

Desert Highway Safety Facilities

Selected Provisions of JTG/T 3331-01-2026

Technical Specifications for Design and Construction of Highway in Desert Region

UNOFFICIAL ENGLISH TRANSLATION OF SELECTED PROVISIONS

Chinese standard issued: 28 August 2026. **Effective:** 1 November 2026. The Ministry of Transport announcement was made public online on 24 September 2026. These dates have different meanings.

Scope and status

This six-page attachment translates Clauses 4.1.4-4.1.6 and Sections 4.3, 4.7, 12.8, 13.1 and 13.2 in full. It focuses on the coordination of roadside safety facilities with wind-blown sand control. It is **not a translation of the entire 76-page Chinese PDF**, nor of all sand-control design and construction requirements.

The selected passages retain their original clause numbers. Printed page numbers refer to the Chinese source; for its main text, the PDF page number is six higher. No source commentary accompanies the selected clauses. Translator's notes are clearly separated and do not add technical requirements.

This is not an official English version and has not been approved or certified by the Ministry of Transport. In case of ambiguity or inconsistency, refer to the Chinese original. Engineering application requires verification by appropriately qualified professionals against the complete standard, applicable local requirements and approved project documents.

This Chinese standard must not be presented as a standard adopted by Saudi Arabia, the UAE or other overseas jurisdictions. It does not establish equivalence with EN 1317 or MASH, or certify any guardrail product.

Translation and contact

English translation and translator's notes prepared by **China Guardrail**. Prepared: 27 September 2026. Version 1.0.

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Overall Design and Sand-Control Coordination

Source: printed pages 13-14 (PDF pages 19-20). Clauses 4.1.4-4.1.6 are selected extracts; Section 4.3 is translated in full.

4.1 General provisions - selected clauses

4.1.4 In areas with severe or moderate wind-blown sand hazards, priority shall be given to proactive measures, such as appropriate route selection, to avoid the hazards. Next, suitable alignment positions, roadbed heights and slope forms shall be selected to reduce sand hazards. Where proactive measures cannot be adopted, the roadside passive sand-control system and measures shall be strengthened. In areas with minor wind-blown sand hazards, conventional highway standards may be followed.

4.1.5 For expressways and Class I highways in shifting deserts and areas with severe sand hazards, priority shall be given to separate roadbeds and gentle side slopes; guardrails should not be installed. For expressways and Class I highways in semi-fixed deserts, separate roadbeds should be adopted. Where conditions do not permit this and a common roadbed is adopted, the roadbed side slopes shall be flattened in accordance with the relevant specifications, without roadside guardrails. Where guardrails are indeed necessary, guardrails with a high degree of openness to airflow should be adopted.

4.1.6 Sand-control works shall be designed, constructed and accepted concurrently with the main highway works.

4.3 Coordinated design of highway works and sand control

4.3.1 The main highway works shall be designed in coordination with the sand-control system. The roadbed cross-section and sand-control system shall be appropriately selected according to desert type and the severity of wind-blown sand hazards. Space and interface conditions shall be provided for sand-interception, sand-fixation and sand-passage measures, forming an integrated design for the roadbed and sand control.

4.3.2 The types and protective extent of roadside sand-control measures shall be determined with regard to the terrain and landforms, vegetation cover, characteristics of wind-blown sand activity, quantity of sand transport, protective materials and highway class along the route.

4.3.3 Highway drainage, traffic safety facilities and other roadside facilities shall be arranged in coordination with the sand-control system, taking account of desert-region characteristics, to avoid creating secondary sand hazards.

Translator's notes - separate from the source

N1. Read 4.1.5 in its complete design context. This is not a general instruction to remove existing guardrails. It concerns specified desert conditions and roadbed arrangements. Guardrail need, containment requirements and roadside risks must be resolved through the responsible project's design process. See also 13.2.3 on page 4.

N2. Airflow openness is not containment performance. The selected guardrail clauses give no numerical airflow-openness threshold and do not prescribe a particular cable, W-beam or thrie-beam product. No product selection or performance equivalence is inferred here.

Planning and General Facility Requirements

Source: printed page 16 (PDF page 22), and printed page 62 (PDF page 68). Sections 4.7 and 13.1 are translated in full.

4.7 Traffic engineering and roadside facilities

4.7.1 Traffic engineering and roadside facilities shall be coordinated with the main highway works, the sand-control system and the natural environment along the route. Facility types, layouts and construction sequences shall be determined in an integrated manner.

4.7.2 The selection and layout of traffic safety facilities, such as guardrails and signs, shall reduce obstruction to wind-blown sand flow and avoid sand accumulation on the pavement caused by those facilities trapping sand.

4.7.3 The overall provision of roadside facilities, such as service areas and parking areas, shall assess the severity of wind-blown sand hazards and determine spacing according to differing conditions.

4.7.4 Management facilities, such as traffic monitoring, toll collection and communications, shall also take account of sand-control requirements, with appropriate siting and protection standards.

13 Traffic engineering and roadside facilities

13.1 General provisions

13.1.1 The design and construction of traffic engineering and roadside facilities shall follow the principles of safety and reliability, advanced technology, economic rationality and ease of maintenance, and shall be coordinated with the main highway works and the natural environment along the route.

13.1.2 Facilities of all types shall be appropriately arranged in accordance with the characteristics of desert highways, taking into account the wind-shaped sandy landforms, prevailing wind direction and sand-control system layout.

13.1.3 Facilities of all types shall use materials that resist wind erosion and ageing and are easy to maintain. Their locations shall avoid areas of concentrated wind-blown sand flow and places prone to sand accumulation.

13.1.4 For reconstruction and widening projects, existing traffic engineering and roadside facilities shall be assessed and classified. Recyclable materials shall be utilized; those that cannot be utilized should be used for temporary construction access roads or maintenance works.

Translator's notes - separate from the source

N3. Material wording. Wind erosion resistance is not the same as corrosion resistance. Clause 13.1.3 specifies no galvanizing mass, coating thickness, steel grade or service-life guarantee. Such requirements must come from the applicable project specifications, not from this translation.

N4. Reuse wording. The last sentence of 13.1.4 follows the source's distinction between utilization and alternative use. It is not permission to reuse a damaged safety component without assessment. No unprovided inspection or acceptance criteria have been added.

Traffic Signs and Guardrails

Source: printed pages 62-63 (PDF pages 68-69). Section 13.2 is translated in full. Sections 13.3 and 13.4 are outside this selected translation.

13.2 Traffic safety facilities

13.2.1 The provision of traffic signs shall comply with the following:

1. It shall comply with the relevant provisions of the current GB 5768.2, Road Traffic Signs and Markings - Part 2: Road Traffic Signs.
2. Signs indicating "Drive cautiously in wind-blown sand conditions" shall be provided on sections affected by wind-blown sand hazards.
3. On sections where sand-control facilities use flammable materials, "No smoking or open flames" prohibition signs should be provided.
4. On long straight sections and continuous gentle gradients, warning signs such as "Check tyre pressure" and "Slow down" should be provided.

13.2.2 Traffic sign design shall comply with the following:

1. Conspicuous, wind-resistant signs should be adopted.
2. Sign materials shall have adequate strength, resistance to wind-blown sand and durability.
3. On sections with severe wind-blown sand hazards, cantilever sign structures should be used, with their posts located on the side slope outside the shoulder.
4. Sign provision should be coordinated with guardrail locations to reduce the need for additional guardrails resulting from sign placement.

13.2.3 Guardrail provision shall comply with the following:

1. On roadbed sections, guardrail forms with greater openness to airflow should be adopted, **provided that crash-protection requirements are met.**
2. On bridge sections, metal beam-and-post guardrails should be adopted.

Translator's notes - separate from the source

N5. The condition in 13.2.3(1) is essential. Greater airflow openness does not replace crash-protection requirements. The clause must not be shortened to a claim that any open railing or cable system is suitable for a desert highway.

N6. Bridge terminology. "Metal beam-and-post guardrail" describes the structural form in the source. It does not designate a particular beam profile, containment level or decorative pedestrian railing.

N7. Sign messages. The English phrases in quotation marks translate the Chinese sign messages for readers. They are not approved sign-face artwork or instructions to replace locally prescribed symbols and wording. The source's "current" reference to GB 5768.2 is retained; this attachment does not independently confirm the applicable edition for a project.

Construction-Period Maintenance

Source: printed page 57 (PDF page 63). Section 12.8 is translated in full. It sits within Chapter 12, Construction of Sand-Control Works.

12.8 Maintenance during construction

12.8.1 During construction, sand-control works shall be protected. Vehicles shall not drive over them, and pedestrian trampling shall be prohibited.

12.8.2 Local damage to sand-interception and sand-fixation facilities shall be repaired promptly.

12.8.3 Where sand-interception barriers become buried until their exposed height is approximately **40 cm**, they shall be raised to restore their height or re-established in place.

12.8.4 Maintenance and management of vegetation-based sand-fixation facilities during construction shall be strengthened. Inspections shall be intensified, replacement planting carried out at appropriate times, and irrigation, fertilization and pest and disease control undertaken.

12.8.5 Stockpiling any materials or miscellaneous items on the shoulder is strictly prohibited, to prevent the formation of sand hazards. Sand accumulated on the highway shall be cleared promptly, transported to open terrain more than **20 m** on the downwind side of the roadbed, and spread evenly and smoothly. Indiscriminate dumping is strictly prohibited.

Translator's notes - separate from the source

N8. These are sand-control works, not crash barriers. The approximately 40 cm exposed-height provision in 12.8.3 concerns a sand-interception barrier. It is not a permitted highway guardrail height, a guardrail clearance or a trigger for resetting crash-barrier posts.

N9. Do not enlarge the scope. Section 12.8 concerns the construction period. It must not be represented as a complete routine-maintenance standard for an operating road or as a general guardrail repair specification.

N10. Preserve the location and comparison. Clause 12.8.5 says more than 20 m on the downwind side of the roadbed, on open terrain, with the sand spread smoothly. The wording is not simply "dump sand 20 m away". The source does not specify a more precise measurement datum in this clause; none has been invented in the translation.

N11. Project permissions still apply. This translation does not authorize work outside project boundaries or override environmental restrictions, approved disposal arrangements, traffic management or construction safety procedures.

Terminology, Notes and Sources

Requirement levels

The Chinese explanation of wording appears on printed page 70 (PDF page 76). In this translation, "shall / shall not" retains the source's requirement wording, "should / should not" retains its recommendation wording, and "may" indicates a permitted option. "Strictly prohibited" retains the emphatic prohibition in 12.8.5. These distinctions do not determine legal applicability in another jurisdiction.

Terminology used in this translation

The explanations below are translator's reading aids, not additional normative definitions.

Term	Meaning in this attachment
Guardrail / safety barrier	Vehicle crash-protection facility; not interchangeable with a sand-control fence or a pedestrian railing.
Sand-interception barrier	A structure intended to intercept wind-blown sand; not a crash-tested vehicle barrier.
Openness to airflow	Rendering of the source's airflow-openness concept. No numerical guardrail threshold is supplied in the selected clauses.
Wind-blown sand flow	Sand carried with near-ground airflow; not just wind loading on a structure.
Sand fixation	Stabilizing the sand surface; distinct from interception of incoming sand.
Sand passage	Allowing wind-blown sand to pass across the roadbed through suitable cross-section arrangements; not delivery of sand by truck.
Separate / common roadbeds	Separate roadbed formations for the two directions / a shared roadbed formation; not merely a change in lane markings.
Wind erosion / ageing	Environmental deterioration addressed by the source; not a coating specification or a guaranteed service life.

Source and coverage check

Chinese source: JTG/T 3331-01-2026, Technical Specifications for Design and Construction of Highway in Desert Region, Ministry of Transport of the People's Republic of China. The supplied Chinese PDF contains 76 pages.

Coverage: 4.1.4-4.1.6 (printed page 13); 4.3.1-4.3.3 (page 14); 4.7.1-4.7.4 (page 16); 12.8.1-12.8.5 (page 57); 13.1.1-13.1.4 (page 62); 13.2.1-13.2.3, including all numbered items (pages 62-63). Other clauses are omitted, not condensed into the translated clauses.

[Official Ministry of Transport announcement, No. 69 of 2026 \(Chinese\)](#)

[Official complete Chinese PDF \(76 pages\)](#)

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Translator self-check completed against the selected Chinese source pages. No independent engineering certification or professional review is claimed. **Unofficial selected translation; the Chinese original governs in case of ambiguity.**