Rail Baltica - Design Guidelines
1. Design Guidelines scope of work
2. Content of Design Guidelines manual
3. Key parameters included in the design guidelines manual
4. Key examples of cross sections included in the design guidelines manual
1. Design guidelines scope of work

- A need of a common design guidelines for the whole Rail Baltica project to ensure a standardized approach for the next procurement stages → Design Guidelines manual will be included in all design tenders.
- A need to detail some TSI requirements and to add some criteria with regards to mixed traffic and high speed for the Rail Baltica corridor.
- Main objectives for the DG requirements: Railways long-term vision, competition neutral and integration of the EU best practice for Railways.
- 3 steps approach for the DG:

  - WP1.1 - Screening of national Railway legislation
  - WP1.2 - Screening of national Rail Baltica studies
  - WP1.3 - Best practice review
  - WP1.4 - Definition of the Railway design model
  - WP1.5 - Definition of the scope for Design guidelines
  - WP2.1 - Drafting Operation rules
  - WP3.1 - Elaboration of design guideline manual
  - WP3.2 - Preparation of a change management procedure

  **Final deliverables**
  - Operation manual (draft)
  - Design guidelines manual

- General overview
- Identification of the key points to be detailed in the DG
- Global assessment of parameters based on EU best practice and TSI
- Review of parameters with RB Rail and stakeholders
2. Content of Design Guidelines manual

- Change management procedure (change of DG manual, derogation, clarification, corrigendum)
  - General parameters
  - Access requirements, Safety and security requirements (fences, portals)
  - Environmental conditions for systems, corrosion and exposure class

- General requirements
  - Anti-penetration device for highway, secondary road
  - Cable ducts requirements
  - Design life

- Railway alignment (mixed traffic and passenger/light freight train traffic)
- Railway superstructure - track
- Railway substructure Part 1 embankments and earthworks
  - Part 2 hydraulic, drainage and culverts
  - Part 3 bridges, overpasses, tunnels and similar structures
    - Main line (embankment, cut, passing loop, station)
    - Specific cross sections (acoustic screen/merlon, technical block, drainage)
- Cross sections (48)
  - Anti-penetration device for highway, secondary road
  - HSL with maintenance road
  - Structures (viaduct, overpass, tunnel/cut and cover)

Based on EN standards, UIC recommendations and best practice
2. Content of Design Guidelines manual

- Railway Energy Part 1 traction power system
  - Part 2 catenary
  - Part 3 Non traction power supply
  - Part 4 Electromagnetic compatibility
- Railway control-command signaling system
- Railway telecommunications system
- Railway SCADA
- Infrastructure facilities (Stations, Passing loops, crossovers)
- Station and passenger platforms
- Environment
- Mechanical Electrical and Plumbing in Tunnel
- Adaptation to climate change
- BIM requirements
- Architectural and landscaping (visual design) requirements
- RAMS requirements

No choice of technologies for systems (ENE and CCS).
→ Definition of the key requirements for system performance and for the interface with Civil works.

Prepared by RB Rail
### 3. Key parameters included in the design guidelines manual

<table>
<thead>
<tr>
<th>Traffic code</th>
<th>Gauge</th>
<th>Axe load</th>
<th>Design speed</th>
<th>Train length</th>
</tr>
</thead>
<tbody>
<tr>
<td>P2</td>
<td>GB</td>
<td>25 t</td>
<td>249km/h</td>
<td>Track and system : 400m</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Passenger platform : 200m</td>
</tr>
<tr>
<td>F1</td>
<td>GC</td>
<td>120km/h</td>
<td>1050m</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Proposed value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level crossing with roads</td>
<td>No level crossing</td>
</tr>
<tr>
<td>Gauge crossing with 1520mm Railways</td>
<td>No gauge crossing</td>
</tr>
<tr>
<td>Access for maintenance and emergency services</td>
<td>access to the main line every 2 or 3km and in specific areas</td>
</tr>
<tr>
<td>Type of track</td>
<td>Ballasted track</td>
</tr>
<tr>
<td>Distance between track centres</td>
<td>4.5m for the main line</td>
</tr>
<tr>
<td></td>
<td>3.8m for passenger line with speed 200km/h</td>
</tr>
<tr>
<td>Maintenance walking path</td>
<td>0.8m maintenance path at 3.0m from the track centres</td>
</tr>
<tr>
<td>Energy system</td>
<td>2x25kV</td>
</tr>
<tr>
<td>ERTMS</td>
<td>Level 2, Baseline 3</td>
</tr>
<tr>
<td>Vertical clearance Road bridges (&lt;22.5m)</td>
<td>6.62m</td>
</tr>
<tr>
<td>Vertical clearance Road bridges (&gt;22.5m) and tunnel</td>
<td>7.02m (249km/h) / 6.43m (200km/h)</td>
</tr>
</tbody>
</table>
4. Key examples of cross sections included in the Design Guidelines

- Key elements:
  - Distance between track centres
  - Catenary position
  - Walkway position
  - Ballast, sub-ballast thickness
  - Frost penetration (sub-grade thickness)
4. Key examples of cross sections included in the Design Guidelines

- Key elements:
  - Drainage requirements

Main line cut - Double track - Wet cut (with water table)

<table>
<thead>
<tr>
<th>Speed (km/h)</th>
<th>E (m)</th>
<th>E/2 (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>3.80</td>
<td>1.90</td>
</tr>
<tr>
<td>249</td>
<td>4.60</td>
<td>2.30</td>
</tr>
</tbody>
</table>

Solution 1: Deep ditch (preferred solution)
Solution 2: Drain + shallow ditch

For security reasons, drain is placed in the external part of the platform, outside of railway vertical loads.
4. Key examples of cross sections included in the Design Guidelines

- Key elements:
  - Security requirements
  - Roadway arrangements as per local standards.
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