



<p>SUPERSEDED BY EI 02-032 EFFECTIVE 5/8/03</p>		<p>ENGINEERING INSTRUCTION <i>New York State Department of Transportation</i></p>	<p>94-030 Supersedes: EI 86-8</p>
<p>Title: MAINTENANCE CLEANING AND WASHING OF BRIDGES</p>			
<p>Distribution: <input checked="" type="checkbox"/> Central Office(30) <input checked="" type="checkbox"/> Regions(32) <input checked="" type="checkbox"/> Consultants(34)</p>	<p>Approved:  <hr/> Date P. J. Clark, Deputy Chief Eng., Facil. Design Div.</p>		

EFFECTIVE DATE This instruction will become effective with the letting of January 12, 1995.

PURPOSE The purposes of this Engineering Instruction are: to provide guidance regarding the maintenance washing of bridges; to transmit two special specifications (15633.94nnnn Maintenance Cleaning and Washing of Bridges and 15633.95nnnn Maintenance Cleaning and Washing of Bridges, Concrete Surfaces) under which the work may be done, and; to disapprove the following special specifications:

02633.90	03633.90	06633.90	08633.90	09633.90
15633.90	03633.92.			

BACKGROUND NYSDOT performs maintenance washing of highway bridges in order to increase bridge life, facilitate bridge inspection, improve bridge appearance and benefit bridge safety for vehicular traffic, pedestrians and cyclists using the bridge. In doing so however, DOT must not violate water quality standards.

The New York State Department of Environmental Conservation (DEC) has established water quality standards, which are contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York. These standards include, but are not limited to:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;
2. There shall be no suspended, colloidal and settleable solids that will cause deposition or impair the waters for their best usage; and
3. There shall be no residue from oil and floating substances, visible oil film, globules or grease.

Also, Article 24 of the Environmental Conservation Law (ECL), pursuant to Section 24-0701(2), prohibits any form of pollution in or within 100 feet of state regulated wetlands without a permit.

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Many of DOT's bridges span wetlands, streams and other water bodies, and recently a few bridge washing contractors have been cited for water quality violations by regulatory agencies. The primary concerns involved with bridge washing over waterbodies with respect to water quality are degradation of trout spawning habitat and decreased fish egg survival due to heavy sediment (sand) loads, and various fish, wildlife and invertebrate vitality concerns due to concentrated spot loadings of salt, lead (from lead paint), ammonia (from bird droppings), and thermal discharges.

Paint condition is an important factor in determining what can be done to the bridge. The table below describes the paint rating categories and is taken from Form TP 350, Box 32.

<u>Rating</u>	<u>Description</u>
7	Paint in good condition.
6	Paint generally in good condition, may require some touch-up painting.
5	Paint system generally showing signs of deterioration, but <u>no</u> corrosion is yet present.
4	Paint system in localized areas is in poor condition and minor corrosion is present requiring at least touch-up sandblasting and painting at the present time.
3	Paint generally in poor condition and corrosion is present but not yet serious. A 3 rated bridge needs to be repainted.
2	Paint in poor condition and serious corrosion in localized areas.
1	Paint in poor condition accompanied by extensive serious corrosion. Besides painting, extensive structural work is required.

Note: Railing paint is not rated under this item (Form TP 350, Box 24)

This EI and attendant specification do not apply to cleaning bridges in preparation for repainting the bridge.

Maintenance bridge washing is conducted as needed and most bridges have now been washed at least once. This means that most bridges will not have excessive amounts of sediment and other debris on or underneath the bridge deck.

To conclude, DOT projects are highly visible and are under increasing scrutiny regarding their impacts on water quality from local, state and federal resource/regulatory agencies, the general public, environmental and conservancy groups, sportsmen and municipal officials. This increased scrutiny will likely result in more potential water quality violations involving bridge washing unless appropriate steps are taken to address resource concerns.

GUIDELINES. All bridges, regardless of what they span and regardless of their paint condition may be washed under Item 15633.95nnnn Maintenance Washing of Bridges, Concrete Surfaces. Item 15633.94nnnn Maintenance Cleaning and Washing of Bridges however may not be used to wash bridges with paint ratings 3 or lower, based on a paint rating not older than two years, that span wetlands or bodies of water but may be used on bridges spanning dry land regardless of paint condition provided the chips of paint that are dislodged from the bridge can be economically and reasonably recovered by ordinary means, such as

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common sweeping, vacuuming, or dropcloths. The recovered chips, if lead containing, must be disposed of as hazardous material.

Bridges that span sensitive streams, including those categorized as CT and CT(s) (ie. trout streams) are sensitive to thermal shock and other pollutants. These structures should therefore be washed only at times when stream flows are high enough to ameliorate these effects. Therefore, streams that are classified by DEC as CT(s) ie. trout spawning shall be washed prior to July 1. In addition, so as to not interfere with D.E.C.'s stocking program and the peak fishing season, bridges located at DEC yearling trout stocking sites should not be washed during the month of April.

The designer should indicate in the proposal all structures at which there will be date restrictions imposed on the Contractor. Information on the location of streams categorized as CT or CT(s) to develop such a table may be obtained from the D.E.C. regional offices and in some NYSDOT regions from the Environmental Coordinators.

In addition to noting date restrictions, the designer should also indicate in the proposal if on-site disposal of small quantities of sand, cinders, or similar materials may not be disposed of on-site.

FIELD INFORMATION. Before washing the bridge, all trash and other debris must be collected from the bridge. This material will then be disposed of in one of three ways. Unless indicated otherwise in the proposal, sand, dirt, cinders and similar material may be disposed of on-site if approved by the Engineer and if the total volume is less than one cubic meter(1.3 CY). If disposal is on-site it must be at an upland area where the material cannot enter a wetland, stream or other waterbody. If the volume of sand, dirt, cinders and similar material is more than one cubic meter or if the Engineer does not approve of on-site disposal, or if on-site disposal is prohibited by the proposal, then the material must be suitably disposed of off-site where it cannot enter a wetland, stream or other waterbody. Other trash and debris, such as paper, rubber, metal, wood and similar materials shall be properly disposed of off-site (C & D dump or landfill). Paint chips will likely contain lead and thus must be disposed of as hazardous waste.

If any steel portions of the bridge surface have flaking paint then that portion of the steel surface where flaking paint is present should not be washed. All other portions of the bridge, including the underside, should still be washed.

It is very important to note that flaking paint will not be removed from bridges prior to washing as was the practice in the past. This is due to practical and economical concerns over methods used to collect paint chips. Nonetheless there remain environmental and health concerns over the alternative of non-collection which are being addressed during design by the judicious selection of structures to be included in the contract and the appropriate selection of which of the two bridge washing items to use. Errors in either of these selections can occur and in addition paint condition can continue to deteriorate between the time the bridge was selected for washing and the time the work is actually performed. Therefore it is acknowledged that the Engineer may have to use individual descretion and field staff should be prepared to excersize judgement regarding which surfaces are to be cleaned. Either of the two specifications allow the excersize of that judgement. It should be noted that small amounts of loose paint chips which have settled on the flanges of beams will be considered *diminimus* with minimal environmental effect, and therefore need not be removed prior to the washing operations.

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DESIGNER INFORMATION . The transmitted items incorporate the work from Item 15566.1302 Cleaning Drainage Systems. Therefore it will not be necessary to use that item with the transmitted specifications. Item 15633.94 Maintenance Cleaning and Washing of Bridges and 15633.95 Maintenance Cleaning and Washing of Bridges, Concrete Surfaces are main office insert specifications. One of them, but not both of them, should be included for each structure to be washed. Item 15566.1302 Cleaning Drainage Systems remains an approved specification and may be used to clean the drainage system on a structure whenever necessary to do so in conjunction with work other than the maintenance cleaning and washing of the structure.

In addition, the bridge washing specifications require the downspouts be cleaned but only down to the first cleanout located above the ground or in cases of downspouts that discharge to a splashblock to the outlet. Therefore, if the downspout discharges into a closed drainage system or a culvert and it is desired to clean the closed system, then it will be necessary to include the pay items covering the cleaning of pipes for that work. Currently these are 203.17 and 203.18.

It is expected that the implementation of this instruction will cause a minimal, but justifiable, increase in project costs.

CONTACT PERSON If you have any questions, please contact Kyle Williams of the Environmental Analysis Bureau at 518 457-5672.

ITEM 15633.94 - MAINTENANCE CLEANING AND WASHING OF BRIDGES

DESCRIPTION

This work shall consist of cleaning bridges by collecting and properly disposing of trash and debris from the bridge, pressure washing the deck, exposed concrete, asphalt and steel bridge surfaces, and cleaning the drainage system and other drainage ways as described herein.

DEFINITIONS

Loose paint chips- paint chips that are no longer adhered to bridge surface,
Flaking paint chips- paint chips that are still partially adhered to bridge surface
Trash and debris- including but not limited to sand, soil, cinders, silt, dirt, mud, salt, glass, paper, rubber, metal, wood, loose paint chips and loose pieces of concrete and asphalt and rock or stones.

MATERIALS

Water for pressure washing shall be clean, fresh water. Water may be heated except over water or if prohibited by the Engineer. Equipment for collecting trash and other debris from bridge decks shall be determined by the contractor, subject to the approval of the Engineer, and will normally consist of, but not be limited to, industrial vacuums, brushes, brooms, shovels or plastic shovels when indicated in the contract documents, directed by the Engineer or when other shovels are damaging coated surfaces. Detergents or other agents shall not be used.

CONSTRUCTION DETAILS

Unless otherwise indicated in the contract documents, all bridge surfaces shall be cleaned, including but not limited to bridge decks, sidewalks, curbs, approach slabs and shoulders, wing walls, back walls, bridge seats, railings, parapets, bridge bearings, piers and pier caps, columns, drainage features, structural steel, light standards, signs, concrete paving block, concrete beams and other surfaces as designated by the Engineer. Limited paved drainage ways and gutters off-structure also shall also be cleaned of debris that if permitted to remain would cast runoff back onto the structure or into its drainage ways including those that may exist underneath the structure. The extent of such removal shall be less than 100 feet but it is intended that they be only the minimum necessary to accomplish the purpose of ensuring that runoff is not cast back onto the structure being cleaned or its drainage ways.

Block paving and paved surfaces other than asphalt paving between adjacent or parallel bridges shall also be cleaned if required by the engineer or if indicated in the contract documents. Such cleaning shall be limited to narrow areas less than twenty four feet in width.

All loose trash and debris shall be collected by sweeping, shoveling, vacuuming and other suitable methods. The contractor shall not cause or allow trash and/or debris from the bridge to be deposited into a wetland, stream, other water body or active traffic lanes during the cleaning of the bridge.

Sand, dirt, cinders and similar debris collected from the bridge deck may be disposed of at an on-site upland area when not prohibited by the contract documents, if approved by the Engineer, and if the amount of this material does not exceed one cubic meter (1.31 cubic yards) in volume. This material shall be disposed of in such a way that it cannot enter a wetland, stream or other water body. If the amount of sand, dirt, cinders and similar debris is greater than one cubic meter, or if the EIC does not

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approve of on-site disposal of the material, then the material shall be disposed at a suitable off-site disposal facility.

All other trash and debris collected from the bridge shall be disposed of at a suitable off-site disposal facility.

When trash and debris collection from the bridge is complete, all bridge surfaces, including the underside of the bridge, shall be pressure washed with clean, fresh water. The washing shall be adequate to remove all visible dirt, salt, animal waste and similar debris, however if flaking paint exists on the bridge surface then the steel surface on that portion of the span where paint is flaking shall not be washed.

The equipment for pressure washing shall be operated at pressures that do not damage the paint or other coatings on the bridge or undercut the grout or harm the masonry plates beneath the bearings. When washing stream and wetland bridges, the quantity and flow rate of the water used shall be the minimum necessary, as approved by the Engineer, to clean foreign materials from the surfaces where they are encountered.

Pressure washing will not be allowed when ambient temperatures are less than 5° C (40°F) or when ambient temperatures are expected to drop below 5°C before the bridge is dry. The Engineer will be the sole determiner as to when temperatures lower than 5°C are likely to occur.

Scuppers, troughs, and downspouts to the first cleanout above ground level or to their outlet if above ground shall be cleaned by using high pressure water, vacuum, or other techniques satisfactory to the Engineer. Chemical cleaning compounds shall not be used during flushing operations, unless their use has been approved by the D.E.C. and clearance has been given by the Regional Director for their use. Debris from the cleaning operations shall not be deposited in, or around the structure, highway roadway slopes, drainage systems or streams. It shall be disposed of in a manner satisfactory to the Engineer.

Cleaned scuppers, downspouts and troughs shall allow the unimpeded flow of water. After cleaning has been completed, the Engineer shall determine the flow characteristics of the cleaned system. If, in the Engineer's opinion, flow is still impeded because of the presence of dirt or other removable matter or object in the system, the Engineer will direct the Contractor to reclean the system, including dismantling and reinstalling, if required, at no additional cost to the State. Any damage to the system or structure that occurs during the operations shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the State.

When concrete paving block is cleaned and washed, the removal of weeds between the blocks will not be required under this item.

All structures or bridge drainage systems over water courses shall be washed during the periods indicated in the Contract Documents. If no schedule is presented, the following shall apply. Washing shall occur only when adequate flow in the stream exists to dilute possible contaminants as determined by the Engineer. Operations shall be sequenced so as to clean structures over small bodies of water or small streams in the spring of the year when flows are greatest. Streams categorized by DEC as Ct(s) ie. trout spawning, shall be washed prior to July 1 and bridges located at DEC yearling trout stocking sites shall not be washed during April. Washing, whether during a scheduled period or not, shall be stopped if stream flow drops below normal or if directed by the Engineer.

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Work shall be conducted in such a manner so as not to damage or remove existing epoxy protective coatings or existing intact or flaking paint coatings or any other protective coating on the bridge. Any damage to the structure being worked on or to surrounding structures and property shall be repaired by the Contractor to the satisfaction of the Engineer and at no cost to the state.

After all trash and debris has been collected, the drainage system cleaned and washing is completed, the bridge will be inspected by the Engineer. The cleaned bridge surfaces shall be free of trash and debris as described under Construction Details and the drainage system free running except those systems the Engineer agrees were damaged prior to any cleaning work on the bridge.

Maintenance and protection of traffic shall be in accordance with contract plans, Section 619 of the Standard Specifications, or as ordered by engineer. High pressure spray and high volume drainage of wash water shall be controlled so as to not present a hazard to traffic or to cause erosion of adjacent ground or drainage ways. Under no circumstances shall high pressure spray or high volume drainage of wash water be discharged directly into active traffic lanes.

METHOD OF MEASUREMENT

The work will be measured for payment of the lump sum basis.

BASIS OF PAYMENT

The lump sum price bid shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete work including the cost of cleaning the drainage system; collecting, removing and disposing of trash and debris including that off structure but necessary to prevent backup of runoff onto the structure or its drainage ways: the cost of maintaining and protecting traffic shall be separately measured and paid.

Payment will be made under:

<u>Item No.</u>	<u>Item</u>	<u>Pay Unit</u>
15633.94nnnn	Maintenance Cleaning and Washing of Bridges	Lump Sum (for each structure)

Note: nnnn denotes serialized pay item. See Section 101-53.

ITEM 15633.95 - MAINTENANCE CLEANING AND WASHING OF BRIDGES, CONCRETE SURFACES

DESCRIPTION

This work shall consist of cleaning bridges by collecting and properly disposing of trash and debris from the bridge, pressure washing the deck and exposed concrete and stone surfaces, and cleaning the drainage system and other drainage way as described herein.

MATERIALS

Water for pressure washing shall be clean, fresh water. Water may be heated except over water or if prohibited by the Engineer. Equipment for collecting trash and other debris from bridge shall be determined by the contractor, subject to the approval of the Engineer, and will normally consist of, but not be limited to, industrial vacuums, brushes, brooms, shovels or plastic shovels when indicated in the contract documents, directed by the Engineer or when other shovels are damaging coated surfaces. Detergents or other agents shall not be used.

CONSTRUCTION DETAILS

Unless otherwise indicated in the contract documents, the drainage system and all stone, asphalt, and concrete bridge surfaces shall be cleaned, including but not limited to bridge decks, sidewalks, curbs, approach slabs and shoulders, wing walls, back walls, bridge seats, parapets, piers and pier caps, columns, drainage features, concrete paving block, concrete beams and other surfaces as designated by the Engineer. Limited paved drainage ways and gutters off-structure also shall be cleaned of debris that if permitted to remain would cast runoff back onto the structure or into its drainage ways, including those that may exist underneath the structure. The extent of such removal shall be less than 100 feet but it is intended that they be only the minimum necessary to accomplish the purpose of ensuring that runoff is not cast back onto the structure being cleaned or its drainage ways.

Block paving and paved surfaces, other than asphalt surfaces, between adjacent or parallel bridges shall also be cleaned if required by the engineer or if indicated in the contract documents. Such cleaning shall be limited to narrow areas less than twenty four feet in width.

All loose trash and debris shall be collected by sweeping, shoveling, vacuuming and other suitable methods. The contractor shall not cause or allow trash and/or debris from the bridge to be deposited into a wetland, stream, other water body or active traffic lanes during the cleaning of the bridge.

Sand, dirt, cinders and similar debris collected from the bridge deck may be disposed of at an on-site upland area when not prohibited by the contract documents, if approved by the Engineer, and if the amount of this material does not exceed one cubic meter (1.31 cubic yards) in volume. This material shall be disposed of in such a way that it cannot enter a wetland, stream or other water body. If the amount of sand, dirt, cinders and similar debris is greater than one cubic meter, or if the EIC does not approve of on-site disposal of the material, then the material shall be disposed at a suitable off-site disposal facility.

All other trash and debris collected from the bridge shall be disposed of at a suitable off-site disposal facility.

When trash and debris collection from the bridge is complete, all concrete, including asphalt concrete

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and stone bridge surfaces, including the underside of the bridge, shall be pressure washed with clean, fresh water. The washing shall be adequate to remove all visible dirt, salt, animal waste and similar debris, however if flaking paint exists on the bridge surface then the surface where paint is flaking shall not be washed.

The equipment for pressure washing shall be operated at pressures that do not damage the paint or other coatings on the bridge or undercut the grout or harm the masonry plates beneath the bearings. When washing stream and wetland bridges, the quantity and flow rate of the water used shall be the minimum necessary, as approved by the Engineer, to clean foreign materials from the surfaces where they are encountered.

Pressure washing will not be allowed when ambient temperatures are less than 5° C (40°F) or when ambient temperatures are expected to drop below 5°C before the bridge is dry. The Engineer will be the sole determiner as to when temperatures lower than 5°C are likely to occur.

Scuppers, troughs, and downspouts to the first cleanout above ground level or to their outlets if above ground shall be cleaned by using high pressure water, vacuum, or other techniques satisfactory to the Engineer. Chemical cleaning compounds shall not be used during flushing operations, unless their use has been approved by the D.E.C. and clearance has been given by the Regional Director for their use. Debris from the cleaning operations shall not be deposited in, or around the structure, highway roadway slopes, drainage systems or streams. It shall be disposed of in a manner satisfactory to the Engineer.

Cleaned scuppers, downspouts and troughs shall be free of dirt or other obstruction and allow the unimpeded flow of water. After cleaning has been completed, the Engineer shall determine the flow characteristics of the cleaned system. If, in the Engineer's opinion, flow is still impeded because of the presence of dirt or other removable matter or object in the system, the Engineer will direct the Contractor to reclean the system, including dismantling and reinstalling, if required, at no additional cost to the State. Any damage to the system or structure that occurs as a result of the operations shall be repaired by the Contractor to the satisfaction of the Engineer at no additional expense to the State.

When concrete paving block is cleaned and washed, the removal of weeds between the blocks will not be required under this item.

All structures or bridge drainage systems over water courses shall be washed during the months indicated in the Contract Documents. If no schedule is presented washing shall occur only when adequate flow in the stream exists to dilute possible contaminants as determined by the Engineer. Operations shall be sequenced so as to clean structures over small bodies of water or small streams in the spring of the year when flows are greatest. Streams categorized by DEC as Ct(s) ie. trout spawning, shall be washed prior to July 1 and bridges located at DEC yearling trout stocking sites shall not be washed during April. Washing shall be stopped if stream flow drops below normal or if directed by the Engineer.

Work shall be conducted in such a manner so as not to damage or remove existing epoxy protective coatings or existing intact or flaking paint coatings or any other protective coating on the bridge. Any damage to the structure being worked on or to surrounding structures and property shall be repaired by the Contractor to the satisfaction of the Engineer and at no cost to the state.

After all trash and debris has been collected, the drainage system cleaned and washing is completed, the

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bridge will be inspected by the Engineer. The cleaned bridge surfaces shall be free of trash and debris as described under Construction Details and the drainage system free running except those systems the Engineer agrees were damaged prior to any cleaning work on the bridge.

Maintenance and protection of traffic shall be in accordance with contract plans, Section 619 of the Standard Specifications, or as ordered by engineer. High pressure spray and high volume drainage of wash water shall be controlled so as to not present a hazard to traffic or to cause erosion of adjacent ground or drainage ways. Under no circumstances shall high pressure spray or high volume drainage of wash water be discharged directly into active traffic lanes.

METHOD OF MEASUREMENT

The work will be measured for payment on the lump sum basis.

BASIS OF PAYMENT

The lump sum price bid shall include the cost of all labor, materials, and equipment necessary to satisfactorily complete work including the cost of cleaning the drainage system, collecting, removing and disposing of trash and debris including that off structure but necessary to prevent backup of runoff onto the structure or its drainage ways: the cost of maintaining and protecting traffic shall be separately measured and paid.

Payment will be made under:

<u>Item No.</u>	<u>Item</u>	<u>Pay Unit</u>
15633.95nnnn	Maintenance Cleaning and Washing of Bridges, Concrete Surfaces	Lump Sum (for each structure)

Note: nnnn denotes serialized pay item. See Section 101-53.