



Mineral Products Association

Highway Contracting, Sweeper & Spray Tanker

Operational Safety Guidance

Introduction:

Health and Safety of MPA Members' staff and contractors remains their number one operational priority, and that of the clients for which they work, particularly in the highways construction and maintenance sector.

This guidance document has been developed to give Members, their clients and specifiers, and other stakeholders a focused approach to considering the requirements of operating in this sector.

Of particular consideration in recent years are mechanical road sweepers and spray tankers, where the number of fatalities, and many times more Near Hits and incidents, continue to be evident.

The document relates not only to the National Highways Strategic Road Network in England, or its equivalent in the Devolved Nations, but all roads.

The document addresses the factors identified within many Health and Safety Plans: Leadership & Culture, Competent People, Managing Risks, Measuring Performance, Engaging Stakeholders – factors that influence safety at all roadworks.

It provides recommendations for achieving good practice now, and beyond what is currently available and being used by MPA members and to encourage and direct the adoption of proven technologies, by a competent, inclusive and empowered workforce in order to achieve Zero Harm.

This guidance does not supersede any Regulatory and/or contractual requirements, but can be considered as complementary. The document should be seen as “live” and will be subject to ongoing development, revision and amendment as necessary.



Relevance

The MPA's 'Fatal 6' identifies and seeks to mitigate those high consequence hazards which have resulted in 94% of fatalities in the broader minerals sector.

Workplace transport and pedestrian interface is Theme 2 of the Fatal 6, with 19% of fatalities in the industry involving workplace transport, and/or involving contact with pedestrians.

This is of particular relevance to the asphalt contract surfacing environment where there are multiple operatives and items of plant working in close proximity to tight programme schedules.

This comes despite the many technical devices to enhance an operator's vision and warn both pedestrians and drivers (workforce and public) of their proximity. New designs and modifications to vehicles will continue to reduce the potential for, and seriousness of, an impact.

NB Spray Tankers present an additional hazard given their function to carry and apply, under pressure, 'hot' emulsions - typically above 50 deg C.

Principles

Previous workshops and discussions have identified a range of issues, but all with several common themes as confirmed and probable root causes of incidents and Near Hits, including:

- Leadership and Inclusion Culture
- Competence
- Plant Standards
- "Sterile and exclusion" safety zones.

Leadership and Inclusion Culture

MPA continues to develop the Safer by Leadership initiative to support member companies in the development of health and safety leadership and behavioural safety programmes, as key facets of a positive safety culture.

Clearly, any operator and/or plant on a highways site needs to be 'right' for the operations to be undertaken. Recommended minimum competence and plant standards will also be addressed in this document.

Not all operators and plant are under the direct ownership or employment of the surfacing organisation, and as such there is a risk of a difference in culture and behaviour. However, this can be addressed by inclusive leadership and supervision, rather than exclusive or dictatorial.

Sweeper operators in particular may move regularly - even within the course of a single shift - from sites of different scale and scope, e.g. from street cleaning of litter, to developer access route cleaning to a motorway construction site. Each of these can have different aspects and working methods to address, but over-complicating the role should be avoided.

However, in ensuring that competence and plant requirements are met, the need for an inclusive approach to 'embedding' operators to feel a part of the surfacing operation and team can have dividends. Initial relevant, brief, and inclusive discussions may prevent prolonged, distressed post-incident investigations.

Competence

Operator competence has been embedded in MPA Guidance for a long time, not least through its Safer by Competence policy and initiatives across the minerals sector, setting out routes to meeting National Occupational Standards relevant to job functions.

Contract surfacing sweepers operate in a particularly different environment than that of a street or even construction site sweeping, for 'housekeeping' purposes. The operation is intended to remove dust/detriment as a contributory factor to material performance. Clean, dust-free substrate contribute to ensuring there is good mechanical interlock between layers, and spray tanker applied bond coats act as intended as additional 'glue', and for waterproofing. Thus, attention to detail is critical, particularly when sites may have exposed or incomplete utility features such as gully pots and access chambers etc.

In addition to the sweeping or spraying operations, there will be multiple operations ahead of (e.g. planing) and behind (asphalt laying) with other workforce staff and vehicles on the site. Enabling safe operations throughout all these contiguous activities against time pressures is a specific challenge.

However, the lack of a common specific minimum competence standard will continue to give rise to inconsistent performance and risk management.

Plant Standards

MPA also continues to develop the Safer by Design initiative to support operating companies in the development of MPA Standard Specified and aspirational requirements for mobile plant which is used on their sites, or under their control or direction. Defining plant requirements will aid in procurement decisions and authority-to-work checks on sites.

While technology solutions can provide enhanced assistance to operators, care should be taken not to develop an over-reliance on multiple electronic systems any one of which can fail, or at worst, distract the operator. Technology should not be preferred to human action, but rather be a complement.

"Sterile and exclusion" safety zones

A basic principle of incident prevention is to remove either the hazard, or the person at risk. It has been good practice to operate plant in 'sterile or exclusion' zones in which only the work operation takes place and no other personnel are permitted to enter.

This guidance will refer generically to Safety Zones, which encompass the need for exclusion.



Specific Guidance and Recommendations

1. Plant Standards

Minimum plant requirements are outlined below, along with aspirational options for use when procuring plant or hiring services. On arrival, pre-start checks will be completed prior to sweeper / spray tanker operations commencing.

'Regulatory' Minimum / Compulsory

- Manufacturer CE etc. marked to relevant plant production Standard
- Road Legal HGV: MOT, taxed, registered (plates displayed), insured etc.
- Traffic Safety Measures and Signs for Road Works and Temporary Situations, Part 2: Operations - CHAPTER 8: Vehicle Conspicuity etc.

+ MPA Specified and Aspirational Options (Fitted, Clean & Operational) including:

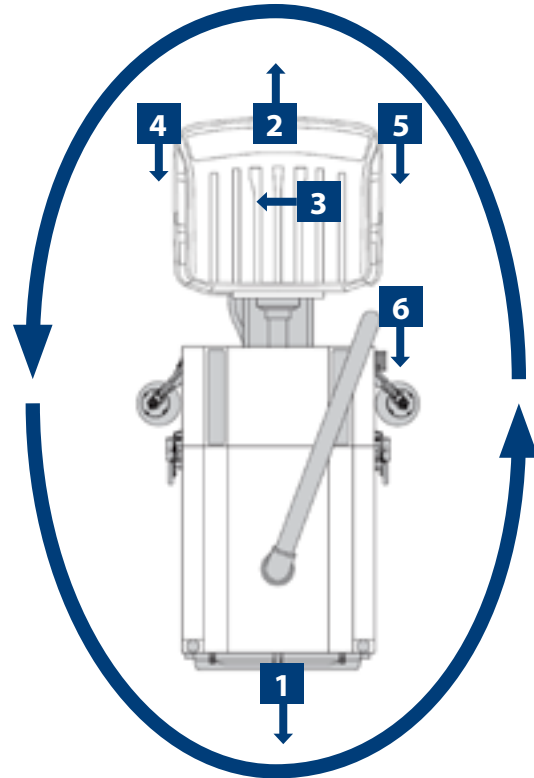
- See: <https://www.safequarry.com/plant/Review-Mobile.aspx> (Select road sweeper, bitumen sprayer)
- 360° Digital Video Recording Camera system (Live Streaming optional but preferred)
- Multiple-image monitoring screen(s) of appropriate resolution, to view camera system images (above).
- Safety Zone Lighting ("5 + 2 metres") – coloured, typically red or blue (Travel direction indicator optional, preferred)
- Proximity sensors – minimum 5m detection when reversing, with audible in-cab alarm.
- Audible reversing / turning white noise alarms
- Prominent Blind Spot warning signage
- Fire extinguisher (dry powder)
- Dedicated Two-way communications device(s) and/or channel (provided by site)

+ MPA Recommended

- CCTV Warning stickers to inform public of recording images



Plan of camera locations (Sweeper – in principle identical locations for spray tankers.)



FORS/MPA 360° DVR camera systems to eliminate blind spots.

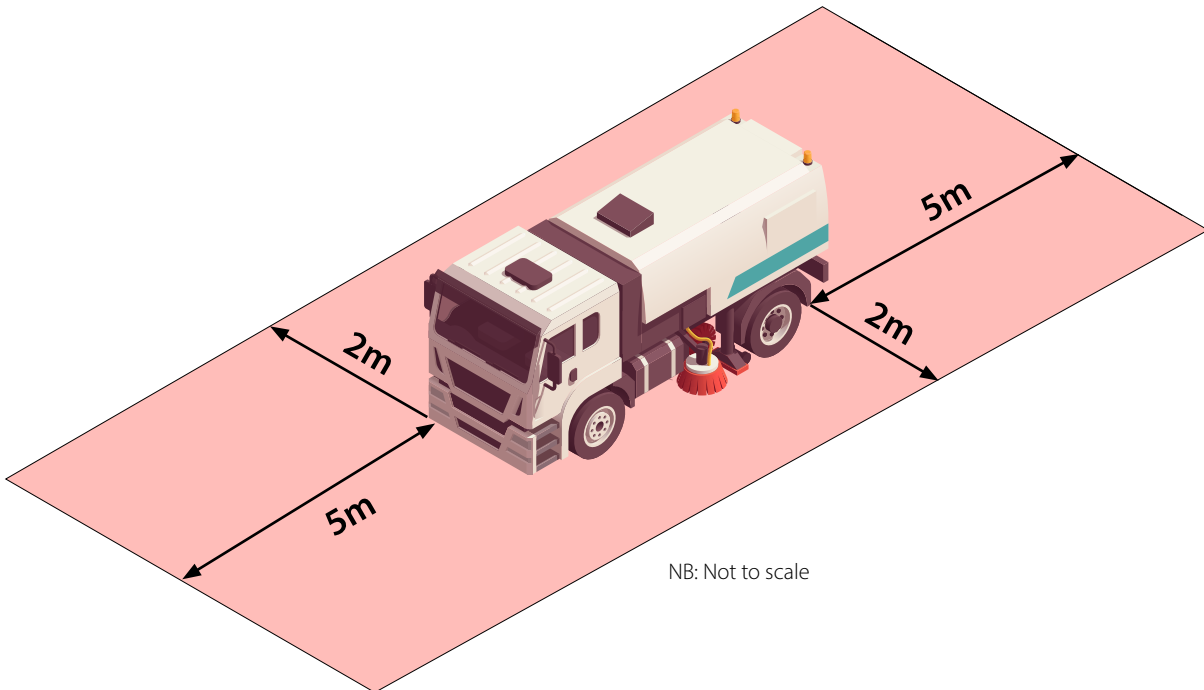
1. Reverse
2. Front
3. In Cab
4. Nearside – rear facing.
5. Offside – rear facing.

FORS/MPA Operating aid cameras.

- 6 Offside sweep gear

+ MPA Aspirational

- Fleet Operator Recognition Scheme (FORS) Accreditation – includes Regulatory requirements for fleet, individual plant and operators.
- Construction Logistics and Community Safety (CLOCS) – FORS **Silver** Accreditation will ensure you are CLOCS compliant..
- 360° Camera in-cab screens to minimise distraction – using e.g. 'stitched imaging' or intuitive single-glance layout.
- Auto-braking system inter-connected to proximity sensors (including Artificial Intelligence systems).
- Artificial Intelligence (AI) systems to provide warning to operator and/or engage auto-braking.



NB: Not to scale

2. Minimum Safety Zone (5+2 metres)

While increasing adoption of technology systems for sweepers and spray tankers is seen as good practice to enhance operator visibility, particularly when reversing, there should not be an over-reliance on their use and ongoing effectiveness. Separation of plant and personnel remains a first priority, such that defensive systems may not be called upon.

It has been good practice for sweepers to operate within an 'exclusion zone' – defined as an area where access has been restricted by physical barriers to any pedestrians, including workers, and moving plant/ vehicles.

While an exclusion zone may be practical on larger schemes with e.g. longer runs of multiple lane occupancy etc. it is much more difficult to achieve on constrained (often urban) locations.

The Working Group recommendation, is therefore to require a Safety Zone of an absolute minimum of 5 metres in the direction of travel and a 2-metre lateral zone, and as adopted for other highway construction plant.

The use of 5+2m lighting systems is a practical way to identify the minimum Safety Zone, but this may be further expanded for an additional area of exclusion e.g. by other physical barriers and signs etc. based on site-specific risk assessment.

3. The 'Spotter'

On all sites - unless it is possible to risk assess and remove all potential hazards - it is **strongly recommended** to also deploy a 'Spotter' for Sweeper / Spray Tanker Safety Zones who is able to communicate directly with the operator. When deployed, one Spotter shall be appointed per sweeper/spray tanker in operation. The Spotter can also help to ensure observance of site (forward and reversing) speed limits and other site rules.

The Spotter is a nominated person appointed to observe the Sweeper / Spray Tanker operations, with a clear line of sight in the direction of travel, and from a safe location **outside the minimum Safety Zone**.

The Spotter's key role is in communication with the operator and they will have authority to stop operations in order to prevent, or react to, hazards within, or incursions into, a Safety Zone.

The Spotter will notify the operator when it is deemed safe to move and/or resume operations following the removal of hazards.



4. Sweeper / spray tanker Operator Competence

Recommended minimum Operator competence requirements are outlined below.

Typical Qualification Structures include generic requirements such as:

- Conforming to productive working practices in the workplace;
- Conforming to general health, safety and welfare in the workplace;
- Operating plant or machinery to sweep, clean or clear in the workplace.

Detailed requirements address preparing and operation of plant, including daily checks, through maintenance of plant, to disposal of sweepings and safe storage and parking etc.

Minimum: CSCS Blue Card – Skilled Worker

(Note: Temporary / Red Cards may be accepted for Experienced Workers, Apprentices and Trainees undergoing training to achieve relevant NVQ qualifications, Level 2+).

CPCS / NPORS

Plant partner Schemes to CSCS, providing evidence of competence on specific items of plant. Red Card – Trained operator, Blue Card – Competent Operator (Trained + Experience, linked to VQs).

NB Spray Tankers present an additional hazard and a need for competence requirements given their function to carry and apply, under pressure, 'hot' emulsions - typically above 50 deg C.

None of the guidance or recommendations contained in this document is intended to supersede legal requirements or existing good practice in relation to e.g. generic and site specific risk assessment, design and planning, speed limits, safety inductions and work instructions as well as behavioural culture to prevent incidents such as fatigue management.

Background:

Within the work of the range of MPA Product Groups, Health and Safety topics have primarily been addressed by Working Groups under the MPA H&S Committee, on a largely generic but transferable basis i.e. topic-related rather than product-related.

In recent years, MPA H&S staff have supported the operation of a further sub-group looking at asphalt production and contract surfacing operations (initially as two groups, merged into one), known as the Contract Surfacing and Asphalt (H&S) Committee ("CSAC").

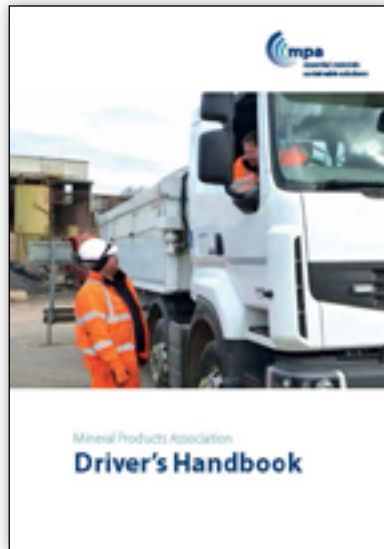
A Working Group, specifically focusing on H&S issues relating to Contract Surfacing operations was convened by open invitation to MPA Asphalt Members in November 2021, to support MPA's Vision Zero objectives, indicators and targets, allied to ongoing initiatives and campaigns, such as "Safer by..." and the "Fatal 6", which focuses on the highest consequence hazards within the industry.

This document is the primary output from the Working Group in relation to Mechanical Road Sweeper operations, which are equally applicable to Spray Tanker activities, in the highways construction and maintenance environment, building on previous efforts within MPA CSAC and industry workshops.

This document is intended to complement the MPA Contract Surfacing Operational Guidance published in 2019 and for the content to be reviewed on an ongoing basis.



Complementary Guidance (download from safequarry.com)



Website Links



Mineral Products Association
www.mineralproducts.org



MPQC
www.mp-qc.org



Mineral Products Association Safequarry
www.safequarry.com

Special thanks go to the following organisations for the active participation of representatives in preparing the document:





MPA Asphalt is part of the mineral products association the trade association for the aggregates, asphalt, cement, concrete, dimension stone, lime, mortar and industrial sand industries. www.mpalime.org

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