Road Emulsion Association Limited

CODE OF GOOD PRACTICE FOR THE USE AND SAFETY OF MOBILE STORAGE TANKS

2025

ROAD EMULSION ASSOCIATION LIMITED

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CODE OF GOOD PRACTICE FOR THE USE AND SAFETY OF MOBILE STORAGE TANKS 2025

1. INTRODUCTION

Mobile storage tanks (MSTs), generally have a capacity of between 4,500 litres to 55,000 litres that are transported to construction sites. After installation they are periodically filled with bitumen emulsion, which is drawn off for use in local highway construction and maintenance work. The emulsion is usually warm or hot and as a result most tanks have a self contained heating and pumping system.

1.1 Reasons for this Code of Good Practice

The Members of the Road Emulsion Association (REA) produced the original "Code of Good Practice" in 1996, which was revised in 2011 then in 2014 and the latest revision stand in 2025, to provide guidance in the use and safe operation of MSTs. The REA Council decided periodically to update the Code as it continues to be concerned for the safety of the public and highway authorities' and contractors' staff, when in close proximity to MSTs that are in use for storing and heating bitumen emulsions. The safety aspects are of particular concern when MSTs are sited outside the confines of depots and are therefore potentially accessible by the public, including children.

1.2 Scope

Although REA promotes the safe and correct use of bitumen emulsions, it considers that this Code must include changes to or from other forms of road binders and have therefore prepared and issued this Code of Practice in conjunction with other advisory bodies including Eurobitume, the Road Surface Treatments Association (RSTA), the Environment Agency and the Health & Safety Executive. **Because MSTs are variable in age and type, and also because designs change, this is a generalised Code of Good Practice and details may not always apply. Ultimate reference should always be made to the individual MST Manual.**

Please note MSTs are sometimes used for the storage of Bitumen, as opposed to Bitumen Emulsions – when that occurs it is vital to refer to the guidance given by Eurobitume.

Generally, it is assumed that this Code will be used and studied by Owners and Hirer's managers to aid the safe management of MSTs

1.3 Glossary of Terms

Owner – the organisation or its representative providing the MST for hire (usually also the emulsion supplier).

Buyer – the organisation hiring the MST from the Owner for use in the temporary storage of a road emulsion (usually the contractor).

Bitumen – a black semi-solid substance, refined from petroleum that is used as a binder in road surfacing compositions and is valued for its adhesive, durability and waterproofing properties.

Bitumen Emulsions – a fine dispersion of bitumen or modified bitumen droplets in a water/emulsifier solution. These are produced to suit various applications and are used cold or heated. *(Sometimes, emulsion is referred to as binder)*

1.4 Types of MST Available

MSTs vary in age and sophistication. The tank itself is usually insulated. In the simplest designs, for use with cold emulsion, they may have no heating or pumping equipment. A top inspection hole may be present, but for safety reasons the cover is usually bolted down. A tank overflow/vent is always fitted. Where pumps are present, centrifugal types with flexible or rigid impellers are preferable for use with emulsions since impinging surfaces will progressively coarsen emulsion particles and result in a loss of emulsion viscosity (the binder viscosity is unaffected). Of the positive pump types, vane is preferable to lobe or gear pumps. The pipe-work system may be designed to allow the pump to load, unload, circulate, drain and purge with cleaning solvent. If there is provision for heating, this is usually atomised oil burning, provided by an electrical supply that runs the fuel pump or pressuriser, air fan, ignition and controls, this electrical supply may be from mains or from a mobile generator or an inbuilt generator. Heaters may alternatively be of gas burning or electric resistance type. The heat transfer method is usually direct, from immersed heating tubes, or less frequently, indirect, heated by thermal exchange from hot oil. Heaters are normally used for temperature maintenance. Heating from cold is to be avoided but may sometimes be necessary (see Section 4.4).

2. CONTRACTUAL

2.1 Arrangements between Client, Contractor and Supplier

Terms and arrangements vary, but for simplicity in this document, the organisation that owns the MST is termed the Owner (usually also the emulsion supplier), even if an agent, employee or representative. The Buyer is similarly an organisation or its representative hiring and using the MST.

The Owner will issue to the Buyer in accordance with their own Policies and Procedures the following

- Terms and Conditions of Hire
- Siting and Bunding Guidance
- MST Operating and Maintenance Manual
- MST Inventory

REA draws attention to the Acts of Parliament and Regulations that affect the use of MSTs – these are shown in Section 5 of this Code document. Specific note is needed to comply with the **Control of Pollution (Oil Storage) (England) Regulations, in Scotland, The Water Environment (Controlled Activities) (Scotland) Regulations, and in Northern Ireland the Control of Pollution (Oil Storage) Regulations (Northern Ireland).**

Compliant bunding protection around the MST is the responsibility of the Buyer. See 3.2 for guidance.

3. SITE MOVEMENTS OF MSTS

3.1 Movement on to site

The Owner is responsible for the delivery of the MST in accordance with the current DfT legislation pertaining to transportation of MSTs

3.2 Siting and Bunding

Please note this item is very important for environment especially where the MST may be sited near drainage gullies, manhole covers, water courses etc.)

All necessary permissions and licences to use the site must be obtained. The siting of the MST should be within a lockable compound. The Health and Safety at Work Act requires that precautions are taken against interference by unauthorised persons. This means that permanent and watchful attendance on a non-secured site is essential. The extra cost of this can usually be offset by the travelling time saved between applicator machine refills, especially if the site also includes the aggregate dump and living facilities for the contracting gang. These latter facilities must be placed away from the MST and not where they might obstruct the access of tankers or emergency services.

The Control of Pollution (Oil Storage) (England) Regulations and the Scottish and Northern Ireland equivalent of these regulations apply to containers of bitumen emulsion having a capacity greater than 200 litres, and to mobile bowsers. The Environment Agency is aware that many self - bunded bowsers are now available. Those that are not bunded will need to be kept in a bunded area or a drip tray when in use. The main provisions contained in the Regulations are outlined below:

- Tanks, drums or other containers must be strong enough to hold the bitumen emulsion without leaking or bursting.
- The bitumen emulsion container must be positioned to avoid damage (e.g. by impact from any vehicular traffic).
- The secondary containment system (e.g. a bund, which is an outer wall or enclosure designed to contain the contents of an inner tank, or drip tray) must be provided to catch any bitumen emulsion leaking from the container or its ancillary pipework and equipment.
- The secondary containment system must have sufficient capacity to contain 110% of the maximum contents of the bitumen emulsion container. Where more than one container is stored, the secondary containment system should be capable of storing not less than 110% of the largest container's storage capacity or 25% of their aggregate storage capacity, whichever is the greater. In the case of drums, the secondary containment system should have a capacity of not less than 25% of the drum's storage capacity or, if more than one drum, not less than 25% of the aggregate storage capacity of the drums.
- The base and walls of any bund must be impermeable to liquid and be regularly checked for leaks. In addition, the walls must be sufficiently strong to withstand the hydraulic pressure generated by the collection of rainwater or the contents of the tank.
- The base and walls must not be penetrated by any valve, pipe or other opening which is used for draining the system.

The proximity of residential and industrial areas, public roads, railways, power lines, water courses, drains, inspection chambers, gullies, other activities (such as washing down) should be avoided. It must be understood that early morning activity around an MST will generate noise and fumes. The site for the MST needs to be reasonably level, capable of supporting weight of the full MST over an extended period of time, well compacted, well drained and, if possible, sheltered from high winds. An area measuring 15 metres x 7 metres with 7 metres overhead clearance is normally required, but this should be checked with the supplier. A space allowance for vehicle manoeuvring, safe access to ladders, fuel tanks and attached equipment is needed. Attendant vehicles must also be able to park on a level area beside the MST.

3.2.1 Commissioning

Before emulsion is put into the tank, the Owner should recheck that the MST is level, and the legs properly supported. The erection of ladders and handrails, filling of the burner fuel tank (White diesel), checking of oil levels and other pre-use checks on the pump engine and setting of valves, all according to the MST manufacturer's instructions, must all be carried out beforehand. The vent/overflow pipe is lowered, secured and a condensate receptacle placed underneath. The electrics must be connected to the designated point by a competent electrician. Only then may loading proceed (see Section 4.3). The Owner then checks that all operational parts of the plant are working correctly, especially the safety controls and cut-outs. Occasionally, it may be decided to check the burner settings by means of a combustion test upon the exhaust gases. The Owner must instruct the Buyer on operation of the MST. Compliance to safety requirements requires that this training session be carried out correctly, to both parties' satisfaction. Signed documentation for the final handing over of the MST should record that this has been completed, and this should also be entered into the MST Log.

3.2.2 MST Manual Pack and Inventory

The Owner has a responsibility to provide an MST Manual that is easily understandable. Its purpose is to repeat instructions given during training (Item 3.2.1) and to provide a source of reference for further details should problems arise. If instructions for component installation in

the original MST assembly are included, they may include confusing and unnecessary information. If possible, they should be edited or their purpose clearly stated

3.3 Movement between Sites

It is illegal to transport emulsion in MSTs. and therefore, must be fully drained before moving. It is the responsibility of the Owner to transport the MST to the new location in accordance with Clause 2.2

3.4 Return to Supplier

The MST must be empty before removal and so provision must be made to remove and accommodate the final drained emulsion. The Buyer will need to be present when the Owner checks the equipment against the MST inventory and this and the collection note signifying the termination of hire are signed.

4. SITE OPERATIONS

4.1 Administrative

4.1.1 Health and Safety

Where an MST has contained hazardous material, it must carry **three statutory Hazard Warning panels** and **Instructions in Writing** are to be available. The panels have to be changed if the tank contents are changed. Safety markings on the MST must not be obscured at any time. An example of a Hazard Warning panel is shown below but reference must be made to current regulations.

<table>
<tr><td>(1) EMERGENCY ACTION CODE</td><td rowspan="2">(3) HAZARD WARNING SIGN (DIAMOND)</td></tr>
<tr><td>(2) SUBSTANCE IDENTIFICATION NUMBER</td></tr>
<tr><td colspan="2">(4) SPECIALIST ADVICE- TELEPHONE NUMBER WHERE SPECIALIST ADVICE CAN BE OBTAINED AT ALL TIMES WHEN THE SUBSTANCE IS BEING CONVEYED</td><td>(5) NAME OF MANUFACTURER, OWNER OF THE SUBSTANCE, OR HOUSE SYMBOL</td></tr>
</table>

(1) Instructions for emergency services are in the form of codes:
2 means use water fog or a fine spray.
W means full protective clothing required, there is danger of violent reaction or explosion, and spillages should be contained.
X means full protective clothing is required, there is no danger of violent reaction or explosion, but spillages should be contained.

(2) Substance identification number (UN Number)
(3) Hazard warning sign – split diamond (top half hatched)

(4) & (5) contain the MST Owner's details.

An example for Bitumen Emulsion on a White Board is shown below

<table>
<tr><td>2X</td><td rowspan="2">LOW HAZARD</td></tr>
<tr><td>BITUMEN WATER EMULSION</td></tr>
</table>

SPECIALIST ADVICE- **TELEPHONE NUMBER WHERE SPECIALIST ADVICE CAN BE OBTAINED AT ALL TIMES WHEN THE SUBSTANCE IS BEING CONVEYED**	**NAME OF MANUFACTURER, OWNER OF THE SUBSTANCE, OR HOUSE SYMBOL**

In addition, for bitumen at elevated temperatures, the display of the elevated temperature 'thermometer' symbol is required.

Bitumen Emulsion does not come under ADR regulations; MSTs should be labelled according to the UK Voluntary Marking Scheme. This uses the Hazard Warning panel format with panel sections having a white background.
Sections (1), (4) & (5) remain the same.
Section (2): Tank contents - **BITUMEN EMULSION** - if bitumen emulsion is being used.
Section (3): Contents description – **HOT LIQUID** - if the contents are hot.

Particularly for bitumen emulsions, all MST moves will be under the control of the Owner. **It is illegal to transport emulsion in MST's.** The MST must only be moved when empty.

Due consideration should be given when transporting an MST which has contained a hazardous product e.g. UN3256 / UN3257 as the last load and should only be undertaken after consulting the bitumen supplier or a qualified Dangerous Goods Safety Advisor. Any such movement of an MST in a 'notionally' empty state must be accompanied by an "Empty Vehicle Document" in lieu of "Instructions in Writing" as prescribed under ADR.

4.1.2 Access to the top of MSTs

Site staff should be made aware of the **Work at Height Regulations** and potential safety issues arising from working at height and activities on the top of an MST and around manholes or apertures or dipsticks. Access should be limited or precluded depending upon the design and age of the MST. Fixed ladders and safety railings should always be used if fitted. A safe system of work accompanied by a suitable and sufficient risk assessment, should be in place, and communicated to any person accessing the top of an MST.

4.2 Operatives

Training must include directions on how to use and maintain the MST , safety and emergency procedures, details of the conditions of hire and where to find advice (MST Owner/emulsion supplier) or further information (MST manual pack).

4.2.1 Supervision and Responsibilities

Under the Sale of Goods Act, the hire of equipment is regarded as sale for a limited period of time. The Owner has a responsibility to provide a safe, fully functional and complete MST; easily readable, understandable and unambiguous supporting documentation, provide adequate training so that the MST will be used correctly and safely and to ensure that all this has been understood. Similarly, while on hire, the Buyer is the temporary Owner of the MST and, in the event of an incident or accident, would have to prove that it was not because of poor operation, maintenance, supervision, or failure to follow the Owner's instructions. The Buyer must supervise and should check regularly that the operation is proceeding according to plan and should inspect and countersign the MST log entries.

4.2.2 Health and Safety Precautions

It is recommended that a daily MST check list is completed. An important part of this is the checking of all safety and cut-off devices – note only the MST owners' competent personnel

should service these devices, but their operation has to be covered in training and instructions given to the site operators. (See Appendix A). An ample safe zone around the MST should be identified and signed as a 'PPE (personal protective equipment)/no smoking/beware of reversing vehicles' area. There must be no unauthorised access into this safety zone.

Additionally, consideration must be paid to any substance heated to or above its flashpoint to prevent any possibility of fire and explosion. Detailed information on this is shown on the Safety Data Sheet for the product.

4.2.3 Safety Rules

It is suggested that the following preamble and general rules on the use of the MST be issued to the operator and to the team of contractors.

"These rules are issued to ensure your safety and the safety of the general public and should be read in conjunction with your employer's safety policy/procedure and the site safety rules. You have a duty under the Health and Safety at Work Act, to take reasonable care for your own safety and the safety of others who may be affected by your acts or omissions. Read these rules carefully and be sure that you fully understand them in order to prevent accidents and ensure that you know what action to take in the event of an accident."

(1) You must be authorised to operate this equipment, be fully trained in its use and be wearing the recommended personal protective equipment. If in doubt, ask for instruction. Do not take risks.

(2) You must know what emulsion is being used, have studied its product information sheet and product health and material safety data sheet (MSDS) and undertaken/be aware of the Control of Substances Hazardous to Health (CoSHH) assessment. Always observe safe handling instructions for emulsion, cleaning oils, lubricants, and other substances. Make sure that safety equipment such as a fire extinguisher and first aid box are in position and serviceable.

(3) Never operate the pump without making sure that the valves are in their correct positions and the guards in place. Obey the instructions on all warning labels and never use the equipment for unauthorised purposes.

(4) Be aware that emulsion is a liquid and, even when cold, will flow by gravity or siphon-without being pumped.

(5) Never try to free pipes that might be pressurised or that might release hot liquids. Never try to release trapped objects from jammed machinery that is active or under stress.

(6) Never continue to use dirty, leaky, defective or partially jammed equipment but report problems immediately. Keep equipment clean. Fill in the daily check list form and enter operational details into the MST Log. Raise, record and report any defect with the supervisor, so necessary actions are taken to address the defect.

(7) Never light the burners without making sure that the heater tubes are covered with emulsion (checked by viewing the sight plate, exposed tubes or warning mark on dip stick/level indicator). Check that heater and tank vents are open. In the case of manually lit burners, always insert the torch before starting the burner. If the burner blows out, open the heating tube shutter and leave for at least five minutes before attempting to re-light.

(8) Keep clear of hot, moving or electrical parts. Do not inhale concentrated engine exhaust or emulsion fumes. Keep oil/solvents off your skin and non-protective clothing.

(9) Observe safety procedures when starting engines (Section 4.2.3.4), pump (Section 4.3.5), generator or burners (Section 4.2.3.5). Never refuel an appliance while it is running, all powered equipment must be turned off during refuelling operations.

(10) Never add any additive, such as water, solvents or chemicals, to the emulsion.

(Should further guidance be required regarding safety and legislation, refer to the Consultative Documents listed in Section 5).

4.2.3.1 Personal Protective Equipment

MST operators should be fully protected using personal protective equipment to protect them with a view to preventing injury against the possibility of emulsion or binder coming into contact with their skin. This includes protection to the eyes and face as well as the hands and feet.

The following PPE must be worn when loading or discharging vehicles carrying products in the following circumstances: -

For Bulk Bitumen Emulsion Products (Maximum Safe Handling and Storage Temperatures 85ºC -95ºC)
Equipment should include.

1. Safety boots (non-slip soles without metal studs)
2. PVC long gauntlet gloves
3. Overalls (natural fibre, without a belt, the trousers should fit over the top of boots and the sleeves over the base of gloves) (wear a shirt underneath overalls)
4. Safety helmet with full face visor (polycarbonate)
5. Neck protector.

4.2.3.2 Personal Hygiene

The first objective must be to prevent emulsion, binder, solvent or oil from reaching the skin either directly or indirectly via clothing. If there is any danger of this, protect the skin with a water dispersible barrier cream. If contamination has occurred, remove the adhering emulsion using a purpose designed hand cleaner or olive oil (in no circumstances use gas oil or similar solvent) and finally, clean with soap and water. Never continue to wear contaminated clothing.

4.2.3.3 Spillage Precautions

Advice on bund construction is given in Section 3.2. Care must be taken to prevent spillages when receiving deliveries of emulsion into the MST from a road tanker, or from the MST to a sprayer, particularly with delivery hoses which are outside of the bunded area. Whilst spilled bitumen emulsion is not flammable, and while solid bitumen is not harmful, it is mobile when cold and able to mix into water courses. In such circumstances bitumen emulsion may harm animal and plant life. This situation is immediately notifiable to the Environment Agency (see Section 4.2.4 and Appendix E).

4.2.3.4 Fault Finding

A fault-finding chart can be found in most MST manuals. Do not attempt to rectify a problem unless you are sure that a dangerous condition is not present, that you understand the problem and are qualified to treat it. It may be better to isolate the MST for a period to allow pipes to cool and if necessary, contact the MST owners.

4.2.4 Emergency Procedures

It is recommended that additional information be attached to the hazard warning panels (Section 4.1.1.) giving names and telephone numbers (EMERGENCIES 999 or 112 – not local numbers), for possible eventualities of fire/hazardous spillage (fire services), injury (ambulance), theft or vandalism (police), spillage into water courses, (Environment Agency – Hot-line 0800 807060). Also give 24 hours notification/instruction contacts (site manager or deputy).

Check that the following statements in 4.2.4.1 and 4.2.4.2 do not conflict with the site safety instructions/employment regulations.

4.2.4.1 First Aid

The most significant short-term hazards are heat burns or splashes in the eyes. In such cases, prompt action in cooling and washing off emulsion under running water can greatly reduce the damage. Adhering emulsion must not be pulled off the skin, but medical treatment sought. The medical technician will want to see the product's CoSHH Assessment Sheet and the material safety data sheet (MSDS) and should be warned that it is usual not to attempt to remove the emulsion. Oil based cleaners or ointments should not be added to the burn, but a small piece of

lint may be used as a parting layer to keep the bandage from adhering. When healing has progressed, if necessary, clean gently with a vegetable oil. Accidents must be entered into the employer's Accident Report Book, in accordance with legal requirements and may have to be reported to the Health and Safety Executive (HSE) in accordance with Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) (with regard to the percentage of burns to the body)

4.2.4.2 Fire/Spillage

Only attempt to control minor fires with fire extinguishers and, before doing so, assess the hazard from unburnt binder/solvent other combustible material and the MST pressurised tyres. Do not inhale the smoke – it is toxic. Do not use water as an extinguisher. Refer to the relevant material safety data sheets for definitive fire fighting advice. **Call for help.** Most MSTs have a fire valve that shuts off the fuel supply to the burners when a fusible link melts.

4.3 Emulsion Reception on to Site

Deliveries of the bitumen emulsion into the MST will be in accordance with the

- REA Road Tanker to MST Pressure Transfer Procedure or
- REA Road Tanker to MST Pump Transfer Procedure

Listed in Appendix ___B____

4.3.1 Off-Loading from Sprayers/Applicators

No material other than binder of the same type and grade and of usable quality should be pumped back into the MST. Should quality problems arise, it is most important that detailed records of such transfers are kept in the MST or site records. In all other respects, the above procedures should be followed.

4.4 Emulsion Care in MSTs

4.4.1 During Operational Time

Keep the MST well filled, and the emulsion circulated for 30 minutes to one hour each day (halve this time if the tank is only half full). The emulsion must not be mishandled if it is to meet performance and specification requirements. Contamination, including gas oil or diesel, will harm performance. Similarly, long periods of storage at spraying temperature will cause the loss of volatile ingredients by evaporation. Equipment malfunctions, or wrong adjustment, pose more severe threats. Overheating may cause emulsion to generate steam and boil over. Over-pumping, failure to circulate in settlement, or freezing, will also damage emulsion.

4.4.2 During Down-time

For long down-times, empty the MST. Drain the pipes if there is any chance of the emulsion freezing. For shorter down-times, consult the Owner, as it may be preferable to return it to the factory and supply fresh and re-tested product when required. For weekends, the MST can just be shut down. For down-time of up to 2 weeks, the emulsion can be maintained in good condition by observing the following practice. Keep the MST well filled. In order to pump, the emulsion viscosity must be reasonably low, and heat is needed to reduce this. The thermostat setting should be 40ºC below normal setting. If the emulsion has become totally cold (which should be avoided), switch the heaters on for 10 minutes in every 30 minutes, until 45ºC has been reached and it is warm enough to pump and circulate. Emulsion grades designed to be used cold, also need regular circulation, and all pipework containing emulsion must be protected from frost. If, by any chance, it is suspected that the emulsion has frozen, it is best to leave it to thaw slowly without disturbance. However, be aware that lumps of binder may have separated from the water phase. Similarly, emulsion that has been neglected may have sedimented to the extent that separation has taken place. If the emulsion has become unfit for use, the Owner will have to be consulted. Do not delay this, as the longer the problem is left, the worse it will become.

4.4.3 Circulation

Circulation for 30 minutes to one hour in any 24-hour period is recommended,

4.4.4 Heating & prevention of overheating

Recommended temperature control settings for hot emulsions are, lower limit 75ºC, upper limit 85ºC, fail safe limit 95ºC. Turning the thermostat up above these settings is dangerous and will not heat the emulsion quicker. Emulsions will boil if heated above 100ºC and there is a serious risk of a major spillage from the venting pipe due to emulsion expansion from the reaction of the broken emulsion and the residual emulsion product. Additionally, the emulsion may block safety vents (allow a safety margin of 3ºC gauge error). If this happens, dangerous pressure may develop.

For operational reasons, MST heaters can be quite fierce. Localized boiling of the emulsion may occur on the heating tubes, inevitably leading to some phase separation. Too much of this can affect the spraying properties of the emulsion. If the timeclock is controlling the burners, it is preferable to circulate during the heating time. Heating settings must not be above the emulsion manufacturer's recommended maximum spraying temperature.

4.4.5 Sampling

BS EN 58 gives the main requirements for sampling emulsion. Some Buyers have specific methods in their annual tenders which should be observed. Failing this, the principle of taking a representative sample from the pipeline, after adequate circulation, should be followed. However, the sample cocks are seldom purpose designed. It may be necessary to use a drain cock on the pump or strainer. In the case of sampling deliveries, this should be done from the inlet pipeline, halfway through the delivery. If required, the Owner will usually supply a flanged link incorporating a sample cock designed to sample from the centre of the flow in the pipe. In either case, some emulsion should be allowed to flow into a waste container, so that an uncontaminated sample can be contained. Typically, a one or two litre plastic bottle or a sample pot is filled. A label should be securely fixed to the bottle or sample pot and have details of sample grade, date, time, MST reference number, site and person sampling. Any other details required should be recoverable from the MST Log if required. In the case of hot emulsions, if plastic bottles are used, it is good practice to store the sample in an insulated container, so that it cools slowly and so that some residual heat may still remain in the sample when tested.

4.5 Emulsion Despatch from Site

4.5.1 Loading Authorisation and Supervision

To avoid vandalism, or unauthorised removal of emulsion, the drainage/unloading valves are kept padlocked or, at least, the valve wheels are removed while the MST is on site and not in use. Blanking caps must also be in place.

4.5.2 Loading Sprayers/Applicators

Loading of Sprayers and Applicators will be carried out in accordance with the

- REA Code of Practice for Tanker to Sprayer Transfer Procedure

Listed in Appendix C

4.5.3 Returning Emulsion from an MST

In the event of returning emulsion to the Owner at the end of the contract, the Buyer should, as far as is known, assure the Owner that it is of usable quality and has not been contaminated. This should be stipulated on the Owner's material returns documentation. The MST should be circulated for a while (time depends on volume), sampled (see Section 4.4.6) and samples kept by Buyer and Owner for use in resolving any possible quality problems. (Note that damaged emulsion may deteriorate markedly during a loading-transport-unloading regime). Unloading the MST then proceeds.

4.6 Changing Emulsion Grade

Change of grade rarely presents problems, although the Owner should be given at least two days notice. The ideal situation is to use or remove the entire previous grade before filling with a new one. Occasionally, for operational reasons, it may not be possible to completely empty the MST before changing grade. In this case, the proportion of the blended materials becomes important, and the Owner should be presented with the expected blend proportions, and approval obtained before carrying out such an operation. In any event, it is essential to circulate well, for example, turn over the tank contents once. (The time is calculated from the volume in the MST, divided by the pump output.)

4.7 Disposal of Waste

Waste material must not be put into domestic disposal systems or back into the MST. Liquid waste is put into sealable drums or IBC's (usually the Owner will have spare ones). Solid waste and absorbed spillage, which should be negligible, is put into open top drums and sealed. Both must be regularly removed from site by licensed waste disposal contractors. On no account may waste be left easily accessible to the public, especially children. In particular, bitumen dissolved in solvent is both flammable and harmful by skin, absorption and must be safely contained. The Contractor will need to be aware of the nature of the contents of the drums. Waste leaving site should be accompanied by either a Waste Transfer Note (if non-hazardous) or a Consignment Note (if hazardous).

5. CONSULTATIVE DOCUMENTS

The following documents are not dated, and the latest issue needs to be referenced:

Acts of Parliament & Regulations that must be taken into account in the use of MSTs

Dangerous Substances (Notification and Marking of Sites) Regulations

Environment Protection Act

Health and Safety at Work Act etc

Dangerous Substances and Explosive Atmosphere Regulations (DSEAR)

Control of Substances Hazardous to Health Regulations (CoSHH)

Control of Pollution (Oil Storage) (England) Regulations

The Water Environment (Controlled Activities) (Scotland) Regulations

The Control of Pollution (Oil Storage) Regulations (Northern Ireland)

Provision of Work Equipment Regulations

BS EN 13808 Bitumen and bituminous binders. Framework for specifying cationic bituminous emulsions

BS 434-Part 1 Specification for Anionic Bitumen Emulsions

BS EN 58 Sampling Bituminous Binders

The Carriage of Dangerous Goods and Use of Transportable Pressure Equipment Regulations.

Reporting of Injuries, Diseases and Dangerous Occurrences Regulations.

REA Technical Sheets
On the REA website **www.rea.org.uk** the "Technical Datasheets" page provides 12 Technical Data sheets to assist users with information and advice on a range of bitumen emulsion uses.

APPENDIX A

Temperature Checking and Gauge Calibration Methods

The calibration of the thermometer and temperature control is vital to the safe running of the MST. It is the responsibility of the Owner to do this, at least annually, and to record all details in the MST Log. The Buyer should check the details and confirm that the calibration is valid and correct. If the thermometer is not adjustable, then a small, waterproof, dated notice should be attached to it giving a correction factor. The calibration method is given below but if the Buyer wishes to carry out a rough check without removing the dial thermometer from its pocket, a glass thermometer can be used to take the temperature of an emulsion sample for comparison (see Section 4.4.6).

(1) Dial Thermometers

Frequency of calibration	:	At least annually or if suspect
Primary Standard(s)	:	Platinum resistance probe or certified glass thermometer
Working Standard(s)	:	Laboratory electronic or calibrated glass thermometer
Tolerance	:	$\pm$ 3.0ºC

Method

Compare with the reading of a calibrated thermometer at the temperature of use.

Procedure

Ensure that the thermometer is clean and sound. Immerse in a water or oil bath to its design depth. Immerse the reference probe beside it. Heat to the normal operational temperature(s), stir until the readings are stable and record them.

Calculation

$$\text{Error \%} = \frac{100 \times (\text{temperature} - \text{reading})}{\text{temperature}}$$

Correction = temperature – reading

Verification

The thermometer is verified if the error is within the permitted tolerance. Thermometers must not be used without a current verification/calibration certificate. This is void after one year or in the event of possible damage or demonstrated inaccuracy. All data is recorded on a test certificate and in any attached plant log. A durable and prominent label is to be placed beside the thermometer display giving the next recalibration deadline together with the correction if required to obtain the correct temperature.

Recording

The certificate and/or MST Log entry, shall, at least, record the test date, test operator's name and signature, the working standard, the equipment reference number, the calibration method number and all the test details and observations.

(2) Temperature Control

This is set against the calibrated dial thermometer reading during a period of circulation. If the reading does not correspond to the actual temperature, then a durable and prominent label, giving a correction factor, is to be displayed beside the control. Recording is as above.

Appendix B

Please refer to https://rea.org.uk/ for the current versions of the below procedures.

REA Road Tanker to MST Pressure Transfer Procedure or
REA Road Tanker to MST Pump Transfer Procedure

Appendix C

Please refer to https://rea.org.uk/ for the current version of the below procedure.

REA Tanker to Sprayer Procedure