SEPA scottish environment protection agency

ENVIRONMENT AGENCY

ENVIRONMENT AND HERITAGE SERVICE

ENVIRONMENTAL ALLIANCE – WORKING TOGETHER

MAINTENANCE OF STRUCTURES OVER WATER: PPG23

POLLUTION PREVENTION GUIDELINES

These guidelines have been drawn up to assist all those who plan or undertake maintenance of structures over water. They have been jointly produced by the Environment Agency for England and Wales, the Scottish Environment Protection Agency and the Environment and Heritage Service in Northern Ireland, referred to as the Agency or Agencies. Consultation with your local Agency office is advisable before any work is started. Contact details can be found at the end of these guidelines.

1. GENERAL

These guidelines focus on the environmental risks that are specific to the maintenance of structures over water, such as bridges and jetties. They supplement the Agency's guidance on "Construction and demolition sites" (PPG6 – Reference 1) and on "Works in, near or liable to affect watercourses" (PPG5 – Reference 2), which provide details of the relevant legal framework and general advice on pollution prevention. It is therefore recommended that the document is read in conjunction with these two, more general, guidance notes.

2. POLLUTING POTENTIAL FOR MAINTENANCE ACTIVITIES

The discharge of pollutants to surface waters and groundwaters must be avoided during maintenance activities. The maintenance of structures over water generates a range of pollutants, including metal particulates, paint, polluted water, detergents and cement. These can directly affect local water quality and can cause soil and groundwater contamination. Within England, Wales and Northern Ireland the control of air pollution and noise nuisance is dealt with by local authorities and queries on these should be addressed to local authority environmental health departments.

3. PLANNING

General precautions that should be taken at the planning stage to minimise environmental risks include:

i. provision for the storage of materials and wastes where spills will not enter any water;

ii. consultation with the Agency and other appropriate bodies prior to the commencement of any maintenance activities;

iii. ensuring that all the materials to be used in maintenance comply with current health and safety legislation;

iv. detailed planning of activities, including containment techniques and methods of waste disposal;

v. consideration of road traffic, navigation and fisheries constraints, which could affect the timing of the work;

vi. consideration of the onset of high water levels after rain or high tides.

Adopting a risk assessment approach to identify and assess the impacts of the proposed activities will assist in deciding the maintenance methodology and level of pollution prevention measures required.

4. GUIDANCE ON MATERIALS AND TECHNIQUES

a. Paint removal

Paint removal methods include abrasive blast cleaning, blasting in a closed circuit, preparation by various types of wet abrasive blasting or water jetting, chemical stripping and hand or power tool cleaning. Abrasive blasting produces the greatest level of dust and debris. The use of vacuum attachments on power tools can significantly reduce dust generation. Water cleaning methods produce less debris, although they generate runoff, which requires appropriate containment and treatment.

The removal of lead-based paint is of particular concern, and existing coatings suspected of containing lead should be sampled prior to their removal. The use of containment limits the likelihood of lead entering the environment but increases exposure levels of lead to workers. The level of containment required depends on the amount of paint to be removed and the sensitivity of the surrounding environment (in terms of sensitive land uses, such as residential areas, schools, hospitals and protected ecological areas). It is recommended that, where possible, open abrasive blasting is avoided and vacuum attachments are used on blasting and power tools to reduce emissions.

b. Surface cleaning

Where high-pressure water or steam cleaners are used for surface cleaning reference should be made to existing guidance (Reference 3). The use of grit blasting with slag derived grit should be avoided where possible. Some slag-derived grits contain significant levels of heavy metals (such as copper) which can pollute surface waters. Alternative methods include using other blasting media (such as garnet or other low silica mineral abrasive), blasting with vacuum attachments and pressure water blasting.

c. Painting

Pollution prevention guidance for maintenance painting is essentially the same as for paint removal although the volume of waste and size of operations will be considerably reduced. Dust and debris should be removed by sweeping or vacuum cleaning prior to painting. Paints can be applied on-site using brush, conventional spray or airless spray. Because of the potential for large volumes of overspray, alternatives to conventional spray, such as the use of electrostatic spray units, should be considered.

Water-based or solvent-free paints can be used as an alternative to solvent-based paints. However, a life cycle analysis may indicate that a high build, surface tolerant, solvent-based paint will be maintenance free for considerably longer than a water-based one and, as a consequence, will have less impact on the environment over the life of the structure. If solvent based paints are to be used, those with high solids should be given primary consideration.

Primers containing 1,1,1 trichloroethane and paints or primers containing lead must be avoided (Reference 4). Any addition of thinners should be undertaken at a safe distance from the surface water. For the replacement of structural elements, where practicable factory finished components should be used in preference to site-finished components.

d. Concrete and cement

Fresh concrete and cement are very alkaline and can cause serious pollution in a watercourse. Particular care should be taken with the use of these materials when repairing concrete structures. Spray techniques for applying concrete should be used with care as over-application can result in spillages. Where spray techniques are used, appropriate protective measures should be adopted. Concrete and equipment washings must not be released into surface waters and mixing should be carried out in a contained area as far away as practicable from surface waters and surface water drains.

e. Application of surface treatments to concrete

Where protective coatings based on epoxy and polyurethane resins are to be site-applied, solvent-free or low-solvent products are preferred. Sealants and glazing compound formulations using asbestos fibre as filler, or lead as the drying agent, and those containing hazardous solvents (such as toluene or chlorinated hydrocarbons) must be avoided. Water-based adhesives are preferable to solvent-based systems. Any addition of thinners should be undertaken at a safe distance from the surface water. Silane (trialkoxy isobutyl silane) is often used to protect concrete structures against the ingress of chlorides. Silane is highly damaging to the aquatic environment and rigorous containment measures should be implemented where it is to be used.

5. GUIDANCE ON CONTAINMENT

A containment system can be used to enclose an entire work area or just a hand tool to minimise the risk of pollution during maintenance activities by preventing debris from entering surface waters and contaminating surrounding land. **The Agency recommends the use of containment systems where practicable**.

Dust, debris and wastewater are the most common pollutants arising from structure maintenance. The containment system used should be selected according to the maintenance method employed and the sensitivity of the environment. In general a combination of features including air or water impenetrable walls, rigid or flexible framing, fully sealed joints, airlocks or resealable entryways, negative air pressure (achieved by forced or natural air flow) and exhaust air filtration is required to provide the appropriate

level of containment. Properly filtered ventilation must be provided to prevent build-up of dust and minimise the possibility of air escaping through breaches of the containment.

The discharge of wastewater directly to surface waters without approval from the Agency is an offence. The most efficient method of containing waters generated from surface washing is by a vacuum attached to the spray nozzle. The containment of water used for pressure washing is an important pollution concern. In some circumstances, it may be possible to use a barge with a wastewater containment facility when working over water.

Secure storage of all materials in appropriate containers is vital. This should be above any anticipated water level and at a sufficient distance from surface waters to minimise the risk of a spill entering the watercourse. In addition, fuel, oils and chemicals should be stored on an impervious base within a bunded area. See PPG2 - Reference 5 for details of oil storage.

6. WASTE MANAGEMENT GUIDANCE

a. On-site collection

Air pressure or a water stream that redistributes or dilutes waste materials should not be used to clean up debris. Dust and debris should be removed by sweeping or vacuum cleaning (such as by continuous suction, possibly into a containment tank or collection hopper on land or a barge). Spent blast media and paint residue should be collected into bags.

b. Storage

Skips and waste in bags should be covered to prevent dust and litter dispersion and to prevent the ingress of rainwater. Liquid wastes must be securely stored to prevent the risk of escape and bunding may be appropriate. Waste containers should be clearly labelled and wastes should be stored in designated areas, isolated from surface water drains and located well away from surface waters.

c. Special waste

Certain hazardous wastes generated during maintenance, including waste paints, empty paint and chemical containers, lead paint debris and oil contaminated materials, may be classified as special waste. Particular precautions are required when transporting and disposing of special waste (Reference 6), including the pre-notification of the Agency prior to waste removal.

d. Treatment and disposal

Under the Duty of Care (Reference 7) waste producers are required to ensure that waste is disposed of, or recovered correctly. The credentials of the waste carrier and the operator of the site where the waste is to be deposited should be checked by inspecting their waste management licences and ensuring that they cover the type of waste in question. A check should be carried out to ensure the waste carrier is registered with the Agency. Waste management licences should indicate whether persons are authorised to dispose of or recover Special Waste. Waste transfer notes must be retained for two years and Special Waste consignment notes for three years (Reference 6).

Prior to handing over waste for disposal, the contractor must ensure that the waste containers are accompanied by an adequate description to allow its appropriate disposal. The description is generally included on a waste transfer note (or consignment note in the case of Special Waste), which accompanies the waste from its place of origin to final disposal location.

e. Liquid wastes

Liquid wastes, including runoff from material storage areas and from wet methods of preparation, should never be released directly into surface waters or surface water drains without prior approval from the Agency. Discharge to foul sewers may be possible, subject to the approval of the sewerage undertaker. Suitable treatment for wastewater containing solid materials only may be possible using settlement lagoons or a grassed area, although care should be taken to locate these treatment facilities away from surface waters. Contact the Agency for further advice.

7. EMERGENCIES

Adequate emergency equipment should be provided on site during maintenance of structures over or adjacent to water. Spill kits containing absorbent material, or booms for emergency containment should be provided on site in the event of a spillage. Contingency procedures should be developed during the planning stage and staff trained in their implementation. In the event of a spillage, the spilled material should be contained and the Agency notified immediately using the emergency hotline number listed at the end of this guidance.

8. REFERENCES

1. PPG 6: Working at construction and demolition sites

2. PPG 5: Works in, near or liable to affect watercourses

3. PPG13: High pressure water and steam cleaners

4. Environmental Impact of Building and Construction Materials, Volume F Paints and Coatings, Adhesives and Sealants, Project Report 16: Construction Industry Research and Information Association: Tel: 020 7222 8891

5. PPG2: Above ground storage tanks

6. A guide to the Special Waste Regulations 1996 (as amended): Environment Agency
   A guide to the Special Waste Regulations 1996: Scottish Environment Protection Agency
   A guide to the Special Waste Regulations (Northern Ireland) 1998: Environment and Heritage Service

7. Waste Management - The Duty of Care- A code of practice (revised 1996):
   The Stationery Office: ISBN 0 11 753210 : Tel: 020 7873 0011/9090

References 1,2,3,5 & 6 are available free of charge from the Agencies

This guidance was produced through Environment Agency national R&D Project P2-145.

All the Agencies' pollution prevention guidance notes are available on the web sites listed below.

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The 24-hour emergency hotline number for reporting all environmental incidents relating to air, land and water in England, Wales, Scotland and Northern Ireland.

EMERGENCY HOTLINE
0800 80 70 60

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Printed on Cyclus TCF Recycled Paper.

HO-11/01-5K-C-BEYF