic microscope.

To evaluate the length of the lines the broken line is determined as continuous if:

- summary distance between separate groups of inclusions located on the same line does not exceed summary length of this groups;
- inclusions groups located parallel are displaced relating to each other at the distance not more than 0,5 mm;
- in alumina inclusions cemented by silicates, only the length of line inclusion of alumina is evaluated without taking into consideration the length of the silicate inclusions in which alumina is located.

2.9 Broken-down ingot (blooms) and rolled from it the rail bar should be cut until complete removal of shrinkage blister, sub-shrink friability, dirt, harmful segregation and tightening. There should not be in the rails also other harmful heterogeneities of macrostructure(freckle type segregation, bubbles under surface, rippled surfaces, white and dark spots, blacks, flaws, splitting, homogeneous metallic and slag inclusions and so on).

2.10 Rails after complete cooling can be subject to cold straightening on mangles and stamp presses.

Even common rail curvature along the whole length in vertical plane with bending deflection not more than 1/60 of the rail length is allowed before cold straightening

2.11 After cold straightening it is allowed:

- even rail curvature in vertical plane along the whole length with bending deflection not exceeding 1/2200 of the rail length;
- single local deformations(sags) not more than 0,5 mm determined between the ruler of length 1m and the rail surface;
- end curves in vertical and horizontal planes of the rails not more than 0,5mm determining them by putting the ruler of 1m length at a tangent to the straight part of the rail.

It is not allowed:

- repeated cold straightening of the rails on mangles in one and the same plane;
- wave and torsion of the rails. The rail is considered to be twisted if at its measurement on the control shelf between the edge of the base and the shelf there are gaps at the ends:
  - 1,5 mm – for the rails of 10 m by length and more,
  - 1,0mm ditto less than 10 m.

2.12 Concavity of the rails base is not allowed. Even concavity of the base relating to its ends should not be more than 0,5 mm.

2.13 Rail surface should be without rolled dirt, bubbles, cracks, and breaks, blisters, rolling marks, wrinkles, cuts, ripple markings, hairlines and marks.

2.14 Rails ends should be milled perpendicularly to its longitudinal axis. Deviation from perpendicularity of the ends should be not more than 1,omm when measured in any

direction. Only one end of the rails of the length 6 m are allowed to be milled and cut at speed friction saws another rail end with allowance which provide removal of effect zones.

Under the agreement with the customer it is allowed to use rails with surface defects, the sizes of which do not exceed the indicated ones in p.1.13, but located in places which subject to mechanical treatment at switch blades production, and as the result these defects are removed. Such rails should be complete into separate lots, have additional marking and distinctive coloring of defect places by indelible paint of red color.

2.15 Rails which meet the requirements of p.p. 2.1 -2.14 can be referred to the first grade.

To the second grade one can refer the rails which have at least one of the following deviations from the norm provided for the rails of the first grade:

by tens. str. - up to minus 100 MPa (10kgc/mm2)
by extension strain up to minus 2 абс. %;
line inclusions (p..7) by the length of more than 2mm,

carbon	±0,03%.
manganese	– to ±0,05%.
silicon	- to ±0,02%.
phosphorus	- to ±0,005%.
sulfur	- to + 0,005%.
Vanadium	- less than 0,03%, but not less than 0,01 %
titanium	- more than 0,025 %
zirconium	- at its introduction into liquid steel not less than 50gr/t

by bending deflection (before cold straightening) – exceeding not more than twice indicated one in p.2.10;

by local deformations, skewing in the ends, outer defects, their flat clean-ups, waves and torsion of the rail, convexity of the base relating to its edged – exceeding not more than twice allowable deviations indicated in p.p. 2.11- 2.13;

by dimensions exceeding not more than twice allowable limit deviations for the rails of the first grade.

Note. It is not allowed to lay the rail of the second grade on the tracks of the Ministry of railways; rails of the second grade are allowed to be laid on the industrial tracks.

2.16 It is allowed to cut the rails ends of the second grade by gas- flame burners or friction saws with allowance which provide the removal of zones of thermal effect.

2.17 It is not allowed the rails falling from the height of more than 1m. Rails fell down from the height of more than 1m are considered not to be compliant with this standard.

3. ACCEPTANCE RULES

3.1 At acceptance test to check the compliance of rails to the requirements of this standard the following should be checked:

- condition of the surface for straightforwardness and rails dimensions (p.p. 2.10 – 2.15);
- chemical content of steel (p.p.2.3, 2.15);
- hammering(pile-driving) durability of rails (p.2.6);
- macrostructure of rails (p.2.9)
- absence of flakes in rails (p.2.7).

3.2 Acceptance test of the rails are done per each melting, if steel is melted in the furnaces of big volume and is poured into two ladles, each ladle is considered individual melting. Rails from ingots of one and the same melting rolled with difference of time in 8 hours are subject to acceptance as rails of different melting.

3.3 Each rail is subject to control for surface condition, straightforwardness, rails dimensions.

3.4 Due to request of the Inspection of the Ministry of railways control chemical analysis of the selected by the, the rail is carried out.

3.5 When there satisfactory results of the primary or repeated tension test (p.p. 2.5 and 2.15) all the rails of the controlled melting are considered to be in compliance with the requirements of this standard.

When at least one of the sample after the repeated tension test do not meet the requirements of p.p. 2.5 and 2.15 all the rails of the controlled melting are considered to be not in compliance with the requirements of this standard.

3.6 At satisfactory results of the primary or the repeated impact test (p.2.6) under pile-driver all the rails of this melting are considered to be in compliance with the requirements of this standard. When the repeated impact test under the pile-drive shows unsatisfactory results at least at one of the sample section all the first head rails (with mark "1") of such melting are considered to be not in compliance with the requirements of this standard.

When there are unsatisfactory results of the third impact test under pile-drive (p.4.5) relating to at least one of the sample section, all the rail of this melting are considered to be not in compliance with the requirements of this standard.

3.7 2(two) samples of each melting are subject to macrocontol – one from bottom (with the mark "X") and one from the head (with the mark "1") rail of each fifth melting.

3.8 In case of finding defects of macrostructure (p.2.9) at macrocontrol of each melting (p.p. 4.6 -4.10) in head rails (with the mark "1") or bottom rails (with the mark "X"), correspondingly all the head and all the bottom rails of the controlled melting are considered to be non compliant with the requirements of this standard.

It is allowed than head and bottom rails are subject to per piece macrocontrol and sorting out.

When freckle-type segregation is found in other (not head rails with the mark "1") all rails of the controlled melting should be considered not compliant to the requirements of this standard.

3.9 Head (with the mark "1") and bottom (with the mark "X") rails at which under per piece control one can find macrostructure which does not meet the requirements of p. 2.9 are to be considered not to be in compliance to the requirements of this standard.

3.10 The selected by the inspector of the Ministry of railways 6 samples from the head and bottom rails of any melting from each thirty rolled melting should be subject to control for absence in the rails local accumulations of non metallic inclusions elongated along the direction of rolling as lines (p.2.8).

3.11 Rails of the melting on which at least on one of the sections one can find local accumulation of non metallic inclusions as lines by length of more than 2mm, but not more than 8 mm can be referred to the rails of the second grade.

3.12 Rails which were not under delayed cooling or isothermal treatment to prevent them from flakes formation and also were treated breaking the procedures but at which no flakes appeared are considered to be no compliant with the requirements of this standard. In case of finding flakes in the rails with delayed cooling or isothermal treatment all the rails of this melting are considered not to be in compliance with the requirements of this standard.

4. TEST METHODS

4.1. Straightforwardness, torsion, wavy and concavity of the base (p.p. 2.10 – 2.12) of each rail should be checked by corresponding tools and templates of the manufacturer agreed with the inspector of the Ministry of the railways.

Control over the surface and ends condition of each rail (p.p. 2.13, 2.14) should be done visually. In necessary cases the availability and depth of surface defects and splitting in the ends are checked by sample cutting or by other method which can guarantee the correctness of determination.

Disintegration and division into two of the chip at cutting is considered to be a defect.

4.2. Selection of samples for per melting chemical analysis of the content of rail steel is under GOST 7565-81.

Determination of the content in steel:

carbon	- under GOST 22536.1 -77,
manganese	- under GOST 22536.5 -77,
silicon	- under GOST 22536.4 -77,
phosphorus	- under GOST 22536.3 -77,
sulfur	- under GOST 22536.2 -77,
vanadium	- under GOST 22536.12 -77,
titanium	- under GOST 22536.11 -77,
zirconium	- under GOST 12365 -84,

To determine chemical content of steel the chips are taken by slicing of the rail end along the whole cross section.

It is allowed to determine chemical content of steel by other methods which can provide exactness of measurement of elements content which correspondent to the indicated standards.

4.3. Tension test (p2.5) should be done under GOST 1497 -81 on proportional cylinder samples by diameter of d = 15 mm with calculated length l =150mm which should be turned along the direction of rolling possibly close to the surface from upper angle of the head of the rail blank.

One sample, for which rail blank under the choice of the inspector of the Ministry of railways is selected from the head end of one of the rails bars of each melting or from the head rail with the mark "1", should be subject to primary test. If the result of the primary test does not correspondent to the requirements of p.2.5, then two samples from other two blanks selected from two rails with the mark "1" of the same melting is subject to the repeated test. Rail blanks should be marked by the number of the melting and the mark of the inspector of the Ministry of railways.

4.4. For the primary impact test for rails under pile-drive (p.2.6) one sample section with the length of 1,3 m which marked from by the number of the melting and the mark of the inspector of the Ministry of railways should be cut from one of the rail bars of each melting following the cut of the shrinkage end of the bar or from the head rails with the mark "1".

4.5. Sample section is laid by the head upward on the supports with radius shoulders 125 mm and the distance between then is 1 m, and hammer with the hammer block of mass 100 kg (with pane(with flat rounded on the radius equal to 125 mm), dropped from the height of 5,9 m – for the rail OP75 type; 5,5m for the rails PO65 type, 4,5m for the rails PO50 type.

After hammering the bending deflection relating to the edge of the rules of 1m length is measured, the ruler attached to the rolling surface of the rail head, at this the bending deflection of the section before the test is taken into consideration.

Results of the bending deflection measurement are not the reason for rejecting the rails but can be used as a base for tension test of the rails.

If the results of the primary impact test under the pile-driver do neo meet the requirements of p. 2.6, then one of the samples for the repeated pile-drive test is selected from the shrinkage end of the rail from which the sample for the primary test has been selected and from the shrinkage end of another head rail of the same melting. In case of unsatisfactory results of the repeated test at least on one of the samples then two samples selected by the inspector of the Ministry of railways and taken from opposite ends of one and the same rails from the fore ends of the rails with the mark "2" are subject to the third test.

4.6. Samples for per melting rails macro- control should be cut from the head and bottom rails on hot condition followed the normal cutting of their shrinkage and bottom ends or from the shrinkage end of the first head rail with the mark "1" and from bottom end of the last rail from the ingot with the mark "X".

4.7. Transverse macro templates of full rail cross section are made from the samples selected by the inspector of the Ministry of railways (p.4.6) using cold treatment to display macro- structure.

4.8. Macro structure of rails (p.2.9) should be studies by deep etching in hot (60 -80 o C) water (50%) solution of hydrochloric acid with density of 1/19 kg/m3.

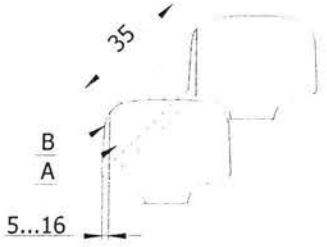
Macro templates for deep etching are dipped into water solution of hydrochloric acid in warm (to 60 -80 o c) condition with the controlled surface upward. The layer of the water solution of acid over the controlled surface of the macro template should be not less than 20mm. Etching of macro templates should be carried out until the complete display of macro-structure but not less then 20 min. It is allowed to display macro-structure by removal of sulfur marks under Bauman.

4.9. When there is per piece control of rails macro structure the samples selection, production of macro templates , study of micro-structure should be done in compliance with p.p. 3.7 -3.9, 4.6- 4.8.

It is allowed to display macro-structure by removal sulfur marks under Bauman directly from the ends of controlled rails after their corresponding preparation.

4.10. Evaluation of tolerances for macro defects (p.2.9) should be done due to standard samples approved in the established order.

4.11. Samples for the control to check non-availability in the rails local accumulations of non-metallic inclusions elongated along the rolling direction as line(stripes) (p.p. 2.7, 2.8, 2.15, 3.1) are selected from the rail or rail bars after their normal cutting from the head and bottom ends. Selected samples should be marked by the number of the melting and the mark of the inspector of the Ministry of railways. From each selected samples by cold treatment or any other method which dos not change the metal structure micro section of 35 m length should be made under the drawing.



Polished section surface should be parallel to the rolling direction and removed from the lateral edge of the rail head for 15-16 mm.

4.12. Rail control for flakes (p.2.7) should be done by ultra sound defectoscopy or by deep etching of longitudinal templates by length (200± 20) mm, cut on vertical plane of rails symmetry.

The procedure of samples selection, methodology of flakes revealing and rails flake control frequency is under the methodology approved in the established order.

5. MARKING

5.1 Numbers and letters with height from 30 to 40 mm should be embossed (not less then 0,8mm) on the one side on the middle line of the web from the wide part of the base of each rail with smooth transition to the web surface and they should be the following order:

- legend of the manufacturer;
- month (Roman numerals) and two last figures of the year of production;
- rails type;
- designation by the arrow the head rail.

On the web along the axis of each rail (on the same side where there embossed letters) there should be done in hot condition:

- number of the melting and number of ingots subject to control for macro structure, in 2-4 places along the rail length at the distance not less than 1,0 m. from its ends;
- figure "1" at the distance not more than 1m from the shrinkage ends of the first head rails rolled from the shrinkage part of the ingot;
- figure "2" at the distance not more than 1m from shrinkage ends of the second head rails;
- sign "X" at the distance not more than 1m. from head ends of this rails rolled from the bottom part if the ingots.

5.2 Marks put on the web of the hot rail should be of height 12,0 -15,0 mm with the depth of 0,8 -1,5 mm in the body of the rail web. They should be clear without sharp contours and their tops. The distance between the signs should be 20 -40 mm.

It is not allowed:

- to put or correct marks and signs in cold condition;
- to put additional marks and signs on the lateral areas of the rails and in the places which are not stipulated by this standard.

5.3 After completion of the rails treatment on the one end of the rail ends by marking in cold condition there should be put the following:

- number of melting – on the end of the base;
- signs of head and bottom rails – on the end of the upper quarter area of the web.

5.4 For each accepted rail of the first and second grade there should be put in cold condition acceptance marks of the inspector of the Ministry of the railways and technical control of the manufacturer – on the end of the rail web.

5.5 On the accepted rails of the first grade there should be put marking by inking the contour of the rail end by indelible blue paint; accepted hard rails (p.2.4) of the first grade by yellow indelible color painted at the ends with the acceptance marks of upper area of the base on the length not less than 100mm.

5.6 The end of the base and half of the web end area of the accepted rails of the second grade should be painted by red indelible color , and on the end with acceptance marks of these rails there should be done two center marks.

5.7 On one end of the rails web which do not meet the requirements of this standard there should be three center marks, and both their ends should be painted by dark-blue indelible color.

It is allowed additional marking of the rails along their lengths by indelible color.

Form of such marking, colors and places of their painting on the rails are indicated by the manufacturer and the inspector of the Ministry of railways.

5.8 Rails shipped to the customer should be accompanied by the document n(certificate of technical fitness of the rails) signed by the representative of the manufacturer, the inspector of the Ministry of railways, and satisfying the compliance of the rails to the requirements of this standard in which there should be indicated:

- legend of the manufacturer;
- standard under which these rails were produced and accepted ;
- grade and type of the rails;
- marks and description of the acceptance marks and rails marking;
- number of rails with grade indication and length;
- wagon number in which these rail are shipped;
- name and address of the addressee.