SHELADIA Associates, Inc.

Engineers •Development Consultants • Architects

Project Office:

Jai Shree Chamunda Krupa, Block No. 10/11, Road No. 10A, Saurashtra Kala Kendra Society, 150 Feet Ring Road, Behind Modi School, Rajkot – 360007 Gujarat, India

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Consultancy Services for Authority's Engineer for Supervision of Up-gradation to 6 lane with paved shoulders of Pkg-3, Pkg.-4, Pkg-5 & Pkg.-6 on EPC Mode in the State of Gujarat

Ref:SA/CSAE/TL/1326/2019 21st November, 2019

To,
The Project Manager,
VIL – JCE(G)CL (JV),
Jassapur Road,
Near JassapurChowkdi,
Sayla, Surendranagar
Gujarat

Pkg -3 : Limbdi - Sayla Section of NH-8A (New No. NH-47) from Km. 99.00 to Km. 138.00

Sub : **Source Approval of Elastomeric Bearings.**

Ref :
1. Your Letter No. VIL/2019/TL/GRBD/PKG-03/724 dated 21.11.2019
2. Our letter no. SA/CSAE/TL/1295/2019 dated 14.11.2019
3. Your Letter No. VIL/2019/TL/GRBD/PKG-03/712 dated 11.11.2019

Dear Sir,

With reference to above cited subject, Contractor has submitted the credential &Company Profile of **M/s Ameenji Rubber Pvt. Ltd** for supply of Elastomeric Bearings and the same has been reviewed by this office and found in order vide the above reference (1).

In this regard, Factory visit has been conducted forElastomeric Bearing at **M/s Ameenji Rubber Pvt. Ltd** in presence of our Bridge Engineer and Contractor Representative Mr. Ranjan Kumar Singh (DPM-Structure) on dated 20.11.2019and it is also found that the technical norms & the documents/quality control system in the manufacturing plant is suitability of the above source and found satisfactory.

Elastomeric Bearing:

1. The various related tests have been conducted in the factory as per the requirement of IRC-83-2015 (part-II) Specifications and standards is found in order.
2. Performance Warranty/guarantee certificate of minimum 15 years for the finished products should be submitted before procurement of the same to the site.
3. Manufactur's Test Certificate (MTC) for the factory has been checked by authority's engineer and found in order.
4. If the elastomeric bearings are showing any defects/deficiency within the warranty period, the same shall be got repaired/replaced by the vendors at their own risk & cost.

Home Office:
15825 Shady Grove Road, Suite 100, Rockville, MD 20850, USA
Tel: 301-590-3939, Fax: 301-948-7174

Indian Regional Office
Amsri Classic, Flat No. 1, 1A, 2 & 2A,
Door No. 9-1-127/4 & 127/4/1, 4th Floor,
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Strip seal Expansion joints:

During our Bridge Engineer/Structure Engineer visit, the technical in charge of the factory has explained the production of strip seal expansion joints in regular basis as per the clients requirement but we have only seen visually the products of expansion joints. No such type of tests has been conducted based on the specifications & standards. So, Contractor has discussed with the factory in charge and tell him lateron decision may be taken for expansion joints.

Hence, the source approval for elastomeric bearing is approved by authority's engineer and the materials may be procured from **M/s Ameenji Rubber Pvt. Ltd** at the earliest.

Yours truly,
For SHELADIA Associates, Inc.

Manoj Kumar,
Team Leader

Encl : Test Reports of Elastomeric Bearing.

Copy to :

1. Executive Engineer, NH Division, Rajkot.
2. Engineer, Sheladia Associates Inc., Hyderabad.
3. Deputy Executive Engineer, NH Sub-Division, Limbdi.

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F/QA/04

AMEENJI RUBBER PVT LTD

P 9/18, Road No. 8, I.D.A Nacharam, Hyderabad-500 076, Telangana State, India.

JOINT TEST REPORT

Ameenji

Date: 20-11-2019

Project.Ref.	**Upgradation to 6 lane with paved shoulders of Rajkot-Bamanbore section of NH 8B (New NH 27) from Km.185+230 to Km.216+000 on EPC mode in the state of Gujarat (Package 5) & Upgradation to 6lane with paved shoulders of Limbdi-Sayla section of NH 8A (New NH 47) from Km.99+000 to Km.138+000 on EPC mode in the state of Gujarat (Package 3)**			
Description of Item	Elastomeric Bearings Lot No.EB/11-19			
Size (mm)	400	300	96	
Governing Specification	IRC:83-2018 (Part II) & MORTH			
Date(s) of Inspection	20-11-2019			

S.No.	Parameter	Clause No.	Permissible Limits	Test Method/ Spec. Ref.	Result
I.Physical Properties and Chemical Analysis carried out on Test Pieces moulded with identical compound and identical vulcanizing conditions as used in the manufacturing of the Elastomeric Bearings.					
1	Physical Properties (Before Ageing):				
1.1	Hardness	Table1 &2, Cl.4.2	60 ± 5 IRHD	IS:3400 (Part II& XXIII)	62 IRHD
1.2	Tensile Strength	Table1, Cl.4.2	16 MPa (min)	IS:3400 (Part I)/ ISO 37	20.33 Mpa
1.3	Elongation at break	Table1, Cl.4.2	425% (min)	IS:3400 (Part I)/ ISO 37	520%
2	Tear Resistance	Table1, Cl.4.2	10KN/m (Min)	IS:3400 (Part XVII)/ISO 34-1	46 KN/m
3	Adhesion Strength	Table1, Cl.4.2.3	7KN/m (Min)	IS:3400 (Part XIV)	16.04 KN/m
4	Composition/ Chemical Analysis:				
4.1	Polymer Identification	Cl. 4.1	Natural Rubber(NR)/ Chloroprene (CR)	ASTM D297/ IS:3400 (Part XXII)	Chloroprene (CR)
4.2	Ash Content	Cl. 4.1.4	5% (Max)	IS:3400 (Part XXII)	3.710%
II.Tests carried out on Complete Bearings					
1	Length of Bearing	Table5, Cl.6.9	**L -0 mm, +6 mm**	IRC: 83 (Part II) /2018	Checked and found ok
2	Width of Bearing	Table5, Cl.6.9	**W -0 mm, +6 mm**	IRC: 83 (Part II) /2018	Checked and found ok
3	Thickness of Bearing	Table5, Cl.6.9	**T -0, +5%**	IRC: 83 (Part II) /2018	Checked and found ok
4	Visual Examination:	Cl.7.9.1.1	-	IRC: 83 (Part II) /2018	Checked and found ok
5	Shear Modulus/Shear Bond Test	Cl. C.2	0.9 ± 0.18 Mpa	IRC: 83 (Part II) /2018	Tested & Found Ok, Report Enclosed
6	Compressive Stiffness/ Elastic Modulus	Cl. C.3	Refer Encl. Report	IRC: 83 (Part II) /2018	Tested & Found Ok, Report Enclosed

Note: Warranty is Subjected to the Bearing Installation as per IRC: 83 (P-II) or Cl. No. 2005.7 of MORTH.

Manager (Quality Control)
AMEENJI RUBBER PVT. LTD.
Plot No.P-9/18, Road No.8,
IDA Nacharam, Hyd-76.

Witnessed By

20/11/19

Ranjan Kumar Singh
DPM - Structure
M/s.Varaha Infra Ltd

Witnessed By

Ratikanta Parida
Bridge Engineer
Sheladia Associates Inc. USA

AMEENJI RUBBER PVT LTD

P 9/18, Road No. 8, I.D.A Nacharam, Hyderabad-500 076, Telangana State, India.

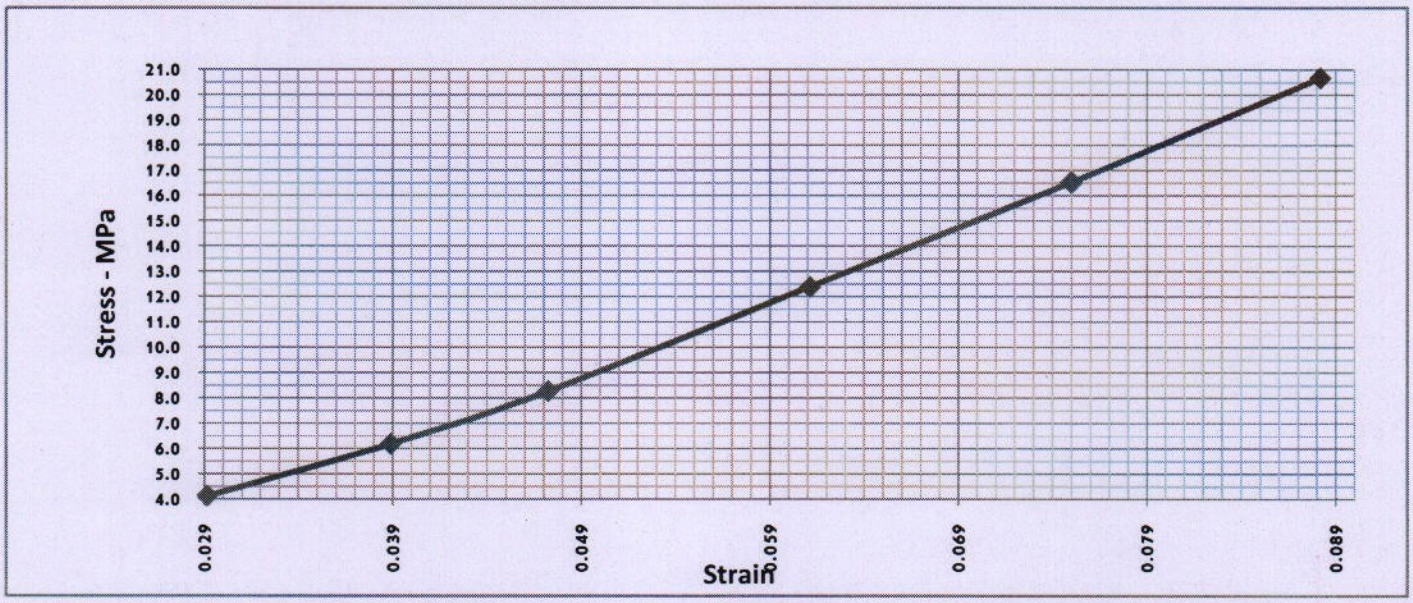
Date: 20-11-2019

Ameenji

ELASTIC MODULUS/ COMPRESSIVE STIFFNESS TEST

ELASTOMERIC BEARING SIZE (mm):	a	b	thick.	**400**	**300**	**96**
STEEL LAMINATE SIZE (mm)	a'	b'	thick.	388	288	4
EFFECTIVE BEARING AREA =L x W of Steel Laminate			A1	111744 mm^2		
No. of STEEL LAMINATES			n	6 nos		
INTERNAL ELASTOMER LAYER THICKNESS (mm)			te	12 mm		
No. of INTERNAL ELASTOMER LAYERS				5 nos		
TOP/ BOTTOM ELASTOMER LAYER THICKNESS (mm)				6 mm		
SIDE COVER THICKNESS (mm)				6 mm		
TOTAL ELASTOMER THICKNESS (mm)			TET	72 mm		
SHAPE FACTOR =A1/{2(a'+b').te} (here te - internal elastomer thick.)			S	6.89		
Max.Test Loading = Fz, Test = 5.G.S.A1/1.5 (G is Shear Modulus) =			0.9	2309749 N = Kgs. 235449		

% F	Load in Kgs F	Req.Pressure F/ Ram Area (2025.84 Cm2)	Stress Mpa F/Bearing Area	Observed deflection in mm D1	D2	D3	D4	Deflection Avg. D	Strain D/TET
20	47090	23	4.134	2.20	2.10	2.10	2.00	2.10	0.0292
30	70635	35	6.201	2.90	2.80	2.80	2.70	2.80	0.0389
40	94180	46	8.268	3.40	3.30	3.60	3.30	3.40	0.0472
60	141269	70	12.402	4.10	4.10	4.90	4.50	4.40	0.0611
80	188359	93	16.536	4.80	5.00	6.10	5.70	5.40	0.0750
100	235449	116	20.670	5.60	5.90	7.20	6.70	6.35	0.0882



	@100%		@30%		
Stress =	20.67	-	6.20	=	14.47
Strain =	0.088	-	0.0389	=	0.0493

Compressive Stiffness, Ea(Mpa) = Stress/Strain = **293.46**

Value Specified as per IRC:83-2018 Pt.II Clause C.3.4.2 (234.77 **to** 352.15)

Result: No discernible defect is found by visual Examination. Result found Satisfactory

Manager (Quality Control)
AMEENJI RUBBER PVT. LTD.
Plot No.P-9/18, Road No.8,
IDA Nacharam, Hyd-76.

Witnessed By
Ranjan Kumar Singh
DPM - Structure
M/s.Varaha Infra Ltd

Witnessed By
Ratikanta Parida
Bridge Engineer
Sheladia Associates Inc. USA

AMEENJI RUBBER PVT LTD
P 9/18, Road No. 8, I.D.A Nacharam, Hyderabad-500 076, Telangana State, India.
Date: 20-11-2019

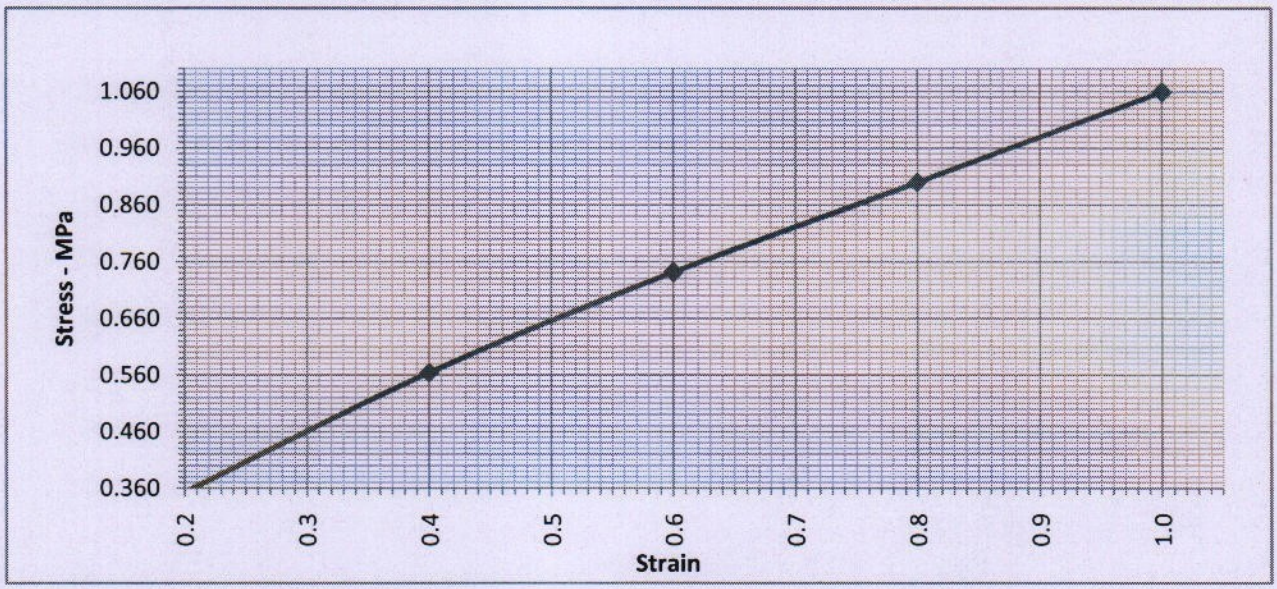
Ameenji

SHEAR MODULUS/ SHEAR BOND TEST

ELASTOMERIC BEARING SIZE: **400** **300** **96**

EFFECTIVE BEARING AREA (mm2)	111744
HORIZONTAL CYLINDER AREA (cm2)	804.57
TOTAL ELASTOMER THICKNESS (mm)	72

Strain (S)	Deflection (SxTRT) (mm)	Pressure (P) (Kg/cm2)	Load (F) on Bearing (Kgs) P*HCA	Stress Mpa F*9.81/(A1*2)
0.2	14.4	10.0	8045.7	0.3532
0.4	28.8	16.0	12873.1	0.5651
0.6	43.2	21.0	16896.0	0.7416
0.8	57.6	25.5	20516.6	0.9006
1.0	72.0	30.0	24137.1	1.0595



Stress = 0.9006 - 0.3532 = 0.5474

Strain = 0.800 - 0.200 = 0.60

SHEAR MODULUS (G) = Stress/Strain = **0.9123**

SHEAR MODULUS PERMISSIBLE LIMITS as per IRC:83-2018 Pt.II Clause 4.2.2, Table 2 0.9 ± 0.15 Mpa

Result: No evidence of instability, defect or damage during test & No Peeling/ Seperation between Rubber & Steel Laminates, No sign of Bond failure. Result Found Satisfactory.

Manager (Quality Control)
AMEENJI RUBBER PVT. LTD.
Plot No.P-9/18, Road No.8,
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Witnessed By
Ranjan Kumar Singh
DPM - Structure
M/s.Varaha Infra Ltd

Witnessed By
Ratikanta Parida
Bridge Engineer
Sheladia Associates Inc. USA

Ameenji

Factory Visit Report

Date: 20-11-2019

Sub.: Factory Inspection Reg.

Project.Ref.: Upgradation to 6 lane with paved shoulders of Rajkot-Bamanbore section of NH 8B (New NH 27) from Km.185+230 to Km.216+000 on EPC mode in the state of Gujarat (Package 5) & Upgradation to 6lane with paved shoulders of Limbdi-Sayla section of NH 8A (New NH 47) from Km.99+000 to Km.138+000 on EPC mode in the state of Gujarat (Package 3)

In reference to above subject

(1)Ranjan Kumar Singh
DPM - Structure
M/s.Varaha Infra Ltd

(2)Ratikanta Parida
Bridge Engineer
Sheladia Associates Inc. USA

visited the factory (Ameenji Rubber Pvt. Ltd. - Hyderabad) for manufacturing and testing facility assessment of Elastomeric Bearing as per IRC 83 part II [redacted]

The Same were verified, Witnessed and found satisfactory as per the guidelines of MORTH Requirement.

P.Lakshminarayana
Manager - QC/QA

Narender Kumar - GM
General Manager

AMEENJI RUBBER PVT. LTD. HYD.

Ranjan Kumar Singh
DPM - Structure
M/s.Varaha Infra Ltd

Ratikanta Parida
Bridge Engineer
Sheladia Associates Inc. USA

AMEENJI RUBBER PVT LTD
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Mail ID ; ameenjirubber@gmail.com., WEB SITE; www.ameenji.net, www.ameenji.com.
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