DESCRIPTION.
This Specification sets out the requirements for worker protection, containment system design and use, environmental protection, and waste disposal during the removal and disposal of coatings containing lead and other toxic metals from NYCDOT bridges. The purpose is to assure that the public, workers, and the environment are properly protected from potential exposure to toxic metals in these coatings during paint removal operations.

The Contractor is responsible and liable for the remediation of all damages caused by the Work, and any required clean up or repair activities.

GENERAL
The Contractor is responsible for compliance with all personal monitoring required under OSHA regulations, and is required to maintain:

A competent person at the project site to observe and monitor work activities, and to oversee the implementation of the Worker Protection Plan, Environmental Protection Plan, Waste Handling Plan, and Containment performance. Authorize the competent person to take prompt corrective measures to rectify any observed problems with the control over emissions, protection of workers, and management of the waste streams. Qualifications of the competent person are presented in Appendix A.

An Industrial Hygienist (IH) to oversee the development of Worker Protection Plans, and to conduct monthly site visits to confirm that the Work is being performed in accordance with the submitted plans. Qualifications of the IH are presented in Appendix A.

The NYCDOT or REI will be employing an environmental consultant to monitor the paint removal project and ensure compliance with NYCDOT specifications and applicable regulations. The Contractor shall coordinate project activities with the environmental consultant, and initiate any action that is necessary to correct specification violations identified by the environmental consultant. The environmental consultant has the authority to halt any operation involving the generation, handling, or disposal of project waste and debris if the operation violates the requirements of this specification, even if the competent person or IH did not observe the violation.

Project submittal requirements are itemized in Appendix A. Terms and definitions are provided in Appendix B.

CONTRACTOR QUALIFICATIONS
The painting Contractor or subcontractor shall possess SSPC QP-1 and QP-2 certifications at the time of bid and throughout the duration of the project.
COMMUNITY NOTIFICATION

As directed by the NYCDOT, participate in community notification efforts regarding the Work. The purpose is to advise the public about the cleaning operations, and plans for maintenance and protection of traffic that will be undertaken on the bridge.

The extent of Contractor involvement is established on a case by case basis. Involvement may include, but is not limited to, the preparation, publication, and distribution of pamphlets describing the operations that will be conducted, and attendance at meetings with affected community members. The specific scope of work will be defined by the NYCDOT in advance.

REGULATORY COMPLIANCE

Comply with the requirements of this Section and all applicable Federal, State, and City laws, codes, and regulations, including, but not limited to the regulations of the United States Environmental Protection Agency (USEPA) and Occupational Safety and Health Administration (OSHA), New York State Department of Environmental Conservation (DEC), New York State Department of Health (NYS DOH), New York State Department of Labor (NYS DOL), and the New York City Department of Environmental Protection (NYC DEP). Codes, Rules and Regulations of the State of New York (NYCRR) are administered by the NYS Department of Environmental Conservation, Albany, N.Y. EPA regulations are administered by the US Environmental Protection Agency, Region 2, N.Y., N.Y.

Identification of the items in this specification which are of specific interest to the NYCDOT in no way relieves the Contractor of the responsibility to comply with all applicable legal requirements. Moreover, compliance with Contract specifications does not relieve the Contractor of the obligation to comply with other applicable requirements. If a Federal, State, or City regulation is more restrictive than any of the requirements of this Section, the more requirements shall apply.

REFERENCE STANDARDS

Latest Edition - the latest edition of the following acts, regulations, guides, and standards form a part of this Specification. In the event of a conflict, comply with the most restrictive requirements. Maintain at the jobsite, a copy of all applicable reference standards.

American Association of State Highway and Transportation Officials (AASHTO)

Standard Specifications for Highway Bridges

Manual for Maintenance Inspection of Bridges

American Industrial Hygiene Association (AIHA)

Proficiency Analytical Testing (PAT) Program for metals analysis

Laboratory Accreditation Program for Metals Analysis

Code of Federal Regulations (CFR)

29 CFR 1910, Occupational Safety and Health Regulations for General Industry
29 CFR 1910.20, Access to Employee Exposure and Medical Records
29 CFR 1910.132, General Requirements for Personal Protective Equipment
29 CFR 1910.133, Eye and Face Protection
29 CFR 1910.134, Respiratory Protection
29 CFR 1910.146, Permit Required Confined Spaces
29 CFR 1910.1000, Air Contaminants
29 CFR 1926, Occupational Safety and Health Regulations for the Construction Industry
29 CFR 1926.16, Rules of Construction
29 CFR 1926.20, General Safety and Health Provisions
29 CFR 1926.21, Safety Training and Education
29 CFR 1926.28, Personal Protective Equipment
29 CFR 1926.32, Definition of Competent Person
29 CFR 1926.51, Sanitation
29 CFR 1926.52, Noise Exposure
29 CFR 1926.55, Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.57, Ventilation
29 CFR 1926.59, Hazard Communication
29 CFR 1926.62, Lead
29 CFR 1926.101, Hearing Protection
29 CFR 1926.104, Safety Belts, Lifelines, and Lanyards
29 CFR 1926.154, Temporary Heating Devices
29 CFR 1926.200, Accident Prevention Signs and Tags
29 CFR 1926.353, Ventilation and Protection in Welding, Cutting and Heating
29 CFR 1926.354, Welding, Cutting and Heating in Way of Preservative Coatings
29 CFR 1926.450 454, Scaffolding
29 CFR 1926.500 503, Fall Protection
29 CFR 1926.1118, Inorganic Arsenic
29 CFR 1926.1127, Cadmium
40 CFR 50, National Primary and Secondary Ambient Air Quality Standards
40 CFR 58, Ambient Air Quality Surveillance
40 CFR 60, App A, Method 9, Visual Determination of the Opacity of Emissions from Stationary Sources
40 CFR 261, Appendix II EPA, Toxicity Characteristic Leaching Procedure
40 CFR 262, Standards Applicable to Generators of Hazardous Waste
40 CFR 263, Standards Applicable to Transporters of Hazardous Waste
40 CFR 264, Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265, Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265, Subpart C, Preparedness and Prevention
40 CFR 265, Subpart D, Contingency Plan and Emergency Procedures
40 CFR 265.16. Personnel Training
40 CFR 268, Land Disposal Restrictions
40 CFR 302, Designation, Reportable Quantities and Notification
40 CFR 355, Emergency Planning and Notification
40 CFR 171-179, Hazardous Materials Regulations

EPA Methods

SW 846, Test Methods for Evaluating Solid Waste Physical/Chemical Methods
Method 1311, Toxicity Characteristic Leaching Procedure (TCLP)
Method 3050, Acid Digestion of Sediment, Sludge, and Soils
National Institute of Occupational Safety and Health (NIOSH) Methods

Method 7048, Cadmium
Method 7082, Lead
Method 7300, Chromium
Method 7900, Arsenic

The Society for Protective Coatings (SSPC)

Guide 6, Guide for Containing Debris Generated During Paint Removal Operations
Guide 7, Guide for the Disposal of Lead Contaminated Surface Preparation Debris
SSPC 95 06, Project Design, Industrial Lead Paint Removal Handbook, Volume II
QP-1, Standard Procedure for Evaluating the Qualifications of Painting Contractors (Field Application to Complex Structures)
QP-2, Standard Procedure for Evaluating the Qualifications of Painting Contractors to Remove Hazardous Paint

Codes, Rules and Regulations of the State of New York (NYCRR)

Title 6, Chapter III, Subchapter B, Air Resources
Part 211.1, Air Pollution
Parts 256 - 257, Ambient Air Quality Standards
MATERIALS
CONTAINMENT MATERIALS AND EQUIPMENT

Supply all materials needed to contain paint removal debris in accordance with the requirements of this Specification and Construction Details. This may include, but is not limited to, ground covers, rigging, scaffolding, planking, containment materials, dust collection and ventilation equipment, HEPA vacuums, water booms, boats with skimmers, and all other containment materials that may be needed.

Properly maintain all equipment in accordance with the NYC Noise Control Code.
Supply the Engineer with (1) portable light meter with a scale of 9 to 50+ foot candles. The meter will be returned to the Contractor upon completion of the Work.

Do not use any materials until they have been accepted by the Engineer.

**MONITORING AND TESTING EQUIPMENT**

**High Volume Ambient Air Monitoring Equipment**

Provide, and maintain in good operating condition, all equipment necessary for the monitoring of airborne emissions in accordance with the provisions of this, specification. If site conditions do not permit permanent installation for the duration of the project, install the equipment each day at locations identified by the environmental consultant. The equipment will be calibrated and used by the environmental consultant. Equipment requirements include:

High volume air monitoring equipment approved for sampling in accordance with 40 CFR 50 equipped with collection heads for total suspended particulate (TSP). Provide mass flow or volumetric flow controlled units, equipped with a flow event recorder. Provide look up tables for the volumetric controlled units. Verify that the monitors have been properly maintained in accordance with the manufacturers' instructions. The environmental consultant will provide the filters.

An ample supply of parts or spare units in order to provide up to four (4) fully operational TSP monitors on the project site each day, for each containment location, including all necessary maintenance.

One variable resistance calibration kit with a current (within 1 year) calibration certificate and 2 slack tube water manometers (15 0 15 inches).

All equipment (e.g., generators, power cords, fuel, etc.) needed to simultaneously operate the monitors. The monitors will be sited by the environmental consultant adjacent to the bridge or at distances away from the bridge approximately equal to three times the bridge height. Provide enough support equipment to accommodate this entire range of monitor placement.

Security and/or secure overnight storage of the equipment (e.g., in jobsite trailers maintained by the Contractor). Note that if the paint removal work is being conducted during evening hours, professional, armed security personnel may be needed since the monitors cannot be placed into secure storage during these times.

**Worker Exposure and Regulated Area Monitoring Equipment**

Supply the instrumentation needed for the monitoring of worker and regulated area exposures including all equipment needed for its operation (e.g., generators, batteries, power cords, fuel, etc.).

Provide all necessary air monitoring cassettes for exposure monitoring. Utilize appropriate cassettes for monitoring exposure to lead and other toxic metals.

**EMERGENCY RESPONSE EQUIPMENT**

Provide all necessary personal protective equipment and emergency response equipment needed for the Project as outlined in the Contractor's Spill Response Plan.
PERSONAL PROTECTIVE EQUIPMENT AND HYGIENE FACILITIES

At each site, provide all personal protective clothing and equipment (PPE) needed to protect Contractor workers, NYCDOT employees, and NYCDOT Agents (REI Consultants and environmental consultant), from project hazards, including proper cleaning and disposal. Repair or replace PPE as required to assure that it continues to provide its intended purpose.

Provide climate controlled decontamination facilities.

Supply the number of facilities as dictated by 29 CFR 1926.51, site conditions, the Contractor's sequence of operations, and as approved by the Contractor's IH and Engineer. Qualifications for the Contractor's IH are presented in Appendix A.

Provide facilities which contain a "clean" area where workers can remove and store their street clothing when they arrive on site; a shower room with hot and cold running water, soap and clean towels; and a "dirty" area where workers can remove their work clothing at the end of their work shift. The "clean" area and the "dirty" area shall each have a separate entrance.

Provide all water required for drinking and hygiene purposes.

WASTE CONTAINERS

Hazardous Waste

Provide DOT approved drums, tanks, roll offs, or other containers of the appropriate size and type in accordance with 49 CFR 178 (e.g., 17H containers in the case of 55 gallon drums) that are suitable for the hazardous waste (liquid and solid) generated on the project. Use containers that are resistant to rust and corrosion (painted, if constructed of steel), that have tight fitting lids or covers, and which are water resistant and leak proof.

Assure that the dry volume capacity of the containers, in cubic yards, is clearly marked on all containers, and that they are labeled as required by applicable Federal, State and City regulatory requirements.

Construction Waste - Provide all containers for non-hazardous construction waste. Use containers that are free of loose debris when brought on site.

Spent Solvents - Provide appropriate containers for spent solvents. Containers shall be corrosion resistant and non reactive to the solvents. Review solvent MSDS to ensure compatibility with container materials. Containers shall be labeled in accordance with all applicable federal, state, and City regulations.

CLEANLINESS OF MATERIALS AND EQUIPMENT

Provide equipment and materials that are free of loose dust and debris when brought onto the bridge site. This includes, but is not limited to, containment and ventilation equipment, scaffolding, waste storage containers, trailers, and paint removal and abrasive recycling equipment.

Clean the materials and equipment and assure that they are free of loose dust and debris upon removal from the Work site. Use HEPA filtered vacuums and/or wet wipe with an approved cleaning solution. Verify proper cleanliness by wiping a cloth across the surface. If dust or debris are dislodged, additional cleaning is required before transporting the materials or equipment off site (See Section 3.06).
CONSTRUCTION DETAILS

WORKER PROTECTION

General

Conduct the Work in strict accordance with Federal OSHA, State, and City regulations governing worker protection. Develop a comprehensive Worker Protection Plan addressing the protection of the health and safety of workers from jobsite hazards, including but not limited to fall protection, coned space (if applicable), lock out/tag out, hearing and eye protection, and exposure to hazardous materials or conditions.

When disturbing paints, institute engineering and work practice controls to reduce worker exposures to lead and other toxic metals to as low as feasible. Present the proposed engineering and work practice controls in the Worker Protection Plan for Engineer review.

Employ an Industrial Hygienist (IH) on staff or through subcontract to develop the Worker Protection Plan, provide general oversight of the Work, and review all exposure monitoring and medical surveillance results. The IH is also required to conduct a monthly site visit and issue a monthly summary report of activities and monitoring results. See Appendix A for the qualifications of the IH and an itemization of the monthly reporting requirements.

In addition to the IH, assign a competent person to the Work site. See Appendix A for the qualifications of the competent person. Have the competent person inspect the Work site on a daily basis for compliance with the requirements of this Section and the approved Worker Protection Plan, and prepare a daily report or daily log of observations made. Maintain the information at the project site and make it available to the Engineer or environmental consultant for review at any time.

Note that all worker protection requirements apply to Contractor and Subcontractor personnel working for the Contractor.

The requirements identified in this Section 3.0 regarding exposure to toxic metals are based on 29 CFR 1926.62, but the Contractor must protect the employees from exposure to any of the other toxic metals which may be present in the paint and/or abrasive, as applicable, in addition to lead.

Pigeon Droppings

In addition to controlling exposures to lead and other toxic metals, take special precautions when working in areas where pigeons have nested.

Develop and implement a worker protection plan for the inspection and removal of pigeon droppings in accordance with NYSDOT Safety Bulletin SB-94-4 (copy attached).

At a minimum, use gloves, whole body protective clothing and a respirator while inspecting or removing the debris, followed by thorough washing of hands, face, and forearms before eating, drinking, or smoking.
Worker Protection Plan

Develop a written Worker Protection Plan under the direction of an IH to establish and implement practices and procedures for protecting the health and safety of employees from Project hazards in accordance with applicable OSHA requirements.

The Worker Protection Plan must include provisions for the protection of workers from toxic metals when exposures to lead or other toxic metals are above the OSHA Action Level. Note that while this specification addresses the protection of employees exposed lead and other toxic metals, the Worker Protection Plan must address the protection of workers from all Project hazards. Requirements for the content of the Worker Protection Plan are presented in Appendix A.

Revise and update the program at least every six months during the portions of the project which involve the disturbance of toxic metals. Verify that the IH signs off on all reviews and revisions.

Establish methods for complying with this specification and any OSHA standards published for the toxic metals present in the paint (e.g., 29 CFR 1926.62 for lead, 29 CFR 1926.1127 for cadmium, and 29 CFR 1926.1118 for inorganic arsenic). Toxic metals may be present in the paint for which OSHA has not developed a comprehensive health and safety standard (e.g., chromium). In these cases, include statements that appropriate measures will be taken to assure that the workers will not be exposed above the Permissible Exposure Limit (PEL) or Threshold Limit Value (TLV) established for the metal as identified in 29 CFR 1926.55.

Identify the methods of compliance that will be used to reduce worker exposures to toxic metals. Rely on respiratory protection only after feasible engineering and work practice controls have been first implemented to reduce airborne exposures.

Exposure Monitoring/Initial Assessment

Conduct initial personal exposure monitoring unless objective data is available to prove that exposures from a given activity cannot exceed the Action Level for lead or other metals contained in the coating. Provide the objective data to the Engineer in writing, signed by the Contractor's IH. Rely upon this data in lieu of monitoring only upon acceptance by the Engineer and Environmental Consultant.

Collect representative personal air samples at the beginning of the lead exposure work (at project start up) to determine employee exposures to lead and other toxic metals that might be present in the coating. Tasks resulting in the potential exposure to toxic metals include, but are not limited to, paint removal activities, installation of lead paste in cables, work site cleanup, and debris handling operations.

Collect full shift (at least 7 hours) air samples for workers in each job classification in each exposure area, and when requested, collect samples on the Engineer and NYCDOT Agents (REI's or environmental consultant personnel). Provide the Engineer and Agents with the results of their analysis within the same five-day notification period required for the employees.

When lead is present, provide personal protective equipment for workers during the initial monitoring. Anticipate exposure levels as dictated by 29 CFR 1926.62 and as specified below. A few activities in addition to those identified by OSHA are included. Use the same level of protection when other toxic metals are found in the coating, unless OSHA has developed a comprehensive health standard for that metal (e.g., cadmium and inorganic arsenic). In those cases, implement the protection requirements of the standard specific to that metal.
Assume an exposure of 10 times the PEL (500 pg/m³): Manual demolition of structures containing lead containing coatings or paint (e.g., dry wall), manual scraping, manual sanding, heat gun applications, power tool cleaning with dust collection systems, and spray painting with lead paint. Although not identified in 29 CFR 1926.62, include chemical stripping, water washing, centrifugal wheel blasting, and the operation of abrasive grit recovery equipment in this category.

Assume an exposure in excess of 500 gg/m³: Using lead containing mortar, lead burning, or conducting the following activities where lead containing coatings or paint are present: rivet busting, power tool cleaning without dust collection systems, cleanup activities where dry expendable abrasives are used, and the movement and removal of abrasive blasting enclosures. Although not identified in 29 CFR 1926.62, include vacuum blasting, water jetting, and wet abrasive blasting removal of paint in this category.

Assume an exposure in excess of 2,500 Vg/m³: Activities involving lead containing coatings or paint on structures disturbed by abrasive blasting, welding, cutting, and torch burning.

During any of the above activities, provide appropriate respiratory protection, personal protective clothing and equipment, change areas and washing facilities, blood lead and zinc protoporphyrin monitoring, and employee training. Maintain the protection as specified above until the test results are received, then modify the protection measures as necessary.

Collect and analyze all air samples according to the appropriate NIOSH method, or equivalent, for the metal of concern (e.g., Method 7082 for lead, Method 7048 for cadmium, Method 7300 for chromium, and Method 7900 for inorganic arsenic). Only use laboratories that meet the qualification requirements established under Appendix A, and which have been approved by the Engineer.

Conduct periodic monitoring of Contractor workers and NYCDOT Agents and provide written employee notifications within five days of receipt of results in strict accordance with the applicable OSHA standard for the metal of concern (e.g., 29 CFR 1926.62 for lead). At a minimum, this requires monitoring at project start up, and after any changes in work practices are made which could have an effect on airborne exposures. If there is no OSHA standard for the detected metal, conduct the monitoring and employee notification based on the requirements of OSHA 29 CFR 1926.62. Provide the Engineer with the results of any subsequent employee monitoring in the monthly IH report.

**Action Level**

The Action Level for lead is 30 Vg/m³ as an eight (8) hour Time Weighted Average (TWA), the Action Level for cadmium is 2.5 gg/m³ as an 8 hour TWA, and the Action Level for inorganic arsenic is 5 Vg/m³ as an 8 hour TWA. For other metals that are found in the coating, and for which no Action Level exists, establish the Action Level at 1/2 of the PEL. If a PEL does not exist, establish the Action Level at 1/2 of the Threshold Limit Value (TLV) found in Appendix A of 29 CFR 1926.55 (e.g., if the TLV is 5 pg/m³, establish the Action Level at 2.5 pg/m³).

If airborne exposures to toxic metals are below the Action Level, provide worker training and hand wash facilities.

If airborne exposures to toxic metals are at or above the Action Level, invoke the following protective measures:

*Written Worker Protection Plan*
*Exposure Monitoring*
*Housekeeping*
Employee Medical Surveillance and Medical Removal Protection
Employee Information and Training
Signs and Regulated Areas
Recordkeeping

Permissible Exposure Limit (PEL) and Threshold Limit Value (TLV)

The PEL for airborne lead exposure is 50 pg/m³ as an 8 hour TWA. The PEL for cadmium is 5 µg/m³ as an 8 hour TWA, and for inorganic arsenic is 10 pg/m³ as an 8 hour TWA. The PEL/TLVs for other metals can be found in 29 CFR 1926.55.

In the event that extended work shifts are allowed, use the following formula to adjust the PEL: Adjusted PEL = 8 hr. PEL x (8 = hours worked in a day).

In addition to complying with the requirements identified when exceeding the Action Level, invoke the following protective measures when the airborne exposure to a toxic metal found in the coating exceeds the PEL or TLV:

Engineering and Work Practice Controls
Respiratory Protection
Protective Clothing and Equipment
Hygiene Facilities and Practices
Respiratory Protection

After feasible engineering controls and work practices have been implemented, use respiratory protection if necessary to maintain employees' exposures to lead and other toxic metals below the PEL or TLV. Require the use of respirators for all employees, inspectors, observers, or other personnel who enter areas where airborne exposures exceed or are expected to exceed the PEL or TLV, or when entering regulated areas.

Develop a written Respiratory Protection Program in compliance with 29 CFR 1910.134 including commitments to provide the necessary medical examinations. When lead is present, include the provisions of 29 CFR 1926.62 in the program. When cadmium is present, include 29 CFR 1926.1127. When inorganic arsenic is present, include 29 CFR 1926.1118. Address the selection, use, maintenance and inspection of respirators, and qualifications for respirator users.

Treat used respirator cartridges as hazardous waste.

Protective Clothing and Equipment

Provide protective clothing and equipment and ensure they are worn by all employees whose exposures exceed the PEL or TLV.
Do not allow workers to wear street clothing beneath protective clothing in any areas where exposures to toxic metals exceed the PEL or TLV. This includes personal shoes unless they are fully protected by shoe covers, or left on the job site until thoroughly decontaminated.

Clean or replace the protective clothing as required by the appropriate OSHA standard for the toxic metal that is present. In the case of lead, clean or replace the clothing weekly if the airborne exposure levels are less than 200 gg/m³ as an 8 hour TWA, or daily if the exposure levels are greater than or equal to 200 ug/m³. In the case of inorganic arsenic, the threshold for daily versus weekly cleaning is 100 pg/m³. Do not use disposable clothing for any longer than one day, and replace the clothing more frequently if it becomes torn or damaged.

Do not remove or clean the clothing by any means which reintroduces the toxic metals into the ambient air such as brushing, shaking, or blowing. Use vacuums equipped with HEPA filters for cleaning.

Store the used clothing in labeled, sealed containers.

If the clothing is to be laundered and it has been exposed to lead, label the containers with the following: "CAUTION: CLOTHING CONTAMINATED WITH LEAD. DO NOT REMOVE DUST BY BLOWING OR SHAKING. DISPOSE OF LEAD CONTAMINATED WASH WATER IN ACCORDANCE WITH APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS." If the clothing has been exposed to cadmium, chromium, inorganic arsenic, or other metals, modify the above text accordingly.

If the clothing is disposable, label the containers as clothing contaminated with lead and other toxic metals, if applicable. Declare the waste as hazardous, or test the waste and apply hazardous waste labels as appropriate based on the results.

If the clothing is washed on site, provide containers for the collection and retention of the water after filtration. Provide ample filtration (e.g., through a multi stage filtration system ending in 5 microns or better if needed) until the water can be disposed of as non-hazardous, or discharged into the sanitary sewer system if allowed by the publicly owned treatment works (POTW). Test the water for the parameters established by the POTW to confirm the acceptability of the filtration. Provide the Engineer with a copy of the test results.

Housekeeping - Conduct housekeeping and project clean up as specified in section 3.06.

Personal Hygiene Facilities and Equipment

Provide clean lavatory and hand washing facilities in accordance with OSHA sanitation standard 29 CFR 1926.51. Locate the hand washing facilities outside of the regulated area, but in close proximity to the paint removal operation, in an area that is convenient for washing prior to eating or smoking.

Provide showers when exposures exceed the PEL or TLV. Confirm that all employees whose exposures exceed the PEL or TLV shower, including hair, prior to leaving the project site. Clean the decontamination facilities at least daily during use.

Filter and containerize all hygiene water. Provide filtration, testing, and disposal of the water as described above under Protective Clothing and Equipment.
Prohibit eating, drinking, smoking, chewing of food or tobacco products, or the application of cosmetics in any area where the exposure to toxic metals exceeds the PEL or TLV or within regulated areas, and confirm that workers thoroughly wash hands and face prior to undertaking any of these activities.

Provide clean lunch and break areas for use by all employees, and maintain airborne concentrations in these areas below the Action Levels.

Provide clean change areas) for employees whose exposures exceed the PEL or TLV. Equip the change areas) with separate storage facilities for street clothing that are adequately segregated to prevent cross contamination from work clothing. Assure that employees do not leave the project site wearing any clothing that was worn while performing activities where exposures exceeded the PEL or TLV.

**Medical Surveillance and Medical Removal Protection**

Provide all employees with initial and periodic medical surveillance as required by the published OSHA health and safety standards for the metal of concern, except that the frequency of blood testing in the case of lead is increased. Conduct blood lead and zinc protoporphyrin (ZPP) sampling and analysis prior to exposure to lead and at monthly intervals thereafter. In addition, conduct exit blood tests for each worker within five working days upon completion of his/her Project activities that involve exposure to lead. Conduct the exit tests even if the departure of the employee occurs prior to the completion of the Contractor's work on the project, and at any time that project activities involving lead exposure will be halted for 30 days or more (e.g., winter shut down).

Verify that all medical tests are completed by, or conducted under the supervision of, a licensed physician. Verify that the blood analysis is conducted by laboratories which meet the qualification requirements established in Appendix A, and which have been accepted by the Engineer. Provide the specialized medical surveillance and X rays required by 29 CFR 1926.1118 for employees exposed to inorganic arsenic.

Do not use workers with initial blood lead levels of 40 pg/dl for any work activities involving exposure to lead above the Action Level.

Provide for intervention by the IH if a blood lead level >25 µg/dl occurs for two or more workers, or there is an increase of 10 pg/dl or more between consecutive tests for any individual worker. Intervention consists of an on site investigation by the IH, implementation of corrective action, and notification of the Engineer in the next monthly report.

Provide for the temporary removal of employees from exposures above the Action Level for the metal of concern when the blood analysis indicates that unacceptable results are occurring (e.g., 50 µg/dl or above in the case of blood lead). Protect employees' benefits during any period of medical removal and conduct all tests required by the OSHA standard for the metal of concern during the removal period. In the case of lead, return workers to exposures above the PEL only after two consecutive blood tests are below 40µg/dl.

Provide all physical examinations as required by the appropriate OSHA standards for the metals) of concern. Include an evaluation and certification that the workers are medically fit to wear respirators. Verify that all examinations are performed by or under the direct supervision of a licensed physician.

Provide all exam information and test results to the employees in writing within 5 days of receipt. Provide the Engineer with a letter report within 10 calendar days after the completion of each month signed by the IH that summarizes all examination and biological monitoring results.
For employees who are offered an examination and biological monitoring but choose not to participate or fail to respond, the Contractor shall provide documentation that the examination and monitoring were offered.

This shall be in the form of a written declination signed by the employee or, for employees who are no longer on the payroll, a registered letter to the employee's last known address.

**Employee Training and Information**

Provide initial and annual refresher training for all employees who will be exposed to toxic metals above the respective Action Levels on any one day in a 12-month period. Include all of the elements of training that are required by the appropriate OSHA standard. If a standard for the metal does not exist, use the training requirements of 29 CFR 1926.62 as the basis of the training program highlighting the differences as appropriate for the other metals of concern.

When other contractors or employers are present at the site, notify them of the nature of the hazards of the work such as lead, noise, and solvent vapors. Advise them of the need to remain out of exposure areas, the warning signs and labeling system in effect, and the potential need for them to take measures to protect their employees in accordance with the applicable OSHA regulations.

**Signs** - As specified in paragraph 3.02, post warning signs around areas or activities that might generate airborne emissions of toxic metals in excess of the Action Levels.

**Parking Areas** - Provide a parking area for employee cars where they will not be contaminated with lead. Relocate the parking area as necessary throughout the course of the project. Have the competent person confirm the suitability of the parking areas on a routine basis.

**Recordkeeping**

Retain all records related to training, medical examinations, blood analysis, exposure monitoring, respirator fit testing, inspections by a competent person, and other related project documentation on file at the project site.

Provide the Engineer with letter reports signed by the IH which summarize all examination results that are indicative of worker exposures to (or which demonstrate proper protection from) toxic metals. In the case of lead, summarize the blood lead and ZPP results, indicate any observed trends, and identify worker intervention or removal provisions that were invoked based on the results. Provide summary reports of the test results prior to worker exposures to Project activities, periodic surveillance results, and results upon completion of site activities. Provide the Engineer with an original signed copy of each report within 10 calendar days after the end of each month.

Retain all records for the duration of employment plus 30 years.

**ESTABLISHMENT OF REGULATED AREAS**

Establish zones (regulated areas) around project locations or activities that might generate airborne emissions of lead, cadmium, chromium, inorganic arsenic, or other toxic metal in excess of the Action Level (e.g., paint removal and clean up locations, dust collector staging areas, waste storage areas, etc.).
Use ropes, ribbons, tape, or other visible means to define the areas. Prohibit entrance into the regulated areas by unprotected or untrained personnel to ensure that they are not exposed to toxic metals from project activities.

Unless objective data is available for establishing the regulated areas, and the data is provided in writing, signed by the Contractor's IH, and is accepted by the Engineer, conduct instrument monitoring in accordance with PD/Lead Method A3 of SSPC 95 06, to verify the adequacy of the regulated areas. Use a minimum of two low flow pumps at each regulated area location (e.g., one pump upwind and one pump downwind). Unless otherwise directed by the Engineer, until the monitoring results are available to establish the perimeter of the regulated area, initially establish the boundary a minimum of 15 feet away from any equipment or operations that might generate airborne emissions of toxic metals.

CONDUCT THE MONITORING ACCORDING TO NIOSH METHOD 7082, OR EQUIVALENT METHOD FOR THE OTHER METALS OF CONCERN, AT THE PRE ESTABLISHED BOUNDARIES OF THE REGULATED AREA(S). COLLECT THE SAMPLES THROUGHOUT AN entire work shift upon full commencement of the paint removal activities (at project start up).

If the monitoring confirms that project emissions at the established boundary do not exceed the Action Level as an 8-hour TWA, establish the boundary at that location and discontinue monitoring.

If the monitoring shows that the emissions exceed the Action Level, modify and improve work practices and containment to provide better controls over the emissions, or reestablish the boundary at a different location if allowed by the Engineer. Repeat the monitoring in either case.

After the boundaries have been established through instrument monitoring, additional monitoring is not required unless directed by the Engineer or environmental consultant if suspect visible emissions occur, or there are changes to the work practices or equipment being used within the regulated areas. In these cases, conduct additional monitoring to confirm the adequacy of the control systems in place, and to verify the suitability of the existing boundary of the regulated area(s).

Verify that the exposure cassettes are only analyzed by laboratories which meet the qualification requirements established under Appendix A, and which have been approved by the Engineer. The laboratory must provide the results to the Contractor within three days of the field sampling. Provide the test results to the Engineer verbally within one day of receipt, and in writing within 5 working days thereafter.

Post caution signs at the entryways around each regulated area. If there is no regulation for the metal of concern, use the legend for the CAUTION sign as found in 29 CFR 1926.62 as the basis, and insert the names) of the other toxic metals. Sign requirements for lead, cadmium, and inorganic arsenic are as follows:

WARNING
LEAD WORK AREA
POISON
NO EATING OR SMOKING

DANGER, CADMIUM
CANCER HAZARD,
CAN CAUSE LUNG AND KIDNEY DISEASE,
AUTHORIZED PERSONNEL ONLY,
RESPIRATORS REQUIRED IN THIS AREA
CONTROL AND MONITORING OF RELEASES TO AIR, SOIL AND WATER

General

Conduct all activities so that spills or releases to the soil, water, sediment, or storm sewers do not occur. Comply with the provisions of the Resource Conservation and Recovery Act (RCRA) for the protection of soils, and the Clean Water Act for the protection of the water and storm water discharges.

Have the competent person inspect the Work site on a daily basis for compliance with the requirements of this Section and the approved Environmental Protection Plan, and prepare a daily report or daily log of observations made. Maintain the information at the project site and make it available to the Engineer or environmental consultant for review at any time.

Initiate immediate corrective action, including the replacement of materials or equipment, or adjustments to work activities as necessary, to correct unacceptable emissions or releases.

Visible Emissions and Releases

Have the competent person conduct observations of visible emissions and releases on an ongoing daily basis when dust producing activities are underway, such as paint removal, clean up, waste handling, and containment dismantling or relocation. Conduct these assessments in accordance with PD/Lead Method A4 of SSPC 95 06. These assessments are in addition to those performed by the environmental consultant.

Visible emissions in excess of SSPC Guide 6, Level 1 are unacceptable. This involves emissions of a cumulative duration of greater than 1 percent of the workday, or greater than 36 seconds in an hour, or 9 seconds in any 15 minutes.

Releases or spills of dust and debris that have become deposited on surrounding property, structures, equipment or vehicles, and bodies of water are unacceptable.

If unacceptable visible emissions or releases are observed, whether by the Contractor, Engineer and/or the environmental consultant:

Shut down the emission producing operations and clean up the debris.
Change work practices, modify the containment, or take other appropriate corrective action as needed and as agreed upon by the environmental consultant, to prevent similar releases from occurring in the future.

Do not resume the emission producing operations until the Engineer or environmental consultant has given permission to resume these operations.

In the event of a conflict between observations between the environmental consultant and the Contractor, the findings of the consultant shall prevail.

Maintain written documentation of the results of the observations in a logbook or other report form available to the Engineer or environmental consultant for review. Verbally report problems to the Engineer or environmental consultant on the same day they are observed.

**High Volume Ambient Air Monitoring**

The environmental consultant, on behalf of the Engineer, will utilize the high volume ambient air monitoring equipment provided by the Contractor. The purpose of the consultant monitoring is to confirm that unacceptable TSP lead emissions are not generated during paint removal and other emission producing activities that involve the disturbance of paint.

Do not conduct any work involving the disturbance or clean up of lead paint debris or move the containment unless the monitors are in place and operating.

Position the monitors at the locations and times as designated by the environmental consultant:

Monitor siting will take into consideration the proximity of homes, businesses, and the general surrounding environment. The locations are likely to change as the work progresses across the bridge. Move and set up the equipment to the designated locations. Put all monitors into position at the designated locations and ensure that they are fully operational at least 30 minutes before the commencement of dust producing operations in order to allow enough time for the environmental consultant to install filters and make any necessary calibration or adjustments to the equipment.

Allow the monitors to remain operational for a minimum of 30 minutes after the completion of daily operations.

At the completion of each day's monitoring activities pick up, transport and store monitors and associated equipment for the next use. If the monitors are to remain in position, provide for the necessary level of security.

Initiate the following action based on the TSP lead results:

The background concentration for NYCDOT projects is established at 0.1 µg/m³.

If TSP-lead levels, measured over 8 hours, are greater than 4.5µg/m³ minus 2 times the background concentration of 0.1 µg/m³ on one day of dust producing operations, assess all field operations undertaken on that day and initiate appropriate corrective action.

If TSP-lead levels, measured over 8 hours, are greater than 4.5µg/m³ minus 2 times the background concentration of 0.1 µg/m³ at the same location on two days of dust producing operations, suspend all dust producing operations pending a full assessment and corrective action.
If the results of the monitoring are unacceptable, undertake the necessary corrective action within 24 hours of receipt of the results. Corrective action may include modifications to the paint removal or containment systems and work practices. Do not resume the emission producing operations until the Engineer or environmental consultant has given permission to resume these operations.

Real Time Particulate Monitoring

The environmental consultant will conduct real time monitoring around the containment (e.g., seams and entryways) each day using a real-time aerosol monitor such as the hand held Mini Ram. The monitoring is being conducted to evaluate the containment seams and entryways for particulate emissions that represent instantaneous increases over background of three times or more.

If unacceptable particulate releases are reported by the environmental consultant, in addition to cleaning the debris, change work practices, modify the containment, or take other appropriate corrective action as needed to prevent similar releases from occurring in the future. Do not resume the emission producing operations until the Engineer or environmental consultant has given permission to resume these operations.

Sensitive Natural Resources

Sensitive natural resource areas may be located around the project. A sensitive natural resource includes any area capable of providing habitat for plant and animal species or capable of functioning to support environmental systems and maintain the City's environmental balance, such as bays, inlets, and wetlands.

If the project is located in a natural resource area, develop a site specific habitat protection plan addressing the steps that will be taken to protect these ecologically sensitive areas from damage.
Endangered Species

Peregrine falcons, barn owls or red tailed hawks may be nesting on the bridge. Note that although these species may not be present on the bridge at the beginning of the project, they could show up at any time. If present, develop a site-specific plan for the sequencing of paint removal operations to avoid disturbing nesting pairs.

Federal and State law permits peregrine falcon nests to be moved if the young have already fledged. Before moving any unoccupied nests. Obtain a Federal United States Fish & Wildlife Service (USF&WS) permit and a NYSDEC depredation permit.

Barn owl and red tailed hawk nests are generally occupied from the beginning of April until the end of July, with eggs laid in April. Peregrine falcon nests are generally occupied from March to July.

CONTAINMENT

General

Use a containment system that maintains the Work area free of emissions of dust and debris in accordance with all provisions of this Specification.

Install and use a containment system for the project based on the paint removal methods that will be utilized.

Provide the containment system in compliance with SSPC Guide 6 guidelines and the requirements of this Specification.

Have the competent person inspect the performance of the containment on a daily basis for compliance this Section and the approved containment submittals, and prepare a daily report or daily log of observations made. Maintain the information at the project site and make it available to the Engineer or environmental consultant for review at any time.

Noise

Comply with the New York City Noise Control Code for construction equipment.

If construction activities will be performed outside of normal hours of operation (7AM to 6PM on weekdays), obtain special permits authorizing this activity. Provide a copy of the permit to the Engineer prior to commencing any operations outside of normal hours.

Containment Drawings and Submittals

Provide containment drawings, calculations, and assumptions, including ventilation criteria as detailed in Appendix A, signed and sealed by a Professional Engineer. Do not conduct any work until the drawings, calculations, and containment submittals have been reviewed and accepted by the Engineer.

Certification of Containment Installation
After the containment system is installed, have the containment design engineer, or a designee working under the direction of the design engineer, conduct a site inspection to verify that the containment system has been assembled as shown on the approved, signed and sealed drawings. Have the design engineer submit a letter to the Engineer attesting to the above. The Engineer must receive the letter before and paint removal work within the containment can begin.

If the containment is not installed in accordance with the design drawings, reinstall the containment, or issue supplemental calculations for the new design for Engineer review and acceptance in accordance with the original submittal requirements.

**Containment Flooring System and Additional Collectors**

If the floor or ground beneath the structure being prepared serves as the base of the containment, cover it with air and dust impenetrable materials such as solid panels of plywood or flexible materials such as tarpaulins. Maintain the materials throughout the project to avoid loosing debris through rips, tears, or breaks in the coverings.

If a suspended or elevated platform is constructed to serve as the base of the containment, use rigid and/or flexible materials, and cover as needed to create an air and dust impenetrable enclosure. Verify that the platform and its components are designed and constructed to support at least 4 times its maximum intended load without failure, with wire cables capable of supporting at least 6 times their maximum intended load without failure. Strictly follow all applicable OSHA regulations regarding scaffolding.

When directed by the Engineer, provide ground covers around and beneath the containment area to capture inadvertent spills or leaks of debris. Extend the covers a minimum of 10 feet beyond the area covered by the containment. Increase this distance based on the height of the work above the ground as directed by the Engineer. Remove debris from the covers at least once per shift, or as directed by the Engineer.

**Containment Requirements for Removal Methods - The minimum containment system requirements for the various methods) of paint removal as follows:**

- **Dry Abrasive Blast Cleaning Class 1 A**
- **Vacuum Blast Cleaning Class 4A**
- **Wet Abrasive Blast Cleaning Class 1 W**
- **Water Jetting Class 2W**
- **Power Tool Cleaning without Vacuum Shrouds Class 1 P**
- **Power Tool Cleaning with Vacuum Shrouds Class 3P**
- **Hand Tool Cleaning Class 3P**
- **Chemical Stripping with Hand Removal Class 3C**
- **Chemical Stripping with Wet Removal Class 2C**

**Containment and Ventilation System Components - The basic components that make up containment systems are defined below. The components are combined in Table 1 and in accordance with the requirements of SSPC Guide 6 to establish the requirements for each method of removal.**

**Rigidity of Containment Materials:** Rigid containment materials consist of solid panels of plywood, aluminum, rigid metal, plastic, fiberglass, composites, or similar materials. Flexible materials consist of screens, tarps, drapes, plastic sheeting, or similar materials.
Permeability of Containment Materials: The containment materials are identified as air impenetrable if they are impervious to dust or wind such as provided by rigid panels, coated solid tarps, or plastic sheeting. Air penetrable materials are those that are formed or woven to allow air-flow. Water impermeable materials are those that are capable of containing and controlling water when wet methods of preparation are used. Chemical resistant materials are those resistant to the specific chemical and solvent stripping solutions.

Support Structure: Rigid support structures consist of scaffolding and framing to which the containment materials are affixed to minimize movement of the containment cocoon. Flexible support structures are comprised of cables, chains, or similar systems to which the containment materials are affixed. Minimal support structures involve the cables or connections necessary to attach the material to the structure being prepared and/or to the ground.

Containment Joints: Fully sealed joints require that mating surfaces between the containment materials and the structure being prepared are completely sealed. Sealing measures include tape, caulk, Velcro, clamps, or other similar material capable of forming a continuous, impenetrable or impermeable seal. Partially sealed joints involve the mating of the materials to one another and to the structure being prepared with concern for the structural soundness of the joint, but without consideration for creating a continuous, impenetrable or impermeable seal.

Entryway: An airlock entryway involves a minimum of one stage that is fully sealed to the containment and which is maintained under negative pressure using the ventilation system of the containment. Resealable door entryways involve the use of flexible or rigid doors capable of being repeatedly opened and resealed. Sealing methods include the use of zippers, Velcro, clamps, or similar fasteners. Overlapping door tarpaulin entryways consist of two or three overlapping door tarpaulins. Open seam entryways involve entrance into the containment through any open seam.

Mechanical Ventilation: The requirement for mechanical ventilation is to ensure that adequate air movement is achieved to reduce worker exposure to toxic metals to as low as feasible, and to enhance visibility. Design the system with proper exhaust ports or plenums, adequately sized ductwork, adequately sized discharge fans and air cleaning devices (dust collectors) and properly sized and distributed make up air points. Natural ventilation does not require the use of mechanical equipment for moving dust and debris through the work area. It relies on natural air-low patterns, if any, through the containment.

Negative Pressure: If negative pressure is specified, verify its performance through instrument monitoring to achieve a minimum of 0.03 in. (0.08 cm) water column (W.C.) relative to ambient conditions. In addition verify through visual assessments for the concave appearance of the containment enclosure.

Exhaust Ventilation: When mechanical ventilation systems are used, provide filtration of the exhaust air, otherwise airborne particulate from the containment will be exhausted directly into the surrounding air. Provide a filter that is at least 99.9% efficient in removing a mono dispersed aerosol at 0.5 micrometers in diameter.

Maintenance of Existing Lighting Systems and Containment Lighting Requirements

Maintain as fully operational throughout the project, all existing navigation and anti collision lighting systems that are attached to the structure. If existing lighting will be concealed, install temporary lighting. Provide the lighting plan to the Engineer for approval in advance.
Make all efforts to maintain existing aerial, roadway, and parking lot lighting, or provide suitable substitutions as approved by the Engineer.

Maintain light intensity inside containment, by natural or artificial means, at a minimum of 20 foot candles on the surface throughout surface preparation and painting activities. Maintain a minimum of 50 foot candles at the surface for inspection activities. Provide auxiliary lighting as necessary. Use explosion proof lighting.

**Protection of Drainage Systems**

Protect storm sewers and drains from the entrance of debris from project activities. Keep all protective systems clean and operational throughout the entire project. At the end of each shift at a minimum, remove all visible debris from the protective devices or from areas where rain water could carry the debris into drains or storm sewers. Conduct more frequent cleaning as directed by the Engineer.

Identify the methods that will be used to route run off from the existing deck drains through the containment enclosure. Do not close any bridge deck drains without the explicit approval of the Engineer.

**Work Over Water Containment Restrictions**

When working over or near water, use water booms to contain inadvertent spills or releases of dust and debris unless prohibited by navigation lanes. In these cases, have a boat available with a skimmer to collect fugitive materials. Remove all project related dust and debris from the surface of the water or from sediment at the end of each shift at a minimum. Conduct more frequent cleaning, if directed by the Engineer.

Provide the Engineer and the appropriate authorities (e.g., Coast Guard) with the distance that the containment will extend below the bottom of the bridge (e.g., below the bottom chord) when operating in the navigation channel. Maintain this distance to the minimum required and approved.

Unless otherwise directed by the Engineer or the appropriate authorities, design the containment to allow it to be moved out of the navigation channel within 24 hours of notification that ships needing additional clearance require passage.

Provide the Engineer and the appropriate authorities with a 24 hour telephone number and contacts for discussions regarding the containment system.

**Inclement Weather**

When threatening weather conditions exist, such as sustained winds of 30 mph or more that could cause the release of waste material to the surrounding environment, stop all Work activities and immediately clean up waste materials within the containment.

Develop and submit to the Engineer for acceptance an Emergency Demobilization Procedure for the securing of equipment and materials, and the removal of necessary containment materials in the event of inclement weather. Inclement weather includes, but is not limited to, sustained wind speeds or gusts of 40 mph or greater, and heavy snow storms that will place unacceptable loads on the containment structure. Initiate the Emergency Demobilization Procedure under inclement weather conditions or as directed by the Engineer.
WASTE CLASSIFICATION, HANDLING, AND DISPOSAL

General

The Contractor and the NYCDOT are co-generators of the hazardous waste. The NYCDOT will provide the EPA identification number, but the Contractor is solely responsible for the aspects of waste management as defined in this Section.

Work under this Section consists of accumulating, packaging, labeling, loading, transporting, treating, and disposing of hazardous paint removal waste, non-hazardous construction debris, and water used for cleaning and washing the bridge and equipment prior to removal from the Work site.

For purposes of this Section, paint removal waste is defined as removed paint particles combined with the material used to remove the paint. The NYCDOT has declared all paint removal waste as hazardous, even if sampling and analysis indicate that hazardous thresholds are not exceeded.

Note that the existing coatings may contain toxic metals in addition to lead.

Recover all waste products generated during cleaning and painting work, including but not limited to rags, tape, disposable coveralls, filters, sediment, paint debris, and paint cans.

Have the competent person inspect the waste handling and storage on a daily basis for compliance with this Section and the approved Waste Management Plan and prepare a daily report or daily log of observations made. Maintain the information at the project site and make it available to the Engineer or environmental consultant for review at any time.

Items Provided by the Contractor

Waste sampling, testing, and classification.
Waste packaging, handling, and secure storage.
Labeling of containers.
Procuring all necessary waste permits and licenses.
Arranging for the transportation and disposal of hazardous waste.
Arranging for the transportation and disposal of non-hazardous waste.

Waste Sampling

All paint removal waste streams are declared hazardous but collect a minimum of four representative samples of each paint removal waste stream to identify the specific composition.

Collect a minimum of \( \frac{1}{2} \) pound of waste per sample, or approximately 8 oz per sample in the case of wastewater. Collect the wastewater sample only after the water has been filtered as specified later in this Section. Collect the samples under the observation of the environmental consultant. Collect the samples in accordance with EPA solid waste test methods SW 846, "Test Methods for Evaluating Solid Waste Physical/Chemical Methods." Use a random sampling technique to collect representative samples.

Complete the initial sampling of each waste stream immediately upon filling the first container, but do not allow waste to accumulate for longer than 30 days before sampling. After the representative samples are collected, send them immediately to the laboratory for analysis.
Unless otherwise directed by the Engineer, or required by State regulations or the waste recycling or disposal facility, once each waste stream is sampled, tested, and classified, additional sampling and analysis are not required for subsequent shipments unless the waste stream changes.

**Waste Testing**

Only use laboratories which meet the qualification requirements of Appendix A, and which have been approved by the Engineer.

Direct the laboratory to test the solid waste in accordance with 40 CFR 261, Appendix II. Method 1311 Toxicity Characteristic Leaching Procedure (TCLP).

Analyze one sample from each waste stream by TCLP for all eight (8) metals, and other hazardous characteristics (e.g., corrosivity, reactivity, and ignitability) as required by the regulations. Conduct any additional tests required by the disposal facility. When chemical strippers are used, test all liquids and sludge. Include pH to determine corrosivity. Retain the other samples for possible further analysis.

After filtration, test the wastewater for lead and any other analytical parameters required for disposal characterization by the POTW or disposal facility.

**Waste Classification**

**Hazardous Waste Classification**

All paint removal waste streams are classified as hazardous. Other waste streams are classified as hazardous if results from TCLP analysis indicate any one of the following eight metals in concentrations at or above limits established in 40 CFR 261:

- Arsenic 5.0 mg/L
- Barium 100.0 mg/L
- Cadmium 1.0 mg/L
- Chromium 5.0 mg/L
- Lead 5.0 mg/L
- Mercury 0.2 mg/L
- Selenium 1.0 mg/L
- Silver 5.0 mg/L

The above list includes only those elements typically associated with paints. Take into account and test for other substances that may be present which can cause debris to be classified as hazardous waste as defined in 40 CFR 261 (e.g., pH <2.0 or >12.5 resulting in corrosivity, or the characteristics of reactivity or ignitability).
The NYCDOT requires that paint removal waste, including waste that is generated through the use of steel abrasives, be handled, transported, and disposed of as hazardous waste, regardless of the TCLP test results.

Typical paint removal waste contains less than 2% by weight of organic material. The Contractor is specifically forewarned that disposal facilities perform spot tests and may refuse to accept wastes in excess of 2% organic content. Waste contaminated in this manner (e.g., with solvent waste) will be the Contractor's responsibility. All penalties and costs associated with the refusal of a disposal facility to accept waste not meeting its requirements will be borne by the Contractor.

Non-hazardous Waste Classification

A waste stream is classified as non-hazardous if the TCLP analysis indicates that the waste stream contains toxic metals or hazardous substances below the thresholds identified above which would classify it as hazardous, and it does not exhibit other characteristics of hazardous wastes.

The NYCDOT has classified paint removal waste as hazardous regardless of the test results.

Laboratory Report

Have the laboratory send the original test report directly to the Engineer no later than five (5) calendar days after the representative samples are submitted for testing, with a copy being sent by facsimile to the Engineer on the same day the original report is sent.

Include the following minimum information in each report: Identity of the waste streams analyzed, the number of samples collected and tested, dates of sampling and testing, laboratory test procedures utilized, the names and signatures of the individuals collecting the samples and conducting the laboratory tests, an interpretation of the test results, and chain of custody forms.

Waste Handling, Site Transportation and Spill Containment Comply with 40 CFR 262, State and City regulations for the on site handling, packaging, and storage of all waste generated by the project.

Sequence the waste collection operations and identify storage locations in order to minimize the amount of container movement required throughout the course of the project. The Engineer must approve all waste storage locations.

Provide secure waste storage areas (e.g., within a locked fenced in area) to prevent access by the public or vandals, and placard the storage area in accordance with applicable regulations. Store the waste on a level surface.

Do not place hazardous waste on the unprotected ground (e.g., cover the ground with impermeable tarpaulins) and provide protection from the elements (e.g., rain and snow) and adequate shielding to prevent dispersion of the waste by wind or rain. Use pallets to store drums in areas prone to flooding from rain. Store drums containing liquid wastes (e.g., wastewater and spent solvents) on drip pads. Clean the drip pads on a periodic basis.

Store non-hazardous waste separately from hazardous waste. Do not co-mix hazardous waste with non hazardous waste. Do not mix different types of hazardous waste together unless specifically approved by the Engineer and the disposal facility.
Arrange containers in the storage area for easy accessibility.

At the end of each working day at a minimum, collect and store the waste in drums or containers such that no waste is left exposed overnight. Cover all containers immediately upon filling and confirm that all lids are closed except when filling. Verify that all labels remain intact.

Maintain all containers in good operating condition with all lids and closing mechanisms intact and operational to prevent the escape of debris by wind, spilling of the contents, or access by unauthorized personnel.

Provide adequate shielding and protection of the surrounding area when transferring and/or conveying hazardous waste from one container to another to prevent dispersion or spills. Immediately clean up spilled debris and return it to the storage containers. Use methods such as HEPA vacuuming that will prevent airborne dispersion of the material.

Do not fill any container or roll off in excess of the capacity marked on the container.

Have the competent person, on a weekly basis, inspect the drums or containers for corrosion, applicable and legible labels, proper covers, ground protection, and leaks, and record the results of all the inspections in a log book. Conduct additional inspections before containers are moved.

Verify that all waste is transported to the appropriate recycling or disposal facility within forty five (45) calendar days after waste is generated, or two weeks following demobilization of the site, whichever occurs first. Failure to comply with the aforementioned deadlines may result in the actions described under Basis of Payment.

Improper waste storage is cause for immediate suspension of the Work by the Engineer until appropriate corrective action is completed.

Train all personnel in the proper handling of hazardous waste at the Work site in accordance with 40 CFR 265.16 and 6 NYCRR 373. Include procedures in the Waste Handling Plan that will be followed in the event of a release or spill when handling the waste, including containment of the spill, notification of the NYCDOT Engineer, collection and containerizing of the waste, and a review of work practices and implementation of necessary changes to prevent a reoccurrence. Maintain all training records on site.

Labeling of Containers

Immediately label all containers of hazardous waste in accordance with 40 CFR 262, and 49 CFR 17-179. Complete missing information upon receipt of the testing results. Include the following minimum information:

Hazardous Waste. Federal law prohibits improper disposal. If found, contact the nearest police, or public safety authority, or the U.S. Environmental Protection Agency.

Proper DOT Shipping Name (e.g., RQ Hazardous Waste Solid, N.O.S. 9, NA 3077, PG III)

Manifest Document No (when manifest is prepared; prior to shipping)

Generator Name, Address, EPA ID No. and Contract No.
Date of Accumulation (accumulation date commences when hazardous waste is first placed into the container)

EPA Waste No (e.g., Arsenic D0004, Cadmium D0006, Chromium D0007, Lead D008)

Enter the above information using permanent marking material, printed in English, and displayed on a background of contrasting color unobscured by other labels or attachments. Locate labeling away from other markings that could substantially reduce its effectiveness.

Complete the labeling, marking, and placarding activities under the observation of the environmental consultant prior to storing or transporting any container or roll-off.

**Waste Transportation and Disposal**

**Hazardous Waste**

Procure all necessary waste permits or licenses that are required by State or City regulations.

Prepare the Uniform Hazardous Waste Manifest for each shipment, including the LDR (Land Disposal Restriction) certification, which will be attached to the manifest. The Engineer will sign the Generator's Certification on the manifest and maintain copies of the original manifest and signed copies upon completion of disposal.

Arrange for the transportation of all hazardous waste by a licensed transporter in accordance with 40 CFR 263, 49 CFR 171 179, and State and City regulations. Verify that all waste is completely covered during transport.

Unless specifically approved by the Engineer in writing, the hazardous waste transporter is not permitted to stop enroute after the pick up of hazardous materials from the construction site.

Arrange for the recycling or disposal of all hazardous waste in accordance with 40 CFR 264, 40 CFR 268, and state regulations. Verify that only licensed recycling or Treatment, Storage, and Disposal (TSD) facilities are used.

Should any problems arise that would preclude the selected facility from accepting the waste, immediately notify the Engineer in writing of such situation. Identify and provide information on an alternate TSD that is properly licensed and acceptable to the NYCDOT, and arrange for disposal at such facility after having obtained written approval from the Engineer.

Provide a certification for each manifested shipment that the waste was accepted by the recycling or disposal facility, and properly treated and disposed. Comply with all of the manifesting, certification, and reporting requirements for hazardous waste in accordance with 40 CFR 262, 40 CFR 268 and State regulations, including certificates of final disposal for each shipment.

If the signed manifest is not received from the disposal facility within forty-five (45) days of shipment, as directed by the Engineer, initiate the EPA Exception Report in accordance with 40 CFR 262.42, and take all steps necessary to locate the manifest and waste.

**Non-Hazardous Municipal/Construction Waste**

Procure all necessary waste permits or licenses that are required by State or City regulations.
Properly transport, and dispose of all non-hazardous municipal/construction waste.

Verify that waste is completely covered during transport.

If toxic metals or hazardous substances were detected during the laboratory testing, notify the disposal facility that such metals or materials are present in the waste.

Comply with additional City regulations as applicable.

**Special Waste Requirements for Recycled Steel Grit**

When recycled steel abrasives are used, collect, handle, store, and transport the waste in the same manner as if it tested hazardous.

Prepare the hazardous waste manifest for each shipment and provide to the Engineer for review and signature.

Notify the waste recycling or TSD facility that the waste contains high levels of lead.

If the waste is shipped to a TSD facility, notify the facility that further stabilization is required prior to disposal. In the case of lead, use stabilization methods that would have been used in the event the waste tested hazardous. Stabilize to less than 0.75 ppm teachable lead.

**Waste Water Handling and Disposal**

Provide containers for the collection and retention of all waste water, including but not limited to the water used for bridge cleaning, hygiene purposes, laundering of clothing if done on site, and cleanup activities. Note that payment for the hygiene and laundering water is included under decontamination facilities for worker protection.

Filter visible paint chips and particulate from the water prior to placing it into the containers. Prior to disposal, test the water for total toxic metals and provide ample filtration (e.g., through a multi-stage filtration system ending in 5 microns or better if needed) until the water is not classified as hazardous. Conduct the necessary laboratory testing as described above.

Make disposal arrangements with the local publicly owned treatment works (POTVI), sanitation company, or other appropriate permitted facility. Provide the Engineer with documentation signed by an official of the facility stating that the facility will accept the waste, and that the levels of any lead or other metals remaining in the water are acceptable. If the facility allows the filtered water to be placed into the sanitary sewer system, include such authorization in the letter.
CLEANING AND CLEARANCE OF MATERIALS, EQUIPMENT, AND SURROUNDING SURFACES

General

Have the competent person inspect the Work site on a daily basis for compliance with the requirements of this Section and the approved Environmental Protection Plan, and prepare a daily report or daily log of observations made. Maintain the information at the project site and make it available to the Engineer or environmental consultant for review at any time.

Daily Cleaning of Work Site

Clean up visible paint chips and paint removal debris from the unprotected ground, the soil, on or in the water or sediment, around storm sewers or drains, or in areas where rain-water could carry the debris into storm sewers or drains. When cleaning pavement surfaces take special care to remove all waste material so as to prevent it from being redistributed into the air by traffic.

Clean the debris at least once each shift or more frequently if directed by the Engineer or environmental consultant.

Conduct the cleaning by manually removing paint chips, washing and wiping, and/or HEPA vacuuming.

Have the competent person document the results of the daily cleaning in a report or log.

Cleaning of Containment

When abrasive blast cleaning is employed, remove bulk abrasive/paint debris from the containment floor in order to minimize excessive waste build up. Acceptable methods include the use of automatic waste conveyance systems or manually operated vacuums. If such ongoing methods of removal are not employed, conduct bulk waste removal approximately every two hours while blast cleaning is underway to remove large accumulations of waste. Remove all bulk abrasive/paint waste at the end of the shift, before new paint is applied, or before a prolonged work stoppage, such as for weather interruptions.

When methods of removal other than abrasive blast cleaning are employed, conduct bulk cleaning of the waste from within containment at the end of the shift, before new paint is applied, or before a prolonged work stoppage, such as for weather interruptions.

Prior to moving the containment enclosure, clean the inside surfaces of the enclosure (walls, floors, ceiling, etc.) of dust and other spent material by vacuuming. Have the competent person conduct a visual inspection to verify that the surfaces are free of loose debris prior to moving and document the results in the daily log or report.

Prior to dismantling the containment, clean the inside surfaces to the extent that dust or debris are not dislodged when wiping a cloth across the surface. Have the competent person conduct the inspection and document the results in the daily log or report.

Cleaning of Contractor Equipment and Materials

Prior to removing equipment or reusable materials from the project site, remove all loose dust and debris from the surfaces to the satisfaction of the Engineer and environmental consultant.
Conduct the cleaning by manually removing paint chips, washing and wiping, and/or HEPA vacuuming.

Have the competent person conduct clearance tests by wiping a cloth across representative surfaces. If dust or debris are dislodged, conduct additional cleaning until the surfaces pass the clearance test. Report the results of the testing in the daily report or log.
Final Cleaning/Clearance of Surrounding Property and Structures

After all Contractor equipment and materials have been removed, conduct a visual inspection and clean up of the project site and surrounding property. This includes all areas used by the Contractor (e.g., staging and equipment yards, shower and trailer areas, waste storage, etc.) and all surrounding property, structures, buildings, equipment, and surfaces located within 100 feet in each direction from the bridge. If project debris is observed to be present beyond 100 feet from the structure, expand the limits of the inspection and clean up, as directed by the Engineer.

Remove all lead dust, spent abrasives or other paint removal media, paint chips, solvents, materials of construction, fuel, and other litter. Clean up and remove the debris to the satisfaction of the Engineer and environmental consultant. This includes all visible debris and waste associated with bridge painting activities, even if the paint chips and abrasive waste are a pre existing condition.

Clean the surrounding ground, equipment and other surfaces by manually removing paint chips, wet washing and wiping, and/or HEPA vacuuming.

The environmental consultant will be conducting visual cleanliness inspections. Conduct additional cleaning as required, based on the results of these inspections.

Clean the surrounding water with the use of approved materials and equipment including but not limited to water booms and/or boats with skimmers, as directed by the Engineer.

Properly collect, handle, store, transport and dispose of all material and/or water along with all waste products generated during the Work including but not limited to rags, tape, disposable coveralls, and filters.

Prepare a letter report presenting the results of the inspections and tests conducted to verify the final cleanliness of the project site, surrounding property, waterways, equipment, buildings, and structures.

METHOD OF MEASUREMENT

Worker Protection Plan - The work of developing and implementing the Worker Protection Plan will be measured on a lump sum basis. This includes all medical testing and exposure monitoring sample analysis, and the furnishing, installation, maintenance, relocation, and removal of decontamination facilities. Included in the price is the cost of testing, storing, and disposing all hygiene water.

Environmental Protection and Project Cleanup - The work to develop and implement the environmental protection plans; supply and maintain the TSP lead monitors; conduct visible emissions evaluations; and conduct routine and final project inspections and clean up will be measured on a lump sum basis.

Containment System The work to design the containment/ventilation system, prepare all working drawings and submittals, and provide all labor, materials and equipment necessary to install, operate, and remove the containment systems will be measured on a lump sum basis. On single projects where different types of containment are being used (e.g., unique designs for girder spans versus through truss, or one design for power tool work versus blast cleaning), the Contractor may elect to provide a separate lump sum price for each type of containment system being employed.
Disposal of Paint Removal Waste and Waste Water

This work will be measured on a lump sum basis to include all paint removal waste and waste water (with the exception of hygiene water which is included under decontamination facilities) accumulated, packaged, stored, transported, treated, and disposed in accordance with the requirements of this Section.

The accumulation, packaging, storage, transportation, and disposal of waste other than paint removal waste or wastewater (e.g., construction debris) is addressed in this specification, but it is not measured for payment. The cost for the handling and disposal of this waste is considered to be incidental to the surface preparation and painting items.

Community Notification The work to develop and distribute pamphlets and participate in community meetings will be measured on a lump sum basis. The specific scope of Contractor involvement will be defined by the NYCDOT in the Special Requirements.

BASIS OF PAYMENT.

General

The extent of the Contractor's compliance with all provisions of this specification (e.g., control of emissions and worker exposures, performance of the containment, timeliness of disposal, etc.) will be considered as relevant in any future determination of an award to the Contractor as the lowest responsible bidder for any project under the supervision of the NYCDOT.

Worker Protection Plan

The lump sum price bid shall include labor costs for the IH and the competent person, and the cost of all materials, personal protective equipment, respirators, other equipment, and fees necessary to complete the Work.

All costs related to worker monitoring and medical surveillance, including worker time and transportation for medical testing, the cost of providing results to employees and the Engineer, and the cost for collection of exposure monitoring samples, shall be included in the lump sum price. No payments shall be made for additional medical tests or laboratory analysis required due to an increase in the blood lead level of any employees) above the OSHA threshold of 40 µg/dl.

The lump sum price shall also include the cost of ground rental, utility and waste water disposal charges necessary to furnish, install, clean, maintain, relocate and remove the decontamination facilities as necessary to complete the Work.

Progress payments for the development and installation of the Worker Protection Plan will be computed in accordance with the following schedule:

15% of the lump sum price will be paid when work entailing a potential for lead exposure has begun, the work is in compliance with the Worker Protection Plan as determined by the Engineer, and the following items (if required) have been completed:

Certification of completion of lead training for supervisors and employees is provided to the Engineer.

Certification of completion of respirator training and documentation of respirator fit testing for all employees who will wear respirators is provided to the Engineer.
Documentation of purchase or mobilization of all required respirators and Personal Protective Equipment (PPE) is provided to the Engineer.

Documentation of purchase or mobilization of decontamination facilities is provided to the Engineer.

Documentation of initial medical testing and a summary of the results is provided to employees and the Engineer.

Documentation of initial exposure monitoring and a summary of the results are provided to employees and the Engineer.

Warning signs are posted in exposure areas.

75% of the lump sum price will be paid in proportional amounts over the duration of Work, based on the percentage of the work completed.

The Engineer will determine a daily rate of payment by dividing 75% of the lump sum amount bid for the Worker Protection Plan by the total number of workdays, as shown in the Contractor’s schedule, without regard to any extension of time.

At any time, the Engineer may request the Contractor to submit a revised schedule that reflects the actual progress of the Work. Failure to submit a revised schedule upon request will result in termination of the progress payments.

No payments will be made under this item for each calendar day during which there are substantial deficiencies in compliance, as determined by the Engineer. The amount of such calendar day non-payments will be deducted from the next progress payment.

10% of the lump sum price will be paid when the exit medical exams have been offered as required and results provided to employees and the Engineer, the final monthly report has been received, all work which entails a potential for lead exposure has been demobilized, and all equipment associated with such operations has been removed from the project site.

Environmental Protection and Project Cleanup

The lump sum price bid shall include the cost for developing and implementing the environmental protection plans; supplying, setting up and maintaining the TSP lead monitors including power, conducting visible emissions evaluations, correcting emissions as required, and conducting routine and final project inspections and clean up.

Prior to the beginning of any Work, the Contractor will supply the Engineer with an initial estimate of workdays required to complete environmental protection and cleanup activities. This initial estimate will not be considered final. The Engineer may request a revised estimate at any time during the progress of the Work.

Progress payments will be made. They will be based upon the number of workdays required to complete all of the dust producing operations such as abrasive blast cleaning or other paint removal, containment moving and demobilization, and project cleanup. Monthly payments will be made based on the percentage of work completed.
**Containment System**

The lump sum price bid shall include the cost for preparing the containment/ventilation system design, working drawings, and all labor, materials and equipment necessary to install, operate, and remove the containment systems. As directed by the Pay Items, provide a separate price for various types of containment design used on unique sections of the bridge (e.g., girder approaches versus through truss), or for unique methods of paint removal (containment for power tool cleaning versus abrasive blast cleaning).

All Work shall be done in a manner satisfactory to the Engineer. Payment for the assessment and clean up of emissions and releases, and final project cleanup, are addressed above in the Environmental Protection and Project Cleanup item.

Prior to the beginning of any work, the Contractor will supply the Engineer with an initial estimate of workdays required to complete all of the paint removal and clean up work involving the use of containment(s). This initial estimate will not be considered final. The Engineer may request a revised estimate at any time during the progress of the Work.

Progress payments will be made. They will be based upon percentage of completion. The percentage of the total containment costs) represented by each section of the bridge (e.g., each span) will be established in advance, and the lump sum prices) divided accordingly. A total of 60% of the proportional containment amounts) will be issued when the last containment in the given section (e.g., span) is erected. The remaining 40% of the proportional amount will be issued when the last containment is removed from the section.

Payment amounts will be deducted for each calendar day during which there are substantial deficiencies in compliance with the requirements of this specification, as determined by the Engineer. Substantial deficiencies are defined as a situation in which either of the following are true:

- A visible emission is observed which indicates failure to perform "in reasonably close conformity" to the specification requirements, and the visible emission is for a similar cause as a previous visible emission that required work to be stopped and corrective action taken.
- Violations of TSP lead criteria occur.

Payment deductions under this item will be taken when the last containment on a given bridge section has been removed. At that time, the total deduction will be calculated as follows:

\[
\text{(Proportional Lump Sum Price for Bridge Segment/Actual No. of Workdays Required to Complete the Segment) \times (No. of Days with Substantial Deficiencies)}
\]

This amount will be deducted from the final movies due to the Contractor for the given bridge section.

Final payment will not be made until verification that all Work has been performed to the satisfaction of the Engineer.
Disposal of Paint Removal Waste and Waste Water

The lump sum price for the disposal of paint removal waste and wastewater used for cleaning the bridge and equipment shall include the cost of all labor, materials, equipment, sampling, testing, and fees necessary to complete the Work. The cost for the handling, testing, and disposal of hygiene water is included in the cost for the decontamination facilities.

The lump sum price shall also include the following fees which are the responsibility of the Contractor:

Special Assessment on Generation, Treatment or Disposal of Hazardous Waste in New York State. The Contractor shall pay the fee to the NYS Department of Taxation and Finance on a quarterly basis within 20 days after the end of each quarter. The fee will be based on actual tons of hazardous waste per quarter.

Hazardous Waste Fee (the Large Generator Fee) The Contractor shall pay the fee to New York State Department of Environmental Conservation on an annual basis (once a year) which shall be based on 1,000 kg (2,200 lbs.) per month.

The Contractor shall contact the NYS Department of Taxation and Finance and NYS Department of Environmental Conservation for proper procedures and forms for payment.

If the NYCDOT is fined or penalized as a result of the Contractor's performance or lack thereof on this item, in addition to other remedies the NYCDOT may possess, said fine or penalty will be deducted from the Contractor's payments on this item.

Progress payments will be made based on the percentage of project completion at a maximum of 10% completion intervals. Payment will be issued after the waste for the given interval has been shipped and the signed manifest is returned. For example, if 10% of the project has been completed, but none of the waste has been shipped and/or the manifests were not returned, payment for 10% of the waste will not be issued at that time.

Community Notification Payment will be made on a lump sum basis to cover the cost of furnishing all labor and materials to develop and distribute pamphlets and participate in community meetings as directed by the NYCDOT.
APPENDIX A – SUBMITTALS

GENERAL

This Appendix identifies the plans, programs, and documentation required prior to mobilization on site, at the start of construction, and during the construction phase.

PRE-CONSTRUCTION SUBMITTALS

Submit the following plans and programs to the Engineer for review and acceptance a minimum of 20 days prior to mobilization at the project site. The Contractor shall not begin any paint removal Work until the Engineer has accepted the submittals.

Do not construe Engineer acceptance of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Acceptance of the programs does not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal, State, or City regulations and this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor remains solely responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

Project Schedule - Provide the Engineer with an initial estimate of the workdays required to complete each phase of the project (e.g., mobilization, paint removal, paint application, and demobilization). Include the estimated number of workdays each month when lead exposures are anticipated.

Qualifications, Experience, and Certifications - Provide written qualification, experience, and certification information for the following:

Contractor - Provide proof of SSPC QP-1 and QP-2 certifications.

Laboratory for worker and area exposure monitoring - Provide the name, address, accreditations, certifications, qualifications, and contact person of the laboratory and/or firm that will be used for the worker and area exposure monitoring. Verify that the analytical laboratory is certified by the NYSDOH for lead analysis, is American Industrial Hygiene Association (AIHA) accredited for metals analysis, and has successfully participated (previous 12 months at a minimum) in the AIHA PAT program.

Laboratory for blood lead analysis - Provide the name, address, contact person, and proof that the laboratory conducting the worker blood lead analysis is approved by OSHA and the NYS DOH. A current list of approved labs may be obtained from the OSHA Technical Center at (801) 487-0267, or at the following address:

OSHA Technical Center
P.O. Box 65200
Salt Lake City, UT 84165-0200

Laboratory for waste sampling and analysis - Provide the name, address, accreditations, certifications, qualifications, and contact person of the laboratory and/or firm that will be used for waste sampling and analysis.
Industrial Hygienist (IH) - Provide the name, experience, and qualifications of the IH who will be reviewing, approving and sealing the site-specific Worker Protection Plan. The IH must meet one or more of the following qualifications:

Current certification by the American Board of Industrial Hygiene (Certified Industrial Hygienist - CIH).

A Bachelor's Degree in engineering, chemistry, physics, biological sciences, industrial hygiene, toxicology, the environmental sciences or a related field, and at least three years of documented full-time work as an IH, including field and sampling experience.

A Master's Degree in one of the above fields, and at least two years of documented full-time work as an IH, including field and sampling experience.

Competent Person, IH, supervisors, and foremen - Provide proof that the competent person, IH, and all project superintendents and foremen, have successfully completed the SSPC C3, Competent Person and Supervisor training, with refresher training completed within the last 12 months, as well as an NYCDOT-approved course that addresses the procedures and documentation specific to NYCDOT projects.

**Contractor Chain of Command**

Submit a listing of key Contractor personnel, including names and relative positions, addresses, and telephone and pager numbers.

Include the names and telephone/pager numbers for contact persons who are available on a 24-hour basis in the event of emergencies.

**Worker Protection Plan**

Submit two copies of a written Worker Protection Plan to the Engineer for review and acceptance. The Worker Protection Plan must provide for the protection of Contractor workers from all project hazards including but not limited to fall protection, confined space (if applicable), lock out/tag out, hearing and eye protection, and exposure to hazardous materials or conditions.

Include as part of the plan, or in a separate submittal, a binder containing MSDS for all materials that will be used on the Project site. If all MSDS are not available at the pre-construction stage, provide the MSDS before using the product on site.

Address as part of the Worker Protection Plan, or in a separate document, the personal protective equipment and hygiene practices that will be invoked to protect workers from exposure to pigeon droppings in accordance with NYSDOT Safety Bulletin SB-94-4.

The Worker Protection Plan must be a project-specific program, prepared under the direction of, and signed by, an Industrial Hygienist (IH).
Address worker protection from lead in strict accordance with 29 CFR 1926.62 and the requirements of this Specification, as well as from other toxic metals in the paint (e.g., 29 CFR 1926.1127 for cadmium, and 29 CFR 1926.1118 for inorganic arsenic). When toxic metals are present in the paint for which OSHA has not developed a comprehensive health and safety standard, include provisions to assure that the workers will not be exposed above the Threshold Limit Values (TLVs) established for the metal as identified in 29 CFR 1926.55. In the event of a conflict between the requirements of this specification and an OSHA standard, follow the most restrictive requirement.

Address the requirements of 29 CFR 1926.62, this specification, and other applicable Federal or State regulations in the Worker Protection Plan. A Worker Protection Plan is required any time that exposures to lead or other toxic metals exceed the Action Level. These elements of the Worker Protection Plan include, but are not limited to, the following:

A description of the Contractor's lead health and safety organization, including the responsibilities and qualifications of the IH and the competent person.

A description of arrangements for ensuring that subcontractors, if any, will comply with the Worker Protection Plan.

A description of each activity which will entail a risk for lead exposure.

Descriptions of the engineering, administrative and work practice controls that will be used to reduce exposure. As required by 29CFR1926.62, all feasible engineering, administrative and work practice controls must be implemented before considering the use of respirators to reduce exposure.

A respiratory protection program in compliance with 29 CFR 1910.134 including commitments to provide the necessary fit testing, respirator training, and medical evaluations. When lead is present, include the provisions of 29 CFR 1926.62. When cadmium is present, include 29 CFR 1926.1127. When inorganic arsenic is present, include 29 CFR 1926.1118. Address the selection, use, maintenance and inspection of respirators, and qualifications for respirator users.

A description of the Personal Protective equipment (PPE) to be provided, and plans for regular laundering or replacement of protective clothing.

Provide the name, address, and qualifications of the launderer, if one will be used, for the cleaning of reusable clothing. Provide a letter from the laundry indicating that it is permitted to handle clothing contaminated with lead and/or the other toxic metals of concern.

A description of the hygiene practices the employees will be required to follow, and the procedures that will be implemented for the proper storage, testing, and disposal of hygiene and laundry wash water. Include a description, floor plan, and proposed number of decontamination facilities and hand wash stations that will be provided.

A description of the Contractor's medical surveillance and removal program, including plans for notifying employees and the Engineer of results. This description shall include the name and address of the clinic(s) where testing will be performed, and of the OSHA approved laboratory where blood samples will be analyzed.
Plans for worker and supervisor lead training.

An initial assessment of anticipated exposure level(s), including any relevant historical exposure monitoring data.

Plans for performing exposure monitoring, and for notifying employees and the Engineer of results.

Plans for posting warning signs in high exposure areas.

Plans for regular inspections of the jobsite by the IH and the competent person. The IH shall inspect the site at least monthly and the competent person at least daily.

Provisions for providing parking area(s) for worker's cars where they will not be exposed to lead.

Plans for updating the Worker Protection Plan.

Plans for keeping and maintaining the records, and issuing monthly summary reports.

Include the name of the competent person who will be making daily inspections of project activities to ensure compliance with the program, and the signature of the IH responsible for the development of the Plan.

Verify that any Subcontractors working for the Contractor are included in the program or in a separate program which meets the requirements of this Specification. If Subcontractors are operating under a separate program, include the program with the submittals.

Include statements that the Contractor will provide NYCDOT employees, NYCDOT Agents (such as REI Consultants engaged in inspection activities, and employees of the environmental monitoring firm), with the same OSHA related equipment and facilities that are provided to the Contractor and sub-contractor personnel. These include:

- Respiratory protection including cleaning and maintenance, and work areas to wash faces and respirator face piece. NYCDOT employees or Agents are responsible for assuring that all of their personnel have the necessary medical surveillance, are qualified to wear the respirators, and have been properly fit tested.

- Protective work clothing including laundering or disposal.

- Clean change areas including separated storage facilities for street and work clothes.

- Hand washing facilities per 29 CFR 1926.51.

- Shower facilities per 29 CFR 1926.51.

Review the Worker Protection Plan at least every six months during the portion(s) of the Project which involve the disturbance of toxic metals. Revise and update as necessary to comply with any newly issued Federal, State or local regulations or revisions to existing regulations. Verify that the IH signs off on all reviews and revisions.
Submit a letter to the Engineer if it is proposed that objective data, rather than monitoring, will be used to prove that exposures from a given activity cannot exceed the Action Level for lead or other metals contained in the coating. Provide the objective data in writing, signed by the Contractor's IH in strict accordance with the requirements of 29CFR1926.62 (d)(3). The Contractor can rely upon this data in lieu of monitoring only upon acceptance by the Engineer.

Environmental Protection Plan - Submit an Environmental Protection Plan to the Engineer. The plan shall include but not be limited to, the following elements:

Assessment of Visible Emissions and Releases.

Provide a written program for the observation of visible emissions during Project activities. Note that these inspections by the Contractor are in addition to the observations that will be made by the Engineer or environmental consultant.

Include the frequency and methods of observation and inspection that will be made, and areas or work activities that will be observed.

Include a statement that the Contractor will shut down operations, adjust work practices, modify containment and take other steps as necessary to comply with the results of the visible emissions assessments as directed by the Engineer and/or the environmental consultant.

Establishment of Regulated Areas - Provide written procedures in accordance with the requirements of Part 3 of this Specification for the instrument monitoring of airborne exposures surrounding project activities, and the establishment of visible barriers (regulated areas) to control the access of personnel within the exposure zones.

Ambient Air Monitoring.

Provide a written description of the TSP-lead high volume ambient air monitoring equipment the Contractor will provide for the Work. Include a description of the power that will be provided to operate the units. Provide catalog cut sheets for the monitors and power generators (if used).

Provide a written description of the maintenance and security measures that will be taken to protect the monitoring equipment (i.e., full time guard, removal and reinstallation of the equipment each day, etc.). Describe the provisions made for setting up and removing (or securing) the monitors each day, as stipulated in this Section.

The environmental consultant will also be conducting real time monitoring (using it's own equipment) to evaluate airborne particulate levels at various locations such as the containment seals and entryways.

Include a statement that the Contractor will shut down operations, adjust work practices, modify containment and take other steps as necessary to comply with the results of the high volume or real time monitoring as directed by the Engineer and/or the environmental consultant.

Evaluations of Ground (Soil), Equipment, Structures and Other Surfaces.
Provide a written program for the visual inspection of the ground, soil, equipment, and other surfaces beneath and around the project site for the presence of project dust and debris. Include the frequency of the inspections, and the inspection procedures that will be followed both during the Work and upon completion of project activities. Note that these inspections by the Contractor are in addition to the observations that will be made by the Engineer or environmental consultant.

Water and Sediment Evaluations.

Provide a written program for the visual inspection of the water and sediment beneath and around the project site for the presence of project dust and debris. Include the frequency of the inspections, and the inspection procedures that will be followed both during the Work and upon completion of project activities. Note that these inspections by the Contractor are in addition to the observations that will be made by the Engineer or environmental consultant.

Cleaning/Clearance Plans

Provide a written program identifying the procedures, methods, equipment, and materials that will be used to conduct daily and final cleanup of project dust and debris. Include a description of the cleanliness examinations the will be made by the competent person (e.g., both visual examinations and more detailed inspections involving wiping the surfaces as described in Section 3.06).

Indicate that these inspections are conducted to assure that the work site and surrounding equipment, property, structures, ground, soil, water, sediment, and other surfaces have been properly cleaned and are free of visible paint chips, blasting material, or other debris in compliance with this Section. Cleaning is required routinely each day and upon completion of all project activities.

When wet wiping or washing is employed, identify the solutions proposed for cleaning the surfaces and equipment.

Sensitive Natural Resources and Endangered or Protected Species.

The NYCDOT will stipulate whether sensitive natural resource areas are located around the project. If the project is located in a natural resource area, develop a site-specific Habitat Protection Plan addressing the steps that will be taken to protect these sensitive ecological areas from damage.

The NYCDOT will advise whether peregrine falcons, barn owls or red-tailed hawks are nesting on the bridge. If present, develop a site-specific plan for the sequencing of paint removal operations to avoid disturbing nesting pairs, including obtaining the required Federal USF&WS and NYSDEC permits if it is proposed that unoccupied peregrine falcon nests be moved.

Spill Response Plan

Develop and implement a Spill Response Plan to control and clean up spills or dispersions of deteriorated paint chip material, and/or abrasive blast material.

Specifically identify the procedures that will be used to comply with the following steps:
Containment of the breach.

Immediate notification of the NYCDOT Engineer and, as directed by the Engineer, other agencies such as the Coast Guard or the New York State Department of Environmental Conservation Spill Bureau.

Collection and removal of the spilled material by washing and wiping and/or HEPA vacuuming.

Visual inspections to confirm complete removal of the material.

Changes to work practices and/or equipment and material used to prevent a reoccurrence.

Noise Permits - If work will be performed outside of the hours 7AM to 6PM on weekdays, obtain a permit authorizing these activities, and provide the Engineer with a copy.

Containment Plans and Drawings - Provide six (6) complete sets of detailed working drawing(s) of each containment system proposed for use on the structure. The drawings shall be prepared and stamped by a registered, licensed Professional Engineer. No paint removal work is allowed to begin until the drawings have been reviewed and accepted by the Engineer.

Provide plan and elevation views of the containment enclosure in relation to the bridge structure.

A design analysis of the loads on the bridge due to the containment enclosure including: maximum dead and live loads of the enclosure, the workers, blast abrasive, and equipment; maximum allowable load for the floor and working platform; wind loads imposed on the structure by the enclosure; and maximum wind velocity that the containment enclosure is designed to withstand.

If the containment system is supported by the bridge, the working drawing submittal shall include certification by the Professional Engineer that the loads imposed do not cause the overall stress level of any element of the bridge to exceed the Operating Allowable Stresses defined in AASHTO Manual for Maintenance Inspection of Bridges (current edition).

The analysis shall account for all loads on the structure, including the enclosure dead load, worker live load, blast abrasive load, equipment load, wind load, structure dead load, and live load plus the impact. The highway live load used for analysis purposes shall be either a HS20 truck or equivalent lane loading, whichever is greater, unless a different highway live load is shown on the plans.

Except as noted, the analysis shall use the loadings and design assumptions in the NYSDOT Standard Specifications for Highway Bridges.

Provide all data, calculations, and assumptions used for the design of the containment and ventilation system. Provide air make-up locations, the location(s) of the exhaust ductwork, and the type and location of dust collector(s) that will be employed. Provide manufacturer's data sheets, equipment weights, and airflow capacities of the equipment.
Provide a description of the type of containment material(s) used for the walls and ceiling, and the type of flooring system or working platform employed. If a barge or another type of floating platform is used, include details regarding its construction, such as materials and dimensions, how the platform will be tied-off, how the debris will be collected and offloaded, etc.

Provide technical data sheets, specification sheets, any other information needed to thoroughly describe the materials proposed for use.

Identify the methods by which the containment enclosure will be supported or attached to the bridge (e.g., rollers, clamps). Welding, bolting, or similar connections will not be allowed.

Identify the methods that will be used to seal the joints (seams) formed when fabricating the containment enclosure, and the method that will be used to seal the mating joints between the containment enclosure and the bridge structure.

Identify the method that will be used to seal the entryway. At a minimum, an airlock or resealable door shall be provided to minimize dust escape through the entryway.

Provide a description of how the drainage run-off from existing deck drains will be routed through the enclosure.

Provide the plans for maintaining the operation of any existing equipment or bridge facilities during the Work (e.g., navigation, anti-collision, aerial, roadway, and parking lot lighting).

Provide the type, size, and configuration of auxiliary lighting that will be provided for inside the containment enclosure.

Provide information on any temporary heating units proposed for use, fuel to be used and the safety measures to be employed for heater use and fuel storage.

Describe the methods that will be used to provide worker access to the enclosure (personal lifts, scaffolds, etc.) and the procedures and equipment that will be used to protect workers from falls.

Provide details on how the use of the containment enclosure will be coordinated with the maintenance and protection of traffic. Encroachments onto roadways, and clearances over waterways and railroads shall be clearly identified. Structures that span a navigable waterway may be subject to regulation by the U.S. Coast Guard, the U.S. Army-Corps of Engineers, the N.Y.S. Thruway Authority - Office of Canals, and the N.Y.S. Dept. of Environmental Conservation.

Provide details on how the containment enclosure is assembled and disassembled, and moved to a new location on the structure as surface preparation work progresses. Indicate how the dust collector will be included in the containment enclosure. All other pertinent details relating to the containment enclosure shall be included with the working drawings as notes, or as written narrative.

Describe the provisions made for moving the containment out of navigation lanes when working over active waterways.
Describe the provisions made for moving or lowering the containment in the event of inclement weather.

Identify the methods that will be used to verify adequate air flow characteristics and negative pressure within containment.

Describe the containment inspection and cleaning procedures that will be undertaken.

Include any other information needed to thoroughly describe the containment plan.

**Emergency Containment Demobilization Plan**

Provide a detailed plan for dropping the containment upon notification of inclement weather, such as sustained wind speeds of 40 mph or greater, or heavy snow.

Include the methods and procedures that will be followed to assure that:

- All equipment and tools are secured,
- The containment is cleaned of loose dust and debris,
- All containment system roof and wall enclosure elements that could contribute to adding wind load to the bridge structure are removed or lowered (excluding containment framing),
- Snow and ice are removed from the containment routinely, as well as under storm conditions.

**Waste Management Plan**

**Waste Handling, Storage and Disposal**

Provide the procedures that will be followed for the collection of random and representative samples of the waste for sampling and testing, and the testing and analysis procedures that will be used to characterize the waste before shipping.

Provide procedures for the site handling, storage, container inspection, packaging, labeling, manifesting, transporting, and disposal of the waste. Include a written containment plan for adequately shielding and protecting the surrounding area when transferring and/or conveying hazardous waste from one container to another to prevent any dispersion or spills.

Provide a detailed contingency plan that addresses worker training and the notification, containment, clean up, and reporting that will be undertaken in the event of a spill during the jobsite handling and transportation of the waste.

**Hazardous Waste Transportation**

Submit evidence that each proposed hazardous waste transporter has a 6 NYCRR Part 364 Waste Transporter Permit.

If it is proposed that the transportation pass through other states, provide evidence that the transporter complies with the applicable laws, codes, rules and regulations of the respective states.
**Hazardous Waste Disposal**

Provide the name, address, license or permit number, qualifications, and contact person of each proposed legally permitted hazardous waste disposal facility that will be used.

Advise each proposed recycling or waste disposal facility that paint removal waste will be generated (e.g., abrasive/paint debris), and identify the metals that the waste will likely contain. Based on that information, request a letter from each facility, stating that the facility can accept this type of waste, is authorized to accept the waste under the laws of the State of residence, has the required capability to treat and dispose of the materials, and will provide or ensure the ultimate disposal method indicated on the Uniform Hazardous Waste Manifest.

Provide the Engineer with the original letter signed by a legally authorized representative of the facility prior to shipping any hazardous waste but within enough time to ensure all wastes are disposed within Contract required time frames. Include a copy of permits or letter of authorization to operate the facility and provide a signed statement from the disposal facility that the waste shipping containers that the Contractor proposes to use are acceptable to the facility.

If recycled steel grit abrasives will be used, the Contractor shall advise the disposal facilities that the paint removal waste must be handled and stabilized as if it tested hazardous, even if the initial TCLP test results are below hazardous thresholds. Provide the Engineer with the proposed means of stabilization that will be used by the facility to comply with the requirements of this specification.

If it is proposed that a secondary smelter will be used for the recycling of the hazardous waste, provide evidence that the smelter holds a valid EPA and consignment state approval for the treatment of the hazardous materials present in the waste that will be generated (e.g., D008 in the case of lead-containing waste).

**Waste Water Disposal Information**

Submit the name, address, and contact person of the facility that will be accepting the wastewater for disposal. Wastewater under this item is water used for washing and cleaning the bridge and equipment. The handling and disposal of hygiene water is included as part of the decontamination units under the Worker Protection Plan.

The Contractor shall advise the facility of all of the toxic metals and anticipated concentrations that the water will likely contain. Based on that information, request a letter from the proposed facility stating that the facility can accept waste water, is authorized to accept the waste under the laws of the State of residence, and has the required capability to treat and dispose of the waste water. If the facility indicates that the wastewater can be placed into the sanitary sewer system, include such an authorization in the letter. Provide the Engineer with the original letter signed by a legally authorized representative of the facility, including a copy of permits or letter of authorization to operate the facility.

**Non-Hazardous Waste Transportation and Disposal Information**

Provide the name, address, license or permit number, qualifications, and contact person of each proposed hauler of non-hazardous waste (note that paint removal waste has been declared hazardous).
Submit the name, address, license or permit number, qualifications, and contact person of each permitted waste landfill that will accept the non-hazardous (construction) waste, and the waste which passes TCLP, but which contains toxic metals.

Provide a letter of intent from the proposed legally permitted landfill operator agreeing to accept waste which passes TCLP, but which contains toxic metals.

**CONSTRUCTION START UP SUBMITTALS**

Worker Protection - Submit the following documentation to the Engineer prior to the initiation of lead exposure-producing operations:

- Documentation of purchase or mobilization of respirators and personal protective equipment (PPE).
- Documentation of purchase and mobilization of decontamination facilities before beginning the project.
- Certification of completion of lead training for supervisors and employees (including SSPC C3 and NYCDOT project-specific requirements).
- Documentation of respirator fit testing for all employees who will wear respirators.
- Verification that the employees who will potentially be exposed to lead above the Action Level have successfully completed the necessary medical surveillance. For employees who refuse to participate in the medical examinations and biological monitoring, provide written proof signed by the employee, that they were offered, but declined the examinations and monitoring.

**Certification of Containment Installation**

Prior to working within each unique containment design, submit a letter signed and sealed by the containment design engineer or his designee, stating that the containment system has been assembled as shown on the approved, signed and sealed drawings.

If the containment is not installed in accordance with the design drawings, and field modifications are made, issue supplemental calculations for the new design for Engineer review and approval in accordance with the original submittal requirements.

**CONSTRUCTION PHASE SUBMITTALS**

Competent Person Daily Reports - Make the competent person's daily oversight reports or logs available for review by the Engineer or environmental consultant when requested. Include enough information and observations to demonstrate compliance with the specification requirements and the documentation requirements of the following plans:

- Compliance with the Worker Protection Plan.
- Compliance with Environmental Protection Plan including daily and final project cleanup.
- Compliance with the Waste Handling Plan.
- Compliance with the Containment submittals.
Worker Protection - Submit the following documentation to the Engineer throughout the course of the project:

For all new supervisors and employees who begin Work after the initial project start-up, before the individual begins working on the project, provide certification of completion of lead training (including SSPC C3 and NYCDOT project-specific requirements), respirator fit testing, and verification that they have successfully completed the necessary medical surveillance. For employees who refuse to participate in the medical examinations and biological monitoring, provide written proof signed by the employee, that they were offered, but declined the examinations and monitoring.

Worker exposure monitoring results (included in the monthly summary report described below).

Depersonalized results of all employee medical testing at the end of each month that testing is performed (included in the monthly summary report described below).

Documentation of any medical removals within 1 day of the removal, a description of what triggered them, and the corrective measures taken.

Copies of the hygiene water test results (water used for washing, showering, or laundering clothing on site). Tests are to address all of the parameters established by the POTW to confirm the acceptability of the filtration. Provide the Engineer with the test results within 5 days of receipt and before disposal or discharge of the water.

Any revisions or updates to the Worker Protection Plan immediately upon development.

Confirmation that the parking lots for worker cars are not in lead-exposure areas.

MSDS for all new products and materials brought onto the Project site. At the Engineer's discretion, the Contractor may be directed to maintain the MSDS at the Project site only, rather than provide a separate copy to the Engineer in addition to the Project site copy.

Monthly progress reports - Except where the Contractor can document that employee lead exposure will be below the Action Level, at the end of each month of Work which entails potential lead exposure, submit a report to the Engineer which has been reviewed, signed, and certified by the IH. Submit the report within 10 calendar days after the completion of each month. This report shall contain the following elements:

A summary of the Work entailing potential lead exposure that was completed in the last month including a summary of the observations made by the IH during the monthly visit and any required intervention activities.

A statement that, with the exception of any deficiencies noted, the past month's work has been in compliance with the requirements of 29 CFR 1926.62, this specification, and all other applicable Federal and State regulations.

A description of any interventions or deficiencies noted, along with a summary of the corrective actions taken.
A summary of the results of any exposure monitoring or medical testing which was completed in the past month. To protect worker privacy, these results shall not include the individual names or Social Security numbers of the workers tested. Instead, workers shall be identified by trade (e.g., ironworker, painter, laborer, etc.) and with an individual control number so that their exposure can be tracked throughout the project.

Results of any exposure monitoring conducted on the Engineer and NYCDOT Agents. Provide the results within the same 5 day notification period required for Contractor employees.

Visible Emissions and Releases

Record the results of the daily assessments of visible emissions and releases in a log or report form approved by the Engineer. Include the following information at a minimum: Contract number, Contractor's name, Work location, date of observations, daily observation results (location and duration of emission), general comments, outline of the visible emission criteria, notation of compliance or noncompliance with the visible emission criteria, notification of Agencies as applicable, corrective actions, and signature block for the observer.

Provide the Engineer with an immediate verbal report each time that unacceptable visible emissions or releases are observed.

Document all cases where Work has been halted due to visible emissions or releases, the resulting cleanup activities performed, the reason or explanation for the emission or release, and the corrective action taken to avoid a reoccurrence. Provide the written report to the Engineer within 48 hours of the occurrence.

Regulated Area Monitoring - The laboratory must provide the results of regulated area monitoring to the Contractor within three days of the field sampling. Provide the test results to the Engineer verbally within one day of receipt, and in writing within 5 working days thereafter.

Containment Scaffolding Inspection Log - Maintain, and make available for review by the Engineer, a daily log of the inspections of scaffolding, platforms, and wire ropes in accordance with the OSHA requirements. Conduct the inspections each shift, and after any occurrence which could affect the structural integrity of the scaffolding or wire suspension ropes.

Temporary Heating Units - If the use of temporary heating units was not anticipated at the time of the initial submittals, notify the Engineer at least one week in advance of use of heating units. Submit, for approval, information on fuel to be used and the safety measures to be employed for heater use and fuel storage.

Waste Management

Waste Storage Logs - Maintain weekly waste storage logs and make them available for inspection by the Engineer or environmental consultant.
**Waste Analysis Reports**

Direct the laboratory to send the original waste analysis test reports directly to the Engineer, with copies of the results to the Contractor. The reports must be issued no later than five (5) calendar days after the representative samples are submitted for testing, with a copy being sent by facsimile transmission to the Engineer the same day the report is sent.

The reports shall contain at a minimum the following information: the identity of the waste streams analyzed, the number of samples collected and tested, dates of sampling and testing, laboratory test procedures utilized, the names and signatures of the individuals collecting the samples and conducting the laboratory tests, an interpretation of the test results, and chain-of-custody forms.

**Waste Manifests and Disposal Documentation**

**Waste Manifest**

The Contractor shall prepare the Uniform Hazardous Waste Manifest for each shipment, including the LDR (Land Disposal Restriction) certification, which will be attached to the manifest. The Engineer will sign the Generator's Certification on the manifest and maintain copies of the original manifest and signed copies upon completion of disposal.

If the signed manifest is not received from the disposal facility within forty-five (45) days of shipment, as directed by the Engineer, the Contractor shall initiate the EPA Exception Report in accordance with 40 CFR 262.42, and take all steps necessary to locate the manifest or waste.

Disposal Certification - The Contractor shall provide a certification for each manifested shipment that the waste was accepted by the recycling or disposal facility, and properly treated and disposed of.

**Daily and Final Project Clean-up**

Maintain a log or report confirming the visual cleanliness of the jobsite each day, the cleanliness of containment prior to movement, and the more detailed testing of cleanliness (wiping with a cloth and inspecting for dislodged material) prior to dismantling, and cleanliness of contractor equipment prior to removal from the project site.

Prepare a letter report presenting the results of the inspections conducted to verify the final cleanliness of the project site, surrounding property, waterways, equipment, buildings, and structures. Submit the report to the Engineer within one (1) week of the final inspection.

Include a summary of any problems or releases that occurred during the project, and the clean up and corrective action measures that were taken to resolve the problem.
APPENDIX B - TERMS AND DEFINITIONS

Action Level - Employee exposure, without regard to the use of respirators, to an airborne concentration in micrograms per cubic meter of air (Rg/m³) calculated as an eight hour time-weighted average (TWA). The Action Level for lead is 30 Rg/m³.

Acceptance Criteria - Minimum standards for the content of programs, plans, procedures, and designs required by this Specification for the performance of the Contract. Acceptance criteria will be the basis for judging the responsiveness of Contractors’ programs and will also be used as a basis for suspending work, if necessary.

Agency - New York City Department of Transportation (NYCDOT)


CIH - Certified Industrial Hygienist holding valid certification by the American Board of Industrial Hygiene (ABIH).

Competent Person - One who is capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization to take prompt corrective measures to eliminate them. The Competent Person is either an employee of the Contractor, or is under contract directly to the Contractor.

Compliance Program - A document prepared by the Contractor performing the removal of the lead-containing paint giving a detailed description of engineering controls, work practices, and safety precautions that will be adopted for the execution of the work. The Compliance Program is part of the overall Worker Protection Plan in this specification.

Containment System - A system which minimizes or prevents debris, generated during surface preparation or the removal of lead-containing paint, from entering into the environment, and which facilitates the controlled collection of the debris for disposal. It includes the cover panels, screens, tarpaulins, scaffolds, supports, and shrouds used to enclose entire work areas or the paint removal tools. Containment systems may also employ the use of ground covers or water booms.

Contractor - The person or corporate body that is party to the contract and bound to execute the work in accordance with the contract.

Discharge - Accidental or intentional spilling, leaking, pumping, pouring, emitting, emptying, or dumping of hazardous material or waste into or on any land, water or airspace.

Disposal - The discharge, deposit, injection, dumping, spilling, leaking or placing of any solid or hazardous waste into or on any land or water, so that no solid waste or hazardous waste, or any constituent thereof, may enter the environment or be emitted into the air or discharged into any waters, including ground waters.
Disposal Facility - A licensed facility where hazardous and non-hazardous waste is intentionally placed, and in which the waste will remain after closure.

Emission - A release of material to the air, water, or ground.

Employee Lead Exposure - Exposure which would occur if the employee were not using a respirator.

Engineer - The designated NYCDOT employee, or authorized representative, who is responsible for the project including the authority to accept or reject Work on behalf of the Agency.

Engineering Controls - The use of technologically feasible controls in the work areas for the purpose of reducing and maintaining employee exposure to lead to or below the PEL, and for controlling emissions from the work area. Examples of engineering controls are mechanical ventilation for enclosures, or methods which capture the dust at the point of generation such as vacuum blast cleaning.

Environmental Consultant - Individual or company employed by the NYCDOT on a periodic or full time basis to monitor the lead removal project to assure that it is conducted in an environmentally protective manner in accordance with the provisions of this specification and the contract documents.


EPA Hazardous Waste Number - The Federal number assigned to each hazardous waste. The number assigned to lead waste is D008.

Flood Plain - A flat, low-lying portion of a stream valley subject to periodic (50 to 100 years) inundation during a flood.

Generator - Any facility owner, operator or person whose act or process produces hazardous waste or whose act first causes a hazardous waste to become subject to regulation. The NYCDOT and Contractor are co-generators for the work under this Specification. The NYCDOT will obtain the EPA ID Number.

Hazardous Waste (lead paint debris) - Waste that is classified as hazardous due to its concentrations of regulated hazardous substances. Wastes may be classified as hazardous based on the characteristics of toxicity, ignitability, corrosivity, and reactivity. Paint debris is typically classified as hazardous waste based on the characteristic of toxicity. This is determined by testing representative samples of the waste using the Toxicity Characteristic Leaching Procedure (TCLP). If the leachate contains any of the 8 metals or other substances in concentrations at or above limits established in 40 CFR 261, Identification and Listing of Hazardous Wastes, it is classified as hazardous.

HEPA - A high efficiency particulate air filter (HEPA filter) removes from the air 99.97% or more of the aerosols having a diameter of 0.3 microns.

Ignitability - A characteristic of waste that causes it to be classified as hazardous. Waste is determined to be ignitable if it is found to be capable of being set afire, or of bursting into flame spontaneously or by interaction with another substance or material, when tested in accordance with 40 CFR 261. Spent solvents and liquid paint waste typically fall into this category.
Leachate - The amount of a specific substance (e.g., lead) that is carried off or dissolved out of a material. The amount of leachable lead that classifies paint debris as being hazardous is 5 mg/L (ppm) when tested by TCLP.

Lead - Metallic lead, all inorganic lead compounds, and organic lead soaps. The lead pigments used in paints comply with this definition.

μg/m³ - Micrograms per cubic meter. Common units for reporting airborne concentrations of lead and other aerosols.

mg/L - Milligrams per liter. Common units for reporting a concentration of a specific substance in units of mass per volume (e.g., amount of hazardous material contained in paint debris).

MSDS - Material Safety Data Sheet. Data provided by the manufacturer of a product that identifies the hazardous constituents contained in the product together with precautions that need to be taken during its handling and use.

NAAQS - National Ambient Air Quality Standards. Federal regulations which establish limits on allowable pollutants in the ambient air. Lead and particulate matter are included. Regulations are found in 40 CFR 50.

NIOSH - National Institute of Occupational Safety and Health.


Owner - New York City Department of Transportation (NYCDOT).

Paint Removal Waste - Removed paint particles combined with the material (e.g., abrasives) used to remove the paint.

Permissible Exposure Limit (PEL) - Employee exposure, without regard to the use of respirators, to an airborne concentration in micrograms per cubic meter of air (pg/m³), calculated as an eight hour time-weighted average (TWA). The PEL for lead is 50 pg/m³ as an 8 hour TWA. If an employee works for longer than 8 hours in a given day, the PEL is reduced using the following formula:

Adjusted PEL = (PEL x 8) ÷ (hours worked in the day)

PM-10 - Particulate matter of an aerodynamic equivalent diameter of 10 microns or less. PM-10. Term associated with the collection of airborne particulate using high volume ambient air samplers.

POTW - Publicly Owned Treatment Works (e.g., waste water treatment facility).

PPM - Parts per million. Common units for reporting a concentration of a specific substance (e.g., amount of hazardous material contained in paint debris).

RCRA - Resource Conservation and Recovery Act. RCRA regulations addressing waste handling and disposal and are found in 40 CFR 240 through 280.
Regulated Area - Area established by the Contractor, outside of which the airborne concentrations of lead or other toxic material can reasonably be expected to not exceed the corresponding Action Level.

Representative Sample - A sample of debris from a pile, drum, or container of debris which can be expected to exhibit the average properties of that pile, drum, or container of debris.

SSPC - The Society for Protective Coatings. An independent, non-profit organization of engineers, technical specialists, and contractors whose goal is research and development of new coatings and methods for removal, application, and disposal of existing coatings on industrial structures.

TCLP - Toxicity Characteristic Leaching Procedure. Laboratory tests conducted on wastes that determine the amount of hazardous materials that leach out into a test solution. The test is intended to simulate the properties of water as it leaches through a solid waste landfill. TCLP testing is defined in 40 CFR 261, Appendix II.

Threshold Limit Value (TLV) - The time-weighted average concentration for a normal 8-hour workday and a 40-hour workweek, to which nearly all workers may be repeatedly exposed day after day, without adverse effect.

Time Weighted Average (TWA) - The average concentration of a contaminant in air during a specific time period.

Treatment - Any method or process designed to change the physical, chemical or biological characteristics or the composition of any hazardous waste so as to render such waste non-hazardous.

Treatment, Storage, and Disposal (TSD) Facility - The TSD facility is the last phase of the cradle-to-grave concept in handling hazardous waste, and is responsible for its proper disposal. Requirements are found in 40 CFR 264 and 265.

TSP - Total Suspended Particulate. Term associated with the collection of airborne particulate using high volume ambient air samplers. Filters are typically analyzed for lead.

Waste Stream - A waste stream represents debris of a similar type, make up, and process. The paint debris from a given structure represents a single waste stream if the coating system and method of removal is constant. The debris represents a different waste stream, if different coating materials or methods of removal are involved. For example, the waste created when using recycled steel grit generates a different waste stream than waste created using a disposable abrasive (e.g., Black Beauty) even though the paint being removed is the same.

Worker Protection Plan - Comprehensive plan addressing the steps that will be taken to protect the health and safety of Contractor workers from jobsite hazards.

Ventilation System - Ventilation systems include both natural ventilation and artificial ventilation (mechanical fans, hoods, and ductwork), to provide air movement across the work area, and dust collectors to clean the air stream prior to discharge.

Visible Emissions - Emissions of particulate from the work area that are visible to the unaided eye. EPA methods for assessing visible emissions are found in 40 CFR 60, Appendix A. Method 9 determinations
are based on the opacity of the emissions. Method 22 is based on total visible emissions regardless of the opacity.
APPENDIX C
HISTOPLASMOSIS
(Code: SB-94-4, Date: 1/21/94)

INTRODUCTION

Employees engaged in a variety of tasks are often required to work in areas where pigeons have nested, usually for long periods. Such conditions are often found in bridge structures and cold storage facilities. This nesting results in a substantial build-up of pigeon droppings, a condition which can be harmful to humans if the material is disturbed and made airborne.

Histoplasmosis is a fungal infection resulting from exposure to pigeon droppings. Infectious material enters the body usually by inhalation into the lungs, but in some cases by ingestion through the mouth into the gastrointestinal tract. Pigeons do not carry the organism that causes histoplasmosis. Histoplasmosis is caused by a soil organism that requires the moist, nutrient rich environment that large masses of droppings offer. Areas with small amounts of dried droppings pose minimal hazard.

This Safety Bulletin is intended to alert employees of this potential health hazard and establish common sense precautions to minimize exposure.

PROCEDURES

Prior to work in any area where pigeons nest, a thorough inspection should be made to determine if, and to what extent there is a build-up of material. Inspection itself requires minimum precautions such as the use of personal protective equipment, which may include gloves, rubber boots, rain suit components, goggles and a dust/nuisance respirator. Questions regarding proper equipment for this activity should be directed to the Regional Safety Representative or Employee Safety Health Section.

If substantial material is found in the immediate work area, cleaning must be performed. Employees engaged in cleaning activity shall wear all of the personal protective equipment specified above. A high-powered water hose is an effective means to remove material. If the material is to be scraped away, it must be kept wet during the entire process. Application of a cleaning agent (bleach, for example), before removal may help dissolve the material, and may be applied as a disinfectant upon the affected surfaces after the droppings have been removed. Compressed air shall not be used to remove pigeon droppings because it increases the potential for inhalation and ingestion of airborne particles and the area of potential exposure.

When cleaning has been successfully completed, the personal protective equipment specified above is no longer required. All other personal protective equipment appropriate for the task and/or location shall be used, such as fall protection, hard hat, etc.

Employees engaged in cleaning, or any other activity which involves exposure to pigeon droppings, should observe a high degree of personal hygiene, even if the exposure is casual. Special care must be taken to wash hands thoroughly before eating or smoking.

Last Update: April 20, 1999
# APPENDIX D

## Table 1

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<td>Hand Tool Cleaning</td>
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<td>Impenetrable &amp; Impermeable</td>
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1. This table provides general design criteria only. Other combinations of materials may provide controls over emissions equivalent to those combinations shown above.

2. The SSPC Classification is based on SSPC Guide 6. Note that for work over water, water booms or boats with skimmers should be employed, where feasible, to contain spills or releases. Debris must be removed daily at a minimum.

3. Permeability addresses both air penetrability and water permeability as appropriate. In the case of water or chemical removal methods, the containment materials must be resistant to both chemicals and water. Ground covers should always be impermeable, and of sufficient strength to withstand the impact and weight of the debris and the equipment used for collection and clean-up.

4. Ground covers must always be impermeable and of sufficient strength to withstand the weight and impact of the debris and the equipment used for cleaning. If debris escape through the seams, then additional sealing of the seams and joints is required. All containment materials and materials used for sealing must be resistant to both chemicals and water. If unacceptable worker exposures to lead or other toxic metals occurs, incorporate a ventilation system.

5. This method applies to high pressure water jetting without abrasives. Ground covers and the lower portions of the containment must be of sufficient strength and integrity to facilitate the collection and holding of the water and debris for proper disposal. Ventilation is not required provided the emissions are controlled as specified in this
Section, and provided worker exposures are properly controlled. If unacceptable worker exposures to lead or other toxic metals occurs, incorporate a ventilation system into the containment.

6 This method applies to any methods which combine water with abrasives. Ground covers and the lower portions of the containment must be of sufficient strength and integrity to facilitate the collection and holding of the water and abrasive/paint debris for proper disposal.

7 Ground covers must be of sufficient strength to withstand the impact and weight of the abrasive and the equipment used for cleaning. Ground covers must also extend beyond the containment boundary to capture escaping debris.