Questions

The user should go through all questions in order unless directed otherwise. It is recommended that a nominated representative should lead the Sighting Committee through the checklist and ensure that all questions are answered and all committee members’ opinions are captured. The checklist has been designed to complement the expertise of sighting committee members, so full participation is essential.

The order of the questions has been carefully prioritised to ensure that the most important questions relating to driver sighting of the Marker Board (MB) are asked first.

The arrows ‘🡻’ or ‘🡺’ direct the user to the next question or the associated mitigation(s) as described in the Action column.

Mitigations

If an answer is selected that directs the user to mitigation, these are described in separate tables (‘A1’, ‘A2’, etc.).

The mitigations have been prioritised to support the user in identifying which should be performed first. Therefore it is important to note that: Mitigations must be addressed in the order provided.

The form should be used to record all mitigation measures that are implemented and any decisions made regarding the type of mitigation to implement.

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| --- | --- | --- | --- |
| Date: |  | MB number: |  |
| Design location: | | Actual location:  (if different from design location) | |
|  | |  | |
| Reason for Sighting:  (new MB, relocation, etc.) | | Track details:  e.g. Single, Multiple or Bi‑directional lines | |
|  | |  | |
| Additional comments: | | | |
|  | | | |

Section A – Minimum Acceptable Sighting

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Minimum Acceptable Sighting | | No | Yes | Action |
| 1 | Is there anything that will cause the driver to have interrupted sighting, for the final approach to the MB? (i.e. last 50 m) | 🡻 | 🡺 | Go to A1 |
| 2 | Does the driver have a total sighting time that is less than the minimum 6 seconds sighting time? The maximum speed when operating to MBs is 40 kph. This requires a minimum sighting distance of 73 m in accordance with T HR SC 10001 ST | 🡻 | 🡺 |
| 3 | Is the MB arrow pointing away from the track it applies? | 🡻 | 🡺 | Go to A2 |
| 4 | Is the height of the MB different to other MBs on the same line or adjacent MBs on parallel lines? | 🡻 | 🡺 | Go to A3 |
| 5 | Is the MB located on a platform or at the end of a platform? | Go to    Section B | 🡻 |  |
| If yes: | Is the MB placed within 30 m from the departure end of the platform? | 🡻 | 🡺 | Go to A4 |
| Is the MB sighting (from the driver’s seated position) hindered or obscured when the train is stationary at the platform? (Consider all types and lengths of trains that can use the platform.) | 🡻 | 🡺 |
| Go to Section B | |  |

| Mitigations: Acceptable Sighting | | 🗹 | Action |
| --- | --- | --- | --- |
| A1 | The MB location is not suitable. |  | Go to Q3 |
|  | 1. Reposition the MB further forward or rearward to increase the sighting distance |  |  |
|  | 1. If this is not possible and the new MB cannot be moved, the Signal Design Engineer must justify why the MB cannot be moved and why a suboptimal location has been selected. If the MB cannot be moved consider: |  |  |
|  | 1. Installing a co-acting MB |  |  |
|  | 1. If on a post, moving the MB to a gantry |  |  |
| A2 | The arrow in the MB shall point to the track it is applicable to.  Position MB correctly. MBs can be placed right, left or above the track they are applicable to as long as the arrow is pointing in the correct direction |  | Go to Q4 |
| A3 | Where practicable, MB heights should be consistent, providing that this does not make the MB less visible to the driver. |  | Go to Q5 |
|  | In some situations, the MB may have to be raised to make it visible (see D1 for exceptions) |  |  |
| A4 | Ensure that the MB is located so that the driver can clearly read the MB when stopped at the platform. Place the MB within 30 m from the departure end of the station platform (or the top of the platform ramp). If track geometry or other obstruction forces the MB beyond 30 m to the platform consider the following mitigations to provide the best sighting for the driver: |  | Go to Section B |
|  | 1. Installing a co-acting MB |  |  |
|  | 1. Raising the MB on a gantry or a higher post |  |  |
|  | 1. Relocating the MB |  |  |
|  | 1. Raising or lowering the MB |  |  |

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| Acceptable Sighting: Justification for mitigation measures adopted  Please provide additional detail about decisions that are taken |
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Section B – Interruptions

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| --- | --- | --- | --- | --- |
| Interruptions | | No | Yes | Action |
| 6 | Are there any objects that could interrupt the driver’s 6 second sighting at line speed? | Go to    Section C | 🡻 |  |
| 7 | On approach to the MB, do the interruptions to MB sighting make up 20% or more of the total sighting distance to the Markerboard? | 🡻 | 🡺 | Go to B1 |
| 8 | Is the interruption caused by: (CHOOSE ALL THAT APPLY) |  |  |  |
| 1. Foliage? |  | 🡺 | Go to B2 |
| 1. A fixed object such as: a cutting, a crest of a hill, a building, a stanchion, platform fence, equipment, furniture, overhead line equipment? |  | 🡺 | Go to B3 |
| 1. Trains on other lines (e.g. train approaching on an adjacent track on a right hand curve or a train in a siding on a left hand curve)? |  | 🡺 |
| 1. The MB being in a tunnel or underground? |  | 🡺 |
| 1. Other: please describe  |  | | --- | |  | |  | 🡺 |

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| Mitigations: Interruptions | | 🗹 | Action |
| B1 | If the interruptions make up more than 20% of the sighting distance the signal sighting committee should work with the Signal Design Engineer to try to improve MB sighting |  | Go to Q8 |
| B2 | If foliage is causing the interruption it should be removed or trimmed and a maintenance plan should be set for ongoing removal or eradication |  | Go to Section C or  Q8 |
| Consultation with other rail network providers may be required |  |
| Make the MB stand out more, see B3 |  |
| B3 | The cause of the interruption must be captured and the most appropriate mitigation justified providing the best sighting for the driver. Consider the following list of mitigations which are placed in order of consideration: |  | Go to Section C |
| 1. Reviewing the object causing the interruption for removal |  |
| 1. Moving the MB horizontally to increase the sighting (this must not put the MB within the structure gauge or ideally further than 2.5 m from the running face of the nearest rail) |  |
| 1. Installing a co-acting MB |  |
| 1. Placing the MB on a gantry or on a higher post |  |
| 1. Raising or lowering the MB |  |

Section C – Distractions

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| Distractions | | No | Yes | Action |
| 9 | Are there possible operational distractions that may affect the driver’s sighting of the MB? | Go to    Section D | 🡻 |  |
| Is the MB positioned near a section of track where:  (CHOOSE ALL THAT APPLY) |  |  |  |
| The MB is near (within 50 m of) a lineside sign? |  | 🡺 | Go to C1 |
| The MB is located at a gradient change or station stop that requires the driver to power up or brake within the LAST 50 m of the sighting distance? |  | 🡺 |
| It is likely that the driver will be attending to another duty (e.g. checking timetable, using train operating system etc.) when they need to sight the MB? Provide details:   |  | | --- | |  | |  | 🡺 |
| Is it likely that another operational factor may distract the driver’s attention from the MB? (E.g. level crossing, another train, platform) Provide details:   |  | | --- | |  | |  | 🡺 |
| Other: Provide details   |  | | --- | |  | |  | 🡺 |

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| Mitigations: Distractions | | 🗹 | Action |
| C1 | Understand the nature of the distraction and the possible effect on train management. The distraction should be removed if possible |  | Go to Section D |
| If it is an operational issue then this should be reviewed with the appropriate train crewing representative |  |
| If there is a sign that could be a distraction, consider changing the location of the MB or the sign to minimise the distraction |  |
| Otherwise, if the distraction is serious, consider the following: |  |
| 1. Installing a co-acting MB |  |

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| Interruptions and Distractions: Justification for mitigation measures adopted  Please provide additional detail about decisions that are taken |
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Section D – MB Design

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| MB Design | | No | Yes | Action |
| 10 | Is the MB placed on a post? | Go to    Q13 | 🡻 |  |
| If yes: | Is the horizontal centre of the MB post not located between 2.2 and 2.5 m from the running face of the nearest rail? | 🡻 | 🡺 | Go to D1 |
| Is the height of the centre of the MB positioned significantly lower or higher than 2.7 m above rail level? | 🡻 | 🡺 |
| Is the MB horizontal distance from the running face of the nearest rail not matched to the previous MB and the next MB? | 🡻 | 🡺 | Go to D2 |
| 11 | Is the track bi-directional? | 🡻 | 🡺 | Go to D4 |
| 12 | Is the MB positioned near a live overhead wiring air gap so that an electric train stopped at the MB will span an air gap? | 🡻 | 🡺 | Go to D5 |
| 13 | Is the MB in a tunnel? | Go to    Section E | 🡻 |  |
| If yes: | Is the MB positioned so that it is not close to the driver’s eye level? | 🡻 | 🡺 | Go to D6 |
| Is the MB located near a tunnel exit? | 🡻 | 🡺 | Go to D7 |
| Go to Section E | |  |

| Mitigations: MB Design | | 🗹 | Action |
| --- | --- | --- | --- |
| D1 | These nominal ranges are specified in DS HR SC 60000 ST  Digital Systems Signalling Principles, however if the MB sighting can be improved then some adjustment is acceptable. For vertical height the centre of the MB should be positioned as close as practical to driver’s eye level, in accordance with the requirements of the structural gauge, and having regard to the different types of trains likely to pass the MB  Guidelines for exceptions:  Where it is necessary to observe a MB over the top of a train on an adjacent track, over a rise, or through a series of curves or if there are other physical lineside obstructions such as the face of a rock cutting |  | Return to Q10 |
| D2 | Where possible, modify the MB so they are consistent. |  | Go to Q11 |
| D4 | 1. Optimise MB position in the correct (or primary) direction |  | Go to Q12 |
| 1. Match the MB height and spacing to neighbouring MBs on the same line to make it easier for drivers to determine which MB applies to their line. If this is not possible, describe why the MB height and spacing will not match on the sighting form and investigate the most appropriate mitigation to provide the best sighting from the driver’s position: |  |
| 1. Changing the MB background to make the MB more conspicuous |  |
| 1. Installing a co-acting MB |  |
|  |  |  |  |
| D5 | Since the last pantograph on an 8 car intercity electric set is approximately 175 metres from the front of the set, the MB should be placed at least 200 metres from the centre of the overlap (air gap) bay, if the air gap is on the approach side of the MB |  | Go to Q13 |
| If this is not possible move the position of the overhead wiring air gap |  |
| **NB** Avoid locating MBs such that any part of it or the maintainer servicing the MB is within 1.5 metres of any live overhead pull-off or isolating insulator |  |
| D6 | DS HR SC 60000 ST states that the MB should be mounted so that the centre of the MB is 2700 above the rail level. If this cannot be achieved, the justification should be recorded on the sighting form |  | Return to Q13 |
| D7 | Consider repositioning the MB so that it is further away from the exit |  | Go to Section E |

Section E – Environment

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Environment | | No | Yes | Action |
| 14 | Is the MB located in front of a dark, light or cluttered background that will disrupt a clear sighting of the MB? | 🡻 | 🡺 | Go to E1 |
| 15 | Can sunlight shine onto the MB from the **front** of the MB (sun is behind driver) and reduce visibility? | 🡻 | 🡺 | Go to E2 |
| 16 | Can sunlight shine onto the MB from the **rear** of the MB (sun shines into the driver’s face) to cause glare and make it hard to see the MB? | 🡻 | 🡺 |
| 17 | Are there any other sources of light that may disrupt a clear sighting of the MB (e.g. traffic lights, street lights, floodlights)? | 🡻 | 🡺 | Go to E3 |
| END | |  |

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| --- | --- | --- | --- |
| Mitigations: Environment | | 🗹 | Action |
| E1 | The MB should be made to stand out from the background |  | Go to Q15 |
| 1. Attach a background to the MB to enhance the contrast between the MB and background |  |
| E2 | For existing MBs, sightings may need to be conducted in the morning or evening to determine if there is an issue. For new MBs consider the direction that the MB is facing – East/West facing MBs are more likely to be affected. |  | Go to  Q16  or  Q17 |
| When sunlight shines onto the **front** of the MB (from behind the driver) other options to consider include the following in approximate priority order: |  |
| 1. Consider lowering the MB |  |
| 1. Install a co-acting MB |  |
| 1. Reposition the MB |  |
| When sunlight shines onto the **rear** of the MB (sun is in the driver’s face) consider making the background bigger to make the MB stand out more |  |
| E3 | Where possible, look to screen the MB from the other light sources. |  | End |
| Talk to the owner of the light source to see if it can be moved or replaced |  |

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| MB Design and Environment: Justification for mitigation measures adopted  Please provide additional detail about decisions that are taken |
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