

**Research Designs and Standards Organisation
Government of India, Ministry of Railways
Manak Nagar, Lucknow (INDIA) -226011**

Global Notice for Expression of Interest

Indian Railways is attempting to design and development of washable apron, requiring line block of only one or two weeks and with cost effective function for use on Indian Railways. The design of washable apron should comply to the 'Technical Requirements' mentioned in the "Procedure for design and development of cost effective washable apron (ballastless) requiring line block of only one or two weeks", which can be obtained from RDSO on any working day or can be downloaded from RDSO website **www.rdsso.indianrailways.gov.in**. Firms, whose design conforms to Technical Requirements, may express their interest to offer their design for evaluation to Executive Director/Track-II/RDSO at the following address. The application in writing with details shall be received at the given address till 28/02/2014. Firms expressing interest shall note that:

1. Technical details submitted for design and development of washable apron shall clearly demonstrate the day wise action plan (eg. Day 1, Day2 etc.) starting from the activity of dismantling of existing track upto completion of the construction & commissioning of ballastless washable apron requiring line block i.e. total track possession time of maximum two weeks which is the essence of this EOI.
2. The firm shall submit offer in two no. sealed envelop one containing application and technical details and the second containing budgetary cost of construction of washable apron (including all cost of fastening components etc.) per meter length based on their design. This is not for the purpose for evaluation but for the purpose of handing over to authorities / Zonal Railways for their guidance where the shortlisted design may be taken up for trial.

Address for sending EOI –

**Director/ Standards Track-IV
Research Designs and Standards Organisation,
Govt. of India, Ministry of Railways,
Manak Nagar, Lucknow (INDIA) - 226011.**

e-mail : eoι.washableapron.tk2rdsο@gmail.com

अनुसंधान अभिकल्प एवं मानक संगठन
भारत सरकार, रेल मंत्रालय,
मानक नगर, लखनऊ – 226011

रुचि अभिव्यक्त करने हेतु वैश्विक नोटिस

भारतीय रेल, प्रभावी लागत क्रिया सहित भारतीय रेलवे में उपयोग हेतु ऐसे वाशेबल एप्रन के डिजाइन और विकास के लिए प्रयासरत है जिसमें केवल एक या दो सप्ताह की लाइन ब्लॉक की आवश्यकता हो। वाशेबल एप्रन के डिजाइन को, "प्रभावी लागत क्रिया सहित वाशेबल एप्रन (बैलॉस्टलेस) जिसमें केवल एक या दो सप्ताह की लाइन ब्लॉक की आवश्यकता हो, के डिजाइन और विकास की विधि" में वर्णित "तकनीकी आवश्यकताओं" के अनुरूप होना चाहिए। जिसे अ.अ.मा.सं. से किसी कार्य दिवस को प्राप्त अथवा अ.अ.मा.सं. की वेबसाइट www.rdso.indianrailways.gov.in से डाउनलोड किया जा सकता है। इच्छुक फर्म जिनके डिजाइन, 'तकनीकी आवश्यकताएं' पर खरे उतरते हो, अपने डिजाइन प्रस्ताव निदेशक/रेलपथ-IV को विस्तृत मूल्यांकन हेतु निम्न पते पर भेज सकते हैं। विस्तृत जानकारी के साथ लिखित आवेदन निम्नलिखित पते पर 28.02.2014 तक प्राप्त हो जाने चाहिए। अभिरुचि व्यक्त करने वालों फर्म ध्यान दे –

1. बैलॉस्टलेस वाशेबल एप्रन के डिजाइन और विकास के लिए प्रस्तुत तकनीकी विवरण में इसके निर्माण की दिनवार कार्य योजना (जैसे दिन 1, दिन 2 आदि) स्पष्ट रूप से प्रदर्शित होनी चाहिए। कार्य योजना में मौजूदा ट्रैक को उखाड़ने से लेकर वाशेबल एप्रन के निर्माण पूरे एवं कमीशन होने तक का कुल समय, जो अधिकतम दो सप्ताह के ट्रैक ब्लॉकसमय में होना चाहिए। यह इस रुचि की अभिव्यक्ति का सार है।
2. फर्म प्रस्ताव को दो मुहरबंद लिफाफों में प्रस्तुत करेगा, जिसमें एक में आवेदन एवं तकनीकी जानकारी होगी और दूसरे में वाशेबल एप्रन के निर्माण की डिजाइन अनुसार प्रति मीटर बजटीय लागत (पूर्ण फासनिंग सिस्टम की लागत सहित) होगी। इसका उद्देश्य चुने हुए डिजाइन का वित्तीय परीक्षण करना नहीं है। परन्तु इसे सम्बन्धित अधिकारियों/क्षेत्रीय रेलवे के मार्गदर्शन हेतु प्राप्त किया जा रहा है। जहाँ चुने हुए डिजाइन का परीक्षण होना है।

निदेशक/रेलपथ-IV
अनुसंधान अभिकल्प एवं मानक संगठन
भारत सरकार, रेल मंत्रालय,
मानक नगर, लखनऊ –226011

ई-मेल:eoi.washableapron.tk2rdso@gmail.com

**PROCEDURE FOR DESIGN AND DEVELOPMENT OF COST EFFECTIVE
WASHABLE APRON (BALLASTLESS) REQUIRING LINE BLOCK OF ONLY
ONE OR TWO WEEKS**

A. GENERAL:

- 1.0 Interested firm should have adequate expertise in design of washable apron/Ballastless track from India & can have technical collaboration with the firm having adequate expertise in design & construction of washable apron in India or abroad as per technical requirement detailed at para B.
- 2.0 The firm should have:
 - (i) ISO: 9001 Certificate
 - (ii) Applying firm should have Collaboration agreement with the abroad based firm, if any having adequate expertise in design & construction of washable apron / Ballastless track as per technical requirement detailed at para B of this document.
 - (iii) The collaborator should have designed & constructed at least one washable apron for 25t axle load and design speed of 30 kmph / 110 kmph requiring line block of only one or two weeks.
 - (iv) Washable apron designed and constructed by the firm at site as per their design should have satisfactory working performance from the date of its construction.
 - (v) Cost effective design & methodology with construction period requiring line block of only one or two weeks will only be considered.
- 3.0 The firm will also submit a budgetary estimate of cost of the construction of washable apron per meter run under Indian condition as per their design.
- 4.0 The application form duly filled in duplicate along with all relevant attested documents, bank draft of Rs.10,000/- (non refundable) drawn in favour of Executive Director /Finance, RDSO, Lucknow shall be submitted to Director General/Track, Research Designs & Standards Organisation (RDSO), Manak Nagar, Lucknow-226011
- 5.0 The details submitted by the firm shall be scrutinized by RDSO. After scrutinizing the details, the deficiencies noticed, if any, would be advised to the firm for improvement. Firm has to rectify deficiencies immediately (not later than one month) otherwise case may be considered as closed.

- 6.0 EOI containing design which is a copy of RDSO existing or under-development design of Ballastless Track may be summarily rejected. Decision of Track Design Directorate, RDSO will be final and binding on the applicant.
- 7.0 The case will be processed based upon details received mentioned in para 2.0 above.
- 8.0 In case, firm is considered prima-facie suitable for design & development of washable apron based upon the documents submitted, the firm shall be asked to submit detail design and relevant drawings and Construction Manual, testing scheme & maintenance manual etc. for the construction & maintenance of the washable apron for trial purpose.
- 9.0 RDSO reserves all the right of this exercise. In case of any doubt/dispute, decision of RDSO shall be final.
- 10.0 The firm shall indemnify Ministry of Railways against any claims from any other party in connection with the intellectual property rights of the drawings and design or any other documents submitted by the firm or any other patent rights.

B. TECHNICAL REQUIREMENTS

1.0 Following criteria shall be adopted:

- i) Washable apron shall be designed for 25t max. Axle Load.
- ii) Washable apron for platform lines shall be designed (i) speed upto 30 kmph (ii) for speed upto 110 kmph.
- iii) Washable apron shall be primarily in form of ballastless track (BLT).
- iv) Washable apron should be designed suitable to mixed traffic running with different speed/axle load on the washable apron on Indian railways.
- v) The design of washable apron should be compatible only with the existing fastening system of the Indian Railways. Any other component proposed should be easily available, manufactured in India and should not have any IPR (Intellectual Property Right) related cost attached to it.
- vi) Design service life of washable apron should be for 60 years.
- vii) Washable aprons are extensively washed on Indian Railways due to various reasons i.e. toilet discharge etc. apart from watering of coaches. Suitable arrangement should be provided for ensuring that washable apron functions properly in view of daily cleaning requirement. Provision of cross slope between 1 in 30 to 1 in 50 for drainage purpose and 6 to 10 mm thick epoxy treated wearing coat is envisaged. Design of associated drainage arrangements in area near to washable apron shall also be part of design of washable apron.
- viii) No appreciable cracks or settlements or separation of parts should be developed during service in the apron leading to impaired service or failure.

- ix) Washable apron should be design for almost maintenance free conditions except replacement of worn-out fastening components / rails.
- x) Length of washable apron may vary from 400 m to 600 m.

2.1 DESIGN REQUIREMENTS

In designing following aspects/factors needs to be considered:

- a) Load distribution factor, prevailing on IR (to be taken as 0.55)
- b) Dynamic augment, prevailing on IR (to be taken as 2.5)
- c) Upward reaction / pressure from support base should be clearly mentioned in design
- d) Spacing of supports to rails – preferably at every 60 cm.
- e) The design should be cost effective serving all functional requirements expected of washable apron.
- f) Any other factor considered necessary by the designer.
- g) Design shall be per various codes of practice of BIS, EN, IRS, IRC and UIC with latest revision/ edition). If for any item/work, abovementioned codes are not relevant, best available Engineering practice / International codes shall be mentioned.
- h) Design & detail of suitable Transition System for smooth transition from ballasted track to washable apron on both ends shall be part of the design of washable apron.
- i) Design and detail of Expansion / Contraction Joints in washable apron at suitable intervals shall be part of the design of washable apron.
- j) Technical parameters required for foundation of washable apron shall be suitably considered for Indian conditions and shall be mentioned in the design. A design monograph of varying subgrade characteristics, if applicable, to be provided by the firm /designers.

2.1.1 Track Details : Washable apron shall be designed for following track details :

- i) Rail section: 60 kg, 90 UTS, 110 UTS / 52 kg, 90 UTS (UIC) (as per RDSO standard specification IRS/T-12) or any other type 60 kg rails
- ii) Schedule of Dimensions (SOD) and Maximum Moving Dimension (MMD) of Indian Railways for BG shall be followed.
- iii) Ruling gradient: 1 in 400 (steepest)
- iv) Rail cant at Rail seat (inward): 1 in 20
- v) Maximum degree of curvature: upto 2°
- vi) Maximum permissible cant: 165mm
- vii) Speed potential: (i)30 kmph for platform lines (ii)110 kmph for platform lines
- viii) Traffic: Mixed – passenger & freight
- (ix) Lateral Load: As per IRS provisions
- (x) During service if some parameter goes out in case of any unforeseen circumstances, the leeway / margin available to correct the parameter. Vertical: + 10 mm / - 3mm, Horizontal: ± 3 mm.
- (xi) Design of washable apron should take into consideration the forces due to continuous welded rail (CWR) and interaction of CWR.

- (xii) Design temperature range: 70 degree Celsius variation of rail temperature as per zone & chart of Indian Railway LWR manual and 40 Degree variation of ambient temperature.

2.1.2 Track Tolerances: Track tolerances over washable apron when installed and later during service under floating condition should be as under:

S. No.	Parameter	Installation	Service
1	Gauge (with reference to 1676mm, measured below 14 mm rail top) for straight track and for curve upto the radius of 350 m.	± 1 mm	± 3 mm
2	Variation in versine on curved track (20 m chord with half overlapping)	± 3 mm	± 6 mm
3	Vertical alignment over a 3.6 m chord	± 1 mm	± 6 mm
4	Lateral alignment over a 7.2 m chord on straight track	± 1 mm	± 3 mm
5	Twist on 3.6 m base	± 1 mm	± 5 mm

Variation in horizontal alignment, vertical alignment, versine, twist and gauge shall not exhibit cyclic pattern.

2.1.3 Type of Traction:

IR has Diesel / Overhead Electric (25 KV) traction. The washable apron design should have adequate electrical insulation for correct performance of signaling and traction equipments and should take care of return current as per traction.

2.2 CONSTRUCTION PROCESS

- a) Procedure of construction process of washable apron should be mentioned in details including dismantling and removal of existing track. Construction process should be suitable to conditions prevailing on stations of Indian Railways, clearly demonstrating how it can be constructed within a time period not exceeding two weeks after line block is taken.
- b) Construction of washable apron should **require line block not exceeding two weeks.**

C. LIST OF DOCUMENTS TO BE SUBMITTED

The firm will submit following document along with application form:

1. Documentary proof for Registration with RDSO or with any Government Department
2. ISO: 9001 Certificate
3. Collaboration Agreement as mentioned in 2.0 (iii)
4. Certificate of satisfactory working performance from the User as mentioned in 2.0(v)

5. Design, drawings & methodology with construction period requiring line block of only one or two weeks as mentioned in 2.0(vi)
6. Estimated cost of construction of washable apron as per their design as mentioned in para A 3.0
7. Bank draft of Rs.10,000/- (non refundable) drawn in favour of Executive Director /Finance, RDSO, Lucknow as per para A4.0
8. The firm has to submit design of washable apron for 25t axle load with speed 30 kmph & 110 kmph as per B(i) & (ii) satisfying technical and design requirements given in para B1.0, B2.1, B2.2 & B2.3. A check list clearly indicating compliance against Technical & Design requirements under para B1.0, B2.1, B2.2 & B2.3 shall also be submitted.
9. Drawing, specification, name of railway, numbers, year of construction, performance of washable aprons used in other railway system designed by collaborator for Indian context.

D. On satisfactory submission of above documents, if RDSO consider the firm fit for designing of washable apron, then firm will be asked to do so. Firm will have to submit design & construction technique to RDSO. In addition, Track monitoring data to the extent available should be provided in support of design calculations.

On successful completion of design, designed washable apron will be considered for trial construction in Indian condition. In this matter decision of railway authorities will be final.

During field trial of washable apron instrumentation in the running line may be done by the firm for measurements of some parameters. For this purpose, firm will have to submit the scheme and details of parameter measurement, if required; instrumentation expert can be engaged by the firm for this purpose.

**APPLICATION FORM FOR DESIGN & DEVELOPMENT OF COST EFFECTIVE WASHABLE
APRON REQUIRING LINE BLOCK OF ONLY ONE OR TWO WEEKS**

Issued to

Serial No:

M/s _____

**GOVERNMENT OF INDIA – MINISTRY OF RAILWAYS
RESEARCH DESIGNS & STANDARDS ORGANISATION
MANAK NAGAR, LUCKNOW – 226011**

SECTION I – GENERAL INFORMATION

1. Name of the Firm:
2. Postal address (of) (I) Head Office
(ii) Works/Factory
3. Telephone No. (I) Head Office
(With STD) (ii) Works/Factory
4. Telegraphic (I) Fax No.
Addresses (ii) E-mail address
5. Name of Collaborator
6. Postal Address of Collaborator
7. Details of Factory / Works location of Collaborator

SECTION II – TECHNICAL INFORMATION

A. PAST PERFORMANCE :

1. Details of important orders of designing & construction of washable aprons requiring line block of one or two weeks
 - (i) Name of the Railway, where washable aprons requiring line block of only one or two weeks have been designed & constructed by the firm / Collaborator

- (ii) Quantity
- (iii) Year of design/ construction
- (iv) Performance of the washable apron requiring
(Certificate from the user Railways to be attached), if any.

B. DRAWING & SPECIFICATIONS

The firm / Collaborator shall have design, drawing & specifications (please give also details of relevant codes, if applicable) of the washable aprons requiring line block of only one or two weeks and constructed by the collaborator in other world Railway system. (Details to be enclosed).

DECLARATION

I/We further declare that the informations furnished by me/us in this form are correct.

(Signature/s)

Place:	Name/s in Capital:	_____
	Letters	_____
Date:	Designation	: _____

Stamp of the firm applying for registration

NOTE : Where the space provided against any item is insufficient, the information should be furnished on a separate sheet of paper, which should be appended to this form.