

MODIFIED BY EI 97-029

EFFECTIVE 4/23/98

SUPERSEDED BY

EI 05-039

EFFECTIVE 5/4/2006

ENGINEERING INSTRUCTION

NEW YORK STATE DEPARTMENT OF TRANSPORTATION

SUBJECT: REMOVAL OF EXISTING STEEL; LOCALIZED
STRUCTURAL STEEL CLEANING, PAINTING, AND
CONTAINMENT SYSTEM

Subject Code:

Distribution:

30 Main Office

32 Regions

34 Consultants

Code: EI 94-019

APPROVED:

P.T. Wells A.M. Shirole
P.T. Wells, Construction Div. / A.M. Shirole, Structures Div.

Date: 6/20/94

Supersedes:

This Engineering Instruction transmits a revised specification for Removal of Existing Steel, a shelf note amending the specification for removal of structures and obstructions, and new specifications for localized paint removal from structural steel by vacuum contained methods, localized painting of bare structural steel, and containment system for localized steel repair and painting. The listed specifications have been added to the Estimate Handling System and are available for immediate use. These items replace a variety of Regional and special specifications that have been used to require or allow vacuum blast steel cleaning and localized containment for various purposes. Those specifications are no longer to be used in conjunction with steel removal and repair effective with the date of this EI.

SPECIFICATIONS TRANSMITTED

202 (Shelf Note)	Demolition of Structures (Amends 202-3.05)
589	Removal of Existing Steel
741-01	Localized Paint Removal From Structural Steel by Vacuum Contained Methods
16570.32	Localized Painting of Bare Structural Steel
18570.2502	Containment System for Localized Steel Repair and Painting
16570.7x	Localized Paint Removal from Structural Steel By Vacuum Contained Methods

BACKGROUND

Any work on structural steel coated with lead-based paint entails a risk of exposing workers to lead and of releasing lead into the environment. Heating structural steel or other materials coated with lead-based paint by flame cutting, welding, or heating to straighten steel produces lead fume which is highly toxic to workers and harmful to the environment. Removal of lead based

Manual	Code EI 94-019	Date 6/20/94	Page 2 of 10
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT SYSTEM			

paint from structures, even in small quantities or in isolated areas, produces paint dust and chips which must be contained and collected to protect workers and the environment.

The items covered by these specifications are to be used only for (1) removal of existing steel and (2) steel repair work. Bridge repainting will continue to require open abrasive blasting using Item 18570.1502 (Class A Containment).

GUIDELINES AND APPLICATIONS

The summary table included in this EI lists the various specifications that are to be utilized for various types of work on painted steel structures. A detailed discussion of applications of each item follows.

SECTION 589 - REMOVAL OF EXISTING STEEL

1. This revised specification requires the submittal of a written work plan meeting the requirements of subsection 202-3.01 and other provisions to ensure that steel removal work is carried out safely.
2. Provisions are added requiring lead-based paint removal prior to steel removal operations. That work is to be done according to the requirements of the new subsection 741-01. Payment for paint removal is included in the steel removal item (589.01 or 589.52).

SUBSECTION 741-01 - LOCALIZED PAINT REMOVAL FROM STRUCTURAL STEEL BY VACUUM CONTAINED METHODS

1. This specification provides an environmentally acceptable procedure to remove lead-based paint from localized areas of a structure prior to flame cutting, bolt or rivet removal, painted railing removal, bearing removal, etc., required for structural steel removal.
2. Work conducted under this subsection will not be included in a separate pay item -- the cost of this work is to be included in the contractor's bid for the 589 items.
3. Paint removal may at times be necessary to protect workers and the environment for structures demolition performed under Section 202. In such cases, this method may be used as an acceptable means for removing paint during demolition. The attached shelf note amending 202-3.05 clarifies this requirement.

Manual	Code EI 94-019	Date 6/20/94	Page 3 of 10
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT SYSTEM			

4. In general, procedures which require flame heating, or air-arc gouging (e.g. weld removal), should be cleaned for at least four inches beyond expected work limits. If the steel is less than one inch thick, a wider cleaning band may be necessary. OSHA 1926.62 requires worker exposure monitoring to determine lead concentrations. Such measurements may indicate the need for greater areas of removal to reduce lead concentrations below the Permissible Exposure Level during cutting, heating and welding operations.

ITEM 16570.32 - LOCALIZED PAINTING OF BARE STRUCTURAL STEEL

1. This item, which provides a long-lasting coating, is to be used for touchup painting on structures where the paint has been removed for steel repair according to the procedures in Item 16570.7x. It is to be used only if total repainting of the structure is not included in the contract and is not programmed in another contract within three years of the time the paint removal is anticipated.
2. Small, localized areas requiring touchup on structures where steel repair is being done may also be repainted using this item. However, this item is not to be used for partial repainting of entire structures as an alternative to full repainting using abrasive sandblasting, Class A containment, (Item 18570.1502), and standard painting items. The Materials Bureau is developing specifications which will be suitable for partial repainting.
3. If painting of the entire bridge is included in the contract or under another contract within three years, structural steel subjected to paint removal or in need of touchup painting is to be left unpainted. Any coating that is not applied to a properly prepared surface may not properly adhere, and will thus adversely affect the bonding of subsequent repaintings of the entire structure. To ensure that poorly bonded paint is not applied, only two options are permitted -- leave the steel unpainted, or touchup using Item 16570.32. No other options are to be permitted.
4. In some cases, it may be desirable to utilize Item 16570.32 on the fascias while leaving interior members unpainted. This practice is permissible at the discretion of the designer. However, it should be noted that localized painting will not provide a uniform appearance, and may cause concerns relative to aesthetics.

Manual	Code EI 94-019	Date 6/20/94	Page 4 of 10
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT SYSTEM			

ITEM 18570.2502 - CONTAINMENT SYSTEM FOR LOCALIZED STEEL REPAIR AND PAINTING

1. For most situations, use of the localized paint removal specifications (Item 16570.7x or Section 741-01) in combination with environmental ground/water protection (Items 570.09 and 570.10) will provide adequate containment and collection of paint debris to satisfy environmental protection requirements without the provision of full containment. However, for certain sensitive areas, as defined below, some form of containment may be needed to enclose the work area. Item 18570.2502 is for use where a simple form of full containment is desired for localized paint removal and localized repainting, but it is not necessary to use Class A Containment. Where complete repainting of the structure is to be done, only Class A Containment is to be used. Item 18570.2502 does not require sealed joints and seams or a powered, filtered ventilating system. It is therefore expected to cost considerably less than Class A Containment.
2. The decision to include localized containment is to be determined by the Regional Director to address specific "sensitive" bridge locations. Suggested criteria to be considered in judging "sensitive" locations include proximity to residential or commercial areas, pedestrian traffic beneath the structure, proximity to schools or playgrounds, environmentally fragile waterways such as trout streams or public water supplies, or other features or development where even minute quantities of lead released into the environment will raise concerns. It is not intended to include this item routinely on highway structures. The preferred method of protection when paint removal is performed under Item 16570.7x or Section 741-01 will be the environmental ground/water protection items (570.09 and 570.10). These items will provide acceptable environmental protection for all but the very most sensitive areas.

ITEM 16570.7x - LOCALIZED PAINT REMOVAL FROM STRUCTURAL STEEL BY VACUUM CONTAINED METHODS

1. Item 16570.7x provides an environmentally acceptable procedure to remove lead-based paint from localized areas of a structure when paint removal is required prior to performing repair work on structural steel. Such instances may include but are not limited to:

Manual	Code EI 94-019	Date 6/20/94	Page 5 of 10
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT SYSTEM			

- Structural steel repairs that require flame cutting, heat straightening, weld removal, weld repair, or similar operations.
 - Connection of new structural steel to existing structural steel requiring cleaning of faying surfaces.
 - Localized (spot) painting performed in conjunction with steel repairs on the same structure.
2. The designer shall show in the plans those locations where localized paint removal is required for steel repair or for localized painting of bare structural steel (Item 16570.32). Payment shall be restricted to only those locations identified in the plans in conjunction with these items, or for locations where paint removal is required because of additional work ordered by the Engineer. Payment will not be provided under this item for paint removal necessitated for steel removal under Section 589, or for bridge demolition under Section 202.
 3. Three separate pay items are provided to address the following conditions:
 - A. Item 16570.72- Planar Surfaces.
 - B. Item 16570-74- Bolted/riveted Connections.
 - C. Item 16570-76- Irregular Surfaces. (This item should be used only if the surface does not meet the requirements of either of the other two.)

Payment limits both for bolted/riveted connections, and for irregular surfaces must be precisely outlined on the plans to prevent field disputes regarding measurements. Planar surfaces should be self-limiting. Two guideline plates are attached as an aid to the designer.

4. Procedures which require flame heating, or air-arc gouging (e.g. weld removal), shall be cleaned for at least four inches beyond expected work limits. If the steel is less than one inch thick, a wider cleaning band may be necessary. Refer to the guideline plates for further examples. OSHA 1926.62 requires worker exposure monitoring to determine lead concentrations. Such measurements may indicate the need for greater areas of removal to reduce lead concentrations below the Permissible Exposure Level during cutting, heating and welding operations.

Manual	Code EI 94-019	Date 6/20/94	Page 6 of 10
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT SYSTEM			

5. Item 16570.7x shall be shown on the plans and included in the quantity estimate for riveted and bolted connections, even though mechanical means rather than flame cutting is the preferred means of removal. However, if the contractor can maintain worker lead exposure below the OSHA Permissible Exposure Limit, then the Engineer can waive removal of the paint. Even though the area of removal is detailed on the plans and included in the estimate, payment will not be provided for areas where paint removal is waived.

ENVIRONMENTAL GROUND AND WATER PROTECTION

For any paint removal or any mechanical cutting, shearing, bolt/rivet removal, sanding, or any other operations that remove or dislodge paint, the paint chips and associated debris must be contained, collected, and disposed of to meet environmental requirements. This is required even when vacuum shrouded tools are employed. If either of the containment items is in place, (Class A or Localized), no additional containment is required. If neither of the containment items are in place, then Environmental Ground/Water Protection (Items 570.09 or 570.10) shall be required for any of the associated items, including localized removal and painting, steel removal and repair items, and demolition. The designer must include a pay item (lump sum) for the appropriate environmental protection item for each structure where any of these removal/repair items will be included, but containment is not required.

These items are intended for collection of waste generated by removal of existing paint. It should be noted that all painting specifications currently used by the Department also require complete protection from paint spatter, spillage, etc. That protection is required as part of the painting item, and containment items (including environmental ground and water protection) are not intended for protection from paint spatter, etc.

DISPOSAL OF PAINT DEBRIS

Paint debris generated by any of the above items must be disposed of using the hazardous waste treatment and disposal item (18570.1291). Designers are reminded to include this item in all contracts where any of the above items are utilized.

Manual	Code EI 94-019	Date 6/20/94	Page 7 of 10
Subject: REMOVAL OF EXISTING STEEL;LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT SYSTEM			

WORKER PROTECTION

The Special Note regarding lead paint hazards is also applicable, and shall be included in all projects involving worker exposure to lead and materials containing lead (see EI 93-034). Worker exposure to lead in construction must be addressed in the contractors' written lead compliance program, as required by OSHA 1926.62. Project inspection staff must also take appropriate precautions. Compliance with Permissible Exposure Levels and air quality standards for lead and dust is highly dependent upon the performance of the worker operating the equipment.

General questions concerning this instruction and the use of these specifications on ongoing contracts may be directed to the Construction Division -- Jim Bryden at (518) 485-1834. Specific questions regarding the specifications may be directed to the Structures Division -- Bob Ecuyer at (518) 457-4549 or Dan Feeser at (518) 457-5715. General questions on alternative paint removal technologies may be directed to the Materials Bureau -- Dave Brewster at (518) 457-4285.

STEEL.EI

Manual	Code EI 94-019	Date 6/20/94	Page 8 of 10
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT			

SUMMARY OF REQUIRED ITEMS FOR WORK ON PAINTED STRUCTURAL STEEL

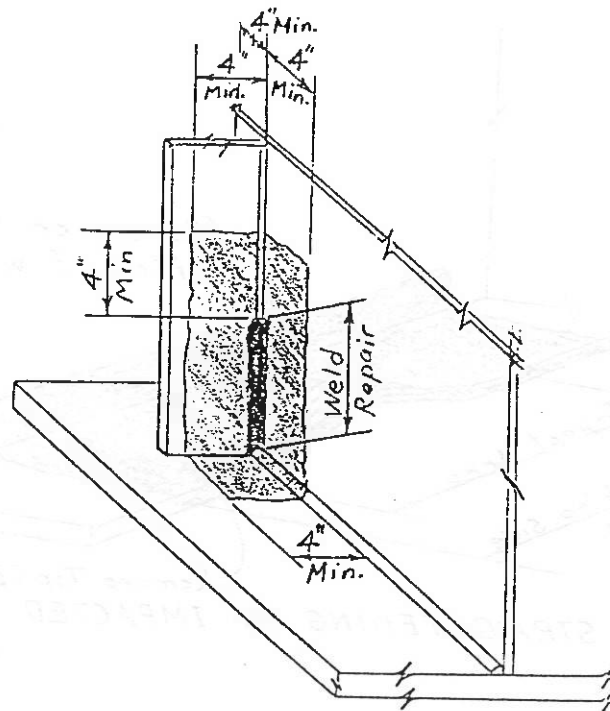
Type of Work	18570.1502 Class A Containment	18570.2502 Loc. Cont.	570.09-10 Env. Gr./ Water Prot.	741-01 Loc. Paint. Rem.	16570.7X Loc. Paint. Rem.	16570.32 Loc. Painting	571.01nnnn Disposal
Steel Removal (589.01,589.52)		X ⁽¹⁾	X ⁽¹⁾	X			X
Steel Repair (various items)		X ⁽¹⁾	X ⁽¹⁾		X	X ⁽²⁾	X
Full Repainting (18570.8611-8616)	X						

(1) Use 570.09-10 for general conditions, 18570.2502 for "sensitive" locations

(2) Use only if structure is not scheduled for full repainting within three years

C:\JEB\STEELPNT.TBL

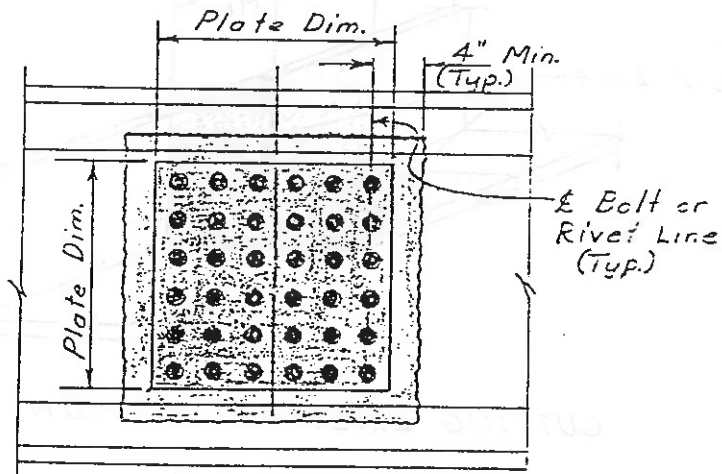
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT



STIFFENER WELD REPAIR
(Similar Removal both Sides of Stiffener)
flange and Web



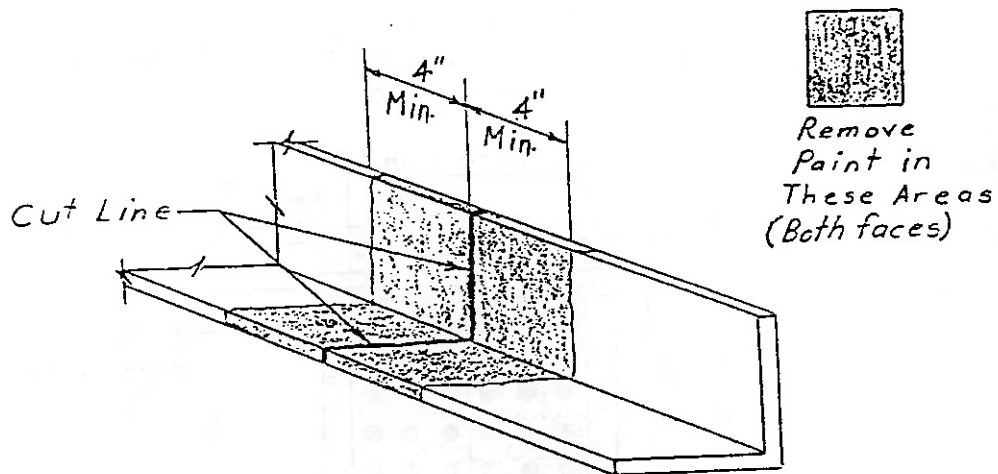
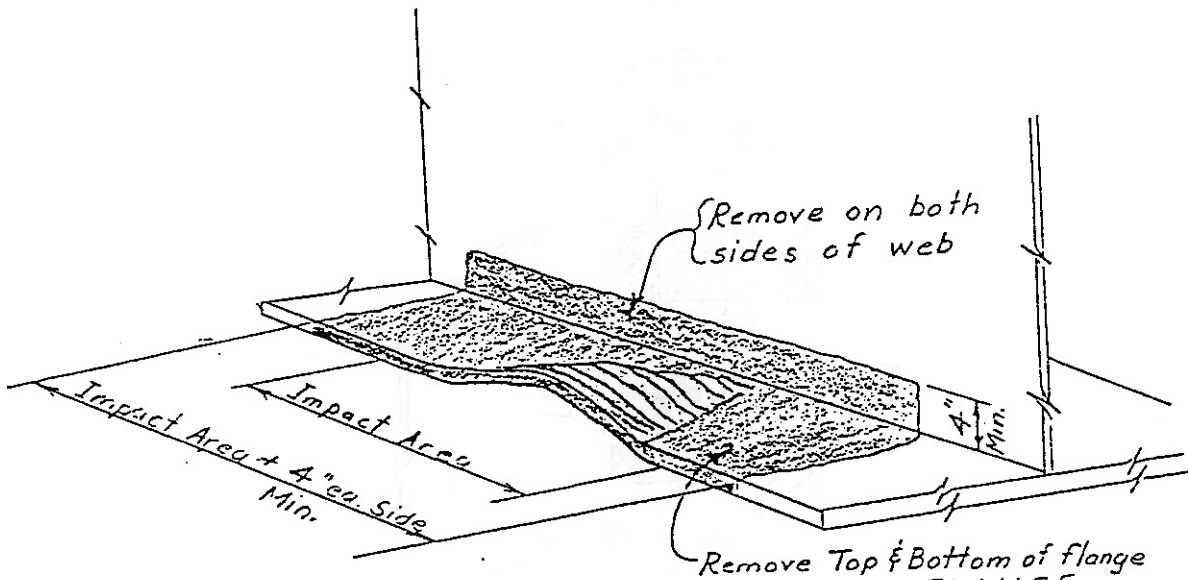
Remove
Paint in
These Areas



REMOVAL OF RIVETS
BY BURNING

PLATE 1

Manual	Code EI 94-019	Date 6/20/94	Page 10 of 10
Subject: REMOVAL OF EXISTING STEEL; LOCALIZED STRUCTURAL STEEL CLEANING, PAINTING, AND CONTAINMENT			



CUTTING EXISTING SECTIONS FOR REMOVAL

DEMOLITION OF STRUCTURES

Make the following changes to the Standard Specifications of January 2, 1990:

Addendum I

Page II-9

Under §202-3.05 Demolition of Structures - General, *add* as a new (fifth) paragraph:

"For steel structures coated with lead-based paint, the contractor shall comply with the provisions of OSHA 1926.62 and all other applicable worker Health and Safety Regulations. In addition, the contractor shall comply with all applicable regulations controlling the release of lead-based paint into the environment. Prior to the beginning of any steel removal operations, the paint shall be removed for a minimum distance of four inches on each side of the centerline of cut, bolt row, or weld as applicable. The paint removal work shall be done in accordance with the requirements of Section 741. In cases where the contractor can clearly demonstrate through exposure monitoring that other work practices and engineering controls, under the oversight of a certified industrial hygienist, can effectively maintain actual worker exposure below the permissible exposure level, exception to this requirement may be granted by the Engineer."

REMOVAL OF EXISTING STEEL

Make the following changes to the Standard Specifications of January 2, 1990.

Page 5-127

Under SECTION 589 REMOVAL OF EXISTING STEEL, *delete* §589-3 CONSTRUCTION DETAILS in its entirety *replace* it with the following:

"589-3 CONSTRUCTION DETAILS. The removal of existing steel requires the submittal of a written work plan. This plan shall meet the requirements of §202-3.01; General and Safety Requirements. The work plan shall set forth all expected supports, disconnections and adjustments to steel which is to remain. If, during the course of the work it becomes necessary to support, disconnect, or adjust steel, not previously noted in the work plan, the contractor shall submit a revised work plan to the Engineer for approval. All such proposals shall be approved prior to implementation.

In addition, the requirements of §202-3.05; Demolition of Structures shall also apply.

All work performed on steel which is to remain as part of the structure shall be in accordance with the applicable requirements of the SCM.

Actual removal procedures shall conform to the following requirements:

589-3.01 Paint. If the steel is painted, then prior to the beginning of any steel removal operations, the paint shall be removed for a minimum distance of four inches on each side of the centerline of cut, bolt row, rivet row, or weld as applicable. The paint removal work shall be done in accordance with the requirements of Section 741. In cases where the contractor can clearly demonstrate through exposure monitoring that other work practices and engineering controls, under the oversight of a certified industrial hygienist, can effectively maintain actual worker exposure below the permissible exposure level, exceptions to this requirement may be granted by the Engineer.

589-3.02 Cutting. All cutting work shall be done in accordance with the requirements of the SCM, part 601, and when applicable, part 602.

589-3.03. Fastener Removals.

A. Bolts. Nuts shall be removed with wrenches, wherever possible, and the bolts driven out with a hand held punch. Alternate removal procedures shall be set forth in the work plan.

B. Rivets.

1. Shear rivet head, using a pneumatic rivet breaker (helldog), and drive out rivet shank with a pneumatic punch.

OR

2. Flame-cut rivet head one-sixteenth ($\frac{1}{16}$) of an inch above the base metal, using a rivet scarfing tip, and drive out shank using a pneumatic punch.

If, in the opinion of the Engineer, rivet shanks, or bolts, cannot be removed by punching, without damaging the base metal, the rivet shank, or bolt, shall be removed by drilling.

REMOVAL OF EXISTING STEEL

589-3.04 Welded Connections. Welded connections shall be disassembled in accordance with the following:

A. The affected weld shall be removed by means of air carbon arc gouging equipment. To ensure that base metal remaining in place is not damaged, at least $\frac{1}{8}$ inch of weld material shall be left in place. If it is necessary to gouge into base metal to remove the weld fusion, the least critical member, as determined by the Engineer, shall be damaged. If the damaged member is permitted to remain, it shall be repaired by procedures approved by the D.C.E.S.

B. The weld material left in place shall be ground flush with the base metal surface. No base metal shall be removed by grinding.

C. The Engineer shall perform a careful visual inspection of all weld removal locations. If damage is suspected the Engineer will direct the Contractor to perform a dye penetrant inspection in accordance with the requirements of the SCM.

If the Contractor's operations damage existing steel which is to remain in place, the damaged steel shall be repaired, or replaced, as determined by the D.C.E.S. The Contractor shall be required to repair damage, or replace damaged material, caused by the Contractor's operations, at no additional expense to the State."

Under **589-5 BASIS OF PAYMENT.** *add* the following at the end of the subsection:

"No separate payment will be made for the removal of paint.

The treatment, handling and disposal of the paint removal waste will be paid under a separate item."

Page 7-219

Add the following after §740-04

"SECTION 741 - PAINT REMOVAL AND CONTAINMENT

741-1 LOCALIZED STRUCTURAL STEEL CLEANING BY VACUUM CONTAINED METHODS

SCOPE. This specification covers cleaning structural steel of paint, corrosion products, dirt, salt, and other materials required by the contract documents. All cleaning will be performed by means of solvents and vacuum containing cleaning equipment.

EQUIPMENT REQUIREMENTS. Equipment used for this work may be shrouded power tools with vacuum attachments; a vacuum blaster; a combination of the two; or any other vacuum containing method which:

- A.* Is capable of cleaning the steel surface of all existing paint.
- B.* Will collect and contain the removed material, and all abrasive employed.
- C.* Does not permit the release of visible, quantities of dust, or debris, into the atmosphere.

REMOVAL OF EXISTING STEEL

D. Will not vaporize existing paint into the atmosphere.

The contractor is hereby notified that some types of vacuum containing removal equipment are patented. The possibility of royalty payments exists.

All equipment will be approved by the Engineer prior to the beginning of any work. Equipment will be approved on the basis of a steel cleaning demonstration. For each type of equipment the Engineer will choose a demonstration site which is part of the work. Each demonstration site shall be at least 10 square feet in area unless otherwise permitted by the Engineer. Each demonstration site shall be reflective of the different configurations to be encountered and exhibit all material in need of removal. If this is not possible, the Engineer shall choose separate demonstration sites which meet the foregoing requirements. Each type of equipment will be required to remove all materials as noted in the contract documents, and conform to the requirements of this specification.

If the equipment uses abrasive, the contractor may supply any recyclable abrasive which contains less than one percent free silica. The supplied abrasive shall be compatible with the requirements of the equipment.

The Engineer is empowered to rescind approval of any piece of equipment which, in his opinion, is not performing as required. All such equipment shall be immediately removed from the work site.

CONSTRUCTION DETAIL. Steel shall be cleaned to bare metal. Unless otherwise provided by the contract documents, all existing paint shall be removed for a minimum distance of four inches on each side of the centerline of cut, bolt row, rivet row, or weld, as applicable. If the steel is to be heated prior to straightening, or other similar operation, the minimum removal limits shall be four inches beyond the direct heat application area or as shown on the plans.

Unless otherwise noted by the contract documents, the contractor shall assume that all paint removed is lead-based, therefore, all waste resulting from the removals shall be treated, handled and disposed of as hazardous waste in accordance with all applicable Federal, State, and Local rules and regulations. The contractors attention is directed to §107-05; SAFETY AND HEALTH REQUIREMENTS.

All material not contained by the steel cleaning equipment shall be collected by vacuum methods only. No shoveling, dry sweeping, wet sweeping, or air-blowing will be permitted. All vacuums shall be equipped with high efficiency particulate (HEPA) filters.

After the cleaning location has been cleaned by vacuum containing methods, the location shall be inspected for cleanliness. No existing paint will be permitted to remain. If the contractor is able to effectively demonstrate that vacuum containing methods are incapable of removing remaining paint, the Engineer may permit paint removal by a supplemental method such as hand tool cleaning, or chemical stripping.

Rust, mill scale, and other similar materials that are not paint, demonstrably not removable by vacuum containing methods, may be permitted to remain, or may be required to be removed by one, or more, of the foregoing methods. Removal will be ordered by the Engineer.

All removed material generated by power tool or hand cleaning methods shall be collected by vacuums equipped with HEPA filters. No other method will be permitted."

SECTION 741 - PAINT REMOVAL AND CONTAINMENT

741-01 LOCALIZED PAINT REMOVAL FROM STRUCTURAL STEEL BY VACUUM CONTAINED METHODS

SCOPE. This specification covers removing paint, corrosion products, dirt, salt, and other materials required by the contract documents from structural steel. All removals will be performed by means of solvents and vacuum containing paint removal equipment.

EQUIPMENT REQUIREMENTS. Equipment used for this work may be shrouded power tools with vacuum attachments; a vacuum blaster; a combination of the two; or any other vacuum containing method which:

1. Is capable of removing all existing paint from the surface.
2. Will collect and contain the removed material, and all abrasive employed.
3. Does not permit the release of visible, quantities of dust, or debris, into the atmosphere.
4. Will not vaporize existing paint into the atmosphere.

The contractor is hereby notified that some types of vacuum containing removal equipment are patented. The possibility of royalty payments exists.

All equipment will be approved by the Engineer prior to the beginning of any work. Equipment will be approved on the basis of a paint removal demonstration. For each type of equipment the Engineer will choose a demonstration site which is part of the work. Each demonstration site shall be at least 10 square feet in area unless otherwise permitted by the Engineer. Each demonstration site shall be reflective of the different configurations to be encountered and exhibit all material in need of removal. If this is not possible, the Engineer shall choose separate demonstration sites which meet the foregoing requirements. Each type of equipment will be required to remove all materials as noted in the contract documents, and conform to the requirements of this specification.

If the equipment uses abrasives, the contractor may supply any recyclable abrasive which contains less than one percent free silica. The supplied abrasive shall be compatible with the requirements of the equipment.

The Engineer is empowered to rescind approval of any piece of equipment which, in his opinion, is not performing as required. All such equipment shall be immediately removed from the work site.

CONSTRUCTION DETAILS. Unless otherwise provided by the contract documents, all existing paint shall be removed for a minimum distance of four inches on each side of the centerline of cut, bolt row, rivet row, or weld, as applicable. If the steel is to be heated prior to straightening, or other similar operation, the minimum removal limits shall be four inches beyond the direct heat application area or as shown on the plans.

Unless otherwise noted by the contract documents, the contractor shall assume that all paint removed is lead-based therefore, all waste resulting from the removals shall be treated, handled and disposed of as hazardous waste in accordance with all applicable Federal, State, and Local rules and regulations. The contractors attention is directed to subsection 107-05; SAFETY AND HEALTH REQUIREMENTS.

All material not contained by the paint removal equipment shall be collected by vacuum methods only. No shoveling, dry sweeping, wet sweeping, or air-blowing will be permitted. All vacuums will be equipped with high efficiency particulate (HEPA) filters.

After the paint has been removed by vacuum containing methods, the location shall be inspected for cleanliness. No existing paint will be permitted to remain. If the contractor is able to effectively demonstrate that vacuum containing methods are incapable of removing remaining paint, the Engineer may permit paint removal by a supplemental method such as hand tools or chemical stripping.

Rust, mill scale, and other similar materials that are not paint, demonstrably not removable by vacuum containing methods, may be permitted to remain, or may be required to be removed by one, or more, of the foregoing methods. Removal will be ordered by the Engineer.

All removed material generated by power tool or hand cleaning methods shall be collected by vacuums equipped with HEPA filters. No other method will be permitted.

ITEM 16570.32 LOCALIZED PAINTING OF BARE STRUCTURAL STEEL

DESCRIPTION. The work shall consist of applying a three coat structural steel paint system to structural steel locations from which paint has previously been removed under a separate item.

The contractor is specifically forewarned that structural steel cleaning will also be required by this item.

The three coat paint system shall consist of the following components:

1. EPOXY PRIMER
2. EPOXY INTERMEDIATE COAT
3. POLYURETHANE TOPCOAT

All components shall be compatible and shall be supplied by a single manufacturer.

MATERIALS.

- A. Equipment. Cleaning equipment shall consist of vacuum equipped blast cleaning equipment only. The contractor may supply any recyclable abrasive which contains less than one percent free silica, and is compatible with the requirements of the equipment.

Hand held abrasive paper shall be used to abrade existing paint, where required.

All equipment shall be acceptable to the Engineer both prior to, and during, cleaning operations.

- B. Paint. All paint used on any one structure shall be produced by a single manufacturer. A list of approved paint types and their manufacturers appears on the Department's approved list.

All paint in storage shall be protected from damage and maintained between 40°F and 90°F.

Each single paint (epoxy primer, epoxy intermediate coat and polyurethane topcoat) shall be of a different color from the others. The color of the primer and intermediate coat will be the Contractor's option. However, they shall contrast with the underlying substrate or previously applied paints. The intermediate coat color shall be such that it can be completely hidden by a single coat of topcoat applied at the minimum specified dry film thickness.

The color of the topcoat shall be as specified in the contract documents.

All components of the system (primer, intermediate coat and topcoat) will be accepted on the basis of the manufacturer's written certification that the batch produced meets their product specification. Only paint arriving at the work site in new, unopened containers and labeled with the manufacturer's name, product name, component part, batch number and shelf life date shall be used. Paint in containers having expired shelf life dates shall be immediately removed from the work site and not used.

CONSTRUCTION DETAILS.

- A. CLEANING. Vacuum blast cleaning is limited to areas where paint has been removed. Six inches outside the paint removal location's perimeter the existing paint shall be abraded only.

1. Bare steel locations. All bare structural steel surfaces to be painted shall be cleaned in accordance with SSPC - SP-6; COMMERCIAL BLAST CLEANING.

Before cleaning begins, visible deposits of oil, grease, dirt, salt, or other contaminants shall be removed by the methods specified in SSPC - SP1, Solvent Cleaning.

No cleaning operations will be conducted under the following conditions:

1. The relative humidity exceeds 85%.
2. The surface temperature is less than 5°F above the dew point.

The area cleaned shall be limited to that which can be cleaned and prime coated within a 16-hour period provided the condition known as flash rusting does not occur. The contractor shall make every effort to avoid removing any existing paint at, or near, the cleaning location. (Refer to Priming). Cleaned areas shall be approved by the Engineer prior to priming.

After cleaning is completed, cleaned surfaces shall be defined by SSPC - Visl.-89, Pictorial Standards BSP6, CSP6 and DSP6 as applicable. All surfaces shall be cleaned of blasting products and other residues by