



## **TTM ADVICE NOTE 4**

# **Guidance on BS 8442: 2015 Ballasting of Temporary Road Signs**



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## Foreword

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### REVISION LIST – AMENDMENTS MADE IN THIS ISSUE

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This document is subject to an annual review process, the current version is the version published at [www.tmca.org](http://www.tmca.org).

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or
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  - which it would be illegal for us to exclude or attempt to exclude our liability".

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## 1. Background

Traffic Signs Manual has always required temporary signs to be ballasted at low level or adequately secured. It is important to provide sufficient ballast that adequate to secure the frame and sign but avoid excessive ballast that causes further hazards to the road user or worker to develop.

There has been no clear guidance for many years with the industry relying on best judgment as previous calculators available have suggested impractical levels of ballast. In 2015 BSi issued BS 8442:2015 containing a theoretical calculator for determining an adequate level of ballast for a specific sign. This standard was found to support levels of ballast that experience over time within the industry had determined to be suitable and sufficient.

This document provides graphical methods for companies to determine ballast levels based on the BS 8442:2015 standard so as to avoid having to undertake a lengthy calculation process. This enables companies to have evidence to support their determined levels of adequately securing temporary frames and signs in their procedures.

## 2. Guidance

The placement of temporary signs on the roads of the UK is a frequent operation within the industry. It is important that this commonly occurring task is carried out correctly to minimum industry guidelines which are also the TMCA minimum standards.

Signs when placed must ALWAYS be adequately secured with low level granular based ballast when on the highway. Failure to secure the signs leads to the sign falling over longitudinally or laterally as the result of passing traffic or general inclement weather specifically the overturning force generated by wind pressure.

As soon as the sign falls over the sign is no longer able to warn or instruct the user of the highway as to what action is required of them at roadworks. This leads to an unsafe situation and could result in an incident involving the general public for which the company could be prosecuted under Health and Safety Legislation.

The displacement of the sign also leads to it potentially forming a hazard when displaced from the structure of the sign itself.

It is also important that the sign has adequate ballast as too much ballast can cause structural failure in the frame leading to a failure in the frame creating spear type safety issues.

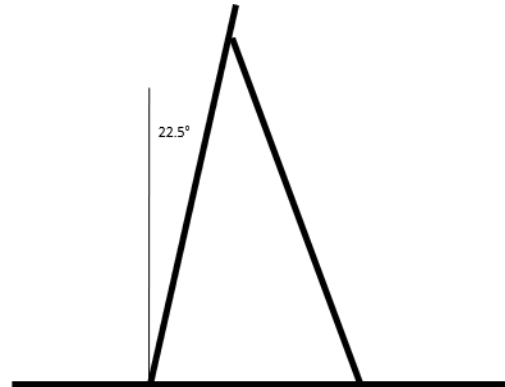


Figure 1 Typical ballast for a quick fit frame

The following criteria should be considered when placing a sign to ensure that it is stable, adequately secured and placed in accordance with the relevant regulations and standards.

To be legal a sign must be:

- Level laterally
- No more than 22.5° to the vertical
- Adequately ballasted at a low level using granular material (Sandbags)



To comply with guidance and the BS standard:

- Ballast spread out equally across each sandbar such as Figure 1
- Placed on firm ground.
- Ballast placed at the front and rear of all signs
- Ballast placed 35% on the front of the sign and 65% on the rear.

Traditional framed signs, typically sized 1050mm x 750mm shown in Figure 2, cannot be secured in accordance with BS 8442 and therefore the TMCA recommends that organisations use micro quick fit frames instead in street works environment as these can:

- have ballast placed at the front and rear
- use signs faces that are narrower and less likely to obstruct footways or be collided by with traffic.
- Be less likely to become a hazard to pedestrians and traffic.



Figure 2 Freestanding traditional framed sign

The quick fit frame that supports the sign should also be of a suitable size to support the size of plate, In creating the graphical charts it became noticeable that using a frame that was too small for the plate contributed to excessive ballast demands and conversely using a frame that was too big also contributed to inefficiencies in mounting.

No graph is provided for micro quick fit frames as the plates on these signs are normally less than 1m<sup>2</sup> and therefore the minimum 40kg of ballast (Single bag front and rear) should always be provided on these signs.

Each graph has two lines, the lower line is the minimum total level of ballast placed 35/65 on a frame to be used on schemes that are:

- Lesser duration
- Have on site attended 24-hour maintenance crews from the owning organisation
- In a location subject to normal weather conditions.

The upper line is the maximum ballast to be used on schemes or individual signs that are:

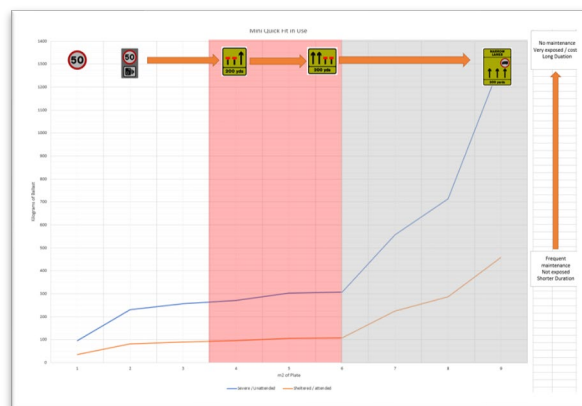
- Lengthy duration
- Isolated from a maintenance crew or are unattended by the organisation
- In an exposed location such as coastal or high open moorland.

Therefore, for the majority of schemes the lower line would be the normal level of adequate ballast. Where a scheme is of significantly shorter duration such as schemes subject to relaxations companies should define a minimum level of front and rear ballast, normally 40 – 80 kg spread front and rear that will temporarily secure the sign in the expected conditions during the short period.

The BS 8442 calculator returns a weight in Kilograms that includes the weight of the frame, this inclusion of the frame has been used to provide a tolerance in the ballast to allow for dry sand and inconsistencies in sandbag filled weight.

### 3. How to use the tables.

Three tables are provided in the appendices to this advice note.



#### **Stage 1**

Establish size of the sign plate in square metres (m<sup>2</sup>). Then use the horizontal x axis to select suitable type of quickfit frame on each of the tables.

- Mini Quick fit
- Standard Quick fit
- WBM Quick fit

The graphs have three background colours,

- White – suitable and recommended for the size
- Red – Not suitable and not recommended for the size
- Grey – Not likely to be considered for the size of plate.

Find the size m<sup>2</sup> size of plate on the 'x' axis.

Visually across the top are typical signs types at the m<sup>2</sup>. I.e. a 900mm 50 roundel is less than 1m<sup>2</sup>.

## Stage 2

Draw a line vertically up the 'y' axis to the lower line. The lower line indicates the *minimum level* of adequate ballast in Kilograms considered that will secure that size of sign plate on that size of quick fit frame on a TTM Scheme that has full attended on site maintenance crew in average environmental conditions. Read the weight in kilograms from the left side 'y' axis.

## Stage 3

If the TTM scheme is in an exposed location or the individual sign is in a remote from the main works location or a exposed location consider increasing the ballast. A suitable level of ballast is found by extended a line up the y axis towards the upper line on the graph, which is the maximum level of ballast considered necessary by BS 8442:2015.

## Worked example:

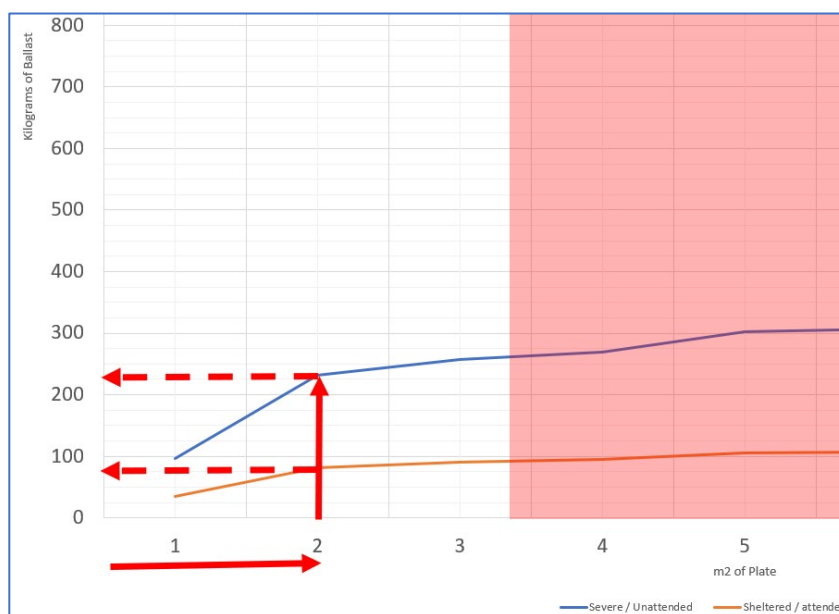


Figure 3 Establishing the ballast for a 900mm repeater sign in the worked example

A 50mph 900mm repeater sign with speed camera repeater on a backing board is 1.99m<sup>2</sup> in area.

There are two suitable quick fit frames given by the white areas on the graphs, mini and standard.

Moving along the x axis to the 2m<sup>2</sup> point then moving up on each graph, the following results for minimum ballast are returned.

- Mini Quick fit returns 85kg equivalent to 5 sandbags
- Standard Quick fit returns 235kg equivalent to 12 sandbags

Continuing up the graph to the upper level

- Mini Quick fit returns 235kg equivalent to 12 sandbags



- Standard Quick fit returns 210kg equivalent to 11 sandbags

As a speed sign is unlikely to be on a scheme without maintenance, the minimum level of ballast provided would therefore be justified to be 4 sandbags equal to around 80kg on a standard quick fit frame which if the scheme was longer term, the organisation would choose to increase towards the 11 sandbag limit.

## 4. Withdrawal Conditions

This Advice note was created in May 2020 when concern was raised over the method and complexity of determining adequate levels of ballast on temporary sign frames.

The TMCA will make it available to the industry, not just TMCA members. It shall remain in force until agreed otherwise or the standard on which it is based changes.

## 5. Normative References

DfT Design Manual for Roads & Bridges GG104 Standard for Safety Risk Assessment on the Strategic Road Network.

DfT Traffic Signs Manual Chapter 8 Part 2 Operations

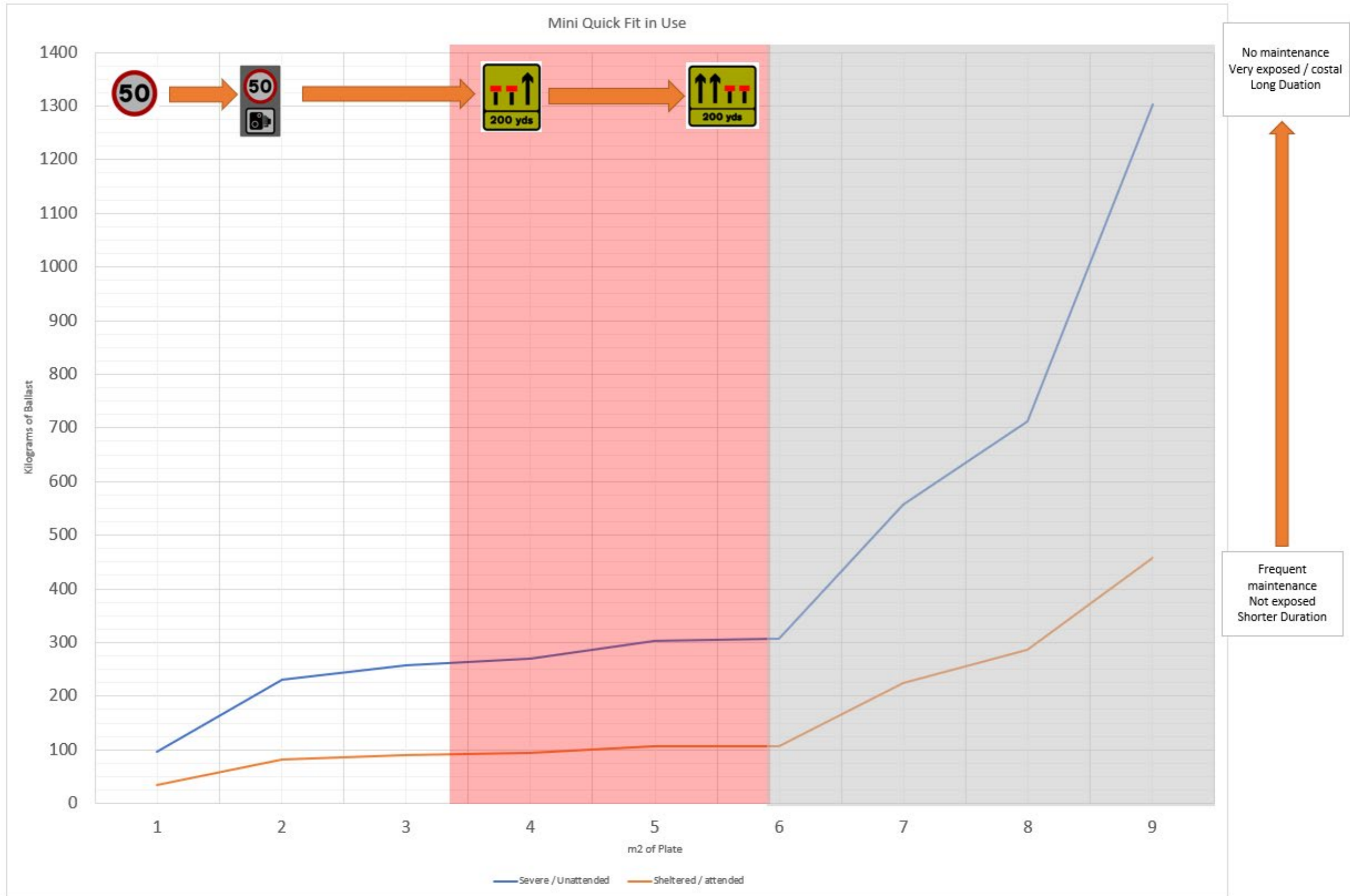
British Standard BS 8442:215 Annex C, *Calculation of minimum recommended ballast required to resist overturning and sliding of self-supporting rigid portable signs.*

## 6. Informative References

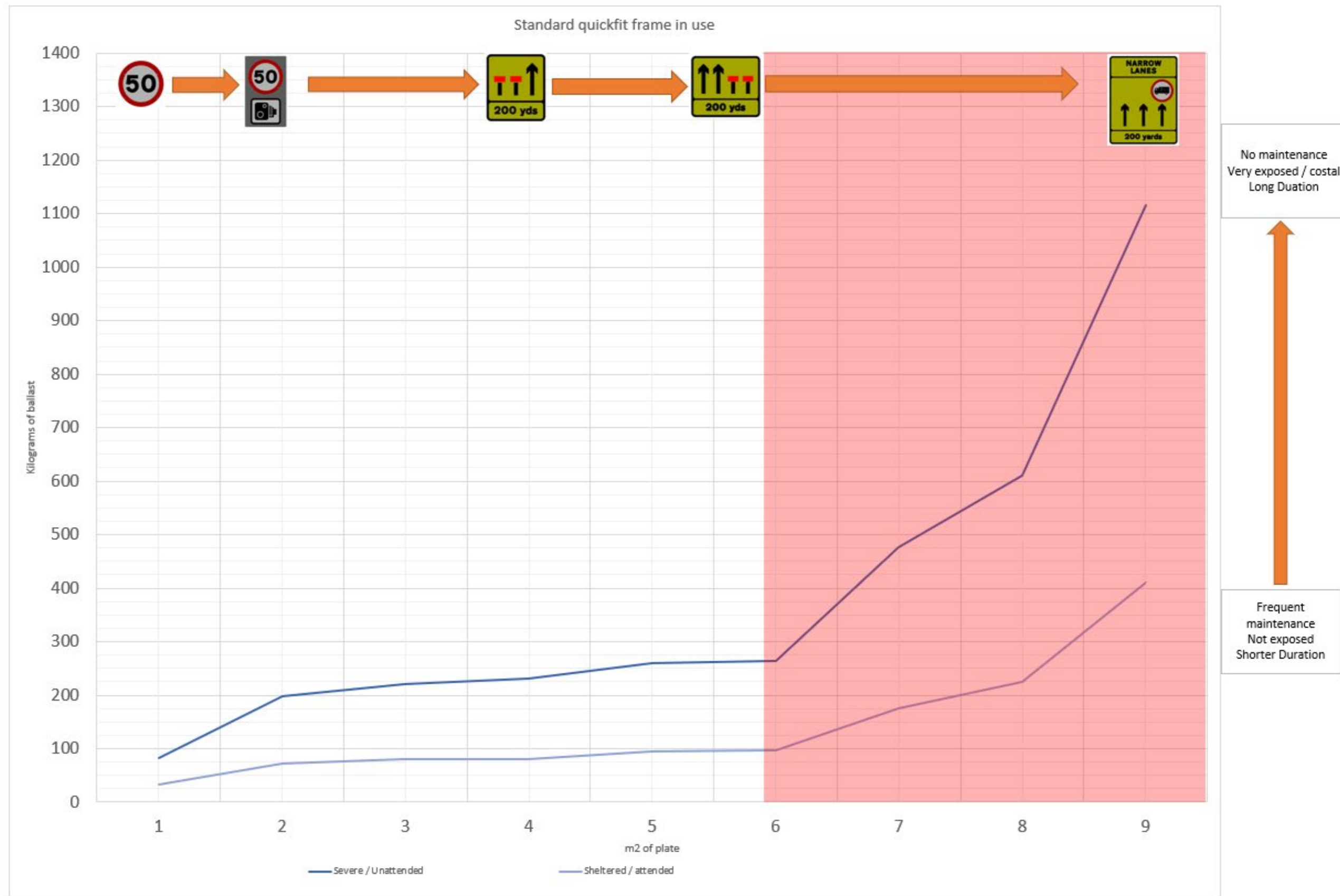
Nil

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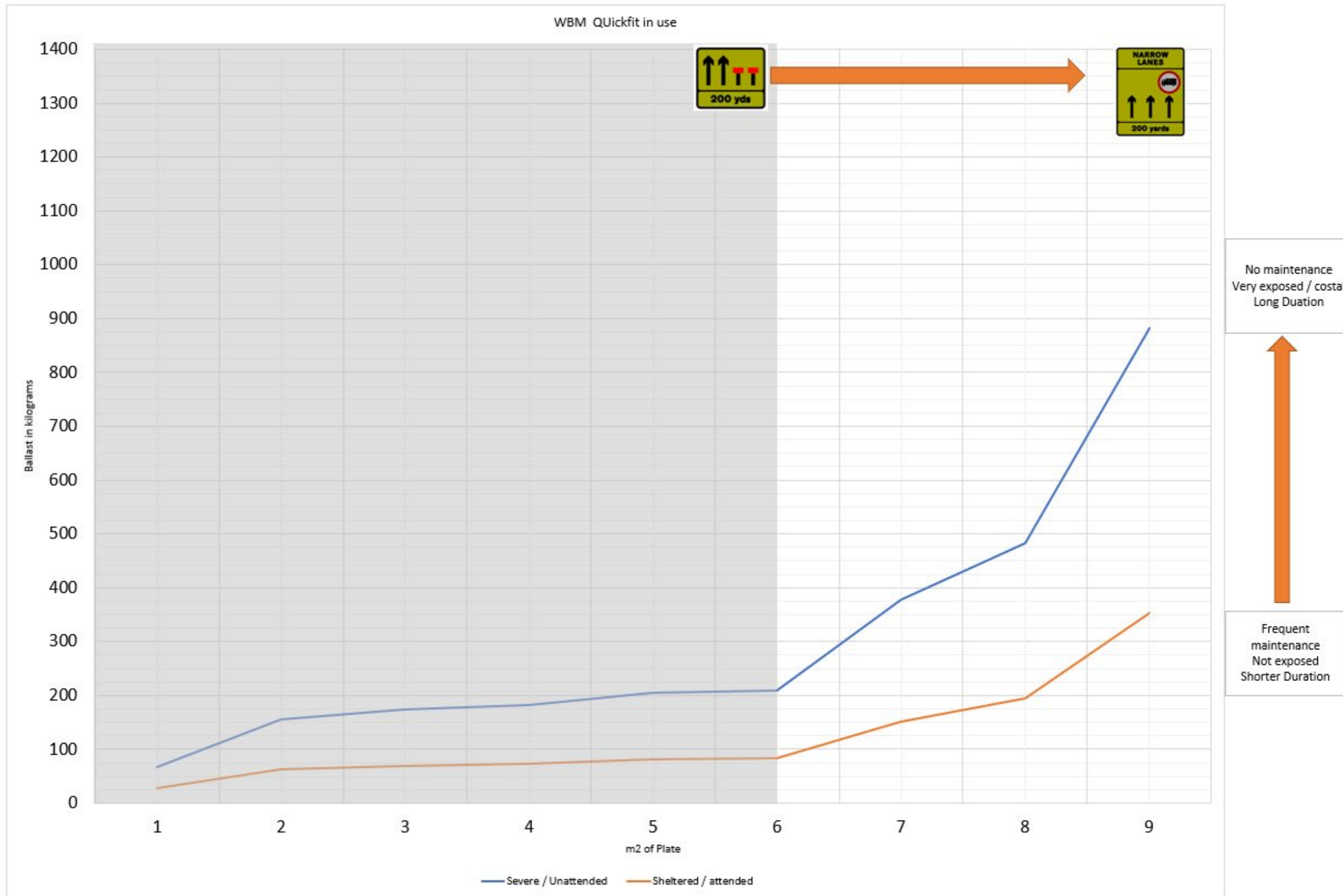
## 7. Appendix A – Table of BS 8442 Ballast for Mini Quick fit Frames



### 8. Appendix B – Table of BS 8442 Ballast for Standard Quick fit Frames



### 9. Appendix C – Table of BS 8442 Ballast for WBM Quick fit Frames





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Traffic Management Contractors Association  
Registered address: 4 Strawberry Close, Tunbridge Wells, Kent, TN2 5PD