

Minnesota Department of Transportation
Best Management Practice (BMP) for
Concrete Washoff of Vehicle, Equipment, Pavement and Walls
May 2009, v3.

The NPDES permit requires that concrete washoff be managed on all construction projects. This document is Mn/DOT’s interpretation of MPCA’s guidance on concrete washoff dated February 2009, and describes recommended best management practices for concrete washoff. As improvements in technology occur for managing liquid and solid concrete washoff process, the department will amend this guidance document.

Mn/DOT Guidance: The NPDES construction permit requires concrete washoff management on every project that uses concrete vehicles, equipment, tools and surface preparation, requiring cleaning (Part IV.F.3) or washoff to remain functional, provide public safety or for engineering process, with SWPPP amendments as necessary (Part III.A.5 & Part III.A.7) to prevent the discharge of concrete liquids and solids from making contact with soils unless in defined, designated areas using Best Management Practices to the Maximum Extent Practicable (Part V.C & MS4 Permit).

- Accidental Discharge: If washoff operations makes accidental discharge to waters of the state, state law requires notifying (Minn R 7045.0468 Subp 6) the State duty Officer and immediately removing discharge materials and restoring the site.
- Designated Area: All designated concrete washoff areas must be determined daily, as needed, and the SWPPP amended to show the locations, as required by permit.
- Special Location Restriction: Washoff BMP must be sited more than 200 feet from a DNR public or permit listed Special Water unless robust, redundant best practice protection measures are installed with wash recovery measures.
- The Department reserves the right to indicate in the plans and final details where or where not concrete washoff may occur.

The following options are recommended as best management practices for handling concrete wash water from machine, equipment and surface washoff:

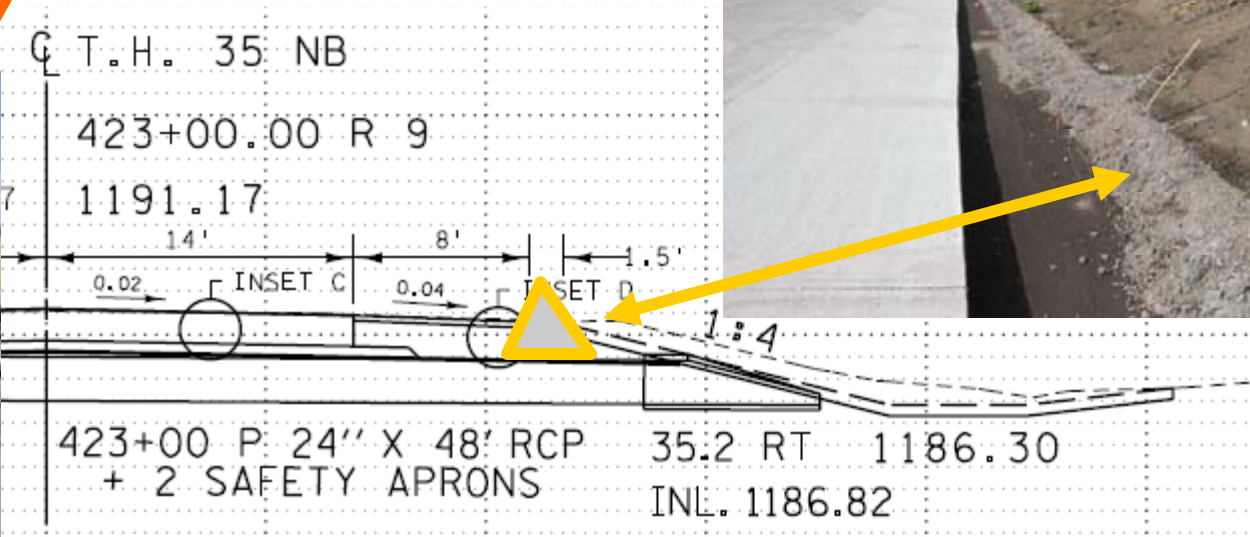
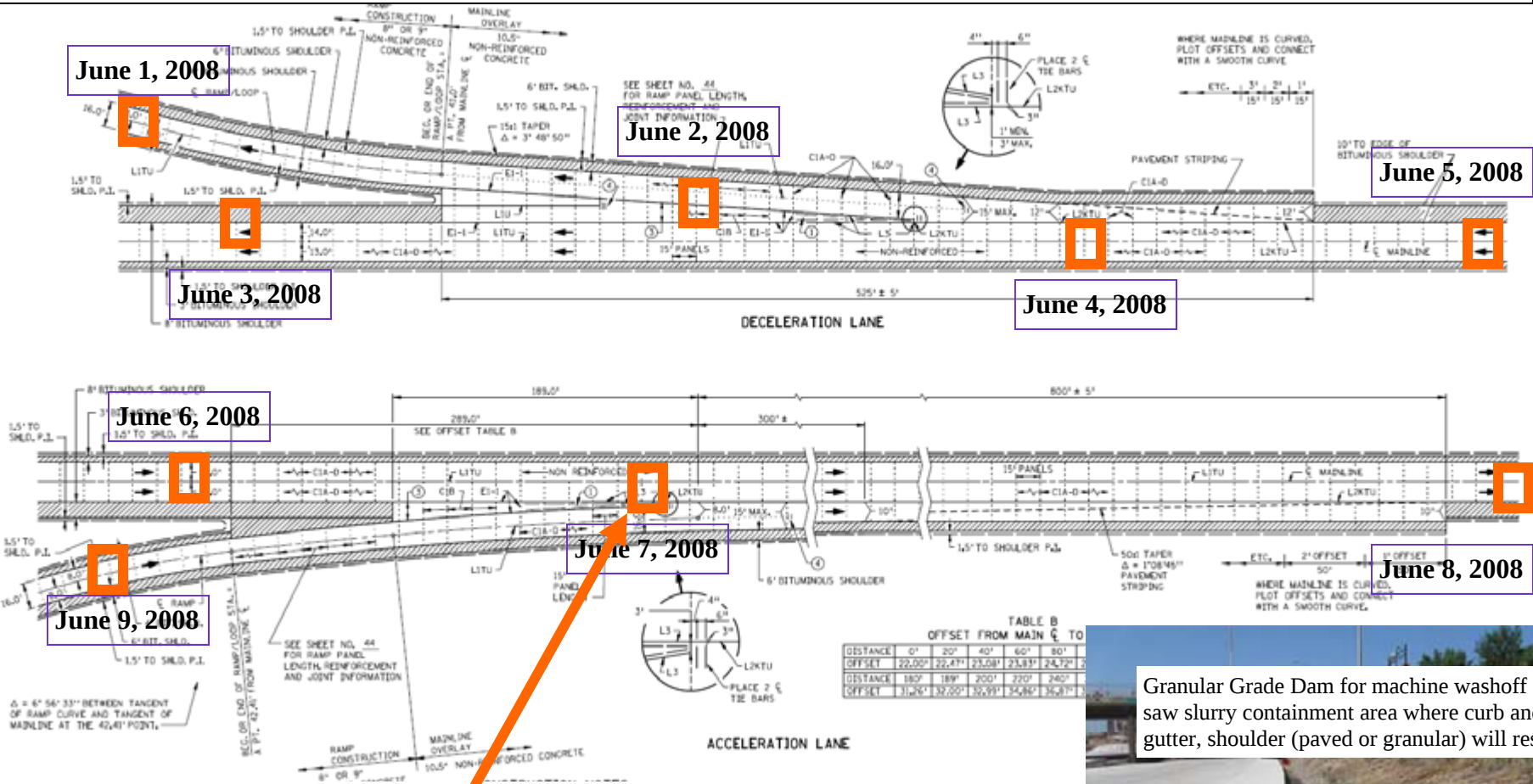
- Method A: Designated Area Open Subgrade or Shoulder
- Method B: Designated Area Closed Surface
- Method C: Work Area Isolation
- Method D: Sump Manhole Isolation Trap & Vacuum Removal

Spill Response Program: The contractor must have on hand the following items capable of capturing, containing or treating accidental discharge of concrete materials on ground and surface waters:

1. dry washed sand or wood slash mulch that can be used to temporarily solidify liquid concrete washout fluids to facilitate emergency pickup, and
2. Citric acid, dry ice or CO2 compressed gas cylinder (CO2 Sparging) to pH neutralize overflowing traps, berms, dumpsters or other emergency cementitious discharge due to weather or under-capacity containment conditions.

1. Prevent nuisance conditions as defined in Minn. R. 7050.0210, subp. 2
2. Compliance to the NPDES Construction and Minnesota State Disposal System (SDS) Permit of the Federal Clean Water Act, as amended, (33 U.S.C. 1251 et seq.), 40 CFR 122, 123, and 124, as amended, et seq.; Minn. Stat. chs. 115 and 116, as amended, Minn. R. chs. 7001 and 7090
3. Protection of ground and surface waters as defined in Minn. Stat. § 115.01, subd. 22
4. Beneficial reuse as defined in Minn. R. 7035.2860, subp. 4, item I

Paving Machine Designated Washoff Update Plan Amendments to the SWPPP example (needs to be signed and dated by the Erosion Control Supervisor, Project Engineer, or person delegated by the Project Owner). At the end of each day of concrete equipment utilization the contractor designates the location of equipment washoff on the paving plan sheet or other suitable plan document after water resource inspection protection measures are installed or made functional, and as indicated in this guidance document.

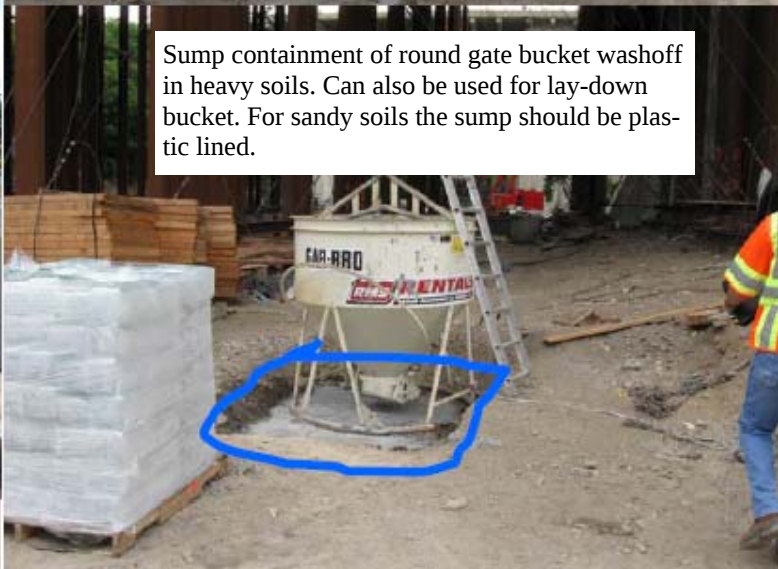
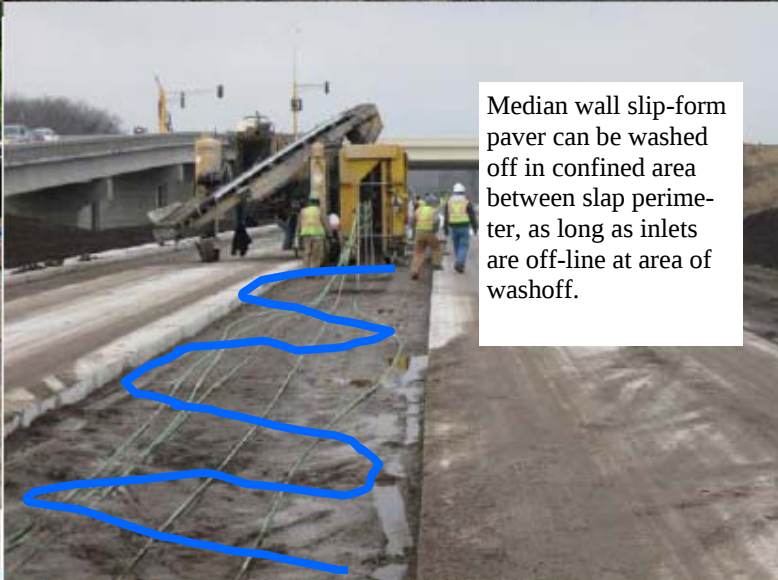
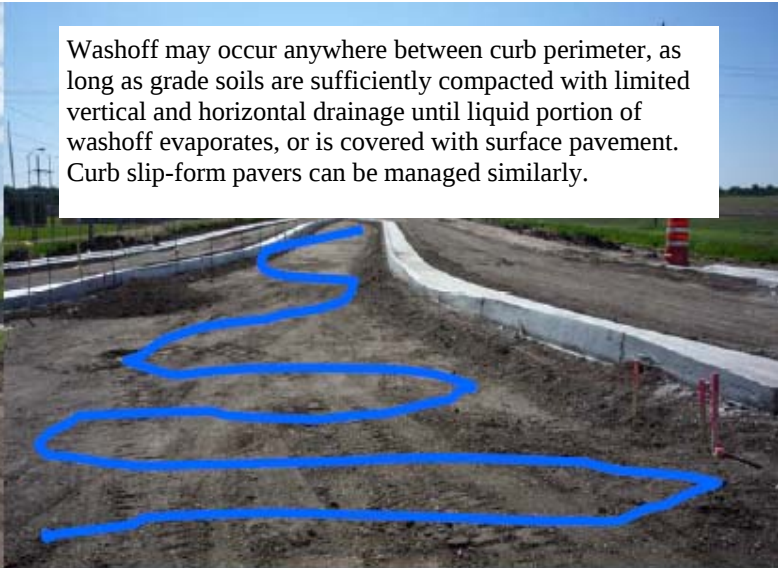
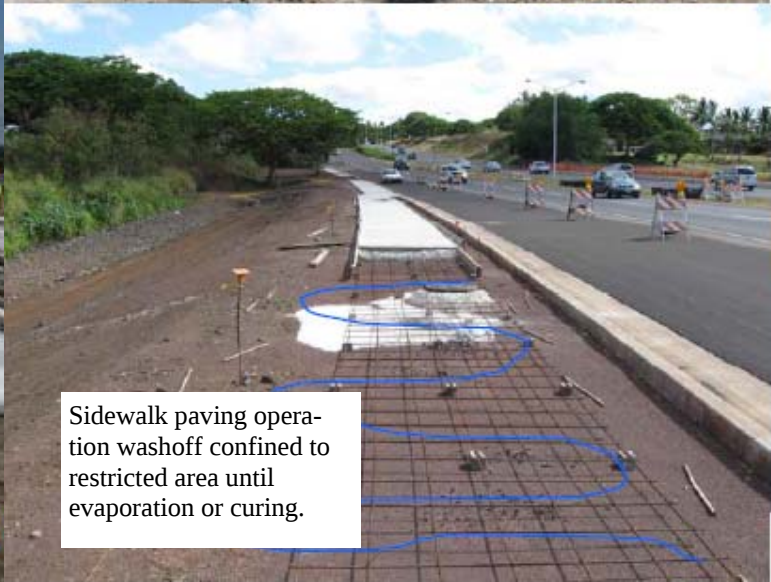
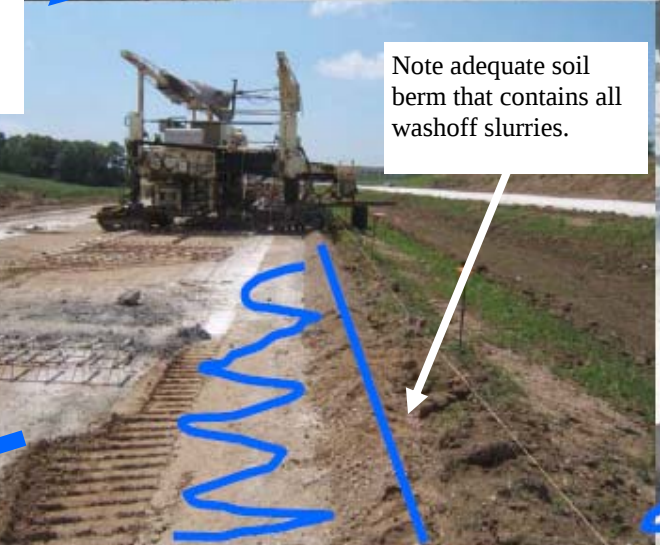
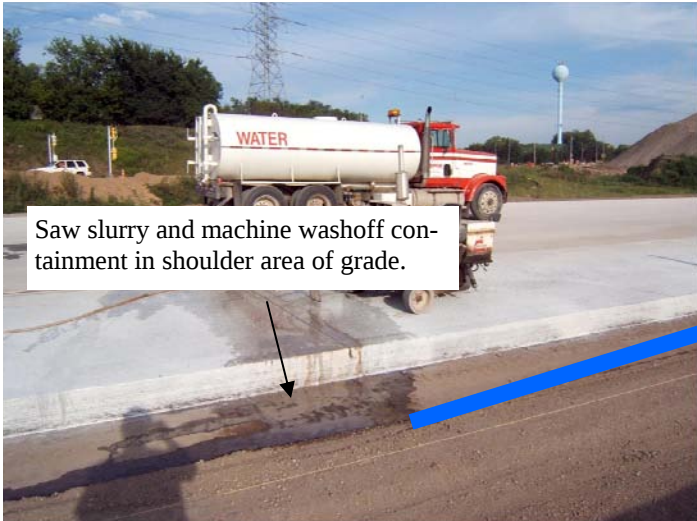


Paving Machine washoff on grade, with zero storm water discharge potential (evaporation or absorption to grade), designated at the end of

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Method A: Designated Area Open Subgrade/
Shoulder**

This method uses low infiltration grade or presurfaced shoulder areas to confine all washoff generated materials from vehicles, equipment, tools, machines to areas that will receive hard surfacing as part of the project (roads, shoulders, medians).

To facilitate equipment washoff containment, it is advised prior to string line installation, to form a granular filter berm unless the subgrade is already depressed. In areas where a berm or subgrade cut can not be constructed, the contractor must install an appropriate concrete slurry perimeter sufficient to contain all run off wastes.



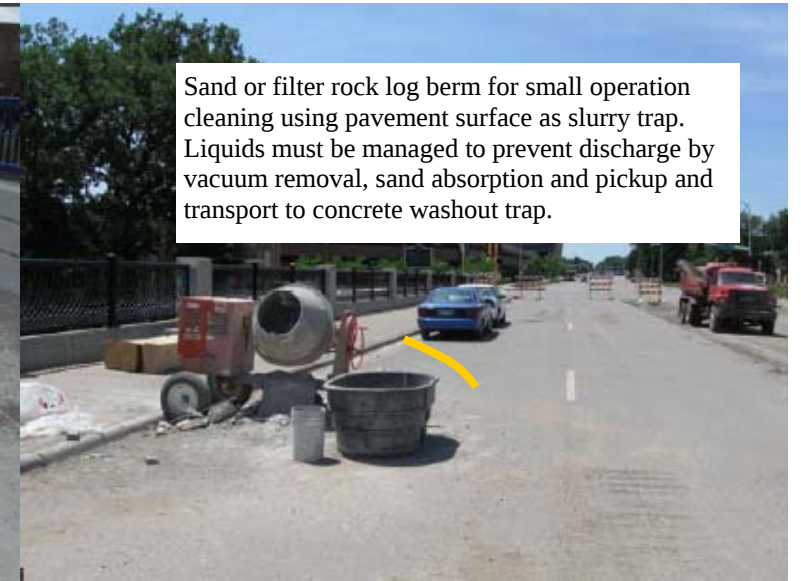
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Method B: Designated Area Closed Surface

This method uses the road, gutter areas or other hard surface areas to confine all washoff generated materials from vehicles, equipment, tools, machines, by utilizing sand bag perimeters, gutter sediment dams, concrete flocculent filter logs, plugged catch basins, foam sealed scuppers, cuts and cracks. At the end of each day, or concurrent with the washoff operation, the SWPPP amendment will indicate the method to clean the hard surface of all collected washoff slurries by vacuum, sweeping, and wash filtering.



Storm drain inlet sealed with plywood plug temporarily foamed in place, or scupper drain plug with foam using curb and gutter as perimeter control and road surface as washoff trap for end of paving machine clean-



Sand or filter rock log berm for small operation cleaning using pavement surface as slurry trap. Liquids must be managed to prevent discharge by vacuum removal, sand absorption and pickup and transport to concrete washout trap.



Rock filter log scupper or curb box plugs for slurry washoff containment.



Defined area washoff using sand bag dike or other best management practice to contain washoff slurry for later removal from pavement surface.



Sand bag perimeter trap using gutter washoff slurry trap, followed by active sweeping with dust control management



Washoff containment on plastic sheeting, berm framed with wood, sand, rock or sandbags.



Sealing of saw cuts, drain scuppers to contain washoff concrete slurries, using pavement as a trap held by walk perimeter.



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Method C: Work Area Isolation.
This method uses isolation soil covers and confinement technologies to control the discharge of concrete products from washing and surface preparation operations. The work area isolation methods that could be used include geotextile covered aggregate, diapers, floating barges, in-place wash traps, and temporary decking to capture washwater and cementitious solids.



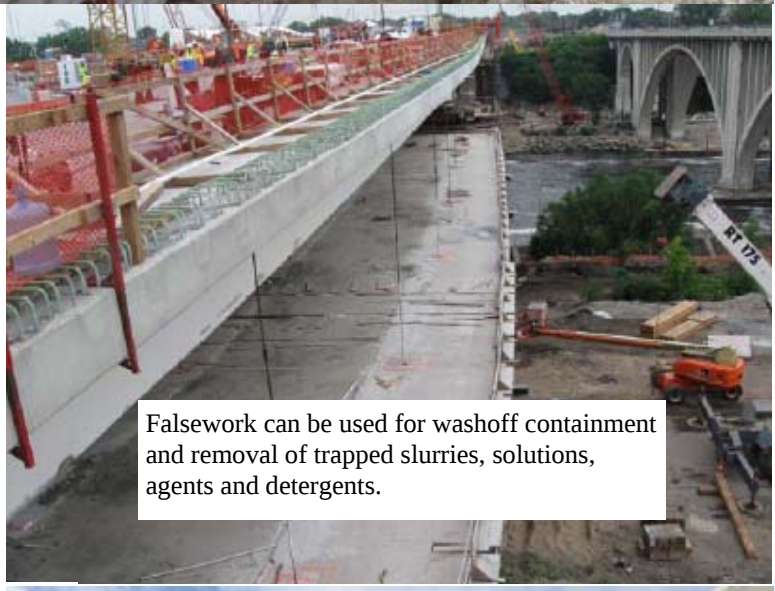
Concrete structure washoff containment trap for preparation of assembly, coatings, stucco, and staining operations.



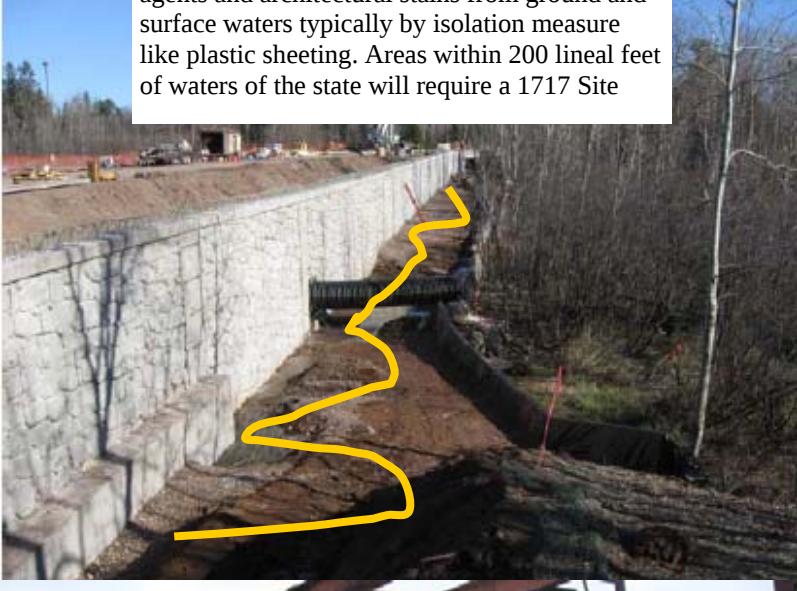
Concrete form washoff in original excavation as long as the washwater does not enter the ground water by infiltration or drain tile flow to surface waters



Robust best management practices must be employed to trap surface preparation cleaning agents and architectural stains from ground and surface waters typically by isolation measure like plastic sheeting. Areas within 200 lineal feet of waters of the state will require a 1717 Site



Falsework can be used for washoff containment and removal of trapped slurries, solutions, agents and detergents.



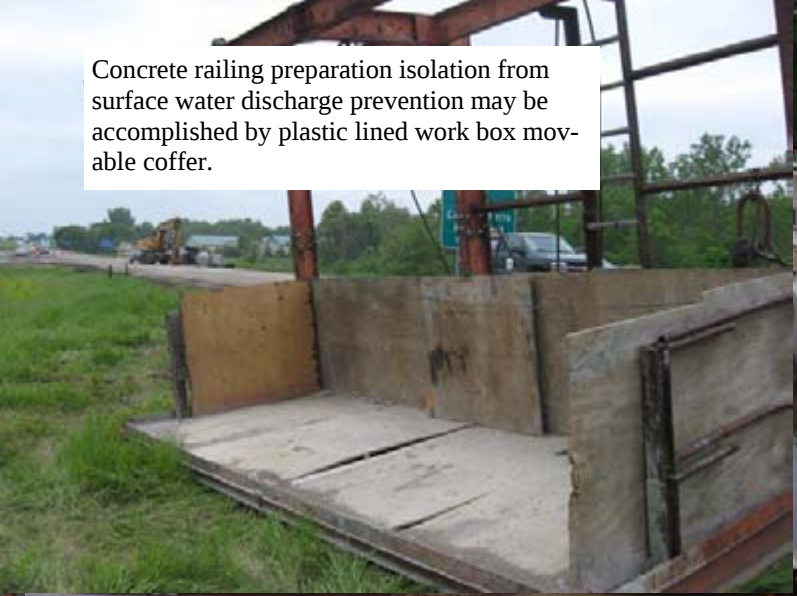
Barge Capture Method



Diaper Capture Method



Staging Platform Method



Concrete railing preparation isolation from surface water discharge prevention may be accomplished by plastic lined work box movable coffer.

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**Method D: Sump Manhole Isolation Trap &
Vacuum Removal**

This method uses an inflatable flexible bladder apparatus to plug a gutter pipe outlet drop structure to form a slurry sump trap with end of day or when full by vacuum removal and sump cleaning from road surfaces, gutter lines, expansion saw cuttings, and accidental slurry spills of concrete washoff.



Washoff of public road prior for safety preparation



Washoff slurry must remain in gutter flow path by use of sand bags, rock logs or other best management practice above curb



Sump trap must be cleaned as necessary by vacuum pump system, or managed by commercial concrete washout companies capable of handling slurry waste, treatment and transport.



Air bladder in structure with rope tether and air fitting



Inflatable air bladder in structure outlet

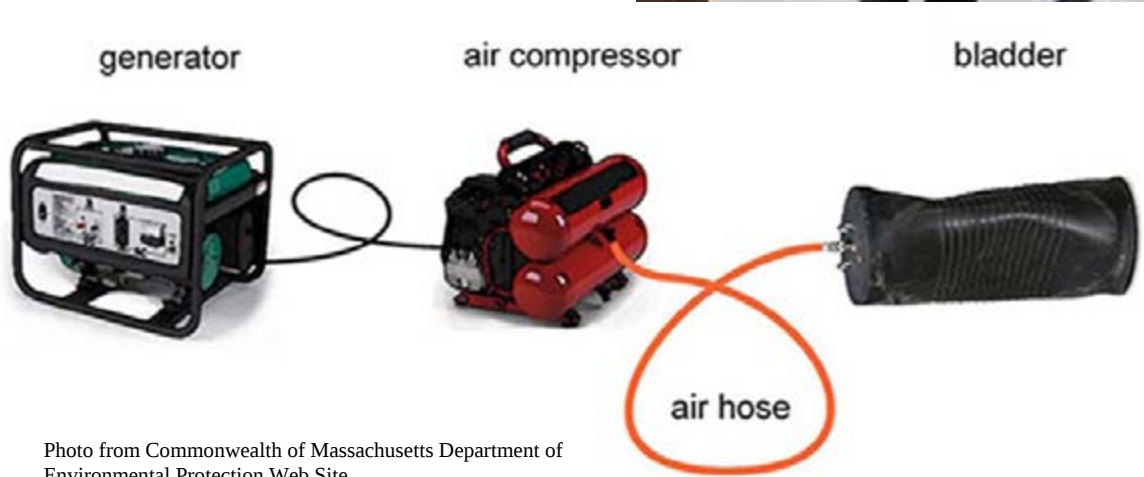
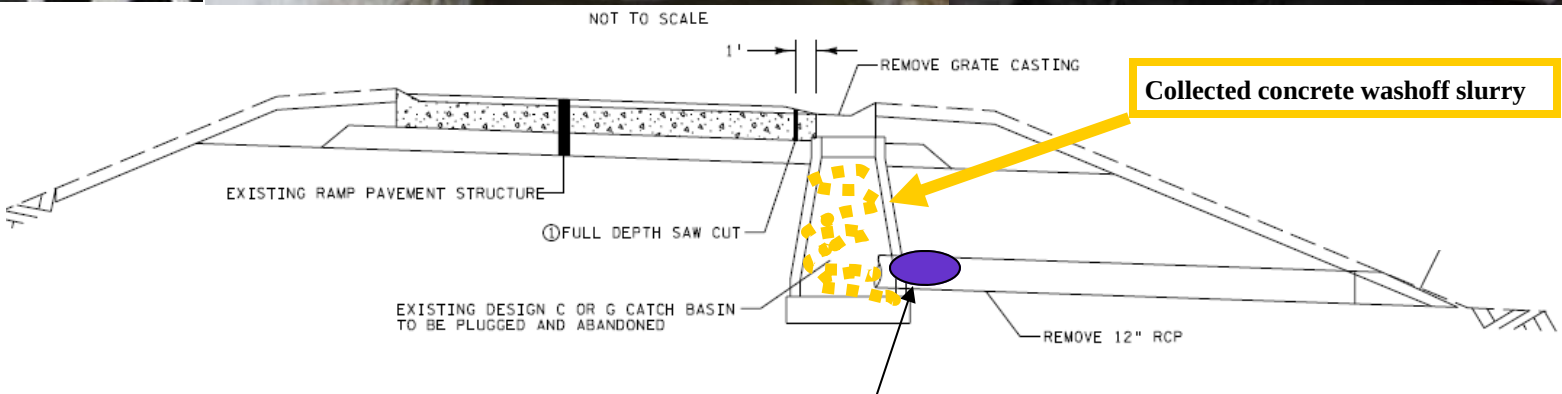


Photo from Commonwealth of Massachusetts Department of Environmental Protection Web Site



Inflatable bladder wash off containment plug system in manhole sump. Material to be vacuumed once wash slurry operations are complete, but prior to the next storm.