1. **New Clause 3.1.2 has been added as under:**

   For GRSP made of natural rubber with a particular grade of RSS 1 to 4, the manufacturer should have license from Rubber Board for procurement of the raw rubber to be used for manufacturing of rail pads. During inspection of rail pads, the supplier should submit invoice in support of procurement of natural rubber of a particular grade from the approved sources of Rubber Board with proof of filing annual return with Rubber Board. Similarly, invoice of carbon blacks of suitable ASTM grades as per ASTM D 1765 procured from the primary manufacturing sources or their authorized dealer shall be submitted at the time of RDSO inspection. A record shall be maintained showing procurement & consumption of natural rubber and carbon blacks used for the production of rubber sole plates.

2. **Existing clause 3.1.2 renumbered to 3.1.3.

3. **The existing limiting values of Ash content & Specific Gravity at SN 9 & 10 under Clause 3.2 have been revised and shall be read as under:**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Property/Test</th>
<th>Units</th>
<th>Acceptance Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.</td>
<td>Ash content</td>
<td>%</td>
<td>Approved value ± 5</td>
<td>IS : 3400 (Part 22) :1984</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Subject to not exceeding 29%</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Specific gravity</td>
<td>-</td>
<td>Approved value ± 0.03</td>
<td>IS: 3400 (Part IX) :2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Subject to not exceeding 1.27</td>
<td></td>
</tr>
</tbody>
</table>

4. **Two new tests have been incorporated under Clause 3.2 at SN 11 & 12 as follows:**

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Property/Test</th>
<th>Units</th>
<th>Acceptance Value</th>
<th>Test Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>11.</td>
<td>Secant Stiffness Test</td>
<td>KN/mm</td>
<td>150-250</td>
<td>Appendix ‘K’</td>
</tr>
<tr>
<td>12.</td>
<td>Impact Attenuation Test</td>
<td>%</td>
<td>30(min)</td>
<td>Appendix ‘L’</td>
</tr>
</tbody>
</table>

   All the above tests shall be performed on Grooved Rubber Sole Plates (6 mm thick). Impact Attenuation test shall be conducted at RDSO during initial approval and / or quality audit of firms by RDSO.
5. The existing sub Clauses 3.5.1 & 3.5.2 have been reworded and shall be read as under:

3.5.1 Specific gravity shall be 1.27 (max.). The tolerances in the specific gravity of the approved samples shall be +0.03, subject to not exceeding 1.27.

3.5.2 The percent ash content shall be 29% max. The tolerances in the percent ash content shall be +5 of the approved sample subject to not exceeding 29%.

6. A new Clause 3.6 has been added as under:

3.6 Finger Printing of Chemical Composition

Finger printing of the chemical composition of GRSP shall be done by measuring the values of Specific Gravity and Ash content which shall not vary from initial approved values and specified tolerance duly communicated to the firm at the time of fresh registration so that there will be no major change in composition of Grooved Rubber Sole Plate in regular supply.

i) Specific Gravity – Approved value + 0.03
Subject to not exceeding 1.27

ii) Ash content % – Approved value + 5
Subject to not exceeding 29%

7. The existing sub Clauses 11.1 & 11.2 have been reworded /merged and shall be read as under:

11.1 The rubber sole plates shall be packed such that each of 50 pads are placed flat on top of one another and bound by rubber bands in two perpendicular directions. The rubber bands used for packing the pads shall be of 15-20 mm width and due care shall be taken to avoid any extra stress developed in such packing. Six such packets placed flat one upon another shall then be placed in a plastic bag / HDPE bag (except PVC bag) and this bag shall be placed in a corrugated box to IS:7151-91, a quality suitable for para dropping of supplies and has waterproofing property for the outer layers of the box, to avoid any damage in transit. This corrugated box shall also be bound by two plastic straps of 15-20mm width in two perpendicular directions using suitable strapping tensioner & sealer tool. The packing shall ensure that no displacement of rail pads should occur during transit.

8. The existing sub Clauses 11.1 & 11.2 have been merged under Clause 11.1, therefore Clause 11.3 has been renumbered as Clause 11.2.

Sd/-
for Director General/Track-II

Lucknow
Dated: 08/2017
SECANT STIFFNESS TEST

1. Place the test pad between steel platens, as shown in Figure 1. A piece of '0' number emery paper shall be placed between the pad and the platens, with the abrasive side against the pad.

2. Apply consecutive loading of 100 KN, and remove it, six times. The loading times shall each be at least 12 seconds.

3. Upon release of the final pre-conditioning deformation a pre-load up to 100N shall be applied before setting deflection measuring devices to zero.

4. Apply a compressive force up to 100 KN at a rate of 50 ± 10 KN/min. As the load increases, record continuously the displacement at the four corners. From this record, determine the displacements with applied loads of 20 KN and 90 KN. If the difference between the largest and smallest of the four displacement measurements is more than 30% of the mean value, the test results are invalid, and the test must be repeated, ensuring that the pad is suitably placed in the test machine. If the difference is less than 30% of the mean, calculate the mean displacement, $S_{20}$, with 20 KN applied, and the mean displacement, $S_{90}$, with 90 KN applied. For used pads drawn from service, this difference shall be considered as 40%, max.

5. Two number samples to be tested per lot and each individual value shall meet the requirement of the specification.

6. The static secant stiffness, $k_{20-90}$, is calculated from

$$k_{20-90} = \frac{70}{(S_{90} - S_{20})} \text{ KN/mm}$$

7. Specified values of Secant Stiffness for 6 mm thick GRSP shall be 150-250 KN/mm.
IMPACT ATTENUATION TEST

1. The impact attenuation of the pad is to be measured in a drop weight test rig of the type shown in Figure 2. The drop weight has a mass of between 10 kg and 50 kg. In order to set the calibration of the rig, the rail fastening should first be assembled with 6mm thick plain hard plastic rail pad (HDPE or EVA), with stiffness not less than 750MN/m. The mass and height of the drop weight should be adjusted so that a clear impulse signal is obtained in the strain gauge, within 2 milliseconds and 5 milliseconds, with the peak strain not exceeding 2/3 of the initial cracking strain of the sleeper. Once these parameters are established for a particular test rig, a new sleeper should be strain gauged and installed for regular testing.

2. For test, standard rail fastening components as per RDSO Drg. No. RDSO/T-3731 using concrete sleeper to Drg. No. RDSO/T-2495 and RDSO/T-2496 are to be used.

3. The test is carried out as follows:

3.1 With a hard plastic pad (stiffness greater than 750 MN/m) in place in the rail fastening assembly, drop the weight from the height established in the preparatory test, record the peak strain value. Repeat the test twice more. The average value of the three strains is recoded as $\xi_{\text{ref}}$.

3.2 Dismantle the rail fastening assembly, and re-assemble it with the test pad in place. Drop the weight from the same height and record the peak strain value. Repeat the test twice more. The average of these three peak strains is recorded as $\xi_{\text{test}}$.

4. The impact attenuation of the pad $A$ is defined by

$$A = (1 - \frac{\xi_{\text{test}}}{\xi_{\text{ref}}}) \times 100\%$$

5. Two samples shall be tested and each individual value shall meet the requirement of the specification.