INTERIM ADVICE NOTE 86/07

Amendments to design requirements for Portal and Cantilever Sign/Signal Gantries

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Introduction

The advent of speed control on wide motorways and the need for active traffic management (ATM) has led to a significant increase in the numbers of gantries required on the network. The current approach to gantry design restricts the development of cheaper and lighter gantries and this has led to a reappraisal of the Highways Agency's basic requirements in support of providing more cost effective traffic management installations whilst still maintaining adequate safety for the road user and road workers.

Advancements in the reliability and ease of replacement of signal equipment has provided the opportunity to review the need for access walkways for new gantries and the rapid development of technology to provide driver information calls into question the need for gantries with 60 year design lives as they are likely to become functionally obsolete much sooner.

This Interim Advice Note introduces certain revised design criteria for new gantries, in the form of amendments to BD 51/98,"Portal and Cantilever Sign/Signal Gantries", pending a full review of BD 51 in due course. The revised criteria do not apply retrospectively to existing gantries but all new non-passively safe gantries must be designed using this Interim Advice Note in conjunction with BD 51/98. Where amendments detailed in this Interim Advice Note conflict with other clauses in BD 51/98, the amendments set out in this IAN shall take precedent. The main changes are that walkways shall not be provided except in exceptional agreed circumstances, and that the gantries shall be designed for a reduced operational life. It should be noted that the amendments to BD 51 arising from the current TD 19 are promulgated by that document and are therefore not included in this IAN.

Technical Approval

Approval In Principle for gantries designed using this IAN in conjunction with BD 51/98 shall record on the AIP document that this IAN has been used. Departures from this IAN shall be regarded as a Level 2 Structures Departure.

Implementation

This IAN shall be used forthwith, in conjunction with BD 51/98 for the design of all non-passively safe gantries where Approval in Principle has not at the date of issue of this IAN been agreed. For gantries where AIP has already been agreed, the Project Sponsor should decide whether it is in the best interests of the project to adopt this IAN, and should issue relevant instructions. An Addendum AIP should be produced if necessary.

Amendments BD 51/98

The following Amendments to Clauses in BD 51/98 are to be adopted in the design of non-passively safe gantries.

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2. GENERAL PRINCIPLES

Layout

After clause 2.3 insert additional clause:

2.3A
"On dual carriageway roads, non-passively safe portal gantries should where feasible span both carriageways without support in the central reserve. The minimum span will be determined in accordance with the clearance and set-back criteria which are dependent on the vehicle restraint system provided and the level of collision loading allowed for.

Access

***2.4** Delete entire clause and replace with the following:*

"Gantries designed or constructed subsequent to this amendment must not be provided with a fixed means of access for inspection and maintenance. Departures from this requirement will only be permitted in exceptional circumstances, through the Departure Approval System, on prior discussion with the Highways Agency for example where the gantry provides the only safe means of access to equipment isolated between carriageways).

For gantries designed or constructed in accordance with this IAN, the requirements of BD 51/98 clauses 6.1 to 6.12, and 6.17 do not apply.

Adaptability

***2.9** At end of clause insert additional sentence:*

"The design of the gantry structure, and the connections between leg and foundation, and leg and main beam, must facilitate rapid and simple installation and removal in order to keep traffic disruption due to traffic management to an absolute minimum.

***2.10** Delete entire clause and replace with:*

"The Designer must consider whether to allow in the design for the likely future repositioning of, or changes to loading from, equipment or signage on the gantry, taking into account the probability of this within the operational life of the gantry. The decision to make such provision must be agreed with the Overseeing Organisation and recorded on the Approval in Principle. Where provision is made for future changes, adequate detail must be provided on drawings to indicate the extent of such provision.

The operational life for new gantries (ie the time during which the gantry is assumed to remain safely in use at that site) is to be 30 years.

In the design for wind and temperature environmental effects, the return period must be taken as the operational life of the gantry. In the design for fatigue, the design life must be based on a period of operational life plus 10 years

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Protection for road users and structure

2.14 *Delete entire clause and replace with:*

"For non-passively safe gantries, vehicle restraint systems in accordance with TD 19 (DMRB 2.2.8) must be provided at gantry supports."

2.15 *Delete entire clause and replace with:*

"For non-passively safe gantries, gantry legs in the verge must wherever possible be set back a minimum of 4.5m from the edge of the carriageway unless one of the following is agreed with the Highways Agency as applicable:

i) there is insufficient land available, in which case the gantry leg shall be set-back the maximum possible distance from the edge of the carriageway;

ii) there is existing planting which would need to be removed, in which case the be set-back of the gantry leg shall be agreed with the Overseeing Organisation;

iii) there is a significant level difference in the earthworks profile, in which case the be set-back of the gantry leg shall be agreed with the Overseeing Organisation;

iv) there is an existing high containment safety fence, in which case the gantry leg shall be positioned to achieve the minimum practical clearance behind the working width of the existing safety fence.

3. LOADINGS

Live Loading

3.2 (viii) *– Delete "Live Loading"*

3.22, 3.23, 3.24 *– Delete entire clauses.*

Environmental effects

3.8 *Delete entire clause and replace with:*

"For new gantries the return period for wind and temperature effects in service must be taken as the operational life of the gantry, 30 years, and the following adopted:

i) Probability factor S_p, taken as 0.97 (see BD 37, DMRB 1.3.14);

ii) Minimum and maximum shade air temperatures taken for a 120 year return period and adjusted by an addition of 1.7°C and a subtraction of 1.7°C respectively (see BD 37, DMRB 1.3.14)."

Vehicle collision loads

*Change heading to "**vehicle collision loads for non-passively safe gantries**"*

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Fatigue from high vehicle buffeting

3.34 *Delete entire clause and replace with:*

"Fatigue effects from high vehicle buffeting must be considered. The gantry must be designed for buffeting loads from high sided vehicles in accordance to the recommendations provided in BD 94/07 "The design of Minor Structures". Criteria shall be agreed with the TAA prior to AIP Submission.

Fatigue due to wind gusting

3.35 *Delete entire clause and replace with:*
"*Loading due to wind gusting must be determined from BS EN 1991-1-4."*

Design life for fatigue purposes

3.36 *Delete first sentence and replace with:*

"For new gantries the design life for fatigue purposes shall be in accordance with Replacement Clause 2.10 above.

4. DESIGN

Structural Criteria

4.5 *Delete entire clause.*

Clearances

4.21 *Delete entire clause and replace with:*

"The horizontal dimensional clearances of the structure and vehicle restraint systems must be in accordance with TD 19 and TD 27.

Cable routes

4.35 *Delete entire clause and replace with:*

"A structured cable management system must be devised and incorporated into the structural design of the gantry. It shall provide continuous protection from the ducted network in the nearside verge to a point 3.5m above adjacent ground level to protect against accidental damage and vandalism. The system must permit rapid fixing and removal of cables and shall include quick release joints at the gantry leg/beam connections. Where cable routes are external to the structure, they must be positioned remote from the usual line of sight, ie on the down stream face, where possible."

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5. APPEARANCE

5.21 *Add new clause:*

"Notwithstanding the requirements of 5.1 to 5.20, gantries designed in accordance with this Interim Amendment must possess continuity of structural form within a scheme, with the aim of minimising overall visual impact. This is irrespective of whether the gantry spans one or more carriageways or slip roads, or carries signal equipment and/or fixed static signs.

6. ACCESS AND SAFETY

See replacement clause 2.4 above. For gantries designed or constructed in accordance with this IAN, the requirements of BD 51/98 clauses 6.1 to 6.12, and 6.17 do not apply.

7. DESIGN CONSIDERATIONS

Sign Alone Gantries

7.5 *line 3 delete the words "preferably without need for permanent access"*

Delete final sentence commencing "Nonetheless, a risk assessment .."

Maintenance of Signals

7.31 *Delete entire clause.*

7.33 *Delete entire clause.*

Ground works

7.40 *Delete entire clause and replace with:*

"Spread footings or piled foundations may be used and the foundation design must facilitate quick and simple installation in order to keep traffic disruption due to traffic management to an absolute minimum. The Designer must give due consideration to the future removal of the foundations.

7.45 *Delete entire clause and replace with:*

"Steel structures must be protected by a Type II protective system in accordance with Specification for Highway Works Series 1900 which satisfies the following durability requirements:

- *minimum interval to first minor maintenance 12 years;*
- *minimum interval to first major maintenance 20 years.*

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