

इरकॉन

Urge to stay Ahead

इरकॉन इन्टरनेशनल लिमिटेड  
(भारत सरकार का उपक्रम)



IRCON

IRCON INTERNATIONAL LIMITED

(A GOVT. OF INDIA UNDERTAKING)

KASHMIR RAILWAY PROJECT

Project Office :  
J&K Rail Project, Dharam Qazigund Section  
Vill. Krawah, Post : Banihal, Distt. Ramban  
(J&K) Pin : 182146

Tele/Fax : 01998-255708  
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**CIN :- ( U45203DL1976GOI008171 )**

No. IRCON/1014/J&K-DQ/RBN/Z-1/HCC /84 /1308

Dated: 02.06.2016

Project Manager  
M/s Hindustan Construction Co. Ltd.  
Post Office: Gund Tathar,  
Tehsil- Banihal, Distt- Ramban

Sub: Construction of Tunnel T-48 (Between Km 100 and Km 110) in connection with Construction of Dharam - Qazigund Section of HCC/T-48/01/1765 Dated 21.11.2015 Udampur-Srinagar-Baramulla New BG Railway Line Project (Package T-48).  
Reg: - **Approval of PVC membrane & Geotextile membrane.**

Ref: (1) LOA No: IRCON/J&K.CELL/JAT/14/1014/T48/210/1395 Dated: 06.09.2012  
(2) DDC Letter No 6181.1-WSL-16-071 dated 15.05.2016  
(3) HCC Letter No HCC/T-48/01/1848 Dated 22.04.2016.  
(4) HCC Letter No HCC/T-48/01/1869 Dated 28.05.2016.  
(5) DDC Letter No 6181.1-WSL-16-079 dated 01.06.2016

Vide letter in Ref (3) & Ref (4) dated 22.04.2016 and dated 01.06.2016 the catalogue of PVC membrane and Geotextile membrane was submitted by M/s HCC for Approval and same was forwarded to DDC.

DDC has gone through the catalogue and test certificates submitted and some more quieres and requires more documents/certificates are required before approving said material (As specified vide letter in Ref (5) (Letter attached).

You are advised to provide the required documents at the earliest.

For and on the behalf of  
IRCON INTERNATIONAL LIMITED

JGM/T-48

*for (Rains) Done*

Copy to :- (i) AGM/PH/Ramban: - For kind information Please.

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01<sup>st</sup> June 2016  
6181.1-WSL-16-079

**Mr. Kotteda Ananthrao, AGM/PH**  
IRCON International Limited  
J&K Rail Project, Dharam - Qazigund Section  
Village - Krawah, Post - Banihal  
Dist. – Ramban, (J&K)  
Pin – 182146, India

**Sub:** Detailed design Consultancy, 3D Monitoring & Supervision of Tunnel T-48 (Between Km 100 and Km 110) in connection with construction of Dharam-Qazigund section of Udhampur -Srinagar-Baramulla New BG Railway line project.

**Submission of PVC Membrane and Geotextile Protective felt for Waterproofing – DDC Comments**

**Ref:**

- (i) HCC Letter HCC/T-48/01/1863 dated 12.05.2016 received from IRCON letter IRCON/1014/J&K/K-Q/Consultancy/T-48/1285 dated 13.05.2016
- (ii) DDC Letter 6181.1-WSL-16-071 dated 15.05.2016
- (iii) HCC Letter HCC/T-48/01/1848 dated 22.05.2016
- (iv) HCC Letter HCC/T-48/01/1869 dated 28.05.2016
- (v) IRCON/1014/J&K/K-Q/Consultancy/T-48/1303 dated 30.05.2016

**Dear Sir,**

DDC acknowledges receipt of the document above referred as (iv), which replies to clarification requested by DDC letter (ii) about the supplier and material to be applied in the waterproofing system.

1. The following materials/suppliers were proposed for PVC waterproof membrane:
  - *Logicbase V-SL from TechoNICOL (Russia)*
  - *Urdin T SL from SINTEC LAMINADOS (Spain)*
  
2. There were also presented, despite not clearly proposed on letter text, the following materials:
  - *Geotextile PP T-GEO 500 GSM from MANAS GEO TECH INDIA*
  - *Geotextile PP GT50 from VIRENDERA TEXTILES*
  - *Delta sheet from Dorken*

3. Technical documentation provided for all materials:

**PVC LOGICBASE V-SL from TechnoNICOL**

- a. TechnoNICOL PVC membrane LOGICBASE V-SL reference list of tunnels, including 6 rail tunnels in Russia;
- b. Presentation of company, including reference to CE mark and ISO 9001 certification;
- c. LOGICBASE V-SL technical data sheet;
- d. Third party test values (report from SPECTRO – India) dated 23.05.2016, for physical tests (delivered by hand in GH office on 25.05.16. Fire resistance and acid and alkaline resistance results are not given (waiting for results).

**PVC URDIN T SL from SINTEC LAMINADOS**

- a. Technical data sheet for “SINTEC URDIN T SL” including manufacturer’s declared values according to EN standards;
- b. Reference list of railway tunnels in Spain and abroad in the last 5 years;
- c. Third party test values (report from Tecnalia - Spain) dated 05.05.2016, for physical tests;
- d. Third party test values (report from CTF- Spain) dated 04.10.2010, for fire resistance tests.

**PP T-GEO 500 GSM from MANAS GEO TECH INDIA**

- a. Geotextile T-GEO 500GSM technical data sheet;
- b. Third party test values (report from SPECTRO – India) dated 20.04.2016, for geotextile 500 GSM;
- c. Third party test values (report from Northern India Textile Research Association – India) dated 09.09.2015, for geotextile 500 GSM.

**PP GT50 from VIRENDERA TEXTILES**

- a. Geotextile PPGT 50 technical data sheet from manufacturer;

- b. Third party test values (report from SPECTRO – India) dated 17.05.2016, for geotextile PPGT 50.

**Delta sheet DELTA-MS 20 from Dorken**

- a. Delta sheet technical data sheet from manufacturer;
- b. Third party test values for fire reaction (report from HOCH – Germany) dated 02.08.2011;
- c. Third party test values for physical tests (report from tBU – Germany) dated 11.08.2011.

4. After test analysis given by manufacturers as well as third party laboratories, we recommend the following actions:

**PVC LOGICBASE V-SL from TECNONICOL**

Third party test results are in compliance with SCC section IIB (11.1.2.2) except fire resistance and acid/alkaline resistance values that are not given. HCC is requested to complete fire resistance and acid/alkaline resistance results for complete compliance with clause 11.1.2.2 of SCC section IIB. Approval of this material should be suspended until the presentation of missing results.

**PVC URDIN T SL from SINTEC LAMINADOS**

Manufacturer is a recognized and experienced provider of waterproofing membranes for tunneling. All results comply with clause 11.1.2.2 of SCC section IIB.

DDC has no objection for its approval.

**PP T-GEO 500 GSM from MANAS GEO TECH INDIA**

All values in compliance with SCC (11.1.2.1 of section IIB) for protective felt. DDC has no objection for its approval.

**PP GT50 from VIRENDERA TEXTILES**

All values in compliance with SCC (11.1.2.1 of section IIB) for protective felt. DDC has no objection for its approval.

**Delta sheet DELTA-MS 20 from Dorken**

All values in compliance with SCC (11.2.2 of section IIB) for groundwater drainage materials.

*[Handwritten signature]*

5. Despite the above mentioned recommendations for approval, according to clause 11.1.1.2 of SCC, section IIB, additional information is required to be submitted as follow:
- i. Manufacturer's instructions for installation of felt backing and waterproofing membrane, including procedure for preparing, fixing, welding and splicing, flashing, etc;
  - ii. Manufacturer's and installer's qualifications to include evidence of experience of the manufacturer and the installer, as well as resume of the lining installation supervisors. According with clause 11.1.1.3 SCC, it is required that Manufacturer's representative are to be present for at least the first 10 working days of installation and later as often as necessary. The Contractor should provide evidence of availability of Manufacturer's representatives to comply with this request.
  - iii. Shop drawings showing all necessary installation details for felt and waterproofing membrane, including installation sequence, position of joints, treatment of projections, connection to waterproofing of structures in open cut, local reinforcements , etc.
  - iv. Included on Manufacturer's instructions for installation, should be presented all fixing and fitting accessories such as rondels, nails and sealing materials as well all the relevant equipment.
6. With the approval of a new Manufacturer, a review of the Method Statement for Tunnel Waterproofing is required for all relevant updates concerning surface irregularities requirements, products specification, minimum radius around bulges, etc.
7. For Preliminary grouting of heavy flows, a grouting Method Statement and proper grout mix design should be submitted, including all relevant grouting equipment (flow meter, pressure gauges, pressures and intake automatic data register, grout plants, etc) and sequence procedure.
8. HCC is requested to clarify if the material now submitted, should replace the previous submission (vide their letter referred as (i)) of the PVC membrane Renolit Alkorplan.

DDC faithfully remains, available for any clarification/additional information you might require.

Yours faithfully  
for **LOMBARDI – SNC LAVALIN (JV)**



**Nuno Vermelhudo**  
Chief Resident Engineer

Copy to:

**Mr. D. P. Choudhary, GM**

IRCON International Limited  
J&K Rail Project, Dharam - Qazigund Section  
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**Mr. B. Gnanamurthy, JGM T-48**

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