



Guide Specifications for Reducing Lead-Based Paint Hazards

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DISCLAIMER

The *Guide Specifications for Reducing Lead-Based Paint Hazards* was developed in response to a pressing national need for guidance concerning lead-based paint. The Guide was drafted by a qualified independent contractor and then extensively reviewed, modified, and refined by a NIBS project committee composed of a broad cross section of knowledgeable professionals from the building and environmental communities. It subsequently was submitted to the project committee for approval. During the review and the approval process, the project committee followed consensus rules set forth in the Rules and Procedures of the NIBS Consultative Council.

It should be noted that lead-based paint hazard reduction activities involve potential health risks to the worker or others in proximity to the work. Further, experts from the building, scientific, and environmental communities have differing views concerning many aspects of lead-based paint hazard reduction. The purpose of this document is to bring together, from many sources, information and viewpoints that reflect current knowledge and technology.

The Guide is intended to assist building owners or their representatives to purchase services for the identification, evaluation, and reduction of lead-based paint hazards. It is not the purpose or burden of this document to provide all-embracing answers to every problem of lead-based paint hazard reduction. Users bear all risks associated with use of the Guide and have sole responsibility for evaluating the information contained herein to form their own independent judgments on the use of the Guide, and to modify or adapt it as may be appropriate.

The Guide must be considered solely as a resource document representing a consensus of expert opinion. The Guide does not purport to represent the views, policies, or position of the funding agency, or any participant involved in the development of the document.

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PREFACE

The National Institute of Building Sciences is pleased to publish the *Guide Specifications for Reducing Lead-Based Paint Hazards* to assist building owners and their representatives purchase services for the identification, evaluation, and reduction of lead-based paint hazards. The development of this document has followed the NIBS consensus process involving experts from many disciplines to develop, review, evaluate and approve the content.

The development of this document was made possible through a grant from the State of New Jersey, Department of Community Affairs. This grant was part of the New Jersey program funded by the United States Department of Housing and Urban Development, Office of LeadBased Paint Abatement and Poisoning Prevention.

The Guide is the product of the cooperative effort of many individuals. The Institute is most grateful to the members of the project committee and their chairman, Marvin Cantor, FAIA, for their technical reviews and commitment to developing the highest quality document. The committee members listed in the appendix have voluntarily contributed their efforts and expertise to assure this document provides unbiased, state-of-the-art guidance for the control of lead-based paint hazards. The Institute also recognizes the diligent efforts of the project consultants, Roger Morse, AJA, ENTEK Environmental & Technical Services, Inc. and Jim Keck, Leadtech Services, Inc, in the preparation of drafts and response to comments from the project committee.

This guide has been written for professionals experienced in the control of lead-based paint hazards as well as people with limited experience in lead-based paint hazard reduction design and construction. Parts one through three contain background information on lead-based paint hazard control, project design and project management. Part four contains the guide specifications. The appendix provides additional information to foster effective use of this document and to respond to their specific project needs. The Guide is available on diskette to facilitate editing and use of the specifications for specific projects.

Through the development of this Guide, a valuable public service has been performed by the members of the project committee, the project consultants and the funding agency to help prevent lead poisoning in our work place and homes.

Peter G. Doyle, AIA
Chairman of the Board

David H. Harris, FAIA
President

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INTRODUCTION

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Guide Specifications for Reducing Lead-Based Paint Hazards is a technical guidance document for the purchase of services for reducing lead-based paint hazards. The Guide is intended for owners, or their representative agents, planning to contract for lead-based paint hazard mitigation. The Guide addresses lead-based paint inspection, risk assessment, interim controls and abatement of lead-based paint in buildings in the context of a stand alone project and as part of a larger renovation project.

The Guide is organized in four parts. Part one is designed for anyone, including homeowners, contractors, architects or engineers, who is seeking a broad overview of the lead hazard problem and how it may be addressed. It contains a summary of the lead inspection and risk assessment protocols, information on worker protection during lead hazard reduction activity, and a description of a lead hazard reduction project, from beginning to end, noting the limitations of various treatment methods and possible pitfalls for the unsuspecting project planner.

Part two provides guidance on how to assemble and contract with a qualified design team, how to develop and coordinate contract documents, how to develop and coordinate a bidding package, how to negotiate and bid, and how to administer contracts for lead-based paint abatement.

Part three contains detailed instructions for the use of the guide specifications including an overview of two Construction Specification Institute (CSI) documents: MasterFormat and SectionFormat. This overview is for the benefit of users who may be unfamiliar with construction specification practices for assigning section numbers and titles. The organization of a specification section into its three component parts: General, Products and Execution is described. The Guide's use of MASTERSPEC[®], the American Institute of Architect's master guide specification system is also explained.

Part four includes information needed for the development of comprehensive lead hazard reduction specifications. This part consists of 34 specification sections that are grouped under 5 of the 16 standard divisions forming the basic framework for organizing construction specifications. The format and writing style of these sections are based on applicable MASTERSPEC[®] sections. Each section contains advice and guidance on how to edit the specifications to retain requirements for lead-based paint hazard reduction applicable to specific project conditions. This is done by presenting the user with a range of choices accompanied by related technical information.

Appendices include a glossary of terms, listing of federal and state contacts, a bibliography, description of the OSHA lead in construction standard, and acknowledgements.

The Guide is written to conform with the Department of Housing and Urban Development (HUD) *Guidelines for The Evaluation and Control of Lead-Based Paint Hazards in Housing* (1995), current Environmental Protection Agency (EPA) regulations and guidance documents, Occupational Safety and Health Administration (OSHA) regulations and other federal regulations and guidance documents affecting lead-based paint hazard reduction. State regulations are addressed by example, and guidance on how to find specific state regulation is provided.

The Guide is designed to be consistent with, and to complement, an operations and maintenance manual for lead painted buildings also being developed by the National Institute of Building Sciences (NIBS).

The Guide was developed using the National Institute of Building Sciences (NIBS) consensus process. Following this process the Guide was reviewed and approved by a balanced project committee of professionals involved in all aspects of lead-based paint hazard reduction. The committee provided technical oversight for development of the document and approved the final document through a formal ballot process.

Part 1

1. LEAD-BASED PAINT HAZARD REDUCTION

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SOURCES AND EFFECTS OF LEAD EXPOSURE

Lead is widespread in our environment. Since being discovered a number of applications for lead have been developed in commerce and industry. Originally used during colonial times along with silver to fashion pewter food and drink vessels, lead has been used in printer's ink, as a primary pigment in paints, in ammunition, in solder, in caulking, and as an additive in gasoline. Today in this country, lead is most often used in the manufacture of portable storage batteries such as automobile batteries. The reduction of lead in gasoline and the reduced use and improvements of handling lead in industry have significantly reduced the quantity of lead in the environment. Now, the most common source of human lead exposure is from the lead pigments used widely in paint during the first half of this century. The sale of residential lead paint (defined as paint containing greater than or equal to 0.06% lead by weight in the dry film) was not banned by the federal government until 1978. The lead dust that can be generated by the disturbance or deterioration of lead paint is a fine heavy particulate that quickly settles out of the air, and sticks tenaciously to surfaces, particularly to ones that are rough or porous.

Lead is a potent neuro-toxin and is likewise toxic to a wide range of body organs. Its most serious effect is on the developing nervous system of young children; however, adults can be affected as well. In large dosages, it can be fatal. Short of death, such dosages can cause mental retardation and severe kidney damage. At lower dosages, it can effect the blood forming system, the reproductive system, the cardiovascular system, the gastrointestinal system, as well as the brain and peripheral nervous system. Increase in blood pressure and some loss of hearing and vision have also been noted. Only a small amount of lead needs to be ingested to cause lead poisoning. The U.S. Centers for Disease Control (CDC), publication, "Preventing Lead Poisoning in Young Children" (1991) states that: "The blood lead level considered to indicate lead poisoning has fallen steadily since the 1970's. Blood lead levels at least as low as 10 µg/dL are associated with adverse effects. Therefore, even in small amounts, previously thought to be safe, current research has shown I.Q. loss in young children, often accompanied by attention deficit disorder and hyperactivity. Lead poisoning often goes undiagnosed, since it is often without immediate symptoms. At higher dosages, symptoms are often mistaken for the flu, overexertion or stress.

Lead can enter the body through the lungs or the digestive tract. For children, the ingestion of small chips of paint, or more commonly, dust from paint, is the primary source of exposure. Most childhood lead poisonings are cumulative in nature. The primary exposure pathway for children is ingestion of fine dust or small chips, which stick to fingers, toys and food products. Small children can inadvertently ingest small amounts of lead dust as they engage in normal hand-to-mouth activity. Over a period of time these small doses can accumulate and cause lead poisoning. Lead dust can be generated during painting or remodeling activity, and lead poisoning is common when such activity is underway. Care should be used to avoid exposing children and pregnant women during remodeling. Deteriorating paint, or paint subject to friction or impact, such as on the jambs of windows, also can generate leaded dust.

Non-occupational exposures to adults are generally greatest when lead-based paint is sanded, scraped or burned. Even when exposures are low enough not to present a hazard to an adult, children in the vicinity of the work can be affected. Also, lead dust levels may be high enough to allow a worker to carry leaded dust

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home on shoes, clothing, tools or vehicles in sufficient quantity to adversely affect the health of his or her children or spouse.

STANDARDS

Standards and regulations for handling lead hazards are in transition as of January 1, 1995. Additionally, many state and local governments have adopted standards different from, and often stricter than the federal standards. Lead-based paint hazard reduction designers should be certain that they are in possession of current, applicable standards, regulations and guidelines for their project. The NIBS Lead Laws data base and the EPA information center can provide information on current regulations. Also see Appendix B, "State and Federal Contacts," for a listing of the current state contacts for lead poisoning prevention, inspection, assessment, and abatement activities.

At the present time, many of the standards used in lead hazard inspection or assessment are not health based standards. A limit that will not produce adverse health effects has not been established for lead content of paint, dust or in soil. This is due in part to differences in individual behavior, particularly with respect to hand-to-mouth activity. For this reason, if paint is or may be converted to dust or fume, any lead in the paint should be considered as a potential health risk.

EPA is required under Title X of the Housing Affordability Reauthorization Act of 1992 to develop health based standards for lead in paint, dust and soil. The deadline for this effort has passed, but presumably these standards will be published in the near future.

Paint

The Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X of the Housing and Community Development Act of 1992) should be referenced as the more authoritative, statutory source of this standard (1.0 mg/cm²) for paint (in addition to the HUD interim standard). (The specific cite under TSCA is 15 U.S.C. § 2681(9).)

The U.S. Department of Housing and Urban Development (HUD) interim standard for lead in paint which must be treated as lead-based paint is greater than or equal to 1.0 mg/cm², when tested by X-ray fluorescence (Section 302 of the Lead-Based Paint Poisoning Prevention Act), or by laboratory analysis when the exact dimensions of the paint chips are known or 0.5% by weight, when tested in the laboratory. There is no direct relationship between these two standards; they are separate and distinct. These standards are not health based.

The Consumer Product Safety Commission (CPSC) standard for lead in new residential housepaint is 0.06% by weight in the dried film. There is no standard for lead in new paint in non-residential settings. The CPSC considers this a health based standard.

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Dust

EPA has given the following guidance regarding levels of leaded dust considered hazardous.

Uncarpeted floors 100 $\mu\text{g}/\text{ft}^2$ (0.93 mg/m^2)

Interior window sills 500 $\mu\text{g}/\text{ft}^2$ (4.65 mg/m^2)

Window troughs *800 $\mu\text{g}/\text{ft}^2$ (7.45 mg/m^2)

*Window troughs are defined as that portion of the exterior window sill covered by the sash, sometimes referred to as the window "well".

HUD uses these lead concentrations as action levels for post abatement or interim control clearance. The EPA recommends the use of the above levels for risk assessment as interim guidance while research on health based standards continues.

Soil

There is presently no standard for lead in soil. EPA has recommended a guideline for use as an interim standard until one can be developed. This guideline, EPA states, has some basis in health considerations.

Bare soil with child contact - 400 ppm up to 1,999 ppm

EPA states that some form of risk reduction should take place with lead in soil in the range of 400 - 2,000 ppm. At a minimum this should take the form of moving child play areas to avoid contact, or to create barriers, such as sod, other plantings, etc.

Bare soil, with or without child contact - 2,000 ppm up to 4,999 ppm

At this level, EPA recommends some manner of risk reduction, even if there is not child contact with the soil.

Residential soil in need of abatement - 5,000 ppm or above

At this level, EPA recommends that the soil be abated.

Hazardous waste

Considerations regarding hazardous waste from a lead hazard reduction project are in a state of extreme flux as of January 1, 1995. Since EPA delegates responsibility for waste disposal interpretation and enforcement to many states, prior to beginning a project, the project planner should contact both the state solid waste disposal agency and the local waste water treatment agency for guidance. EPA standards for hazardous waste require that a representative sample of the waste stream, including lead painted building components, be tested utilizing the toxic characteristic leaching procedure (TCLP) test. Waste would be deemed hazardous

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at a lead level of 5 ppm or greater in the leachate. Liquid wastes, such as wash water, often must be tested as well and handled according to local standards. In no case should wash water be poured into the ground or storm drains, however. Even if the water meets the local standard, it must be disposed of in a sanitary sewer to avoid environmental contamination.

Worker Protection

The Occupational Safety and Health Administration (OSHA) has promulgated a number of regulations applicable to lead hazard reduction activities. These standards should not be considered health-based, because OSHA acknowledges that adverse health effects can occur at airborne levels below those permitted by the OSHA regulations.

Lead in Construction Standard, 29 CFR 1926.62. This regulation is the basic standard for worker protection for lead-related activities in construction. It is structured so that protection increases as the potential airborne levels of lead increase.

Regardless of the exposure level, the employer must:

- perform an exposure assessment
- maintain all surfaces free of accumulations of lead
- provide adequate handwashing facilities
- train exposed workers in the hazards of lead and in the requirements of the lead in construction standard

At or above the action level (30 ug/m^3), the employer must additionally:

- conduct individual exposure monitoring
- conduct medical surveillance of exposed workers
- provide comprehensive training to exposed workers

At or above the permissible exposure level ($\text{PEL} = 50 \text{ ug/m}^3$), the employer must additionally:

- establish engineering controls and work practices to reduce lead dust levels
- institute a respiratory protection program
- provide protective clothing and equipment
- provide full hygiene facilities
- post warning signs

For certain specified lead-related activities where exposure levels are presumed to be high, the employer must treat the employee as being exposed in excess of the PEL, until the employer can demonstrate through air monitoring, that the employees are not being exposed at or above the PEL.

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Respiratory protection standards. The OSHA Lead in Construction Standard, 29 CFR 1926.62, the Construction Industry Respiratory Standard, 29 CFR 1926.103, and the General Industry Respiratory Standard, 29 CFR 1910.134, require employers to provide employees with proper respiratory protection. Such protection must be used when employees are exposed to lead dust above the PEL, or when performing any of the specified trigger tasks.

Hazard Communication Standard. The Hazard Communication Standard in Construction, 29 CFR 1926.59, requires employers to inform workers of health risks associated with exposure to chemicals in the workplace. Requirements include: labelling toxic chemicals, providing information about chemicals through Material Safety Data Sheets, and training employees.

General Safety and Health Requirements in Construction. OSHA requires employers in construction to undertake a number of general safety and health duties, including affording basic sanitation, housekeeping, training and personal protection to employees. These construction "general duty" requirements are found at 29 CFR 1926.20 through 1926.32.

Training

In addition to the OSHA training requirements specified above, and current state and local training and certification requirements, the Environmental Protection Agency (EPA) is developing training and certification criteria for individuals and firms engaged in lead-based paint activities. EPA is proposing these requirements as a model for state programs. If a state does not meet or exceed the EPA model, then the EPA will enforce the model requirements in that state.

Under EPA's proposal, persons working in the following job categories will require certification that training (in courses at the specified length) has been completed:

- worker: 32 hours
- supervisor, target housing and public buildings: 40 hours
- supervisor, commercial buildings and steel structures: 32 hours
- inspector technician: 24 hours
- inspector/risk assessor: 40 hours
- inspector technician: 24 hours
- planner/project designer: 56 hours

In addition, under EPA's proposal, all firms engaged in or offering to perform lead-based paint activities will have to be certified as only employing certified persons to conduct lead-based paint activities.

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Work Practice Standards

EPA has also proposed standards (40 CFR 745.228, September 2, 1994) for performing certain lead based paint activities. This includes standards for inspection, risk assessment and lead abatement in target housing; identification of lead, risk assessment, abatement and demolition in public buildings; and identification of lead, deleading and demolition in commercial buildings and superstructures. See appendix D for details.

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INSPECTION AND RISK ASSESSMENT

A lead-based paint hazard reduction project starts with an inspection/risk assessment. Determination of the level of risk and how to reduce it are based on the information provided in the inspection and risk assessment report. Consequently, it is critical that the information contained therein is accurate and complete.

The lead-based paint inspection/risk assessment profession is young and not yet well developed. Training and accreditation programs for practitioners are still evolving. State certification programs are rare, and the quality of professional assessment services varies widely.

In the absence of sufficient standards for the practice of inspection/risk assessment, considerable judgement and experience are required in the selection of sampling sites and in the interpretation of analytical results. The judgment of an inspector frequently must augment the objective analysis of data. As such, lead-based paint inspection/assessment at this time is more of an art than an exact science. The quality of the assessment depends considerably on the knowledge and experience of the investigator. Designers, contractors, and other consumers of such services should review the consultant reports very carefully for accuracy, completeness and internal consistency.

LEAD-BASED PAINT INSPECTION

A lead paint inspection determines which painted building components contain lead in excess of a stated standard, and which do not. The measured levels are compared to a threshold (such as a regulatory limit on the amount of lead in paint) to determine if the paint inspected is lead-based or not. This means that a finding that a paint is not lead-based does not mean that it is lead free. Confusion can result if different standards are applied. For example, a painted surface that is not lead-based under the HUD standard (0.5% by weight) could be considered lead-based if the CPSC standard for new paint (0.06% by weight) is used. An inspection finding that a paint is not lead-based (as opposed to being lead free) does not mean that it cannot present an exposure risk if abraded or damaged to produce dust, chips or fumes. This possibility must be dealt with in a risk assessment.

A lead-based paint inspection involves the determination of the lead content in paint on each and every surface in a building which may have a different painting history. Such surfaces are differentiated by all combinations of room, building component or subcomponent (door, door jamb, door casing), type of substrate (wood, sheetrock, plaster, concrete, brick or metal) and paint color. In a typical three bedroom house, this can amount to over 100 separate testing locations. Testing may be done either through the use of a portable X-ray fluorescence analyzer (XRF), through laboratory analysis of paint chip samples, or through a combination of the two when XRF's yield inconclusive results. Other technologies are being investigated as well, and may prove useful for inspection in the future.

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Accurate testing for lead paint is a complex process, requiring considerable skill and experience. Lead-based paint inspection should be carried out by a trained lead paint inspector, certified in the state in which they are operating, and certified as having completed the manufacturer's training for the particular XRF instrument they are using. The entity requesting the inspection should have some knowledge of the process to be used, and be able to verify the skills, experience, and certification of the inspector, as well as the adequacy and completeness of his reports.

X-ray fluorescence (XRF)

X-ray fluorescence (XRF) inspection involves the use of a device measuring the intensity of K-shell and/or L-shell lead X-rays emitted from paint when exposed to gamma radiation from the device. Instruments based solely on the measurement of L-shell X-rays may considerably underestimate the amount of lead, particularly when the lead is buried beneath several layers of non-lead paint. Because portable XRF's contain radioactive isotopes, inspectors should be licensed for the handling of radioactive material in the state of operation, or should have received reciprocity from that state for a license in their home state.

The U.S. EPA will publish in 1995 a series of *XRF Performance Characteristic Sheets* for each approved model of XRF. These *XRF Performance Characteristic Sheets* will specify an inconclusive range, calibration check tolerance and other instrument specific information. For copies of these *XRF Performance Characteristic Sheets*, contact the National Lead Information Center Clearinghouse at 1-800-424-LEAD.

XRF testing in single family housing involves the average of three XRF readings at different locations on each combination of room/component/substrate/paint color; the length of those readings is determined by the formula:

$$\text{Open-shutter Time} = 2^{(\text{AGE}/\text{HALF LIFE})} * \text{nominal time(seconds)}$$

Where "AGE" equals the age of the radioactive source, and "HALF LIFE" equals the half life of that radioactive source, and "nominal time" is the recommended nominal time taken from the *XRF Performance Characteristic Sheet*.

Various substrates (wood, metal, concrete, etc.) affect the XRF readings in different ways. The affect may vary depending upon temperature, humidity, design of the device, age of the isotope, etc. A substrate correction must be calculated for all substrates in each buildings being inspected. Information of substrate bias and the need for correction of that bias will also be contained in the performance characteristic sheets.

Since many states have standards at variance with the HUD lead paint standard, the values for positive, negative or inconclusive in the HUD guidelines may have to be adjusted. Be familiar with the lead abatement standards, operating procedures, and other requirements for your particular state.

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Accurate inspections can be achieved using x-ray fluorescence analyzers when the inspector:

- conducts frequent calibration checks to make certain the instrument is operating properly;
- corrects for substrate interference;
- selects the appropriate spot for sampling; e.g., one that obviously contains all layers of paint, one that is representative of other similar components in the room, and one that is not difficult to read accurately because of the nature of the underlying substrate;
- tests all components in a given room that may have a different painting history;
- takes the appropriate number of readings of the appropriate length of time on each surface combination;
- understands the idiosyncrasies of the particular testing device being used, such as the effect of temperature, humidity, substrate density, substrate combination, etc.;
- understands the need to alter testing protocols and interpretation of results, depending on the purpose of the inspection, e.g. to determine which surfaces to abate, to determine which surfaces may be safely disturbed during remodeling, to get a general idea of the amount of lead in the building, etc.

Paint Samples

According to HUD guidelines, inconclusive XRF results may have to be confirmed by laboratory analysis of a paint sample. Laboratory analysis of paint samples is quite accurate. The accuracy of the result, however, is dependent upon the quality of the sample, and good quality paint samples are often difficult to obtain. An appropriate paint chip sample is approximately one to two square inches, depending upon the thickness of the paint, and should contain all the layers of paint, with no substrate, such as wood or plaster, attached. Since the lead is usually concentrated in the lower layers, unless all the paint is included, the laboratory result reported may be quite a bit lower than the actual lead level. Including a portion of the substrate in the sample will also lead to lower than actual reported result.

Heat guns are useful for removal of paint samples. However, because of the potential for release of harmful organic vapors they should not be used in occupied housing when residents are present, and should only be used in well ventilated space. If the surface is charred, lead fume could also be released. If an inspector is using a heat gun for removal of significant numbers of paint samples, a half mask respirator with both HEPA filtered and organic vapor cartridges should be worn as the minimum level of protection. Use of butane torches for removing the paint should be discouraged because of the high temperatures involved; it should be absolutely prohibited in occupied property.

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The taking of paint samples may also result in the release of lead particulate. Appropriate precautions must be taken to contain and clean up any such residue. Surfaces from which samples are taken should be repaired by removing all loose and flaking material and sealing with a paint primer or other suitable sealant.

All paint samples should be sent to a laboratory recognized by the EPA National Lead Laboratory Accreditation Program (NLLAP) for analysis. The inspector should communicate with the laboratory and be certain that they analyze the entire sample or use approved subsampling techniques. Subsampling may result in a reported lead result that is not indicative of the whole, since the contents of the sample may not be uniform. Subsampling in the laboratory is permissible if the laboratory grinds the entire sample and homogenizes it first. Proper subsampling procedures may increase the cost per sample considerably.

Sampling Multi-family housing

The testing protocol outlined above is for single family housing and multi-family housing of 20 units or less. In multi-family housing consisting of 21 units or more, where the concern is to locate **most** of the lead painted surfaces in excess of the standard, rather than all of the lead paint in each unit, random sampling of units may be carried out, rather than testing all components in every unit. The number of units to be tested is determined using Table 7.3 ("Number of Units to be Tested in Multi-family Developments") of the Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing (HUD), 1995. The specific units to be tested are determined through the use of a random number table. Testing rules are designed to give a 95% confidence that fewer than 5% or 50 units, whichever is less, have undetected lead. This, of course, means that there is no guarantee that all lead painted surfaces in multi-family housing will receive the proposed hazard reduction treatments.

In multi-family housing, instead of testing three different locations on each combination of room/component/substrate/color, only one reading on each combination is taken in each unit tested. Component types, defined as similar components with the same substrate (e.g. wooden doors, plaster walls), are grouped. If 15% or more of a specific component type in the random sample are positive, a decision will have to be made as to whether it is more cost effective to test 100% of those components in all units, or to assume that the untested ones are positive.

If fewer than 15% of a specific component are positive, a paint chip for all components for which the XRF indicated a reading of 1.0 mg/cm² or greater must be submitted for analysis. If any sample comes back with a lead level of 0.5% or greater, a positive result is indicated; a decision of whether it is more cost effective to test 100% of that component in all units, or to assume they are all positive, must be made.

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Testing reports

Testing reports should include:

- A list of all surfaces tested (not just those which tested positive) with information on the specific location of tests.
- Calibration checks, with the standards used to make those checks.
- Individual XRF readings for each measurement, along with the average, unless using an instrument which automatically averages the readings.
- Values for making corrections for substrate interference, along with the calculated corrected readings where appropriate.
- If the inspector has randomly selected the units for testing in a multi-family project, the random numbers used and the calculations of unit numbers tested.
- The particular protocols for testing, if not specified by the project designer. For example, HUD has published a testing protocol for public housing and another for private housing; EPA has published a somewhat different protocol; the manufacturers of XRF instruments have different protocols; and many state and local governments have developed protocols that differ from all the above.
- Serial number of XRF machine used and name and license number of inspector

Specifications for inspections

Well designed and complete inspection specifications combined with a requirement for detailed testing reports can reduce the risk of incomplete or inaccurate inspections or even outright fraud. Major items for inclusion in a specification for lead paint inspection are:

- requirement to present certifications of inspection firm and all individual inspectors, to include evidence of completion of XRF manufacturer's course, a lead inspector course (EPA Model Curriculum or equivalent), and radiation licensing in the home state with evidence of reciprocity if from out of state
- the specific testing protocol to be followed (HUD, EPA, manufacturer, etc.)
- inventory of typical building components to be tested in each room and on the exterior

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- specific instructions on the handling of inconclusive results, i.e. paint chip analysis
- specific instructions on what must be included in the testing report, including brand, model and serial number of instrument used, name of inspector, all measurements (positive, negative and inconclusive), all calibration checks, and all corrections for substrate interference
- The lead paint standards to be used in interpreting the results

For further detail, see "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" (HUD, 1995); "Lead Inspector Training, Model Training Course Curriculum (US EPA, 1993); "Standard Practice for X-Ray Fluorescence (XRF) Field Test Detection of in Situ Lead-Based Paint in and Around Buildings and Related Structures" (ASTM draft, 1994); and "Standard Practice for the Field Collection of Dried Paint Samples for Lead Determination By Atomic Spectrometry Techniques" (ASTM draft, 1994).

RISK ASSESSMENT

Risk assessment is the on-site investigation of a building to determine the presence of immediate lead hazards, or potential hazards. Immediate hazards include dust, paint chips, and soil contaminated with lead paint or dust. Potential hazards include situations which could cause the development of dust or chips such as lead-based paint subject to friction or impact, and unstable paint. The assessment includes a visual inspection of the property, combined with a limited and selected sampling of paint, dust and soil to determine the presence of immediate lead hazards, an evaluation of their magnitude, source and accessibility. Risk assessment includes investigating the age, history, management, and maintenance of the dwelling, the presence of children under age 6 and women of child-bearing age, the condition of paint and causes of any deterioration, and the presence of any conditions which could lead to paint failure.

Risk assessment in and around buildings containing lead-based paint necessitates a visual inspection of the property to determine locations of deteriorated paint, paint subject to friction or impact, and the causes of any deterioration of these surfaces. If paint is being damaged by forces external to the paint itself such as leaking roofs or pipes, the progress of the damage may be arrested by repairing the external cause. In this instance, all that may be needed is to stabilize the paint film, apply operation and maintenance work practices to any activity that may disturb the paint, and periodically monitor the paint condition. On the other hand, if the paint is damaged due to an internal failure of the paint film or its bond to the substrate, it may be necessary to abate the painted surface. This visual inspection should result in an inventory of conditions that are damaging paint and repairs necessary to halt the damage.

In occupied property, the above information must be correlated with information about the habits of building occupants, particularly children. The risk assessor should also be directly involved in the sample collection or the selection of sample collection sites. Lead dust levels in a home, and lead in soil levels surrounding a home, are non-homogenous, and may vary widely from place to place. Selection of the appropriate sites for sampling is a critical part of the assessment process in order to determine the presence of a risk to a particular

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child, the magnitude of that risk, and its source. The risk assessment report will also contain appropriate options for controlling any hazards found.

Dust sampling

Dust is most typically sampled by a process known as wipe sampling. A defined area (at least one square foot if possible) is wiped following specific procedures described in the HUD Guidelines or NIOSH method 9100, Lead in Surface Wipes Samples. Dust wipes are then analyzed in the laboratory (NLLAP accredited). Risk assessment involves limited dust sampling of accessible horizontal surfaces, usually floors, window sills and window troughs (wells) (the portion of exterior window sills covered by the sash). Sites for sampling are not random. They are chosen to identify situations where high lead dust levels may coincide with accessible surfaces, or to determine the source of lead dust.

Laboratory test results are compared to the EPA guidelines for reference. The health risk is relatively low when these guidance levels are met; however, it is necessary to realize that a child may become lead poisoned, even if lead dust is present below the EPA guideline levels.

According to the HUD Guidelines, in buildings built between 1960 and 1978 with paint in good condition, or other buildings where a low hazard level is anticipated, risk assessments may be conducted by composite sampling. A composite sample is comprised of up to four wipes combined as a single sample. All surfaces wiped for a composite must be of the same surface area and from the same type component (e.g. all floors). The results are reported as a single result for the size of the total area wiped. In buildings where dust levels are likely to be low, the cost of assessment can be reduced significantly by composite sampling. If the composite sample exceeds the standard the property would have to be re-sampled with individual wipes. In the case of re-sampling, care must be taken to select different sampling sites, since the initial sampling should have removed most lead dust from those sites.

Soil sampling

Soil sampling is generally limited to bare soil in contact areas, such as children's play areas, pet sleeping areas, gardens, pathways, etc. With the exception of vegetable gardens, soil sampling is done only in the top layer of soil (EPA Guidance for Measuring Lead in Soil and Paint, July 1994 recommends top 1/2 inch, however, depending upon reason for sampling the soil, the assessor will have to make a judgement on depth of sample), since lead does not usually migrate through the soil, but remains concentrated at the surface.

Stones, twigs and other organic matter should be removed from the sample. Approximately one-eighth to one-quarter cup of soil is sufficient. Soil should be collected with an unpainted implement that is not made from a lead alloy.

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Since soil lead levels are generally not homogenous, composite soil sampling is usually preferred. Composite sampling involves first identifying a base line, such as a line 18 inches from a foundation wall, or a horizontal and vertical axis through a child's play area, and then taking five to eight samples equidistant along the line and combining them. The composite sample should be submitted to an NLLAP accredited laboratory. Sample preparation methodology should be discussed with the lab to assure that subsamples do not destroy the integrity of the composite (See ASTM ES 29-94, "Field Collection of Soil Samples for Lead Determination by Atomic Spectrometry Techniques").

Until health based standards are available, the EPA interim guidelines on soil (refer to the section on "Standards" above) should be used. The risk assessor is required to make a subjective determination of the extent to which soil lead levels are contributing to household leaded dust levels and the extent of risk to residents, particularly children. When EPA health based standards become available, the risk assessor will have more concrete information on which to make a judgement.

Specifications for Risk Assessment

A risk assessment specification combined with a requirement for a detailed report can increase confidence in the assessment. Major items for inclusion in a specification for lead-based paint risk assessments are:

- The firm making the assessment and all individual assessors should be required to provide evidence of completion of a risk assessment course (as of January 1, 1995, there is no EPA model curriculum for risk assessor courses, though one is currently under development), and an inspector and contractor/supervisor abatement course (EPA Model Curriculum or equivalent). Assessors should be required to provide evidence of training and experience in building construction and design. (See ASTM E06.23.70, "Draft Practice for Lead Hazard Risk Assessment in Residential Housing or other Properties Frequented by Children").
- Field investigation should be required, even if a lead-based paint inspection has previously been performed.
- The assessment report should include an inventory of building components which require hazard reduction work and the hazard reduction activity selected for each.
- The logic used in determining the appropriate hazard reduction procedures should be explained in the report.

For further detail, see HUD, "Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing" ("HUD Guidelines" see bibliography); "Lead Inspector Training, Model Training Course Curriculum (USEPA, 1993); "Lead-Based Paint Risk Assessment Protocol" (HUD, September, 1992).

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RENOVATION, REMODELING OR REPAINTING.

Renovation, remodeling or repainting of lead-based painted surfaces could expose workers, building occupants and their belongings, and the environment. Prior to such activity an inspection and assessment of the affected areas should be performed. This may be limited to the paint which is being disturbed. If lead is found it may be necessary to modify work practices or perform localized abatement prior to the work. Some state and local regulations may govern this type of activity as well. (See also, "Lead-Based Paint Operations and Maintenance Work Practices Manual", NIBS, 1995).

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ABATEMENT AND INTERIM CONTROL METHODS

Lead-based paint hazard reduction involves the elimination of exposure to **immediate** lead hazards resulting from lead painted building components through an appropriate combination of lead-based paint abatement, and interim controls, as well as removal of leaded dust and soil that may be posing an immediate risk. Lead-based paint hazard reduction includes a number of options for reducing the risk of human exposure to lead.

Due to the high cost of complete abatement and the number of properties requiring remediation, future work in lead-based paint hazard reduction will emphasize lead-based paint interim controls and limited abatement. Most properties requiring intervention will, therefore, receive a mix of treatments.

LEAD-BASED PAINT ABATEMENT

According to federal regulations and guidelines, lead-based paint abatement is the permanent (defined as designed to last at least 20 years, or, in the case of encapsulation, a twenty year product warranty) elimination of lead-based paint hazards through replacement, enclosure, encapsulation, paint removal, and cleaning to remove lead-contaminated dust.

When lead-based paint abatement is planned, a lead-based paint inspection is performed to determine which painted surfaces must be abated and which do not. Paint which is not lead-based under criteria of the inspection need not be abated. This means that if more restrictive criteria are used later on, lead-based paint may be found in an abated area. For example, if abatement is carried out only on surfaces which exceed the HUD standard for lead paint (1.0 mg/cm² or 0.5% Pb by weight), a later inspection conducted using a more stringent standard, such as the Consumer Products Safety Commission's level for new paint (0.06% Pb by weight), may find unabated lead-based paint.

Necessary ancillary work is considered part of the abatement, including the preparation, cleanup, disposal, post-abatement clearance testing, record keeping, and applicable monitoring. The following are considered viable abatement alternatives by HUD.

Replacement

Replacement is the removal of lead painted components and their replacement with new lead-free components. This method is most appropriate for windows, doors, and trim.

Advantages

- Only truly "permanent" abatement method, since all other methods leave lead paint or lead residues behind
- Integrates well with remodeling

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- Allows for upgrade of building components
- Can be carried out in a fashion that will minimize lead dust contamination

Disadvantages

- Generally more expensive than encapsulation or enclosure (though generally not more expensive than proper paint removal)
- Requires a skilled construction worker with carpentry skills
- May not be permitted in historical structures

Enclosure

Enclosure is the covering of lead painted surfaces with a rigid material mechanically fastened and sealed to prevent the penetration of lead dust into the environment. Enclosure also prevents contact with the lead-based paint. This method is most appropriate for large surface areas such as walls, ceilings, and floors, but may also be used on trim and other building components.

Advantages

- Generally very durable,
- Many contractors have the necessary skills
- It generates little contamination, as long as surface preparation is minimal

Disadvantages

- Lead paint remains in dwelling, therefore some ongoing monitoring and maintenance is required
- Normal installation procedures must be altered to include the sealing of all edges and seams

Encapsulation

Encapsulation is the covering of lead painted surfaces with a durable liquid coating or reinforced coating to prevent contact with the lead-based paint and/or penetration of dust or chips into the environment. Liquid encapsulants rely on an adhesive bond to their substrate rather than being mechanically fastened. For an encapsulant to qualify as an abatement product, it must be durable enough to last at least twenty years.

Advantages

- Often less expensive than other methods of abatement
- It generates little contamination, as long as surface preparation is minimal
- Requires less skill than replacement or enclosure

Disadvantages

- Depends upon the stability of the encapsulated paint film and the bond of the paint to its substrate
- Depends upon the surface conditions of the paint to be encapsulated and the ability to form a bond

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- Since durability is partially a function of the painting history, must be field patch tested on each surface which may have a different painting history
- Proper surface preparation and proper application critical to success
- Requires ongoing monitoring and maintenance

Off-Site Paint Removal

The stripping of lead-based paint from components at the facilities of a professional paint stripping operation is most appropriate for doors, mantels, and other trim which have architectural and/or historical significance. This type of stripping usually involves emersion in a chemical bath.

Advantages

- Contamination generated by the removal process is created off-site
- Is appropriate for historic restoration

Disadvantages

- Significant lead residues remain on porous surfaces, such as wood, and are likely to become embedded in new paint
- Components will require extensive cleaning after paint removal
- Generally more expensive than on-site methods
- Swelling of woods, raised grains of woods, failure of joinery, and inability to re-install assemblies after dipping without alteration.
- Requires components be stamped on the reverse side with proper locations for reassembly

On-Site Paint Removal

Lead-based paint can be removed from the surfaces of components while they remain in-place using non-methylene chloride-based chemicals, flameless heat guns/grids, or mechanical equipment assisted by a vacuum equipped with a high efficiency particulate air filter (HEPA).

Advantages

- Generally requires less skill than many other methods
- Appropriate for historic restoration

Disadvantages

- Most hazardous of all abatement methods. Workers and occupants may need protection from toxic solvents.
- Often leaves very large lead residues behind, which may become embedded in new paint in amounts high enough to fail XRF tests (this is a particular concern with chemical stripping)

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- Chemical residues may cause premature deterioration of new paint
- May cause aesthetic damage to the substrate
- Often the most expensive abatement method
- Often generates both liquid and solid hazardous waste
- If residues were high, will require ongoing monitoring of condition of paint and dust levels on friction surfaces

Inappropriate paint removal methods, including open flame burning, the use of methylene chloride-based chemicals, dry scraping/sanding, uncontained water blasting, uncontained abrasive blasting, and uncontained power assisted mechanical removal should be avoided. These methods generate large amounts of lead dust that may contaminate the environment and expose the workers. A number of these methods are also illegal in various jurisdictions throughout the country.

The advantages and disadvantages of different abatement alternatives may vary for exterior work. Exterior surfaces may be exposed to the weather, and this may affect the type of enclosure or encapsulant that is appropriate. Exterior building components may be out of reach of building occupants so that the tendency for a surface to release dust and chips may be a greater issue than direct contact with surfaces.

INTERIM CONTROLS

Interim controls (sometimes known as "in-place management") are treatments designed to temporarily reduce human exposure or the risk of exposure to lead hazards. These treatments include specialized cleaning, repairs, maintenance, painting, paint stabilization, temporary containment, and education programs. If encapsulation products do not provide a twenty year warranty, they may still be useful as an interim control. Ongoing monitoring of building conditions and surface lead dust levels is necessary to ensure the continued efficacy of interim control measures. For more information on interim controls refer to the NIBS Lead-Based Paint Operations and Maintenance Work Practice Guide.

Interim controls may be appropriate for a property with minor maintenance or clean-up problems but in generally good condition, or as a temporary measure until a planned abatement or other hazard reduction is implemented. Interim controls are likely to be least effective on properties in poor condition, with poor painting and maintenance histories. It may be necessary to repair water leaks, paint, friction surfaces and perform necessary cleaning before initiating a program of interim controls. Where interim controls are used ongoing monitoring of conditions is necessary. The poorer the overall condition of the property, the more frequently such monitoring will be necessary.

Advantages

- Least expensive first cost
- Can be implemented immediately

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Disadvantages

- Lead paint remains in dwelling.
- Continuing expense
- Requires ongoing monitoring of condition of paint and dust levels on friction surfaces

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DESIGNING THE PROJECT

Introduction

The goal of a lead-based paint hazard reduction project in buildings is the minimization of exposure to lead through an appropriate combination of lead-based paint abatement, partial abatement and interim controls. A lead-based hazard reduction project begins with a lead paint inspection, if abatement is the ultimate goal, or with a lead hazard risk assessment, which may or may not include some lead paint inspection, when full abatement is not the intent. The assessment recommends either lead-based paint abatement, interim controls or a combination of the two on a substrate-by-substrate basis.

Design of a lead-based paint hazard reduction project requires the designer, who may or may not be separate from the risk assessor or contractor, depending upon the size and nature of the project, to determine the nature of the work necessary (See "Designer" on page 38). Specific remediation methods will need to be applied to each situation that exists in the building. Any pre-existing conditions that may damage surfaces painted with lead-based paint need to be identified and dealt with. After the nature of the work is determined the designer must determine the extent of the work. The nature and extent of the work must be set forth in a document that can be understood by contractors who will be performing the work.

Site Investigation:

The lead-based paint hazard reduction project designer may precede other investigators at the project site. If there has been no lead-based paint inspection of the site, the designer will need to make an initial presumption that all painted surfaces contain lead. Based on this presumption the designer will make a preliminary risk assessment to determine what work is needed for a hazard reduction program. The designer can then supply to the inspectors a list of surfaces that require testing. After the inspection results are available, the design will have to be finalized based upon test data regarding the lead content of the affected paint. If an inspection has been accomplished prior to the project design, the designer can use the information from the inspection in making an assessment of work required. Frequently, more detailed inspection will be necessary to answer questions that arise during design. A follow-up inspection will then address these specific issues (such as developing more detailed information about surfaces that are to be disturbed).

During the site investigation the designer should determine if there are conditions that will adversely affect the lead painted surfaces such as active roof leaks, internal plumbing leaks, badly damaged and/or overly soiled flooring, including carpeting. These conditions will need to be corrected either as a part of the project or before it begins.

The designer needs to determine if there are adequate utilities to perform the work of the project. Typically, at a minimum, water, heat, and electricity are required. If these utilities are not available, are insufficient or inaccessible, a provision for temporary utilities will need to be added to the work.

Defining the Scope of Work

The designer is responsible for defining the nature and quantity of work to be performed by the contractor. The designer determines what work is necessary to accomplish the hazard reduction and states this in terms of the type of work to be performed, the quantity and locations of the work, and the boundaries and limitations for the contractor's activities. Usually the scope of work will be set forth in drawings, or a specification or tabulation listing type, quantity, and location of the work to be performed. If the lead hazard reduction is to be carried out in conjunction with broader renovation/remodeling activity, the boundaries between the two activities must be clearly defined. The scope of work not only sets the physical boundaries of the work, but it also determines whether additional testing is necessary. Designers should realize that lead-based paint hazard reduction projects may involve different levels of treatment (abatement, encapsulation, interim controls) used in combination. There is no one correct response to each situation.

Some of the work involved in the project may include the installation or alteration of building systems or components that are regulated by the applicable state or local building code. Where required, a permit for such work must be obtained from the appropriate enforcing agency, necessary approvals must be secured and required inspections arranged.

Pilot Projects

Some projects are so complicated that they defy simple design. HUD advises designers to consider pilot projects for lead-based paint hazard reduction projects involving multiple dwelling units. HUD Guidelines allow 10 units to be set aside for a pilot project for projects with 100 or more units, and 5 for projects with less than 100 units. Information gained from the pilot projects can help designers make decisions in the following areas:

- Relocation - Monitoring of airborne and surface dust in vacant units during and after the pilot project will help determine if relocation of occupants from occupied dwelling units is an absolute necessity, or whether barring them from the contained work area will be sufficient.
- Worker Protection - Monitoring of airborne and surface dust, including the breathing zone of workers, during and after the pilot project will help determine the extent of worker protection required for the entire project.

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- **Lead Hazard Reduction Methods** - Testing of various lead hazard reduction methods on different surfaces during the pilot project will help planners to decide on the most appropriate methods(s) for the project as a whole.
- **Clean-up** - Altering the approach to final clean-up during a pilot project will help planners determine the exact amount of clean-up required as it relates to the scope of lead hazard reduction. The work area should always be left clean enough to meet or exceed the HUD and EPA surface dust clearance levels.
- **Waste Disposal** - Lead contaminated waste may be regulated as a hazardous waste. By segregating different waste streams and testing them separately, planners can determine the amount and classification of waste (hazardous/non-hazardous) each pilot test method generated.

Hazard Reduction Project

Full abatement is generally very costly and sometimes even exceeds the value of the property. If resources are limited, the expected life of the property is much shorter than twenty years, or future plans for the property won't warrant a full abatement, lead hazard reduction may be considered. Lead hazard reduction consists of a combination of abatement (of surfaces, for example, presenting the highest risk), and interim controls. A risk assessment is required when a hazard reduction project is planned, to distinguish between those painted surfaces which are generating significant lead hazards and those which may simply benefit from interim controls. Ongoing monitoring in the form of visual inspection of painted surfaces and dust sampling is necessary, since full abatement was not carried out.

In the past lead-based paint hazard reduction projects have involved abatement of all lead-based painted surfaces. Now an assessment is made to determine the most appropriate hazard reduction procedure or combination of procedures to be applied to a situation. A current project is more likely to involve a number of different hazard reduction procedures applied in a coordinated fashion to a project. An operations and maintenance program may be set up as an interim control to prevent damage to painted surfaces during routine maintenance and cleaning. A program of interim controls performed on a periodic and scheduled basis, such as cleaning to remove leaded dust, may be initiated. Repairs may be made to the building to halt processes such as leaking roofs or pipes that are damaging paint. Damaged paint may then be repaired and stabilized. Preventative maintenance to prevent the reoccurrence of paint damaging processes may be initiated. High contact areas such as chewable or accessible and easily damaged surfaces may be abated. Localized abatement may be performed in areas such as friction points on doors and windows. The exact lead-based paint hazard reduction procedures used will be determined on a case-by-case basis.

In all lead-based paint hazard reduction projects there are number of common elements, particularly where lead-based paint abatement is involved. Occupants and workers need to be protected. Any work area in which lead-based paint is disturbed must be isolated from the balance of the building to prevent the spread of leaded dust. The project will need to be monitored to assure that work is being done properly. The work

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area must be cleaned and tested to make sure it is safe before it is re-occupied. The debris from the project must be disposed of properly.

Occupant Protection

Most lead-based paint hazard reduction methods generate some lead contamination in the form of chips, dust, and fumes. Consequently, it is practically impossible to perform lead-based paint hazard reduction in an occupied space without running the risk of exposing occupants to some lead contamination. The most effective way to protect occupants is to temporarily relocate them, along with their movable belongings, including rugs. Fixed carpeting, such as wall-to-wall, poses a particular problem for the hazard reduction designer. There is no effective way to test carpeting to determine the degree of contamination, there is no effective way to decontaminate carpeting, and there is no effective way to measure the degree of risk that carpeting poses to a child. For that reason, it is generally recommended that carpeting suspected of being contaminated with lead (such as carpeting which was left in a room during renovation or remodeling) be disposed of. Occupants or their belongings should not be permitted to move back in until the affected area has been cleared for re-occupancy. As a general rule relocation is especially applicable to young children (less than 6 years old) and pregnant women.

Total relocation of the occupants and all of their belongings may not be necessary in some situations. Exceptions include very short term projects (i.e., completed in one day), and discreet work (e.g., window replacement) where the occupants and their furniture and other belongings can be effectively isolated from the work area. The family must also have access to critical facilities such as the bathroom and kitchen.

It may also be unnecessary to relocate occupants when exterior work that is relatively non-invasive to the interior is being performed (e.g., vinyl siding installation with minimal surface preparation). With proper coordination, occupants may still use the building while this type of work is being performed, so long as uncontaminated ingress and egress to the building can be maintained and dust penetration into the interior can be prevented.

Worker Protection

Exposure to lead at the worksite is a serious health risk to construction workers. In addition, the families of construction workers can be exposed when contamination is carried home on clothing and tools. To reduce these risks, the Occupational Safety and Health Administration (OSHA) developed the Lead in Construction Standard, 29 CFR 1926.62. In addition, other general OSHA construction standards also apply to lead-related work. These include the Hazard Communication in Construction Standard, 29 CFR 1926.59, the Construction Respiratory Protection Standard, 29 CFR 1926.103, and the General Safety and Health Provisions in Construction, 29 CFR 1926.20-32. These regulations are addressed in more detail in *The Guide Specifications* sections 01555, Worker Protection - Lead-Based Paint and 01556, Respiratory Protection - Lead-Based Paint.

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The first step in providing worker protection is the selection of hazard reduction methodologies which will minimize and control the production of leaded dust. Work practices prohibited by the HUD Guidelines (open flame burning, machine sanding, uncontained high pressure washing, abrasive blasting) should be avoided. However, hazardous levels of lead dust may not be visible. Many health and safety professionals feel that, because of this fact, and because of the variability of exposure concentrations in the construction industry and the difficulty of monitoring a mobile work force, most if not all of the safety precautions required of the employers by the Standard should be implemented routinely whenever construction employees are potentially exposed to lead. This more prudent approach to worker protection is thought to be more protective of workers than a strictly regulatory response. It also assures the measure of protection necessary to protect the family members of construction workers.

Training

The tasks addressed in this guide should be performed by persons who are properly trained and certified to perform them. As stated above, OSHA requires training for all workers performing lead-related construction tasks, as do many state and local governments.

In addition, EPA is proposing that certification of appropriate training be required for all individuals performing work in the following categories, in courses at the minimum length specified: worker - 32 hours; supervisor (target housing and public buildings) - 40 hours; inspector technician - 24 hours; inspector/risk assessor - 40 hours; planner/project designer - 56 hours. And EPA is also proposing that all firms engaged in or offering to perform lead-based paint activities be certified as only employing certified persons to conduct lead-based paint activities.

Containment of the Work Area

The environment must be protected from contamination by the lead dust generated by lead-based paint hazard reduction activities. The work area must be properly contained to prevent the spread of contamination and to ease final cleanup of the leaded dust. Typically, the materials used in containment include six mil thick sheet plastic, duct tape, and heavy duty staples.

Flapped plastic barriers are created at the doorways used to enter/exit the work area by installing multiple layers of 6 mil plastic over the doorways in such a way that workers can enter/exit while at the same time minimizing the escape of lead dust from the work area. Plastic barriers are particularly important in situations where only part of a building is being affected by the lead-based paint hazard reduction activities and there is a need to prevent the unaffected portion from becoming contaminated. Proper use of plastic protects the occupants and reduces the scope and duration of cleaning after the work is completed.

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All floors (including stair treads and risers) in the work area should be covered with at least two layers of 6 mil plastic and sealed with tape and/or staples, unless floors are being abated. (CAUTION! The combination of polyethylene plastic on the stairs and paper shoe coverings is extremely slippery. A traction surface (such as duct tape, taped down cardboard, etc.) must be installed over the polyethylene on stairs. Older wooden floors are particularly difficult to clean of lead dust, and young children spend a lot of time on floors (e.g., crawling, playing, etc.), so it is particularly important to keep floors clean. By using the multiple layers of plastic, the top layer can be removed as it becomes overly soiled or damaged during the work without adversely affecting the floor itself.

Immovable and/or built-in items such as cabinets, bookcases, radiators, and fixtures should be covered with at least one layer of 6 mil plastic and sealed. HVAC systems should be shut down during lead-based paint hazard reduction work and their vents should be covered with 6 mil plastic and sealed with tape.

When performing lead-based paint hazard reduction work on exteriors (including any work involving windows), the ground below should be protected with 6 mil plastic sheeting. The 6 mil plastic should be installed starting at the foundation, and have a minimum width of ten feet. Plastic on the ground so as to contain any liquid waste and must be removed at the end of each work day. In residential neighborhoods, the area must be cordoned off to prevent curious children or others from wandering into the work area, and may require a full-time "lookout", and perhaps even a temporary fence or other barrier.

Controlling Airborne Contamination

In general, the dust and debris generated by lead-based paint hazard reduction work has little aerodynamic capability and will be adequately contained by the sheet plastic containment barriers described above. It is prudent to stop dust generating work near windows and on the exterior of buildings if wind speeds exceed 15 mph. For projects involving gross demolition and on-site invasive paint removal methods such as abrasive blasting, more stringent methods for controlling airborne lead contamination may be necessary.

Only power tools equipped with local area exhaust through a HEPA filtered vacuum cleaner should be used. If high levels of airborne lead dust are being generated by the work a Negative Pressure Enclosure system should be set up. This system exhausts air from the work area to the outside through HEPA filtered portable exhaust fan units. Airborne dust levels are reduced as clean air is drawn from outside the containment replacing the dust-laden air that has been exhausted after cleaning by HEPA filters. The system should be set up so that make-up air comes in on one side, completely traverses the work area and is exhausted on the opposite side. The exhaust system should be set up so that workers can conduct work activities with their backs to the make-up air so that dust is drawn away from them toward the exhaust fans. The HEPA filtered exhaust fans remove air from the work area creating a reduced air pressure inside. This will prevent the escape of any dust into surrounding areas. Clean make-up air is drawn into the work area, and so long as the pressure gradient is maintained, contaminated air cannot escape.

Project Monitoring

Lead-based Paint hazard reduction projects should be monitored to assure the intent of the project design is carried out and protection of occupants, workers and the environment is maintained.

The contractor has responsibility for monitoring associated with the worker protection program. According to OSHA's Lead in Construction Standard, under certain circumstances the contractor must conduct exposure air monitoring to determine the level of worker protection required. Medical monitoring (blood testing) of workers may also be required in certain situations.

Owners may have the contractor conduct monitoring outside the work area in conjunction with lead-based paint hazard reduction projects, or they may hire an independent consultant to conduct monitoring if there is concern of a conflict of interest. Especially on large scale projects and/or those involving aggressive demolition and paint removal, owners may want to monitor surface dust levels and/or airborne lead levels outside the work area to insure that no lead contaminated dust has escaped from containment. Owners may also wish to conduct unscheduled monitoring visits during the work to insure compliance with specifications. The frequency of these visits may be tied to the amount of lead dust that is expected. Caution must be exercised in that a consultant may not, in many instances, give direction directly to employees of a contractor without an accompanying transfer of liability. Concerns over conformance with specifications or regulations can always be made to the contractor's on-site supervisor. At the end of the project, owners should enlist the services of a consultant working for the owner (not the contractor) to conduct clearance testing (surface dust) before permitting re-occupancy.

Clean-up and Clearance

Clean-up is the most important part of a lead-based paint hazard reduction project. The project is only judged to be complete based on how clean the property is with regard to surface lead dust. Ineffective clean-up is the most common failure point in most projects. Engineering controls and work practices which minimize the production of dust, dust control measures, and adequate containment will do much to reduce the problems of clean-up at the conclusion of the project. Should dust contamination be significant, wet sweeping should be supplemented by HEPA vacuuming.

To help ensure the success of the final clean-up, the area directly affected by lead-based paint hazard reduction activities should be cleaned at the end of each day of operations. Daily clean-up consists of wrapping or bagging all bulk debris (windows, doors, trim, etc.), wet sweeping and bagging small debris (dust, chips, etc.), and disposing of the debris.

Durable tools/equipment (power tools, HEPA vacuums, etc.) used on lead hazard reduction projects should be cleaned as they are removed from the site. Damp wiping them with an appropriate detergent solution will help to decontaminate them.

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Effective final clean-up procedures are designed to deal with the peculiar properties of lead dust. The lead dust particles tend to be very small, very heavy, and stick tenaciously to surfaces. Lead dust is difficult to remove from porous surfaces such as bare wood, masonry and sheetrock. For this reason, new building materials should not be brought into the work area until dust producing activity is over and the dust has been cleaned up. Special vacuum cleaners with high efficiency particulate air (HEPA) filters have proven to be successful in helping to remove lead dust. The HEPA filter effectively traps the very fine lead dust. Only vacuums with sufficient power to lift the lead particle from the surface are effective. A high phosphate detergent, generically known as trisodium phosphate (TSP), helps in the clean-up of lead dust by "unsticking" the lead particle from affected surfaces. Any detergent which contains at least 5% phosphate by weight is considered a high phosphate detergent. There may be other phosphate-free detergents that will prove to be effective in helping to remove lead. NOTE: A number of states have banned the use of trisodium phosphate and detergents with a high phosphate content. Research is currently underway regarding the effectiveness of other cleaning agents, but it is not possible at this time to comment on their usefulness.

At the conclusion of the dust producing phase of a lead-based paint hazard reduction project and prior to the application of paint, liquid encapsulants or other sealants, a HEPA vacuuming, used in combination with a detergent wash in alternating steps, is the recommended method for final clean-up. The final cleaning process is as follows:

1. HEPA vacuum the entire affected area.
2. Wash the entire affected area with an appropriate detergent solution followed immediately by a clear rinse.
3. After the surfaces dry, HEPA vacuum again.
4. Arrange for a preliminary visual inspection by a person not employed by or under contract to the contractor. If the visual inspection fails (i.e. visible dust or debris present), repeat steps 1-4. Otherwise, proceed to step 5.
5. Paint or otherwise seal all affected surfaces and all floors with an appropriate paint, encapsulant, or sealant. (Where surfaces are not rough or porous and likelihood of achieving clearance is high, the owner may wish to conduct clearance prior to repainting in order to assure that lead residues are not embedded in the new paint or sealant).
- *6. HEPA vacuum the entire affected area again.
- *7. Damp wipe the entire affected area again with a clear rinse.
- *8. After the surfaces dry, HEPA vacuum again.

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9. Arrange for a final inspection, including clearance testing, by a person not employed by or under contract to the contractor.

*If clearance can be reached after painting, then these three steps may be eliminated.

Clearance testing involves the use of thin, non-alcohol-based, aloe-free, baby wipes, or the equivalent, to wipe a measured section of selected horizontal surfaces (floors, interior window wells, exterior window wells or troughs) in each affected room or area, submitting those wipes for laboratory analysis and comparing the results with established standards. The maximum allowable post-project lead dust levels according to current HUD/EPA guidelines are:

Floors - 100 $\mu\text{g}/\text{ft}^2$

Interior window wells - 500 $\mu\text{g}/\text{ft}^2$

Exterior window wells or troughs - 800 $\mu\text{g}/\text{ft}^2$

If any one of the results does not meet the standards, then typically the contractor must re-clean the entire room or area before it is re-tested. It should be noted that a common reason for clearance failure, after initial clean-up, is workers not changing the cleaning and rinse water frequently enough. Generally, clearance testing is performed by a regulatory authority or another person not employed by, or under contract to the contractor.

After exterior work, clearance soil samples should be collected. The EPA recommends that at least 4 samples be taken. The recommended clearance criteria is a finding that there has been no measurable contamination of the site by the work (necessitating pre-abatement sampling for comparison), and that in no case is there more than 400 milligrams of lead per kilogram of bare soil with which there is child contact. (Note: standards in some states may be different).

Disposal

Lead-based paint hazard reduction projects generate lead contaminated waste. All lead contaminated waste is potentially harmful and needs to be handled carefully. Some lead contaminated waste may be regulated as a hazardous waste. Given the relative lack of clear direction from federal agencies regarding the sampling of lead contaminated waste, and the various interpretations made by state and local governments regarding exemptions and other aspects of the problem, the appropriate waste management authority should be contacted to get specific direction about how to properly handle the contaminated waste. It should also be noted that EPA is currently (as of January 1, 1995) reviewing how the agency handles responsibility for lead contaminated building debris; the rules may change in the near future.

Lead contaminated construction debris should be contained properly to ensure against the contamination of workers and the environment during the disposal process. Solid waste should be bagged or wrapped and sealed in 6 mil plastic or 6 mil plastic bags; sludge from chemical stripping operations should be placed in corrosion-resistant drums; paint waste from mechanical removal operations shall be placed in approved waste

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drums; and liquid waste (e.g., waste water) should be temporarily stored in containers with sealable lids until testing determines proper disposal methods.

Hazardous waste is regulated pursuant to the Resource Conservation and Recovery Act (RCRA). Lead is one of the heavy metals covered by these regulations and it is considered to be a hazardous waste if it exceeds a certain level of lead leachability. A representative sample of the waste is submitted for toxicity characteristic leachate procedure testing (TCLP) to determine if the waste is classified as hazardous. This test mimics the conditions that are likely to exist in landfills and measures the amount of lead that leaches from the submitted sample. If greater than or equal to 5 ppm of lead is found in the leachate, then the waste represented by that sample must be handled as a hazardous waste. The owner and possibly the contractor have responsibilities, record keeping and otherwise, pursuant to RCRA for the proper handling of a hazardous waste. The owner cannot, under RCRA, contract away his responsibility for proper disposal of hazardous waste. Lead contaminated waste with less than 5 ppm of lead is judged to be non-hazardous, but is still potentially harmful and should be handled carefully. Though requirements for this non-hazardous waste vary from jurisdiction to jurisdiction, it should be bagged or wrapped in 6 mil plastic and be transported in covered vehicles to a lined landfill in order to avoid contamination of the environment. It should never be put out for regular commercial/residential trash pick-up, and it should never be incinerated.

Because the disposal of hazardous waste can be a major project expense, and because it is very difficult to predict whether waste will be hazardous or not, it is recommended that a representative sample of building materials be submitted for a TCLP prior to bidding. In that way, all bidders will be making proper assumptions.

Integration of Lead-Based Paint Hazard Reduction with General Rehabilitation and Modernization

Many lead-based paint hazard reduction projects will be incorporated into general rehabilitation and modernization projects. The goals of these combined projects can best be achieved through proper sequencing. In general, the demolition portion of such projects should be completed by specially trained lead-based paint hazard reduction contractors. All work involving the potential generation of lead contaminated dust and debris should be performed during this phase of the job. After performing the first three steps of final clean-up as described above, it is **probably** safe for the rehabilitation/modernization contractor to perform their work, provided their workers have been properly trained and use the minimal safety precautions required by OSHA for working in environments where lead may be present.

After the general rehabilitation/modernization contractor has completed work, but before painting has taken place, the lead-based paint hazard reduction contractor should return to the job site and repeat the first three steps of final clean-up as described above. After a second visual inspection, painting and sealing can take place, followed by clearance testing. With proper sequencing, lead-based paint hazard reduction can readily be incorporated into general rehab/modernization projects.

Summary of Steps in Designing Reduction Projects

1. Inspection and risk assessment, and site investigation.
2. Determination of the scope and sequence of work
3. Pilot project (not necessarily required in single-family dwellings)
4. Selection of specific hazard reduction methods
5. Selection of occupant protection
6. Determination of worker protection and training requirements.
7. Containment of work area
8. Determination of project monitoring requirements
9. Clean-up and clearance requirements
10. Disposal of waste

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Part 2

2. CONTRACTING THE LEAD HAZARD REDUCTION PROJECT

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PARTIES INVOLVED IN THE LEAD HAZARD REDUCTION PROJECT

The construction work necessary for abatement or interim control of lead paint hazards is the lead hazard reduction project. A lead hazard reduction project is both a construction project (repair, demolition and/or rehabilitation) and an environmental decontamination project. There are three roles or principal functions directly involved in any construction project. It is important to know the role of each. The building owner, project designer(s) and contractor each have well defined roles in traditional projects. Blurring the time honored distinctions between the three roles will complicate the issues of responsibility and liability.

Owner

The building owner has the ultimate responsibility for the lead-based paint and related hazards on the property. The owner has concerns about responsibility for the safety of people occupying, visiting, and maintaining the building. The owner can transfer some, but not all, responsibility by hiring expert consultants and contractors. The owner may wish to consult an attorney and insurance advisor in order to determine possible lead-based paint liabilities throughout the process and after its completion.

Designer

The designer is responsible for developing an accurate and complete scope of work. In a means and methods specification, such as developed using the NIBS Guide Specification, the designer also determines what procedures will be used to accomplish the lead-based paint hazard reduction. The design is described in documents used as the basis for a contract between the owner and contractor (contract documents). The designer requires some or all of the skills of a lead-based paint inspector, risk assessor, project designer, architect or engineer, and project monitor. The size and complexity of the project and the skills and qualifications of the designer will determine if any consultants are required to provide necessary skills.

Contractor

The contractor provides the labor, materials, and equipment necessary to carry out the work set forth in the contract with the owner. The scope of work is defined by the contract documents prepared by the designer. The designer, not the contractor, is responsible for the scope of work being accurate and complete. However, the contractor is responsible for alerting the owner and designer of deficiencies if and when they are discovered. In some cases, it can be useful to take advantage of contractor expertise in methods, practices, and strategies for performing the work by involving the contractor in the design process. If the contractor is going to be asked to both design and execute the project or implement hazard control measures, then their qualifications for design should be investigated with the same care as is described below for the design team. Having the contractor both design and execute the project or implement hazard control measures, can, but

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doesn't necessarily, raise conflict of interest concerns. The contractor is normally also responsible for obtaining any required permits from the agency responsible for enforcement of applicable state and local building codes.

CHOOSING THE DESIGNER

The owner may look for a single source to be responsible for all aspects of the project design and construction administration. Alternatively, the owner may put together a "design team" by contracting directly with a number of consultants. If the second approach is followed, one consultant should be made responsible for coordination of the team. Whether the designer is an individual, a firm or a team of consultants, there are specific skills that are required for a successful project. The degree to which these skills are necessary will depend upon the complexity of the project. Some or all of the skills of an Architect/Engineer, Lead Paint Inspector, Risk Assessor, Hazard Reduction Designer, Certified Industrial Hygienist, and a testing laboratory must somehow be supplied. The owner should make sure that the designer, or on complex projects each member of the design team, can reasonably hold himself forth as expert in their designated area, and that all licenses and certifications required by applicable laws and regulations are provided. The following skills are required for a successful design.

Hazard Reduction Designer

The hazard reduction designer considers specific procedures for reducing lead-based paint hazards and protection of occupants, workers and the environment. The designer must consider: isolation of the work area, protection of workers, and criteria for determining when the work has been completed and can be re-occupied. The designer must be expert in the numerous procedures and techniques available, as well as the cost impact of using those procedures on the project. The designer must be able to interpret the results of the risk assessment and lead inspection to determine the hazard reduction required. This requires specialized knowledge and may require licensing or certification under state or local laws and regulations. Lead hazard reduction design is a relatively new discipline and is not uniformly defined or practiced in all parts of the country. Training requirements and certifications are currently being drafted and refined.

Architect/Engineer

Most states require that construction projects affecting occupant life and safety be designed by an architect or engineer. Architects and engineers are licensed by the state(s) in which they practice. Changes and modifications to existing buildings and structures which involve the cutting of structural supports or walls; which change the means of egress; which increase dead loads; which affect fire protection systems; water supply, sewer, drainage, drain leaders, gas, soil, waste, vent or similar piping; electric wiring; energy efficiency; mechanical work; or other work affecting public health, or general safety are all examples of work that may require an architect's or engineer's license. On complex projects, the preparation of the contract documents (drawings and specifications) describing the scope and requirements of the project requires the expertise of an architect or engineer.

Lead Paint Inspector

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An experienced inspector is necessary to determine the presence or absence of lead on each building component, in each room or area in which work is to be done. Whether X-Ray Fluorescence sampling or bulk paint chips are obtained for analysis, the inspector's skill and experience can determine the accuracy of the sample information. The inspector must convey the type, location and extent of lead-based paint components to the project designer and risk assessor. There are training and certification requirements for lead-based paint inspectors in some localities. Training requirements and certifications are currently being drafted and refined.

The skills necessary to properly operate X-ray fluorescence equipment, to take proper paint chip samples and adequately interpret the results are complex, and require extensive training and experience. Lead paint inspectors need training in the theory of X-ray fluorescence, with a strong focus on sampling and measurement techniques. They also need specific training in the particular instrument being utilized. Often training offered by manufacturers, while necessary, is not adequate to understand the limitations of particular instruments. At a minimum, in addition to the manufacturer's training, inspectors should have successfully completed a Lead Inspector Training Course utilizing the EPA Model Curriculum, or its equivalent. Since, at the present time, most states do not have accreditation programs for training providers, care must be exercised; checking the credentials of training providers is especially important.

One important criterion for inspectors, often overlooked, is a thorough knowledge of building construction. Unless the lead inspector understands how buildings are constructed, as well as understanding how various substrates and combinations of substrates can effect the validity of XRF results, neither proper selection of testing sites, nor accurate interpretation of inspection results are possible.

Risk Assessor

Prior to hazard reduction design a risk assessment of the property should be performed. A risk assessment is appropriate when hazard reduction is planned, to distinguish between those painted surfaces which are generating significant lead hazards and painted surfaces which may simply benefit from lead hazard controls. In some cases the risk assessment may have already been performed by others. In those cases the risk assessor will review and perform additional assessments as required to meet the overall project scope of work. There are training and certification requirements for risk assessors in some localities.

Lead hazard risk assessment, particularly of an occupied property, requires detailed understanding of the nature of lead hazards; routes and pathways of exposure. The risk assessor needs the ability to observe conditions, selecting sampling sites to determine the extent and source of the hazard. Skills of observation, data analysis, and deductive reasoning are critical.

The lead hazard risk assessor must have a broad understanding of potential sources of lead risk, including the rare and unusual. Since paint failure is the most common source of lead risk, an understanding of the causes of paint failure and the ability to discriminate among them is also vital. Even more than the lead inspector,

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the risk assessor must have an understanding of construction and the building conditions which can result in paint failure.

Since the risk assessor will often be called upon for mitigation advice, an understanding of the remedies of paint failure, as well as a thorough understanding of abatement methodologies, should be considered essential. In the absence of accreditation programs for risk assessors, a qualified risk assessor should have evidence of satisfactory completion of a quality Lead Inspector Course (EPA Model Curriculum), Lead Abatement Contractor/Supervisor Course (EPA Model Curriculum), several years of experience in the identification of lead hazards and their mitigation, and a background in building construction.

Certified Industrial Hygienist (CIH)

On a lead-based paint hazard reduction project, industrial hygienists are concerned with the evaluation of worker exposures, worker protection, and the evaluation of exposure and potential exposure to building occupants. The industrial hygienist develops sampling protocols for monitoring abatement worker exposures, exposure monitoring and clearance sampling. The industrial hygienist is usually a consultant to the contractor or designer. The industrial hygienist should be certified by the American Board of Industrial Hygiene and be familiar with lead-based paint remediation.

Project Monitor

The project monitor observes the contractor's work procedures to monitor compliance with the requirements of the contract documents, collects samples for analysis, visually inspects for clearance and collects clearance samples at the end of the job. Monitoring is performed using sampling and analytical protocols set forth in the contract documents. The role and authority of the monitor should be described in the contract documents for the contractor's information. Personal sampling required by OSHA is the contractor's responsibility and as such is not performed by the project monitor.

The training and experience required for the project monitor are not addressed by current or anticipated training and certification programs. If the monitor is to have authority on the job site, she or he should have the same level of skill and experience as a risk assessor, have received supervisor training, and have a thorough knowledge of the construction documents and the intent of the design.

Laboratory

The analytical protocols to be used for analysis of air, lead dust wipes, soil samples, paint samples and waste characterization samples should be determined with the assistance of the laboratory that will be performing

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the analysis. Discussions with the laboratory must be held to determine that the laboratory will be able to supply the needed services within the schedule limitations of the project.

The laboratory is responsible for correctly analyzing samples and reporting accurate results to the lead hazard reduction designer for interpretation. The laboratory can be a sub-consultant to the designer or can be contracted directly by the owner to furnish sample analysis for the project monitor.

Uniformity of analysis is most assured when the laboratory is accredited for the analysis they perform. Some states have requirements and certification programs for laboratories. Any laboratory performing analysis of lead should participate in EPA's National Lead Laboratory Accreditation Program (NLLAP), administered by the American Association for Laboratory Accreditations and the American Industrial Hygiene Association. To gain accreditation under NLLAP, laboratories must participate in the Environmental Lead Proficiency Analytical Testing program (ELPAT) and meet other requirements. The ELPAT program is administered by the American Industrial Hygiene Association. Other organizations may be recognized as having a competent proficiency testing program in the future. Laboratories must successfully pass an on-site visit and be rated as proficient in ELPAT to be recognized by EPA. The entity retaining the laboratory should request a copy of the accreditation certificate and verify participation in the ELPAT program.

A list of recognized laboratories is available from:

- EPA Lead Hotline: 1-800-424-LEAD
- National Institute for Occupational Safety and Health (NIOSH): 1-800-35-NIOSH

Lists of recognized laboratories are also available from the accrediting organizations. Organizations currently offering recognized laboratory accreditation programs are:

- American Association for Laboratory Accreditation (A2LA)
656 Quince Orchard Road #300
Gaithersburg, MD 20878
(301) 670-1377
- American Industrial Hygiene Association (AIHA)
2700 Prosperity Ave., Suite 250
Fairfax, VA 22031
(703) 849-8888

Additional organizations may be added at a later date.

Other Advisors

During the design of a lead hazard reduction project issues sometimes arise requiring expertise beyond that available from the design team.

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- **Attorney:** Many issues relating to the contractual obligations and liability of the owner, the design team, and the contractor arise during the course of lead hazard reduction project. The owner should have legal counsel who is independent from the other members of the design team.
- **Insurance Consultant:** Both availability and amount of insurance are important issues on lead hazard reduction projects. Many insurance policies for consultants and contractors contain a “pollution exclusion” that may limit or eliminate insurance coverage for lead-based paint hazard reduction work. Frequently Lead related insurance is a complex and rapidly changing field which will likely be beyond the expertise of the owner's normal insurance agent. Expert advice should be sought from an insurance consultant specializing in the lead field. Documents describing insurance requirements should be reviewed by both the owner's attorney and the insurance consultant. Insurance requirements should be set forth in the contract documents and made available to the contractors bidding on the project. During evaluation of contractor qualifications, copies of contractor insurance policies should be provided and reviewed.
- **Health Department And Other Regulatory Officials:** The requirements for training, certifications and regulations are being developed and/or constantly changing. Contact with the local Health Department and other regulatory officials is necessary to determine local requirements, including if inspections, permits or notifications are necessary. Health Departments in some areas will also provide inspections to determine if lead based paint is present. Health Departments typically work on a small scale or a single unit basis.

Review of Design Team Qualifications by the Owner

The qualifications of each member of the design team should be investigated by the owner. If a single consultant is providing services in more than one area, qualifications in each area should be reviewed separately.

- **Review History of Experience:** The consultant's experience should be specific to the type of project involved, including similar lead painted materials, conditions, locations, and types of structures. Both the experience of the specific individuals to be involved in the project as well as the firm's experience should be evaluated.

A review of qualifications may not eliminate a consultant but may instead indicate an area where specific limitation may be imposed. For example, a consultant on a HUD funded housing project may lack experience with and hence need assistance in dealing with the requirements of that agency.

- **Check References:** Several references should be checked to verify satisfactory performance on past projects. At least one reference from a similar project should be investigated. Inquiries should seek more than simple testimonials of good performance. A determination should be made as to whether design principles and procedures such as those discussed in this guide were followed. When checking references one should be aware that no single source is likely to give a complete portrayal of the consultant's work. The biases of each source of information should be understood and considered during the evaluation.

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A project monitor can be a useful source of information, but may know nothing about budget problems. A contractor may provide useful information about past performance relating to issues such as thoroughness and practicality. Building owners will know if projects have been executed in a timely fashion, within budget, and without complaints; however, they may know little about the actual work and the quality of performance.

- **Site Visits:** Visits to job sites of present projects may be informative.
- **Interview:** Potential consultants should be personally interviewed by the owner. Interviews enable the owner to make a determination about the depth of knowledge of the individuals involved. The specific individuals who will work on the project should be interviewed. The knowledge, experience, and public presentation skills of the consultant can be very important in maintaining relations with occupants and the public.
- **Certification:** Lead hazard design consultants should have completed required training and be certified by federal, state, or local agencies as required. Specific training requirements are currently under development by the Environmental Protection Agency (EPA).
- **License:** If the project involves work requiring an architectural or engineering license, a member of the design team should have a current license to practice in the state in which the project is located.
- **Complaints and Settlements:** Check with consumer councils, state boards, better business bureaus, etc., for complaints. Check for past litigation, jury awards, insurance payouts, etc.

Conflict of Interest

The division of responsibilities outlined previously in this section is much more likely to be present on large lead hazard reduction projects involving many different participants. However, for small projects, an individual contractor may be asked to accept the responsibilities of designer and contractor. Where there are no built-in checks and balances, a conflict of interest may develop. Owners should be aware of this possibility and take steps to avoid it, possibly by hiring a disinterested third party consultant to provide certain technical services, such as clearance testing.

FINDING A CONTRACTOR

The work to be accomplished in the lead-paint hazard reduction project is set forth in a set of contract documents prepared by the design team. The contract documents are issued as the basis for obtaining bids or estimates from potential contractors, and become the basis for the contract between the owner and contractor.

The contract documents should clearly describe the scope of the work of the project. This may require drawings or other detailed descriptions of the work, its extent and limitations. Vague descriptions of the work such as telling the bidder to "replace, enclose, remove, or encapsulate all the lead-based paint," will result in uncertainty on the part of the bidders. This uncertainty normally translates into a wide range in bids received, higher cost and disputes about the extent of the work.

Contractors can be selected on the bases of proposed cost (bid) or qualifications.

Qualification Based Selection

Building owners may have the option to select a contractor based on qualifications, then negotiate terms. A negotiated contract is appropriate when the owner wants to: work with a specific contractor, save time, or avoid publicity. Methods of evaluating a contractor's qualifications are described later in this section.

Bidding

Public building owners typically are legally required to obtain competitive bids for construction projects. Many building owners both public and private prefer to obtain competitive bids for construction projects to insure open competition and obtain the lowest reasonable price for the work.

- **Bidding Public Projects:** Public building owners are normally legally required to accept the lowest responsible bid. A responsible bidder is one who meets the qualification requirements set out in the bidding documents and also meets any requirements set forth in the contract documents. This means that in theory, a bid from an unqualified contractor can be rejected. Unfortunately, in practice it is sometimes difficult to determine if a contractor is qualified, and there is considerable pressure to accept the low bid whether the contractor is qualified or not.

In some jurisdictions public authorities are allowed to accept qualification statements from contractors prior to bidding and allow only pre-qualified contractors to bid. A compromise frequently allowed is to require contractors to submit qualification statements at the time of bidding. Qualification of contractors prior to bidding provides greater safeguards to the owner and is recommended when allowed.

- **Bidding Private Projects:** Private building owners have considerable latitude in the bidding process. The following steps will help identify a qualified contractor.

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- a. Evaluate qualifications of all bidders using the factors outlined in the section on contractor qualification.
- b. After receipt of bids, meet with the three low bidders to determine if there is a significant difference in terms of manpower available, current workload, scheduling, insurance, bonding or other factors that may affect the award. These factors should be considered before awarding a contract.
- c. Owners may feel there is no reason to require a bid bond (or payment and performance bonds) and they can exercise sufficient control over the project making a bid bond unnecessary.

Evaluating Contractor Qualifications

The contractor's qualifications should include technical competency of the organization, its staff and work force, as well as the financial resources, manpower, and organizational skills necessary to carry out the project. If the project involves work other than abatement work the contractor's capabilities in these areas should also be evaluated. It may be prudent to require that a sub-contractor be engaged if additional skills or capacity are required.

It may not be clear cut whether a contractor is qualified for a particular project. For example, a small contractor with impeccable technical qualifications may be undertaking a large project where there is a question about his capacity to properly manage and support the project. In the private sector, if the owner discerns a weak point in a contractor's capabilities it may be worthwhile to seek a negotiated solution to the problem. For example, a small contractor may need to team up with a larger general contractor to provide logistical and financial support for the project. Joint venture arrangements of this type must be part of the competitive bid criteria for some public sector projects.

Contractor's Qualification Form: The American Institute of Architects (AIA) Document A-305, Contractor's Qualification Statement, 1986 Edition, can be used as a form to organize and evaluate a contractor's capabilities. In addition to collecting information about the contractor's business type (e.g. corporation, partnership, joint venture, etc.), the form asks the contractor to describe how the firm is organized, licenses held, experience, references, and financing. Other qualifications in addition to those listed may be appropriate for specific jobs.

- **Past Performance:** Find out if the contractor has successfully completed similar projects. Look for projects completed on time and within budget with a minimum of problems. Repeat clients and expressions of satisfaction from owners, designers and project monitors are convincing evidence of good performance. Also look for problem projects such as: halted projects, projects not completed on schedule, projects not completed within budget, large number of change orders, high levels of lead in air samples, and spilled material outside of work area. Find out if there have been any fines levied or citations issued by authorities. Ask for references from past owners, A/E's, environmental consultants, laboratories, etc.

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Evidence of successful completion of projects of similar size and scope gives a strong indication of the contractor's capability. However, there are several caveats:

Supervisory personnel and key members of the work crew on past successful projects should be the same as those proposed for the current project.

The types and extent of the lead-based painted installation(s) in past projects should be similar to those of the current project.

The types of remediation work should be the same.

Stripping paint involves different skills than removing entire lead-based painted trim. Historic preservation work requires a high level of care and expertise. If the project is in a high rise building the contractor should be able to demonstrate experience with the specialized problems encountered (such as access, isolation of elevators, stair towers, vertical chases, etc.).

- The firm's history, a statement of qualifications, and list of principals with resumes.
- Resume of supervisor: This is the key individual on the contractor's team. He should have specific experience on the same type of project.
- Training and Certification: The contractor should use trained supervisory personnel and workers. Certified completion of specific training is required in some states.
- Respiratory Protection Program: OSHA regulations require the contractor to operate a respiratory protection program. This program requires exposure monitoring, a written program manual, respirator fit testing, training, record keeping, and a number of other requirements (refer to 29 CFR 1910.134 and 1926.62). The ability to produce the written documentation required by OSHA without delay should be a minimum qualification requirement. OSHA requires these documents be available upon demand. The operations of a contractor who is unable to produce these documents may not be in compliance with OSHA.
- Hazard Communication: The contractor should be able to demonstrate compliance with the OSHA Hazard Communication standard (29 CFR 1926.59).
- Air sample data: Personal exposure data from past projects with similar processes, materials, work practices, control methods, and environmental conditions should show that the contractor has successfully controlled airborne lead levels on similar projects.
- Industrial Hygiene Capability: The contractor should have the capability to adequately implement worker protection programs. This may require a staff industrial hygienist or demonstration of an ongoing

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working relationship with an industrial hygienist.

- **Equipment:** The contractor should have the proper type of equipment in sufficient quantity for the project.
- **Business Capability:** The contractor should be able to demonstrate the business capability to complete the project. On emerging specialty contracting areas such as lead-based paint abatement, small contractors have been known to bid on projects with carrying costs beyond their capability. It is not wise to permit this to happen. Indicators of the contractor's business capability include: bonding capacity, Dun and Bradstreet rating, credit references, and a history of completing similar projects in the past. It may be necessary to team a small specialty contractor with a larger general contractor to assure a successful project.

Bidding Documents

Bidding documents set forth the rules for bidding and the basis for awarding the bid. Because these documents refer to activities that terminate upon the award of the contract they should not be made a part of the contract documents. Many times the bidding documents are not bound into the project manual as they apply only to the bidding process not to the construction contract. Standard bidding documents are published by the American Institute of Architects (AIA) and the Engineers Joint Contract Documents Committee (EJCDC).

- **Notice to Bidders:** The notice to bidder, also referred to as the Invitation to Bid, is a solicitation of bids for the work. In public bidding this notification usually is published in a local newspaper. For lead-based paint abatement projects it is good practice to specifically notify or invite bids from contractors who are known to be qualified. The notice to bidders generally describes when and where bids will be received, availability of contract documents, notice of pre-bid meeting, availability of the site for inspections, contact person for the owner and design team.
- **Instructions to Bidders:** Sets out the procedures to be followed during the bidding. This section of the bidding documents tells potential contractors how the owner intends to evaluate bids and make an award. It is useful to use a standard form such as AIA document A 701, "Instructions to Bidders," or the "Guide To The Preparation of Instruction To Bidders," EJCDC document 1910-12. These documents spell out the "rules of the game" as they are understood by the construction industry for all types of construction contracts.
- **Modification of Bidding Documents:** If the bidding documents need to be modified after initial publication (during the bidding process, but before bids are received), the written form of notice is known as an addendum. An addendum may result from bidders' questions. The owner or owner's agent must be careful not to give a bidder a competitive advantage by making an individual interpretation of the contract documents. It is important to provide the same information to all bidders. If the response to a question is a reasonable interpretation of clear information in the bidding documents, it may not be necessary to transmit the response to all bidders; however, if the response conveys new information, it

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should be incorporated in a written addendum for all bidders. Addenda are frequently transmitted by certified mail with return receipt or some other means that documents receipt. Frequently the bidder is required to list all addenda on their bid as a means to avoid disputes.

- **Bid Form:** Without definitive instructions, bids are not likely to be submitted in like format or in consistent manner. This can make it extremely difficult, if not impossible to compare bids and fairly award the contract. A required bid form insures that bids will be in both a common format and contain consistent information so logical comparisons can be made. This becomes particularly important if the owner is seeking pricing for alternatives to the base bid work. A Bid Form should contain:
 - a. **The base bid amount:** The base bid is the cost for performing all the work and supplying all the labor, materials, and equipment, including overhead and profit, required to complete the project as designed.
 - b. **Alternates (either add or deduct):** Alternates are bids for increases or decreases to the base bid for changes to the work. For example, if the owner wanted to find out what it would cost to encapsulate rather than remove, the bid form could ask for a proposal on this alternate. The exact nature and extent of the alternate work must be as carefully detailed and specified as the base bid work.
 - c. **Unit Prices:** Unit prices are a bid for a specific quantity of a particular type of work. For example, a bid for removal of one square foot of lead-based paint from a concrete wall using wet scraping methods would be a unit price. The bid form should include a description of the particular unit and a place for the contractor to indicate his bid for this unit of work. Generally unit prices are used to adjust the base bid amount if work is added or deleted during the course of the work due to unforeseen circumstances.
 - d. **Acknowledgement of bidding requirements:** Acknowledgement by the bidder that they understand the contract documents and bid documents (including addenda) is important. This acknowledgement should be included as an integral part of the bid form so that the act of submitting a bid becomes an acknowledgement. This protects the owner from claims that the work was inadequately described or unfairly awarded because of confusion on the part of the bidders.
 - e. **Acknowledgement of addenda:** Addenda may affect the quantity, quality, or schedule of work involved and as such affect the contractor's bid (price). For this reason it is important to be assured that the bidder did in fact receive all addenda, and acknowledge same in writing with his bid.
 - f. **Signature, corporate seal and date:** The bid must be signed and/or sealed by the contractor as necessary to make it binding. Bid requirements generally stipulate the bid must be signed by at least one principal of the bidding corporation.

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See EJCDC Document 1910-18, Suggested Bid Form and Commentary for Use.

- **Bid Bond:** The bid bond is a financial instrument posted by the bidder guaranteeing that the bidder is "responsible" and the bid complies with the requirements of the bidding and contract documents. If the low bidder fails to enter into a contract, the owner's costs to obtain the services from other qualified bidders will be reimbursed up to the amount of the bid bond. Or, if the bidder is deficient in the terms of the bond, the bid may be determined to be "non-responsive" and the bid bond may be forfeited with the face value being awarded to the owner.

Generally if an owner determines that a bidder is non-responsive, the bid bond is used as a negotiating tool to encourage the bidder to withdraw his bid. AIA Document A310, Bid Bond, provides a form for this bond that sets forth the conditions and amount of bond forfeiture.

- **Construction Performance and Payment Bonds:** Two types of construction bonds are widely used for private and sometimes required for public projects. The construction performance bond is used to assure that funds are available to complete construction. The construction payment bond is used to assure funds are available to pay for labor, materials, and equipment used in the construction; providing a mechanism for workers', suppliers', and subcontractors' rights to recovery. The payment bond is an alternative to mechanics lien laws for private work.

AIA Documents A-311, Performance Bond and Labor and Material Payment Bond, AIA Document A-312, Performance Bond and Payment Bond, EJCDC Document No. 1910-28A, Construction Performance Bond, and EJCDC 1910-28B, Construction Payment Bond are standard forms available for this use.

- **Pre-bid Meeting:** All bidders should be required to attend a pre-bid meeting including the following:
 - a. **Tour of the Work:** The bidder needs to assess the amount of effort involved in the contract. This makes it imperative that the contractor see the configuration of the painted surfaces, the condition of the paint and substrate. The bidders should understand that the tour is intended to display representative areas and is not a substitute for contract requirements defined in the contract documents. Allowing additional investigation of the building by the bidders should be evaluated. On some projects escorted, but unguided, access to the project areas may clarify conditions for the bidders and result in more accurate pricing.
 - b. **Explanation of Contract Documents:** The lead-based paint control industry is a young and maturing discipline. Many contractors in the business are technically proficient, but inexperienced at the business of contracting or may be familiar only with the role of a subcontractor. This makes it important, particularly on small projects, that the contract documents be explained and the drawings and specifications reviewed so that all bidders understand the contract requirements. It does neither party any good if the contractor discovers after starting the work that the specifications or general conditions require work that has not been allowed for. This can result in a contractor with an inadequate budget and hence problems on the job.

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Care must be used in providing information to bidders at the pre-bid meeting or during later contact. The bidder should be directed to the portion(s) of the contract documents to answer questions. If the answer can not be gained in this manner, a written addendum should be issued to all bidders. New information should only be provided by written addendum. Each bidder should reach their own determination of the contract requirements. It may be advisable to transmit minutes of the pre-bid meeting as an addendum.

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CONTRACTING THE WORK

The work to be accomplished in a lead-paint hazard reduction project and the terms of the working relationship between owner and contractor is set forth in the contract documents prepared by the design team.

The Contract between the Owner and Contractor

The lead-based paint hazard reduction contract is an agreement between the owner and the contractor. The several parts of the agreement define the scope and terms of the work in explicit detail, and responsibility for actions identified in the contract documents. The architect, engineer or environmental consultant may serve as the owner's agent in dealing with the contractor. The owner's agent is not party to the contract, but the role and authority of the agent is defined in the contract.

Defining Scope of the Work

The contract documents define the scope of the work. The contractor will be responsible only for work identified and described by the designer in the contract documents. If additional work is discovered by the contractor during the course of construction, the cost will be added to the contract by a change order.

It is preferable to fix the scope of the work and include methods such as allowances or unit prices to control the costs of any additional work that is discovered. Normally drawings and specifications are used to define the scope of work, but schedules and general scope statements criteria can also be used.

- **Drawings and specifications:** This is the most common, and most accurate method of describing the scope of work. Typically the drawings and specifications are coordinated so as to clearly describe the nature, extent and limitations on what is to be done. The drawings generally show the design, locations, quantities and dimensions of the work. The drawings should be sufficiently detailed that the contractor is able to determine material quantities directly from the drawings. The specifications give written requirements for work procedures, standards, materials, and workmanship. The specifications usually do not define the location or quantity of the work.
- **Schedule:** The work can be set forth in a schedule or table. This approach is most successful on projects where identical units of work are to be performed in a number of different locations. The unit of work is described, and then a schedule establishes the locations where the work is to be performed. The chances for a dispute are minimized if the schedule sets forth the quantities and sizes as well as location. On complex projects or where the interface between contractors must be identified this method can lead to misunderstandings and claims for extra work. The practice of using an on-site project administrator to iron out details of scheduled work should be avoided. Problems encountered during the course of the project can result in disputes if the project is not properly managed (see the discussion on "Partnering" later in the section on Construction).

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- General scope statement: A very general scope of work can be established, with the detailed scope of work determined by the contractor during bidding. The specifications give written requirements for work procedures, standards, materials, and workmanship. Unless the work is very straight-forward and easily described by a general statement this method can lead to disputes about the scope of the work.

The Contract Documents

The contract documents for a construction project include:

- Owner Contractor Agreement
- General Conditions (of the Contract for Construction)
- Supplementary and Other Conditions
- Specifications
- Contract Drawings
- Addenda
- Modifications

The contract documents are complementary, meaning that what is called for by one is as binding as if called for by all. It is important to coordinate carefully between different parts of the contract documents to avoid conflicting requirements. Usually, to avoid conflicts, information is only given in one location. The general conditions should stipulate how conflicts will be resolved by the designer.

Owner Contractor Agreement

Standard agreements for building construction projects such as AIA Document A101, "Standard Form of Agreement Between Owner and Contractor," or EJCDC Form 1910-8-A-1, "Standard Form of Agreement Between Owner And Contractor On The Basis Of A Stipulated Price," may be used for Lead abatement work in buildings. Standard forms of agreement generally identify the parties to the agreement, identify the owner's consultants, define the contract documents, set the schedule for commencement and substantial completion of the work, set the contract sum and schedule for progress payments, establish miscellaneous provisions, and contain the signatures of the owner and contractor required to execute the agreement.

General Conditions

Published standard documents such as AIA Document A201 "General Conditions of the Contract for Construction," or EJCDC Form 1910-8, "Standard General Conditions Of The Construction Contract" define applicable terms, detail the responsibilities of each party involved in the construction process, and set forth general requirements for insurance, schedule, cost, changes, warranties, payments, termination, and dispute resolution. The standard documents are in generalized form and require modification for specific project requirements.

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The following differences between the AIA and the EJCDC general conditions are relevant for lead hazard reduction projects:

- **Shop Drawings:** The AIA General Conditions specifically note that shop drawings are not contract documents; while the EJCDC General Conditions are silent on whether or not shop drawings are contract documents. Both documents use the term "approval" with respect to the action the Architect/Engineer is to take with respect to contractor's shop drawings submissions. This should be carefully considered if the A/E's policies are to use other terms (such as "no exception taken," etc.) in the actions taken on such submittals. The AIA and EJCDC General Conditions both limit the responsibility of the A/E to a review for compliance with the "design concept" rather than a detailed technical oversight.
- The AIA documents refer to the design professional as "Architect." All of the EJCDC documents refer to the design professional as "ENGINEER." In using these documents it is necessary to clarify the use of these terms in the Supplementary Conditions. This coordination must also include the terms used in the technical specifications.
- AIA General Conditions address contractor - subcontractor relations with respect to payment to subs, etc. The EJCDC General Conditions take a less directly involved approach to this issue.

Supplementary Conditions

Where portions of the standard general conditions are inappropriate for a specific project or do not include needed provisions, the supplementary conditions are used to make the modifications and additions. In lead hazard reduction projects the criteria for qualifying contractors and specialized insurance requirements are frequently identified in the supplementary conditions. AIA form A511, "Guide for Supplementary Conditions" and EJCDC document 1910-17 "Guide to the Preparation of Supplementary Conditions," both give useful guidance in the preparation of this document.

Other Conditions

Scheduling or liquidated damages provisions are sufficiently important to be spelled out in special specification sections as "Other Conditions", or sometimes referred to as Special Conditions.

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Technical Specifications

Technical specifications give the details of materials and work practices to be followed. See Part 3 "Using the NIBS Guide Specifications" for details on how guide specifications are edited for use as technical project specifications for a specific project.

Drawings

A graphic and pictorial description of the work sufficiently specific that qualified contractors are able to determine the extent of the work, and the location and quantity of material and labor needed to complete the project. Typical drawings required include:

- Site and Floor Plans
- Sections
- Details
- Temporary Electrical and Plumbing
- Elevations (interior and exterior)
- Photographs
- Schedules
- Diagrams

Addenda

Addenda are changes to the drawings, specifications, or other contract documents issued prior to the execution of the owner-contractor agreement.

Modifications

Modifications to the construction documents are used to detail changes in the work which occur after executing the owner-contractor agreement.

- **Change Order:** A change order is a formal written agreement between the owner and contractor for a change in the scope-of-work, cost or schedule. Change orders are normally signed by the owner, owner's representative and contractor.
- **Field Order:** A field order is a directive issued by the owner's representative to the contractor for a change in the work resulting in neither a change in cost nor schedule.
- **Construction Change Directive:** A construction change directive is a written order directing the contractor to perform a change in the work. This directive is used in the absence of total agreement on the terms for a change order. When agreement is reached between the owner and contractor on the cost and time adjustments, a change order is executed.

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- Clarification: A clarification is an explanation of the intent of the contract documents issued by the Architect/Engineer to the contractor, usually in response to a question by the contractor. A clarification does not change the scope-of-work, cost or schedule.

Typically, the contract documents will require the contractor to notify the owner in writing within a specified period of time after a field order or clarification is issued, if the contractor believes a change in cost or schedule is required. If the owner is not notified, the contractor is bound to the direction in the modification. Also, the contractor is obligated to accomplish modifications in the work only if such modifications are consistent with the general scope of the work. While not legally part of the contract documents, shop drawings and other such submittals should be discussed.

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CONSTRUCTION

Roles set forth in the contract for construction

The roles of each of the parties involved in the project during a lead-based paint hazard reduction project are set forth in the contract documents.

- **Owner:** During construction the owner's primary responsibility is to pay the contractor's bills in a timely fashion. Other responsibilities of the owner, that may relate to preparation of the site, relocating the owner's activities, etc., are defined in the contract documents.
- **Design Team:** Normally, the design team administers the contract for construction. This includes on-site monitoring of the contractor's work, including any air monitoring (in any) and wipe samples, to assure that the requirements of the contract documents are being met. The design team normally reviews and certifies the contractor's requests for change orders and payment.
- **Contractor:** The contractor is responsible for performing the work in accordance with the contract documents, and is responsible for worker safety. The contractor generally is responsible for making the notifications and securing permits as necessary for the work.

Before Start of Work

Before any work starts several items should be completed:

- **Fully executed Owner - Contractor agreement:** Before any work starts on the project it is imperative for the contract between the owner and contractor to be fully executed with bonds and insurance in place. A fully executed agreement protects the interests of all parties and avoids misunderstandings and claims that could result if work is started under a letter of intent or other informal "handshake" arrangements.
- **Preconstruction submittals:** A number of submittals are necessary for adequate preparation of the project. Preconstruction submittals should be approved by the owner's representative and returned to the contractor before mobilization to the work site.
- **Occupant meeting:** In an occupied building it is good practice to hold an informational meeting for all occupants to reduce the likelihood of misunderstanding during the course of the project.
- **Preconstruction Meeting:** A meeting between the contractor, owner and design team should be held at the job site before work begins.

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Contractor: The supervisor who will be on site and a representative from the home office who is authorized to make decisions.

Owner: An individual who is familiar with the building, its mechanical systems and operation, and a representative who can make decisions for the owner.

Design Team: The on site project monitor and a representative who has the authority to interpret the contract documents and make decisions.

The preconstruction meeting is intended to anticipate and resolve problems before they occur. Frequently this will be the first time field personnel involved in the project will meet. The precise location and operation of electrical, plumbing and mechanical systems, schedule of building occupancy, use of the building's facilities by the contractor, location of any decontamination facilities, and changes in conditions since the project design should be discussed and resolved.

Partnering

The contract documents establish the legal responsibilities of all the parties involved in the project; however the success of the project is dependent on the interpersonal working relationships among all the project participants. Partnering is the process of establishing a mutually-developed strategy for communication and resolution of problems that may arise. On larger projects, partnering may involve workshops and the development of a formal charter. On smaller projects it may be one of the issues discussed during the preconstruction meetings. In either case a successful partnering process requires a commitment from top management and all participants, recognition of the interests of all parties in developing mutual project goals, open communications and mutual trust, and a process for resolving problems as they occur in a timely manner.

Project Monitor

On site project monitoring of lead-based paint hazard reduction projects vary from traditional construction practice. The duties, responsibilities and limits of authority of an owner's project representative are generally defined on construction projects as those of a passive observer who reports to the design professional or owner. In lead-based paint hazard reduction projects, this individual has a much more active role with greater authority and responsibility. The project monitor is extremely important to the project. The project monitor should have the same level of training and skill as a risk assessor, and also have received supervisor training.

The project monitor observes the work of the contractor to verify that it is performed in accordance with the contract documents. The project monitor may also act as the contract administrator either directly reviewing and approving payment requests and change orders or functioning as the field component of the design team in accomplishing these tasks. The project monitor may respond to observed field conditions and provide expert advice on lead-based paint remediation methods. The project monitor is responsible for collection of

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air samples, performing the visual inspections and securing clearance samples. On small projects all these roles are normally carried out by a single individual; however, on large projects there may be separate individuals responsible for each monitoring task.

In a lead-based paint hazard reduction project, the owner is paying for a procedure as well as a finished project. If the procedure is improperly carried out, serious problems can occur in a matter of minutes. Violations of proper abatement procedures can create potential danger to workers, violation of applicable laws and regulations, dissemination of lead dust beyond the work site, or lead dust contamination remaining after completion of work. Continuous on-site monitoring of the work by a project monitor able to make judgments at the work site protects the owner's interests.

The project monitor must be aware of the limits of their responsibility and authority with respect to the contract between the owner and contractor. It is possible for the project administrator to compromise the owner's contract by becoming over involved with direction to the contractor or even assisting in the work. It is critical that the project monitor be aware of the fine line between quality control for the owner and usurping the contractor's responsibility to perform the work. If this line is crossed, the responsibility and corresponding liability for successful abatement could in part be transferred from the contractor to the owner.

Contract Administration

During construction the owner's representative acts as the contract administrator. This is primarily an office function involving the processing of paperwork generated during the project.

- **Processing payment requests:** On a periodic basis, as established by the contract documents, the contractor makes a request for payment. The owner's representative then makes a determination of the level of completion and if the payment claimed by the contractor is justified. This determination may be made based upon an estimation of the percentage of completion of the project, it may be based on man-hour and material expenditure, or the number of units (such as liner feet of trim or square feet of wall) completed. If the owner's representative concurs with the contractor's request he certifies the request for payment and it becomes a certificate for payment submitted to the owner.
- **Processing change orders:** The change order usually originates with the owner's representative and is based on a proposal submitted by the contractor.
- **Processing submittals:** The owner's representative reviews and approves shop drawings, samples, schedules, and other submittals from the contractor.

Substantial Completion

Substantial completion is the point in the project where the contractor is considered to be finished even if some work (loose ends) remains. Typically this means that the work is complete enough for the owner to occupy and use the area where work has occurred for its intended purpose. The scheduled date for substantial completion should be specified in the contract documents. The scheduled date for substantial completion is usually the start of liquidated damages and warranties. Generally, the project designer certifies substantial completion and attaches a punch list of the miscellaneous items to be resolved by the contractor prior to contract closeout.

- **Work area Clearance:** Substantial completion can be tied to clearance of the work area. Once the surface lead dust samples are satisfactory and meet specified clearance standards, the lead-based paint hazard reduction project is substantially complete. If the work includes reconstruction following the hazard reduction under the same contract, substantial completion may occur after the reconstruction phase of the work.
- **Punch List:** Is a list prepared by the designer and owner that itemizes incomplete or deficient items remaining at substantial completion. This list should be formally transmitted to the contractor and completion of items on the punch list made the basis for final payment.

Final Payment and Contract Closeout

The contract between the owner and contractor and between the owner and designer are open until closed by the final payment.

- **Punch List Completion:** The Contractor typically completes the items on the punch list to close out the contract. In some cases the owner and contractor will agree to the value of the unfinished items and deduct that amount from the contract sum. It has been said that it takes 5% of the time to complete 95% of the work, and 95% of the time to complete the remaining 5% (the punch list).
- **Final Submittals:** Final submittals are transmitted by the contractor to the owner through the project designer. A listing of specific required items should be included in the contract documents including: waiver of liens, record drawings, landfill receipts, consent of surety, and project logs.

Part 3

3. USING THE NIBS GUIDE SPECIFICATION

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SPECIFYING THE PROJECT

The *Guide Specifications for Reducing Lead-Based Paint Hazards* contains a compilation of guide specification sections used to assemble project specifications for lead-based paint hazard reduction projects including: removal of lead-based painted elements, encapsulation of lead-based paint, enclosure of lead-based paint, removal of lead-based paint, and contract work necessary for interim control of lead-based paint.. The guide covers both interior and exterior projects.

An operations and maintenance program as an interim control for a lead-based paint hazard reduction program can be accomplished by contracting with an outside contractor rather than have building staff involved with lead-based paint. The Guide Specifications can be used to prepare the specifications necessary to contract for this work. Bids for an annual service contract can then be secured from lead-based paint abatement contractors. For more information on operations and maintenance programs refer to the NIBS publication *Guidance Manual, Lead-Based Paint Operations and Maintenance Work Practices*.

Format

Part 4 - Guide Specifications Sections are arranged according to the Construction Specification Institute's (CSI) "MASTERFORMAT" a standard for presentation of specification material in the construction industry. "MASTERFORMAT" organizes specification material into sixteen divisions corresponding to related construction activities. Divisions are organized by sections corresponding to the work accomplished by common trades, thus facilitating organization of the work into subcontracts.

Division 1 General Requirements: contains sections on temporary facilities, quality control testing, and administrative requirements.

Division 2 Site Work, contains sections for removal of lead-based painted materials, contaminated soil and their proper disposal are described in as specialized demolition work.

Division 5 Metals: contains section on sheet metal enclosures as a specialized type of sheet metal work.

Division 6 Wood and Plastics: contains sections on enclosure of lead-based paint by wood or exterior siding as well as other carpentry affected by lead-based paint.

Division 9 Finishes: contains sections on removal of, encapsulation of, and painting over lead-based paint and enclosure with gypsum board as they constitute specialized interior finish work.

Section Organization

The **Guide Specifications** organize each section into the Construction Specifications Institute (CSI) three part format. This format includes:

- Part 1 - General: includes a description of the work in that section, identification of related contract documents, required submittals, inter-sectional coordination (related work specified elsewhere), and identification of referenced standards.
- Part 2 - Products: includes requirements to be met by products, equipment, or materials physically provided by the contractor, through the use of specific prescriptive or performance provisions or through reference to standards or other criteria.
- Part 3 - Execution: defines procedures to be followed by the contractor in actually carrying out the work. This includes sequencing of the work with requirements of other sections and special requirements for methods described or incorporated by reference to installation standards.

Prescriptive Versus Performance Specifications:

The **Guide Specifications** presented in this document are prescriptive in nature. The specification sections explicitly set forth the way in which the work is to be accomplished. The contractor is given virtually step-by-step instructions for each work activity. Responsibility for the success of the work practices used in the project lies with the designer. The contractor is responsible for correctly following the instructions in the specifications, but is not responsible for the success of the work practices. The contract documents should include a mechanism for the contractor to suggest alternate work practices. The specifications can also be written to place a responsibility on the contractor to propose an alternate if he/she has reason to believe the specified techniques will fail.

Lead-paint hazard reduction is an area of emerging technology where the knowledge and skill base is under development. The use of prescriptive specifications have a number of advantages in an emerging field. Written step-by-step work practices allow procedures that are effective to be easily duplicated. Work practices can be developed in a systematic manner. The skill base of the emerging industry can be more rapidly increased by the distribution of written procedures, than could be accomplished by individual training.

Projects can also be based on a performance specification which sets forth the requirements that must be met when the work is complete, but allows the contractor to meet these requirements by any method. Performance based specifications allow the maximum flexibility for the contractor, but relies for success on the skill and knowledge of the contractor. The performance based specification used by the US Navy is included at Appendix F. The approach represented by the Navy performance specification works well for an owner that has a well developed and experienced infrastructure of contracting and contract enforcement officers. The work practices proposed by the contractor need to be evaluated by a contracting officer that is

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knowledgeable in lead-based paint abatement practices. The contractor's work also needs to be evaluated by a contract enforcement officer that is familiar with lead-based paint abatement practices.

Compatibility with "MASTERSPEC®"

To make the **Guide Specifications** easier to coordinate with other building renovation needs, they have been produced in a format and writing style that is compatible with **MASTERSPEC®**, a master guide specification system produced by The American Institute of Architects (AIA). This system is offered on an annual license basis to architects, engineers, and other design professionals for their use in preparing construction specifications for individual projects. **MASTERSPEC®** consists of over 450 guide specification sections written in a uniform format and consistent writing style. Because AIA's system is widely used by architects and other design professionals, the *Guide Specifications* have been made compatible with **MASTERSPEC®** so they can readily be used to develop consistent and coordinated specifications for related work such as finish carpentry or installation of new trim. Also, they are more easily coordinated with the standard contract documents published by the AIA and the Engineers Joint Contract Documents Committee (EJCDC).

The **Guide Specifications** can also be used with other commercially available guide specifications systems such as "SPECTEXT™" published by CSI. In addition, they can be used with public domain guide specifications developed and required to be used by many government agencies for their projects. However, the format and content of such specifications should be carefully checked and coordinated to assure compatibility among all of the contract documents.

Advisory Notes

In the text of the sections of the **Guide Specification**, notes are included to provide additional guidance to the user. These notes must be deleted when preparing a project specification from this guidance document. The following is an example of the format and style of the notes:

NOTES ARE ALWAYS PRINTED IN CAPITAL LETTERS AND ARE IN BOXES JUST AS THIS PARAGRAPH IS PRINTED. ALWAYS DELETE THESE NOTES BEFORE PRINTING A SET OF PROJECT SPECIFICATIONS, BUT ONLY AFTER THEIR USE IN EDITING TO SUIT THE PARTICULAR NEEDS OF THE PROJECT.

Sample text

Sample text is provided as examples of how specification language for specific situations can be developed. This text needs to be edited to suit the requirements of the project or deleted if unneeded. Sample text is set forth in italic to differentiate it from the balance of the section.

Using the Guide Specifications

In writing project specifications, the *Guide Specifications for Reducing Lead-Based Paint Hazards* is used by selecting the sections appropriate for the project requirements and editing them as necessary to meet the requirements of the project. Some sections are necessary for any type of lead-based paint hazard reduction project. Other sections contain specific requirements and will be appropriate only for certain types of abatement work. The appropriate sections are selected from the "Table of Contents" to form the basis for the specifications for removal, encapsulation, enclosure, or maintenance and repair.

Specification Sections

The specification sections needed to describe different types of lead-based paint hazard reduction work are described below. The specification sections are presented in a chronological order according to typical sequencing of hazard reduction work:

General and Administrative Requirements: that apply to contracting work for abatement or interim controls are set forth in sections:

01014 Summary of the Work - Lead-Based Paint: provides an overview of the work, describes the contract documents, work of other contractors, and any other conditions affecting the contract. Specific requirements of site access and the contractor's use of the job site are set forth.

01029 Application for Payment - Lead-Based Paint: administrative procedures involving application and certification for payments to the contractor are set forth.

01044 Coordination - Lead-Based Paint: sets forth administrative and supervisory requirements relative to project coordination including: meetings, reports, logs, and experience and training of supervisory personnel.

01093 Reference Standards and Definitions - Lead-Based Paint: terms used in the contract documents are defined in this section. The format of the specification is explained. The role of industry standards in the contract is set forth.

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01302 Submittals - Lead-Based Paint: administrative procedures for the submittal, review and action on submittals is described in this section. This section also sets forth requirements for the contractor's construction schedule.

01602 Material and Equipment - Lead-Based Paint: describes general requirements for materials and equipment provided by the contractor.

01633 Substitutions - Lead-Based Paint: sets forth the submissions necessary for the contractor to propose a substitute material, equipment or procedure. The basis for evaluation of such submissions is discussed.

01702 Contract Closeout - Lead-Based Paint: sets forth administrative and procedural requirements for project closeout.

Abatement Work: requirements are set forth in the following sections:

01094 Codes, Regulations and Standards - Lead-Based Paint: sets forth many governmental regulations and industry standards which are adopted by reference and made a part of the contract (specifications). Notices and permits which must be made to or obtained from governmental authorities before start of work are also to be identified in this section. This section requires the addition of requirements (criteria such as codes, regulations, and referenced standards) specific to the project location.

01420 Test Laboratory Services - Lead-Based Paint: describes testing performed by the owner and the effect of this testing on the contract. Air monitoring to determine required respiratory protection for contractor personnel as required by OSHA is the responsibility of the contractor.

01504 Construction Facilities and Temporary Controls - Lead-Based Paint: sets forth the support facilities needed such as electrical and plumbing connections for the decontamination unit, storage and staging areas, and office space for the project monitor.

01505 Exterior Regulated Area - Lead-Based Paint: provides language for specifying a controlled area where exterior lead hazard reduction will take place.

01506 Work Area Containment - Lead-Based Paint: describes the measures necessary to isolate the area where the hazard reduction work will take place from the remainder of the building and the exterior.

01514 Negative Pressure Enclosure - Lead-Based Paint - Describes the arrangement of HEPA filtered fan units to provide ventilation and a negative pressure differential in the work area for dusty operations such as abrasive blasting.

01555 Worker Protection - Lead-Based Paint: describes the training, equipment and procedures necessary to protect workers against lead dust exposure and other work place hazards. Respiratory protection is covered in the following section.

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01556 Respiratory Protection - Lead-Based Paint: establishes procedures and equipment for adequate protection against lead exposure.

Lead-Based Paint Removal Work Procedures: are described in the following specification sections:

02065 Removal of Lead-Based Painted Substrates: describes the removal of complete assemblies and pieces that are painted with lead-based paint.

02066 Remediation of Lead Contaminated Soil: procedures for removing soil that is contaminated with lead are described in this section.

02067 Disposal of Waste Materials - Lead Based Paint: requirements for the proper containing, transport and disposal of lead-based paint waste are set forth in this section.

02068 Cleaning and Decontamination - Lead-Based Paint: sets forth the procedures for removing dust that contains lead.

09951 Chemical Stripping of Lead-Based Paint: describes the removal of lead-based paint from its substrate by use of chemical stripping compounds.

09952 Mechanical Removal of Lead-Based Paint: describes the removal of lead-based paint from its substrate by mechanical means.

Enclosure Procedures:

Sheet metal, wood, siding, plaster, stucco, and drywall can and have been used for enclosure of lead painted surfaces.

05582 Sheet Metal Enclosures - Lead-Based Paint: Describes the fabrication of sheet metal enclosures for lead-based painted surfaces.

06106 Wood Enclosures - Lead Based Paint: Describes procedures for enclosing lead-based painted surfaces with wood.

06107 Exterior Siding & Enclosures - Lead-Based Paint: describes procedures for applying aluminum or vinyl siding to provide a safe enclosure of lead-based painted surfaces.

09252 Gypsum Drywall Enclosures - Lead-Based Paint: describes the use of gypsum drywall as a means of enclosing lead-based painted surfaces.

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09253 Cementitious Enclosures - Lead-Based Paint: describes the use of cementitious materials as a means of enclosing lead-based painted surfaces.

09953 Surface Preparation and Paint Stabilization - Lead-Based Paint: describes steps necessary to prepare a surface painted with a lead-based paint for enclosure.

Encapsulation Procedures: are described in the following sections:

09953 Surface Preparation and Paint Stabilization - Lead-Based Paint: describes steps necessary to prepare a surface painted with a lead-based paint for encapsulation.

09954 Encapsulation - Lead-Based Paint: describes the application of encapsulant to lead-based painted surfaces.

Decontamination of the Work Area

After completion of abatement work, is described in the following sections:

01421 Project Clearance - Lead-Based Paint: describes the testing and analytical methods used to determine if a regulated area or work area has been cleaned to acceptable standards.

01715 Project Decontamination - Lead-Based Paint: describes the sequence of cleaning and decontamination procedures to be followed during removal of the sheet plastic barriers isolating a work area.

Repair and Maintenance (interim controls)

The following sections are used for lead-based paint remediation projects, but can also be used in securing contractor services in support of an operations and maintenance program.

06402 Carpentry and Trim Work - Lead-Based Paint: describes procedures for activities such as removing compete windows and doors that are painted with a lead-based paint.

06403 Repair of Lead-Based Painted Substrates: describes procedures for repair work on Lead-based painted surfaces.

09953 Surface Preparation and Paint Stabilization - Lead-Based Paint: describes procedures to repair and stabilize damaged lead-based paint or steps necessary to prepare a surface painted with a lead-based paint for re-painting.

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09954 Painting - Lead-Based Paint: sets forth the procedures necessary to safely paint a lead-based painted surface.

SELECTING GUIDE SPECIFICATION SECTIONS

The sections of the **Guide Specifications** appropriate for a project must be selected and edited to suit project specifics. The following matrix indicates the Guide Specification sections typically used for each type of project. An "X" signifies that the section is generally required. Under O&M the sections labeled "1" would be selected if the O&M was going to be accomplished by an outside contractor. Sections labeled "2" are also needed for an O&M contract, but are also useful as the basis for work practices to be used by internal staff. The sections labeled "3" may be unnecessary for small projects with a single payment at the end of the work. The section labeled "4" is only used for projects such as abrasive blasting where high airborne lead levels are expected.

DIVISION 1 - GENERAL REQUIREMENTS	Remove	Enclose	Encapsulate	O & M
01014 - Summary of Work - Lead-Based Paint	X	X	X	1
01029 - Applications For Payment - LBP	3	3	3	1
01044 - Coordination - Lead-Based Paint	3	3	3	1
01093 - Reference Standards and Definitions - LBP	X	X	X	1
01094 - Codes & Regulations - Lead-Based Paint	X	X	X	2
01302 - Submittals - Lead-Based Paint	3	3	3	1
01420 - Test Laboratory Services - Lead-Based Paint	X	X	X	1
01421 - Project Clearance - Lead-Based Paint	X	X	X	2
01504 - Construction Facilities & Temporary Controls - LBP	X	X	X	
01505 - Exterior Regulated Areas - Lead-Based Paint	X	X	X	2
01506 - Work Area Containment - Lead-Based Paint	X	X	X	2
01514 - Negative Pressure Enclosure - Lead-Based Paint	4			
01555 - Worker Protection - Lead-Based Paint	X	X	X	2

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DIVISION 1 - GENERAL REQUIREMENTS	Remove	Enclose	Encapsulate	O & M
01556 - Respiratory Protection - Lead-Based Paint	X	X	X	2
01602 - Materials and Equipment - Lead-Based Paint	3	3	3	1
01633 - Substitutions - Lead-Based Paint	3	3	3	1
01702 - Contract Closeout - Lead-Based Paint	3	3	3	1
01715 - Project Decontamination - Lead-Based Paint	X	X	X	2
DIVISION 2 - SITE WORK	Remove	Enclose	Encapsulate	O & M
02065 - Removal of Lead-Based Painted Substrates	X			1
02066 - Remediation of Lead Contaminated Soil	X	X		
02067 - Disposal of Waste Materials - Lead-Based	X	X	X	2
02068 - Cleaning and Decontamination - Lead-Based Paint	X	X	X	2
DIVISION 5 - METALS	Remove	Enclose	Encapsulate	O&M
05582 - Sheet Metal Enclosure - Lead-Based Paint		X		
DIVISION 6 - WOOD & PLASTICS	Remove	Enclose	Encapsulate	O&M
06106 - Wood Enclosures - Lead-Based Paint		X		
06107 - Exterior Siding & Enclosure - Lead-Based Paint		X		
06402 - Carpentry And Trim Work - Lead-Based Paint		X		
06403 - Repair of Lead-Based Painted Substrates		X	X	2

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DIVISION 9 - FINISHES	Remove	Enclose	Encapsulate	O& M
09252 - Gypsum Wallboard Enclosure - Lead-Based Paint		X		
09253 - Cementitious Enclosure - Lead-Based Paint		X		
09940 - Encapsulation - Lead-Based Paint			X	
09951 - Chemical Stripping of Lead-Based Paint	X			
09952 - Mechanical Removal of Lead-Based Paint	X			
09953 - Surface Preparation - Lead-Based Paint		X	X	2
09954 - Painting - Lead-Based Paint				2

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Part 4

4. GUIDE SPECIFICATION SECTIONS

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GUIDE SPECIFICATION SECTIONS

DIVISION 1 - GENERAL REQUIREMENTS

- 01014 - Summary of Work - Lead-Based Paint
- 01029 - Applications For Payment - Lead-Based Paint
- 01044 - Coordination - Lead-Based Paint
- 01093 - Reference Standards and Definitions - Lead-Based Paint
- 01094 - Codes, Regulations & Standards- Lead-Based Paint
- 01302 - Submittals - Lead-Based Paint
- 01420 - Test Laboratory Services - Lead-Based Paint
- 01421 - Project Clearance - Lead-Based Paint
- 01504 - Construction Facilities and Temporary Controls - Lead-Based Paint
- 01505 - Exterior Regulated Areas - Lead-Based Paint
- 01506 - Work Area Containment - Lead-Based Paint
- 01514 - Negative Pressure Enclosure - Lead-Based Paint
- 01555 - Worker Protection - Lead-Based Paint
- 01556 - Respiratory Protection - Lead-Based Paint
- 01602 - Materials and Equipment - Lead-Based Paint
- 01633 - Substitutions - Lead-Based Paint
- 01702 - Contract Closeout - Lead-Based Paint
- 01715 - Project Decontamination - Lead-Based Paint

DIVISION 2 - SITE WORK

- 02065 - Removal of Lead-Based Painted Substrates
- 02066 - Remediation of Lead Contaminated Soil
- 02067 - Disposal of Waste Materials - Lead-Based Paint
- 02068 - Cleaning and Decontamination - Lead-Based Paint

DIVISION 5 - METALS

- 05582 - Sheet Metal Enclosure - Lead-Based Paint

DIVISION 6 - WOOD & PLASTICS

- 06106 - Wood Enclosures - Lead-Based Paint
- 06107 - Exterior Siding & Enclosure - Lead-Based Paint
- 06402 - Carpentry And Trim Work - Lead-Based Paint
- 06403 - Repair of Lead-Based Painted Substrates

DIVISION 9 - FINISHES

- 09252 - Gypsum Wallboard Enclosure - Lead-Based Paint
- 09253 - Cementitious Enclosure - Lead-Based Paint
- 09940 - Encapsulation - Lead-Based Paint
- 09951 - Chemical Stripping of Lead-Based Paint
- 09952 - Mechanical Removal of Lead-Based Paint
- 09953 - Surface Preparation - Paint Stabilization - Lead-Based Paint
- 09954 - Painting - Lead-Based Paint

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SECTION 01014 - SUMMARY OF WORK - LEAD-BASED PAINT

BASED ON SECTION 01010 "SUMMARY OF WORK" FROM MASTERSPEC® TEXT
COPYRIGHTED IN 1993 BY AIA, THE AMERICAN INSTITUTE OF ARCHITECTS.

THIS SECTION USES THE TERM DESIGNER. CHANGE AS NECESSARY TO MATCH THE
ACTUAL TERM USED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

THIS SECTION, MORE THAN ANY OTHER, IS PROJECT SPECIFIC. REVISE PARAGRAPHS
CAREFULLY TO REFLECT SPECIFIC PROJECT REQUIREMENTS, OR DELETE THEM IF THEY
DO NOT APPLY.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including
General and Supplementary Conditions and other Division 1
Specification Sections, apply to this Section.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

THIS ARTICLE ILLUSTRATES ONE METHOD OF SUMMARIZING THE WORK. REVISE AS
NECESSARY TO DESCRIBE THE PROJECT ACCURATELY.

IN THE FOLLOWING PARAGRAPHS, REMOVE TEXT ENCLOSED IN ANGLE BRACKETS <>
AND INSERT TEXT APPROPRIATE FOR THE PROJECT.

PARAGRAPHS BELOW IDENTIFIES NAME AND LOCATION OF THE PROJECT AND NAME OF
THE OWNER AND THE DESIGNER.

- A. **The Project** consists of <INSERT BRIEF PROJECT DESCRIPTION>.
 - 1. **Project Location:** <INSERT PROJECT LOCATION (STREET
ADDRESS, CITY, AND STATE).>
 - 2. **Owner:** <INSERT NAME AND ADDRESS OF THE OWNER.>
- B. **Contract Documents**, dated <INSERT DATE INDICATED IN THE
CONTRACT DOCUMENTS> were prepared for the Project by <INSERT
NAME AND ADDRESS OF THE DESIGNER>.

INCLUDE AN ABBREVIATED SUMMARY OF WORK FOR THE PROJECT DESCRIBED ABOVE
IN PARAGRAPHS BELOW. USE LANGUAGE IDENTICAL TO THAT IN THE AGREEMENT.

- C. **The Work** consists of <INSERT AN ABBREVIATED SUMMARY OF THE
PROJECT [EXAMPLE] *The Work consists of the removal of windows
and associated wood trim that is painted with a lead-based*

paint.>.

REVISE PARAGRAPH BELOW AS NECESSARY TO SATISFY PROJECT REQUIREMENTS. IF THE WORK IS PART OF A MULTI-PRIME CONTRACT THE FOLLOWING WILL HAVE TO BE MODIFIED APPROPRIATELY.

D. **The Work** will be constructed under a single prime contract.

1.3 PLAN OF ACTION:

Submit a detailed job-specific plan of the procedures proposed for use in complying with the requirements of this specification. Include in the plan the location, size, layout and details of the work areas and worker decontamination facilities. Include the sequencing of abatement work, the interface of trades involved in the performance of work, methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including location of approved disposal site, and a detailed description of the methods to be employed to control pollution. Method of removal to reduce lead dust generation in the work area, and packaging of removed lead paint, dust and debris. Describe the methods that will be used to comply with OSHA requirements including submission of exposure monitoring to demonstrate adequacy of respiratory and worker protection equipment selected. The plan must be approved by the Designer prior to commencement of work.

1.4 EXAMINATION:

Prior to commencement of work, examine areas in which work will be performed with the Designer. Prepare a listing of damage to structure, surfaces, equipment or of surrounding properties which could be misconstrued as damage resulting from the work. Photograph or videotape existing conditions as necessary to document conditions. Submit to Designer prior to starting work.

1.5 POTENTIAL LEAD HAZARD:

The disturbance or dislocation of lead-based painted materials may cause lead dust to be released into the building's atmosphere, thereby creating a potential health hazard to workers and building occupants. Apprise all workers, supervisory personnel, subcontractors and consultants who will be at the job site of the seriousness of the hazard and of proper work procedures which must be followed.

Where in the performance of the work, workers, supervisory personnel, subcontractors, or consultants may encounter, disturb, or otherwise function in the immediate vicinity of any identified lead-based paint, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to lead dust.

Such measures shall include the procedures and methods described herein, and compliance with regulations and guidelines of applicable federal, state and local agencies.

1.6 STOP WORK:

If the Owner presents a written or verbal stop work order, or if stop work levels as set forth in the Contract Documents are exceeded immediately and automatically stop all work. Do not recommence work until authorized in writing by the Owner or Designer.

1.7 LEAD BASED PAINTED SURFACES:

THE FOLLOWING IS AN EXAMPLE OF THE PRESENTATION OF INFORMATION NEEDED. REVISE AS REQUIRED TO SUIT PROJECT. INSERT A LISTING OF ALL SURFACES PAINTED WITH LEAD-BASED PAINT THAT ARE EXPECTED TO BE ENCOUNTERED AT EACH WORK LOCATION. IT WOULD BE HELPFUL IF A COPY OF ANY SURVEY REPORTS COULD BE MADE AVAILABLE FOR REVIEW BY THE CONTRACTOR AT THE SAME LOCATION AS THE CONTRACT DOCUMENTS.

- A. Lead-based painted surfaces are known to be present at the worksite. Following is a list of some of the surfaces that are known to be painted with lead-based paint. There may be other surfaces that are also painted with lead-based paint. Components and surfaces not in this list may be included in the Work.

THE FOLLOWING IS AN EXAMPLE. SUBSTITUTE A DESCRIPTION OF THE LEAD-BASED PAINTED ITEMS INVOLVED IN THE PROJECT.

*Exterior Entrance Jamb
Interior Entrance Jamb
Interior Walls
Baseboards
Ceilings
Chair Rail
Entrance Doors
Rear Porch Ceilings
Door Casing
Door Thresholds
Lintels
Boiler Room Door Jambs
Porch Columns and Railings
Skirt Boards*

1.8 WORK UNDER OTHER CONTRACTS

RETAIN THIS ARTICLE IF WORK UNDER THIS CONTRACT DEPENDS ON SUCCESSFUL COMPLETION OF WORK PERFORMED UNDER OTHER CONTRACTS AND VICE VERSA.

RETAIN PARAGRAPH BELOW WHEN WORK UNDER OTHER CONTRACTS IS EXPECTED TO BE COMPLETE BEFORE WORK ON THIS CONTRACT BEGINS. REVISE TO SUIT ACTUAL PROJECT CONDITIONS.

- A. Separate Contract:** The Owner has awarded a separate contract for performance of certain construction operations at the site. Those operations are scheduled to be substantially complete before work under this Contract begins. The separate contract includes the following:

THE FOLLOWING PARAGRAPHS ARE ONLY SAMPLE TEXT, WHICH MUST BE REWRITTEN FOR EACH PROJECT (OR THE PRECEDING PARAGRAPH AND THE FOLLOWING SHOULD BE DELETED IF THERE ARE NO CONTRACTS THAT ARE EXPECTED TO BE COMPLETE BEFORE WORK OF THIS CONTRACT BEGINS).

1. *Demolition:* A separate contract has been being awarded to Acme Demolition, Inc. for interior demolition work that includes removal of suspended ceilings, carpeting and demountable partitions.
2. *Asbestos Removal:* A separate contract is being awarded for removal of asbestos-containing fireproofing and thermal system insulation. Critical barriers installed for the asbestos removal work will remain in place at the completion of that work and can be used for the work of this contract.

RETAIN PARAGRAPH BELOW WHEN WORK UNDER OTHER CONTRACTS WILL BE CONDUCTED CONCURRENTLY WITH WORK UNDER THIS CONTRACT. REVISE TO SUIT ACTUAL PROJECT CONDITIONS.

- B. Separate Contract:** The Owner has awarded a separate contract for performance of certain construction operations at the site. Those operations will be conducted simultaneously with work under this Contract. That Contract includes the following:

THE FOLLOWING PARAGRAPHS ARE ONLY SAMPLE TEXT, WHICH MUST BE REWRITTEN FOR EACH PROJECT (OR THE PRECEDING PARAGRAPH AND THE FOLLOWING SHOULD BE DELETED IF THERE ARE NO CONTRACTS THAT WILL BE CONDUCTED CONCURRENTLY WITH WORK UNDER THIS CONTRACT).

1. **Demolition:** *A separate contract has been being awarded to Acme Demolition, Inc. for interior demolition work that includes removal of suspended ceilings, carpeting and demountable partitions in the Cafeteria which is adjacent to the area where the work of this contract is to occur..*
2. **Asbestos Removal:** *A separate contract is being awarded for removal of asbestos-containing fireproofing and thermal system insulation in the Cafeteria which is adjacent to the area where work of this contract is to occur.*

- C.** Cooperate fully with separate contractors so that work under those contracts may be carried out smoothly, without interfering with or delaying work under this Contract.

1.9 FUTURE WORK

RETAIN THIS ARTICLE IF WORK UNDER A FUTURE CONTRACT DEPENDS ON SUCCESSFUL COMPLETION OF WORK PERFORMED UNDER THIS CONTRACT.

REVISE PARAGRAPH BELOW TO SUIT ACTUAL PROJECT CONDITIONS.

- A. Future Contract:** The Owner has awarded a separate contract for additional work to be performed at the site following Substantial Completion. Completion of that work depends on successful completion of preparatory work under this Contract. The Contract for future work includes the following:

THE FOLLOWING PARAGRAPHS ARE ONLY SAMPLE TEXT, WHICH MUST BE REWRITTEN FOR EACH PROJECT (OR THE PRECEDING PARAGRAPH AND THE FOLLOWING SHOULD BE DELETED IF THERE ARE NO FUTURE CONTRACTS THAT DEPEND ON SUCCESSFUL COMPLETION OF WORK PERFORMED UNDER THIS CONTRACT).

1. **Window Replacement Contract:** *A separate contract has been awarded to Acme Home Remodelers, Inc. for the installation of replacement windows after all lead-based painted windows and trim are removed as part of the work of this contract.*

2. **Asbestos removal:** *A separate contract is being awarded for removal of asbestos-containing thermal system insulation which is located behind lead-based painted walls removed as a part of this contract.*

1.10 WORK SEQUENCE

RETAIN THIS ARTICLE IF THE PROJECT IS CONDUCTED IN SEPARATE PHASES. DELETE IF PHASED CONSTRUCTION IS NOT REQUIRED.

AMPLIFY PARAGRAPH GRAPH BELOW IF NECESSARY. REVISE TO SUIT ACTUAL PROJECT CONDITIONS.

- A. **The Work** will be conducted in <INSERT NUMBER OF PHASES> phases.

THE FOLLOWING PARAGRAPHS ARE ONLY SAMPLE TEXT, WHICH MUST BE REWRITTEN FOR EACH PROJECT (OR THE PRECEDING PARAGRAPH AND THE FOLLOWING SHOULD BE DELETED IF THE WORK IS NOT GOING TO BE PHASED).

1. **Phase 1:** *Removal of windows and associated trim. Work of this phase shall be substantially complete, ready for occupancy within 30 days of commencement of construction.*
2. **Phase 2:** *Removal of lead painted walls on either side of plumbing chase. Work of this phase shall be substantially complete, ready for occupancy within <INSERT TIME> of commencement of construction.*
3. **Phase 3:** *Removal of lead baseboards, handrails and other trim. Work of this phase shall be substantially complete, ready for occupancy within <INSERT TIME> of commencement of construction.*

1.11 CONTRACTOR USE OF PREMISES

THIS ARTICLE SPECIFIES REQUIREMENTS THAT GOVERN THE CONTRACTOR'S USE OF THE PREMISES.

RETAIN PARAGRAPH BELOW WHEN THE PROJECT IS ON A VACANT SITE OR IN AN UNOCCUPIED BUILDING BEING RENOVATED. REVISE IF NECESSARY. IF PARAGRAPH IS RETAINED, DELETE THE REMAINDER OF THE ARTICLE UNLESS UNUSUAL PROJECT REQUIREMENTS EXIST.

- A. **General:** During the construction period the Contractor shall have full use of the premises for construction operations, including use of the site. The Contractor's use of the premises is limited only by the Owner's right to perform work or to retain other contractors on portions of the Project.

DELETE ABOVE AND RETAIN BELOW IF THE SITE WILL BE ACCESSIBLE TO OTHER PARTIES, OR IF SOME PARTS OF A BUILDING BEING RENOVATED WILL BE OCCUPIED DURING CONSTRUCTION. REVISE TO SUIT SPECIFIC PROJECT REQUIREMENTS.

B. Use of the Site: Limit use of the premises to work in areas indicated. Confine operations to areas within contract limits indicated. Do not disturb portions of the site beyond the areas in which the Work is indicated.

1. **Owner Occupancy:** Allow for Owner occupancy and use by the public.

SUBPARAGRAPHS BELOW CONTAINS AN EXAMPLE OF A SPECIAL REQUIREMENT APPROPRIATE TO MANY PROJECTS. CHANGE THE REQUIREMENT AS NECESSARY TO SUIT PROJECT CONDITIONS OR DELETE IF INAPPROPRIATE.

2. **Driveways and Entrances:** Keep driveways and entrances serving the premises clear and available to the Owner, the Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.
3. Lock automotive type vehicles, such as passenger cars and trucks and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place or accessible to unauthorized persons.
4. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to the areas indicated. If additional storage is necessary obtain and pay for such storage off site.

RETAIN REQUIREMENTS BELOW WHEN THE WORK INVOLVES AN EXISTING OCCUPIED BUILDING SUCH AS THE ONE IN THE IMAGINARY PROJECT PREVIOUSLY DESCRIBED. DELETE OTHERWISE.

C. Use of the Existing Building: Maintain the existing building in a weather-tight condition throughout the construction period. Repair damage caused by construction operations. Take all precautions necessary to protect the building and its occupants during the construction period.

1. Keep public areas such as hallways, stairs and toilet rooms free from accumulation of waste, rubbish or construction debris.
2. No Smoking or open fires will be permitted within the building enclosure or on the premises.

INSERT ADDITIONAL PARAGRAPHS SPECIFYING SPECIFIC LIMITATIONS ON A CONTRACTOR'S USE OF AN EXISTING BUILDING. THE FOLLOWING ARE EXAMPLES MODIFY OR DELETE AS NECESSARY TO SUIT PROJECT.

3. **Use of Toilet Room:** Except for toilet rooms designated for use by the Contractor's personnel, use of existing toilets within the building, by the Contractor and his personnel, will not be permitted.

COORDINATE THE FOLLOWING PARAGRAPH WITH DIVISION-1 SECTION ON WORK AREA CONTAINMENT AND DIVISION-14 SECTION ON ELEVATORS. MODIFY THE PARAGRAPH AS APPROPRIATE TO SUIT PROJECT. DELETE IF PROVISIONS ARE INCLUDED ELSEWHERE, OR IF THE PROJECT DOES NOT INVOLVE THE USE OF ELEVATORS.

4. **Use of Existing Elevators:** Except for the Freight Elevator, use of elevators by the Contractor will not be permitted. The Contractor will be permitted to use the freight elevator for temporary freight service and the transportation of construction personnel during the construction period. This elevator must also be available to the Owner at all times; coordinate freight elevator usage with the Designer. Provide protective pads for the elevator cab and other appropriate protective measures for the car and entrance doors and frames. During lead-based paint removal activities the car is to be protected as set forth in Section 01505 Work Area Containment - Lead-Based Paint.

1.12 OCCUPANCY REQUIREMENTS

THE ARTICLE BELOW CONTAINS SAMPLE PARAGRAPHS DESCRIBING OCCUPANCY OF THE PROJECT DURING CONSTRUCTION. IT ALSO DESCRIBES PARTIAL OCCUPANCY BEFORE SUBSTANTIAL COMPLETION.

- A. **Full Owner Occupancy:** The Owner will occupy the site and existing building during the entire construction period. Cooperate with the Owner during construction operations to minimize conflicts and facilitate owner usage. Perform the Work so as not to interfere with the Owner's operations.

RETAIN PARAGRAPH BELOW WHEN THE OWNER MIGHT OCCUPY COMPLETED PORTIONS OF THE BUILDING PRIOR TO SUBSTANTIAL COMPLETION. MODIFY TO SUIT PROJECT REQUIREMENTS.

- B. **Partial Owner Occupancy:** The Owner reserves the right to occupy and to place and install equipment in completed areas of the building prior to Substantial Completion, provided such occupancy does not interfere with completion of the Work. Such placing of equipment and partial occupancy shall not constitute acceptance of the total Work.

RETAIN PARAGRAPH BELOW WHEN THE BUILDING WILL BE UNOCCUPIED DURING

LEAD-BASED PAINT WORK.

- C. **No Owner Occupancy:** The building will be completely unoccupied during the work of this contract. After Substantial Completion the work of other contracts will begin.

RETAIN PARAGRAPH BELOW WHEN THE BUILDING IS VACANT AND WILL BE DEMOLISHED AFTER THE LEAD-BASED PAINT ABATEMENT WORK IS COMPLETE.

- D. **Vacant Building:** The building is vacant and will be demolished at the completion of lead-based paint abatement work. Building demolition work will be performed by others after Substantial Completion of this contract.

IF THE WORK INCLUDES GENERAL CONSTRUCTION BEYOND LEAD-BASED PAINT ABATEMENT REFER TO A.I.A. "MASTERSPEC-BASIC", CSI'S "SPECTEXT" OR OTHER COMPETENT GUIDE SPECIFICATION FOR SPECIFIC FORMAT AND LANGUAGE.

1.13 SUBMITTALS

DELETE THIS ARTICLE WHERE THERE WILL BE NO SUBMITTALS. COORDINATE THIS ARTICLE WITH THE DIVISION 1 SECTION ON SUBMITTALS.

Before the Start of Work: Submit the following to the Designer for review. Do not begin work until these Submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.

- A. **Plan of Action:** Submit as a written report in the same manner as product data.
- B. **Inspection:** Report on inspection carried out as required by this section. Include copies of all photographs, video tapes, etc. Submit in the same manner as product data.
- C. **Alternative Methods:** Submit any alternative methods proposed to accomplish the work of this contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01014

SECTION 01029 - APPLICATIONS FOR PAYMENT - LEAD-BASED PAINT

BASED ON MASTERSPEC® SECTION 01027 - "APPLICATION FOR PAYMENT" COPYRIGHT 1993 BY AIA, THE AMERICAN INSTITUTE OF ARCHITECTS

THIS SECTION USES THE TERM DESIGNER CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED IN THE AGREEMENT, GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

THE FOLLOWING IS CORRECT FOR A SINGLE PRIME CONTRACT WITH THE OWNER. IF THE LEAD-BASED PAINT ABATEMENT CONTRACTOR IS A PRIME CONTRACTOR ON A PROJECT WITH OTHER PRIME CONTRACTORS THEN THE FOLLOWING WILL HAVE TO BE REVISED.

- A. This Section specifies administrative and procedural requirements governing the Contractor's Applications for Payment.
 - 1. Coordinate the Schedule of Values and Applications for Payment with the Contractor's Construction Schedule, Submittal Schedule, and List of Subcontracts.
- B. **Related Sections:** The following Sections contain requirements that relate to this Section.
 - 1. **Schedules:** The Contractor's Construction Schedule and Submittal Schedule are specified in Division 1 Section "Submittals."

1.3 SCHEDULE OF VALUES

SMALL PROJECTS OF SHORT DURATION MAY NOT NEED A SCHEDULE OF VALUES, EVEN THOUGH GENERAL CONDITIONS REQUIRE ONE. IF THIS IS THE CASE, MODIFY GENERAL CONDITIONS ACCORDINGLY, DELETE THIS ARTICLE AND REFERENCE THE SCHEDULE OF VALUES ELSEWHERE IN SPECIFICATIONS.

THE FOLLOWING IS CORRECT FOR A SINGLE PRIME CONTRACT WITH THE OWNER. IF THE ABATEMENT CONTRACTOR IS A PRIME CONTRACTOR ON A MULTI-PRIME PROJECT THE FOLLOWING WILL HAVE TO BE REVISED.

A. Coordination: Coordinate preparation of the Schedule of Values with preparation of the Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Values with other required administrative schedules and forms, including:

MODIFY THE LIST BELOW TO SUIT PROJECT REQUIREMENTS BY ADDING OR DELETING ITEMS.

- a. Contractor's Construction Schedule.
- b. Application for Payment forms, including Continuation Sheets.
- c. List of subcontractors.
- d. Schedule of allowances.
- e. Schedule of alternates.
- f. Schedule of submittals.

REVISE THE 7-DAY TIME PERIOD IN PARAGRAPH BELOW IF NECESSARY TO SUIT PROJECT REQUIREMENTS.

2. Submit the Schedule of Values to the Designer at the earliest possible date but no later than 7 days before the date scheduled for submittal of the initial Applications for Payment.

DELETE THE REQUIREMENT BELOW IF PHASING IS NOT REQUIRED. FOR LARGE PROJECTS, CONSIDER REVISING THE REQUIREMENT TO PROVIDE SUBSCHEDULES FOR SEPARATE FLOORS OR LARGE INDIVIDUAL AREAS.

3. **Subschedules:** Where Work is separated into phases requiring separately phased payments, provide subschedules showing values correlated with each phase of payment.

RETAIN THE REQUIREMENTS BELOW. REVISE TO SUIT PROJECT REQUIREMENTS. IF DESIRED, INCLUDE A SAMPLE SCHEDULE OF VALUES AT END OF SECTION.

B. Format and Content: Use the Project Manual table of contents as a guide to establish the format for the Schedule of Values. Provide at least one line item for each Specification Section.

1. **Identification:** Include the following Project identification on the Schedule of Values:

MODIFY THE LIST BELOW TO SUIT PROJECT REQUIREMENTS BY ADDING OR DELETING ITEMS.

- a. Project name and location.
 - b. Name of the Designer
 - c. Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
2. Arrange the Schedule of Values in tabular form with separate columns to indicate the following for each item listed:

MODIFY THE LIST BELOW TO SUIT PROJECT REQUIREMENTS BY ADDING OR DELETING ITEMS.

- a. Related Specification Section or Division.
 - b. Description of Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value.
 - h. Percentage of Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
3. Provide a breakdown of the Contract Sum in sufficient detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Break principal subcontract amounts down into several line items.
 4. Round amounts to nearest whole dollar; the total shall equal the Contract Sum.

RETAIN THE REQUIREMENT BELOW. STRENGTHEN TO PROTECT AGAINST UNDUE FRONT-END LOADING, IF NECESSARY.

5. Provide a separate line item in the Schedule of Values for each part of the Work where Applications for Payment may include materials or equipment, purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. Include requirements for insurance and bonded warehousing, if required.

6. Provide separate line items on the Schedule of Values for initial cost of the materials, for each subsequent stage of completion, and for total installed value of that part of the Work.

DELETE THE REQUIREMENT BELOW IF SPECIFICATIONS DO NOT INCLUDE UNIT-COST ALLOWANCES. DO NOT CONFUSE UNIT-COST ALLOWANCES WITH UNIT PRICES. REFER TO AIA "MASTERSPEC®," CSI "SPECTEXT OR OTHER COMPETENT GUIDE SPECIFICATION FOR A DISCUSSION ON COST ALLOWANCES.

7. **Unit-Cost Allowances:** Show the line-item value of unit-cost allowances, as a product of the unit cost, multiplied by the measured quantity. Estimate quantities from the best indication in the Contract Documents.

RETAIN THE REQUIREMENT BELOW. MODIFY AS REQUIRED TO SUIT PROJECT REQUIREMENTS. THE OWNER'S FINANCIAL ADVISORS USUALLY INSIST ON THIS REQUIREMENT.

8. **Margins of Cost:** Show line items for indirect costs and margins on actual costs only when such items are listed individually in Applications for Payment. Each item in the Schedule of Values and Applications for Payment shall be complete. Include the total cost and proportionate share of general overhead and profit margin for each item.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the Schedule of Values or distributed as general overhead expense, at the Contractor's option.

REVISE THE REQUIREMENT BELOW AS NECESSARY. AS AN ALTERNATE APPROACH TO THE METHOD DESCRIBED, INCLUDE EACH CHANGE ORDER AS A NEW LINE ITEM OR A SEPARATE SHEET.

9. **Schedule Updating:** Update and resubmit the Schedule of Values prior to the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.4 APPLICATIONS FOR PAYMENT

REFER TO AIA "MASTERSPEC®," CSI "SPECTEXT OR OTHER COMPETENT GUIDE SPECIFICATION FOR A DISCUSSION ON WAIVERS OF LIEN AND OTHER DOCUMENTATION INVOLVED IN APPLICATION FOR PAYMENT PROCEDURES.

- A. Each Application for Payment shall be consistent with previous

applications and payments as certified by the Designer and paid for by the Owner.

1. The initial Application for Payment, the Application for Payment at time of Substantial Completion, and the final Application for Payment involve additional requirements.

RETAIN THE REQUIREMENTS BELOW WHEN THE AGREEMENT STIPULATES PAYMENT DATES. THESE DATES MIGHT AFFECT THE CONTRACTOR'S NEED TO HAVE SUFFICIENT FUNDS AVAILABLE TO FINANCE CONSTRUCTION OPERATIONS. REVIEW THE DATES IN A PRECONSTRUCTION CONFERENCE IF A POTENTIAL PROBLEM ARISES.

- B. Payment-Application Times:** Each progress-payment date is indicated in the Agreement. The period of construction Work covered by each Application for Payment is the period indicated in the Agreement.

IF THE AGREEMENT DOES NOT STATE PAYMENT DATES, DELETE THE REQUIREMENTS ABOVE AND RETAIN THE REQUIREMENTS BELOW. CHANGE THE DATES IF NECESSARY TO SUIT PROJECT REQUIREMENTS.

- C. Payment-Application Times:** The date for each progress payment is the 15th day of each month. The period covered by each Application for Payment starts on the day following the end of the preceding period and ends 15 days prior to the date for each progress payment.

GENERALLY RETAIN PARAGRAPH BELOW. REVISE IF OWNER USES ANOTHER FORM. FORMS DESCRIBED BELOW ARE AVAILABLE AT MOST AIA CHAPTER OFFICES. EJCDC DOCUMENT 1910-8-E IS ANOTHER STANDARD-INDUSTRY FORM OWNERS OFTEN USE. ALTERNATE FORMS MAY INCLUDE LOCAL CONSTRUCTION-INDUSTRY FORMS OR THE LENDING INSTITUTION'S OWN STANDARD FORMS.

- D. Payment-Application Forms:** Use AIA Document G702 and Continuation Sheets G703 as the form for Applications for Payment.

DELETE THE REQUIREMENT ABOVE AND RETAIN THE ONE BELOW IF A STANDARD-INDUSTRY FORM IS NOT USED. ATTACH OWNER'S APPLICATION FOR PAYMENT FORM TO THE END OF THIS SECTION. IF NO FORM IS TO BE PROVIDED IN SPECIFICATION, DELETE THE SENTENCE FROM THE PARAGRAPH.

- E. Payment-Application Forms:** Use forms provided by the Owner for Applications for Payment. Sample copies are included at the end of this Section.

- F. Application Preparation:** Complete every entry on the form. Include notarization and execution by a person authorized to sign legal documents on behalf of the Contractor. The Designer will return incomplete applications without action.
1. Entries shall match data on the Schedule of Values and the Contractor's Construction Schedule. Use updated schedules if revisions were made.
 2. Include amounts of Change Orders and Construction Change Directives issued prior to the last day of the construction period covered by the application.

REVISE THE NUMBER OF COPIES BELOW TO SUIT OWNER'S PROJECT REQUIREMENTS.

- G. Transmittal:** Submit 3 signed and notarized original copies of each Application for Payment to the Designer by a method ensuring receipt within 24 hours. One copy shall be complete, including waivers of lien and similar attachments, when required.
1. Transmit each copy with a transmittal form listing attachments and recording appropriate information related to the application, in a manner acceptable to the Designer.

INSERT INSTRUCTIONS FOR PREPARATION AND SUBMITTAL OF WAIVERS OR RELEASES HERE IF NOT STATED IN SUPPLEMENTARY CONDITIONS.

THE 2 OPTIONAL PARAGRAPHS BELOW ARE EXAMPLES OF WAYS WAIVERS OF LIEN MAY BE HANDLED. SELECT 1 OR REPLACE BOTH WITH ANOTHER EFFECTIVE METHOD. OWNER'S LEGAL COUNSEL AND FINANCIAL ADVISORS SHOULD ESTABLISH REQUIREMENTS, NOT THE DESIGNER. THERE IS A WIDE VARIANCE IN LIEN LAWS IN THE UNITED STATES.

- H. Waivers of Mechanics Lien:** With each Application for Payment, submit waivers of mechanics lien from every entity who is lawfully entitled to file a mechanics lien arising out of the Contract and related to the Work covered by the payment.

DELETE PARAGRAPH ABOVE OR PARAGRAPH BELOW.

- I. Waivers of Mechanics Lien:** With each Application for Payment, submit waivers of mechanics liens from subcontractors, sub-subcontractors and suppliers for the construction period covered by the previous application.
1. Submit partial waivers on each item for the amount requested, prior to deduction for retainage, on each item.
 2. When an application shows completion of an item, submit final

- or full waivers.
3. The Owner reserves the right to designate which entities involved in the Work must submit waivers.

DELETE REQUIREMENTS BELOW ON DELAY OF WAIVERS UNLESS APPROVED BY OWNER. UNLESS PROVISIONS BELOW ARE RETAINED, THE REQUIREMENTS ABOVE MAY PUT A FINANCIAL BURDEN ON THE CONTRACTOR AND UNDUE PRESSURE ON SUBCONTRACTORS AND SUPPLIERS TO PREMATURELY WAIVE THEIR RIGHTS.

4. **Waiver Delays:** Submit each Application for Payment with the Contractor's waiver of mechanics lien for the period of construction covered by the application.
 - a. Submit final Applications for Payment with or preceded by final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

DELETE THE REQUIREMENT BELOW AND INSERT A SPECIFIC FORM OR SPECIAL REQUIREMENTS WHERE PREDETERMINED.

5. **Waiver Forms:** Submit waivers of lien on forms, and executed in a manner, acceptable to the Owner.
- J. **Initial Application for Payment:** Administrative actions and submittals, that must precede or coincide with submittal of the first Application for Payment, include the following:

REVISE THE LIST BELOW TO SUIT PROJECT REQUIREMENTS.

1. List of subcontractors.
2. List of principal suppliers and fabricators.
3. Schedule of Values.
4. Contractor's Construction Schedule (preliminary if not final).
5. Schedule of principal products.
6. Schedule of unit prices.
7. Submittal Schedule (preliminary if not final).
8. List of Contractor's staff assignments.
9. List of Contractor's principal consultants.
10. Copies of building permits.
11. Copies of authorizations and licenses from governing authorities for performance of the Work.
12. Initial progress report.
13. Report of preconstruction meeting.
14. Certificates of insurance and insurance policies.

DELETE ITEMS SUBMITTED BEFORE EXECUTING THE CONTRACT FROM THOSE LISTED

BELOW.

15. Performance and payment bonds.
16. Data needed to acquire the Owner's insurance.
17. Initial settlement survey and damage report, if required.

K. Application for Payment at Substantial Completion: Following issuance of the Certificate of Substantial Completion, submit an Application for Payment.

1. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
2. Administrative actions and submittals that shall precede or coincide with this application include:

DELETE FROM AND ADD TO THE FOLLOWING LIST TO SUIT PROJECT REQUIREMENTS.

- a. Occupancy permits and similar approvals.
- b. Warranties (guarantees) and maintenance agreements.
- c. Test/adjust/balance records.
- d. Maintenance instructions.
- e. Meter readings.
- f. Startup performance reports.
- g. Changeover information related to Owner's occupancy, use, operation, and maintenance.
- h. Final cleaning.
- i. Application for reduction of retainage and consent of surety.
- j. Advice on shifting insurance coverages.
- k. Final progress photographs.
- l. List of incomplete Work, recognized as exceptions to Designer's Certificate of Substantial Completion.

- L. Final Payment Application:** Administrative actions and submittals that must precede or coincide with submittal of the final Application for Payment include the following:

DELETE FROM AND ADD TO THE LIST BELOW TO SUIT PROJECT REQUIREMENTS. CHECK WITH OWNER ABOUT THE NEED FOR ADDITIONAL AFFIDAVITS AND OTHER REQUIREMENTS.

1. Completion of Project closeout requirements.
2. Completion of items specified for completion after Substantial Completion.
3. Ensure that unsettled claims will be settled.
4. Ensure that incomplete Work is not accepted and will be completed without undue delay.
5. Transmittal of required Project construction records to the Owner.
6. Certified property survey.
7. Proof that taxes, fees, and similar obligations were paid.
8. Removal of temporary facilities and services.
9. Removal of surplus materials, rubbish, and similar elements.
10. Change of door locks to Owner's access.
11. Disposal receipts, bills of lading and other required documentation of transportation and disposal of lead-based paint containing waste.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01029

SECTION 01044 - COORDINATION - LEAD-BASED PAINT

BASED ON SECTION 01040 "PROJECT COORDINATION" FROM MASTERSPEC® TEXT COPYRIGHTED IN 1994 BY AIA, THE AMERICAN INSTITUTE OF ARCHITECTS.

THIS SECTION USES THE TERM "DESIGNER". CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY THE DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A.** Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A.** This Section includes administrative and supervisory requirements necessary for Project coordination including, but not necessarily limited to the following:

DELETE REQUIREMENTS NOT INCLUDED FROM THE LIST BELOW. INSERT SPECIAL REQUIREMENTS, AS NECESSARY.

- 1. General project coordination procedures.
- 2. Conservation.
- 3. Coordination Drawings.
- 4. Administrative and supervisory personnel.
- 5. Cleaning and protection

- B. Related Sections:** The following Sections contain requirements that relate to this Section:

- 1. Division 1 Section "Submittals" for preparing and submitting the Contractor's Construction Schedule.
- 2. Division 1 Section "Materials and Equipment" for coordinating general installation.
- 3. Division 1 Section "Contract Closeout" for coordinating contract closeout.

1.3 COORDINATION

REQUIREMENTS IN THE ARTICLE BELOW AMPLIFY REQUIREMENTS IN THE GENERAL CONDITIONS. DELETE THIS ARTICLE IF THE GENERAL CONDITIONS SUIT PROJECT REQUIREMENTS AND ACTIONS SPECIFIED ARE NOT REQUIRED.

- A. Coordinate construction operations included in various Sections of these Specifications to assure efficient and orderly installation of each part of the Work. Coordinate construction operations included under different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in the sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to assure maximum accessibility for required maintenance, service, and repair.
 - 3. Make provisions to accommodate items scheduled for later installation.

- B. Where necessary, prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and attendance at meetings.
 - 1. Prepare similar memoranda for the Owner and separate contractors where coordination of their work is required.

- C. **Administrative Procedures:** Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

INSERT OTHER ADMINISTRATIVE ACTIVITIES NEEDED TO SUIT PROJECT REQUIREMENTS.

- 1. Preparation of schedules.
- 2. Installation and removal of temporary facilities.
- 3. Delivery and processing of submittals.
- 4. Progress meetings.
- 5. Project Close-out activities.

CONSERVATION PROVISIONS BELOW MAY BE DIFFICULT TO ENFORCE. PENALTIES FOR WASTEFUL PRACTICES, IF NECESSARY, ARE MORE ENFORCEABLE IF MADE A CONDITION OF THE CONTRACT AND ADDED BY SUPPLEMENTARY CONDITIONS. INSERT SPECIFIC CONSERVATION REQUIREMENTS IN THE APPROPRIATE SECTIONS.

- D. **Conservation:** Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated in, the Work.

1.4 **ADMINISTRATIVE AND SUPERVISORY PERSONNEL:**

- A. **General Superintendent:** Provide a full-time General

Superintendent who is experienced in administration and supervision of lead based paint abatement projects including work practices, protective measures for building and personnel, disposal procedures, etc. This person is the Contractor's representative responsible for compliance with all applicable federal, state and local regulations and guidelines, particularly those relating to lead based paint and hazardous waste.

- B. **Foreman:** Provide a Foreman to directly supervise and direct no more than 10 abatement workers. Each Foreman will act as the Competent Person as required by OSHA 29 CFR 1926.62 for the workers the foreman is directing. The Foreman has oversight authority over the workers and reports to the General Superintendent. If there are 10 or fewer abatement workers on the project the General Superintendent may fill the foreman's position.

THE EPA REGULATION ON TRAINING HAS NOT YET BEEN FINALIZED. THE FOLLOWING PARAGRAPH MAY NEED TO BE REVISED WHEN THE FINAL RULE IS ISSUED.

- C. **Experience and Training:** The General Superintendent and foreman must meet all the requirements as a Competent Person as required by OSHA 29 CFR 1926.62. They must have completed training in Lead Paint Abatement Health and Safety. The course shall meet the requirements of the HUD Guidelines and the EPA Model Accreditation Program for supervisors (40 CFR 745). They must have experience with projects of similar type and size.

1.5 PRE-CONSTRUCTION CONFERENCE:

- A. An initial progress meeting, recognized as "Pre-Construction Conference" will be convened by the Designer prior to start of any work. Meet at project site, or as otherwise directed with General Superintendent, Owner, Designer, Project Administrator, and other entities concerned with lead abatement work.
 - 1. **Attendees:** Authorized representatives of the Owner, Designer, and their consultants; the Contractor and its superintendent; major subcontractors; manufacturers; suppliers; and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

REVISE PARAGRAPH BELOW IF MORE TIME IS NEEDED.

- 2. 72 hours advance notice will be provided to all participants prior to convening Pre-construction Conference.
- 3. This is an organizational meeting, to review responsibilities and personnel assignments, to locate regulated areas and temporary facilities including power, light, water etc.

4. **Agenda:** Discuss items of significance that could affect progress, including the following:

ADD ITEMS FOR DISCUSSION AS NECESSARY TO SUIT PROJECT REQUIREMENTS.

- a. Tentative construction schedule.
- b. Critical work sequencing.
- c. Designation of responsible personnel.
- d. Procedures for processing field decisions and Change Orders.
- e. Procedures for processing Applications for Payment.
- f. Distribution of Contract Documents.
- g. Submittal of Shop Drawings, Product Data, and Samples.
- h. Preparation of record documents.
- i. Use of the premises.
- j. Parking availability.
- k. Office, work, and storage areas.
- l. Equipment deliveries and priorities.
- m. Safety procedures.
- n. First aid.
- o. Security.
- p. Housekeeping.
- q. Working hours.

1.6 PROGRESS MEETINGS:

THE FOLLOWING IS BASED ON PROGRESS MEETINGS CONDUCTED BY THE DESIGNER. THIS IS NORMAL PRACTICE ON ENVIRONMENTAL REMEDIATION PROJECTS. IN TRADITIONAL CONSTRUCTION PROJECTS THIS WOULD BE THE RESPONSIBILITY OF THE CONTRACTOR. REVISE THIS SECTION IF THE CONTRACTOR IS TO BE RESPONSIBLE FOR PROGRESS MEETINGS. REFER TO MASTERSPEC® SECTION 01200 FOR APPROPRIATE LANGUAGE IF THE CONTRACTOR IS TO BE RESPONSIBLE FOR PROGRESS MEETINGS. MODIFY THE PARAGRAPH BELOW IF THE PROJECT REQUIRES MEETINGS ON A DIFFERENT SCHEDULE.

- A. **General:** In addition to specific coordination and pre-installation meetings for each element of work, and other regular project meetings held for other purposes, the Designer will hold general progress meetings as required. These meeting will be scheduled, where possible, at time of preparation of payment request.

MODIFY THE PARAGRAPH BELOW IF ATTENDANCE BY OTHER KNOWN ENTITIES IS NECESSARY.

- B. **Attendees:** In addition to representatives of the Owner and Designer, the Contractor, each subcontractor, supplier, or other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be

represented at these meetings. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the work. Require each entity then involved in planning, coordination or performance of work to be properly represented at each meeting.

- C. **Agenda:** Be prepared to discuss the following items at the progress meetings. Review other items of significance that could affect progress.
1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to the Contractor's Construction Schedule, whether on time or ahead or behind schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to insure that current and subsequent activities will be completed within the Contract Time.
 2. Review the present and future needs of each entity present, including the following:

ADJUST THE LIST BELOW AS NECESSARY TO SUIT PROJECT REQUIREMENTS.

- a. Interface requirements.
- b. Time.
- c. Sequences.
- d. Status of submittals.
- e. Deliveries.
- f. Access.
- g. Site utilization.
- h. Temporary facilities and services.
- i. Hours of work.
- j. Hazards and risks.
- k. Housekeeping.
- l. Quality and work standards.
- m. Change Orders.
- n. Documentation of information for payment requests.

- D. **Reporting:** Revise the Contractor's Construction Schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue the revised schedule no later than 3 days after each meeting. Include a brief summary, in narrative form, of progress since the previous meeting and report.

1.7 **DAILY LOG:**

- A. **Daily Log:** Maintain a daily log documenting the dates and time of but not limited to, the following items:

EDIT LIST BELOW TO SUIT PROJECT REQUIREMENTS. DELETE ITEMS BELOW THAT ARE NOT APPLICABLE. INSERT OTHERS AS REQUIRED.

1. Meetings; purpose, attendees, brief discussion and significant decisions.
2. Visitations; authorized and unauthorized
3. Log of those entering and leaving Work Area including personnel, by name.
4. Accidents
5. Special or unusual events, i.e. Barrier breaching, Equipment failures, accidents
6. Documentation of Contractor's completion of the following:
 - a. Inspection of work area preparation prior to start of removal and daily thereafter.
 - b. Removal of any sheet plastic barriers
 - c. Contractors inspections prior to painting, enclosure or any other operation that will conceal the condition of lead based painted components or the substrate from which such materials have been removed.
 - d. Removal of waste materials from work area
 - e. Decontamination of equipment (list items)
7. List of subcontractors at the site.
8. Approximate count of personnel at the site.
9. High and low temperatures, general weather conditions.
10. Stoppages, delays, shortages, losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of governing authorities.
14. Change Orders received, implemented.
15. Services connected, disconnected.
16. Equipment or system tests and start-ups.
17. Partial Completions, occupancies.
18. Substantial Completions authorized.
19. Contractors final inspection/final wipe test analysis

MODIFY THE NEXT PARAGRAPH IF REPORTS ARE REQUIRED MORE OR LESS OFTEN THAN DAILY.

- B. Provide two (2) copies of this log to Project Administrator on a daily basis.
- C. Submit copies of this log at final closeout of project as a project close out submittal.

1.8 SPECIAL REPORTS:

- A. **General:** Except as otherwise indicated, submit special reports directly to Owner within one day of occurrence requiring special report, with copy to Designer and others affected by occurrence.
- B. **Reporting Unusual Events:** When an event of unusual and significant nature occurs at site, within 24 hours prepare and

submit a written special report to the Designer listing chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise Owner in advance at earliest possible date.

UNDER OSHA ANY INJURY REQUIRING MORE THAN ORDINARY FIRST AID (SUCH AS MINOR SCRATCHES, CUTS, OR BURNS) MUST BE RECORDED ON THE OSHA 200 LOG.

- C. Reporting Accidents:** Prepare and submit written reports of significant accidents, at site and anywhere else work is in progress. Reports must be submitted to the Designer within 24 hours after the accident occurs. Record and document data and actions; comply with industry standards. For this purpose, a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, where the event posed a significant threat of loss or personal injury, or where an OSHA 200 Log is required. A copy of an OSHA 200 Log may be submitted for this purpose.
- D. Report Discovered Conditions:** When an unusual condition of the building is discovered during the work (e.g. leaks, corrosion) prepare and submit a written special report to the Designer indicating condition discovered.

1.9 CONTINGENCY PLAN:

STANDARD FORM GENERAL CONDITIONS SUCH AS AIA A201 MAKE JOB SITE SAFETY THE RESPONSIBILITY OF THE CONTRACTOR. THE DESIGNER MUST BE CAUTIOUS THAT THE CONTINGENCY PLAN IS RECEIVED FOR INFORMATION PURPOSES AND NOT "APPROVED." APPROVAL OF THE CONTINGENCY PLAN COULD TRANSFER SOME OF THE CONTRACTOR'S RESPONSIBILITY FOR JOB SITE SAFETY TO THE DESIGNER OR OWNER.

- A. Contingency Plan:** Prepare a contingency plan for emergencies including fire, accident, power failure, or any other event that may require modification or abridgement of decontamination or work area isolation procedures. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this specification should impede safe exiting or providing of adequate medical attention in the event of an emergency.
- B. Post:** At entrance of work area. Telephone numbers and locations of emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, telephone company.

1.10 NOTIFICATIONS

JOB SITE SAFETY IS THE RESPONSIBILITY OF THE CONTRACTOR. NOTIFICATIONS ON A NORMAL CONSTRUCTION PROJECT ARE ADEQUATELY COVERED BY GENERAL CONDITIONS REQUIREMENTS. PROBLEMS HAVE OCCURRED WHEN EMERGENCY SERVICE AGENCIES RESPOND TO THE UNFAMILIAR CONDITIONS THAT EXIST ON ENVIRONMENTAL DECONTAMINATION PROJECTS. THIS SECTION IS INTENDED TO RESOLVE THESE PROBLEMS BY REQUIRING SPECIFIC ADVANCE NOTIFICATIONS.

- A. Notify other entities at the job site of the nature of the lead paint abatement activities, location of lead based painted components, requirements relative to lead paint set forth in these specifications and applicable regulations.
- B. Notify emergency service agencies including fire, ambulance, police or other agency that may service the abatement work site in case of an emergency. Notification is to include methods of entering work area, emergency entry and exit locations, modifications to fire notification or fire fighting equipment, and other information needed by agencies providing emergency services.
- C. **Notifications of Emergency:** Any individual at the job site may notify emergency service agencies if necessary without effect on this contract or the Contract Sum.

1.11 SUBMITTALS

IT IS A GOOD IDEA TO INSIST THAT PRE-CONSTRUCTION SUBMITTALS BE COMPLETE BEFORE THE CONTRACTOR ARRIVES AT THE JOBSITE. OTHERWISE IT CAN BE DIFFICULT TO GET SUBMITTALS FROM THE CONTRACTOR, PARTICULARLY ON SMALL PROJECTS. SAFETY AT THE JOB SITE IS THE CONTRACTOR'S RESPONSIBILITY. THIS SECTION REQUIRES ACKNOWLEDGMENT OF RECEIPT BY THE DESIGNER RATHER THAN REVIEW AND APPROVAL OF THE LISTED SUBMITTALS. IN THIS MANNER THE DESIGNER IS NOT APPROVING JOB SAFETY PROCEDURES. THE DESIGNER SHOULD NOT BE IN THE POSITION OF APPROVING THE CONTRACTOR'S SAFETY PROCEDURES.

- A. **Before the Start of Work:** Submit the following to the Designer. No work shall begin until these submittals are returned with Designer's stamp indicating that the submittal has been received.
 - 1. **Contingency Plans:** for emergency actions.
 - 2. **Telephone Numbers:** and location of emergency services.
 - 3. **Notifications:** sent to other entities at the work site.
 - 4. **Notifications:** sent to emergency service agencies.
 - 5. **Accreditation:** submit evidence in form of training course

certificate for the general superintendent, foreman and workers as being trained in lead-based paint health and safety in accordance with HUD.

6. **Staff Names:** submit a list of the Contractor's principal staff assignments, including the Superintendent and other personnel in attendance at the site; identify individuals, their duties and responsibilities; list their addresses and telephone numbers.

- B. **Post copies** of the list in the Project meeting room, the temporary field office, and each temporary telephone.

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

IF REPLACEMENT OF MATERIALS IS TO BE PART OF THE CONTRACT REFER TO AIA SERVICE CORPORATION'S "MASTERSPEC-BASIC". CSI'S "SPECTEXT", OR OTHER COMPETENT GUIDE SPECIFICATION FOR LANGUAGE AND PROVISIONS RELATING TO CLEANING AND PROTECTION, AND CUTTING AND PATCHING.

END OF SECTION 01044

SECTION 01093 - REFERENCE STANDARDS AND DEFINITIONS - LEAD-BASED PAINT

BASED ON SECTION 01095 - "REFERENCE STANDARDS AND DEFINITIONS" FROM MASTERSPEC® TEXT, COPYRIGHT 1994, AIA, THE AMERICAN INSTITUTE OF ARCHITECTS

THIS SECTION USES THE TERM DESIGNER. CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY THE DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 GENERAL:

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 DEFINITIONS

TERMS DEFINED BELOW ARE NOT DEFINED IN THE GENERAL CONDITIONS. DELETE THIS ENTIRE ARTICLE OR SELECTED PARAS IN THE ARTICLE, IF DEFINITIONS BELOW ARE INCLUDED ELSEWHERE IN THE PROJECT MANUAL OR ARE NOT REQUIRED.

- A. **General:** Basic Contract definitions are included in the Conditions of the Contract.
- B. **Indicated:** The term indicated refers to graphic representations, notes, or schedules on the Drawings, or other paragraphs or Schedules in the Specifications, and similar requirements in the Contract Documents. Terms such as shown, noted, scheduled, and specified are used to help the reader locate the reference. Location is not limited.

WHEN USING TERMS SUCH AS THE ONES IN THE NEXT 2 PARAGRAPHS, DO NOT EXTEND THE DESIGNER'S RESPONSIBILITY INTO THE CONTRACTOR'S AREA OF MEANS, METHODS, AND TECHNIQUES OF CONSTRUCTION. A MEANS AND METHODS SPECIFICATION FOR ENVIRONMENTAL REMEDIATION DIFFERS FROM TRADITIONAL CONSTRUCTION PRACTICE. RATHER THAN DESIGNING A FINISHED PRODUCT, THE DESIGNER DEVELOPS A PROCESS THAT IS DESIGNED TO REDUCE LEAD-BASED PAINT HAZARD. THE DESIGNER IS RESPONSIBLE FOR THE EFFICACY OF THE DESIGN. THE CONTRACTOR IS RESPONSIBLE FOR PROPER EXECUTION OF THE DESIGN. THE DESIGNER SHOULD BE CAREFUL TO AVOID THE ASSUMPTION OF THE CONTRACTOR'S RESPONSIBILITY BY "DIRECTING" THE EXECUTION OF THE WORK OR BY "APPROVING" A METHOD OR SEQUENCE OF EXECUTION.

- C. **Directed:** Terms such as directed, requested, authorized, selected, approved, required, and permitted mean directed by the Designer, requested by the Designer, and similar phrases.
- D. **Approved:** The term approved, when used in conjunction with the Designer's action on the Contractor's submittals, applications, and requests, is limited to the Designer's duties and responsibilities as stated in the Conditions of the Contract.

- E. **Regulations:** The term regulations includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.

AVOID MODIFYING THE NEXT 3 PARAGRAPHS BECAUSE OF THE WIDESPREAD ACCEPTANCE AND UNDERSTANDING OF THE TERMS AS DEFINED.

- F. **Furnish:** The term furnish means supply and deliver to the Project Site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. **Install:** The term install describes operations at the Project Site including the actual unloading, unpacking, assembly, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. **Provide:** The term provide means to furnish and install, complete and ready for the intended use.

RETAIN PARAGRAPHS BELOW WHERE QUALITY ASSURANCE ARTICLES IN OTHER SECTIONS INCLUDE PARAGRAPHS SPECIFYING INSTALLER QUALIFICATIONS. DELETE IF USE OF THE TERM IS PROHIBITED.

- I. **Installer:** An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, and similar operations. Installers are required to be experienced in the operations they are engaged to perform.

REVISE THE NUMBER OF PROJECTS IN SUBPARAGRAPH BELOW TO SUIT OFFICE POLICY AND OWNER'S REQUIREMENTS. DELETE IF EXPERIENCE REQUIREMENTS ARE INCLUDED IN INDIVIDUAL SECTIONS OF THE SPECIFICATIONS.

- a. **The term experienced,** when used with the term Installer, means having a minimum of 5 previous projects similar in size and scope to this Project, being familiar with the special requirements indicated, and having complied with requirements of the authority having jurisdiction.

GENERALLY RETAIN SUBPARAGRAPH BELOW. IT IS HELPFUL TO AVOID UNREASONABLE CLAIMS.

- J. **Trades:** Using terms such as carpentry does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as carpenter. It also does not imply that requirements specified apply exclusively to trades persons of the corresponding generic name.

DELETE SUBPARAGRAPH BELOW UNLESS OTHER SPECIFICATION SECTIONS ASSIGN CERTAIN ITEMS OF WORK TO PRESELECTED CONTRACTORS (SPECIALISTS). MODIFY IF NECESSARY TO SUIT SPECIAL PROJECT REQUIREMENTS.

- K. Assigning Specialists:** Specialists are recognized experts in operations where required by the specifications. Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling Contract requirements remains with the Contractor.

GENERALLY RETAIN PARAGRAPH BELOW BUT MODIFY TO SUIT SPECIAL PROJECT CIRCUMSTANCES.

- L. Project Site:** is the space available to the Contractor for performing construction activities, either exclusively or in conjunction, with others performing other work as part of the Project. The extent of the Project Site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- M. Testing Agencies:** A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project Site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.
- N. Designer:** This is the entity described as the "Architect" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." All references to Architect or Engineer in the Contract Documents in all cases refer to the Designer. The Designer will represent the Owner during construction and until final payment is due. The Designer will advise and consult with the Owner. The Owner's instructions to the Contractor will be forwarded through the Designer.
- O. Project Monitor:** This is the entity described as the "Project Representative" in AIA Document A201 "General Conditions of the Contract for Construction," or is the entity described as "Engineer" in Engineers Joint Contract Document Committee (EJCDC) Document 1910-8 "Standard General Conditions of the Construction Contract." The Project Monitor is a full time representative of the Owner at the job site.

THE FOLLOWING IS COMMON PRACTICE ON ENVIRONMENTAL REMEDIATION PROJECTS, BUT MAY MAKE THE PROJECT MONITOR (AND HENCE THE DESIGNER AND OWNER) RESPONSIBLE FOR THE PROJECT. THE USE OF THIS PARAGRAPH AND ACCOMPANYING LANGUAGE IN THE CONTRACTS BETWEEN THE OWNER, DESIGNER, CONTRACTOR AND PROJECT MONITOR SHOULD BE REVIEWED WITH LEGAL COUNCIL.

1. The Project Monitor has the authority to stop the work upon verbal order if requirements of the Contract Documents are not met, or if in the sole judgement of the Project Monitor or the Designer, the Owner, the interests of the Owner, safety of any person or the Owner's property are jeopardized by the work.

SUBSTANTIAL COMPLETION IS DEFINED IN GENERAL TERMS IN AIA A201 GENERAL CONDITIONS. IT IS PREFERABLE TO CLARIFY THIS DEFINITION IN THE SUPPLEMENTARY CONDITIONS RATHER THAN IN THIS SECTION. IF A DEFINITION IS INCLUDED HERE IT SHOULD BE CAREFULLY COORDINATED WITH THE GENERAL AND SUPPLEMENTARY CONDITIONS. THE FOLLOWING IS AN EXAMPLE OF LANGUAGE THAT TIES SUBSTANTIAL COMPLETION TO THE CLEARANCE CRITERIA. IF RECONSTRUCTION IS INCLUDED IN THE CONTRACT IT IS ADVISABLE TO TIE SUBSTANTIAL COMPLETION TO THE RECONSTRUCTION PHASE OF THE WORK.

- P. Project Manual:** A bound manual consisting of the General Conditions, the Supplementary Conditions, any Special Conditions and the specification sections.
- Q. Substantial Completion:** The work of this contract is substantially complete when clearance criteria set forth in the Contract Documents are met and the work area may be occupied by the Owner.

THE DEFINITIONS BELOW ARE SPECIFICALLY FOR THE SPECIFICATIONS FOR A LEAD-BASED PAINT HAZARD REDUCTION CONTRACT. THEY DO NOT NECESSARILY MATCH UP WITH THE DEFINITIONS THAT ARE FOUND IN THE APPENDIX.

1.3 DEFINITIONS RELATIVE TO LEAD BASED PAINT ABATEMENT:

1. **Accreditation:** A formal recognition that an organization (e.g. laboratory) is competent to carry out specific tasks or type of tests.
2. **Accredited laboratory:** A laboratory that has been evaluated and given approval to perform a specified measurement or task (such as the National Lead Laboratory Accreditation Program), usually for a specific property or analyze for a specified period of time.
3. **Accredited Training Provider:** means a training provider that meets the standards established by EPA to train risk assessors, inspectors, supervisors, and workers.
4. **Adhesion:** the ability of dry paint or other coating to attach to or remain fixed on a surface without blistering, flaking, cracking, or being removed by tape.
5. **Blank:** A non-exposed sample of the medium used for testing, such as a wipe or filter, which is analyzed like other samples to determine whether (1) samples are contaminated with lead before samples are collected (e.g., at the factory, or at the testing site), (2) the samples are contaminated after sample

collection (e.g., during transportation to the laboratory or in the laboratory).

6. **Breathing Zone:** A hemisphere forward of the shoulders with a radius of approximately 6 to 9 inches around the nose and mouth of the face.
7. **Ceiling Concentration:** The concentration of an airborne substance that shall not be exceeded.
8. **Certified Industrial Hygienist (C.I.H.):** An industrial hygienist certified by the American Board of Industrial Hygiene.
9. **CFR - The Code of Federal Regulations:** The basic component of the Federal Register publication system. The CFR is a codification of the regulations of the various Federal Agencies.
10. **Common Area:** A room or area that is accessible to all tenants in a project (e.g., hallway, boiler room). Generally, any area that is not kept locked.
11. **Competent Person:** An agent of the Contractor who is a Competent Person as defined by OSHA in 29 CFR 1926.62. This person must be capable of identifying existing and predictable lead hazards in the surroundings or working conditions and who has authorization by the Contractor to take prompt corrective measures to eliminate them.
12. **Detection Limit:** The minimum of a component that a method can reliably measure.
13. **Exposure Monitoring:** The personal air monitoring of an employee's breathing zone to determine the amount of contaminant (e.g. lead) to which he/she is exposed.
14. **Federal Register:** A document published daily by the Federal government that contains either proposed or final regulations.
15. **Hazardous Waste:** As defined in RCRA the term "hazardous waste" means a solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may:
 - a. Cause, or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
 - b. Pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.
 - c. As defined in the regulations, a solid waste is hazardous if it meets one of four conditions:
 - i. Exhibits a characteristic of a hazardous waste (40 CFR Sections 261.20 through 262.24).
 - ii. Has been listed as hazardous (40 CFR Section 261.31 through 261.33).
 - iii. Is a mixture containing a listed hazardous waste

- and a non-hazardous solid waste (unless the mixture is specifically excluded or no longer exhibits any of the characteristics of hazardous waste).
- iv. Is not excluded from regulation as a hazardous waste.
16. **HEPA - High Efficiency Particulate Air:** A filter capable of filtering out particles of 0.3 microns or greater from a body of air at 99.97% efficiency or greater.
 17. **High Phosphate Detergent:** Detergent which contains at least 5% tri-sodium phosphate (TSP).
 18. **Landfill:** A disposal facility or part of a facility where hazardous waste is placed in or on land and which is not a land treatment facility, a surface impoundment, or an injection well.
 19. **µg - Micrograms:** The prefix "micro-" means "1/1,000,000 of" (one millionth of). A microgram is 1/1,000,000 of a gram and 1/1,000 of a milligram. A microgram is equal to about 35/1,000,000,000 (thirty-five billionths) of an ounce. 28,400,000 µg are equal to 1 ounce.
 20. **Negative Pressure Respirator:** A respirator in which the air pressure inside the respiratory-inlet covering is positive during exhalation in relation to the air pressure of the outside atmosphere and negative during inhalation in relation to the air pressure of the outside atmosphere.
 21. **Personal Monitoring:** Sampling of the lead dust concentrations within the breathing zone of an employee.
 22. **Personal Samples (for sampling lead dust):** Air samples collected from within the breathing zone of a worker, but outside the respirator. The samples are collected with a personal sampling pump, pulling 1 to 4 liters/minute of air.
 23. **Protection Factor:** The ratio of the ambient concentration of an airborne substance to the concentration of the substance inside the respirator at the breathing zone of the wearer. The protection factor is a measure of the degree of protection provided by a respirator to the wearer.
 24. **Respirator:** A device designed to protect the wearer from the inhalation of harmful atmospheres.
 25. **Solid Waste:** As defined in RCRA the term "solid waste" means any garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility and other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities, but does not include solid or dissolved material in domestic sewage, or solid or dissolved materials in irrigation return flows or industrial discharges which are point sources subject to permits under the Clean Water Act, or special nuclear or

byproduct material as defined by the Atomic Energy Act of 1954.

26. **TCLP (Toxicity Characteristic Leaching Procedure):** A test, called the extraction procedure, that is designed to identify wastes likely to leach hazardous concentrations of particular toxic constituents into the ground water as a result of improper management. It is a characteristic of hazardous waste.
27. **Time Weighted Average (TWA):** The average concentration of a contaminant in air during a specific time period.
28. **TSP:** Acronym for tri-sodium phosphate.
29. **ULPA - Ultra Low Particulate Air:** Means a filter capable of filtering out particles of 0.13 microns or greater from a body of air at 99.9995% efficiency or greater.
30. **Wet Cleaning (Wet Detergent Wash):** The process of eliminating lead dust contamination from building surfaces and objects by using cloths, mops, or other cleaning utensils which have been dampened with a solution of water and trisodium phosphate (TSP) or appropriate substitute and afterwards thoroughly decontaminated or disposed of as lead contaminated waste.
31. **Work Area:** The area where lead based paint abatement or related work is performed which is defined and/or isolated to prevent the spread of lead dust, or debris, and entry by unauthorized personnel.
32. **Work Practice:** A procedure followed by workers that is intended to minimize exposure to the worker and the environment.

1.4 SPECIFICATION FORMAT AND CONTENT EXPLANATION

DELETE THIS ARTICLE OR PORTIONS OF THIS ARTICLE IF INFORMATION IS UNNECESSARY. SEE AIA "MASTERSPEC®", CSI "SPECTEXT" OR OTHER COMPETENT GUIDE SPECIFICATIONS FOR FURTHER DISCUSSION AND INFORMATION REGARDING SPECIFICATION FORMATS AND CONTENT.

1. **Specification Format:** These Specifications are organized into Divisions and Sections based on the Construction Specifications Institute's 16-Division format and MASTERFORMAT numbering system.

IF NECESSARY, INSERT PARAGRAPHS EXPLAINING THE SECTION-NUMBERING AND PAGE-NUMBERING SYSTEMS USED. IF NECESSARY, ADD AN EXPLANATION OF LINE-NUMBERING OR ALPHA-NUMERIC PARAGRAPH-OUTLINE SYSTEM USED IN THE SPECIFICATION AND THE METHOD OF TEXT SUBORDINATION.

2. **Specification Content:** This Specification uses certain conventions regarding the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations or circumstances. These conventions are

explained as follows:

- a. **Abbreviated Language:** Language used in Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words will be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
- b. Imperative and streamlined language is used generally in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor, or by others when so noted.
- c. The words "shall be" are implied wherever a colon (:) is used within a sentence or phrase.

INSERT AN ARTICLE ON SPECIAL COMPLIANCE WITH A GOVERNING CODE ONLY IF NECESSARY. PROVISIONS OF THIS NATURE BELONG IN SUPPLEMENTARY CONDITIONS.

1.5 INDUSTRY STANDARDS

1. **Applicability of Standards:** Except where the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

RETAIN PARAGRAPH BELOW UNLESS THE ENTIRE SPECIFICATION IS EDITED TO INSERT DATES (THOUGH THIS IS NOT RECOMMENDED), AND UNREFERENCED STANDARDS ARE NOT APPLICABLE. REVISE THE DATE ESTABLISHED BELOW TO COMPLY WITH PROJECT REQUIREMENTS.

2. **Publication Dates:** Comply with the standards in effect as of the date of the Contract Documents.

PARAGRAPHS BELOW MAY RESOLVE PROBLEMS THAT SOMETIMES ARISE USING REFERENCE STANDARDS.

3. **Conflicting Requirements:** Where compliance with 2 or more standards is specified and where the standards may establish different or conflicting requirements for minimum quantities or quality levels, refer requirements that are different but apparently equal and uncertainties to the Designer for a decision before proceeding.
 - a. **Minimum Quantity or Quality Levels:** The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may

comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of the requirements. Refer uncertainties to the Designer for a decision before proceeding.

4. **Copies of Standards:** Each entity engaged in construction on the Project is required to be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
 - a. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source.
5. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. Where such acronyms or abbreviations are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-generating organization, authority having jurisdiction, or other entity applicable to the context of the text provision. Refer to the "Encyclopedia of Associations," published by Gale Research Co., available in most libraries.

DELETE EITHER PARAGRAPH ABOVE OR BELOW. IF PARAGRAPH BELOW IS DELETED, ALSO DELETE THE LIST OF ACRONYMS THAT FOLLOWS IT. THE SPECIFICATION TEXT IN MASTERSPEC® SECTIONS ASSUMES THE LISTING IS RETAINED.

6. **Abbreviations and Names:** Trade association names and titles of general standards are frequently abbreviated. The following acronyms or abbreviations, as referenced in Contract Documents, are defined to mean the associated names. Names and addresses are subject to change and are believed, but not assured, to be accurate and up-to-date as of date of the Contract Documents.

DELETE ENTRIES BELOW NOT REFERENCED IN THE SPECIFICATION. THE LIST HAS BEEN CHECKED AGAINST THE 28TH EDITION OF THE "ENCYCLOPEDIA OF ASSOCIATIONS" PUBLISHED BY GALE RESEARCH CO. INSERT ACRONYMS AND NAMES USED IN THE SPECIFICATION OR ADDED TO THE OFFICE MASTER. A LIST OF FEDERAL AGENCIES THAT ALSO PRODUCE STANDARDS FOLLOWS THIS LIST.

A2LA	American Association for Laboratory Accreditation 656 Quince Orchard Road #300 Gaithersburg, MD 20878	(301) 670-1377
AIA	The American Institute of Architects 1735 New York Ave., NW Washington, DC 20006	(202) 626-7300
AIHA	American Industrial Hygiene Assoc. 2700 Prosperity Avenue, Suite 250	

	Fairfax, VA 22031-4307	(703) 849-8888
ANSI	American National Standards Institute 11 West 42nd St., 13th Floor New York, NY 10036	(212) 642-4900
ASTM	American Society for Testing and Materials 1916 Race St. Philadelphia, PA 19103-1187	(215) 299-5400
GA	Gypsum Association 810 First St., NE, Suite 510 Washington, DC 20002	(202) 289-5440
IESNA	Illuminating Engineering Society of North America 345 E. 47th St. New York, NY 10017	(212) 705-7926
ML/SFA	Metal Lath/Steel Framing Assoc. (A Division of the National Association of Architectural Metal Manufacturers) 600 S. Federal St., Suite 400 Chicago, IL 60605	(312) 922-6222
NEC	National Electrical Code (from NFPA)	
NEMA	National Electrical Manufacturers Assoc. 2101 L St., NW, Suite 300 Washington, DC 20037	(202) 457-8400
NFPA	National Fire Protection Assoc. One Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101	(800) 344-3555 (617) 770-3000
NSF	National Sanitation Foundation 3475 Plymouth Rd. P.O. Box 130140 Ann Arbor, MI 48113-0140	(800) 223-2301 (313) 769-8010
PDCA	Painting and Decorating Contractors of America 3913 Old Lee Highway Suite 33-B Fairfax, VA 22030	(703) 359-0826
UL	Underwriters Laboratories 333 Pfingsten Rd. Northbrook, IL 60062	(708) 272-8800

DELETE THE LIST OF FEDERAL AGENCIES BELOW IF THE LIST OF ASSOCIATION ACRONYMS ABOVE IS DELETED. THE TEXT OF SPECIFICATION SECTIONS ASSUMES THE LIST IS RETAINED.

7. **Federal Government Agencies:** Names and titles of federal government standard- or Specification-producing agencies are often abbreviated. The following acronyms or abbreviations referenced in the Contract Documents indicate names of standard- or Specification-producing agencies of the federal

government. Names and addresses are subject to change and are believed, but are not assured, to be accurate and up-to-date as of the date of the Contract Documents.

DELETE ACRONYMS AND NAMES OF GOVERNMENT AGENCIES IN THE LIST BELOW NOT REFERENCED IN THE SPECIFICATION.

CFR Code of Federal Regulations
(Available from the Government Printing Office)
N. Capitol St. between G and H St. NW
Washington, DC 20402 (202) 783-3238
(Material is usually first published in the
"Federal Register")

CPSC Consumer Product Safety Commission
5401 Westbard Ave.
Bethesda, MD 20207 (800) 638-2772

EPA Environmental Protection Agency
401 M St., SW
Washington, DC 20460 (202) 382-2090

HUD Department of Housing and Urban Development
Office of Lead-Based Paint Abatement and Poisoning Prevention
Room B-133
451 7th St. SW, Washington, DC 20410 (202) 755-1805

MSHA Mine Safety and Health Administration
(U.S. Department of Commerce)
4015 Wilson Blvd
Arlington, VA 22203 (703) 235-1565

NIOSH National Institute of Occupational Safety and Health
U.S. Dept. of Labor, Room N-3718
200 Constitution Ave, N.W.
Washington, D.C. 20210 (800) 35-NIOSH

NIST National Institute of Standards and Technology
(U.S. Department of Commerce)
Gaithersburg, MD 20899 (301) 975-2000

OSHA Occupational Safety and Health Administration
(U.S. Department of Labor)
200 Constitution Ave., NW
Washington, DC 20210 (202) 219-6091

1.6 SUBMITTALS

RETAIN GENERAL REQUIREMENTS IN PARAGRAPH BELOW. SPECIFIC SUBMITTALS MAY BE SPECIFIED IN OTHER SECTIONS.

A. Permits, Licenses, and Certificates: For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar

documents, established in conjunction with compliance with standards bearing upon performance of the Work.

END OF SECTION 01093

SECTION 01094 - CODES, REGULATIONS AND STANDARDS - LEAD-BASED PAINT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to this section.

1.2 SUMMARY

This section sets forth governmental regulations and industry standards which are included and incorporated herein by reference and made a part of the specification. This section also sets forth those notices and permits which are known to the Owner and which either must be applied for and received, or which must be given to governmental agencies before start of work.

- A. Requirements include adherence to work practices and procedures set forth in applicable codes, regulations, guidelines and standards.
- B. Requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with codes, regulations, and standards.

1.3 CODES AND REGULATIONS

- A. **General Applicability of Codes and Regulations, Guidelines and Standards:** Except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable codes, regulations, guidelines and standards have the same force and effect (and are made a part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.
- B. **Contractor Responsibility:** The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold the Owner and Designer harmless for failure to comply with any applicable work, hauling, disposal, safety, health or other regulation on the part of himself, his employees, or his subcontractors.

ALWAYS INCLUDE THE FOLLOWING SECTION ON FEDERAL REGULATIONS.

C. **Federal Requirements:** which govern lead based paint abatement work or hauling and disposal of hazardous waste materials include but are not limited to the following:

1. **OSHA:** U.S. Department of Labor, Occupational Safety and Health Administration, (OSHA), including but not limited to:

- 29 CFR 1910.134 -Respiratory Protection
- 29 CFR 1926.20 -General safety and health provisions;
- 29 CFR 1926.21 -Safety training and education;
- 29 CFR 1926.23 -First Aid
- 29 CFR 1926.24 -Fire Protection
- 29 CFR 1926.25 -Housekeeping;
- 29 CFR 1926.28 -Personal protective equipment;
- 29 CFR 1926.51(f) - Washing facilities;
- 29 CFR 1926.55 -Gases, vapors, fumes, dusts, and mists;
- 29 CFR 1926.56 -Illumination
- 29 CFR 1926.57 -Ventilation;
- 29 CFR 1926.59 -Hazard Communication Standard;
- 29 CFR 1926.62 -Lead Construction Standard
- 29 CFR 1926.103 -Respiratory protection;
- 29 CFR 1926.353 -Ventilation: Welding, cutting or heating of metals of toxic significance.
- 29 CFR 1926.300, 301, 302 -Hand and power tools.
- 29 CFR 1926.451 -Scaffolding
- 29 CFR 1926.500, 502, 503 -Fall Protection

2. **DOT:** U. S. Department of Transportation, including but not limited to:

49 CFR 171 and 172 -Hazardous Substances

3. **EPA:** U. S. Environmental Protection Agency (EPA), including but not limited to:

40 CFR 260, 261, Resource Conservation and Recovery Act (RCRA)
262, 263 and 264

AS OF THE DATE OF PUBLICATION OF THIS GUIDE SPECIFICATION, THE FOLLOWING WAS NOT FINAL.. IT PROPOSES A MODEL ACCREDITATION PLAN TO BE IMPLEMENTED BY STATE REGULATION. BEFORE COMPLETING THIS SECTION CHECK TO SEE IF THE EPA HAS FINALIZED THIS REGULATION, AND WHETHER THE STATE IN WHICH THE PROJECT IS LOCATED HAS PROMULGATED ANY REGULATION. REFER TO THE APPENDIX ON FEDERAL AND LOCAL CONTACTS FOR THE SOURCE OF CURRENT INFORMATION.

40 CFR 745 (Proposed) Lead Based Paint Activities: Training, Certification, and Work Practice Requirements

HUD IS IN THE PROCESS OF REVISING ITS REGULATIONS. REFER TO THE APPENDIX ON FEDERAL AND LOCAL CONTACTS FOR THE SOURCE ON CURRENT INFORMATION.

4. **HUD:** Department of Housing and Urban Development

24 CFR 35, 905, -Lead Based Paint Hazard Elimination; Interim Rule
941, 965 and 968

- D. **State Requirements:** which govern lead based paint abatement work or hauling and disposal of hazardous waste materials include but are not limited to the following:

LAWS AND REGULATIONS INVOLVING ALL ASPECTS OF LEAD ABATEMENT WORK ARE AN EXTREMELY ACTIVE AREA AMONG STATES. BEFORE WRITING THIS SECTION, THE RECENT REGULATORY ACTIVITIES OF THE STATE THE PROJECT IS IN SHOULD BE RESEARCHED. REFER TO THE LISTING OF STATE CONTACTS IN THE APPENDIX. STATE AGENCIES TYPICALLY INVOLVED INCLUDE:

DEPARTMENT OF ENVIRONMENTAL PROTECTION
HEALTH DEPARTMENT
EDUCATION DEPARTMENT
LABOR DEPARTMENT
DEPARTMENT OF TRANSPORTATION
BUILDING DEPARTMENT
DEPARTMENT OF SANITATION
OCCUPATIONAL SAFETY AND HEALTH

FOLLOWING IS AN EXAMPLE. REVISE TO SUIT STATE AND PROJECT SPECIFICS.

1. **NEW YORK STATE - DEC:** *New York State Department of Environmental Conservation, Bureau of Hazardous Waste Operations*

*Regulations regarding waste collector registration
Title 6, Part 364 of the
New York State Official Compilation of Codes,
Rules and Regulations - 6 NYCRR 364*

DELETE THE FOLLOWING TWO PARAGRAPHS IF THERE ARE NO LOCAL REGULATIONS WHICH APPLY TO THE LEAD-BASED PAINT ABATEMENT WORK.

- E. **Local Requirements:** which govern lead-based point abatement work or hauling and disposal of lead-based paint waste materials include but are not limited to the following:

DELETE EITHER ABOVE OR BELOW. ABOVE ACCOMPANIED BY A LISTING OF APPLICABLE REGULATIONS IS PREFERABLE. BELOW IS A CATCH ALL APPROACH.

- F. **Local Requirements:** Abide by all local requirements which govern lead abatement work or hauling and disposal of hazardous waste materials.
- G. **Building Codes:** Comply with applicable provision of state and/or local building codes that govern any part of the work.

DELETE EITHER ABOVE OR BELOW. ALWAYS INCLUDE A REQUIREMENT FOR COMPLIANCE WITH BUILDING CODES. IT IS PREFERABLE TO REVISE ABOVE TO INCLUDE REFERENCE TO SPECIFIC BUILDING CODES THAT APPLY. BELOW IS A CATCH ALL APPROACH.

- H. **Model Codes:** In the absence of an applicable adopted state or local building code which governs work involved in the lead abatement project, comply with the applicable provisions of the BOCA National Codes/1993 published by International Conference for Building Officials or the SBCCI Standard Codes published by Southern Building Code Congress International.

1.4 PERMITS:

- A. **Permit:** All hazardous waste is to be transported by an entity maintaining a current "Industrial waste hauler permit" as required for transporting of waste materials to a disposal site.
- B. **Building Permit:** Secure all necessary building permits as required by state and/or local building codes.

1.5 POSTING AND FILING OF REGULATIONS

- A. **Posting and Filing of Regulations:** Post all notices required by applicable federal, state and local regulations. Maintain two (2) copies of applicable federal, state and local regulations and standards. Maintain one copy of each at job site. Keep on file in contractor's office one copy of each.

1.6 SUBMITTALS:

- A. **Before Start of Work:** Submit each item in this article to the Designer. No work shall begin until these submittals are returned with Designer's stamp indicating that the submittal has been received.
 - 1. **Permits, Licenses, and Certificates:** For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, and similar documents, correspondence and records established in conjunction with compliance with standards and regulations bearing upon performance of the Work including:
 - 2. **State and Local Regulations:** Submit copies of codes and regulations applicable to the work.
 - 3. **Permits:** Submit copies of current valid permits required by state and local regulations.
 - 4. **Licenses:** Submit copies of all State and Local licenses and permits necessary to carry out the work of this contract.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

END OF SECTION - 01094

SECTION 01302 - SUBMITTALS - LEAD-BASED PAINT

BASED ON MASTERSPEC® SECTION 01300 - "SUBMITTAL" COPYRIGHT 1993 BY AIA, AMERICAN INSTITUTE OF ARCHITECTS.

THIS SECTION USES THE TERM "DESIGNER". CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY THE DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for submittals from the Contractor to the Designer as required for performance of the Work, including;

REVISE THE LIST BELOW TO INCLUDE OTHER REQUIRED SUBMITTALS.

1. Contractor's construction schedule.
2. Submittal schedule.
3. Daily construction reports.
4. Shop Drawings.
5. Product Data.
6. Samples.

- B. Administrative Submittals:** Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

THE LIST BELOW INCLUDES ADMINISTRATIVE SUBMITTALS INCLUDED ELSEWHERE IN CONTRACT DOCUMENTS. ADD ITEMS IF NECESSARY.

1. Permits.
2. Applications for payment.
3. Performance and payment bonds.
4. Insurance certificates.
5. List of Subcontractors.

THE PARAGRAPH BELOW INCLUDES SUBMITTALS USUALLY SPECIFIED IN OTHER SECTIONS. REVISE TO SATISFY PROJECT REQUIREMENTS.

- C.** The Schedule of Values submittal is included in Section "Applications for Payment."

1.3 SUBMITTAL PROCEDURES

- A. Coordination:** Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.

RETAIN THE NEXT PARAGRAPH WHERE ONE SUBMITTAL HAS AN IMPACT ON ANOTHER.

2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

- a. The Designer reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

REVISE THE PARAGRAPHS BELOW TO SATISFY PROJECT REQUIREMENTS. DELETE IF GENERAL CONDITIONS ARE ADEQUATE.

3. **Processing:** Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for

resubmittals.

MODIFY TIME TO SUIT PROJECT REQUIREMENTS.

- a. Allow two weeks for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Designer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
- b. If an intermediate submittal is necessary, process the same as the initial submittal.
- c. Allow two weeks for reprocessing each submittal.
- d. No extension of Contract Time will be authorized because of failure to transmit submittals to the Designer sufficiently in advance of the Work to permit processing.

- B. Submittal Preparation:** Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

IF DESIRED, REVISE THE SIZE OF THE SPACE INDICATED BELOW.

1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken.

MODIFY THE LIST BELOW TO SATISFY PROJECT REQUIREMENTS.

- a. Project name.
- b. Date.
- c. Name and address of Designer.
- d. Name and address of Contractor.
- e. Name and address of subcontractor.
- f. Name and address of supplier.
- g. Name of manufacturer.
- h. Number and title of appropriate Specification Section.
- i. Drawing number and detail references, as appropriate.

EXPAND OR OTHERWISE MODIFY THE NEXT PARAGRAPH TO SUIT PROJECT REQUIREMENTS.

- C. Submittal Transmittal:** Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Designer using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

RETAIN THE NEXT PARAGRAPH WITH ANY OF THE OPTIONAL TRANSMITTAL FORMS THAT FOLLOW.

1. On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

IF TRANSMITTAL FORMS USED BY CONTRACTORS ARE ACCEPTABLE DELETE OPTIONS BELOW. OTHERWISE, SELECT ONE.

2. **Transmittal Form:** Use AIA Document G 810.

PROVIDE A SAMPLE FORM AT THE END OF THE SECTION IF THIS OPTION IS SELECTED.

3. **Transmittal Form:** Use the sample form at the end of this Section for transmittal of submittals.

1.4 CONTRACTOR'S CONSTRUCTION SCHEDULE

USE THE FOLLOWING AND DELETE THE BALANCE OF THIS SECTION FOR LEAD-BASED PAINT ABATEMENT PROJECTS WITH A DURATION OF NO MORE THAN SEVERAL WEEKS.

- A. **Schedule:** Provide proposed detailed schedule including work dates, work shift time, number of employees, dates of start and completion including dates of preparation work, removals and final inspection dates.

DELETE THE PARAGRAPH ABOVE AND USE THE FOLLOWING FOR PROJECTS WITH A LONGER DURATION.

COMPLICATED PROJECTS USUALLY BEGIN WITH A PRELIMINARY SCHEDULE. THIS SORT OF SCHEDULE IS DESCRIBED IN AIA MASTERSPEC® NARROWSCOPE SECTION "SCHEDULES AND REPORTS." INSERT A REQUIREMENT FOR AND DESCRIPTION OF A PRELIMINARY SCHEDULE IN THIS LOCATION IF ONE IS NECESSARY.

THE BAR CHART SCHEDULE BELOW IS ADEQUATE FOR MOST PROJECTS, INCLUDING MULTIPLE PRIME CONTRACTS. WHERE A CPM SCHEDULE IS REQUIRED AND PROJECT COMPLEXITY AND SIZE JUSTIFY ADDITIONAL TIME AND EXPENSE DELETE THIS ARTICLE AND CROSS-REFERENCE A SEPARATE SECTION THAT SPECIFIES MORE DETAILED AND

COMPLEX SCHEDULE REQUIREMENTS.

REVISE 30 DAY TIME PERIOD BELOW IF NECESSARY TO SUIT PROJECT REQUIREMENTS.

- B. Bar-Chart Schedule:** Prepare a fully developed, horizontal bar-chart type Contractor's construction schedule. Submit within 30 days of the date established for "Commencement of the Work".
1. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".

REVISE THE PERCENTAGE INCREMENTS AND TIME REQUIREMENTS BELOW TO SUIT REQUIREMENTS.

2. Within each time bar indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically sequences necessary for completion of related portions of the Work.
5. Coordinate the Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests and other schedules.

THE TWO PARAGRAPHS BELOW SHOULD BE USED IF WORK AREA CLEARANCE AND SUBSTANTIAL COMPLETION ARE DIFFERENT MILESTONES. THIS WILL OCCUR WHERE THERE ARE MULTIPLE WORK AREAS OR PUT-BACK OF REMOVED INSTALLATIONS IS A PART OF THE WORK.

IF THESE TWO PARAGRAPHS ARE USED DELETE THE THIRD PARAGRAPH BELOW.

6. Indicate Clearance of each Work Area in advance of the date established for Clearance. Allow time for testing and other Designer's procedures necessary for certification of Clearance.
7. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Designer's procedures necessary for certification of Substantial Completion.

THE TWO PARAGRAPHS ABOVE SHOULD BE DELETED AND THE FOLLOWING USED FOR SMALL PROJECTS THAT DO NOT INVOLVE REPLACEMENT OF REMOVED MATERIALS.

8. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Designer's procedures necessary for certification of Substantial Completion.

DELETE THE NEXT PARAGRAPH IF PHASING IS NOT APPLICABLE. AMPLIFY IF NECESSARY TO SUIT PROJECT REQUIREMENTS.

- C. **Phasing:** Provide notations on the schedule to show how the sequence of the Work is affected by requirements for phased completion to permit Work by separate Contractors and partial occupancy by the Owner prior to Substantial Completion.

RETAIN THE NEXT PARAGRAPH FOR LARGE OR COMPLICATED SMALL PROJECTS. CONSIDER LIMITING IT TO CRITICAL WORK.

- D. **Work Stages:** Indicate important stages of construction for each major portion of the Work, including testing and installation. Include indication of start and finish times for the following:

REVISE THE FOLLOWING TO SUIT PROJECT REQUIREMENTS. RETAIN THE NEXT PARAGRAPH FOR HIGH-RISE BUILDINGS, MULTIPLE-BUILDING PROJECTS, AND COMPLEX STRUCTURES. DELETE FOR SMALL PROJECTS, AND LARGE SINGLE-STORY AND SINGLE VOLUME PROJECTS.

1. Non lead-based paint demolitions.
2. Preparation of the Work Area
3. Lead-based paint removal
4. Removal of lead-based painted installations.
5. Clearance Testing
6. Substantial Completion.

RETAIN THE NEXT PARAGRAPH FOR PROJECTS WITH MULTIPLE WORK AREAS. DELETE FOR SMALL PROJECTS WITH A SINGLE WORK AREA.

- E. Area Separations:** Provide a separate time bar to identify each major construction area for each major portion of the Work. Indicate where each element in an area must be sequenced or integrated with other activities.

INSERT A LIST OF "MAJOR AREAS" HERE IF REQUIRED. THE NEXT PARAGRAPH ESTABLISHED PROGRESS MEASURED IN TERMS OF DOLLAR-VOLUME OF WORK.

- F. Cost Correlation:** At the head of the schedule, provide a two item cost correlation line, indicating "precalculated" and "actual" costs. On the line show dollar-volume of Work performed as of the dates used for preparation of payment requests.

- 1. Refer to Section "Applications for Payment" for cost reporting and payment procedures.

- G. Distribution:** Following response to the initial submittal, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

- 1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

- H. Schedule Updating:** Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

RETAIN THE NEXT ARTICLE. THE REQUIREMENT FOR A SUBMITTAL SCHEDULE WAS ADDED TO THE 1987 EDITION OF AIA DOCUMENT A 201.

1.5 SUBMITTAL SCHEDULE

REVISE THE TIME PERIOD BELOW TO SATISFY PROJECT REQUIREMENTS. CONSIDER REQUIRING SUBMITTAL CONCURRENTLY WITH THE CONTRACTOR'S CONSTRUCTION SCHEDULE.

- A.** After development and acceptance of the Contractor's construction schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for establishment of the Contractor's construction schedule.

REVISE THE NEXT PARAGRAPH IF NECESSARY TO SATISFY PROJECT REQUIREMENTS.

1. Coordinate submittal schedule with the list of subcontracts, schedule of values and the list of products as well as the Contractor's construction schedule.
2. Prepare the schedule in chronological order; include submittals required during the first 90 days of construction. Provide the following information:

IF CIRCUMSTANCES WARRANT, REVISE THE LIST BELOW; ADD INFORMATION SUCH AS SCHEDULED DATES FOR PURCHASING AND INSTALLATION, AND THE ACTIVITY OR EVENT NUMBER IF A CPM TYPE CONSTRUCTION SCHEDULE IS USED.

- a. Scheduled date for the first submittal.
 - b. Related Section number.
 - c. Submittal category.
 - d. Name of subcontractor.
 - e. Description of the part of the Work covered.
 - f. Scheduled date for resubmittal
 - g. Scheduled date the Designer's final release or approval.
- B. Distribution:** Following response to initial submittal, print and distribute copies to the Designer, Owner, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.
1. When revisions are made, distribute to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
- C. Schedule Updating:** Revise the schedule after each meeting or activity, where revisions have been recognized or made. Issue the updated schedule concurrently with report of each meeting.

1.6 DAILY CONSTRUCTION REPORTS

MODIFY THE NEXT PARAGRAPH IF REPORTS ARE REQUIRED MORE OR LESS OFTEN THAN WEEKLY.

- A.** Prepare a daily construction report, recording the following information concerning events at the site; and submit duplicate copies to the Designer at weekly intervals:

DELETE ITEMS BELOW THAT ARE NOT APPLICABLE. INSERT OTHERS AS REQUIRED.

1. Log of those entering and leaving Work Area.
2. List of subcontractors at the site.
3. Approximate count of personnel at the site.

4. High and low temperatures, general weather conditions.
5. Accidents and unusual events.
6. Meetings and significant decisions.
7. Stoppages, delays, shortages, losses.
8. Meter readings and similar recordings.
9. Emergency procedures.
10. Orders and requests of governing authorities.
11. Change Orders received, implemented.
12. Services connected, disconnected.
13. Equipment or system tests and start-ups.
14. Partial Completions, occupancies.
15. Substantial Completions authorized.

1.7 SHOP DRAWINGS

MODIFY THE PARAGRAPHS BELOW TO SUIT EACH PROJECT AND TO COMPLY WITH THE OWNER'S REQUIREMENTS AND OFFICE POLICY.

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.
- B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

AMPLIFY THE LIST BELOW AS NECESSARY TO SATISFY PROJECT REQUIREMENTS.

1. Dimensions.
2. Identification of products and materials included.
3. Compliance with specified standards.
4. Notation of coordination requirements.
5. Notation of dimensions established by field measurement.

MODIFY THE PARAGRAPH BELOW TO ESTABLISH A STANDARD SHEET SIZE AND FORMAT.

6. **Sheet Size:** Except for templates, patterns and similar full-size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 36" x 48".
7. **Initial Submittal:** Submit one correctable translucent reproducible print and one blue- or black-line print for the Designer's review; the reproducible print will be returned.

USUALLY RETAIN THE PARAGRAPH ABOVE AND DELETE THE ONE BELOW. RETAIN THE ONE BELOW ONLY FOR SMALL PROJECTS.

8. **Initial Submittal:** Submit 2 blue- or black-line prints for the Designer's review; one will be returned.

RETAIN THE NEXT PARAGRAPH WHEN INITIAL SUBMITTAL IS A REPRODUCIBLE PRINT.

9. **Final Submittal:** Submit 3 blue- or black-line prints; submit 5 prints where required for maintenance manuals. 2 prints will be retained; the remainder will be returned.

RETAIN THE NEXT PARAGRAPH WHEN INITIAL SUBMITTAL IS AN OPAQUE PRINT.

10. **Final Submittal:** Submit 3 blue- or black-line prints and 2 additional prints where required for maintenance manuals, plus the number of prints needed by the Designer for distribution. 2 prints will be retained; the remainder returned.

RETAIN THE NEXT PARAGRAPH WITH EITHER OF THE PARAGRAPHS ABOVE.

- a. One of the prints returned shall be marked-up and maintained as a "Record Document".
11. Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.
- C. Coordination drawings are a special type of Shop Drawing that show the relationship and integration of different construction elements that require careful coordination during fabrication or installation to fit in the space provided or function as intended.
 1. Preparation of coordination Drawings is specified in section "Project Coordination" and may include components previously shown in detail on Shop Drawings or Product Data.
 2. Submit coordination Drawings for integration of different construction elements. Show sequences and relationships of separate components to avoid conflicts in use of space.

1.8 PRODUCT DATA

MODIFY PARAGRAPHS BELOW TO COMPLY WITH OWNER'S REQUIREMENTS AND OFFICE POLICY.

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

AMPLIFY THE LIST BELOW AS NECESSARY TO SATISFY PROJECT REQUIREMENTS.

- a. Manufacturer's printed recommendations.
 - b. Compliance with recognized trade association standards.
 - c. Compliance with recognized testing agency standards.
 - d. Application of testing agency labels and seals.
 - e. Notation of dimensions verified by field measurement.
 - f. Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

RETAIN THE NEXT PARAGRAPH UNLESS THIS PROCEDURE IS NOT PERMITTED OR ENCOURAGED.

3. **Preliminary Submittal:** Submit a preliminary single-copy of Product Data where selection of options is required.

REVISE THE NEXT PARAGRAPH IF A METHOD OF HANDLING SIMILAR TO THAT FOR SHOP DRAWINGS IS DESIRED.

4. **Submittals:** Submit 2 copies of each required submittal; submit 4 copies where required for maintenance manuals. The Designer will retain one, and will return the other marked with action taken and corrections or modifications required.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
5. **Distribution:** Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities. Show distribution on transmittal forms.

- a. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.
- b. Do not permit use of unmarked copies of Product Data in connection with construction.

1.9 SAMPLES

MODIFY PARAGRAPHS BELOW TO COMPLY WITH OWNER'S REQUIREMENTS AND OFFICE POLICY.

- A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials.
 1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Include the following:

AMPLIFY THE LIST BELOW AS NECESSARY TO SATISFY PROJECT REQUIREMENTS.

- a. Generic description of the Sample.
 - b. Sample source.
 - c. Product name or name of manufacturer.
 - d. Compliance with recognized standards.
 - e. Availability and delivery time.
2. Submit Samples for review of kind, and for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.

CONSIDER CHANGING THE NUMBER OF SETS IN THE NEXT PARAGRAPH TO 1 OR 2, OR MODIFY TO COMPLY WITH THE OWNER'S REQUIREMENTS.

3. **Submittals:** submit 3 sets; one will be returned marked with the action taken.
4. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.
 - a. Unless noncompliance with Contract Document provisions is observed, the submittal may serve as the final submittal.
 - b. Sample sets may be used to obtain final acceptance of the construction associated with each set.

1.10 MISCELLANEOUS SUBMITTALS:

GENERALLY RETAIN THE FOLLOWING

- A. **Material Safety Data Sheets:** Acknowledge receipt of material safety data sheets.

GENERALLY DELETE THE FOLLOWING UNLESS SPECIFIC INSPECTIONS OR TESTING ARE REQUIRED BY THE SPECIFICATION. USUALLY ALL TESTING ON A LEAD ABATEMENT PROJECT WILL PROVIDED BY OWNER

- B. **Inspection and Test Reports:** Classify each inspection and test report as being either "shop drawings" or "product data" depending on whether the report is specially prepared for the project, or a standard publication of workmanship control testing at the point of production. Process inspection and test reports accordingly.

GENERALLY DELETE THE FOLLOWING OR REVISE TO COMPLY WITH SPECIFIC OWNER REQUIREMENTS.

- C. **Project Photographs:** Furnish 2 prints each of 3 project photographs at monthly intervals. Comply with Designer's direction concerning desired vantage points for shots.
- D. **Records of Actual Work:** Furnish 4 copies of records of actual work, one of which will be returned for inclusion in the record documents as specified in section "Project Closeout".

POSSIBLY REVISE THE NEXT PARAGRAPH TO INCLUDE A COPY OF STANDARDS FOR THE OWNER'S RECORDS.

- E. **Standards:** Where submittal of a copy of standards is indicated, and except where copies of standards are specified as an integral part of a "Product Data" submittal, submit a single copy of standards for the Designer's use. Where workmanship, whether at the project site or elsewhere is governed by a standard, furnish additional copies of the standard to fabricators, installers and others involved in the performance of the work.
- F. **Closeout Submittals:** Refer to section "Project Closeout" and to individual sections of these specifications for specific submittal requirements of project closeout information.
- G. **Record Documents:** Furnish set of original documents as maintained on the project site. Along with original marked-up

record drawings provide 2 photographic copies of marked-up drawings, which, at the Contractor's option, may be reduced to not less than half size.

1.11 DESIGNER'S ACTION

ARTICLE 4.2.7 OF AIA A 201 STATES "THE ARCHITECT WILL REVIEW AND APPROVE OR TAKE OTHER APPROPRIATE ACTION UPON THE CONTRACTOR'S SUBMITTALS ...". TO COMPLY WITH LANGUAGE IN AIA A 201, THE WORD "APPROVED" IS USED IN THIS ARTICLE. UPON ADVICE OF LEGAL COUNSEL, MODIFY THE ARTICLE BY CHANGING THE WORD TO "ACCEPTED" OR SOME Milder PHRASE. SEE THE EVALUATIONS FOR FURTHER DISCUSSION.

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Designer will review each submittal, mark to indicate action taken, and return promptly.
 - 1. Compliance with specified characteristics is the Contractor's responsibility.

MOST ARCHITECTURAL OFFICES USE A STAMP TO INDICATE THE ACTION TAKEN. RETAIN THE NEXT PARAGRAPH WHERE A STAMP IS USED, OR SUBSTITUTE ANOTHER SYSTEM.

MANY ARCHITECTS USE THE TERM "NO EXCEPTIONS TAKEN" IN LIEU OF "APPROVED"; "MAKE CORRECTIONS NOTED" IN LIEU OF "APPROVED AS NOTED"; "AMEND AND RESUBMIT" IN LIEU OF "NOT APPROVED REVISE AND RESUBMIT". A FOURTH CATEGORY OF "REJECTED - SEE REMARKS" IS FREQUENTLY USED. USE OF "NO EXCEPTIONS TAKEN" WILL RENDER THE TERM "ACTION NOT REQUIRED" UNNECESSARY.

- B. **Action Stamp:** The Designer will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:
 - 1. **Final Unrestricted Release:** Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
 - 2. **Final-But-Restricted Release:** When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
 - 3. **Returned for Resubmittal:** When submittal is marked "Not Approved, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different

action mark.

- a. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

THE NEXT PARAGRAPH IS FOR USE WHERE NEITHER APPROVAL NOR REJECTION IS AN APPROPRIATE ACTION FOR THE DESIGNER'S MARKING OF A SUBMITTAL. SEE EVALUATIONS.

4. **Other Action:** Where a submittal is primarily for information or record purposes, special processing or other activity, the submittal will be returned, marked "Action Not Required".

PART 2 - PRODUCTS (Not Applicable).

PART 3 - EXECUTION (Not Applicable).

SEE SUBMITTAL CHECK LIST ON FOLLOWING PAGES.

SUBMITTAL CHECKLIST

BEFORE START OF WORK

Supplementary Conditions

- Bodily Injury and Property Damage Liability: Certificate of Coverage
- Worker's Compensation Insurance: Certificate of Coverage
- Automobile Liability: Certificate of Coverage
- Performance Bond: Certificate of Coverage
- Labor and Material Bond: Certificate of Coverage

01014 Summary of Work - Lead-Based Paint

- Plan of Action
- Pre-construction Inspection
- Alternate Methods

01029 Applications for Payment - Lead-Based Paint

- Schedule of Values

01044 Coordination - Lead-Based Paint

- Contingency Plans
- Telephone Numbers
- Notification sent to entities at the work site
- Notifications sent to emergency service agencies
- Accreditation: of general superintendent, foreman and workers
- Staff Names

01093 Reference Standards and Definitions - Lead-Based Paint

- Refer to Section

01094 Codes, Regulations, and Standards - Lead-Based Paint

- Copy of State Regulations
- Copy of Local Regulations
- Licenses
- Certifications
- Permits

01302 Submittals - Lead-Based Paint

- Submittal Schedule
- Contractor's Construction Schedule

01504 Construction Facilities and Temporary Controls - Lead-Based Paint

- ___ Scaffolding (including Shop Drawing)
- ___ Hot Water Heaters: Product data
- ___ Decontamination Unit Sub-panel: Product data and Shop drawing
- ___ Ground Fault Circuit Interrupters (GFCI): Product data
- ___ Lamps and Light Fixtures: Product data
- ___ Temporary Heating Units: Product data
- ___ Temporary Cooling Units: Product data and installation instructions
- ___ Self Contained Toilet Units: Product data and name of sub-contractor
- ___ First Aid Supplies: Provide list of contents
- ___ Fire Extinguisher: Product data, location schedule

01506 Work Area Containment - Lead-Based Paint

- ___ Schedule of locked doors
- ___ Polyethylene: Product data (including fire ratings)
- ___ Construction plan
- ___ Lumber (including fire ratings)
- ___ Spray Cement: Product data

01514 Negative Pressure Enclosure - Abrasive Blasting - Lead-Based Paint

- ___ Pressure Differential System Design (provide adequate air flow in all portions of the work area)
- ___ HEPA Filtered Fan Units: Product data
- ___ Number of HEPA Filtered Fan Units required
- ___ Monitoring Equipment (pressure differential): Product data

01555 Worker Protection - Lead-Based Paint

- ___ State and Local License: for each worker
- ___ Certificate Worker Acknowledgement: for each worker
- ___ Training Program: course outline
- ___ Report of Medical Examination: of each worker
- ___ Compliance Program: in compliance with 1926.62
- ___ Exposure Assessment: in compliance with 1926.62
- ___ Notarized Certifications

01556 Respiratory Protection - Lead-Based Paint

- ___ Respiratory Protection Program: written manual
- ___ Respirator Product Data
- ___ Historic Sample Data

01602 Materials and Equipment - Lead-Based Paint

- ___ Product List Schedule

01633 Substitutions - Lead-Based Paint

- ___ Refer to Section

02065 Removal of Lead-Based Painted Substrates

- ___ HEPA Vacuums: Product data
- ___ Wet Detergent Wash:
- ___ Material Safety Data Sheet

02067 Disposal of Waste Materials - Lead-Based Paint

- ___ Waste Hauler State License
- ___ Waste Hauler Local License
- ___ U.S. EPA Identification Number of Waste Hauler
- ___ Name, address, permit and State License of landfill
- ___ Landfill contact person and telephone number
- ___ EPA Uniform Hazardous Waste Manifest
- ___ EPA Notification of hazardous waste activity
- ___ Forms required by State or Local agencies

05582 Sheet Metal Enclosure - Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Samples for initial selection
- ___ Installation instructions

06106 Wood Enclosure - Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Samples for initial selection
- ___ Installation instructions

06107 Exterior Siding & Enclosure - Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Samples for initial selection
- ___ Installation instructions

06403 Repair of Lead-Based Painted Substrate

- ___ Product data: each type of product specified
- ___ Samples for initial selection
- ___ Installation instructions

09252 Gypsum Board Enclosures Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Samples for initial selection
- ___ Installation instructions

09253 Cementitious Enclosures - Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Samples for initial selection
- ___ Installation instructions
- ___ Material Safety Data Sheet

09940 Encapsulation -Lead-Based Paint

- ___ Encapsulant: Product data
- ___ Installation instructions
- ___ Material Safety Data Sheet

09951 Chemical Stripping of Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Material Safety Data Sheet
- ___ Off-site removal: Name, location, materials and methods

09952 Mechanical Removal of Lead-Based Paint

- ___ Manufacturer's product data: each type of equipment specified
- ___ Description of removal methods
- ___ Historic airborne lead concentrations for proposed methods

09953 Surface Preparation - Paint Stabilization - Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Material Safety Data Sheet

09954 Painting - Lead-Based Paint

- ___ Product data: each type of product specified
- ___ Samples for initial selection
- ___ Installation instructions

PERIODICALLY DURING WORK

01029 Application for Payment - Lead-Based Paint

Refer to section for specific requirements for Payment Requests

01044 Coordination - Lead-Based Paint

- ___ Daily Logs
- ___ Event Reports
- ___ Accident Reports
- ___ Discovered Condition Reports

01302 Submittals - Lead-Based Paint

- ___ Record Documents

01514 Negative Pressure Enclosure - Abrasive Blasting - Lead-Based Paint

- ___ Pressure Differential Monitoring Results

01506 Work Area Containment - Lead-Based Paint

- ___ Photograph of existing damage prior to applying coatings.

01555 Worker Protection - Lead-Based Paint

- ___ Updated information on workers

01566 Respiratory Protection - Lead-Based Paint

___ Update information on new equipment

01633 Substitutions - Lead-Based Paint

___ Refer to section

01702 Contract Closeout - Lead-Based Paint

___ Refer to section

02067 Disposal of Waste Material - Lead-Based Paint

___ Copies of manifests and disposal site receipts.

09940 Encapsulation of Lead-Based Paint

___ Notification of unsatisfactory substrate.

PROJECT CLOSEOUT

01044 Coordination - Lead-Based Paint

___ Daily Log

01702 Contract Closeout - Lead-Based Paint

___ Record Documents

___ Record Product Data

01715 Project Decontamination - Lead-Based Paint

___ Certificate of Visual Inspection

END OF SECTION 01302

SECTION 01420 - TEST LABORATORY SERVICES - LEAD-BASED-PAINT

THIS SECTION IS BASED ON THE PRESUMPTION THAT THE OWNER WILL HAVE ENGAGED THE SERVICES OF A COMPETENT PROJECT MONITOR AND A TECHNICIAN WHO WILL BE AT THE JOB SITE. THIS MAY BE ONE PERSON OR SEVERAL DEPENDING ON PROJECT ORGANIZATION AND COMPLEXITY.

THE PURPOSE OF THIS SECTION IS TO EXPLAIN TO THE CONTRACTOR HOW AIR MONITORING AND SURFACE DUST SAMPLING IS TO BE DONE BY THE OWNER RATHER THAN TO SPECIFY METHODS TO BE USED BY THE MONITORING FIRM. THIS ENTIRE SECTION SHOULD BE EDITED WITH THE ASSISTANCE OF THE ENVIRONMENTAL CONSULTING FIRM THAT IS TO BE PERFORMING SAMPLING FOR THE OWNER.

IT MAY BE POSSIBLE TO REDUCE THE DETAIL IN THIS SECTION AND STILL ADEQUATELY ADVISE THE CONTRACTOR.

THIS SECTION SETS BASELINE LEVELS THAT MAY REQUIRE THAT THE CONTRACTOR STOP WORK OR EXTEND WORK TO AREAS OUTSIDE THE WORK AREA UNDER SPECIFIC CIRCUMSTANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to work of this section.
- B. Surface lead dust wipe sampling and soil sampling during work area clearance are described in section 01421-project clearance.

1.2 DESCRIPTION OF THE WORK

- A. Not in Contract Sum: This section describes work being performed by the Owner's Project Monitor. This work is not in the Contract Sum.
- B. This section describes air monitoring, soil sampling and surface lead dust wipe sampling carried out by the Project Monitor to verify that the building beyond the work area and outside environment remain uncontaminated. This section also sets forth baseline levels that the contractor must comply with, and describes the action required if the levels are exceeded.
- C. Corrective Work triggered by this section is part of the contract sum and is to be performed by the contractor at no additional cost to the owner.
- D. Additional air monitoring required by OSHA and Section 01556 is work of the Contractor and is not covered in this section.

1.3 ANALYTICAL METHODS:

- A. Atomic Absorption Spectroscopy or Inductively Coupled Plasma Emission Spectroscopy will be used for analysis of:
 - 1. **Surface lead** dust wipe samples
 - 2. **Air Samples**
 - 3. **Soil Samples**

1.4 ESTABLISH BASELINE LEAD CONCENTRATION:

- A. Before start of work the owner will secure the following air, dust and soil samples to establish a baseline level.

EDIT TO MEET PROJECT SPECIFICS FOR NUMBER OF SAMPLES AND LOCATION. CONSIDER A SCHEDULE OF SAMPLES SIMILAR TO TABLE IN SECTION 01421 ON LARGE OR COMPLICATED PROJECTS.

FOLLOWING IS AN EXAMPLE: EDIT THE LIST TO MEET PROJECT SPECIFICS. ON SMALL PROJECTS CONSIDER OBTAINING ONLY OUTSIDE SAMPLES IN ADJACENT NON-WORK AREAS OR OBTAIN WIPES FROM SEVERAL REPRESENTATIVE COMPONENTS BUT NOT IN EVERY AREA OR SURFACE AS INTENDED FOR FINAL CLEARANCE.

- 1. **Air Samples:** One sample outside work area.
- 2. **Dust Samples:** One sample each from floor, interior window sill and window Trough in each work area. One sample outside work area at entrance.
- 3. **Soil Samples:** One Composite sample per building all sides included.

IF BASELINE CONCENTRATION DATA COLLECTED IS ABOVE CLEARANCE LEVELS, INCLUDE HAZARD REDUCTION IN THOSE LOCATIONS IN THE SCOPE OF WORK.

1.5 AIR AND SURFACE LEAD DUST MONITORING: The purpose of the Owner's air and surface lead dust monitoring will be to detect faults in the work area isolation which may cause contamination of the building or exterior with lead dust.

- A. Should any of the above occur, cease Hazard Reduction activities. Correct fault in work area isolation or work procedures at no cost to the owner.

PROVIDE COPIES OF BASELINE SAMPLES TO CONTRACTOR PRIOR TO START OF PROJECT.

1.6 AIRBORNE LEAD CONCENTRATIONS DURING WORK: The Owner may monitor airborne lead concentrations inside and outside the work area.

- A. **Inside Work Area:** Maintain lead concentrations at lowest possible levels, not to exceed 50 micrograms/cubic meter. If concentrations rise above this figure revise work procedures to lower lead levels.
- B. **Outside Work Area:** Maintain lead concentrations at lowest possible levels, not to exceed baseline levels. If concentrations rise above baseline levels, stop hazard reduction work and institute corrective actions. Owner's project monitor will determine source of the high reading.

1.7 SURFACE LEAD DUST CONCENTRATIONS:

- A. **Outside Work Area:** Maintain lead concentrations below baseline levels. baseline levels will be determined by the owner prior to the start of work. If baseline levels are exceeded stop all hazard reduction activities, and institute corrective actions. Project monitor will determine source of the high reading.

1.8 SOIL LEAD CONCENTRATIONS:

- A. **Outside Work Area:** Maintain lead concentrations at or below baseline levels. If concentrations rise above baseline levels institute corrective actions. Project monitor will determine source of the high reading.

1.9 CORRECTIVE ACTIONS

- A. If the high reading above is outside work area, but inside building and was result of failure of work area containment measures initiate the following action:
 - 1. Erect new critical barriers as set forth in section 01506 - work area containment.
 - 2. Decontaminate affected area in accordance with section

01715 - project decontamination at no cost to the owner..

- B. If the high reading above is soil outside building and was result of failure of work area containment measures initiate the following action; remediate soil in accordance with Section 02066 at no cost to the owner.

1.10 SCHEDULE OF SAMPLES: From start of work of Section 01506 - Work Area Containment - Lead-Based Paint through the work of section 01715 Project Decontamination, the owner may be taking the following samples on a daily basis.

FOLLOWING IS A SAMPLE SCHEDULE ON A PROJECT THAT INCLUDED INTERIOR AND EXTERIOR HAZARD REDUCTION. EDIT TO MEET SPECIFIC PROJECT REQUIREMENTS.

Location Sampled	Number of Samples	Type Of Sample	Remarks
Each Work Area	1	Air	
Outside Each Work Area	1	Lead Dust	Within Building Adjacent to critical barrier or entrance to work area
Outside each work area (Exterior Abatement)	1	Soil	Outside regulated area within 10' of barrier fence or tape

1.11 PERSONAL MONITORING:

- A. Owner's Project Monitor will not be performing air monitoring to meet Contractor's OSHA requirements for personnel sampling.

1.12 EFFECT ON CONTRACT SUM: Complete corrective work with no change in contract sum if high concentrations were caused by contractor's activities. The contract sum will be adjusted for additional work caused by high concentrations beyond the contractor's control.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION - 01420

SECTION 01421 - PROJECT CLEARANCE - LEAD-BASED PAINT

THIS SECTION IS INTENDED TO SET FORTH CONTRACTOR RELEASE CRITERIA FOR HAZARD REDUCTION PROJECTS INVOLVING REMOVAL OF LEAD-BASED PAINT, REMOVAL OF LEAD-BASED PAINTED SUBSTRATES, ENCLOSURE, ENCAPSULATION, SOIL REMEDIATION AND AT COMPLETION OF CLEANING AND DECONTAMINATION PROJECTS.

SECTION 01715 PROJECT DECONTAMINATION MUST BE CLOSELY COORDINATED WITH THIS SECTION. THIS SECTION ONLY PROVIDES INFORMATION ON THE ANALYTICAL PROCEDURES TO BE USED FOR PROJECT CLOSEOUT. OTHER PROCEDURES AND REQUIREMENTS CAN BE FOUND IN SECTION 01715

PART - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division - 1 Specification Sections, apply to work of this section.
 - 1. **Visual Inspection:** Required as a prerequisite of sampling is set forth in Section 01715 Project Decontamination.

1.2 DESCRIPTION OF THE WORK

- A. **Not in Contract Sum:** This section describes work being performed by the Owner's Project Monitor. This work is not in the Contract Sum.
- B. This section sets forth required surface lead dust concentration in the work area and describes testing procedures the Owner will use to measure these levels.
- C. **Soil Testing:** This section sets forth required soil lead content measurements conducted on exterior abatement projects which will be used to:
 - 1. Support pre-and post-abatement comparisons, and
 - 2. Determine if statistically significant changes in soil lead content exist following completion of abatement.

1.3 ANALYTICAL METHODS:

A. Atomic Absorption Spectroscopy or Inductively Coupled Plasma Emission Spectroscopy will be used for analysis of:

1. **Surface lead dust wipe samples**
2. **Air Samples**
3. **Soil Samples**

1.4 VISUAL INSPECTION:

A. Work of this section will not begin until the visual inspection described in section 01715 Project Decontamination has been completed and certified by the project monitor.

AT COMPLETION OF HAZARD REDUCTION ACTIVITIES AND FOLLOWING A SATISFACTORY VISUAL INSPECTION OF THE WORK AREA, THREE LEAD DUST SAMPLES ARE TYPICALLY OBTAINED IN THE ROOM WHERE THE ACTIVITY TOOK PLACE. ONE EACH FROM THE FLOOR, WINDOW SILL AND WINDOW TROUGH. ON EXTERIOR ABATEMENTS ONE SAMPLE FOR EACH CONTIGUOUS AREA IS SUFFICIENT.

THE LEVELS SPECIFIED MAY BE REVISED AS GUIDANCE DOCUMENTS AND REGULATIONS ARE FINALIZED. CONSULT WITH MOST CURRENT PUBLISHED DOCUMENTS WHEN EDITING THIS SECTION. CLEARANCE LEVELS FOR FLOORS, WINDOW SILLS, WINDOW THROUGHES AND EXTERIOR SURFACES ARE FROM HUD GUIDANCE DOCUMENTS. SOIL CLEARANCE IS A "SCREENING LEVEL" FROM CURRENT EPA GUIDANCE DOCUMENTS.

EDIT THE FOLLOWING TO MEET SPECIFIC PROJECT REQUIREMENTS

1.5 CLEARANCE CRITERIA:

A. On-site Paint Removal: Clearance will be conducted on three surfaces in each room or area. One each from the floor, window sill and window trough.

B. Off-site Paint Removal: Substrate Removal, Enclosure Projects:. Clearance will be conducted on one surface per room or area, equally divided among floors, window sills and window troughs.

- C. Wipe Sampling Clearance:** Decontamination is complete when every sample is at or below the following levels. If clearance levels are not satisfactory, the decontamination is incomplete and recleaning per Section 01715 - Project Decontamination is required at no additional cost to the Owner.
1. **Floors:** 100 micrograms per square foot.
 2. **Window Sills:** 500 micrograms per square foot.
 3. **Window Troughs:** 800 micrograms per square foot.
 4. **Exterior:** 800 micrograms per square foot
- D. Soil Sampling Clearance:** Remediation is complete when every sample is at or below the following levels. If clearance levels are not satisfactory, the remediation is incomplete and additional remediation per section 02066 is required at no additional cost to the owner.
1. **Soil:** 400 parts per million

1.6. SCHEDULE OF SAMPLES: At the completion of hazard reduction the following samples will be collected.

FOLLOWING IS A SAMPLE SCHEDULE ON A PROJECT THAT INCLUDED ON-SITE AND OFF-SITE PAINT REMOVAL. THE AREAS INDICATED SHOULD BE SHOWN ON THE DRAWINGS. EDIT TO MEET SPECIFIC PROJECT REQUIREMENTS. CONSIDER DELETING THE FOLLOWING IF ONLY ONE HAZARD REDUCTION TECHNIQUE IS USED OR IF THE SAMPLE PARAGRAPHS ABOVE DESCRIBE THE CLEARANCE CRITERIA SUFFICIENTLY.

<i>BUILDING</i>	<i>UNIT/ APARTMENT</i>	<i>FLOOR LEVEL LOCATION</i>	<i>ROOM/AREA DESIGNATION</i>	<i>SURFACE</i>	<i>NUMBER OF SAMPLES</i>
<i>SEVEN</i>	<i>7-20</i>	<i>GROUND</i>	<i>KITCHEN</i>	<i>FLOOR</i>	<i>ONE</i>
<i>SEVEN</i>	<i>7-20</i>	<i>GROUND</i>	<i>KITCHEN</i>	<i>WINDOW TROUGH</i>	<i>ONE</i>
<i>SEVEN</i>	<i>7-20</i>	<i>GROUND</i>	<i>KITCHEN</i>	<i>WINDOW TROUGH</i>	<i>ONE</i>
<i>EIGHT</i>	<i>8-10</i>	<i>SECOND</i>	<i>BATHROOM</i>	<i>FLOOR</i>	<i>ONE</i>
<i>EIGHT</i>	<i>8-10</i>	<i>SECOND</i>	<i>BEDROOM #1</i>	<i>WINDOW TROUGH</i>	<i>ONE</i>
<i>EIGHT</i>	<i>8-10</i>	<i>SECOND</i>	<i>BEDROOM #2</i>	<i>WINDOW SILL</i>	<i>ONE</i>
<i>EIGHT</i>	<i>8-10</i>	<i>EXTERIOR</i>	<i>PORCH</i>	<i>FLOOR</i>	<i>ONE</i>
<i>EIGHT</i>	<i>8-10</i>	<i>N/A</i>	<i>EXTERIOR OF BUILDING</i>	<i>SOIL</i>	<i>ONE COMPOSITE</i>

CONSIDER OBTAINING ADDITIONAL WIPE SAMPLES FOR LARGER AREAS, EDIT TO MEET PROJECT SPECIFICS. THE AREA SAMPLED MUST BE MEASURED ACCURATELY AND MAY RANGE FROM 0.1 to 2 SQUARE FEET.

PART 2 - PRODUCT (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION - 01421

SECTION 01504 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS - LEAD-BASED PAINT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS:

- A. **General:** Provide temporary connection to existing building utilities or provide temporary facilities as required herein or as necessary to carry out the work.

1.3 SUBMITTALS

EDIT THE FOLLOWING LIST AS REQUIRED FOR PROJECT SPECIFICS.

- A. **Before the Start of Work:** Submit the following to the Designer for review. Begin no work until these submittals are returned with Designer's action stamp indicating that the submittal is returned for unrestricted use or final-but-restricted use.
- B. **Scaffolding:** submit list of rolling and fixed scaffolding intended for use on the project. Submit sufficient detail to indicate compliance with applicable worker safety regulations or other requirements.
- C. **Hot water heater:** Submit manufacturers name, model number, size in gallons, heating capacity, power requirements.
- D. **Decontamination Unit Sub-panel:** Submit product data.
- E. **Ground Fault Circuit Interrupters (GFCI):** Submit product data.
- F. **Lamps and Light Fixtures:** Submit product data.
- G. **Temporary Heating Units:** Provide product data.
- H. **Temporary Cooling Units:** Provide product data and installation instructions.
- I. **Self Contained Toilet Units:** Provide product data and name of sub-contractor used for servicing self contained toilets. Submit method to be used for servicing.

- J. **First Aid Supplies:** Provide list of contents of first aid kit. Submit in form of check list.
- K. **Fire Extinguishers:** Provide product data. Submit schedule indicating location at job site.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT:

- A. **General:** Provide new or used materials and equipment that are undamaged and in serviceable condition. Provide only materials and equipment that are recognized as being suitable for the intended use, by compliance with appropriate standards.

2.2 SCAFFOLDING:

- A. Provide all scaffolding, ladders and/or staging, etc. as necessary to accomplish the work of this contract. Scaffolding may be of suspension type; or standing type such as metal tube and coupler, tubular welded frame, pole or outrigger type or cantilever type. The type, erection and use of all scaffolding shall comply with all applicable OSHA provisions.
- B. Equip rungs of all metal ladders, etc. with an abrasive non-slip surface.
- C. Provide a nonskid surface on all scaffold surfaces subject to foot traffic.

2.3 WATER SERVICE:

- A. **Temporary Water Service Connection:** All connections to the Owner's water system shall include backflow protection. Valves shall be temperature and pressure rated for operation of the temperatures and pressures encountered. After completion of use, connections and fittings shall be removed without damage or alteration to existing water piping and equipment. Leaking or dripping valves shall be piped to the nearest drain or located over an existing sink or grade where water will not damage existing finishes or equipment.
- B. **Water Hoses:** Employ heavy-duty abrasion-resistant hoses with a pressure rating greater than the maximum pressure of the water distribution system to provide water into each work area and to each Decontamination Unit. Provide fittings as required to allow for connection to existing wall hydrants or spouts, as well as temporary water heating equipment, branch piping, showers, shut-off nozzles and equipment.

DELETE FOLLOWING WHERE HOT WATER WILL BE SUPPLIED FROM EXISTING BUILDING HOT WATER SYSTEM.

- C. **Water Heater:** Provide UL rated 40 gallon electric water heater to supply hot water for the Decontamination Unit shower. Activate from 30 amp circuit breaker located within the Decontamination Unit subpanel. Provide with relief valve compatible with water heater operation; pipe relief valve down to drip pan on floor with type L copper. Drip pans shall consist of a 12" X 12" X 6" (30 cm x 30 cm x 15 cm) deep pan, made of 19 gauge galvanized steel, with handles. A 3-quart (3 L) kitchen saucepan may be substituted for this purpose. Drip pan shall be securely fastened to the water heater with bailing wire or similar material. Wiring of the water heater shall be in compliance with NEMA, NECA, and UL standards.

DELETE FOLLOWING WHEN BUILDING HOT WATER SYSTEM WILL BE SHUT DOWN OR OTHERWISE UNAVAILABLE FOR USE.

- D. **Hot Water:** may be secured from the building hot water system, provided backflow protection is installed at point of connection as described in this section under Temporary Water Service connection, and if authorized in writing by the Designer.

2.4 ELECTRICAL SERVICE:

INCLUDE THIS ARTICLE IF THE WORK INVOLVES DUST CREATING ACTIVITIES AND WORK AREA CONTAINMENT WITH PRIMARY AND SECONDARY BARRIERS, OR CONDITIONS AT THE WORK SITE REQUIRE INSTALLATION OF A TEMPORARY ELECTRICAL SERVICE. DELETE IF WORK IS TO BE ACCOMPLISHED WITHIN INDIVIDUAL REGULATED AREAS WITH DROP CLOTHS AT EACH WORK SITE AND POWER IS TO BE PROVIDED FROM EXISTING BUILDING ELECTRICAL SYSTEM. GFCI PROTECTION SHOULD BE PROVIDED FOR EACH ELECTRICAL POWER CORD BY SWITCHING OUT CIRCUIT BREAKER OR GFCI AT OUTLET.

- A. **General:** Comply with applicable NEMA, NECA and UL standards and governing regulations for materials and layout of temporary electric service. Provide equipment which is compatible with existing electrical characteristics and available power. If existing power is either incompatible or inadequate for performance of the Work, provide auxiliary generators(s) located outside of the building.
- B. **Temporary Power:** Provide service to Decontamination Unit subpanel with minimum 60 amp, 2 pole circuit breaker or fused disconnect connected to the buildings main distribution panel. Subpanel and disconnect shall be sized and equipped to accommodate all electrical equipment required for completion of the work.

- C. **Voltage Differences:** Provide identification warning signs at power outlets which are other than 110-120 volt power. Provide polarized outlets for plug-in type outlets, to prevent insertion of 110-120 volt plugs into higher voltage outlets. Dry type transformers shall be provided where required to provide voltages necessary for work operations.

DELETE THE NEXT PARAGRAPH IF THE CONTRACTOR IS TO HAVE OTHER OPTIONS.

- D. **Ground Fault Protection:** Equip all circuits for any purpose entering Work Area with ground fault circuit interrupters (GFCI). Locate GFCI's exterior to Work Area so that all circuits are protected prior to entry to Work Area. Provide circuit breaker type ground fault circuit interrupters (GFCI) equipped with test button and reset switch for all circuits to be used for any purpose in work area, decontamination units, exterior, or as otherwise required by national electrical code, OSHA or other authority. Locate in panel exterior to Work Area.

2.5 ELECTRICAL EQUIPMENT:

ALWAYS USE THIS ARTICLE

- A. **Electrical Power Cords:** Use only grounded extension cords; use "hard-service" cords where exposed to abrasion and traffic. Use single lengths or use waterproof connectors to connect separate lengths of electric cords, if single lengths will not reach areas of work.
- B. **Lamps and Light Fixtures:** Provide sealed quartz halogen construction lights, general service incandescent lamps or fluorescent lamps of wattage indicated or required for adequate illumination as required by the work or this section. Protect lamps with guard cages where fixtures are exposed to breakage by construction operations. Provide lighting with a secure base to insure that they will not be knocked over. Keep lights away from combustible materials.

2.6 TEMPORARY HEAT:

DELETE IF NO TEMPORARY HEAT IS REQUIRED.

- A. **Heating Units:** Provide temporary heating units that have been tested and labeled by UL, FM or another recognized trade association related to the fuel being consumed. Use steam or hot water radiant heat where available, and where not available use electric resistant fin radiation supplied from

a branch circuit with ground fault circuit interrupter.

IT IS SOMETIMES NECESSARY TO COOL AND DEHUMIDIFY WORK AREAS IN HOT CLIMATES. THE AMOUNT OF COOLING REQUIRED CAN BE DETERMINED USING NORMAL MECHANICAL ENGINEERING CALCULATIONS. FOLLOWING IS EXTREMELY GENERAL AND SHOULD BE REVISED TO FIT PROJECT REQUIREMENTS. VENTILATION OF THE WORK AREA CAN BE ACCOMPLISHED BY USE OF A PRESSURE DIFFERENTIAL AND AIR CIRCULATION SYSTEM EXHAUSTING AIR FROM THE WORK AREA THROUGH HEPA FILTERED FAN UNITS TO THE EXTERIOR.

WINDOW AIR CONDITIONING UNITS ARE SOMETIMES USED FOR THIS PURPOSE. THE SEAL BETWEEN THE INSIDE AND OUTSIDE OF THESE UNITS CAN BE PROBLEMATIC AND SHOULD BE FREQUENTLY CHECKED.

DELETE FOLLOWING IF NO COOLING IS REQUIRED.

2.7 TEMPORARY COOLING:

- A. **Cooling Units:** Provide temporary cooling units consisting of a fan coil unit inside the work area with a compressor and heat rejection coil outside.

THE FOLLOWING DESCRIBES CHEMICAL TOILETS TO BE USED IN THE WORK AREA IF NO EXISTING FACILITIES ARE AVAILABLE. DELETE THIS PARAGRAPH WHEN EXISTING FIXTURES ARE AVAILABLE IN THE WORK AREA. IF THIS SECTION IS DELETED THEN ALSO DELETE THE PARAGRAPH IN PART 3 OF THIS SECTION THAT DESCRIBES WHERE SUCH UNITS ARE TO BE LOCATED.

2.8 SELF-CONTAINED TOILETS:

- A. **Self-Contained Toilet Units:** Provide single-occupant self-contained toilet units of the chemical type, properly vented and fully enclosed with a glass fiber reinforced polyester shell or similar non-absorbent material.

THE NEXT PARAGRAPH COULD BE MADE MORE SPECIFIC, EVEN FOR SMALL PROJECTS.

2.9 FIRST AID:

- A. **First Aid Supplies:** Comply with governing regulations and recognized recommendations within the construction industry.

2.10 FIRE EXTINGUISHERS:

- A. **Fire Extinguishers:** Provide Type "A" fire extinguishers for temporary offices and similar spaces where there is minimal

danger of electrical or grease-oil-flammable liquid fires. In other locations provide type "ABC" dry chemical extinguishers, or a combination of several extinguishers of NFPA recommended types for the exposures in each case.

PART 3 - EXECUTION

3.1 SCAFFOLDING:

- A. Require that a Competent Person supervise the erection, movement, and dismantling of scaffolding in accordance with OSHA 29 CFR 1926.451.
- B. During the erection and/or moving of scaffolding, care must be exercised so that the polyethylene floor covering is not damaged.
- C. Clean as necessary debris from non slip surfaces.
- D. At the completion of abatement work clean all construction aids within the work area, wrap in one layer of 6 mil polyethylene sheet and seal before removal from the work area.

3.2 INSTALLATION, GENERAL:

- A. **General:** Use qualified tradesmen for installation of temporary services and facilities. Locate temporary services and facilities where they will serve the entire project adequately and result in minimum interference with the performance of the Work.
 - 1. Require that tradesmen accomplishing this work be licensed as required by local authority for the work performed.
- B. Relocate, modify and extend services and facilities as required during the course of work so as to accommodate the entire work of the project.

3.3 WATER SERVICE:

- A. **General:** Water connection (without charge) to Owner's existing potable water system is limited to one 3/4" pipe-size connection, and a maximum flow of 10 gpm each to hot and cold water supply. Install using vacuum breakers or other backflow preventer as required by local authority.
- B. Maintain hose connections and outlet valves in leak-proof condition. Where finish work below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize the possibility of water damage. Drain water promptly from pans as it accumulates.

USE FOLLOWING ARTICLE IF AVAILABLE POWER IN WORK AREA IS GENERALLY ADEQUATE AND WORK IS TO BE ACCOMPLISHED WITHIN INDIVIDUAL REGULATED AREAS WITH DROP CLOTHS AT EACH WORK SITE. DELETE THIS ARTICLE IF THE WORK INVOLVES DUST CREATING ACTIVITIES AND WORK AREA CONTAINMENT WITH PRIMARY AND SECONDARY BARRIERS.

3.4 TEMPORARY POWER - REGULATED AREAS:

- A. General:** Use existing power available in Work Area.
- B. Circuit Protection:** Protect each tool or extension cord with a ground fault circuit interrupter (GFCI) of proper size. GFCI can be type that plugs into existing duplex outlets. Insure that outlet is properly grounded before installation of GFCI.

DELETE ARTICLE ABOVE AND USE BELOW IF THE WORK INVOLVES DUST CREATING ACTIVITIES AND WORK AREA CONTAINMENT WITH PRIMARY AND SECONDARY BARRIERS, OR IF A COMPLETE TEMPORARY ELECTRICAL SERVICE IS REQUIRED BY PROJECT CONDITIONS.

3.5 ELECTRICAL SERVICE:

- A. General:** Provide a weatherproof, grounded temporary electric power service and distribution system of sufficient size, capacity, and power characteristics to accommodate performance of work during the construction period. Install temporary lighting adequate to provide sufficient illumination for safe work and traffic conditions in every area of work.

INCLUDE FOLLOWING IF THE WORK INVOLVES DUST CREATING ACTIVITIES AND WORK AREA CONTAINMENT WITH PRIMARY AND SECONDARY BARRIERS. DELETE IF WORK IS TO BE ACCOMPLISHED WITHIN INDIVIDUAL REGULATED AREAS WITH DROP CLOTHS AT EACH WORK SITE.

- B. Lockout:** Lockout all existing power to or through the work area as described below. Unless specifically noted otherwise existing power and lighting circuits to the work area are not to be used. All power and lighting to the Work Area is to be provided from temporary electrical panel described below.
 - 1.** Lockout power to work area by switching off all breakers serving power or lighting circuits in work area. Label breakers with tape over breaker with notation "DANGER circuit being worked on". Lock panel and have all keys under control of contractor's superintendent or owner's designated representative.

2. Lockout power to circuits running through work area wherever possible by switching off all breakers serving these circuits. Label breakers with tape over breaker with notation "DANGER circuit being worked on". Sign and date danger tag. Lock panel and supply keys to contractor, Owner and Designer. If circuits cannot be shut down for any reason, label at 4'-0" on center with tags reading, "DANGER live electric circuit. Electrocution hazard."

INCLUDE FOLLOWING IF THE WORK INVOLVES DUST CREATING ACTIVITIES AND WORK AREA CONTAINMENT WITH PRIMARY AND SECONDARY BARRIERS. DELETE IF WORK IS TO BE ACCOMPLISHED WITHIN INDIVIDUAL REGULATED AREAS WITH DROP CLOTHS AT EACH WORK SITE.

- C. **Temporary Electrical Panel:** Provide temporary electrical panel sized and equipped to accommodate all electrical equipment and lighting required by the work. Connect temporary panel to existing building electrical. Protect with circuit breaker or fused disconnect. Locate temporary panel as directed by Owner or Designer. Power may be obtained from adjacent apartments if authorized in writing by the Owner.
- D. **Power Distribution System:** Provide circuits of adequate size and proper characteristics for each use. In general run wiring overhead, and rise vertically where wiring will be least exposed to damage from construction operations.
- E. **Circuit Protection:** Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel. Do not use outlet type GFCI devices.

MODIFY THE PARAGRAPH BELOW TO SUIT PROJECT REQUIREMENTS.

- F. **Temporary Wiring:** in the work area shall be type UF non-metallic sheathed cable located overhead and exposed for surveillance. Do not wire temporary lighting with plain, exposed (insulated) electrical conductors. Provide liquid tight enclosures or boxes for wiring devices.
- G. **Number of Branch Circuits:** Provide sufficient branch circuits as required by the work. All branch circuits are to originate at temporary electrical panel. At minimum provide the following:
 1. For power tools and task lighting, provide one temporary 4-gang outlet in the following locations. Provide a separate 110-120 Volt, 20 Amp circuit for each 4-gang outlet (4 outlets per circuit).
 - a. One outlet in the work area for each 2500 square

feet of work area

- b. One outlet at each decontamination unit, located in equipment room

DELETE THE FOLLOWING IF THERE IS NOT GOING TO BE ANY AREA AIR SAMPLING BY THE OWNER DURING THE PROJECT

- 2. 110-120 volt 20 amp branch circuits with 4-gang outlet for Owner's exclusive use while conducting air sampling during the work as follows:
 - a. One in each work area
 - b. One at clean side of each Decontamination Unit.

USE FOLLOWING ARTICLE IF LIGHTING IN WORK AREA IS GENERALLY ADEQUATE AND WORK IS TO BE ACCOMPLISHED WITHIN INDIVIDUAL REGULATED AREAS WITH DROP CLOTHS AT EACH WORK SITE. DELETE THIS ARTICLE IF THE WORK INVOLVES DUST CREATING ACTIVITIES AND WORK AREA CONTAINMENT WITH PRIMARY AND SECONDARY BARRIERS.

3.6 TEMPORARY LIGHTING - REGULATED AREAS:

- A. **General:** Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.
- B. **Circuit Protection:** Protect each light with a ground fault circuit interrupter (GFCI) of proper size. GFCI can be type that plugs into existing duplex outlets. Insure that outlet is properly grounded before installation of GFCI.

DELETE ARTICLE ABOVE AND USE BELOW IF THE WORK INVOLVES DUST CREATING ACTIVITIES AND WORK AREA CONTAINMENT WITH PRIMARY AND SECONDARY BARRIERS, OR IF A COMPLETE TEMPORARY LIGHTING SYSTEM IS REQUIRED BY PROJECT CONDITIONS.

3.7 TEMPORARY LIGHTING - CONTAINMENT:

- A. **Lockout:** Lockout all existing power to lighting circuits in work area. Unless specifically noted otherwise existing lighting circuits to the work area are not to be used. All lighting to the Work Area is to be provided from temporary electrical panel described above.

REQUIREMENTS IN THE NEXT PARAGRAPH COULD BE EXPRESSED AS WATTS PER SQUARE FOOT OR FOOT-CANDLES AT TABLE HEIGHT AND COULD BE SPECIFIED AS EITHER

MINIMUM OR MAXIMUM REQUIREMENTS. REDUCE WATTAGE REQUIREMENTS TO CONSERVE ENERGY.

- B. Lighting levels:** Provide the following or equivalent where natural lighting or existing building lighting does not meet the required light level:
1. One 200-watt incandescent lamp per 1000 square feet of floor area, uniformly distributed, for general construction lighting, or equivalent illumination of a similar nature. In corridors and similar traffic areas provide one 100-watt incandescent lamp every 50 feet. In stair ways and at ladder runs, provide one lamp minimum per story, located to illuminate each landing and flight. Provide sufficient temporary lighting to ensure proper workmanship everywhere; by combined use of daylight, general lighting, and portable plug-in task lighting.
 2. Provide lighting in areas where work is being performed as required to supply a 100 foot candle minimum light level.
 3. Provide lighting in any area being subjected to a visual inspection as required to supply a 100 foot candle minimum light level.
 4. Provide lighting in the Decontamination Unit as required to supply a 50 foot candle minimum light level.
- C. Number of Lighting Circuits:** Provide sufficient lighting circuits as required by the work. All lighting circuits are to originate at temporary electrical panel.
- D. Circuit Protection:** Protect each circuit with a ground fault circuit interrupter (GFCI) of proper size located in the temporary panel.

3.8 TEMPORARY HEAT:

DELETE THIS ARTICLE IF TEMPORARY HEAT IS NOT GOING TO BE REQUIRED.

- A. General:** Provide temporary heat where indicated or needed for performance of the Work.

EXCEPTIONS TO THE MINIMUM TEMPERATURE SPECIFIED IN THE FOLLOWING PARAGRAPHS SHOULD BE SPECIFIED IN INDIVIDUAL WORK SECTIONS.

- B. Temperature:** Maintain a minimum temperature of 70 degrees F. where finished work has been installed.

FOLLOWING INSURES A COMFORTABLE ENVIRONMENT FOR WORKER DECONTAMINATION. DELETE IF THERE IS NO SHOWER INVOLVED IN THE DECONTAMINATION UNIT.

- C. **Temperature in shower:** Maintain a minimum temperature of 75 degrees F. in the shower of the decontamination unit.

FOLLOWING PROVIDES A COMFORTABLE WORK ENVIRONMENT FOR WORKERS LIGHTLY CLAD IN ONLY PAPER SUITS.

- D. **Temperature:** Maintain a minimum temperature of 70 degrees F. in the Work Area at all times that work is going on. At all other times and at completion of removal work, but before start of reconstruction work, maintain a minimum temperature of 50 degrees F.

DELETE THE ABOVE AND USE THE FOLLOWING IF WORKERS ARE GOING TO BE PROVIDED WITH WARM CLOTHING WHICH WILL BE KEPT IN THE WORK AREA AND DISCARDED AT THE END OF THE WORK.

- E. **Temperature:** Maintain a minimum temperature of 50 degrees F. in the Work Area at all times during and after removal work.

3.9 TEMPORARY COOLING:

DELETE THIS ARTICLE IF TEMPORARY COOLING IS NOT NEEDED.

FOLLOWING IS AN EXAMPLE ONLY. THE AMOUNT OF COOLING REQUIRED IS DEPENDENT UPON MANY THINGS (OUTSIDE TEMPERATURE, HUMIDITY, EXPOSURE TO SUN, AMOUNT OF VENTILATION). AS A GENERAL RULE IT IS PREFERABLE TO SUPPLY TOO LITTLE RATHER THAN TOO MUCH COOLING AS THIS WILL CONTROL HUMIDITY BETTER. IF THE WORK AREA IS OVER-COOLED A FOG CAN DEVELOP IN THE SPACE. DETERMINE THE AMOUNT OF COOLING REQUIRED AND REVISE AS APPROPRIATE.

- A. **Required Cooling:** Provide units sufficient to supply 20,000 BTU's of cooling per 8,000 cubic feet of work area.

3.10 PROJECT MONITOR'S FIELD OFFICE:

DELETE THIS ARTICLE IF AN OFFICE FOR THE PROJECT MONITOR IS NOT GOING TO BE PROVIDED.

- A. Project Monitor's Field Office:** Provide air conditioned, heated office space near the Work Area for professional person, suitably finished, furnished, equipped, locked, heated, naturally ventilated, lighted and wired with electrical power, not less than 250 sq. ft. floor area. Equip office with 1 telephone line and 1 telephone, and not less than 2 duplex convenience power outlets. In addition to 1 desk, 1 four drawer file cabinet and 3 chairs, furnish office with one 36" X 96" plan table, and one 24" X 48" work table near electrical power outlet. Provide portable office or use a suitable room as designated by Owner and relocate or add equipment as required to meet the above requirements.

3.11 SANITARY FACILITIES:

- A. Toilets:** Use of the Owner's existing toilet facilities, as indicated, will be permitted, so long as these facilities are properly cleaned and maintained in a condition acceptable to the Owner. At substantial completion, restore these facilities to the condition prevalent at the time of initial use. Written permission from the owner must be obtained, and all provisions of these specifications regarding leaving the work area are met.

DELETE THE FOLLOWING PARAGRAPH IF EXISTING TOILET FACILITIES ARE AVAILABLE WITHIN THE WORK AREA. THIS PARAGRAPH DESCRIBES THE LOCATION AND REQUIRED NUMBER OF THE CHEMICAL TOILET UNITS DESCRIBED IN PART 2 OF THIS SECTION. THIS HELPS TO AVOID EXCESSIVE TRAVEL IN AND OUT OF THE WORK AREA.

- B. Toilets:** Provide one self-contained chemical toilet unit in the Work Area for each 30 workers.. Facilities shall be maintained throughout the Work. At the end of the job, facilities shall be decontaminated in accordance with these specifications.

3.12 FIRE EXTINGUISHERS:

GENERALLY INCLUDE THIS ARTICLE AS A PRUDENT SAFETY MEASURE.

- A. Fire Extinguishers:** Comply with the applicable recommendations of NFPA Standard 10 "Standard for Portable Fire Extinguishers". Locate the appropriate class of fire extinguishers where they are most convenient and effective for their intended purpose.

3.13 STORAGE FACILITIES:

DELETE THIS ARTICLE IF TEMPORARY STORAGE FACILITIES ARE NOT NEEDED.

- A. Storage:** The Contractor shall provide a temporary construction trailer as a storage area for tools, equipment and supplies. Waste generated during abatement shall be stored in a construction trailer in addition to above.

END OF SECTION - 01504

SECTION 01506 - WORK AREA CONTAINMENT - LEAD-BASED PAINT

THIS SECTION DESCRIBES THE MEASURES NECESSARY TO ISOLATE THE AREA WHERE THE HAZARD REDUCTION WILL TAKE PLACE FROM THE REMAINDER OF THE BUILDING AND EXTERIOR.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 RELATED WORK SPECIFIED ELSEWHERE:

- A. **Temporary Facilities:** is specified in Section 01504
- B. **Worker Protection:** is specified in Section 01555.
- C. **Respiratory Protection:** is specified in Section 01556.
- D. **Exterior Abatement:** is specified in Section 01505.

1.3 DESCRIPTION OF WORK:

EDIT LIST AS REQUIRED TO MEET PROJECT SPECIFICS.

- A. Work of this section consists of preparing a work area for interior work of the following specification sections.

1. **Section 01715** Project Decontamination - Lead-Based Paint
2. **Section 02065** Removal of Lead-Based Painted Substrates
3. **Section 02068** Removal of Lead-Containing Dust
4. **Section 06106** Wood Enclosures - Lead-Based Paint
5. **Section 06402** Carpentry and Trim Work - Lead-Based Paint
6. **Section 06403** Repair of Lead-Based Painted Substrates
7. **Section 09252** Gypsum Wallboard Enclosure - Lead-Based

Paint

8. **Section 09253** Cementitious Enclosures - Lead-Based Paint
9. **Section 09940** Encapsulation - Lead-Based Paint
10. **Section 09951** Chemical Stripping of Lead-Based Paint
11. **Section 09952** Mechanical Removal of Lead-Based Paint
12. **Section 09953** Surface Preparation - Paint Stabilization - Lead-Based Paint
13. **Section 09954** Painting - Lead-Based Paint

PART 2 - PRODUCTS

2.1 HEPA Filtered Vacuum Cleaners:

- A. Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products which may be incorporated in the Work include, but are not limited to, the following:

A LIST OF FIRMS KNOWN TO MANUFACTURE HEPA VACUUMS CAN BE FOUND IN APPENDI X E. NO MANUFACTURERS HAVE BEEN KNOWINGLY EXCLUDED AND NO ATTEMPT HAS BEEN MADE TO EVALUATE THESE PRODUCTS. ADDITIONAL SUPPLIERS MAY EXIST. EDIT OR ADD TO LIST AS APPROPRIATE.

- 2.2 Duct Tape:** Provide 2" (51mm) width tape with an adhesive which is formulated to aggressively stick to sheet polyethylene.

THE USE OF DETERGENTS WITH HIGH PHOSPHATE CONTENT ARE RESTRICTED OR BANNED IN SOME AREAS BECAUSE OF THE IMPACT ON THE ENVIRONMENT. OTHER DETERGENTS THAT ARE LEAD-SPECIFIC MAY BE EQUALLY EFFECTIVE AND SHOULD BE PERMITTED.

EVEN DILUTED TRI-SODIUM PHOSPHATE IS VERY IRRITATING TO THE SKIN AND SHOULD BE USED ONLY WITH WATERPROOF GLOVES AND EYE PROTECTION. PORTABLE EYE WASH FACILITIES SHOULD BE AVAILABLE, SEE SECTION 01555 - WORKER PROTECTION..

- 2.3 Wet Detergent Wash:** Provide detergent with a high phosphate content (at least 5%) trisodium phosphate (TSP). Follow dilution ratio recommended by the manufacturer's instructions.

CONSIDER PARAGRAPH BELOW FOR NON-TSP DETERGENTS. DELETE ABOVE OR BELOW.

Wet Detergent Wash: Provide detergent or cleaning agent formulated to be effective in removing lead dust. Follow dilution ratio recommended by the manufacturer's instructions.

2.4 Plastic Sheet: A single polyethylene film in the largest sheet size possible to minimize seams, 6.0 mils thick.

PART 3 - EXECUTION

3.1 SECURING WORK AREA:

A. Secure work area from access by public, occupants, staff or users of the building. Accomplish this where possible, by locking doors, windows, or other means of access to the area.

3.2 DEMARCATION OF WORK AREA:

A. Demarcate each Work Area as described below.

B Provide warning signs at each locked door and at entrance to change room leading to the controlled area reading as follows:

WARNING

LEAD WORK AREA

POISON

NO SMOKING OR EATING

3.3 SCHEDULING:

A. Work may be carried out during normal working hours in those areas which can be completely secured by lockable doors from access by building occupants, the public, and staff.

THE FIRST STEP IN AN LEAD HAZARD PROJECT IS TO ISOLATE THE AREA SO THAT ONLY TRAINED WORKERS CAN ENTER AND LEAVE THROUGH A CONTROLLED ENTRANCE.

THIS SUBSECTION DESCRIBES THE MEASURES NECESSARY TO ACCOMPLISH THIS ISOLATION. THE ISOLATION IS ACCOMPLISHED ONLY AT THE COST OF EASE OF ACCESS AND EXITING FROM THE BUILDING.

IT IS VERY POSSIBLE THAT THE WORK AREA ISOLATION COULD EFFECT EMERGENCY EXITING FROM PORTIONS OF THE BUILDING BEYOND THE WORK AREA. IT MAY BE NECESSARY TO CLOSE DOWN THESE PORTIONS OF THE BUILDING TO AVOID A LIFE SAFETY HAZARD FOR OCCUPANTS OF THESE AREAS.

THE FOLLOWING COULD AFFECT EXITING FROM THE BUILDING AND CERTAINLY AFFECTS EXITING FROM THE WORK AREA. THIS CHANGE IN EXITING SHOULD BE REVIEWED TO INSURE THAT IT DOES NOT VIOLATE LOCAL BUILDING CODES OR THE ANSI LIFE SAFETY CODE. IT MAY BE NECESSARY TO CONSTRUCT TEMPORARY EXITS. THERE MAY BE SPECIFIC BUILDING CODE REQUIREMENTS GOVERNING THE LAYOUT AND CONSTRUCTION OF THESE EXITS.

3.4 INTERIOR ABATEMENT GENERAL PROCEDURES:

- A. The following precautions and procedures have application to work of this section. Workers must exercise caution to avoid release of lead dust into the air and to contain lead dust within the work area.
1. Before start of work comply with requirements for worker protection in section 01555, and respiratory protection in section 01556.
 2. Do not allow eating, drinking, smoking, chewing tobacco or gum, or applying cosmetics in the Work Area.
 3. Shut down any air handling equipment bringing air into or out of the Work Area.
 4. Pick up any debris which may puncture polyethylene sheeting from floor and other surfaces in the immediate location of the work prior to commencing work by hand or use of a High Efficiency Particulate Air (HEPA) filtered vacuum.

EDIT THE FOLLOWING IF SINGLE OR MULTIPLE LAYERS OF POLYETHYLENE SHEETING ON FLOORS ARE REQUIRED. WHEN SELECTING PROTECTION, THE EXPENSE OF CLEANING, REPAIRING OR REPLACING THE SURFACE TO BE PROTECTED AND THE AMOUNT OF LEAD DUST TO BE GENERATED BY THE WORK SHOULD BE CONSIDERED.

5. Cover floor in work area with two (2) layers of 6 mil polyethylene sheeting. Secure with duct tape and tape all seams.
6. Be certain polyethylene sheeting is square and tight to all corners of walls, cabinetry, etc. so it will not be punctured or pulled loose by workers, ladders. tools etc.

7. Except for egress to change room, seal all openings, doorways, supply and exhaust vents, and convectors within the work area with 6 mil polyethylene sheeting secured and completely sealed with duct tape. Cover all cabinetry to remain with one (1) sheet of 6 mil polyethylene sheeting. Seal windows if not part of hazard reduction. Replace broken glass or cover window openings with 1/2" (13mm) CDX plywood.
8. Provide an approximately 3'-0" by 3'-0" (1m x 1m) Change Room, with additional space as required for storage, attached to work area. Fabricate Change Room from 6 mil sheet plastic. Locate so that access to Work Area is through Change Room.
9. Cover floor in front of entry to Change Room with one layer of 6 mil sheet plastic. Securely anchor sheet plastic to prevent slipping.
10. Provide Flapped Door as entry to Change Room from work area and exit from Change Room to non-work side of area. Fabricate each flapped door from overlapping contacting layers of sheet plastic. Fasten each layer on the top and one side. Each flap is to be 3" (76mm) longer than door opening. Reinforce free side and bottom of each sheet with duct tape. Alternate sides that are fastened on each layer. Form arrows pointing to entry side with duct tape on inside and outside of door.
11. At entry to Change Room post an approximately 20 inch by 14 inch (508mm x 356mm) manufactured caution sign displaying the legend cited above in Section 3.2B.
12. Complete requirements of the following:
 - a. **Section 01555** Worker Protection - Lead-Based Paint
 - b. **Section 01556** Respiratory Protection - Lead-Based Paint
13. At end of work shift remove any paint chips, dust and debris which collects on the sheeting either by using a HEPA vacuum or by spraying with wet wash solution, collect debris with wet paper towels, place in disposal bag while still wet, and clean surface of plastic sheet with wet paper towels.
14. Complete the following at completion of work in an area before entering Change Room. (Minimum 2 man procedure)
 - a. Each worker shall be HEPA vacuumed thoroughly by the other worker. First worker shall then enter Change Room.

- b. While standing on plastic drop sheet thoroughly HEPA vacuum ladder and any tools used and pass to worker in Change Room.
- 15. Perform a thorough cleanup of the entire work area daily during active Hazard Reduction Activities.
 - a. **Large Debris:** Large debris (e.g. doors, trim, casing, etc.) shall be wrapped in 6 mil polyethylene sheeting and moved to the area designated for waste storage or a lockable trailer or dumpster.
 - b. **Small Debris:** Small debris shall be collected by HEPA vacuuming all surfaces or by wet misting the area with wet wash solution. Sweep debris while wet and place in 6 mil disposal bags. Seal with duct tape and move to designated waste storage area.
- 16. Wet wipe the exterior surfaces of all disposal bags or large items wrapped in 6 mil polyethylene sheeting prior to exiting work area.
- 17. If moving to the next work area in the same secured area: Worker on the drop sheet don clean foot covers, placing each foot, in turn, off the sheet as the foot cover is put on. Remove clean foot covers at the next Work Area while standing on the sheet. Dispose of the used foot covers at completion of work in that area. Do not reuse foot covers to move off the sheet.
- 18. If work day is complete or if next work area is in another secured area: Follow decontamination procedures in Section 01555 - Worker Protection.

END OF SECTION - 01506

SECTION 01555 - WORKER PROTECTION - LEAD-BASED PAINT

THIS SECTION SPECIFIES THE WORKER PROTECTION REQUIREMENTS FOR LEAD HAZARD REDUCTION PROJECTS. THIS SECTION DOES NOT ADDRESS ADDITIONAL PROTECTIVE EQUIPMENT NECESSARY FOR OTHER WORK SITE HAZARDS.

THE SPECIFIER SHOULD UTILIZE COPIES OF THE MOST RECENT STATE AND LOCAL REGULATIONS AND GUIDELINES WHEN EDITING THIS SECTION.

THIS SECTION MAY BE EDITED WITH THE ASSISTANCE OF A CERTIFIED INDUSTRIAL HYGIENIST OR OTHER QUALIFIED HEALTH PROFESSIONAL.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. This section describes the equipment and procedures required for protecting workers against lead contamination and other workplace hazards except for respiratory protection.

1.3 STANDARDS:

- A. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.

- B. OSHA U.S. Department of Labor, Occupational Safety and Health Administration, Safety and Health Standards including but not limited to:

The following sections are brought to the contractor's attention for convenience. All appropriate OSHA Standards apply to this project.

1. 29 CFR 1910.134 - Respiratory Protection;
2. 29 CFR 1926.20 -General safety and health provisions;
3. 29 CFR 1926.21 -Safety training and education;
4. 29 CFR 1926.23 -First Aid;
5. 29 CFR 1926.24 -Medical Surveillance and Medical

Removal Protection Programs;

6. 29 CFR 1926.25 -Housekeeping;
7. 29 CFR 1926.28 -Personal protective equipment;
8. 29 CFR 1926.51(f) - Washing facilities;
9. 29 CFR 1926.55 -Gases, vapors, fumes, dusts, and mists;
10. 29 CFR 1926.56 -Illumination;
11. 29 CFR 1926.57 -Ventilation;
12. 29 CFR 1926.59 -Hazard Communication Standard;
13. 29 CFR 1926.62 -Lead Construction Standard;
14. 29 CFR 1926.103 -Respiratory protection;
15. 29 CFR 1926.353(c) -Ventilation: Welding, cutting or heating of metals of toxic significance;
16. 29 CFR 1926.300, -Hand and power tools; 301, 302
17. 29 CFR 1926.451,-Scaffolding & Fall Protection. 500, 501, 502, 503

1.4 RELATED WORK SPECIFIED ELSEWHERE:

- A. Respiratory Protection: is specified in Section 01556.

1.5 COMPETENT PERSON

- A. Definition: A "Competent Person" is one who is capable of identifying existing and predictable hazards at the worksite, and who has the authority to ensure prompt corrective measures are taken to eliminate them. The competent person has authority to shut down the project in accordance with OSHA 1926.62.
- B. Provide on-site, full time competent person (or persons) to ensure that the worker protection program is effective.

EPA IS CURRENTLY PROPOSING TRAINING REQUIREMENTS FOR WORKERS AND SUPERVISORS. INCLUDE EPA REQUIREMENTS IN THIS ARTICLE WHEN THEY BECOME EFFECTIVE.

1.6 WORKER TRAINING:

- A. Certification: All workers and supervisors are to be trained, certified and accredited as required by federal, state, or local code or regulation.

- B. OSHA-Required Training: all workers are to be trained in the dangers inherent in handling lead and breathing or ingesting lead dust and in the proper work procedures and personal and area protective measures prior to the time of initial job assignment and at least annually thereafter. Include but do not limit the topics covered in the course to the following:
1. Content of OSHA lead standard;
 2. Possible routes of exposure to lead;
 3. Health effects associated with lead exposure;
 4. Medical removal protection program;
 5. The importance of good personal hygiene;
 6. Nature of operations that could result in exposure to lead;
 7. The proper use and maintenance of protective clothing and equipment, including respiratory protection;
 8. The correct use of engineering controls and implementation of good work practices;
 9. Importance of and instruction in the use of necessary protective controls, practices and procedures to minimize exposure including:
 - a. Engineering controls;
 - b. Work Practices;
 - c. Respirators;
 - d. Housekeeping procedures;
 - e. Hygiene facilities;
 - f. Protective clothing;
 - g. Decontamination procedures;
 - h. Emergency procedures;
 - i. Waste disposal procedures;
 10. Purpose, proper use, fitting, instructions, and limitations of respirators as required by 29 CFR 1926.103;
 11. The specific methods of hazard reduction to be used for the project;
 12. Requirements of medical monitoring/surveillance program;
 13. Signs and labels;

- training;
14. Work practices including hands on or on-the-job
 15. Personal decontamination procedures;
 16. Health and safety considerations;
 17. Review of OSHA written compliance program as required by 29 CFR 1926.62;
 18. Information on the use of chelating agents and the fact that they should not be routinely used to remove lead from their bodies except under the direction of a licensed physician;
 19. The employees' right of access to medical records per 29 CFR 1910.20.

C. EPA-Required Training: Training proposed by EPA for all persons conducting "Lead-Based Paint activities," as defined by EPA, calls for additional training requirements including:

1. For workers:
 - a. A minimum of 32 hours of training, with a minimum of 10 hours devoted to hands-on training; and
 - b. Instruction in regulatory background, Federal, state and local.
2. For supervisors:
 - a. A minimum of 40 hours training, with a minimum of 8 hours devoted to hands-on training; and
 - b. Instruction in legal insurance issues;
 - c. Development of pre-abatement work plans;
 - d. Employee information and training;
 - e. Project management;
 - f. Contract specifications;
 - g. Supervisory techniques;
 - h. Soil, dust and air testing;
 - i. Clearance standards and testing;
 - j. Community relations process;
 - k. Cost estimations; and
 - l. Recordkeeping.

1.7 MEDICAL SURVEILLANCE:

EMPLOYERS SHALL MAKE INITIAL MEDICAL SURVEILLANCE AVAILABLE TO ANY EMPLOYEE EXPOSED ST OR ABOVE THE ACTION LEVEL ON ANY DAY. THE SURVEILLANCE MUST INCLUDE SAMPLING FOR BLOOD LEAD AND ZINC PROTOPORPHYRIN LEVELS. EMPLOYERS MUST ALSO PROVIDE BIOLOGICAL MONITORING FOR ALL EMPLOYEES PERFORMING LEAD-RELATED TASKS.

A MEDICAL SURVEILLANCE PROGRAM MUST BE PROVIDED FOR EMPLOYEES EXPOSED AT OR ABOVE THE ACTION LEVEL FOR MORE THAN 30 DAYS IN ANY CONSECUTIVE 12 MONTHS. THIS PROGRAM WILL INCLUDE BIOLOGICAL MONITORING AND MEDICAL EXAMINATIONS AND CONSULTATIONS.

- A. Provide full medical examinations for all workers performing lead abatement at first use of negative pressure respirators and for each worker exposed to lead for more than thirty days a year and/or who have blood lead levels over 25 micrograms/deciliter. Provide initial medical examinations for each worker exposed to lead for more than 1 day year. Provide medical examination for any employee who has signs and symptoms of lead poisoning or when a worker becomes pregnant.
- B. Medical evaluation to include:
 - 1. A detailed work and medical history.
 - 2. A thorough physical examination.
 - 3. Evaluation of pulmonary status.
 - 4. A blood pressure measurement.
 - 5. A blood sample and analysis that determines blood lead levels, hemoglobin and hematocrit, red cell indices, peripheral smear morphology, blood urea nitrogen, serum creatinine and zinc protoporphyrin.
 - 6. A routine urinalysis.
 - 7. Any other laboratory or other test which is recommended by the examining physician.
- C. The medical evaluation must be provided prior to the start of the lead hazard reduction project or assignment requiring the use of negative pressure respirators.
- D. Blood testing (blood lead and zinc protoporphyrin) shall be performed at least every 2 months during the first six months of the project and every two months thereafter. An additional blood test shall be performed at the completion of the project and upon termination of employment. The employer must make available the following:
 - 1. Biological monitoring for blood lead level and zinc protoporphyrin level at least every 2 months during the first six months and every two months thereafter.

2. When an employee's blood lead level is at or above 40 $\mu\text{g}/\text{dl}$, biological monitoring at least every two months until two consecutive blood lead level results are below 40 $\mu\text{g}/\text{dl}$.
3. Monthly blood lead level testing during removal period or any employee medically removed due to an elevated blood lead level.
4. When an employee's blood lead level meet the criterion for medical removal (at or above 50 $\mu\text{g}/\text{dl}$), follow-up blood testing within two weeks.

1.8 MEDICAL REMOVAL:

A DOCTOR MAY MAKE A FINAL MEDICAL DETERMINATION TO REMOVE AN EMPLOYEE FROM WORKING WITH LEAD. THE DOCTOR IS NOT TO REVEAL ANY FINDINGS, LAB RESULTS, OR DIAGNOSIS UNRELATED TO OCCUPATIONAL EXPOSURE TO LEAD TO THE EMPLOYER. AN EMPLOYEE EXPOSED TO LEAD AT OR ABOVE THE ACTION LEVEL MUST BE REMOVED FROM LEAD WORK IF THE EMPLOYEE HAS A BLOOD LEAD LEVEL AT OR ABOVE 50 MG/DL ON TWO SEPARATE TESTINGS, TWO WEEKS APART. AN EMPLOYEE CAN RETURN TO LEAD WORK WHEN HIS OR HER BLOOD LEAD LEVEL RESULT IS AT OR BELOW 40 MG/DL ON TWO CONSECUTIVE TESTINGS OR A DOCTOR HAS MADE A MEDICAL RECOMMENDATION THAT THE EMPLOYEE CAN RETURN TO LEAD WORK. THE EMPLOYER MUST PROVIDE WAGES AND BENEFITS FOR ANY EMPLOYEE REMOVED FROM LEAD WORK FOR UP TO 18 MONTHS, AS LONG AS THE JOB EXISTS.

THE EMPLOYER MAY NOT PROVIDE "PROPHYLACTIC CHELATION". PROPHYLACTIC CHELATION IS THE ROUTINE USE OF CHELATING (BINDING) OR SIMILAR ACTING DRUGS TO PREVENT ELEVATED BLOOD LEVELS IN WORKERS WHO ARE OCCUPATIONALLY EXPOSED TO LEAD, OR THE USE OF THESE DRUGS TO ROUTINELY LOWER BLOOD LEAD TO LEVELS BELIEVED TO BE SAFE. CHELATING DRUGS SHOULD NOT BE USED AS A SUBSTITUTE FOR ENGINEERING CONTROLS, APPROPRIATE WORK PRACTICES AND PROPER PERSONAL PROTECTIVE EQUIPMENT.

- A. Employers must remove employees with lead exposure at or above 30 micrograms/cubic meter of air each time:
 1. A periodic and follow-up blood sampling test indicates a blood lead level at or above 50 $\mu\text{g}/\text{dl}$; and
 2. A final medical determination indicates a detectable medical condition that increases health risks from lead exposure.

1.9 COMPLIANCE PROGRAM:

- A. The OSHA Lead in Construction Standard requires the employer to establish and implement a written compliance program prior to the commencement of a job. All employees covered under this standard must implement engineering and work practice controls to reduce and maintain employee exposures to lead at or below the Permissible exposure limit (PEL). This program must include:

1. Description of activities that produce lead exposures.
2. Description of the specific means that will be employed to reduce exposure, and where engineering controls are used, the plans and studies used to determine the methods selected.
3. A detailed schedule for implementing the compliance program.
4. A report of the technology considered in meeting the PEL.
5. Air monitoring data that documents the source of the lead exposure.
6. Specific work practice procedures which will be employed on the project.
7. A schedule of administrative controls if these are to be utilized.
8. A description of all arrangements made on multi-employer work sites to inform affected employers about the lead project.

1.10 EXPOSURE ASSESSMENT

- A. The OSHA Lead in Construction Standard requires employers to implement protective measures before exposure assessment has been completed if they are conducting any one of a number of "lead related tasks". These tasks are divided into three different classes. The employer must assume that the worker is exposed to airborne concentrations at least to a certain level of lead (depending on the class) until exposure assessment shows otherwise. When the employer has objective data demonstrating that the process, operation or activity does not result in employee exposure to lead at or above the action level, the employer may rely upon such data for the initial exposure assessment.
- B. Class 1 Tasks - Employer must assume exposure of at least 50 $\mu\text{g}/\text{m}^3$ - 500 $\mu\text{g}/\text{m}^3$ until exposure assessment proves otherwise. Examples include:
 1. Manual demolition of structures;
 2. Manual scraping;
 3. Manual sanding;
 4. Using a heat gun;
 5. Power tool paint removal with dust collection systems;
 6. Spray painting with lead-based paint.

- C. **Class 2 Tasks** - Employers must assume exposure of at least 500 $\mu\text{g}/\text{m}^3$ - 2500 $\mu\text{g}/\text{m}^3$ until exposure assessment proves otherwise. Examples include:
1. Using lead containing mortar;
 2. Burning lead;
 3. Rivet busting on lead paint;
 4. Power tool paint removal without dust collection systems;
 5. Clean up activities where dry expendable abrasives are used;
 6. Abrasive blasting enclosures movement and removal.
- D. **Class 3 Tasks** - Employer must assume exposure of at least 2,500 $\mu\text{g}/\text{m}^3$ until exposure assessment proves otherwise. Examples include:
1. Abrasive blasting;
 2. Cutting;
 3. Welding;
 4. Torch burning.
- E. Prior to the completion of an exposure assessment of the tasks being conducted, the employer should follow the regulations as if the employee was exposed above the PEL. The employee(s) must be notified in writing within 5 days of receipt of the results representing their exposure. Where exposure is above the PEL, employees must be informed of this fact and advised of corrective action to be taken. Monitoring and analysis must have an accuracy (to a confidence level of 95%) of not less than plus or minus 25% for airborne lead levels equal to or greater than 30 $\mu\text{g}/\text{m}^3$.
- F. Personal protective equipment for each of the tasks above is to include protective work clothing and equipment, change areas, washing facilities, and training. The only difference in protective equipment for the different classes of tasks is respiratory protection which is to be provided in accordance with section 01556.

1.11 SUBMITTALS:

- A. **Before Start of Work:** Submit the following to the Owner's Project Monitor for review. Do not start work until these submittals are returned with Owner's Project Monitor action stamp indicating that the submittal is returned for unrestricted use.
- B. **Certifications:** Submit evidence that all workers and

supervisors have been trained, certified and accredited as required by federal, state, or local code or regulation.

- C. **Certificate of Worker's Acknowledgement:** Submit an original signed copy of the Certificate of Worker's Acknowledgement found at the end of this section, for each worker who is to be at the job site or enter the Work Area.
- D. **Training Program:** Submit a course outline of the worker and supervisor training courses. Include date and time course was given, name and title of teacher.
- E. **Report from Medical Examination:** conducted within last 12 months as part of compliance with medical surveillance requirements for each worker who is to enter the Work Area. Submit, at a minimum, for each worker the following:
 - 1. Name and Social Security Number
 - 2. Physicians Written Opinion from examining physician including at a minimum the following:
 - a. Whether worker has any detected medical conditions that would place the worker at an increased risk of material health impairment from lead exposure.
 - b. Any recommended limitations on the worker or on the use of personal protective equipment such as respirators.
 - c. Results of blood lead determinations and any actions taken as a result of recommendations.
 - d. Statement that the worker has been informed by the physician of the results of the medical examination and of any medical conditions that necessitates further medical exam or treatment.
 - 3. Copy of information that was provided to physician prior to the examination.
 - 4. Statement that worker is able to wear and use the type of respiratory protection proposed for the project, and is able to work safely in an environment capable of producing heat stress in the worker.
 - 5. **Compliance Program:** Submit program in compliance with 1926.62.
 - 6. **Exposure Assessment:** Submit assessment in compliance with 1926.62.
 - 7. **Notarized Certifications:** Submit certification signed by an officer of the contracting firm and notarized that exposure measurements, medical surveillance, and worker training records are being kept as required in this specification.

PART 2 - EQUIPMENT

2.1 PROTECTIVE CLOTHING:

- A. Coveralls: Provide disposable full-body coveralls and disposable head covers, and require that they be worn by all workers in the Work Area. Provide a sufficient number for all required changes, for all workers in the Work Area. Dispose of coveralls as clothing waste at the end of each day.

DELETE ABOVE OR BELOW TO MEET PROJECT REQUIREMENTS. CONSIDER GIVING CONTRACTOR OPTION.

- B. Coveralls: Provide cloth full-body coveralls and hats, require that they be worn by all workers in the Work Area. Require that workers change out of coverall in the Equipment section of the Change Room. Dispose of coverall as clothing waste at completion of all work.
- C. Shoe Covers: Provide disposable shoe covers and require that they be worn by all workers in the Work Area. Shoe covers must be replaced each time a worker leaves the work area. Shoe covers are disposed as clothing waste in the equipment section of the Change Room.
- D. Boots: Provide work boots with non-skid soles, and where required by OSHA, foot protectives, for all workers. Provide boots at no cost to workers. Do not allow boots to be removed from the Work Area for any reason, after being contaminated with lead dust. Dispose of boots with clothing waste at the end of the work, or bag and take to next project. Boots that are non-porous may be decontaminated and removed from work area.
- E. Hard Hats: Provide head protectives (hard hats) as required by OSHA for all workers, and provide 4 spares for use by Designer, Project Monitor and Owner. Require hard hats to be worn at all times that work is in progress that may potentially cause head injury. Provide hard hats of type with plastic strap type suspension. Require hats to remain in the Work Area throughout the work. Thoroughly clean and decontaminate hats before removing them from Work Area at the end of the project.
- F. Goggles and Face Shields: Provide eye and face protection (goggles or face shields) as required by OSHA for all workers involved in scraping, spraying, stripping or any other activity which may potentially cause eye or face injury. Thoroughly clean and decontaminate goggles or face shields before removing them from Work Area at the end of the project.
- G. Gloves: Provide work gloves to all workers and require that they be worn at all times in the Work Area. Chemical resistant gloves must be provided when using chemical strippers to remove lead based paint. Gloves must be secured to the coveralls using duct tape to protect arms and hands from the chemical strippers. Do not remove gloves from Work Area. Dispose of as clothing waste at the end of the work.

2.2 ADDITIONAL PROTECTIVE EQUIPMENT:

- A. Respirators, disposable coveralls, head covers, and footwear covers shall be provided by the Contractor for the Owner, Designer, Project Monitor, and other authorized representatives who may inspect the job site.

2.3 SHOWER FACILITIES

- A. Provide shower facilities to be used by all workers when lead air concentrations exceed $30\mu\text{g}/\text{m}^3$ or surface lead dust concentrations exceed $2,000\ \mu\text{g}/\text{FT}^2$.
 - 1. Provide pre-fabricated or site-built shower facilities. Supply hot and cold water to shower head which can be controlled from inside shower. Filter all shower water or dispose of in accordance with section 02067.
 - 2. Supply a sufficient quantity of soap and towels for the workers and authorized visitors.

2.4 WASHING FACILITIES

- A. Provide washing facilities to be used by all workers when exiting the work area.
 - 1. Provide temporary sink with hot and cold water supply. Filter all water or dispose of in accordance with Section 02067.
 - 2. Supply a sufficient quantity of soap and towels for the workers and authorized visitors.

2.5 EYEWASH STATION

- A. Where the eyes of employees may be exposed to injurious corrosive materials, suitable facilities for flushing of the eyes shall be provided within the work area for immediate emergency use.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Provide worker protection as required by the most stringent OSHA and/or EPA standards applicable to the work. The following procedures are minimums to be adhered to regardless of lead concentration in the Work Area.
- B. Each time Work Area is entered remove street clothes and put on new disposable coverall or (re-use previous coverall if not overly contaminated or torn), new head cover, and a clean respirator with cartridges appropriate for the abatement work to be performed. Reinforce coverall seams and secure gloves

to coveralls with duct tape. Proceed through Change Room, don foot covers and enter Work Area.

3.2 DECONTAMINATION PROCEDURES:

- A. Require all workers to adhere to the following personal decontamination procedures whenever they leave the Work Area:
- B. Air Purifying-Negative Pressure Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area with a half or full face cartridge type respirator:
 - 1. Still wearing respirators, comply with the following procedure. Care must be taken to follow reasonable procedures in removing the respirator and filters to avoid disturbing lead dust. The following procedure is required as a minimum:
 - a. HEPA vacuum heavily contaminated protective work clothing.
 - b. When exiting Work Area, remove foot covers in work area. Remove disposable coveralls and disposable head covers in the Change Room. Remove protective coveralls by carefully rolling down the garment to minimize exposure to lead dust.
 - 2. Remove respirator and set aside.
 - 3. Thoroughly wash hands and face with soap and water. If shower facilities are available, proceed to shower and shower completely with soap and water.
 - 4. Remove respirator cartridges from facepiece and either seal with duct tape or discard.
 - 5. Carefully wash facepiece of respirator inside and out.
 - 6. Thoroughly wash hands with soap and water.
- C. Powered Air Purifying Respirators: Require that all workers use the following decontamination procedure as a minimum requirement whenever leaving the Work Area with a PAPR:
 - 1. Still wearing respirators, comply with the following procedure. Care must be taken to follow reasonable procedures in removing the respirator and filters to avoid disturbing lead dust. The following procedure is required as a minimum:
 - a. HEPA vacuum heavily contaminated protective work clothing.
 - b. When exiting Work Area, remove foot covers in work area. Remove disposable coveralls and disposable head covers in the Change Room. Remove protective

coveralls by carefully rolling down the garment to minimize exposure to lead dust.

2. Remove respirator, cap filter cartridges, shut blower unit off and set aside.
3. Thoroughly wash hands and face with soap and water. If shower facilities are available, proceed to shower and shower completely with soap and water.
4. Carefully wash facepiece of respirator inside and out. Wet wipe blower unit, hose and battery pack. Do not allow battery pack terminals to get wet. Do not remove respiratory cartridges unless wet. If wet, remove respirator cartridges from blower unit and discard.
5. Thoroughly wash hands with soap and water.

D. Within Work Area:

1. Require that workers NOT eat, drink, smoke, chew tobacco or gum, or apply cosmetics in the Work Area. To eat, chew, drink or smoke, workers shall follow the procedure described above before entering the Non-Work Areas of the building or exterior.

3.3 CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT:

- A. Following this section is a Certificate of Worker Training. After each worker has been included in the Contractor's Respiratory Protection Program, completed the training program and medical examination, secure a fully executed copy of this form.

END OF SECTION - 01555

CERTIFICATE OF WORKER'S ACKNOWLEDGEMENT

PROJECT NAME _____
DATE _____

PROJECT ADDRESS _____

CONTRACTOR'S NAME _____

WORKING WITH LEAD CAN BE DANGEROUS. INHALING AND INGESTING LEAD DUST CAN CAUSE AN INCREASE IN BLOOD LEAD LEVELS WHICH CAN LEAD TO ADVERSE HEALTH EFFECTS SUCH AS KIDNEY DAMAGE, ELEVATED BLOOD PRESSURE OR INFERTILITY.

Your employer's contract with the Owner for the above project requires that: You be supplied with the proper respirator and be trained in its use. You be trained in safe work practices and in the use of the equipment found on the job. You receive a medical examination. These items are to have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators, and informed of the type respirator to be used on the above referenced project. You must be given a copy of the written respiratory protection manual issued by your employer. You must be equipped at no cost with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling lead and breathing and ingesting lead dust and in proper work procedures and personal and area protective measures. The topics covered in the course must have included the following:

- Possible routes of exposure to lead
- Health hazards associated with lead
- Respiratory protection
- Use of protective equipment
- Work practices including hands on or on-the-job training
- Personal decontamination procedures
- Health and safety considerations

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history, physical examination, a blood pressure measurement, pulmonary function test and blood sample and analysis for lead.

By signing this document you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer, the Contractor.

Signature _____ Social Security No _____

Printed Name _____ Witness _____

SECTION 01556 - RESPIRATORY PROTECTION - LEAD-BASED PAINT

THIS SECTION MAY BE EDITED WITH THE ASSISTANCE OF A CERTIFIED INDUSTRIAL HYGIENIST OR OTHER QUALIFIED HEALTH PROFESSIONAL.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

- A. Instruct and train each worker involved in lead abatement or lead based paint hazard reduction in proper respiratory use and require that each worker wear a respiratory, properly fitted on the face in the Work Area from the start of any operation which may expose the worker above the permissible exposure limit (PEL) until the Work Area is completely decontaminated. Use respiratory protection appropriate for the lead levels encountered in the work place or as required for other toxic or oxygen-deficient situations encountered.

1.3 STANDARDS:

- A. Except to the extent that more stringent requirements are written directly into the Contract Documents, the following regulations, guidelines and standards have the same force and effect (and are made a part of the Contract Documents by reference) as if copied directly into the Contract Documents, or as if published copies were bound herewith. Where there is a conflict in requirements set forth in these regulations and standards, meet the more stringent requirement.

THE FOLLOWING STANDARDS AND REGULATIONS SHOULD BE IN HAND AND REFERRED TO DURING EDITING OF THIS SECTION. ADD STATE REQUIREMENTS IF MORE STRINGENT.

- B. **OSHA-** U.S. Department of Labor Occupational Safety and Health Administration, Safety and Health Standards 29 CFR 1910, Section 1000 - Air Contaminants, Section 1926.103, 1910.134 - Respiratory Protection and Section 1926.62 - Lead.
- C. **ANSI-** American National Standards Institute, American National Standard Practices for Respiratory Protection, ANSI Z88.2-1992.
- D. **HUD-** U.S. Department of Housing and Urban Development, Lead Based Paint: Interim Guidelines for Hazard Identification and Abatement in Public and Indian Housing.

- E. **NIOSH-** National Institute for Occupational Safety and Health, Guide to Respiratory Protection, 1987, 87-116.
- F. **MSHA-** Mine Safety and Health Administration

1.4 SUBMITTALS:

- A. Before Start of Work submit the following to the Owner's project monitor for review. Do not begin work until these submittals are returned with the Owner's Project Monitor's action stamp indicating that the submittal is returned for unrestricted use.
- B. **Written Respiratory Protection Program:** Submit written respiratory protection program in accordance with the OSHA Respiratory Protection Standard 29 CFR 1926.103, 29 CFR 1910.134 and OSHA Lead Construction Standard 1926.62.
- C. **Product Data:** Submit manufacturer's product information for each component used, including NIOSH and MSHA Certifications for each component in an assembly and/or for entire assembly.
- D. **Respiratory Protection Schedule:** Submit level of respiratory protection intended for each operation required by the project. Submit this information on the "Respiratory Protection schedule" on the form included at the end of this Section.
- E. **Historic Sampling Data:** Submit air sampling data from previous projects to substantiate selection of respiratory protection proposed. Data submitted shall include at least the following for each procedure required by the work
 - 1. Date of measurements
 - 2. Operation monitored
 - 3. Sampling and analytical methods used and evidence of their accuracy
 - 4. Number, duration, and results of samples taken
 - 5. Workers name, social security number and job classification
 - 6. Type of respirator worn by workers
 - 7. Type of material
 - 8. Control Methods
 - 9. Work Practices
 - 10. Training and experience level of workers and supervisors

PART 2 PRODUCTS

2.1 AIR PURIFYING RESPIRATORS

- A. Respirator Bodies:** Provide half face or full face type respirators. Equip full face respirators with a nose cup or other anti-fogging device as would be appropriate for use in air temperatures less than 32 degrees fahrenheit.
- B. Filter Cartridges:** Provide, at a minimum, HEPA type filters labeled with NIOSH and MSHA Certification for "Radionuclides, Radon Daughters, Dust, Fumes, Mists including Asbestos-Containing Dusts and Mists" and color coded in accordance with ANSI Z88.2 (1992). In addition, a chemical cartridge section (organic vapor/acid gas) may be added, if required, for solvents, strippers, etc., in use. In this case, provide cartridges that have each section of the combination canister labeled with the appropriate color code and NIOSH/MSHA Certification.
- C. Non-permitted respirators:** Do not use single use, disposable or quarter face respirators.

PART 3 - EXECUTION

3.1 GENERAL:

- A. Respiratory Protection Program:** Comply with ANSI Z88.2 - 1992 "Practices for Respiratory Protection" and OSHA 29 CFR 1910 and 1926.
- B.** Require that respiratory protection be used at all times that there is any possibility of airborne lead levels exceeding the permissible exposure level required in OSHA 1926.62

SPECIFIER MUST DETERMINE IF RESPIRATORS ARE TO BE REQUIRED IF AIRBORNE LEAD LEVELS ARE BELOW THE PERMISSIBLE EXPOSURE LIMIT (PEL) THE PARAGRAPH BELOW EXCEEDS OSHA REQUIREMENTS. REQUIRING THAT A RESPIRATOR BE WORN AT ALL TIMES MAY DISCOURAGE THE WIPING OF THE FACE WITH LEAD CONTAMINATED HANDS, AND INGESTION OF LEAD IN THAT MANNER. RESPIRATOR USE MAY ALSO DISCOURAGE NON-PERMITTED ACTIVITIES IN THE WORK AREA SUCH AS EATING AND SMOKING.

EDIT THE FOLLOWING TWO PARAGRAPHS IF RESPIRATORS ARE NOT REQUIRED AT ALL TIMES. IF THE OSHA PERMISSIBLE EXPOSURE LIMIT IS USED TO TRIGGER RESPIRATORY PROTECTION DELETE OR MODIFY PARAGRAPHS 3.1C. AND 3.1D.

- C.** Require that a respirator be worn by anyone in a Work Area at all times, regardless of activity, during a period that starts with any operation which could cause disturbance of lead based paint or dust, until the area has met the requirements of Section 01715 or Section 01421.
- D.** Regardless of Airborne Lead Levels or Surface Dust Contamination: Require that the minimum level of respiratory protection used be half-face air-purifying respirators with high efficiency filters.

- E. Do not allow the use of single-use, disposable, or quarter-face respirators for any purpose.

3.2 FIT TESTING:

- A. **Initial Fitting:** Fit types of respirator to be worn by each individual. Require that an individual use only those respirators for which training and fit testing has been provided. require that fit testing be repeated semiannually, and at any time a respirator is replaced.
- B. On a Monthly Basis, check the fit of each worker's respirator by having irritant smoke blown onto the respirator from a smoke tube.
- C. **Upon Each Wearing:** Require that each time an air-purifying respirator is put on it be checked for fit with a positive and negative pressure fit check in accordance with 29 CFR 1926.62, Appendix D.

3.3 PERMISSIBLE EXPOSURE LIMIT (PEL):

FOLLOWING IS THE CURRENT OSHA PERMISSIBLE EXPOSURE LIMIT AND ACTION LEVEL FOUND IN 29 CFR 1926.62

- A. **Permissible Exposure Limit** (PEL-TWA) - 50 micrograms/cubic meter
- B. **Action Level** (TWA) - 30 micrograms/cubic meter

FOLLOWING ARE BASED ON CURRENT OSHA REQUIREMENTS. FOR MORE DETAIL ON PROTECTION FACTORS REFER TO ANSI Z88.2-1992.

3.4 TYPE OF RESPIRATORY PROTECTION REQUIRED:

- A. Provide Respiratory Protection as indicated in paragraph below.

3.5 RESPIRATORY PROTECTION FACTOR:

Table I. -- Respiratory Protection for Lead Aerosols

- A. Airborne concentration of lead or Required respirator{1} condition of use
 - 1. Not in excess of 500 $\mu\text{g}/\text{M}^3$
 - 1/2 mask air purifying respirator with high efficiency filters.{2},{3} 1/2 mask supplied air respirator operated in demand (negative pressure) mode.
 - 2. Not in excess of 1,250 $\mu\text{g}/\text{M}^3$
 - Loose fitting hood or helmet powered air purifying respirator with high efficiency filters.{3} Hood or helmet supplied air respirator operated in a continuous flow mode -- e.g., type CE abrasive blasting respirators

operated in a continuous-flow mode.

3. Not in excess of 2,500 $\mu\text{g}/\text{M}^3$
Full facepiece air purifying respirator with high efficiency filters.{3} Tight fitting powered air purifying respirator with high efficiency filters.{3} Full facepiece supplied air respirator operated in demand mode. 1/2 mask or full facepiece supplied air respirator operated in a continuous-flow mode. Full facepiece self-contained breathing apparatus (SCBA) operated in demand mode.
4. Not in excess of 50,000 $\mu\text{g}/\text{M}^3$
1/2 mask supplied air respirator operated in pressure demand or other positive-pressure mode.
5. Not in excess of 100,000 $\mu\text{g}/\text{M}^3$
Full facepiece supplied air respirator operated in pressure demand or other positive-pressure mode -- e.g., type CE abrasive blasting respirators operated in a positive-pressure mode.
6. Greater than 100,000 $\mu\text{g}/\text{M}^3$ or unknown
Full facepiece SCBA operated in concentration pressure demand or other positive- pressure mode

{1} Respirators specified for higher concentrations can be used at lower concentrations of lead.

{2} Full facepiece is required if the lead aerosols cause eye or skin irritation at the use concentrations.

{3} A high efficiency particulate filter (HEPA) means a filter that is 99.97 percent efficient against particles of 0.3 micron size or larger.

3.6 AIR PURIFYING RESPIRATORS:

- A. **Negative pressure:** Half or full face mask: Supply a sufficient quantity of respirator HEPA filters approved for lead, so that workers can change filters as necessary. Require that respirators be wet-rinsed, and filters discarded or covered with duct tape, each time a worker leaves the Work Area. Store respirators and filters at the job site in the changing room and protect totally from exposure to lead prior to their use. Respirator cartridges must be replaced whenever a worker experiences increased breathing resistance.
- B. **Powered air purifying:** Half or full face mask: Supply a sufficient quantity of high efficiency respirator filters approved for lead so that workers can change filters at any time that flow through the face piece decreases to the level at which the manufacturer recommends filter replacement. Require that regardless of flow, filter cartridges be replaced after 40 hours of use. Require that HEPA elements in filter cartridges be protected from wetting during personal decontamination. Require entire exterior housing of respirator, including blower unit, filter cartridges, hoses, battery pack, face mask, belt,

and cords, be washed each time a worker leaves the Work Area. Caution should be used to avoid shorting battery pack during washing. Provide an extra battery pack for each respirator so that one can be charging while one is in use.

END OF SECTION - 01556

SECTION 01602 - MATERIALS AND EQUIPMENT

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THIS SECTION USES THE TERM "OWNER'S REPRESENTATIVE". CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY THE DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

THIS SECTION DOES NOT INCLUDE PROVISIONS NECESSARY FOR AESTHETIC REQUIREMENTS OF PUT-BACK FOLLOWING ABATEMENT. REFER TO THE APPROPRIATE SECTION IN AIA "MASTERSPEC®" CSI "SPECTEXT" OR OTHER ADEQUATE GUIDE SPECIFICATION.

PART 1 - GENERAL

1.0 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements governing the Contractor's selection of products for use in the Project. REVISE THE NEXT PARAGRAPH IF A MORE DETAILED SCHEDULE IS REQUIRED.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals."
- C. Standards: Refer to Section "Definitions and Standards" for applicability of industry standards to products specified.
- D. Administrative procedures for handling requests for substitutions made after award of the Contract are included under Section 01633, Substitutions - Lead-Based Paint.

1.3 DEFINITIONS RETAIN THE FOLLOWING ARTICLE. THESE DEFINITIONS REFER SPECIFICALLY TO THE CONTENTS OF THIS SECTION AND ARE NOT REPEATED IN SECTION "DEFINITIONS AND STANDARDS."

A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms such are self-explanatory and have well recognized meanings in the construction industry.

1. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

a. "Named Products" are items identified by manufacturer's product name, including make or model designation, indicated in the manufacturer's published product literature, that is current as of the date of the Contract Documents.

DELETE THE NEXT PARAGRAPH UNLESS USE OF FOREIGN PRODUCTS IS LIMITED BY PROVISIONS INCLUDED IN ARTICLE "QUALITY ASSURANCE".

b. "Foreign Products", as distinguished from "domestic products," are items substantially manufactured (50 percent or more of value) outside of the United States and its possessions; or produced or supplied by entities substantially owned (more than 50 percent) by persons who are not citizens of nor living within the United States and its possessions.

2. "Materials" are products that are substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

3. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

1.4 SUBMITTALS

ARTICLE 5.2.1 OF AIA A 201 REQUIRES THE CONTRACTOR TO FURNISH A LIST OF PROPOSED SUBCONTRACTORS AND SUPPLIERS. AIA A 511 SUGGESTS EXPANSION OF THIS REQUIREMENT TO INCLUDE MANUFACTURERS AND INSTALLERS.

A. Product List Schedule: Prepare a schedule showing products specified in a tabular form acceptable to the Owner's Representative. Include generic names of products required. Include the manufacturer's name and proprietary product names for each item listed.

1. Coordinate the product list schedule with the Contractor's Construction Schedule and the Schedule of Submittals.

RETAIN THE NEXT PARAGRAPH ONLY IF SPECIFIC DATA ARE REQUIRED ON EACH ITEM.

2. **Form:** Prepare the product listing schedule with information on each item tabulated under the following column headings:

DELETE HEADINGS THAT ARE NOT NECESSARY FOR THE PROJECT. ADD HEADINGS AS NECESSARY. SEE EVALUATIONS FOR POSSIBLE EXPANSION OF THIS SCHEDULING ACTIVITY.

- a. **Related Specification** Section number.
 - b. **Generic name** used in Contract Documents.
 - c. **Proprietary name**, model number and similar designations.
 - d. **Manufacturer's name** and address.
 - e. **Supplier's name** and address.
 - f. **Installer's name** and address.
 - g. **Projected delivery date**, or time span of delivery period.
3. **Initial Submittal:** Before start of work submit 3 copies of an initial product list schedule. Provide a written explanation for omissions of data, and for known variations from Contract requirements.

USUALLY RETAIN THE NEXT PARAGRAPH. CHANGE THE REVIEW PERIOD TO SUIT SPECIAL PROJECT CONDITIONS.

4. **Designer's Action:** The Designer will respond in writing to the Contractor within 2 weeks of receipt of the completed product list schedule. No response within this time period constitutes no objection to listed manufacturers or products, but does not constitute a waiver of the requirement that products comply with Contract Documents. The Owner's Representative's response will include the following:

ADD OTHER ELEMENTS TO THE FOLLOWING LIST AS NECESSARY TO SUIT PROJECT CONDITIONS.

- a. A list of unacceptable product selections, containing a brief explanation of reasons for this action.

1.5 QUALITY ASSURANCE

- A. **Source Limitations:** To the fullest extent possible, provide products of the same kind, from a single source.

THE NEXT PARAGRAPH CONTAINS A REQUIREMENT THAT COULD BE CONSIDERED PART OF PROJECT COORDINATION.

- B. **Compatibility of Options:** When the Contractor is given the option of selecting between two or more products for use on the Project, the product selected shall be compatible with products previously selected, even if previously selected products were also options.

GENERALLY DELETE THE NEXT PARAGRAPH. IT CONTAINS A LIMITATION DESIRED BY

SOME OWNERS, BUT DIFFICULT TO ENFORCE. REVIEW REQUIREMENTS WITH THE OWNER'S COUNSEL.

- C. **Foreign Product Limitations:** Except under one or more of the following conditions, provide domestic products, not foreign products, for inclusion in the Work:

ADD EXCEPTIONS AS NECESSARY TO SUIT PROJECT REQUIREMENTS.

1. No available domestic product complies with the Contract Documents.
2. Domestic products that comply with Contract Document are only available at prices or terms that are substantially higher than foreign products that also comply with the Contract Documents.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

THE ARTICLE BELOW ELIMINATES THE NEED TO INCLUDE THIS INFORMATION IN EACH SECTION IN DIVISIONS-2 THROUGH -16. LIMIT USE OF THIS ARTICLE IN EACH SECTION TO UNUSUAL REQUIREMENTS.

- A. Deliver, store and handle products in accordance with the manufacturer's recommendations, using means and methods that will prevent damage, deterioration and loss, including theft.

DELETE PARAGRAPHS BELOW THAT ARE NOT NECESSARY. INSERT PARAGRAPHS NECESSARY TO SATISFY SPECIAL PROJECT REQUIREMENTS.

1. Schedule delivery to minimize long-term storage at the site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft and other losses.
3. Deliver products to the site in the manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting and installing.
4. Inspect products upon delivery to ensure compliance with the Contract Documents, and to ensure that products are undamaged and properly protected.
5. Store products at the site in a manner that will facilitate inspection and measurement of quantity or counting of units.
6. Store heavy materials away from the Project structure in a manner that will not endanger the supporting construction.
7. Store products subject to damage by the elements above ground, under cover in a weather-tight enclosure, with ventilation adequate to prevent condensation. Maintain temperature and humidity within range required by manufacturer's instructions.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

THE METHODS OF SPECIFYING USED LIMIT THE OPTIONS AVAILABLE TO THE CONTRACTOR FOR PRODUCT SELECTION. THIS ARTICLE DEFINES PROCEDURES GOVERNING PRODUCT SELECTION. REFER TO AIA MASTERSPEC® OR THE CSI MANUAL OF PRACTICE FOR A DISCUSSION OF THE SPECIFYING METHODS. REVISE AND EXPAND THE NEXT PARAGRAPH AS NECESSARY TO SUIT PROJECT REQUIREMENTS.

- A. General Product Requirements:** Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, unused at the time of installation.

AMPLIFY THE PARAGRAPH ABOVE BY INSERTING PARAGRAPHS SIMILAR TO THE EXAMPLES BELOW.

- 1. Provide products complete with all accessories, trim, finish, safety guards and other devices and details needed for a complete installation and for the intended use and effect.
- 2. **Standard Products:** Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.

- B. Product Selection Procedures:** Product selection is governed by the Contract Documents and governing regulations, not by previous Project experience. Procedures governing product selection include the following:

RETAIN THE PARAGRAPH BELOW WHEN THE SPECIFICATIONS CONTAIN EXAMPLES OF PROPRIETARY SPECIFICATIONS (CLOSED PROPRIETARY SINGLE PRODUCT SPECIFICATIONS AS DESCRIBED IN THE CSI "MANUAL OF PRACTICE"). REVISE IF PROJECT CONDITIONS PERMIT CONSIDERATION OF SUBSTITUTIONS.

- 1. **Proprietary Specification Requirements:** Where only a single product or manufacturer is named, provide the product indicated. No substitutions will be permitted.

RETAIN THE PARAGRAPH BELOW WHEN THE SPECIFICATIONS CONTAIN EXAMPLES OF SEMI-PROPRIETARY SPECIFICATIONS (CLOSED PROPRIETARY OPTIONAL PRODUCTS SPECIFICATIONS AS DESCRIBED IN THE CSI "MANUAL OF PRACTICE"). REVISE IF PROJECT CONDITIONS PERMIT CONSIDERATION OF SUBSTITUTIONS.

- 2. **Semi-proprietary Specification Requirements:** Where two or more products or manufacturers are named, provide one of the products indicated. No substitutions will be permitted.

DELETE THE NEXT PARAGRAPH. RETAIN ONLY WHEN THE PROJECT REQUIRES USE OF A TERM SIMILAR TO "OR EQUAL" WHEN PRODUCTS ARE SPECIFIED BY NAME. THE NEXT PARAGRAPH PROVIDES THE MAXIMUM CONTROL POSSIBLE OVER USE OF THIS TYPE OF SPECIFICATION.

- a. Where products or manufacturers are specified by name, accompanied by the term "or equal," or "approved equal" comply with the Contract Document provisions concerning

"substitutions" to obtain approval for use of an unnamed product.

RETAIN THE NEXT PARAGRAPH ONLY WHEN THE "AVAILABLE PRODUCTS" OR "AVAILABLE MANUFACTURER" PARAGRAPHS ARE USED. NOTE: THIS IS NOT A METHOD OF SPECIFYING. IT SHOULD NOT BE USED UNLESS SPECIFICATIONS ALSO ESTABLISH PERFORMANCE REQUIREMENTS, REQUIRE COMPLIANCE WITH AN INDUSTRY STANDARD, OR USE SOME OTHER METHOD TO ESTABLISH PRODUCT REQUIREMENTS. SEE EVALUATIONS FOR FURTHER DISCUSSION.

3. **Non-Proprietary Specifications:** When the Specifications list products or manufacturers that are available and may be incorporated in the Work, but do not restrict the Contractor to use of these products only, the Contractor may propose any available product that complies with Contract requirements. Comply with Contract Document provisions concerning "substitutions" to obtain approval for use of an unnamed product.

RETAIN THE PARAGRAPH BELOW WHEN THE SPECIFICATIONS CONTAIN EXAMPLES OF DESCRIPTIVE SPECIFICATIONS.

4. **Descriptive Specification Requirements:** Where Specifications describe a product or assembly, listing exact characteristics required, with or without use of a brand or trade name, provide a product or assembly that provides the characteristics and otherwise complies with Contract requirements.

RETAIN THE PARAGRAPH BELOW WHEN THE SPECIFICATIONS CONTAIN EXAMPLES OF PERFORMANCE SPECIFICATIONS.

- 5. Performance Specification Requirements:** Where Specifications require compliance with performance requirements, provide products that comply with these requirements, and are recommended by the manufacturer for the application indicated. General overall performance of a product is implied where the product is specified for a specific application.
- a. Manufacturer's recommendations may be contained in published product literature, or by the manufacturer's certification of performance.

USUALLY RETAIN THE PARAGRAPH BELOW. MOST SPECIFICATIONS WILL CONTAIN EXAMPLES OF PRODUCTS THAT REQUIRE COMPLIANCE WITH SOME RECOGNIZED STANDARDS, CODES OR REGULATIONS. SEE EVALUATIONS FOR FURTHER DISCUSSION.

- 6. Compliance with Standards, Codes and Regulations:** Where the Specifications only require compliance with an imposed code, standard or regulation, select a product that complies with the standards, codes or regulations specified.

PART 3 - EXECUTION

3.1 INSTALLATION OF PRODUCTS:

- A.** Comply with manufacturer's instructions and recommendations for installation of products in the applications indicated. Anchor each product securely in place, accurately located and aligned with other Work.
1. Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

INSERT INSTALLATION REQUIREMENTS NECESSARY TO SUIT PROJECT REQUIREMENTS. IF A REFERENCE TO AN INCLUDED "LIST OF PRODUCTS" WAS RETAINED, INCLUDE THIS LIST AT THIS POINT.

IF A REFERENCE TO AN INCLUDED "LIST OF PRODUCTS" WAS RETAINED, INCLUDE THIS LIST AT THIS POINT.

END OF SECTION 01602

SECTION 01633 - SUBSTITUTIONS - LEAD-BASED PAINT

BASED ON MASTERSPEC® SECTION ON "SUBSTITUTIONS" COPYRIGHT 1994 BY AIA, AMERICAN INSTITUTE OF ARCHITECTS.

THIS SECTION USES THE TERM "DESIGNER". CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY THE DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for handling requests for alternative procedures or substitutions made after award of the Contract.
- B. The Contractor's Construction Schedule and the Schedule of Submittals are included under Section "Submittals - Lead-Based Paint."
- C. Standards: Refer to Section "Referenced Standards and Definitions - Lead-Based Paint" for applicability of industry standards to products specified.
- D. Procedural requirements governing the Contractor's selection of products and product options are included under Section "Materials and Equipment - Lead-Based Paint."

1.3 DEFINITIONS

RETAIN THE ENTIRE ARTICLE BELOW. THESE DEFINITIONS REFER SPECIFICALLY TO THE CONTENTS OF THIS SECTION AND ARE NOT REPEATED IN SECTION "DEFINITIONS AND STANDARDS."

- A. **Definitions** used in this Article are not intended to change or modify the meaning of other terms used in the Contract Documents.

REVISE THE FOLLOWING PARAGRAPHS AS APPROPRIATE FOR MULTIPLE PRIME CONTRACTS OR SPECIAL PROJECT REQUIREMENTS.

- B. Substitutions:** Requests for changes in work procedures, products, materials, equipment, and methods of construction required by Contract Documents proposed by the Contractor after award of the Contract are considered requests for "substitutions." The following are not considered substitutions:

DELETE THE NEXT PARAGRAPH IF SUBSTITUTION REQUESTS WILL NOT BE CONSIDERED DURING THE BIDDING PERIOD. REVISE IF REQUESTS MAY BE PROPOSED BY BIDDERS AND SUBMITTED WITH THE BID. SEE THE EVALUATIONS FOR DISCUSSION ON TIMING OF SUBSTITUTION REQUESTS AND THE OPEN PROPRIETARY METHOD OF SPECIFYING PRODUCTS DESCRIBED IN THE CSI MANUAL OF PRACTICE.

1. Substitutions requested by Bidders during the bidding period, and accepted prior to award of Contract, are considered as included in the Contract Documents and are not subject to requirements specified in this Section for substitutions.
2. Revisions to Contract Documents requested by the Owner or Designer.
3. Specified options of products and construction methods included in Contract Documents.
4. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.

1.4 SUBMITTALS

SUBSTITUTION REQUESTS ARE NOT ADDRESSED DIRECTLY IN AIA A 201, BUT AIA A 511 SUGGESTS ADDING REQUIREMENTS TO ARTICLE 3.4 OF AIA A 201 FOR CONSIDERATION OF REQUESTS RECEIVED AFTER CONTRACT AWARD. THE PARAGRAPHS BELOW, AND IN ARTICLE "SUBSTITUTIONS", AMPLIFY REQUIREMENTS SUGGESTED BY AIA A 511.

REVISE THE TIME PERIOD IN THE PARAGRAPH BELOW TO SATISFY PROJECT REQUIREMENTS. SEE EVALUATIONS FOR FURTHER DISCUSSION

- A. Substitution Request Submittal:** Requests for substitution will be considered if received within 3 weeks prior to beginning work affected by the substitution. Requests received less than 3 weeks before commencement of affected work may be considered or rejected at the discretion of the Designer.
1. Submit 3 copies of each request for substitution for consideration. Submit requests in the form and in accordance with procedures required for Change Order proposals.
 2. Identify the work procedure product, or the fabrication or installation method to be replaced in each request. Include related Specification Section and Drawing numbers. Provide complete documentation showing compliance with the requirements for substitutions, and the following

information, as appropriate:

DELETE REQUIREMENTS BELOW THAT ARE NOT UNNECESSARY OR INCLUDED IN SUPPLEMENTARY CONDITIONS. MODIFY RETAINED PARAGRAPHS TO SATISFY PROJECT CIRCUMSTANCES.

- a. **Product Data**, including Drawings and descriptions of products, fabrication and installation procedures.
- b. **Samples**, where applicable or requested.
- c. A detailed comparison of significant qualities of the proposed substitution with those of the Work specified. Significant qualities may include elements such as size, weight, durability, performance and visual effect.
- d. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by the Owner and separate Contractors, that will become necessary to accommodate the proposed substitution.
- e. A statement indicating the substitution's effect on the Contractor's Construction Schedule compared to the schedule without approval of the substitution. Indicate the effect of the proposed substitution on overall Contract Time.
- f. Cost information, including a proposal of the net change, if any in the Contract Sum.
- g. Certification by the Contractor that the substitution proposed is equal-to or better in every significant respect to that required by the Contract Documents, and that it will perform adequately in the application indicated. Include the Contractor's waiver of rights to additional payment or time, that may subsequently become necessary because of the failure of the substitution to perform adequately.

REVISE THE TIME LIMITS IN THE PARAGRAPH BELOW TO ALLOW MORE TIME TO PROCESS REQUESTS, IF DESIRED.

3. **Designer's Action:** Within one week of receipt of the request for substitution, the Designer will request additional information or documentation necessary for evaluation of the request. Within 2 weeks of receipt of the request, or one week of receipt of the additional information or documentation, which ever is later, the Designer will notify the Contractor of acceptance or rejection of the proposed substitution. If a decision on use of a proposed substitute cannot be made or obtained within the time allocated, use the product specified by name. Acceptance will be in the form of a Change Order.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

REVIEW THIS ARTICLE WITH THE OWNER'S LEGAL COUNSEL.

- A. Conditions:** The Contractor's substitution request will be received and considered by the Designer when one or more of the following conditions are satisfied, as determined by the Designer; otherwise requests will be returned without action except to record noncompliance with these requirements.

DELETE OR MODIFY CONDITIONS BELOW THAT ARE NOT ACCEPTABLE. IF DESIRED, INSERT MORE RESTRICTIVE CONDITIONS TO LIMIT CONSIDERATION OF PROPOSED SUBSTITUTIONS.

1. Extensive revisions to Contract Documents are not required.
2. Proposed changes are in keeping with the general intent of Contract Documents.
3. The request is timely, fully documented and properly submitted.

DELETE THE NEXT PARAGRAPH IF AN "OR-EQUAL" CLAUSE IS NOT INCLUDED.

4. The request is directly related to an "or equal" clause or similar language in the Contract Documents, or produces the same results if a change in work procedure.
5. The specified product or method of construction cannot be provided within the Contract Time. The request will not be considered if the product or method cannot be provided as a result of failure to pursue the Work promptly or coordinate activities properly.
6. The specified product or method of construction cannot receive necessary approval by a governing authority, and the requested substitution can be approved.
7. A substantial advantage is offered the Owner, in terms of cost, time, energy conservation or other considerations of merit, after deducting offsetting responsibilities the Owner may be required to bear. Additional responsibilities for the Owner may include additional compensation to the Designer for redesign and evaluation services, increased cost of other construction by the Owner or separate Contractors, and similar considerations.
8. The specified product or method of construction cannot be provided in a manner that is compatible with other materials, and where the Contractor certifies that the substitution will overcome the incompatibility.
9. The specified product or method of construction cannot be coordinated with other materials, and where the Contractor certifies that the proposed substitution can be coordinated.

10. The specified product or method of construction cannot provide a warranty required by the Contract Documents and where the Contractor certifies that the proposed substitution provide the required warranty.

RETAIN THE NEXT PARAGRAPH ONLY IF THE PROJECT IS CONSTRUCTED UNDER MULTIPLE PRIME CONTRACTS. ADD REQUIREMENTS AS NECESSARY. THERE MAY BE CONFLICTS AND OTHER PROBLEMS WHERE ONE CONTRACTOR'S PROPOSED SUBSTITUTION AFFECTS ANOTHER CONTRACTOR'S WORK.

11. Where a proposed substitution involves more than one prime Contractor, each Contractor shall cooperate with the other Contractors involved to coordinate the Work, provide uniformity and consistency, and to assure compatibility of products.

USUALLY RETAIN THE NEXT PARAGRAPH.

- B. The Contractor's submittal and Designer's acceptance of Shop Drawings, Product Data or Samples that relate to construction activities not complying with the Contract Documents does not constitute an acceptable or valid request for substitution, nor does it constitute approval.

PART 3 - EXECUTION (Not Applicable)

END OF SECTION 01633

SECTION 01702 - PROJECT CLOSEOUT - LEAD BASED PAINT

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THIS SECTION USES THE TERM "DESIGNER". CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY THE DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:
 - 1. Inspection procedures.
 - 2. Project record document submittal.
 - 3. Submittal of warranties.
 - 4. Final cleaning.
- B. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions-2 through -16.

1.3 SUBSTANTIAL COMPLETION

- A. **Preliminary Procedures:** Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

DELETE ITEMS THAT ARE NOT APPLICABLE FROM THE LIST BELOW OR MODIFY ITEMS RETAINED TO SUIT PROJECT.

- 1. In the Application for Payment that coincides with, or first follows, the date Substantial Completion is claimed, show 100 percent completion for the portion of the Work claimed as substantially complete. Include supporting documentation for completion as indicated in these Contract Documents and a statement showing an accounting of changes to the Contract Sum.

- a. If 100 percent completion cannot be shown, include a list of incomplete items, the value of incomplete construction, and reasons the Work is not complete.

SEE THE EVALUATIONS FOR COMMENTS ON THE PARAGRAPHS BELOW.

2. Advise Owner of pending insurance change-over requirements.
3. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
4. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.

USUALLY DELETE THE NEXT PARAGRAPH. HOLD THIS MATERIAL FOR FINAL ACCEPTANCE.

5. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
6. Deliver tools, spare parts, extra stock, and similar items.
7. Make final change-over of permanent locks and transmit keys to the Owner. Advise the Owner's personnel of change-over in security provisions.
8. Complete start-up testing of systems, and instruction of the Owner's operating and maintenance personnel. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

DELETE THE NEXT PARAGRAPH IF THESE ITEMS ARE NOT INCLUDED IN THE WORK OR ARE DELAYED UNTIL FINAL ACCEPTANCE.

9. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

MODIFY THE NEXT PARAGRAPH TO COMPLY WITH OFFICE POLICY AND PROJECT REQUIREMENTS.

- B. Inspection Procedures:** On receipt of a request for inspection, the Designer will either proceed with inspection or advise the Contractor of unfilled requirements. The Designer will prepare the Certificate of Substantial Completion following inspection, or advise the Contractor of construction that must be completed

or corrected before the certificate will be issued.

1. The Designer will repeat inspection when requested and assured that the Work has been substantially completed.
2. Results of the completed inspection will form the basis of requirements for final acceptance.

1.4 FINAL ACCEPTANCE

- A. Preliminary Procedures:** Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

REVISE THE PARAGRAPHS BELOW TO MATCH SUPPLEMENTARY CONDITIONS.

1. Submit the final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of the Designer final inspection list of items to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, and the list has been endorsed and dated by the Designer.
4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when the Owner took possession of and responsibility for corresponding elements of the Work.
5. Submit consent of surety to final payment.
6. Submit a final liquidated damages settlement statement.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.

MODIFY THE NEXT PARAGRAPH TO COMPLY WITH OFFICE POLICY AND PROJECT REQUIREMENTS.

- B. Reinspection Procedure:** The Designer will reinspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to the Designer.

1. Upon completion of reinspection, the Designer will prepare a certificate of final acceptance, or advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. If necessary, reinspection will be repeated.

ON LARGE PROJECTS THERE IS SOMETIMES A SECTION DEDICATED TO "PROJECT RECORD DOCUMENTS." AIA MASTERSPEC® HAS A "NARROWSCOPE" SECTION FOR THIS. DELETE THE NEXT ARTICLE WHEN NARROWSCOPE SECTION "PROJECT RECORD DOCUMENTS" IS USED.

1.5 RECORD DOCUMENT SUBMITTALS

GENERAL PROVISIONS FOR RECORD DOCUMENTS ARE INCLUDED IN ARTICLE 3.11 OF AIA DOCUMENT A 201. THE PARAGRAPHS IN THIS ARTICLE EXPAND UPON THOSE REQUIREMENTS.

- A. General:** Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Designer's reference during normal working hours.

DELETE THE FOLLOWING IF RECORD DRAWINGS ARE NOT REQUIRED.

- B. Record Drawings:** Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark the set to show the actual installation where the installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.
1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
 2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
 3. Note related Change Order numbers where applicable.
 4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

CONSIDER DELETING THE NEXT PARAGRAPH ON SMALL PROJECTS.

- C. **Record Specifications:** Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with the text of the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot otherwise be readily discerned later by direct observation. Note related record drawing information and Product Data.
5. Upon completion of the Work, submit record Specifications to the Designer for the Owner's records.

CONSIDER DELETING THE NEXT PARAGRAPH ON SMALL PROJECTS. IF CHANGE ORDER PROPOSALS INCLUDE RESUBMITTAL OF UPDATED PRODUCT DATA THE NEED TO MARK-UP THE PREVIOUS SUBMITTAL IS ELIMINATED.

- C. **Record Product Data:** Maintain one copy of each Product Data submittal. Mark these documents to show significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the site, and from the manufacturer's installation instructions and recommendations. Give particular attention to concealed products and portions of the Work which cannot otherwise be readily discerned later by direct observation. Note related Change Orders and mark-up of record drawings and Specifications.
1. Upon completion of mark-up, submit complete set of record Product Data to the Designer for the Owner's records.

THE NEXT PARAGRAPH REPRESENTS THE NORMAL DISPOSITION OF SAMPLES.

- D. **Record Sample Submitted:** Immediately prior to the date or dates of Substantial Completion, the Contractor will meet at the site with the Designer and the Owner's personnel to determine which of the submitted Samples that have been maintained during progress of the Work are to be transmitted to the Owner for record purposes. Comply with delivery to the Owner's Sample storage area.

ALWAYS INCLUDE THE FOLLOWING AS IT APPLIES TO SUBMITTALS OF LANDFILL RECEIPTS, LOGS, ETC.

- E. **Miscellaneous Record Submittals:** Refer to other Specification

Sections for requirements of miscellaneous record-keeping and submittals in connection with actual performance of the Work. Immediately prior to the date or dates of Substantial Completion, complete miscellaneous records and place in good order, properly identified and bound or filed, ready for continued use and reference. Submit to the Designer for the Owner's records.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 FINAL HOUSEKEEPING

DELETE THIS ARTICLE WHEN OWNER PREFERS TO USE HIS OWN FORCES. CLEANING PROVISIONS IN GENERAL CONDITIONS ARE LIMITED TO RUBBISH REMOVAL AND SIMILAR ACTIVITIES. THE CLEANING HERE IS IN ADDITION TO CLEANING WHICH IS PART OF DECONTAMINATION ACTIVITIES. THIS SECTION IS INTENDED TO RETURN THE BUILDING TO THE OWNER IN PRESENTABLE CONDITION.

- A. General:** General cleaning during construction is required by the General Conditions and included in Section "Temporary Facilities".
- B. Cleaning:** Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

IF FINAL CLEANING IS DELAYED UNTIL FINAL ACCEPTANCE, MODIFY THE NEXT PARAGRAPH.

1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.

THE FOLLOWING IS A SAMPLE LIST OF FINAL CLEANING REQUIREMENTS. MODIFY TO SUIT PROJECT. IF THE LIST IS EXTENSIVE USE THE NARROWSCOPE SECTION "FINAL CLEANING" IN MASTERSPEC®.

- a. Remove labels that are not permanent labels.
- b. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.

- c. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.
- d. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
- e. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

THE NEXT TWO PARAGRAPHS REPRESENT THE END OF WORK SPECIFIED IN SECTION "TEMPORARY FACILITIES." MOST PROJECTS REQUIRE THESE ACTIONS AT COMPLETION OF CONSTRUCTION.

- C. **Removal of Protection:** Remove temporary protection and facilities installed for protection of the Work during construction.
- D. **Compliance:** Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.
 - 1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

END OF SECTION 01702

SECTION 01715 - PROJECT DECONTAMINATION - LEAD-BASED PAINT

PART 1 - GENERAL

THIS SECTION DETAILS THE DECONTAMINATION PROCEDURES TO BE FOLLOWED DURING REMOVAL OF SHEET PLASTIC ISOLATING THE WORK AREA.

FOR DECONTAMINATION AND REMOVAL OF LEAD CONTAINING DUST THAT IS AN EXISTING CONDITION AND IS NOT GENERATED BY LEAD HAZARD REDUCTION ACTIVITIES SEE SECTION 02068 - CLEANING AND DECONTAMINATION - LEAD-BASED PAINT.

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF REQUIREMENTS:.

- A. **General:** Decontamination of the Work Area following Lead-Based Paint Hazard Reduction.

1.3 RELATED WORK SPECIFIED ELSEWHERE:

EDIT FOLLOWING LIST TO MEET PROJECT REQUIREMENTS.

- A. Removal of Gross Debris is integral with the performance of Lead Hazard reduction work and as such is specified in the appropriate work section(s) of these specifications:
 - 1. Section 02065 Removal of Lead-Based Painted Substrates
 - 2. Section 05582 Sheet Metal Enclosure - Lead-Based Paint
 - 3. Section 06106 Wood Enclosures - Lead-Based Paint
 - 4. Section 06107 Exterior Siding & Enclosure - Lead-Based Paint
 - 5. Section 06402 Carpentry & Trim Work - Lead-Based Paint
 - 6. Section 06403 Repair of Lead-Based Painted Substrates
 - 7. Section 09252 Gypsum Wallboard Enclosure - Lead-Based Paint

8. Section 09253 Cementitious Enclosures - Lead-Based Paint
 9. Section 09940 Encapsulation - Lead-Based Paint
 10. Section 09951 Chemical Stripping of Lead-Based Paint
 11. Section 09952 Mechanical Removal of Lead-Based Paint
 12. Section 09953 Surface Preparation-Paint Stabilization - Lead-Based Paint
 13. Section 09954 Painting - Lead-Based Paint
- B. Work Area Clearance: Wipe sample testing and other requirements which must be met before release of Contractor and reoccupancy of the work area are specified in Section 01421 Project Clearance.

PART 2 - PRODUCTS

2.1 Disposal Bags/Plastic Sheeting: Provide 6 mil polyethylene disposal bags sealed with duct tape.

THE USE OF DETERGENT WITH HIGH PHOSPHATE CONTENT ARE RESTRICTED OR BANNED IN SOME AREAS BECAUSE OF THE IMPACT ON THE ENVIRONMENT. OTHER DETERGENTS THAT ARE LEAD-SPECIFIC MAY BE EQUALLY EFFECTIVE AND SHOULD BE PERMITTED.

EVEN DILUTED, TRI-SODIUM PHOSPHATE IS VERY IRRITATING TO THE SKIN AND SHOULD BE USED ONLY WITH WATERPROOF GLOVES AND EYE PROTECTION. PORTABLE EYE WASH FACILITIES SHOULD BE AVAILABLE.

2.2 Wet Detergent Wash: Provide detergent with high phosphate content (at least 5%) trisodium phosphate (TSP). Follow dilution ratio recommended by manufacturer's instructions.

CONSIDER PARAGRAPH BELOW FOR NON-TSP DETERGENTS. DELETE ABOVE OR BELOW.

Wet Detergent Wash: Provide detergent or cleaning agent formulated to be effective in removing lead dust. Follow dilution ratio recommended by the manufacturer's instructions.

PART 3 - EXECUTION

3.1 GENERAL:

THE NEXT PARAGRAPH SHOULD BE EDITED IF SECTION 02068 IS INCLUDED AS THE REMOVAL OF A LARGE QUANTITY OF PRE-EXISTING LEAD-CONTAINING DUST SHOULD NOT BE REMOVED HERE.

- A. Work of This Section: includes the decontamination of surfaces in the Work Area which has been, or may have been, contaminated by lead dust generated during Hazard Reduction activities, or which may previously have been elevated.
- B. Work of This Section: includes the cleaning, decontamination, and removal of temporary facilities installed prior to Hazard Reduction work, including:
 - 1. Floor Sheeting and Critical barriers erected by work of Section 01506
- C. Work of This Section: includes the cleaning, and decontamination of all surfaces (ceiling, walls, floor) of the Work Area, and all cabinetry or equipment in the Work Area.

3.2 START OF WORK:

- A. Previous Work: During completion of the Lead Hazard reduction work specified in other sections, the layer of polyethylene sheeting will have been removed and disposed of along with any gross debris generated by the lead work.
- B. Start of Work: Work of this section begins with the cleaning of the building surfaces. At start of work the following will be in place:
 - 1. Floor Sheeting And Critical Barrier: A barrier between the work area and other portions of the building or the outside.
 - 2. Critical Barrier Sheeting: Over lighting fixtures, ventilation, openings, doorways, convectors, and other openings.
 - 3. Flapped Doorway Sheeting: Between the work area and the changing room.

3.3 PRELIMINARY FIRST CLEANING:

- A. Preliminary Cleaning: Clean tools, scaffolding, ladders and equipment by HEPA vacuuming. Follow HEPA vacuuming with wet cleaning of all tools and equipment.
- B. Immediately following preliminary cleaning, mist and remove poly sheeting. Remove highest sheeting first and work down to floor. Fold sheeting inward to trap any leaded dust or

residue. Place sheeting in 6 mil disposal bags and dispose if in accordance with Section 02067.

3.4 FINAL CLEANING:

- A. HEPA Vacuum: All surfaces in work area. Start at point farthest from main entrance and finish vacuuming back at that point. Begin at top of each room and work down. Sequence to avoid passing through rooms already cleaned.
- B. Mist Critical barriers sheeting and remove.
- C. HEPA Vacuum area previously covered by critical barrier sheeting.
- D. Perform wet detergent wash of all surfaces. Begin at point farthest from main entrance, work from top to bottom. Take care not to damage existing finishes and surfaces. Change cleaning mixture in accordance with manufacturer's recommendations or minimum after each room. Filter all waste water or dispose of in accordance with section 02067.
- E. Wiping Work Area
 1. The work area should be cleaned using a three container method. Fill two buckets with clean water and place them in the work area with the container of cleaning solution.
 2. Pour cleaning solution onto a clean cloth. Wring excess solution into one of the buckets without placing the cloth into the bucket. Wipe the work surface with the cloth. Add more cleaning solution to the cloth and continue wiping until the entire surface area has been covered. Discard all cloths used in this procedure in the disposal bag.
 3. Dip and wring out a clean cloth in the first rinse bucket. Wipe off the work area. Rinse the cloth in the first bucket again and wring out thoroughly. Rinse the cloth in the second bucket and wring out thoroughly again.
 4. Continue to clean the work surface with the cloth and rinse using this procedure until the entire work surface has been cleaned. Wipe off all tools to remove any dust.
 5. NOTE: The rinse water in the bucket should be changed periodically. The frequency will vary depending on the level of contamination.
- F. Mopping Work Area
 1. Collect any visible debris using wet cloths before mopping the area. Pour the cleaning solution into

the mop bucket. fill two rinse buckets with clean water. Place the mop into the cleaning solution. Wring excess solution into the mop bucket. mop small sections of the work area. Place the mop into the cleaning solution and wring thoroughly between sections. After the entire surface has been mopped thoroughly, rinse the mop head. Completely rinse the surface by placing the mop in the first bucket, wringing it out thoroughly, placing it in the second bucket, wringing thoroughly and then mopping the surface. Continue this cycle until all areas have been rinsed.

2. NOTE: The water in the two containers should be changed periodically. The frequency will depend on the level of contamination.

- G. Perform clear water wash of all surfaces in same manner as wet detergent wash.
- H. After all surfaces in work area are allowed to dry, complete final HEPA vacuuming of all surfaces in same manner as first HEPA vacuuming.
- I. After Final Cleaning Perform a Complete Visual Inspection of the entire work area including: all surfaces, ceiling, walls, floor, doorways, windows, surfaces previously covered with critical barrier sheeting, and other openings; look for debris from any source, residue on surfaces, dust or other matter. If any debris, residue, dust or other matter is found repeat final cleaning and continue decontamination procedure from that point. When the area is visually clean, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by Project Monitor.

CONSIDER DELETING THE NEXT PARAGRAPH IF PAINTING OR SEALING OF SUBSTRATE WILL BE ALLOWED ONLY AFTER CLEARANCE IS OBTAINED.

- J. Painting of substrates: Perform painting/sealing of substrates at this time.
- K. Perform final clearance sampling in accordance with subsection 3.6 final clearance sampling.

3.5 EXTERIOR ABATEMENT DECONTAMINATION:

- A. First Cleaning: Carry out a first cleaning of all surfaces affected by the work including remaining sheeting, ladders, scaffolding and exterior of building in a ten feet (10') radius from the work by use of a High Efficiency Particulate Air (HEPA) filtered vacuum. Immediately following first cleaning remove plastic sheeting and

dispose of. Remove any remaining paint chips on soil or surrounding walk ways, porches, etc.

- B. Final Cleaning: Carry out a final cleaning of all surfaces in the same manner as the first cleaning. Comply with requirements of visual inspection.

3.6 FINAL CLEARANCE SAMPLING:

- A. Wipe Sampling by Atomic Absorption Spectroscopy (AAS) or Inductively Coupled Plasma Emission Spectroscopy (ICP): After the work area is found to be visually clean, wipe samples will be obtained and analyzed in accordance with the procedure set forth in Section 01421 Project Clearance.
 - 1. If Release Criteria are not met, repeat HEPA vacuuming, wet wash, HEPA vacuuming until satisfactory clearance results are obtained.
 - 2. If Release Criteria are met, remove work area isolation. Remove all equipment, materials from the site.

DELETE FOLLOWING PARAGRAPH IF NO SOIL REMEDIATION IS PERFORMED.

- B. Soil Sampling by Atomic Absorption Spectroscopy (AAS) or Inductively Coupled Plasma Emission Spectroscopy (ICP): After the work area is found to be visually clean, soil samples will be obtained and analyzed in accordance with the procedure set forth in Section 01421 Project Clearance.

3.7 SUBSTANTIAL COMPLETION OF HAZARD REDUCTION:

- A. Hazard Reduction Work is Substantially Complete upon meeting the requirements of this section, section 01421 project Clearance , including submission of:
 - 1. Certificate of Visual Inspection
 - 2. Receipts Documenting proper disposal as required by Section 02067 Disposal of Waste Material.
 - 3. Punch list detailing repairs to be made and incomplete items.

3.8 CERTIFICATE OF VISUAL INSPECTION:

MODIFY FOLLOWING IF OTHER PARTIES INDEPENDENT OF THE CONTRACTOR WILL SIGN
CERTIFICATE OF VISUAL INSPECTION AT THE COMPLETION OF WORK

- A. Following this section is a "Certificate of Visual Inspection". This certification is to be completed by the Contractor and certified by the Project Monitor. Submit completed certificate with application for final payment. Final payment will not be made until this certification is executed.

END OF SECTION - 01715

CERTIFICATION OF VISUAL INSPECTION

In accordance with Section 01715 "Project Decontamination" the contractor hereby certifies that he has visually inspected the work area (all surfaces including pipes, counters, ledges, walls, ceiling and floor, behind critical barriers, sheet plastic, etc.) and has found no dust, debris or residue.

by: (Signature _____ Date _____

(Print Name) _____

(Print Title) _____

PROJECT MONITOR CERTIFICATION

The Project Monitor hereby certifies that he has accompanied the contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the contractor's certification above is a true and honest one.

by: (Signature _____ Date _____

(Print Name) _____

(Print Title) _____

WORK AREA

Location: _____

Room: _____

Hazard Reduction Performed: _____

SECTION 02065 - REMOVAL OF LEAD-BASED PAINTED SUBSTRATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 Summary of Work: Work of this section includes the removal and off site disposal of the following lead-based painted substrates.

EDIT, ADD OR DELETE FROM THE FOLLOWING LIST OF EXAMPLES TO MEET PROJECT REQUIREMENTS.

- A. *Plaster and lath walls and ceilings*
- B. *Door jambs at boiler rooms.*
- C. *Wood baseboards and chair rails.*
- D. *Door jambs on the rear entrance of each apartment.*
- E. *Exterior thresholds.*
- F. *Entrance doors.*
- G. *Porch ceilings.*
- H. *Wrought iron railings.*

1.3. RELATED WORK SPECIFIED ELSEWHERE: Removal of lead-based painted windows, related trim, cabinets and other millwork items are specified in section 06402-Carpentry and Trim Work.

PART 2 - PRODUCTS

2.1 DISPOSAL BAGS/PLASTIC SHEETING: Provide 6 mil polyethylene disposal bags or wrap substrates to be disposed of in 6 mil polyethylene, sealed with duct tape.

THE USE OF DETERGENTS WITH HIGH PHOSPHATE CONTENT ARE RESTRICTED OR BANNED IN SOME AREAS BECAUSE OF THE IMPACT ON THE ENVIRONMENT. OTHER DETERGENTS THAT ARE LEAD-SPECIFIC MAY BE EQUALLY EFFECTIVE AND SHOULD BE PERMITTED.

EVEN DILUTED TRI-SODIUM PHOSPHATE IS VERY IRRITATING TO THE SKIN AND SHOULD BE USED ONLY WITH WATERPROOF GLOVES AND EYE PROTECTION. PORTABLE EYE WASH FACILITIES SHOULD BE AVAILABLE.

- 2.3 Wet Detergent Wash:** Provide detergent with a high phosphate content (at least 5%) trisodium phosphate (TSP). Follow dilution ratio recommended by the manufacturer's instructions.

CONSIDER PARAGRAPH BELOW FOR NON-TSP DETERGENTS. DELETE ABOVE OR BELOW.

Wet Detergent Wash: Provide detergent or cleaning agent formulated to be effective in removing lead dust. Follow dilution ratio recommended by the manufacturer's instructions.

PART 3 - EXECUTION

3.1 BEFORE STARTING WORK OF THIS SECTION, COMPLETE THE FOLLOWING:

EDIT LIST TO MEET PROJECT REQUIREMENTS

- A. Section 01504 - Temporary Facilities - Lead-Based Paint**
- B. Section 01505 - Exterior Regulated Areas - Lead Based Paint**
- C. Section 01506 - Work Area Containment - Lead Based Paint**
- D. Section 01555 - Worker Protection - Lead Based Paint**
- E. Section 01556 - Respiratory Protection - Lead-Based Paint**

3.2 GENERAL

- A. Score paint at edges, corners etc. to reduce chipping of paint. Carefully remove by wet scraping loose and flaking paint prior to removal of substrate in accordance with the following procedure:
 - 1. Fine mist surface with wet wash detergent or water using plant mister or garden sprayer.
 - 2. Carefully scrape loose and flaking material.
 - 3. Clean up paint chips and flakes by wet sweeping or pick up with wet towels.
- B. Care shall be taken to avoid damage to adjacent areas during the removal of substrates.
- C. Carefully remove the lead based painted substrates to minimize the disturbance of lead based paint and the generation of lead dust.
- D. HEPA vacuum and/or wet wipe to remove all paint chips, debris and dust generated during the work. Do not allow dust or debris to accumulate.
- E. Substrates that are removed shall be wrapped , labeled and disposal or disposed of in accordance with section 02067 - Disposal of Waste Materials - Lead-Based-Paint.

EDIT, DELETE OR MODIFY THE FOLLOWING PARAGRAPH TO MEET PROJECT SPECIFICS OR EDIT AND USE PARAGRAPH 3.4

- F. Complete interior abatement prior to removal of exterior doors to allow unrestricted access to the apartment unit for inspections, etc.

3.3 DAMAGES: Protect areas adjacent to substrates that are removed for replacement from damage caused by this work. Damages to non-protected areas or from lack of care shall be repaired or replaced at the Contractor's expense.

FOLLOWING IS EXAMPLE TEXT THAT CAN BE USED WHEN RECONSTRUCTION DOES NOT IMMEDIATELY FOLLOW LEAD HAZARD REDUCTION WORK. DIFFERENT MATERIALS AND METHODS MAY BE SPECIFIED DEPENDING ON PROJECT REQUIREMENTS.

3.4 SECURITY: *Install temporary 3/4" plywood and stud framing in openings where entrance doors or windows are removed.*

Provide temporary lockable doors where egress is required.

END OF SECTION 02065

SECTION 02066 - REMEDIATION OF LEAD CONTAMINATED SOIL

PART 1 - GENERAL

1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to work of this section.

1.2 Summary Of Work:

EDIT FOLLOWING PARAGRAPH AFTER TESTING CONFIRMS THAT SOIL CONTAINS LEAD. SHOW AREAS TO BE REMEDIATED ON THE DRAWINGS. THE REMEDIATION REQUIRED WILL BE DEPENDENT ON THE SOIL LEAD CONCENTRATION AND IF THE AREA IS FREQUENTED BY CHILDREN. EXTERIOR LEAD-BASED PAINT CAN BE A SIGNIFICANT SOURCE OF RECONTAMINATION OF SOIL. EXTERIOR PAINT MUST BE ASSESSED AND ADDRESSED IF NECESSARY ALONG WITH SOIL REMEDIATION.

THE SOIL LEAD CONCENTRATION OF 400 PARTS PER MILLION (PPM) INDICATED BELOW IS A "SCREENING LEVEL" NOT A CLEANUP GOAL. SCREENING LEVELS ARE DEFINED BY EPA AS A LEVEL OF CONTAMINATION ABOVE WHICH THERE MAY BE ENOUGH CONCERN TO WARRANT SITE SPECIFIC STUDY OF RISKS. FOR BARE SOIL ABOVE 400 PPM AND UP TO 1,999, EPA RECOMMENDS THAT SOME FORM OF RISK REDUCTION MUST TAKE PLACE IF THERE IS CHILD CONTACT. AT A MINIMUM THIS MAY INCLUDE MOVING CHILD PLAY AREAS OR CONSTRUCTING BARRIERS SUCH AS SOD OR OTHER GROUND COVER. BARE SOIL WITH LEAD CONTENT OF 2,000 PPM AND UP TO 4,999 PPM EPA RECOMMENDS SOME MANNER OF RISK REDUCTION WITH OR WITHOUT CHILD CONTACT. THIS CAN INCLUDE SOIL REMOVAL, PLANTINGS AND INSTALLATION OR BRICK PAVERS, ETC. SOD IS PREFERRED IN HIGH TRAFFIC AREAS WHERE THE PUBLIC CANNOT BE CONTROLLED. SOD CREATES AN INSTANT GROUND COVER. USE APPROPRIATE MASTERSPEC[®] SECTIONS WHEN EDITING THIS SECTION.

APPROPRIATE GROUND COVER AND/OR SHRUBBERY MAY BE SUBSTITUTED FOR SEED/SOD. LANDSCAPING REQUIREMENTS CAN BE SPECIFIED IN THIS SECTION OR IF EXTENSIVE, USE APPROPRIATE MASTERSPEC[®] SECTIONS.

- A. **Bare soil** with child contact, lead concentration 400 PPM up to 1,999 PPM.
 - 1. Install Sod over bare soil
 - 2. Install ground cover and/or shrubbery

- B. Bare soil**, with or without child contact, lead concentration - 2,000 PPM up to 4,999PPM.
 - 1. Install sod over bare soil
 - 2. Install ground cover and/or shrubbery.
 - 3. Remove soil to a depth of three (3) inches.

- C. Bare soil**, lead concentration greater than 5,000 PPM
 - 1. Remove soil to a depth of three (3) inches.

ASPHALTIC PAVING OR CONCRETE MAY BE USED FOR HIGH TRAFFIC AREAS WHERE THE PUBLIC CANNOT BE CONTROLLED. ASPHALTIC PAVING AND CONCRETE CAN BE SPECIFIED BY USING APPROPRIATE MASTERSPEC® SECTIONS.

- 2. Install asphalt paving
- 3. Install concrete paving

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 SOIL REMOVAL

- A.** Use hand held spray equipment to dampen soil. Do not over saturate and cause water to run-off to adjacent areas.

- B.** Remove soil using shovels or vacuum loading equipment starting at the point farthest from load out area.

- C.** Load soil into containers, trucks or dumpsters. Do not track through areas where soil has been removed. Cover containers, trucks or dumpsters prior to transport. Dispose of soil in accordance with section 02067 - Disposal of Waste Materials - Lead-Based Paint .

- D.** At the end of each shift or during winds which may disturb and spread soil contamination, cover contaminated sections of soil with 6 mil polyethylene sheeting.

- E.** Wash tools, and equipment which came in contact with contaminated soil. Collect and filter wash water. Dispose of in accordance with section 02067 - Disposal of Waste Materials - Lead-Based Paint .

CLEARANCE SAMPLING SHOULD BE USED IF SOIL REMOVAL WILL NOT BE CLOSELY MONITORED AND COMPLETE REMOVAL IS SPECIFIED. CONSIDER DELETING THIS ARTICLE AND THE REQUIREMENTS IN SECTION 01421-PROJECT CLEARANCE FOR AREAS WHERE SOIL WILL NOT BE REMOVED BUT COVERED. OTHER ABATEMENT TECHNIQUES WHICH CAN BE VISUALLY INSPECTED DO NOT REQUIRE CLEARANCE MONITORING.

3.2 CLEARANCE CRITERIA

A. Complete Soil Sampling in accordance with Section 01421 - Work Area Clearance following soil removal.

- 1.** If release criteria is not met, continue Soil Remediation from that point.

END OF SECTION - 02066

SECTION 02067 - DISPOSAL OF WASTE MATERIALS - LEAD-BASED PAINT

EDIT THIS SECTION AFTER CONSULTING WITH THE APPROPRIATE LOCAL, CITY, AND STATE AUTHORITY WHO HAS JURISDICTION OVER THE WORK TO DETERMINE SPECIFIC WASTE DISPOSAL REQUIREMENTS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division-1 Specification Sections, apply to work of this section.
- B. Section 01094 Codes and Regulations - Lead-Based Paint describes applicable federal, state and local regulations.

1.2 DESCRIPTION OF THE WORK:

- A. This section describes the disposal of lead-containing or lead contaminated waste materials. Disposal includes packaging of waste materials. Disposal is accomplished by landfilling.

1.3 SUBMITTALS:

- A. Before Start of Work: Submit the following to the Designer for review. Do not start work until these submittals are returned with Designer action stamp indicating that the submittal is returned for unrestricted use.
 - 1. Contractor must ascertain that the facility owner is registered with the U.S. EPA as a generator of hazardous waste. If there is no generator status established, the contractor shall assist the owner in obtaining generator identification numbers.
 - 2. Copy of state or local license for waste hauler.
 - 3. U.S. EPA identification number of waste hauler.
 - 4. Name and address of waste disposal facility where hazardous waste materials are to be disposed. Include contact person and telephone number. Copy of state license and permit. Provide disposal facility permits.
 - 5. Copy of EPA "uniform hazardous waste manifest" form.
 - 6. Copy of EPA "notification of hazardous waste activity" form.
 - 7. Copy of forms required by state or local agencies.

8. Sample of disposal bag and labels to be used.

B. Submit copies of all manifests and disposal site receipts to Owner's project monitor.

PART 2 - PRODUCTS:

2.1 **Disposal:** Provide 6 mil thick leak-tight polyethylene bags or wrap components in 6 mil polyethylene sheeting and seal with duct tape. Label with text as follows:

A. "Label with specific Hazardous Waste Label: "

B. For wrapped materials provide stick-on labels.

PART 3 - EXECUTION

3.1 GENERAL:

A. Contact DOT, EPA, state and local authorities to determine lead-based paint disposal requirements.

CONSIDERATION SHOULD BE MADE ON WHO WILL OBTAIN AND ANALYZE SAMPLES FOR WASTE CHARACTERIZATION. IF THE OWNER PERFORMS THE TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP), THE EXACT DISPOSAL REQUIREMENTS CAN BE SPECIFIED.

IF NOT, THE WASTE CAN BE PACKAGED, LABELED AND STORED ON-SITE. THE OWNER CAN HAVE TESTING DONE AND DISPOSE OF THE WASTE MATERIALS ACCORDINGLY. IF THE DISPOSAL REQUIREMENTS ARE NOT SPECIFIED, THE CONTRACTOR IS LEFT GUESSING HOW MUCH OF THE WASTE WILL BE CONSIDERED HAZARDOUS. CONTRACTOR'S TEND TO ERROR ON THE HIGH SIDE GIVEN THE HIGH COST OF HAZARDOUS WASTE DISPOSAL. IT IS PREFERABLE TO SPECIFY DISPOSAL REQUIREMENTS IN THE CONTRACT DOCUMENTS PRIOR TO BIDDING.

SELECT ONE OF THE FOLLOWING TESTING PROCEDURES. THE OWNER CAN ALSO TEST DURING THE WORK IF OBTAINING REPRESENTATIVE SAMPLES OF IN-PLACE MATERIALS PRESENTS A PROBLEM

B. Testing of waste shall be performed by a laboratory accredited by either the American Industrial Hygiene Association (AIHA) or the American Association of Laboratory Accrediation (AALA) retained by the contractor. Include the cost of testing in the contract sum and supply all test results to the owner.

C. Testing of waste will be performed by a qualified laboratory retained by the owner. Results will be supplied to the contractor. The contractor shall pay for any additional samples obtained at the site for his use.

- D. Testing of waste by use of the Toxicity Characteristic Leaching Procedure (TCLP) test was completed by the Owner prior to this project. Results will be supplied to the Contractor and can be used in conjunction with samples obtained and analyzed by the Contractor. The Contractor shall pay for any additional TCLP samples obtained at the site for his use.
- E. Waste tested which results in a lead content in the leachate of greater than or equal to five parts per million is to be considered hazardous, handled and disposed of according to local, city, state, and federal regulations.
- F. Place all waste generated during the project in 6 mil disposal bags or wrap in 6 mil polyethylene sheeting, store in the designated storage area, enclosed dumpsters or trucks. Separate waste materials into the following categories and label all disposal bags and wrapped packages.

EDIT THE FOLLOWING LIST TO MEET PROJECT REQUIREMENTS. IF THE WASTE HAS NOT BEEN CHARACTERIZED DELETE THE NEXT TWO PARAGRAPHS.

G. Non-Hazardous Solid Waste:

- 1. *Baseboard and other wood work.*
- 2. *Plastic sheeting and duct tape used during abatement.*
- 3. *Porch ceiling and trim.*
- 4. *Plaster.*
- 5. *Doors.*

H. Hazardous Solid Waste:

- 1. *Thresholds.*
- 2. *Paint chips.*
- 3. *Rags, sponges, mops, HEPA Vac filters and contents, respirator cartridges and other materials used during abatement.*

I. Hazardous Liquid Waste (as determined by testing)

- 1. *Caustic Pastes*
- 2. *Neutralizers*
- 3. *Paints, Solvents*

- J. Properly store and secure waste at all times. Do not leave debris in the yard or in uncovered or unlocked trucks or dumpsters. Do not incinerate debris or use an unauthorized dumpster. Do not introduce lead contaminated water into storm or sanitary sewers. Do not permit recycling of building components coated with Lead-Based Paint.

EDIT THE FOLLOWING PARAGRAPH TO MEET STATE REQUIREMENTS. CONSIDER ADDING CATEGORY OF WASTE WITH DESCRIPTION OF MATERIALS OR SOURCES. SEE HUD GUIDELINES FOR MORE INFORMATION.

3.2 DISPOSAL OF NON-HAZARDOUS SOLID WASTE: (As Determined By Testing)

- A. Materials are to remain in 6 mil disposal bags or wrapped in polyethylene sheeting. Label all packages. Substrates removed with paint in good condition which is adhered to the substrate may be placed directly in dumpsters then covered.
- B. Transport waste in covered or enclosed trucks or dumpsters.

3.3 DISPOSAL OF NON-HAZARDOUS LIQUID WASTE: (As Determined By Testing)

- A. Dispose of liquid waste by pouring into sanitary sewage system if permission is received from publicly owned treatment works facility (POTW). Do not dispose of liquid waste by pouring onto ground or into storm drain. If the liquid waste contains phosphates or other chemicals advise treatment facility of quantity of liquid and that it likely will contain phosphates.

3.4 DISPOSAL OF HAZARDOUS LIQUID OR SOLID WASTES: (As Determined By Testing)

- A. Comply with RCRA, DOT, STATE and local regulations.
- B. Apply for an EPA identification number from the appropriate regional office if more than 100 kg of hazardous waste is generated from the lead hazard reduction process during any calendar month.
- C. Comply with DOT and STATE regulations for containers. The most stringent regulation shall apply.
- D. All waste is to be hauled by a licensed waste hauler with all required licenses from all state and local authorities with jurisdiction.
- E. Load all waste material into properly labeled disposal bags, polyethylene sheeting, or leak-tight drums. All materials are to be contained in one of the following:
 - 1. One 6 mil layer of sheet polyethylene, duct tape all seams

- or
- One 6 mil disposal bag or
- 2. Two 4 mil disposal bags
- 3. Sealed steel drum with no bag
- F. Protect interior of truck or dumpster with two layers of 6 mil polyethylene sheeting with all seams sealed with duct tape.
- G. Carefully load containerized waste in fully enclosed dumpsters, trucks or other appropriate vehicles for transport. Exercise care before and during transport, to insure that no unauthorized persons have access to the material.
- H. Do not store containerized materials outside of the Work Area. Take containers from the Work Area directly to the designated storage area, sealed truck or dumpster,
- I. At disposal site unload containerized waste:
 - 1. At a disposal site, sealed plastic bags may be carefully unloaded from the truck. If bags are broken or damaged, return to work site for rebagging. Clean entire truck and contents using procedures set forth in section 01715 Project Decontamination.
- J. Retain all documents from the disposal site.
- K. At completion of hauling and disposal of each load submit copy of Uniform Hazardous Waste Manifest, to Owner's Project Monitor.

INCLUDE THE FOLLOWING ARTICLE ON BACKCHARGES AFTER REVIEW BY THE OWNER AND PREFERABLY THE OWNER'S ATTORNEY. CONSIDER DELETING THIS ARTICLE IF BACKCHARGES AND "OWNER'S RIGHT TO DO WORK" ARE COVERED ADEQUATELY IN THE GENERAL CONDITIONS OF THE CONTRACT.

3.5 BACKCHARGES: Where Contractor fails to fulfill packaging, handling, or disposal requirements as outlined herein, Owner will charge back to Contractor all costs associated with insuring that hazardous wastes are packaged and segregated in accordance with EPA and DOT regulations.

- A. Environmental pollution of Owner's property resulting from Contractor's hazardous waste management activities shall be promptly remediated under Owner direction, to the Owner's sole satisfaction, and at the Contractor's sole expense.
- B. Contractor agrees to either reimburse the Owner, or reduce the Contract amount by change order to cover all costs associated with waste repackaging, waste re-segregation, or pollution remediation efforts.

END OF SECTION - 02067

SECTION 02068 - CLEANING AND DECONTAMINATION - LEAD-BASED PAINT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY OF WORK: Work of this section includes cleaning and decontamination of the following:

The extent of cleaning and decontamination work is shown on the drawings.

USE ABOVE IF THERE ARE DRAWINGS DESCRIBING THE WORK, IF THERE ARE NO DRAWINGS PROVIDE A WRITTEN DESCRIPTION OF THE WORK.

ADD, DELETE OR MODIFY THE FOLLOWING LIST TO MEET PROJECT REQUIREMENTS.

- Decontamination of the kitchen, living room and bath room on the first floor of apartment unit #702.

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. **Work Area Clearance:** Wipe sample testing and other requirements which must be met before release of Contractor and reoccupancy of the work area are specified in Section 01421 Project Clearance.

PART 2 - PRODUCTS

2.1 Disposal Bags/Plastic Sheeting: Provide 6 mil polyethylene disposal bags sealed with duct tape.

THE USE OF DETERGENT WITH HIGH PHOSPHATE CONTENT ARE RESTRICTED OR BANNED IN SOME AREAS BECAUSE OF THE IMPACT ON THE ENVIRONMENT. OTHER DETERGENTS THAT ARE LEAD-SPECIFIC MAY BE EQUALLY EFFECTIVE AND SHOULD BE PERMITTED.

EVEN DILUTED, TRI-SODIUM PHOSPHATE IS VERY IRRITATING TO THE SKIN AND SHOULD BE USED ONLY WITH WATERPROOF GLOVES AND EYE PROTECTION. PORTABLE EYE WASH FACILITIES SHOULD BE AVAILABLE.

- 2.2 Wet Detergent Wash:** Provide detergent with high phosphate content (at least 5%) trisodium phosphate (TSP). Follow dilution ratio recommended by manufacturer's instructions.

CONSIDER PARAGRAPH BELOW FOR NON-TSP DETERGENTS. DELETE ABOVE OR BELOW.

Wet Detergent Wash: Provide detergent or cleaning agent formulated to be effective in removing lead dust. Follow dilution ratio recommended by the manufacturer's instructions.

PART 3 - EXECUTION

3.1 GENERAL

- A. Work of This Section:** includes the decontamination of surfaces which have been contaminated by lead dust.

3.2 START OF WORK

- A. Start of Work:** Work of this section begins with the set up of the work area in accordance with section 01506 work area containment. Complete the following before the start of work of this section.
- 1. Critical Barrier:** Install critical barrier between the work area and other portions of the building of the outside. Pre-clean surfaces to be covered by critical barriers.
 - 2. Critical Barrier Sheeting:** Cover lighting fixtures, ventilation, openings, doorways, convectors, and other openings.
 - 3. Flapped Doorway Sheeting:** Install between the work area and the changing room.

3.3 CLEANING PROCEDURES; ROOMS AND HARD SURFACES

- A. HEPA Vacuum:** All surfaces in work area. Start at point farthest from main entrance and finish vacuuming back at that point. Begin at top of each room and work down. Sequence to avoid passing through rooms already cleaned.
- B.** Perform wet detergent wash of all surfaces. Begin at point farthest from main entrance, work from top to bottom. Take care not to damage existing finishes and surfaces. Change cleaning mixture in accordance with manufacturer's recommendations or minimum after each room. Filter all waste water or dispose of in accordance with section 02067.
- C. Wiping Work Area**

1. The work area should be cleaned using a three container method. Fill two buckets with clean water and place them in the work area with the container of cleaning solution.
2. Pour cleaning solution onto a clean cloth. Wring excess solution into one of the buckets without placing the cloth into the bucket. Wipe the work surface with the cloth. Add more cleaning solution to the cloth and continue wiping until the entire surface area has been covered. Discard all cloths used in this procedure in the disposal bag.
3. Dip and wring out a clean cloth in the first rinse bucket. Wipe off the work area. Rinse the cloth in the first bucket again and wring out thoroughly. Rinse the cloth in the second bucket and wring out thoroughly again.
4. Continue to clean the work surface with the cloth and rinse using this procedure until the entire work surface has been cleaned. Wipe off all tools to remove any dust.
5. **NOTE:** The rinse water in the bucket should be changed periodically. The frequency will vary depending on the level of contamination.

D. Mopping Work Area

1. Collect any visible debris using wet cloths before mopping the area. Pour the cleaning solution into the mop bucket. fill two rinse buckets with clean water. Place the mop into the cleaning solution. Wring excess solution into the mop bucket. mop small sections of the work area. Place the mop into the cleaning solution and wring thoroughly between sections. After the entire surface has been mopped thoroughly, rinse the mop head. Completely rinse the surface by placing the mop in the first bucket, wringing it out thoroughly, placing it in the second bucket, wringing thoroughly and then mopping the surface. Continue this cycle until all areas have been rinsed.
2. **NOTE:** The water in the two containers should be changed periodically. The frequency will depend on the level of contamination.

E. Mist Critical barrier sheeting and remove.

F. HEPA Vacuum area previously covered by critical barrier sheeting followed by wet detergent wash.

G. Perform clear water wash of all surfaces in same manner as wet detergent wash.

- H. After all surfaces in work area are allowed to dry, complete final HEPA vacuuming of all surfaces in same manner as first HEPA vacuuming.
- I. After Final Cleaning Perform a Complete Visual Inspection of the entire work area including: all surfaces, ceiling, walls, floor, doorways, windows, and other openings; look for debris from any sources, residue on surfaces, dust or other matter. If any debris, residue, dust or other matter is found repeat final cleaning and continue decontamination procedure from that point. When the area is visually clean, complete the certification at the end of this section. Visual inspection is not complete until confirmed in writing, on the certification, by Project Monitor.

CONSIDER DELETING THE NEXT PARAGRAPH IF PAINTING OR SEALING OF SUBSTRATE WILL BE ALLOWED ONLY AFTER CLEARANCE IS OBTAINED.

H. **Painting of substrates:** Perform painting/sealing of substrates at this time.

I. Perform final clearance sampling in accordance with subsection 3.6 final clearance sampling.

3.4 FINAL CLEARANCE SAMPLING:

- A. Wipe Sampling By Atomic Absorption Spectroscopy (AAS) or Inductively Coupled Plasma Emission Spectroscopy (ICP): After the work area is found to be visually clean, wipe samples will be obtained and analyzed in accordance with the procedure set forth in Section 01421 Project Clearance.
 - 1. If Release Criteria are not met, repeat HEPA vacuuming, wet wash, HEPA vacuuming procedure until satisfactory clearance results are obtained.
 - 2. If Release Criteria are met, remove work area isolation. Remove allequipment, materials from the site.

3.5 SUBSTANTIAL COMPLETION OF HAZARD REDUCTION:

- A. Hazard Reduction Work is Substantially Complete upon meeting the requirements of this section, section 01421 project Clearance , including submission of:
 - 1. Certificate of Visual Inspection
 - 2. Receipts Documenting proper disposal as required by Section 02067 Disposal of Waste Material.
 - 3. Punch list detailing repairs to be made and incomplete items.

3.6 CERTIFICATE OF VISUAL INSPECTION:

- A.** Following this section is a "Certificate of Visual Inspection". This certification is to be completed by the Contractor and certified by the Project Monitor. Submit completed certificate with application for final payment. Final payment will not be made until this certification is executed.

END OF SECTION 02068

CERTIFICATION OF VISUAL INSPECTION

In accordance with Section 02068 "Cleaning and Decontaminations" the contractor hereby certifies that he has visually inspected the work area (all surfaces including pipes, counters, ledges, walls, ceiling and floor, sheet plastic, etc.) and has found no dust, debris or residue.

by: (Signature)_____ Date_____

(Print Name)_____

PROJECT MONITOR CERTIFICATION

The Project Monitor hereby certifies that he has accompanied the contractor on his visual inspection and verifies that this inspection has been thorough and to the best of his knowledge and belief, the contractor's certification above is a true and honest one.

by: (Signature)_____ Date_____

(Print Name)_____

(Print Title)_____

WORK AREA

Location: _____

Room: _____

Hazard Reduction Performed: _____

SECTION 05582 - SHEET METAL ENCLOSURES - LEAD-BASED PAINT

THIS SECTION USES THE TERM "DESIGNER". CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

THIS SECTION USES PREPAINTED ALUMINUM COVERING OF LEAD-BASED PAINTED EXTERIOR TRIM AS AN EXAMPLE OF THE USE OF SHEET METAL AS AN ENCLOSURE. COPPER, STAINLESS STEEL, GALVANIZED SHEET METAL ALL CAN BE USED FOR ENCLOSURES. USE THIS SECTION FOR EXAMPLE LANGUAGE IN DEVELOPING SPECIFICATIONS FOR ENCLOSURES USING DIFFERENT TYPES OF SHEET METAL.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes aluminum sheet metal enclosures of lead-based painted trim.
- B. **Related Sections:** The following Sections contain requirements that relate to this Section:
 - 1. **Section 01505** - Exterior Regulated Areas
 - 2. **Section 01555** - Worker Protection
 - 3. **Section 01556** - Respiratory protection

1.3 SUBMITTALS

- A. Product data for each type of product specified.
- B. Samples for initial selection purposes in form of manufacturer's color charts showing full range of colors, textures, and patterns available for each type of sheet metal fabrication indicated.

DELETE ABOVE IF COLORS, ETC. PRESELECTED AND SPECIFIED OR SCHEDULED OR ALL PRODUCTS OF THIS SECTION ARE TO BE FIELD PAINTED. RETAIN BELOW WITH OR WITHOUT ABOVE.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver sheet metal materials and fabrications with protective crating and covering.

- B. Store products on elevated platforms in a dry location.

1.5 PROJECT CONDITIONS

- A. **Field Measurements:** Verify size, location, and placement of sheet metal fabrications with adjoining construction prior to fabrication.

PART 2 - PRODUCTS

2.1 SHEET METALS

- A. **General:** Provide sheet metals selected for their surface flatness, smoothness and freedom from surface blemishes where exposed to view in the finished unit. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, variations in flatness exceeding those permitted by referenced standards for stretcher-leveled metal sheet, stains, discoloration or other imperfections. Other metals may be suitable for enclosures such as copper, galvanized sheet metal, stainless steel, etc. See appropriate MASTERSPEC® section for requirements.
- B. **Aluminum Sheet:** Alloy and temper recommended by manufacturer for use intended and as suitable for application of finish indicated, but with not less than the strength and durability properties specified in ASTM B 209 for 5005-H15.

2.2 MISCELLANEOUS MATERIALS

- A. **Fasteners:** Of same basic metal and alloy as fastened metal, unless otherwise indicated. Do not use metals which are corrosive or incompatible with metals joined.
 - 1. Provide concealed fasteners for interconnection of sheet metal fabrications and for their attachment to other work except where exposed fasteners are unavoidable or are the standard fastening method.

2.3 CLOSURES AND TRIM

- A. Form closures and trim members from sheet metal of type and minimum nominal thickness as indicated below. Incorporate components required for support and installation of closures and trim. Fabricate closures and trim to tightly close with adjoining construction.
 - 1. Aluminum sheet, 0.0625 inch.
- B. Conceal fasteners where possible; otherwise locate where they will be as inconspicuous as possible. Size fasteners to support closures and trim, with fasteners spaced to prevent buckling or waviness in finished surfaces.
- C. Support joints with concealed stiffeners as required to hold exposed faces of adjoining sheets in flush alignment.
- D. Miter or cope trim members at corners to form tight joint.

2.4 FINISHES

- A. Comply with NAAMM "Metal Finishes Manual" and Aluminum Association for recommendations relative to application of finishes.
- B. **Baked Enamel Finish:** AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: chemical conversion coating, acid chromate-fluoride-phosphate pretreatment; Organic Coating: as specified below). Apply baked enamel in compliance with paint manufacturer's specifications for cleaning, conversion coating, and painting.
 - 1. **Organic Coating:** Thermosetting modified acrylic enamel primer/topcoat system standard with manufacturer, with minimum dry film thickness of 1.5 mils, medium gloss. RETAIN ONE COLOR REQUIREMENT FROM BELOW.
 - 2. **Color:** As indicated by reference to manufacturer's standard color designations.
 - 3. **Color:** Match Designer's samples.
 - 4. **Color:** As selected by Designer from manufacturer's standard colors.

PART 3 - EXECUTION

3.1 GENERAL

- A. Before starting work of this section, complete the following:
 - 1. **Section 01505** - Exterior Regulated Areas
 - 2. **Section 01555** - Worker Protection
 - 3. **Section 01556** - Respiratory protection

3.2 EXAMINATION

- A. Examine substrates for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of siding. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Prior to installation of enclosure carefully remove flaking and loose areas of lead-based paint by wet scraping. Allow paint with good adhesion to remain.
- B. Affix 3" x 5" (76 x 127 mm) warning labels every 4 feet (1.22 m) on surface reading "Lead-Based Paint" or using an indelible marker write "Lead-Based Paint" every 4 feet (1.22 m) prior to installing air infiltration barrier or siding .
- C. Clean substrates of projections and substances detrimental to application.

3.4 INSTALLATION

- A. Locate and place sheet metal fabrications plumb, level and in alignment with adjacent construction.
- B. Back caulk at perimeter of sheet metal enclosure seal seams to form a continuously sealed enclosure.
- C. Form tight joints with exposed connections accurately fitted together. Provide reveals and openings for sealants and joint fillers, as indicated.
- D. Provide sealants, flashing, and install as the installation progresses to make installations weather-tight and sealed.

END OF SECTION 05582

SECTION 06106 - WOOD ENCLOSURES - LEAD-BASED PAINT

THIS SECTION USES THE TERM "DESIGNER." CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the furnishing of all labor, materials, and equipment required for wood enclosures of lead-based painted surfaces.
- B. **Related Sections:** The following Sections contain requirements that relate to this Section:
 - 1. **Section 01505** - Exterior Regulated Areas
 - 2. **Section 01555** - Worker Protection
 - 3. **Section 01556** - Respiratory protection

THE FOLLOWING SECTIONS ARE NOT IN THIS GUIDE SPECIFICATION. IF ANY OF THEM ARE NECESSARY FOR THE PROJECT, SELECT APPLICABLE SECTIONS FROM AA MASTERSPEC® OR CSI SPECTEXT OR OTHER COMPETENT GUIDE SPECIFICATION.

- 4. **Division 6** Section "Rough Carpentry" for furring, blocking, and other carpentry work that is not exposed to view.
- 5. **Division 6** Section "Finish Carpentry" for carpentry exposed to view that is not specified in this section.
- 6. **Division 6** Section "Exterior Architectural Woodwork" for exterior woodwork.
- 7. **Division 8** Section "Flush Wood Doors" for doors specified by reference to architectural woodwork standards.
- 8. **Division 8** Section "Stile and Rail Wood Doors" for doors specified by reference to architectural woodwork standards.
- 9. **Division 8** Section "Wood Windows" for stock wood windows.
- 10. **Division 9** Section "Painting" for final finishing of installed architectural woodwork.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Protect woodwork during transit, delivery, storage, and handling to prevent damage, soilage, and deterioration.
- B. Do not deliver wood for enclosures until painting, wet work, grinding, and similar operations that could damage, soil, or deteriorate woodwork have been completed in installation areas. If wood must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions."

1.4 PROJECT CONDITIONS

- A. **Environmental Conditions:** Do not install wood enclosures until the interior is protected from the weather and is heated, if required, to 60 degrees fahrenheit.
- B. **Field Measurements:** Field fit wood enclosures to existing construction.

PART 2 - PRODUCTS

2.1 FABRICATION, GENERAL

- A. **Wood Moisture Content:** Comply with requirements of referenced quality standard for moisture content of lumber in relation to relative humidity conditions existing during time of fabrication and in installation areas.
- B. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:

REVISE BELOW TO DESCRIBE CONDITIONS WHERE EASED EDGES ARE REQUIRED (OR NOT REQUIRED).

- 1. Corners of cabinets and edges of solid wood (lumber) members less than 1 inch in nominal thickness: 1/16 inch.
- 2. Edges of rails and similar members more than 1 inch in nominal thickness: 1/8 inch.

2.2 JOB FABRICATED WOOD ENCLOSURES AND TRIM FOR OPAQUE FINISH

- A. **Quality Standard:** Comply with AWI Section 300.

DELETE ABOVE OR BELOW.

- B. **Quality Standard:** Comply with WIC Section 10 "Interior Trim."

RETAIN 1 GRADE FROM BELOW AND DELETE THE OTHER 2.

- C. **Grade:**
 - 1. **Premium.**
 - 2. **Custom.**
 - 3. **Economy.**
- D. Backout or groove backs of flat trim members and kerf backs of other wide flat members, except for members with ends exposed in finished work.
- E. **Lumber Species:** Any closed-grain hardwood listed in referenced woodworking standard.

DELETE ABOVE OR BELOW. REVISE SPECIES LIST BELOW TO SUIT PROJECT LOCATION AND LUMBER AVAILABILITY.

- F. **Lumber Species:** Eastern white pine, sugar pine, or Idaho white pine.

2.3 FASTENERS AND ANCHORS

- A. **Screws:** Select material, type, size, and finish required for each use. Comply with FS FF-S-111 for applicable requirements.

DELETE BELOW IF NONE.

- 1. For metal framing supports, provide screws as recommended by metal framing manufacturer.
- B. **Nails:** Select material, type, size, and finish required for each use. Comply with FS FF-N-105 for applicable requirements.
- C. **Anchors:** Select material, type, size, and finish required by each substrate for secure anchorage. Provide nonferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed steel or lead expansion bolt devices for drilled-in-place anchors. Furnish inserts and anchors, as required, to be set into concrete or masonry work for subsequent woodwork anchorage.

PART 3 - EXECUTION

3.1 GENERAL

- A. Before starting work of this section, complete the following:
 - 1. **Section 01505** - Exterior Regulated Areas
 - 2. **Section 01555** - Worker Protection

3. Section 01556 - Respiratory protection

3.2 PREPARATION

- A. Prior to installation of enclosure carefully remove flaking and loose areas of lead-based paint by wet scraping. Allow paint with good adhesion to remain.
- B. Affix 3" x 5" (76 x 127 mm) warning labels every 4 feet (1.22 m) on surface reading "Lead-Based Paint" or using an indelible marker write "Lead-Based Paint" every 4 feet (1.22 m) prior to installing air infiltration barrier or siding .
- C. Clean substrates of projections and substances detrimental to application.
- D. Condition wood to average prevailing humidity conditions in installation areas before installing.

3.3 INSTALLATION

- A. **Seal Edges:** Caulk all joints and seal all edges of wood enclosures. Apply caulk to edges of trim that abut existing construction. Back caulk edges of any panels that are not sealed with trim.
- B. **Back-paint:** exterior wood trim prior to installation.
- C. Install wood trim plumb, level, true, and straight with no distortions. Shim as required with concealed shims. Install to a tolerance of 1/8 inch in 8'-0" for plumb and level (including tops) and with no variations in flushness of adjoining surfaces.
- D. Scribe and cut woodwork to fit adjoining work and refinish cut surfaces or repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where pre-finished matching fastener heads are required, use fine finishing nails for exposed nailing, countersunk and filled flush with woodwork and matching final finish where transparent finish is indicated.

DELETE BELOW IF NO WORK OF THIS TYPE.

- F. **Standing and Running Trim and Rails:** Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to the greatest extent possible. Stagger joints in adjacent and related members. Cope at returns and miter at corners.
- G. **Paneling:** Anchor paneling to supporting substrate with concealed

panel-hanger clips and by blind nailing on backup strips, splined-connection strips, and similar associated trim and framing. Do not face nail unless otherwise indicated.

3.4 ADJUSTMENT AND CLEANING

- A.** Repair damaged and defective woodwork where possible to eliminate defects functionally and visually; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.

- B.** Clean woodwork on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.5 PROTECTION

- A.** Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensures that woodwork is without damage or deterioration at time of Substantial Completion.

END OF SECTION 06106

SECTION 06107 - EXTERIOR SIDING & ENCLOSURE - LEAD-BASED PAINT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK:

- A. Work under this section includes the furnishing of all labor, materials, and equipment required to enclose lead-based painted exterior surfaces with the following:

ADJUST LIST BELOW TO SUIT PROJECT.

1. **Aluminum** clapboard siding.
2. **Vinyl** clapboard siding.
3. **Lumber** siding

PART 2 - PRODUCTS

SIDING TYPES ARE EXAMPLES ONLY. EXPAND THIS SECTION BY USING APPROPRIATE MASTERSPEC® SECTIONS.

2.1 ENCLOSURE SYSTEM MATERIALS:

- A. **Aluminum Clapboard Siding:** Formed aluminum siding and accessories complying with AAMA 1402 fabricated from aluminum sheet.
- B. **Vinyl Clapboard Siding:** Solid vinyl siding and accessories fabricated by extrusion from a polyvinyl chloride compound complying with ASTM B-3679.
- C. **Lumber Siding:** Kiln dried wood lumber for siding in size and pattern shown on drawings.
- D. **Siding Accessories:** Solid soffit panels, ventilating soffit panels, post, door castings, window casings, starter strips, and field fabricated materials to match type of siding selected.
- E. **Fasteners:** Non-corrosive aluminum siding nails of sufficient length to penetrate substrate 1" (25 mm). Stainless steel, non-corrosive aluminum or hot dipped galvanized are to be used for wood lumber siding.
- F. **Air Infiltration Barrier:** House wrap and compatible seaming tape.

- G. **Insulation:** Rigid or fan-fold insulation intended as a substrate for siding materials.

PART 3 - EXECUTION

3.1 PREREQUISITES

- A. Before starting work of this section, complete the following:
 - 1. **Section 01505** - Exterior Regulated Areas
 - 2 **Section 01555** - Worker Protection
 - 1. **Section 01556** - Respiratory protection

3.2 PREPARATION

- A. Prior to installation of enclosure carefully remove flaking and loose areas of lead-based paint by wet scraping. Allow paint with good adhesion to remain.
- B. Affix 3' x 5" (76x127 mm) warning labels every 4 feet (1.22 m) vertically and 4 feet (1.22 m) horizontally, for a minimum of one label every 16 square feet, on surface reading 'Lead-Based Paint' prior to installing enclosure or using an indelible marker write "Lead-Based Paint" every 4 feet (1.22 m).

THE LEAD-BASED PAINTED COMPONENTS OF A VENTILATED SOFFIT SHOULD BE REMOVED AND REPLACED, SINCE THE NEW VENTILATED SOFFIT WILL NOT ACT AS AN DUST BARRIER.

3.3 INSTALLATION

- A. Comply with siding manufacturer's installation instructions and recommendations. Install rigid sheathing or furring strips to provide a level surface prior to installation of siding. Do not remove original siding.
- B. Wrap existing siding with air infiltration barrier or install rigid or fan fold insulation prior to installation of siding. Install infiltration barrier and/or insulation so that it forms a continuous layer under the siding and becomes a barrier to the release of dust through cracks in the siding.

INSTALLATION DETAILS SHOULD BE SHOWN ON THE DRAWINGS.

- C. Install siding and accessories to cover all lead-based painted materials. Field fabricate accessories that are not commercially available from sheet aluminum stock or wood. Caulk all joints and seams.

END OF SECTION 06107

SECTION 06402- CARPENTRY AND TRIM WORK - LEAD-BASED PAINT

USE THIS SECTION TO SPECIFY THE REMOVAL AND REPLACEMENT PROCEDURES FOR CARPENTRY AND TRIM WORK. THIS SECTION IS NOT USED TO SPECIFY NEW WINDOWS, DOORS, MATERIALS, ETC. USE THE APPROPRIATE MASTERSPEC® SECTION COORDINATED WITH THIS SECTION.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

EDIT DELETE OR ADD TO THE FOLLOWING LIST TO MEET PROJECT SPECIFICS.

- A. This Section includes the following:
 - 1. Replacement of standing and running trim and rails
 - 2. Removal and replacement of lead-based painted windows
 - 3. Removal and replacement of lead-based painted doors
 - 4. Removal and replacement of cabinetry
 - 5. Removal and replacement of stair components

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. **Section 01505** - Exterior Regulated Areas - Lead-Based Paint
- B. **Section 01506** - Work Area Containment - Lead-Based Paint
- C. **Section 01555** - Worker Protection - Lead-Based Paint
- D. **Section 01556** - Respiratory Protection - Lead-Based Paint
- E. **Section 02067** - Disposal Of Waste Materials - Lead-Based Paint
- F. **Section 09951** - Chemical Stripping of Lead-Based Paint
- G. **Section 09954** - Painting - Lead-Based Paint

ADD REFERENCE TO THE RELATED MASTERSPEC® SECTION WHEN EDITING THIS SECTION.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Arrange for installation of finish carpentry by a firm that can demonstrate successful experience in installing finish carpentry items similar in type and quality to those required for this Project.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Delivery and Storage: Keep materials under cover and dry. Protect against exposure to weather and contact with damp or wet surfaces. Stack lumber, plywood and other panels. Provide for air circulation within and around stacks and under temporary coverings including polyethylene and similar materials.
- B. Do not deliver interior finish carpentry materials until environmental conditions meet requirements specified for installation areas. If finish carpentry must be stored in other than installation areas, store only in areas where environmental conditions meet requirements specified for installation areas. Complete cleaning and decontamination requirements of section 01715 prior to delivery of materials.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting installation and performance of finish carpentry. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Condition finish carpentry to average prevailing humidity conditions in installation areas before installation for a minimum of 24 hours unless longer conditioning recommended by manufacturer.
- C. Backprime lumber for painted finish exposed on the exterior. Comply with requirements for surface preparation and application appropriate sections.

3.3 INSTALLATION, GENERAL

- A. Do not use finish carpentry materials that are unsound, warped, bowed, twisted, improperly treated or finished, not adequately seasoned, or too small to fabricate with proper jointing arrangements.
 - 1. Do not use manufactured units with defective surfaces, sizes, or patterns.
- B. Install finish carpentry plumb, level, true, and aligned with adjacent materials. Use concealed shims where required for alignment.
 - 1. Scribe and cut finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
 - 2. Install to tolerance of 1/8 inch in 8 feet for plumb and level. Install adjoining finish carpentry with 1/16 inch maximum offset for flush installation and 1/8 inch maximum offset for reveal installation.
 - 3. Coordinate finish carpentry with materials and systems that may be in or adjacent to standing and running trim and rails. Provide cutouts for mechanical and electrical items that penetrate exposed surfaces of trim and rails.
- C. Finish in accordance with specified requirements.
- D. Refer to Division 9 Sections for final finishing of finish carpentry.

3.4 STANDING AND RUNNING TRIM AND RAILS

- A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Stagger joints in adjacent and related standing and running trim and rails. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane back of casings to provide uniform thickness across joints if required.
 - 1. Match color and grain pattern across joints.
 - 2. Install trim after drywall joint finishing operations are completed.
 - 3. Drill pilot holes in hardwood prior to nailing or fastening to prevent splitting. Fasten to prevent movement or warping. Countersink nail heads on exposed carpentry work and fill holes.
 - 4. Fit exterior joints to exclude water. Apply flat grain

lumber with bark side exposed to weather.

SELECT FROM THE FOLLOWING ALTERNATIVES FOR EACH COMPONENT. REFERENCE APPROPRIATE SECTIONS FOR REPLACEMENT MATERIALS. IT IS REQUIRED THAT NO FRICTION SURFACES REMAIN AT THE COMPLETION OF COMPONENT REPLACEMENT.

3.5 WINDOWS: Replacement/repair options for typical double-hung wooden window units.

- A. Remove, package in 6 mil plastic, and dispose of sash, stop and parting beads, jamb, interior sill (stool), apron and casing. Provide and install new jamb and window unit to match original. Install new trim to match original for sill, apron and casing. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.
- B. Remove, package in 6 mil plastic, and dispose of sash, stop and parting beads, interior sill (stool), apron and casing. Provide and install a prefabricated double-hung vinyl replacement window. Wrap exterior frame and sill with aluminum coil stock. Apply back caulk and nail 6' (1.83 m) on center 1/4" (6 mm) from the edge. Caulk the edges to seal. Retrim with 1 x 6s (25 x 152 mm) (or smaller as permitted) for sill, apron and casing. Prep for paint. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.
- C. Remove, package in 6 mil plastic, and dispose of inside stop and parting beads. Remove carefully, label and package in 6 mil plastic the sashes, apron and inner casing for off-site stripping. Remove paint from jamb, sill (stool) and exterior frame using on-site paint removal methods in accordance with section 09951 - Chemical Stripping of Lead-Based Paint. Neutralize chemically (caustics) stripped components in accordance with manufacturer's recommendations. Wash down. Reinstall treated sash and casing. Replace inside stop and parting beads with new comparable components. Prep for paint. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.
- D. Remove, package in 6 mil plastic, and dispose of inside stop and parting beads, sill (stool), and lower sash; replace with comparable components. Fix upper sash in place by nailing into jamb or attaching corner braces beneath sash and attached to jamb. Stabilize deteriorated paint inside and out with wet scraping; clean and degloss surface with wet detergent wash solution; reglaze as necessary; spot prime bare wood with primer; enclose window well and exterior sill with aluminum cap.
- E. Remove, package in 6 mil plastic, and dispose of inside stop and parting beads; remove and set aside existing sashes. Cut chains/ropes attached to weights/balances; remove or drive in existing pulleys. Stabilize deteriorated paint inside and out

by wet scraping; clean and degloss surface with wet detergent wash solution; repair and reglaze as necessary; spot prime with primer; apply one finish coat paint encapsulate window well and exterior sill with aluminum cap, install window channels, sealing with adhesive; reinstall original sashes; replace inside stop bead; prime in accordance with section 09954 - Painting - Lead-Based Paint.

EDIT, DELETE OR ADD THE FOLLOWING ALTERNATIVES TO MEET PROJECT REQUIREMENTS

3.6 DOORS: Replacement

- A. Remove, package in 6 mil plastic, and dispose of door stop, jamb and casing. Hardware shall be removed and set aside or disposed of prior to packaging. Provide and install new jamb, stop, door and casing to match original. Prep for paint. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint. Install new or saved hardware.
- B. Remove, label, and package in 6 mil plastic door and casing for off-site stripping. Hardware shall be removed, set aside and disposed prior to packaging. Remove, package in 6 mil plastic, and dispose of door stop; remove paint from jamb using on-site paint removal methods; neutralize chemically stripped (caustics) jamb as necessary; wash down jamb; reinstall hardware, treated door and casing; replace door stop with comparable components; prep for paint/sealant; apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.
- C. Remove, package in 6 mil plastic. and dispose of door, stop, and casing. Stabilize deteriorated paint on jamb with wet scraping; provide and install a pre-hung door unit, including new hardware. Retrim for casing with 2 x 6s (51 x 152 mm) (or smaller as permitted). Prep for paint. Caulk to seal edges of door unit and trim. Apply one coat of primer in accordance with 09954 - Painting - Lead-Based Paint.
- D. Check door for all friction points. Remove, package in 6 mil plastic, and dispose of door stop. Rework hardware as needed, Plane friction points and repair existing components as needed to minimize friction. Stabilize all deteriorated paint with wet scraping; clean and degloss surface with wet detergent wash solution; replace door stop with comparable component; prep for paint, spot prime bare wood with primer in accordance with 09954 - Painting - Lead-Based Paint.
- E. Stabilize deteriorated paint with wet scraping; clean and degloss surface with wet detergent wash solution; prep for paint. Spot prime all bare wood with primer in accordance with 09954 - Painting - Lead-Based Paint.

3.7 CABINETS:

- A. Remove, package in 6 mil plastic, and dispose of cabinets in accordance with Section 02067. Install new lead free cabinets.
- B. For cabinet to remain, check doors/drawers for all friction points. Plane friction points and repair existing components to minimize friction. Stabilize all deteriorated paint with wet scraping; clean and degloss surface with wet detergent wash solution; prep for paint; spot prime with oil based paint. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.
- C. Stabilize all deteriorated paint with wet scraping; clean and degloss surface with wet detergent wash solution; prep for paint; spot prime. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.

EDIT FOLLOWING TO MEET PROJECT REQUIREMENTS. SELECT APPROPRIATE TREATMENT TO MATCH EXISTING CONDITIONS.

DO NOT SPECIFY CARPET REPLACEMENT FOR COVERING LEAD-BASED PAINTED TREADS AND RISERS. THE ABRASION BETWEEN THE CARPET AND TREAD WILL CREATE LEAD DUST. CARPET BACKING WILL NOT ACT AS A DUST BARRIER. STAIRS FIRST COVERED WITH A SOLID BACKING MATERIAL MAY BE CARPETED.

3.8 STAIR SYSTEMS

- A. **Tread and Riser:** Wet scrape any loose or flaking paint. Remove foreign material by washing down substrate with wet detergent wash solution. Laminate treads with 1/8" (3 mm) vinyl composition tile secured with manufacturer's recommended adhesive. Install metal bullnose and fasten. Laminate riser with 1/4" (6 mm) luan or equivalent, secure with finish nails. Caulk all edges to seal. Apply one coat primer to riser in accordance with section 09954 - Painting - Lead-Based Paint.
- B. **Tread and Riser:** Remove foreign material by washing down substrate with a wet detergent wash solution. Laminate treads with commercial grade tread guards. Secure with manufacturer's recommended adhesive and fasteners. Install metal bullnose and fasten. Laminate riser with 1/4" (6 mm) luan or equivalent, secure with finish nails. Caulk all edges to seal. Prep for paint. Apply one coat primer in accordance with section 09954 - Painting - Lead-Based Paint.
- C. **Posts/Bannister/Spindles:** Remove, package in 6 mil plastic, and dispose of components. Install new components. Prep for paint. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.

- D. **Posts/Bannister/Spindles:** Secure existing components as needed. Box posts with 1/4" luan plywood, attaching 1x nailer to back of posts.
- E. **Entire, Except Treads, Risers, and Bannister:** Stabilize deteriorated paint with wet scraping; remove foreign materials; clean and degloss using a wet detergent wash solution. Apply acrylic/latex elastomeric per manufacturer's instructions. (Note: Flexible encapsulant can only be used after a successful patch test demonstrates the proper adherence of product to surface).
- F. **Stringer/Carriage:** Remove paint from components using on-site paint removal methods in accordance with section 09951 - Chemical Stripping of Lead-Based Paint. Neutralize components as recommended by chemical removal manufacturer's recommendation. Prep for paint. Apply one coat primer in accordance with section 09954 - Painting - Lead-Based Paint.
- G. **Entire System:** Remove paint from entire system with on-site paint removal methods in accordance with Section 09951 - Chemical Stripping of Lead-Based Paint. Prep for paint. Apply one coat of primer in accordance with section 09954 - Painting - Lead-Based Paint.
- H. **Entire except treads and risers:** Stabilize deteriorated paint with wet scraping. Remove foreign material and degloss with wet wash solution. Prep for paint. Prime bare wood with primer in accordance with section 09954 - Painting - Lead-Based Paint.

3.9 ADJUSTING

- A. Repair damaged or defective finish carpentry where possible to eliminate functional or visual defects. Where not possible to repair, replace finish carpentry. Adjust joinery for uniform appearance.

3.10 CLEANING

- A. Clean finish carpentry on exposed and semi-exposed surfaces. Touch up factory-applied finishes to restore damaged or soiled areas.

3.11 PROTECTION

- A. Provide final protection and maintain conditions that ensure finish carpentry is without damage or deterioration at time of Substantial Completion.

END OF SECTION 06402

SECTION 06403 - REPAIR OF LEAD-BASED PAINTED SUBSTRATES

PART 1 - GENERAL

THIS SECTION DETAILS THE REPAIR OF SUBSTRATES PRIOR TO ENCLOSURE OR ENCAPSULATION AND FOLLOWING LEAD-BASED PAINT REMOVAL. THE WORK WILL BE ACCOMPLISHED INSIDE THE WORK AREA OR REGULATED AREA WHERE OTHER HAZARD REDUCTION ACTIVITIES ARE BEING PERFORMED.

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

- A. This section requires repair of the following lead-based painted substrates in the areas indicated.

EDIT/DELETE OR ADD TO THE FOLLOWING LIST TO MEET PROJECT REQUIREMENTS.

1. *Wood Trim.*
2. *Plaster walls and ceilings.*

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. **Section 01505** - Exterior Regulated Areas Lead-Based Paint
- B. **Section 01506** - Work Area Containment - Lead-Based Paint
- C. **Section 01555** - Worker Protection - Lead-Based Paint
- D. **Section 01556** - Respiratory Protection - Lead-Based Paint

PART 2 - PRODUCTS

2.1 REPAIR MATERIALS:

- A. Gypsum Wallboard: sized to match existing thickness, Type: Regular, unless indicated
- B. Joint Compound: Powder or ready-mixed vinyl
- C. Wood Filler: Epoxy or Latex Based

PART 3 - EXECUTION

3.1 GENERAL

CONSIDER USING THIS SECTION FOR LARGE SCALE REPAIRS ONLY WHEN COMPONENT REPLACEMENT IS NOT FEASIBLE.

- A. Mist damaged area with wet detergent wash solution. Using a utility knife, score paint around area to be removed. Include entire area of patch.
- B. Remove paint from area to be patched with scraper or utility knife. Mist area during scraping operations.
- C. Do not allow paint chips, debris or dust to accumulate. Pick up with wet paper towel and place in disposal bag.
- D. Carefully remove loose paint at edges. Remove damaged sections of substrate place in disposal bag.
- E. Prepare area for new patching materials.
 - 1. **Gypsum Board:** Cut out area of damaged wall board. Replace with new section. Finish edges with joint compound and dry wall tape. Do not sand compound, sanding will disturb lead-based paint unless a large area of paint is removed. Use wet sponge or lightly wet sand joint compound.
 - 2. **Plaster:** Prepare area in accordance with gypsum board above. Mix compatible plaster materials and fill area to be patched. Use wet sponge or lightly wet sand new plaster.
 - 3. **Wood Trim:** Remove damaged area and fill void with wood filler or epoxy. finish/lightly wet sand filler:

END OF SECTION 06403

SECTION 09252 - GYPSUM BOARD ENCLOSURES - LEAD-BASED PAINT

BASED ON MASTERSPEC® SECTION 09255 "GYPSUM BOARD ASSEMBLIES" COPYRIGHT IN 1992, BY AIA, THE AMERICAN INSTITUTE OF ARCHITECTS.

THIS SECTION USES THE TERM DESIGNER. CHANGE THIS TERM AS NECESSARY TO MATCH THE ACTUAL TERM USED TO IDENTIFY THE DESIGN PROFESSIONAL AS DEFINED IN THE GENERAL AND SUPPLEMENTARY CONDITIONS.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the enclosure of lead based paint by the following methods:

ADJUST LIST BELOW TO SUIT PROJECT.

1. Gypsum board assemblies attached directly over lead-based painted surfaces.
2. Gypsum board assemblies attached to steel framing and/or furring members.
3. Gypsum board assemblies attached to wood framing and/or furring members.

LIST ONLY MATERIALS IN THIS PROJECT THAT THE READER MAY EXPECT TO FIND IN THIS SECTION. VERIFY THAT LISTED SECTIONS ARE INCLUDED IN THIS PROJECT SPECIFICATION AND THAT THEIR TITLES ARE CORRECTLY INDICATED HERE.

- B. **Related Sections:** The following Sections contain requirements that relate to this Section:

1. Division 1

- a. **Section 01505** - Exterior Regulated Areas
- b. **Section 01555** - Worker Protection
- c. **Section 01556** - Respiratory protection

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
- C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.4 PROJECT CONDITIONS

- A. **Environmental Conditions, General:** Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. **Room Temperatures:** For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. **Ventilation:** Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. **Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

RETAIN ABOVE FOR NONPROPRIETARY OR BELOW FOR SEMIPROPRIETARY SPECIFICATION. REFER TO DIVISION 1 SECTION "MATERIALS AND EQUIPMENT."

- B. **Manufacturers:** Subject to compliance with requirements, provide products by one of the following:

MFRS LISTED IN APPENDICES MARKET PRODUCTS NATIONALLY. INSERT NAMES OF OTHER GYPSUM BOARD MFRS WHO ARE MEMBERS OF THE GYPSUM ASSOCIATION IF THEIR

PRODUCTS ARE AVAILABLE IN PROJECT AREA AND COMPLY WITH SPECIFIED REQUIREMENTS. NOT ALL MFRS OFFER A FULL RANGE OF RELATED PRODUCTS.

A LIST OF FIRMS WHO REPORTEDLY MANUFACTURE GYPSUM BOARD AND ACCESSORIES CAN BE FOUND IN THE APPENDICES. NO MANUFACTURERS HAVE BEEN KNOWINGLY EXCLUDED AND NO ATTEMPT HAS BEEN MADE TO EVALUATE THESE PRODUCTS. ADDITIONAL SUPPLIES MAY EXIST. PRODUCT LITERATURE SHOULD BE USED ALONG WITH ON-SITE TESTING TO EVALUATE PRODUCTS THESE MANUFACTURER'S PRODUCE TO VERIFY COMPLIANCE WITH THE SPECIFICATIONS AND ON-SITE REQUIREMENTS.

2.2 STEEL FRAMING AND FURRED

DELETE THIS ARTICLE IF NO STEEL FRAMING OR FURRING.

- A. General:** Provide steel framing members complying with the following requirements.
1. **Protective Coating:** Manufacturers standard corrosion-resistant coating.
 2. **Protective Coating:** G40 hot-dip galvanized coating per ASTM A 525 for framing members attached to and within 10 feet (3.05 m) of exterior walls.
- B. Steel Studs and Runners:** ASTM C645, with flange edges of studs bent back 90 deg and doubled over to form 3/16-inch-wide (4.8 mm) minimum lip (return) and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
1. **Thickness:** 0.0179 inch (0.45 mm), unless otherwise indicated.
 2. **Depth:** 3-5/8 inches (92 mm), unless otherwise indicated.
 3. **Spacing:** 24" (610 mm) on center, unless otherwise indicated.
- C. Steel Rigid Furring Channels:** ASTM C645, hat-shaped, depth and minimum thickness of base (uncoated) metal as follows:
1. **Depth:** 7/8 inch (16 mm).
 2. **Thickness:** 0.0179 inch (0.45 mm), unless otherwise indicated.
 3. **Spacing:** 24" (610 mm) on center, unless otherwise indicated.
- D. Steel Resilient Furring Channels:** Manufacturer's standard product designed to reduce sound transmission.

BELOW AVAILABLE IN DEPTHS OF 1, 1-1/2, 2, 2-1/2 AND 3 INCHES. USG PRODUCT HAS A SLOTTED WEB.

- E. Z-Furring Members:** Manufacturer's standard Z-shaped furring members with slotted or nonslotted web, fabricated from steel

sheet complying with ASTM A 525 or ASTM A 568; with a minimum base metal (uncoated) thickness of 0.0179 inch (0.45 mm), face flange of 1-1/4 inch (32 mm), wall-attachment flange of 7/8 inch (22 mm), and of depth required to fit insulation thickness indicated.

- F. **Fasteners for Metal Framing:** Provide fasteners of type, material size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved; complying with the recommendations of gypsum board manufacturers for applications indicated.

2.3 GYPSUM BOARD PRODUCTS

- A. **General:** Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints.

- B. **Gypsum Wallboard:** ASTM C36 and as follows:

1. **Type:** Regular for vertical surfaces, unless otherwise indicated.
2. **Type:** Sag-resistant type for ceiling surfaces.
3. **Edges:** Tapered.
4. **Thickness:** 3/8 inch (10 mm), where applied directly to a surface
5. **Thickness,** 1/2 inch (13 mm), unless otherwise indicated.

2.4 TRIM ACCESSORIES

- A. **Accessories for Interior Installation:** Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. **Material:** Formed metal, plastic, or metal combined with paper, with metal complying with the following requirement:
 - a. Sheet steel zinc-coated by hot-dip process.

DELETE ABOVE OR BELOW. COATING WEIGHT FOR HOT-DIP GALVANIZED COATING IS G30 PER ASTM C 1047, WHICH, UNLIKE OTHER FINISHES AND ROLLED ZINC, IS NOT REQUIRED TO UNDERGO 120-HOUR SALT-SPRAY PERFORMANCE TEST WITHOUT SHOWING ANY RED OXIDATION.

- b. Sheet steel coated with zinc by hot-dip or electrolytic processes, or with aluminum or rolled zinc.

2.5 JOINT TREATMENT MATERIALS

- A. **General:** Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet

products and of joint treatment materials for each application indicated.

GLASS-FIBER-MESH JOINT TAPES, WITH OR WITHOUT PRESSURE-SENSITIVE ADHESIVE BACKING, ARE ALSO AVAILABLE BUT ARE ONLY APPROVED BY MFRS TO USE WITH SELECTED SETTING-TYPE JOINT COMPOUNDS.

- B. Joint Tape for Gypsum Board:** Paper reinforcing tape, unless otherwise indicated.

DELETE BELOW IF NOT APPLICABLE.

1. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.

EXAMPLES BELOW ARE THE USUAL RANGE OF PRODUCT CHOICES. BEFORE EDITING BELOW, FIRST EDIT PART 3 "FINISHING GYPSUM BOARD ASSEMBLIES" ARTICLE TO DETERMINE WHICH COMPOUNDS TO RETAIN.

- C. Setting-Type Joint Compounds for Gypsum Board:** Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.

RETAIN APPLICABLE REQUIREMENTS BELOW. SETTING-TYPE JOINT COMPOUNDS OFFER ADJUSTABLE SETTING AND WORKING TIMES. THEY ARE USED WHERE FAST ONE-DAY FINISHING IS REQUIRED OR WHERE RAPID DRYING CONDITIONS EXIST THAT WOULD CAUSE DRYING-TYPE JOINT COMPOUNDS TO SHRINK EXCESSIVELY AND LOSE SURFACE STRENGTH.

1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
 2. For pre-filling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
 3. For topping compound, use sandable formulation.
- D. Drying-Type Joint Compounds for Gypsum Board:** Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
1. Ready-Mixed Formulation: Factory-mixed product.

RETAIN BELOW EITHER BOTH TAPING AND TOPPING COMPOUND OR ALL-PURPOSE COMPOUND OR ALL THREE TO CORRELATE WITH FINISHING REQUIREMENTS IN PART 3.

2. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
3. Topping compound formulated for fill (second) and finish (third) coats.
4. All-purpose compound formulated for both taping and topping compounds.

2.6 MISCELLANEOUS MATERIALS

- A. General:** Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

DELETE MATERIALS BELOW NOT APPLICABLE TO PROJECT.

ACOUSTICAL SEALANT SHOULD ALWAYS BE USED TO PROVIDE A DUST TIGHT SEAL

- B. Latex Acoustical Sealant:** Manufacturer's standard nonsag, printable, nonstaining latex sealant complying with ASTM C834 and the following requirements.
- C. Fastening Adhesive for Wood:** ASTM C 557.
- D. Fastening Adhesive for Metal:** Special adhesive recommended for laminating gypsum panels to steel framing.
- E. Steel drill screws** complying with ASTM C 1002 for the following applications:

DELETE APPLICATIONS BELOW THAT ARE NOT REQUIRED FOR THIS PROJECT.

1. Fastening gypsum board to steel members less than 0.03 inch (0.76 mm) thick.
 2. Fastening gypsum board to wood members.
 3. Fastening gypsum board to gypsum board.
- F. Gypsum Board Nails:** ASTM C514.

RETAIN BELOW IF ENCLOSURE IS BEING INSTALLED OVER AN EXTERIOR WALL OR CEILING.

- G. **Polyethylene Vapor Retarder:** ASTM D 4397, thickness and maximum permeance rating as follows:
 - 1. **6.0 mils**, 0.13 perms, clear
- H. **Vapor Retarder Tape:** Pressure-sensitive tape of type recommended by vapor retarder manufacturer for sealing joints and penetrations in vapor retarder.

PART 3 - EXECUTION

3.1 GENERAL

- A. Before starting work of this section, complete the following:
 - 1. **Section 01505** - Exterior Regulated Areas
 - 2. **Section 01555** - Worker Protection
 - 3. **Section 01556** - Respiratory protection

3.2 PREPARATION

- A. Prior to installation of enclosure carefully remove flaking and loose areas of lead-based paint. Paint with good adhesion shall remain.
- B. Prior to installing enclosure, affix 3" x 5" (76 x 127 mm) warning labels or using an indelible marker write "Lead-Based Paint" every 4 feet (1.2 m) vertically and 4 feet (1.2 m) horizontally, for a minimum of 1 label every 16 square feet, on lead-based painted surface.

3.3 INSTALLING STEEL FRAMING, GENERAL

ASTM C 840 INCLUDES INSTALLATION REQUIREMENTS THAT ARE NOT INCLUDED IN ASTM C 754.

- A. **Steel Framing Installation Standard:** Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.
- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.

INCLUDE DETAILS ON DRAWINGS SHOWING EXPANSION AND CONTROL JOINT CONSTRUCTION AND LOCATIONS.

- C. Do not bridge building expansion and control joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.

DELETE PARAGRAPH BELOW IF NO WOOD FRAMING (CEILING JOISTS/BEAMS, STUDS, ETC).

- D. Screw members directly to wood framing.
- E. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
 - 1. Where studs are installed directly against exterior walls, install asphalt felt strips between studs and wall.
- F. Install steel studs so that flanges point in the same direction and so that leading edges or ends of each gypsum board can be attached to open (unsupported) edges of stud flanges first.
- G. Frame door openings to comply with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.

LEAVE THE FOLLOWING ARTICLE IN IF EXTERIOR WALLS ARE GOING TO BE INSULATED, OTHERWISE DELETE.

- H. Install thermal insulation as follows:
 - 1. Erect insulation vertically and hold in place with studs or Z-furring members spaced 24 inches (610 mm) o.c.
 - 2. Except at exterior corners, securely attach narrow flanges of furring members to wall with concrete stub nails, screws designed for masonry attachment, or power-driven fasteners spaced 24 inches (610 mm) o.c.
 - 3. At exterior corners, attach wide flange of furring members to wall with short flange extending beyond corner; on adjacent wall surface, screw attach short flange of furring channel to web of attached channel. Start from this furring channel with standard width insulation panel and continue in regular manner. At interior corners, space second member no more than 12 inches (305 mm) from corner and cut insulation to fit.

ALWAYS INCLUDE THE FOLLOWING ARTICLE FOR EXTERIOR WALLS AND CEILINGS.

- I.** Install polyethylene vapor retarder on all exterior walls and ceiling. Comply with the following requirements:
1. Prior to installing gypsum panels, , affix 3" x 5" (76 x 127 mm) warning labels or using an indelible marker write "Lead-Based Paint" every 4 feet (1.22 m) vertically and 4 feet (1.22 m) horizontally, for a minimum of 1 label every 16 square feet, on lead-based painted surface.
 2. Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with mechanical fasteners or adhesive. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose mineral-fiber insulation.
 3. Seal vertical joints in vapor retarders over framing by lapping not less than two wall studs. Fasten vapor retarders to framing at top, end, and bottom edges, at perimeter of wall openings, and at lap joints; space fasteners 16 inches (408 mm) o.c.
 4. Seal joints in vapor retarders caused by pipes, conduits, electrical boxes and similar items penetrating vapor retarders with vapor retarder tape.
 5. Repair any tears or punctures in vapor retarder immediately before concealing it with the installation of gypsum board or other construction.
 6. Affix 3" x 5" (76 x 127 mm) warning labels every 4 feet (1.22 m) vertically and 4 feet (1.22 m) horizontally, for a minimum of 1 label every 16 square feet, on surface of vapor retarder (dust barrier) reading "Lead-Based Paint" or using an indelible marker write "Lead-Based Paint" on same spacing prior to installing gypsum board.

3.4 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

- A. Gypsum Board Application and Finishing Standards:** Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
- B.** Install ceiling board panels access framing to minimize the number of abutting end joints and avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- C.** Install wall/partition board panels to minimize the number of abutting end joints and avoid them entirely. Stagger abutting end joints not less than one framing member in alternate courses of board. At stairwells and other high walls, install panels horizontally with end abutting joints over studs and staggered.
- D.** Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- E.** Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board

back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at corners of framed openings where possible.

- F. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- G. Attach gypsum panels to framing provided at openings and cutouts.

DELETE BELOW IF NO GYPSUM PANELS ARE USED OVER WOOD FRAMING.

- H. Do not attach gypsum panels across the flat grain of wide-dimension lumber including floor joists and headers. Instead, float gypsum panels over these members using resilient channels or provide control joints to counteract wood shrinkage.

SHOW LOCATIONS AND DETAIL ON DRAWINGS.

- I. Form control joints and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

BELOW IS FEASIBLE ONLY WITH WOOD FRAMING WHERE FIRE RATINGS ARE NOT REQUIRED. DELETE FOR METAL-FRAMED GYPSUM BOARD ASSEMBLIES.

- J. **Floating Construction:** Where feasible, including where recommended by manufacturer, install gypsum panels over wood framing, with floating internal corner construction.
- K. Seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
- L. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.5 GYPSUM BOARD APPLICATION METHODS

- A. Install gypsum wallboard panels as follows:

DELETE BELOW IF NO GYPSUM BOARD CEILINGS.

1. On ceilings, apply gypsum panels prior to wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated, and provide panel lengths that will minimize end joints.

DELETE ABOVE OR BELOW.

3. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless parallel application is required for fire-resistive-rated assemblies. Use maximum-length panels to minimize end joints.

DELETE BELOW IF NO Z-FURRING MEMBERS.

4. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.

- B. Apply gypsum panels to supports as follows:

RETAIN ONE OF THE FOLLOWING. SCREWS ARE SUITABLE FOR STEEL OR WOOD FRAMING. SCREWS ARE MUCH LESS LIKELY TO "BACK OUT" AND AS SUCH ARE PREFERABLE.

1. Fasten with screws.
2. Fasten to wood supports with single nailing.
3. Fasten to wood supports with double nailing.
4. Fasten to wood supports with adhesive and supplementary nails or screws.

3.6 INSTALLING TRIM ACCESSORIES

- A. **General:** For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

- B. Install corner beads at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed or semi-exposed. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.

LOCATE EXPANSION JOINTS TO COMPLY WITH ASTM C840 REQUIREMENTS FOR SPACING CONTROL (EXPANSION) JOINTS.

- D. Install control joints at locations indicated, and where not indicated according to ASTM C 840, and in locations approved by Designer for visual effect.

3.7 FINISHING GYPSUM BOARD ASSEMBLIES

- A. **General:** Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints except those with trim accessories having concealed face flanges not requiring taping to prevent cracks from developing in joint treatment at flange edges.
- D. **Gypsum board finish:** embed tape in joint compound and apply three separate coats over joints, angles, fastener heads, and trim accessories. Produce surfaces free of tool marks and ridges ready for painting.

3.8 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer, that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION 09252

SECTION 09253-CEMENTITIOUS ENCLOSURE - LEAD-BASED PAINT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the enclosure of lead-based paint by the following methods:

ADJUST LIST BELOW TO SUIT PROJECT REQUIREMENTS

- 1. Cementitious enclosure mechanically attached directly over lead-based painted surface, on drywall, wood, stucco, plaster and other masonry products.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Section 01505 - Exterior Regulated areas
 - 2. Section 01506 - Work area containment
 - 3. Section 01555 - Worker protection
 - 4. Section 01556 - Respiratory protection
 - 5. Section 09953 - Surface preparation - Paint Stabilization

1.3 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages, containers or rolls bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep dry and protected against damage from weather, construction traffic and other causes.

1.4 PROJECT CONDITIONS

- A. Environmental conditions, General: Establish and maintain environmental conditions for applying and finishing cementitious enclosure according to manufacturers recommendations.

- B. Room temperature: For adhesive attachment and finishing of cementitious materials, maintain not less than 40 degrees F (4 degrees C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 degrees F (35 degrees C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces, as required, for drying cementitious materials.

1.5 SUBMITTALS

- A. Submit copies of manufacturer's specifications, product data and installation instructions.
- B. Submit Material Safety Data Sheets.
- C. Submit copies of ASTM test results.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to the following:

RETAIN ABOVE FOR NON PROPRIETARY OR BELOW FOR SEMI-PROPRIETARY SPECIFICATION. REFER TO DIVISION 1 SECTION "MATERIAL AND EQUIPMENT".

- B. Subject to compliance with requirements, provide cementitious enclosure and related products by one of the following:

A LIST OF FIRMS WHO REPORTEDLY MANUFACTURE ENCAPSULANTS CAN BE FOUND IN THE APPENDICES. NO MANUFACTURERS HAVE BEEN KNOWINGLY EXCLUDED AND NO ATTEMPT HAS BEEN MADE TO EVALUATE THESE PRODUCTS. ADDITIONAL SUPPLIERS MAY EXIST. PRODUCT LITERATURE SHOULD BE USED ALONG WITH ON-SITE TESTING TO EVALUATE PRODUCTS THESE MANUFACTURER'S PRODUCE TO VERIFY COMPLIANCE WITH THE SPECIFICATIONS AND ON-SITE REQUIREMENTS.

MANUFACTURERS LISTED IN THE APPENDICES MARKET PRODUCTS NATIONALLY. INSERT NAMES OF OTHER CEMENTITIOUS ENCLOSURE MANUFACTURERS WHO ARE

MEMBERS OF THE NATIONAL ALLIANCE FOR ENCAPSULATION TECHNOLOGY IF THEIR PRODUCTS ARE AVAILABLE IN PROJECT AREAS AND COMPLY WITH SPECIFIED REQUIREMENTS. NOT ALL MANUFACTURERS OFFER A FULL RANGE OF RELATED PRODUCTS.

2.2 CEMENTITIOUS ENCLOSURE SYSTEM MATERIALS

- A. Hard surfaced polymer acrylic cementitious coating
- B. Glass fiber reenforcing mesh
- C. Bonding coating

2.3 MIXING

- A. Mechanically mix cementitious materials to comply with referenced application standard and with recommendations of manufacturer.

PART 3 - EXECUTION

3.1 GENERAL

- A. Before starting work of this section, complete the following:
 - 1. Section 01506 - Work area containment
 - 2. Section 01555 - Worker protection
 - 3. Section 01556 - Respiratory protection

3.2 EXAMINATION

- A. Examine substrates for compliance with requirements for substrates, installation tolerances, and other conditions affecting performance of enclosure. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Prior to installation of cementitious enclosure carefully remove flaking and loose areas of lead-based paint in accordance with Section 09953 - Surface Preparation-Paint Stabilization.

- B. Clean substrates of projections and substances detrimental to application conduct final preparation of surfaces in accordance with manufacturer's written instructions.
- C. Protect adjacent surfaces not to be enclosed. Immediately remove cementitious material by wet wiping from any surface not intended to be covered.

3.4 APPLICATION

- A. Prepare monolithic surfaces for bonded base coats and use bonding compound or agent to comply with requirements of referenced plaster application standards for conditioning of monolithic surfaces.
- B. Tolerances: Do not deviate more than 1/8 inch (3.2 mm) in 10'0" (3.05 m) from a true plane in finished plaster surfaces, as measured by a 10'0" (3.05 m) straightedge at any location on surface.
- C. Apply thickness and number of coats of cementitious materials required by manufacturer's written instructions.

3.5 WALL APPLICATION

- A. Apply light coat of cementitious material to wall with a trowel
- B. Trowel reinforcing mesh into the wet base coat. work from center to edges. Embed mesh until uniformly covered and barely visible.
- C. Mechanical fasteners may be installed immediately after installation of mesh or after curing. Space fasteners 10" to 24" (25 to 610 mm) o.c. Drive fasteners into framing or other supports.
- D. Allow base coat to cure in accordance with manufacturer's written instructions.
- E. Apply finish coat 1/8" to 3/16" (3.2 to 4.8 mm) in thickness over entire base coat. Maintain uniform appearance.

3.6 CEILING APPLICATION

- A. Apply bonding agent to ceiling in accordance with manufacturer's written instructions. Allow agent to cure completely.

- B. Follow installation instructions for walls above.

3.7 CLEANING AND PROTECTION

- A. Remove temporary protection. Promptly remove cementitious material and bonding agent from door frames, windows, and other surfaces that are not to be enclosed. Repair floors, walls, and other surfaces that have been stained, marred, or otherwise damaged during the enclosure work. When work is completed, removed unused materials, containers, and equipment and clean floors of plaster debris.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer that ensure cementitious enclosure work's being without damage or deterioration at time of Substantial Completion.

END OF SECTION 09253

SECTION 09940 - ENCAPSULATION - LEAD-BASED PAINT

PART 1 - GENERAL

AT THIS TIME, THERE ARE NO APPROVED OR PROHIBITED ENCAPSULANTS. CHECK WITH CURRENT STATE REGULATIONS REGARDING ENCAPSULANT USE BEFORE EDITING THIS SECTION. THERE ARE ALSO NO STANDARDS FOR THEIR USE. STANDARDS FOR MINIMUM PERFORMANCE CHARACTERISTICS ARE NOW BEING DEVELOPED UNDER AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) COMMITTEE E6.23.30, AT LEAST ONE STATE (MASSACHUSETTS) AND EPA. TITLE X REQUIRES THAT ENCAPSULANT STANDARDS BE COMPLETED BY APRIL, 1996. UNTIL ASTM STANDARDS NOW IN BALLOT ARE APPROVED, REFERENCE IS MADE TO THE MASSACHUSETTS ENCAPSULANT PRODUCT PERFORMANCE PROTOCOL FOR INTERIOR USE (SEE APPENDIX G). A COPY OF THE PROTOCOL SHOULD BE IN HAND WHEN EDITING THIS SECTION.

MOST ENCAPSULANTS ARE NOT ENCLOSURES, WHICH ARE RIGID BARRIERS FASTENED BY MECHANICAL MEANS. ENCAPSULANTS RELY ON THE SUCCESSFUL BOND BETWEEN THE SURFACE OF THE EXISTING PAINT FILM AND THE ENCAPSULANT FOR PERFORMANCE. THIS CONDITION ALONE IS NOT SUFFICIENT FOR ENCAPSULANT SYSTEM SUCCESS. ALL LAYERS OF THE EXISTING PAINT FILM MUST ADHERE WELL TO EACH OTHER, AS WELL AS TO THE BASE SUBSTRATE.

THE SUCCESS OF AN ENCAPSULATION APPLICATION OFTEN DEPENDS ON SUCCESSFUL PATCH TESTING IN THE FIELD, PROPER SURFACE PREPARATION AND APPLICATION PROCEDURES, AND ONGOING MONITORING. REFER TO HUD GUIDELINES FOR MORE INFORMATION ON THE CIRCUMSTANCES WHEN AND WHEN NOT TO CONSIDER USE OF ENCAPSULANTS.

ENCAPSULATION TECHNOLOGY IS DEVELOPING RAPIDLY MAKING CLASSIFICATION DIFFICULT. THE ASTM STANDARD REFERENCES TWO GENERAL CLASSIFICATIONS OF ENCAPSULANTS, LIQUID SPREADABLE COATINGS AND LIQUID SPREADABLE REINFORCED COATINGS. ASTM ALSO ACCEPTS THREE GENERAL TYPES OF ENCAPSULANTS; ACRYLIC - ELASTOMERIC FORMULATIONS, EPOXY - URETHANE FORMULATIONS AND CEMENTITIOUS FORMULATIONS.

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY OF WORK:

- A. Work under this section includes the furnishing of all labor, materials, and equipment required to encapsulate the following lead-based painted surfaces:

EDIT, DELETE OR ADD TO THE FOLLOWING EXAMPLES TO MEET PROJECT SPECIFICS

1. *Lead-based* painted plaster kitchen walls where cabinetry is located.
2. *Lead-based* painted wood crown molding.

1.3 SUBMITTALS:

- A. Before Start of Work:** Submit the following to the Designer for review. Do not start work until these submittals are returned with Designer action stamp indicating that the submittal is returned for unrestricted use.

NOT ALL MANUFACTURERS HAVE CHOSEN TO SUBMIT TO THE MASSACHUSETTS CERTIFICATION REQUIREMENTS, ELECTING INSTEAD TO WAIT FOR THE ASTM STANDARDS. IN THIS CASE THE SPECIFIER MUST DETERMINE IF THE PRODUCT MEETS THE PHYSICAL PROPERTY REQUIREMENTS CONTAINED IN THE MASSACHUSETTS PROTOCOL AND WHEN AVAILABLE THE ASTM STANDARD.

- B. Product Data:** Submit product data, use instructions, and recommendations from manufacturer's intended for use. Include data substantiating that material complies with requirements of this section and the physical properties requirements established by the Commonwealth of Massachusetts. Submit manufacturer's warranties on the durability of the product. Provide material safety data sheets.

1.4 DELIVERY AND STORAGE

- A.** Deliver materials to the job site in original, new and unopened packages and containers bearing manufacturer's name and label and following information:

Name And Title Of Material
Manufacturer's Name
Manufacturer's Stock Number And Date of Manufacture
Applications Instructions

1.5 JOB CONDITIONS

- A.** Apply Encapsulating Materials only when environmental conditions in the work area are as required by the manufacturer's instructions.

1.6 QUALITY ASSURANCE

FOLLOWING SHOULD BE USED IF ENCAPSULATION IS TREATED AS A PROPRIETARY SYSTEM. EDIT FOLLOWING IF MANUFACTURER DOES NOT APPROVE INSTALLATION PERSONNEL.

- A. Installation of encapsulation materials by a firm and personnel approved by manufacturer of the primary encapsulation material.
- B. **Testing:** Test Encapsulation Material using methods set forth in the HUD guideline until ASTM standard is approved. Test each encapsulant system on each component and surface to receive treatment. Allow product to cure properly before performance patch test.

REFER TO HUD GUIDELINES FOR DESCRIPTION OF TESTING METHODS. UPDATE THIS SECTION WHEN ASTM PUBLISHES PROTOCOLS FOR TESTING.

- 1. **X-cut Or Patch Edge Method:** Apply encapsulation system in accordance with manufacturer's instructions including adequate cure time before testing. If inspector can lift, peel or tear a large (1/2 inch x 1/2 inch (13 x 13 mm) or larger square) section of the patch away from the existing top coat then the encapsulant fails the patch test. For the "patch-edge" method, if the encapsulant can be lifted easily, then the patch test fails.
- 2. **Soundness Method:** Apply encapsulant in accordance with manufacturer's instructions. When peeled away the paper backing on the wallboard attached to the painted surface should remain. If the adhesive is removed from the painted surface or if the lead-based paint film splits the test fails.

ENCAPSULATION TESTING IS NOT SATISFACTORY IF ADHESIVE FAILURE WAS BETWEEN UNDERLYING LAYERS OF PAINT OR PAINT AND BASE SUBSTRATE. FAILURE IN THIS MANNER IS NORMALLY NOT CORRECTABLE, DO NOT USE ENCAPSULANT SYSTEM. MECHANICALLY ATTACHED REINFORCED ENCAPSULANTS CAN OFTEN BE USED TO CORRECT THIS DEFICIENCY. IF THE FAILURE WAS BETWEEN ENCAPSULANT AND TOP COAT, SURFACE PREPARATION AND APPLICATION TECHNIQUE MAY BE CAUSE AND MAY BE CORRECTABLE. ADDITIONAL TESTING MAY BE REQUIRED.

- C. **Performance Warranty:** submit written performance warranty, executed by the manufacturer and co-signed by the contractor, agreeing to repair/replace work that has cracked, peeled, blistered or otherwise deteriorated to a condition where it would not perform effectively for its intended purpose due substantially to defective materials or workmanship, and not due to abuse by occupants. Improper maintenance, unforeseeable ambient exposures or other causes beyond anticipated conditions and manufacturer's/contractor's control are not covered by the warranty.

EDIT BELOW TO SET WARRANTY PERIOD APPROPRIATE TO SPECIFIC PROJECT CIRCUMSTANCES.

1. **Warranty** Period is _____ years after date of substantial completion.

PART 2 - PRODUCTS

SPECIFY ENCAPSULATION SYSTEMS FOR USE ON NON-FRICTION SURFACES ONLY. DO NOT SPECIFY FOR DOOR JAMBS, DOOR STOPS, WINDOW JAMBS, SASHES ETC.

THE LONG TERM PERFORMANCE OF THE ENCAPSULANTS VARIES BY CLASSIFICATION, TYPE OF ENCAPSULANT AND MANUFACTURER. MANUFACTURERS WARRANTIES AND PERIODIC SURVEILLANCE OF THE SURFACES WILL BE REQUIRED.

FIBERGLASS/POLYESTER MAT ENCAPSULATION SYSTEMS WORK WELL ON FLAT SURFACES SUCH AS WALLS AND CEILINGS. CONSIDER SPECIFYING LARGER TEST AREAS AND VARIOUS ENCAPSULANTS PRIOR TO PRODUCT SELECTION.

A LIST OF FIRMS WHO REPORTEDLY MANUFACTURE ENCAPSULANTS CAN BE FOUND IN THE APPENDICES. NO MANUFACTURERS HAVE BEEN KNOWINGLY EXCLUDED AND NO ATTEMPT HAS BEEN MADE TO EVALUATE THESE PRODUCTS. ADDITIONAL SUPPLIES MAY EXIST. PRODUCT LITERATURE SHOULD BE USED ALONG WITH ON-SITE TESTING TO EVALUATE PRODUCTS THESE MANUFACTURER'S PRODUCE TO VERIFY COMPLIANCE WITH THE SPECIFICATIONS AND ON-SITE REQUIREMENTS.

2.1 ENCAPSULATION SYSTEMS:

A. Liquid Spreadable Encapsulants

1. Provide encapsulation system consisting of a durable coating which is compatible with the lead-based painted surface.

EDIT LIST TO MEET PROJECT REQUIREMENTS. ADD MANUFACTURER'S SYSTEM IF PROPRIETARY SYSTEM IS KNOWN.

- a. **Elastomeric**
- b. **Semi-Rigid, flexible**
- c. **Rigid**

2. **Available Manufacturer's** include but are not limited to:

ADD MANUFACTURER'S ENCAPSULATION SYSTEM IF PROPRIETARY SYSTEM IS DESIRED.

B. Liquid Spreadable Reinforced Encapsulants

1. Provide encapsulation system consisting of a coated reinforced covering.

EDIT LIST TO MEET PROJECT REQUIREMENTS.

- a. **Elastomeric**
- b. **Urethane/Epoxy**
- c. **Cementitious**

ADD MANUFACTURER'S ENCAPSULATION SYSTEM IF PROPRIETARY SYSTEM IS SPECIFIED.

2. **Available Manufacturer's:** include but are not limited to:

PART 3 - EXECUTION

3.1 BEFORE STARTING WORK OF THIS SECTION, COMPLETE THE FOLLOWING:

- A. **Section 01505** - Exterior Regulated Areas - Lead-Based Paint
- B. **Section 01506** - Work Area Containment - Lead-Based Paint
- C. **Section 01555** - Worker Protection - Lead-Based Paint
- D. **Section 01556** - Respiratory Protection - Lead-Based Paint
- E. **Section 09953** - Surface Preparation - Paint Stabilization - Lead-Based Paint

3.2 SURFACE PREPARATION:

- A. Prior to installation of encapsulation system carefully remove flaking and loose areas of lead based paint by wet scraping until a sound, intact edge is achieved. Remove loose or unsound substrates and repair/replace prior to encapsulation. Paint with good adhesion is to remain. Follow manufacturer's printed instructions.
- B. Degrease and degloss walls if required by manufacturer's printed instructions.

3.3 ENCAPSULATION APPLICATION:

- A.** Apply encapsulation system in accordance with manufacturer's recommendations. Examine existing conditions to determine surface preparation required and compatibility with substrate.
- B.** Encapsulation system shall be applied to the substrate in a continuous system to seal the entire surface being coated. Number of coats and coverage rates shall be in accordance with manufacturer's recommendations.
- C.** Test the adhesion of the system by using minimum 6" X 6" (152 x 152 mm) area in accordance with HUD Guidelines. The area must pass a visual inspection before applying and performing the patch test to ensure a clean surface and before completing the encapsulation process.
- D.** At completion of encapsulation comply with requirements of section 01715 - Project Decontamination - Lead-Based Paint.
- E.** At completion of work submit manufacturer's warranty executed by both manufacturer and contractor.

END OF SECTION 09940

SECTION 09951 - CHEMICAL STRIPPING OF LEAD-BASED PAINT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY OF WORK: Work of this section includes removal and disposal of lead-based paint.

INCLUDE A LIST OF SUBSTRATES FROM WHICH LEAD-BASED PAINT IS BEING REMOVED. THIS SECTION CAN BE COORDINATED WITH DRAWINGS SHOWING THE LOCATION ON PLANS OR BY PROVIDING A SCHEDULE OF REMOVAL. THE FOLLOWING ARE EXAMPLES AND ARE NOT ALL INCLUSIVE.

A. The following substrates require on-site paint removal:

1. *Wood stair rails.*
2. *Wood balusters.*
3. *Wood crown molding.*
4. *Fireplace mantle.*
5. *Wrought iron rails.*

EDIT BELOW IF OFF-SITE PAINT REMOVAL IS SPECIFIED.

B. The following substrates require off-site paint removal:

1. *Wood stair rails.*
2. *Wood balusters.*
3. *Wood crown molding.*
4. *Fireplace mantle.*
5. *Wrought iron rails.*

1.3 GENERAL: prohibited lead hazard removal methods.

- A. Open flame burning;

- B. Chemical stripping with methylene chloride based paint strippers;
- C. Uncontained abrasive blasting;
- D. Uncontained power washing;
- E. Dry sanding or scraping;
- F. Power sanding without HEPA attachment;
- G. Sanding of wood after chemical stripping.

1.4 SUBMITTALS: Before start of work: Submit the following to the Designer for review. Do not start work until these submittals are returned with Designer action stamp indicating that the submittal is returned for unrestricted use.

- A. **Chemical Stripping Removers And Neutralizers:** Submit product data, use instructions and recommendations from manufacturer for use intended. Include data substantiating that material complies with requirements.
- B. **Material Safety Data Sheet:** Submit material safety data sheet, or equivalent, in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200) for each chemical stripper and neutralizer, include a separate attachment for each sheet indicating the specific worker protective equipment proposed for use with the material indicated.
- C. **Off-Site Removal:** Submit name, location, materials and methods to be used to remove paint off-site.

PART 2 - PRODUCTS

- A. **Chemical Stripping Removers:** Shall contain no methylene chloride products. Chemical removers shall be compatible with, and not harmful to the substrate that they are applied to. The contractor shall comply with the manufacturer's recommendations for use of the product supplied.

NOT ALL CHEMICAL STRIPPERS REQUIRE NEUTRALIZATION. EDIT BELOW TO MEET MANUFACTURER'S RECOMMENDATIONS OF PRODUCTS USED.

- B. **Chemical Stripping Agent Neutralizer:** Provide chemical agent neutralizer in accordance with manufacturer's recommendations. Neutralizers shall be compatible with and not harmful to the substrate. Neutralizers shall also be compatible with the stripping agent used.

THE USE OF DETERGENTS WITH HIGH PHOSPHATE CONTENT ARE RESTRICTED OR BANNED IN SOME AREAS BECAUSE OF THE IMPACT ON THE ENVIRONMENT. OTHER DETERGENTS THAT ARE LEAD-SPECIFIC MAY BE EQUALLY EFFECTIVE AND SHOULD BE PERMITTED.

EVEN DILUTED TRI-SODIUM PHOSPHATE IS VERY IRRITATING TO THE SKIN AND SHOULD BE USED ONLY WITH WATERPROOF GLOVES AND EYE PROTECTION. PORTABLE EYE WASH FACILITIES SHOULD BE AVAILABLE.

- C. **Wet Detergent Wash:** Provide detergent with a high phosphate content (at least 5%) trisodium phosphate (TSP). Follow dilution ratio recommended by the manufacturer's instructions.

CONSIDER PARAGRAPH BELOW FOR NON-TSP DETERGENTS. DELETE ABOVE OR BELOW.

Wet Detergent Wash: Provide detergent or cleaning agent formulated to be effective in removing lead dust. Follow dilution ratio recommended by the manufacturer's instructions.

PART 3 - EXECUTION

3.1 Before starting work of this section, complete the following:

- A. **Section 01504** - Temporary Facilities
- B. **Section 01505** - Exterior Regulated Areas
- C. **Section 01506** - Work Area Containment (Interior)
- D. **Section 01555** - Worker Protection
- E. **Section 01556** - Respiratory Protection

3.2 CHEMICAL LEAD-BASED PAINT REMOVAL ON-SITE:

- A. Chemical Stripping Agents** and neutralizers shall be applied in accordance with the recommendations of the manufacturer.
- B. Caustic Stripper Neutralization:** Caustic strippers shall be neutralized in accordance with manufacturer's recommendations. Provide workers with proper protective equipment, including but not limited to; protective clothing (non-paper), chemically resistant gloves, eye protection and respiratory protection with filters selected for the hazards to be encountered.
- C. Remove Stripper Sludge:** Place lead containing stripper sludge in corrosion-proof containers and place in a secure waste storage area. The surface from which lead-based paint has been removed shall be thoroughly scrubbed, while still damp from the stripper, in accordance with the manufacturer's recommendation. Monitor pH of the neutralizing solution to ensure it has not become neutralized in the process. If the pH exceeds 6.5, or the solution becomes overly soiled, change solution. Solution may be classified as hazardous waste. Place in 55 gallon drums and test in accordance with Section 02067- Disposal of Waste Materials - Lead-Based Paint . The surface shall be tested with litmus paper following this process. If the litmus paper turns pink, the acid has effectively neutralized the alkali. If litmus turns blue continue scrubbing until satisfactory results are achieved.

FOLLOWING NEUTRALIZATION OF THE ALKALI, CONSIDERABLE LEAD RESIDUE WILL REMAIN ON THE SURFACE, PARTICULARLY POROUS SURFACES LIKE WOOD AND MASONRY. FOR WOOD SURFACES, IT IS IMPORTANT NOT TO ALLOW THE SURFACE TO DRY BEFORE THE NEXT STEP.

D. Final Cleaning Of Surfaces:

Prepare wet detergent wash. Workers must wear eye shields and chemically resistant gloves when working with this solution. Thoroughly scrub stripped surface to remove as much remaining lead residue as possible. The wash solution may also be hazardous waste, treat in accordance with Section 02067- Disposal of Waste Materials - Lead-Based Paint . Following wet detergent wash, perform a final wash with clear water to remove any traces of detergent. Sponges used in the clean-up process may not be reused and must be placed in double 4 mil or single 6 mil plastic bags, which will be sealed, labeled, and placed in the secure waste storage area. Surfaces must be allowed to dry thoroughly before repainting. A grayish film indicates that significant lead residues remain and the cleaning process must be repeated. If a white powder appears, the surface is Alkaline and requires further neutralization.

- E. Painting/sealing:** After complete drying, prepare the substrate and seal all surfaces where lead-based paint was

removed with a primer or encapsulant which is compatible with the substrate.

- F. Complete Project Decontamination** Requirements of Section 01715 - Project Decontamination - Lead-Based Paint.

- 3.3 CHEMICAL LEAD-BASED PAINT REMOVAL OFF SITE:** Carefully remove lead-based painted substrates in accordance with Section 02065 - Removal of Lead-Based Painted Substrates. Wrap with 6 mil polyethylene sheeting and label with "CAUTION-LEAD DUST". Do not deliver stripped components back to job site until visual inspection requirements of Section 01715 - Project Decontamination - Lead-Based Paint are met.

END OF SECTION 09951

SECTION 09952 - MECHANICAL REMOVAL OF LEAD-BASED PAINT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY OF WORK: Work of this section includes removal and disposal of lead-based paint.

INCLUDE A LIST OF SUBSTRATES FROM WHICH LEAD-BASED PAINT IS BEING REMOVED. THIS SECTION CAN BE COORDINATED WITH DRAWINGS SHOWING THE LOCATION ON PLANS OR BY PROVIDING A SCHEDULE OF REMOVAL. THE FOLLOWING ARE EXAMPLES AND ARE NOT ALL INCLUSIVE.

A. The following substrates require Mechanical paint removal:

1. *Steel lintels*
2. *Metal door frames*
3. *Steel columns*
4. *Concrete walls*
5. *Wrought iron rails.*

1.3 GENERAL: Prohibited lead hazard removal methods.

- A. Open flame burning;
- B. Chemical stripping with methylene chloride based paint strippers;
- C. Uncontained abrasive blasting;
- D. Uncontained power washing;
- E. Dry sanding or scraping;
- F. Power sanding without HEPA attachment;
- G. Sanding of wood after chemical stripping.

1.4 SUBMITTALS: Before start of work: Submit the following to the Designer for review. Do not start work until these submittals are returned with Designer action stamp indicating that the submittal is returned for unrestricted use.

- A. Manufacturer's Product Data on removal equipment to be used.
- B. Description of removal methods to be used for each substrate condition including manufacturer's operating instructions and recommendations for equipment usage.

PART 2 - PRODUCTS

2.1. TOOLS AND EQUIPMENT

- A. Portable power sanders with HEPA vacuum attachment.
- B. Needle gun with HEPA vacuum attachment
- C. Vacuum blasting equipment with HEPA vacuum attachment

BECAUSE HIGH LEVELS OF AIRBORNE LEAD CAN BE PRODUCED AND DISPERSED BY HEAT GUNS, RESPIRATORY PROTECTION IS REQUIRED. AT THE TEMPERATURE EXPECTED TO OCCUR DURING PAINT REMOVAL OPERATIONS WITH MOST CURRENTLY AVAILABLE HEAT GUNS, SOME LEAD FUME IS LIKELY TO BE GENERATED. HEAT GUNS SHOULD NOT BE OPERATED IN EXCESS OF 700°F.

- D. Flameless heat guns and heat grid with maximum temperature setting of 700 degrees fahrenheit.
- E. Paint scrapers
- F. Wet/dry sand paper

MANUAL PAINT REMOVAL SHOULD BE USED ON LIMITED AREAS BECAUSE OF THE GENERATION OF LEAD DUST.

PART 3 - EXECUTION

3.1 RELATED WORK SPECIFIED ELSEWHERE:

- A. Section 01504 - Temporary Facilities
- B. Section 01505 - Exterior Regulated Areas
- C. Section 01506 - Work Area Containment (Interior)
- D. Section 01555 - Worker Protection
- E. Section 01556 - Respiratory Protection
- F. Section 02067 - Disposal of Waste Materials - Lead-Based Paint

3.2 MECHANICAL REMOVAL OF LEAD-BASED PAINT

MACHINE SANDING WITHOUT A HEPA FILTERED VACUUM SHOULD NOT BE USED AS A FINISHING METHOD AFTER SCRAPING OR ANY OTHER METHOD OF ABATEMENT. WHEN USING A SANDER EQUIPPED WITH A HEPA FILTERED VACUUM, FOLLOW THE MANUFACTURER'S OPERATING INSTRUCTIONS AND INSTRUCTIONS FOR CARE AND MAINTENANCE. THE POTENTIAL FOR PRODUCTION OF LEAD DUST INCREASES WHEN THE SANDING DISK IS WIDER THAN THE SURFACE BEING ABATED (E.G., A DOOR STOP) BECAUSE THE SANDING SHROUD IS NOT ALWAYS IN CONTACT WITH THE SURFACE. THE HEPA SANDER IS RECOMMENDED ONLY FOR LIMITED SURFACE AREAS. ITS USE IS MOST APPROPRIATE ON FLAT SURFACES SUCH AS JAMBS/STAIR RISERS.

- A. Portable Power Sanders:** Maintain HEPA vacuum attachment in operation during sanding operations. Sanding surface shall be held flat to surface. Conduct sanding operations on flat surfaces only. Do not allow sanding pad surface to extend beyond surface being sanded.

NEEDLE GUNS ARE APPROPRIATE FOR METAL SURFACES, BUT MAY DAMAGE WOOD OR MASONRY. FOR MASONRY AND CONCRETE SURFACES A DEPTH CONTROL MECHANISM MUST BE USED TO LIMIT PENETRATION OF THE NEEDLES INTO THE SUBSTRATE. FIELD TESTING MAY BE REQUIRED TO DETERMINE COMPATIBILITY OF EQUIPMENT AND SUBSTRATE.

- C. Needle Gun:** Maintain HEPA vacuum attachment in operation during removal operation. Select proper shroud to match the configuration of the surface being treated.
- D. Vacuum Blasting:** conduct abrasive removal of exterior surfaces only using machine blasting equipment mounted with a fully contained, coaxially mounted local exhaust hood with HEPA-Vacuuming capability and using either recyclable or dry ice (CO₂) abrasive media.
1. Conduct blasting on flat surfaces or surfaces compatible with available blast heads as provided by equipment manufacturer.
 2. Maintain blast head in contact with surface to provide maximum containment of dust, debris, etc. created by blasting operation.
- E. Flameless Heat Gun/Heat Grid:** Provide proper respiratory and worker protection prior to use. Soften paint surface with heat gun/heat grid. Use putty knife to scrape paint from surface. Collect sludge and properly containerize in accordance with Section 02067 - Disposal of Waste Materials - Lead-Based Paint .
- F. Paint Scrapers:** Use wet scraping methods only. Lightly mist surface to be scraped. Properly containerize waste in

accordance with Section 02067 - Disposal of Waste Materials - Lead-Based Paint.

- G. Wet/Dry Sand Paper:** Use wet sanding methods only. Do not allow removed paint to accumulate. Properly containerize waste in accordance with Section 02067 - Disposal of Waste Materials - Lead-Based Paint.

END OF SECTION 09952

SECTION 09953 - SURFACE PREPARATION-PAINT STABILIZATION-LEAD-BASED PAINT

USE THIS SECTION TO SPECIFY THE PREPARATION OF SURFACES PRIOR TO ENCLOSURE PAINTING OR ENCAPSULATION OF THE SUBSTRATE. REPAIR OF DAMAGED SUBSTRATES IS SPECIFIED IN SECTION 06403. EDIT TO MEET PROJECT REQUIREMENTS.

PAINT STABILIZATION IS AN INTERIM MEASURE TO TEMPORARILY CONTROL LEAD-BASED PAINT HAZARDS. THIS WORK TYPICALLY INCLUDES CORRECTIVE WORK AND/OR REPAIRS TO THE BUILDING. EXAMPLES INCLUDE LEAKS IN THE EXTERIOR ENVELOPE, MOISTURE PROBLEMS, MISSING TRIM OR FLASHING, INADEQUATELY VENTILATED ATTICS, ETC. AGING, MECHANICAL DAMAGE, CHEMICAL INCOMPATIBILITY AND POOR SURFACE PREPARATION. THESE REPAIRS AND DEFECTS ARE NOT SPECIFIED HERE AND MUST BE ADDRESSED BEFORE PAINT STABILIZATION. PAINT STABILIZATION IN THIS SECTION IS USED TO SPECIFY THE SURFACE PREPARATION FOR PAINTING OVER FAILED LEAD-BASED PAINT AND PRIOR TO ENCAPSULATION.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

1.2 SUMMARY OF WORK:

- A. Work of this section includes the preparation of surfaces to be enclosed by the following sections:
 - 1. 06106 - Wood enclosures - lead-based paint
 - 2. 06107 - Exterior siding & enclosure - lead-based paint
 - 3. 09252 - Gypsum wallboard enclosure - lead-based paint
- B. **Work** of this section includes the stabilization of lead-based painted surfaces to be encapsulated or painted by the following sections:
 - 1. 09253 - Cementitious Enclosure - Lead-Based Paint
 - 1. 09940 - Encapsulation - lead-based paint
 - 2. 09954 - Painting - lead-based paint

PART 2 - PRODUCTS

2.1 Disposal Bags/Plastic Sheeting: Provide 6 mil polyethylene disposal bags.

THE USE OF DETERGENTS WITH HIGH PHOSPHATE CONTENT ARE RESTRICTED OR BANNED IN SOME AREAS BECAUSE OF THE IMPACT ON THE ENVIRONMENT. OTHER DETERGENTS THAT ARE LEAD-SPECIFIC MAY BE EQUALLY EFFECTIVE AND SHOULD BE PERMITTED.

EVEN DILUTED TRI-SODIUM PHOSPHATE IS VERY IRRITATING TO THE SKIN AND SHOULD BE USED ONLY WITH WATERPROOF GLOVES AND EYE PROTECTION. PORTABLE EYE WASH FACILITIES SHOULD BE AVAILABLE.

2.2 Wet Detergent Wash: Provide detergent with a high phosphate content (at least 5%) trisodium phosphate (TSP). Follow dilution ratio recommended by the manufacturer's instructions.

CONSIDER PARAGRAPH BELOW FOR NON-TSP DETERGENTS. DELETE ABOVE OR BELOW.

Wet Detergent Wash: Provide detergent or cleaning agent formulated to be effective in removing lead dust. Follow dilution ratio recommended by the manufacturer's instructions.

PART 3 - EXECUTION

3.1 Before starting work of this section, complete the following:

- A. Section 01504 - Temporary Facilities
- B. Section 01505 - Exterior Regulated Areas
- C. Section 01506 - Work Area Containment (Interior)
- D. Section 01555 - Worker Protection
- E. Section 01556 - Respiratory Protection

USE THIS SUBSECTION TO SPECIFY PREPARATION REQUIREMENTS PRIOR TO ENCLOSURE OF A LEAD-BASED PAINTED SUBSTRATE. DELETE THIS SUBSECTION IF THERE IS NO ENCLOSURE ON THE PROJECT. DO NOT USE THIS SUBSECTION IF A LARGE QUANTITY OF DETERIORATED PAINT MUST BE REMOVED.

3.2 SURFACE PREPARATION

- A. Remove loose, flaking and deteriorated paint by wet scraping or wet sanding.

- B. Remove loose, unsound or deteriorated substrates. Place in 6 mil polyethylene disposal bag and dispose of in accordance with section 02067 - Disposal of Waste Materials - Lead-Based Paint.
- C. Hepa Vacuum and/or wet wipe to remove all paint chips, debris and dust generated during the work. Do not allow dust or debris to accumulate.
- D. Label all areas to be enclosed with permanent marker every four feet with term "lead paint", in minimum 3" (76 mm) high letters.

USE THIS SUBSECTION TO SPECIFY PREPARATION REQUIREMENTS PRIOR TO ENCAPSULATION OR PAINTING. DELETE THIS SUBSECTION IF THERE IS NO ENCAPSULATION OF PAINTING ON THE PROJECT.

3.3 PAINT STABILIZATION

A. SUBSTRATE REPAIRS

- 1. Prior to stabilizing lead-based paint, correct substrate surface defects. Remove loose, unsound or deteriorated substrates. Place in 6 mil polyethylene disposal bag and dispose of in accordance with section 02067 - Disposal of Waste Materials - Lead-Based Paint.

B. PAINT REMOVAL

- 1. Wet Scraping: remove all loose, flaking and deteriorated paint by wet scraping. Continually mist surface with water during scraping.
- 2. Wet Sanding: prepare finish surface by wet sanding. Feather edges lightly. Keep surface wet while sanding.

DO NOT USE SANDING TO CREATE ADHESION FOR APPLICATION OF NEW PAINT. EDIT THE FOLLOWING PARAGRAPH ON SURFACE CLEANING. GOOD SURFACE PREPARATION WILL REMOVE DAMAGED, OXIDIZED AND DETERIORATED PAINT, BUT WILL ALSO CREATE DUST. AFTER SURFACE HAS BEEN ALLOWED TO DRY HEPA VACUUM SURFACE TO COLLECT DUST.

C. SURFACE CLEANING

- 1. Dust and chips: HEPA vacuum surface after drying.

LIMIT USE OF VOLATILE SUBSTANCES. REVIEW PRODUCT DATA AND MATERIAL SAFETY DATA SHEETS PRIOR TO SPECIFYING SURFACE TREATMENTS TO ENHANCE PAINT BOND.

2. Chemically treat surface if necessary for good paint adhesion. Follow manufacturer's printed instructions for system used.
3. Test surface for pH. Place LITMUS paper on wet surface. Surface pH should be between 6-8. Re-rinse surfaces that do not meet pH with clear water or weak acid solution.
4. Remove oils, waxes and mold. Remove mold with a 1% to 10% bleach solution. Provide appropriate eye, skin and respiratory protection during mold decontamination procedures. Remove waxes with ammonia and water. Degrease surfaces with suitable cleaner. Rinse thoroughly following cleaning.

END OF SECTION 09953

SECTION 09954- PAINTING - LEAD-BASED PAINT

BASED ON SECTION 09900 "PAINTING" FROM MASTERSPEC® TEXT COPYRIGHTED IN 1993 BY AIA, THE AMERICAN INSTITUTE OF ARCHITECTS.

THIS SECTION SPECIFIES THE SEALING AND PRIMING OF SUBSTRATES OF LEAD-BASED PAINTED SURFACES AND FROM WHICH LEAD-BASED PAINT HAS BEEN REMOVED. THE WORK ALSO INCLUDES SEALING OF BUILDING SURFACES WHICH WERE PART OF A HAZARD REDUCTION WORK AREA. FINISH PAINTING IS NOT INCLUDED IN THIS SECTION, AS THIS WORK IS NOT TO BE COMPLETED BY THE LEAD HAZARD REDUCTION CONTRACTOR. FINISH PAINTING WOULD TYPICALLY BE PERFORMED AT THE COMPLETION OF THE REHABILITATION WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A.** Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY OF WORK

THE PAINTING AND DECORATING CONTRACTORS OF AMERICA (PDCA) STANDARD "P3-93 DESIGNATION OF PAINT COLORS" CAN BE INCORPORATED INTO THIS SECTION TO DEFINE THE NUMBER AND PLACEMENT OF PAINT COLORS AND COLOR RANGES TO BE USED ON THE PROJECT. THE PDCA STANDARD MUST BE IN HAND WHEN ADDING THE PROCEDURES TO THE SECTION. INFORMATION CAN BE OBTAINED FROM THE PAINTING AND DECORATING CONTRACTORS OF AMERICA, 3913 OLD LEE HIGHWAY, SUITE 33-B, FAIRFAX, VIRGINIA 22030, TELEPHONE: 703-359-0826.

- A.** This Section includes surface preparation, and painting, exposed interior and exterior items and surfaces.
 - 1.** Surface preparation, priming, and finish coats specified in this Section are in addition to surface treatments specified under other Sections.
- B.** Paint exposed surfaces whether or not colors are designated in schedules, except where a surface or material is specifically indicated not to be painted or is to remain natural. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.

1. Painting includes field-painting lead-based painted surfaces, substrates from which lead-based paint has been removed, and building surfaces which were included in a hazard reduction work area.
- C. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts, and labels.
- D. Related Sections: The following Sections contain requirements that relate to this Section.
 1. 02065 - Removal
 2. 05582 - Sheet Metal
 3. 06106 - Wood Enclosures
 4. 06107 - Exterior Siding & Enclosure
 5. 06402 - Carpentry and Trim Work
 6. 06403 - Repair of Lead-Based Painted Substrates
 7. 09252 - Gypsum Wallboard Enclosure
 8. 09940 - Encapsulation - Lead-Based Paint
 9. 09951 - Chemical Stripping Of - Lead-Based Paint
 10. 09952 - Mechanical Removal Of Lead-Based Paint
 11. 09953 - Surface Preparation - Paint Stabilization - Lead-Based Paint

1.3 SUBMITTALS

- A. **General:** Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
- B. Product data for each paint system specified, including block fillers and primers.
 1. Provide the manufacturer's technical information including instructions for handling, storage, and application of each material proposed for use.
 2. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.

DELETE PARAGRAPH BELOW IF VOC'S ARE NOT REGULATED BY LOCAL JURISDICTION

3. Submit information by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Samples for initial color selection in the form of manufacturer's color charts.
1. After color selection, the Architect will furnish color chips for surfaces to be coated.

1.4 QUALITY ASSURANCE

THIS ARTICLE CAN BE EXPANDED BY INCLUDING THE PAINTING AND DECORATING CONTRACTORS OF AMERICA STANDARD (PDCA) "P5-94 BENCHMARK SAMPLE PROCEDURES FOR PAINT AND OTHER DECORATIVE COATING SYSTEMS." THE PDCA STANDARD PROVIDES A GUIDELINE TO BE USED TO ESTABLISH APPROVED BENCHMARK SAMPLES OF COMPLETE PAINT AND COATING SYSTEMS FOR CONSTRUCTION PROJECTS. THE PDCA STANDARD MUST BE IN HAND WHEN ADDING THE PROCEDURES TO THE SECTION.

- A. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.
1. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted. Apply coatings in this room or surface according to the schedule or as specified.
 - a. After finishes are accepted, this room or surface will be used to evaluate coating systems of a similar nature.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
1. Product name or title of material.
 2. Product description (generic classification or binder type).
 3. Manufacturer's stock number and date of manufacture.
 4. Contents by volume, for pigment and vehicle constituents.

5. Thinning instructions.
 6. Application instructions.
 7. Color name and number.
- B.** Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.
1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

- A.** Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).
- B.** Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).
- C.** Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.
1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Manufacturers:** Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

RETAIN ABOVE FOR NONPROPRIETARY OR BELOW FOR SEMIPROPRIETARY SPECIFICATION. REFER TO DIVISION 1 SECTION "MATERIALS AND EQUIPMENT."

- B. Manufacturer:** Subject to compliance with requirements, provide products of one of the following:

1. Devoe and Raynolds Co. (Devoe).
2. Fuller O'Brien (Fuller).
3. The Glidden Company (Glidden).
4. Benjamin Moore and Co. (Moore).
5. PPG Industries, Pittsburgh Paints (PPG).
6. Pratt and Lambert (P & L).
7. The Sherwin-Williams Company (S-W).

2.2 PAINT MATERIALS, GENERAL

ALWAYS RETAIN THE NEXT PARA. SYSTEMS COULD FAIL IF COATINGS ARE INCOMPATIBLE.

- A. **Material Compatibility:** Provide block fillers, primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.
- B. **Material Quality:** Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

DELETE THE NEXT PARA IF OWNER-IMPOSED OR OTHER PROJECT REQUIREMENTS PROHIBIT MENTION OF MFR'S NAMES OR IF PRODUCTS OF A SINGLE MFR ONLY ARE ACCEPTABLE.

1. **Proprietary Names:** Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.

RETAIN ONLY ONE OF THE THREE OPTIONAL PARAS BELOW. IF MORE THAN ONE COLOR IS REQUIRED, INDICATE COLORS IN A SEPARATE SCHEDULE OR SHOW LOCATION AND EXTENT ON THE DRAWINGS.

- C. **Colors:** Provide custom colors of the finished paint systems to match the Architect's samples.

- D. **Colors:** Match colors indicated by reference to the manufacturer's standard color designations.
- E. **Colors:** Provide color selections made by the Architect from the manufacturer's full range of standard colors.

NOTE: THE FOLLOWING EDITOR'S NOTES APPLY TO ALL SUBSEQUENT PART 2 ARTICLES.

EDIT SCHEDULES AT THE END OF PART 3 BEFORE EDITING THE FOLLOWING ARTICLES IN PART 2. DELETE SUBSTRATES, FINISHES, AND PRODUCTS NOT REQUIRED. PRODUCTS LISTED IN THE FOLLOWING ARTICLES ARE THE MFRS' GOOD-QUALITY TRADE SALE PAINT MATERIALS. CHANGE THE PRODUCTS TO PROFESSIONAL-TYPE COATINGS IF NEEDED TO SATISFY PROJECT REQUIREMENTS. INSERT PRODUCTS OF LOCAL OR REGIONAL PAINT MFRS IF DESIRED. SEE EVALUATIONS FOR FURTHER DISCUSSION.

FOR A NONPROPRIETARY SPECIFICATION, DELETE PRODUCT NAMES BUT RETAIN GENERIC PRODUCT DESCRIPTIONS.

SEE EDITING INSTRUCTION NO. 1 IN THE EVALUATIONS FOR CAUTIONS ABOUT NAMING PRODUCTS AND MFRS.

2.3 MASONRY BLOCK FILLER

- A. **Filler Coat Materials:** Provide the manufacturer's recommended factory-formulated, latex-type concrete masonry block fillers that are compatible with the finish materials indicated.
- B. **Available Products:** Subject to compliance with requirements, block fillers that may be incorporated in the Work include, but are not limited to, the following:

RETAIN THE PARA ABOVE FOR A NONPROPRIETARY SPECIFICATION OR THE PARA BELOW FOR A SEMIPROPRIETARY SPECIFICATION. REFER TO DIVISION 1 SECTION "MATERIALS AND EQUIPMENT."

- C. **Products:** Subject to compliance with requirements, provide one of the following:

BLOCK FILLERS BELOW ARE RECOMMENDED BY THE MFRS TO FILL POROUS SURFACES OF CONCRETE MASONRY BLOCK UNDER A VARIETY OF PRIMERS AND FINISH COATS.

1. High-Performance Latex Block Filler:

BLOCK FILLERS BELOW ARE RECOMMENDED BY THE MFRS TO FILL POROUS SURFACES OF CONCRETE MASONRY BLOCK UNDER A VARIETY OF PRIMERS AND FINISH COATS.

- a. **Devoe:** 52901 Bloxfil Interior/Exterior Acrylic Latex Block Filler.
- b. **Fuller:** 280-00 Interior/Exterior Latex Block Filler.
- c. **Glidden:** 5317 Ultra-Hide Acrylic Latex Block Filler.
- d. **Moore:** Moorcraft Interior & Exterior Block Filler #173.
- e. **PPG:** 6-7 Latex Masonry Block Filler.
- f. **P & L:** Pro-Hide Plus Block Filler.
- g. **S-W:** Heavy-Duty Block Filler B42W46.

2.4 PRIMERS

- A. **Primers:** Provide the manufacturer's recommended factory-formulated primers that are compatible with the substrate and finish coats indicated.
- B. **Available Products:** Subject to compliance with requirements, prime coat materials that may be incorporated in the Work include, but are not limited to, the following:

RETAIN THE PARAGRAPH ABOVE FOR A NONPROPRIETARY SPECIFICATION OR THE PARAGRAPH BELOW FOR A SEMIPROPRIETARY SPECIFICATION. REFER TO DIVISION 1 SECTION "MATERIALS AND EQUIPMENT."

- C. **Products:** Subject to compliance with requirements, provide one of the following:

RETAIN THE PRIMER LISTED BELOW OVER MINERAL-FIBER-REINFORCEMENT CEMENT PANELS AND UNDER FLAT ACRYLIC EMULSIONS. NEITHER PITTSBURGH NOR SHERWIN-WILLIAMS REQUIRES A PRIMER ON THIS SURFACE, HOWEVER USE OF A PRIMER IS REQUIRED FOLLOWING LEAD-BASED PAINT HAZARD REDUCTION.

- 1. **Exterior Primer Coating:** Exterior, alkyd wood primer.
 - a. **Devoe:** 1102 All-Weather Alkyd House Paint Primer.
 - b. **Fuller:** 220-23 Exterior Wood and Masonry Primer.

- c. **Glidden:** 1951 Spread Gel-Flo Base Coat.
- d. **Moore:** Moorwhite Primer #100.
- e. **PPG:** 1-70 or 1-870 Sun Proof Exterior Wood Primer
- f. **P & L:** Permalize Exterior Primer.
- g. **S-W:** A-100 Exterior ALKYD wood primer Y24W20.

RETAIN PRIMERS LISTED BELOW OVER CONCRETE OR MASONRY AND UNDER FLAT OR SEMIGLOSS ALKYD ENAMEL.

- 2. **Concrete and Masonry Primers:** Interior, flat, latex-based paint.
 - a. **Devoe:** 51701 Wonder-Prime Interior All Purpose Latex Primer Sealer & Vapor Barrier.
 - b. **Fuller:** 202-XX Interior - Exterior Acrylic Latex Wall Paint.
 - c. **Glidden:** 5300 Ultra-Hide Flat Wall Paint.
 - d. **Moore:** Moore's Latex Quick-Dry Prime Seal #201.
 - e. **PPG:** 80 Line Wallhide Flat Latex Paint.
 - f. **P & L:** Vapex Latex Flat Wall Finish.
 - g. **S-W:** ProMar 200 Latex Flat B30W200.

RETAIN PRIMERS LISTED BELOW OVER NEW PLASTER AND UNDER ALKYD FINISH MATERIALS.

- 3. **New Plaster Primers:** Interior, flat, latex-based paint.
 - a. **Devoe:** 51701 Wonder-Prime Interior All Purpose Latex Primer Sealer & Vapor Barrier.
 - b. **Fuller:** Interior Latex Enamel Undercoater.
 - c. **Glidden:** 5019 PVA Primer Sealer.
 - d. **Moore:** Moore's Latex Quick-Dry Prime Seal #201.
 - e. **PPG:** 80 Line Wallhide Flat Latex Paint.
 - f. **P & L:** Vapex Latex Flat Wall Finish.

- g. **S-W:** Wall and Wood Primer B49W2.

RETAIN PRIMERS LISTED BELOW OVER GYPSUM DRYWALL AND UNDER FLAT LATEX PAINTS OR SEMIGLOSS ALKYD ENAMELS.

- 4. **Gypsum Drywall Primer:** White, interior, latex-based primer.
 - a. **Devoe:** 50801 Wonder-Tones Latex Primer and Sealer.
 - b. **Fuller:** Pro-Tech Interior Latex Wall Primer and Sealer.
 - c. **Glidden:** 5019 PVA Primer.
 - d. **Moore:** Moore's Latex Quick-Dry Prime Seal #201.
 - e. **PPG:** 6-2 Quick-Dry Latex Primer Sealer.
 - f. **P & L:** Latex Wall Primer Z30001.
 - g. **S-W:** ProMar 200 Latex Wall Primer B28W200.

RETAIN PRIMERS LISTED BELOW ON WOOD UNDER GLOSS ALKYD ENAMELS, FLAT FINISHES, AND ON WOOD TRIM UNDER HIGH-GLOSS ALKYD FINISH. (FOR DEEP-COLOR, FULL-GLOSS WOOD TRIM, SUBSTITUTE MOORE'S MOREWHITE DEEP COLOR BASE #100-04 FOR PRIMER INDICATED.)

- 5. **Exterior Primer Coating:** Exterior, alkyd wood primer.
 - a. **Devoe:** 1102 All-Weather Alkyd House Paint Primer.
 - b. **Fuller:** 220-23 Exterior Wood and Masonry Primer.
 - c. **Glidden:** 1951 Spread Gel-Flo Base Coat.
 - d. **Moore:** Moorwhite Primer #100.
 - e. **PPG:** 1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - f. **P & L:** Permalize Exterior Primer.
 - g. **S-W:** A-100 Exterior Alkyd Wood Primer Y24W20.

RETAIN THE PRIMERS LISTED BELOW ON SEALED PLYWOOD AND UNDER FLAT ACRYLIC EMULSION FINISH.

6. **Exterior Primer Coating:** Exterior, alkyd wood primer.
 - a. **Devoe:** 1102 All-Weather Alkyd House Paint Primer.
 - b. **Fuller:** 220-08 Exterior Latex Wood Primer.
 - c. **Glidden:** 3651 Spread House Paint Prime Coat.
 - d. **Moore:** Moorwhite Primer #100.
 - e. **PPG:** 1-70 or 1-870 Sun-Proof Exterior Wood Primer.
 - f. **P & L:** Permalize Exterior Primer.
 - g. **S-W:** A-100 Exterior Alkyd Wood Primer Y24W20.

RETAIN PRIMERS LISTED BELOW OVER FERROUS METALS AND UNDER FLAT, SEMIGLOSS AND GLOSS ALKYD AND LATEX FINISHES.

7. **Ferrous Metal Primers:** Synthetic, quick-drying, rust-inhibiting primers.
 - a. **Devoe:** 13101 Mirrolac Cover Up Rust Penetrating Primer.
 - b. **Fuller:** 621-04 Blox-Rust Alkyd Metal Primer.
 - c. **Glidden:** 5210 Glid-Guard Universal Fast-Dry Metal Primer.
 - d. **Moore:** IronClad Retardo Rust-Inhibitive Paint #163.
 - e. **PPG:** 6-208 Red Inhibitive Metal Primer.
 - f. **P & L:** Effecto Rust-Inhibiting Primer.
 - g. **S-W:** Kem Kromik Metal Primer B50N2/B50W1.

RETAIN PRIMERS LISTED BELOW OVER FERROUS METALS AND UNDER HIGH-GLOSS ALKYD ENAMELS

8. **Ferrous Metal Primers:** Alkyd-type primers.
- a. **Devoe:** 41820 Bar-Ox Alkyd Shop/Field Primer Grey.
 - b. **Fuller:** 621-05 Blox-Rust Latex Metal Primer.
 - c. **Glidden:** 5205 Glid-Guard Tank and Structural Primer.
 - d. **Moore:** IronClad Retardo Rust-Inhibitive Paint #163.
 - e. **PPG:** 6-612 Speedhide Inhibitive White Primer.
 - f. **P & L:** Effecto Primer Red or White.
 - g. **S-W:** Kem Kromik Metal Primer B50N2/B50W1.

RETAIN PRIMERS LISTED BELOW OVER GALVANIZED METAL AND UNDER GLOSS ALKYD ENAMELS, UNDER INTERIOR FLAT LATEX PAINTS, AND ODORLESS, SEMIGLOSS OR GLOSS ALKYD ENAMELS.

9. **Galvanized Metal Primers:**
- a. **Devoe:** 13201 Mirrolac Galvanized Metal Primer.
 - b. **Fuller:** 621-05 Blox-Rust Latex Metal Primer.
 - c. **Glidden:** 5229 Glid-Guard All-Purpose Metal Primer.
 - d. **Moore:** IronClad Galvanized Metal Latex Primer #155.
 - e. **PPG:** 6-215/216 Speedhide Galvanized Steel Primer.
 - f. **P & L:** P & L Interior Trim Primer.
 - g. **S-W:** Galvite B50W3.

RETAIN PRIMERS LISTED BELOW OVER ALUMINUM AND UNDER HIGH-GLOSS ALKYD ENAMELS.

10. Aluminum Primers:

- a. **Devoe:** 41820 Bar-Ox Alkyd Shop/Field Primer Grey.
- b. **Fuller:** 621-05 Blox-Rust Latex Metal Primer.
- c. **Glidden:** 5229 Glid-Guard All-Purpose Metal Primer.
- d. **Moore:** Iron Clad Retard Rust Inhibitive Paint #163.
- e. **PPG:** 6-712 Speedhide Inhibitive Metal Primer, White.
- f. **P & L:** Effecto Primer Red or White.
- g. **S-W:** KEM Kromik Metal Primer B50N2/B50W1

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.
 - 1. Do not begin to apply paint until unsatisfactory conditions have been corrected.

THIS ARTICLE CAN BE EXPANDED BY ADDING THE PAINTING AND DECORATING CONTRACTORS OF AMERICA (PDCA) STANDARD "P4-94 RESPONSIBILITIES FOR INSPECTION AND ACCEPTANCE OF SURFACES PRIOR TO PAINTING AND DECORATING." THE STANDARD ESTABLISHES THE RESPONSIBILITIES FOR INSPECTION AND APPROVAL OF SURFACES CONSTRUCTED OR PREPARED BY OTHERS PRIOR TO THE CONTRACTOR STARTING WORK.

- 2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

COORDINATE PRIMERS SPECIFIED IN OTHER SECTIONS WITH FINISH MATERIAL IN THIS SECTION TO ENSURE COMPATIBLE PRIMERS. SOME FINISH-COAT MATERIALS, SUCH AS

LACQUERS AND EPOXIES, LIFT OIL AND OLEORESINOUS AIR-DRY PRIMERS. A LONG-OIL FINISH COAT MAY CRAWL AND HAVE POOR ADHESION WHEN USED OVER ZINC-DUST PHENOLIC OR BAKED PRIMERS.

3.2 PREPARATION

- A. **General:** Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.
- B. **Cleaning:** Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

ALWAYS RETAIN THE FOLLOWING PARAS SPECIFYING SURFACE PREPARATION. AMPLIFY THE PARAS IF NECESSARY TO INCLUDE SPECIAL PROCEDURES REQUESTED BY THE MFRS OR TO SATISFY SPECIAL PROJECT CONDITIONS.

- C. **Surface Preparation:** Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified in section 09953.

COORDINATION OF SHOP-APPLIED PRIMERS WITH FINISH COATS IS CRITICAL. SEE "EXAMINATION" ARTICLE, "COORDINATION OF WORK" PARA. IF COMPATIBILITY PROBLEMS DEVELOP, IT MIGHT BECOME NECESSARY TO PROVIDE BARRIER COATS OVER SHOP-APPLIED PRIMERS OR REMOVE THE PRIMER AND RE-PRIME THE SUBSTRATE.

- 1. Provide barrier coats over incompatible primers or remove and re-prime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.

DELETE THE PARAS BELOW IF CEMENTITIOUS SURFACES ARE NOT TO BE PAINTED, OR REVISE TO SUIT PROJECT REQUIREMENTS.

- a. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before

application. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.

DELETE THE NEXT PARA IF THIS PROCEDURE IS NOT REQUIRED.

3.3 APPLICATION

REVISE THIS ARTICLE TO SATISFY PROJECT REQUIREMENTS. ADD RESTRICTIONS TO APPLICATION METHODS, IF REQUIRED.

- A. **General:** Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.
- B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
- C. **Application Procedures:** Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.
 - 1. **Brushes:** Use brushes best suited for the material applied.
 - 2. **Rollers:** Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
 - 3. **Spray Equipment:** Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.
- D. **Minimum Coating Thickness:** Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

THE PARA BELOW IS A SIMPLIFIED EXAMPLE OF PAINTING REQUIREMENTS FOR MECHANICAL AND ELECTRICAL WORK. DELETE IF THIS PAINTING IS INCLUDED IN DIVISIONS 15 AND 16, OR REVISE TO SUIT PROJECT.

3.4 CLEANING

- A. Cleanup:** At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

DELETE THE NEXT PARA IF THIS FINAL CLEANING IS NOT DONE BY THE PAINTER.

- 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.5 PROTECTION

- A.** Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- B.** Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
 - 1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

END OF SECTION 09954

APPENDICES

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APPENDIX A:

GLOSSARY

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Appendix A - Glossary

This glossary is from U.S. Department of Housing and Urban Development *Guidelines For The Evaluation And Control Of Lead-Based Paint Hazards In Housing*, 1995.

AAALA: American Association for Laboratory Accreditation. Also known as A2LA.

Abatement: A measure designed to permanently eliminate lead-based paint hazards according to standards established by the Environmental Protection Agency (EPA) Administrator, pursuant to Title IV of the Toxic Substances Control Act (TSCA). Abatement strategies include the removal of lead-based paint, its enclosure, its encapsulation with a product shown to meet established or recognized standards pursuant to Title IV of TSCA, replacement of building components coated by lead-based paint, removal of lead-contaminated dust, and removal of lead-contaminated soil or overlaying of a durable covering—not grass or sod, which are considered interim control measures—on top of the soil, as well as preparation, cleanup, disposal, post-abatement clearance testing, recordkeeping, and, if applicable, monitoring.

Abrasion resistance: Resistance of the paint to being worn away by rubbing or being exposed to friction; related to both toughness and gloss.

Accessible surface: Any interior or exterior surface such as sills and protruding surfaces that a young child can mouth or chew.

Accreditation: A formal recognition that an organization, such as a laboratory, is competent to carry out specific tasks or types of tests.

Accredited laboratory: A laboratory that has been evaluated and approved by an accrediting body, such as the National Lead Laboratory Accreditation Program, to perform a specified measurement or task, usually for a specific property or material to be analyzed and for a specified period of time.

Accredited training provider: A training provider that meets the standards established by EPA to train risk assessors, inspector technicians, lead-based paint hazard control contractors, and workers.

Accuracy: The degree of agreement between an observed value and an accepted reference value; a data quality indicator. Accuracy includes a combination of random errors (precision) and systematic errors (bias) due to sampling and analysis.

Acrylic: A synthetic resin used in high-performance waterborne coatings; a coating whose binder contains acrylic resins.

Adhesion: The ability of dry paint or other coating to attach to a surface and remain fixed on it without blistering, flaking, cracking, or being susceptible to removal by tape.

Administrative removal: The temporary removal of workers before the concentration of lead in their blood reaches levels that require medical removal.

AIHA: American Industrial Hygiene Association.

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ALC: See **Apparent Lead Concentration**.

Aliquot: See **Subsample**.

Alkali: A chemical, such as lye, soda, lime, and so on, that will neutralize an acid. Oil paint films can be destroyed by alkalies.

Alkyd: Synthetic resin modified with oil; coating that contains alkyd resins in the binder.

Apparent Lead Concentration (ALC): The average of three or more x-ray fluorescence (XRF) single cycle readings (nominal assay time of 15 to 25 seconds) on a *painted* surface. See **XRF analyzer**.

Bare soil: Soil not covered with grass, sod, or some other similar vegetation. Bare soil includes sand (for example, the sand in sandboxes).

Base substrate: The building material beneath the lead-based paint film. The material may be plaster, wood, brick, or metal.

Bias: A systematic error in the measurement process. For x-ray fluorescence readings, one source of bias is the substrate effect. See **Substrate effect**.

Biennial report: A report, EPA Form 8700–13A, submitted by generators of hazardous waste to the EPA Regional Administrator. The report is due on March 1 of even-numbered years. The report includes information on the generator's activities during the previous calendar year. The owner or operator of a treatment, storage, and disposal facility must also prepare and submit a biennial report using EPA Form 8700–1313.

Binder: Solid ingredients in a coating that hold the pigment particles in suspension and bind them to the substrate. Binders used in paints and coatings include oil, alkyd, acrylic, latex, and epoxy. The nature and amount of binder determine many of the coating's performance properties—washability, toughness, adhesion, gloss, and so on. See also **Pigment**.

Biological monitoring: The analysis of blood, urine, or both to determine the level of lead contamination in the body. Blood lead levels are expressed in micrograms of lead per one-tenth of a liter of blood (a deciliter), or $\mu\text{g/dL}$.

Blank: A nonexposed sample of the medium used for testing, such as a wipe or filter, and analyzed like other samples to determine whether the medium is contaminated with lead before samples are collected (for example, at the factory or the testing site) or whether the samples are contaminated after collection (for example, during transportation to the laboratory or in the laboratory).

Blind sample: A subsample submitted for analysis with a composition and identity known to the submitter but not to the analyst and used to test the analyst's or laboratory's proficiency in conducting measurements.

Building component: Any part of a building coated with paint.

Building component replacement: See **Replacement**.

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Cementitious material: A material that is mixed with water, either with or without aggregate, to provide the plasticity, cohesion, and adhesion necessary for the placement and formation of a rigid mass (ASTM Standard C 11).

Certification: The process of testing and evaluating against specifications, the competence of a person, organization, or some other entity in performing a function or service, usually for a specified period of time.

Certified: The designation for contractors who have completed training and other requirements to allow them to safely undertake risk assessments, inspections, and abatement work. Risk assessors, lead-based paint inspectors, and abatement contractors should be certified by the appropriate State or Federal agency.

Certified Industrial Hygienist (CIH): A person certified by the American Board of Industrial Hygiene, who has at least 4 years' industrial hygiene experience and a graduate degree or 5 years' experience and who has passed a 2-day board examination. See also **Industrial hygienist**.

Certified reference material (CRM): Reference material that has at least one of its property values established by a technically valid procedure and is accompanied by or traceable to a certificate or other documentation issued by a certifying body.

CFR: See **Code of Federal Regulations**.

Chalking: The photo-oxidation of paint binders—usually due to weathering—which causes a powder to form on the film surface.

Characteristics: EPA has identified four characteristics of hazardous waste: ignitability, corrosivity, reactivity, and toxicity (as determined by the TCLP Test). Any solid waste that exhibits at least one of these characteristics may be classified as hazardous under the Resource Conservation and Recovery Act, depending on how the waste is produced and what quantities are generated.

Chewable surface: See **Chewed surface**.

Chewed surface: Any painted surface that shows evidence of having been chewed or mouthed by a young child. A chewed surface is usually a protruding, horizontal part of a building, such as an interior window sill.

CLC: See **Corrected Lead Concentration**.

Cleaning: The process of using a HEPA vacuum and wet cleaning agents to remove leaded dust; the process includes the removal of bulk debris from the work area. OSHA prohibits the use of compressed air to blow lead-contaminated dust off a surface.

Clearance examination: Visual examination and collection of environmental samples by an inspector technician or risk assessor and analysis by an accredited laboratory upon completion of an abatement project, interim control intervention, or maintenance job that disturbs lead-based paint (or paint suspected of being lead-based paint). The examination is done to assure that lead exposure levels do not exceed standards established by the EPA Administrator pursuant to Title IV of the Toxic Substances Control Act and that any cleaning following such work adequately meets those standards.

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Clearance examiner: A person who conducts clearance examinations following lead-based paint hazard control and cleanup work.

Code of Federal Regulations (CFR): The codification of the regulations of various Federal agencies. The regulations are published in the Federal Register.

Cohesion: Ability of a substance to adhere to itself; internal adhesion; the force holding a substance together.

Common area: A room or area that is accessible to all residents in a community (for example, a hallway or a lobby); in general, any area not kept locked.

Competent person: As defined in the OSHA Lead Construction Standard (29 CFR 1926.62), a person who is capable of identifying or predicting hazardous working conditions and work areas, and who has authorization to take prompt, corrective measures to eliminate the hazards. A competent person is not necessarily a risk assessor, inspector technician, or abatement project supervisor.

Complete abatement: Removal or enclosure of lead-based paint in a dwelling and reduction of any lead-contaminated dust or soil hazards. See **Abatement**.

Compliance plan: A document that describes the tasks, workers, protective measures, and tools and other materials that may be used in lead-based paint hazard control to comply with the OSHA Lead in Construction Standard.

Containment: A process to protect workers and the environment by controlling exposures to lead-contaminated dust and debris created during abatement. See **Worksite preparation level**.

Contingency plan: A document that describes an organized, planned, and coordinated course of action during an event that could threaten human health or the environment, such as a fire, explosion, or release of hazardous waste or its constituents from a treatment, storage, or disposal facility.

Contractor: Any business entity, public body, or person performing the actual work on a lead-based paint hazard control project.

Corrected Lead Concentration (CLC): The absolute difference between the Apparent Lead Concentration and the Substrate Equivalent Lead.

Detection limit: The minimum amount of a substance that can be reliably measured by a particular method.

Deteriorated lead-based paint: Interior or exterior lead-based paint that is peeling, chipping, blistering, flaking, worn, chalking, alligating, cracking, or otherwise becoming separated from the substrate, or lead-based paint on a damaged or deteriorated surface or fixture.

Digestion blank: A mixture of the reagents used for digesting of paint, soil, or dust matrixes but without the matrix. The blank undergoes all the steps of the analysis, starting with digestion. The blank is used to evaluate the contamination process from a laboratory.

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Direct-reading XRF: An analyzer that provides the operator with a display of lead concentrations calculated from the lead "K" x-ray intensity without a graphic of the spectrum. See **XRF analyzer**.

Disposal: The discharge, deposit, injection, dumping, spilling, leaking, or placement of solid or hazardous waste on land or in water so that none of its constituents can pollute the environment by being emitted into the air or discharged into a body of water, including groundwater.

Disposal facility: A facility or part of one in which hazardous waste is placed on land or in water to remain there after the facility closes.

Door mat: See walk-off mat.

Dust removal: A form of interim control that involves initial cleaning intervention followed by periodic monitoring and recleaning, as needed. Depending on the degree of lead-based paint hazards, dust removal may be the primary activity or just one element of a broader effort that addresses lead-based paint hazards.

Dust trap: A surface, component, or furnishing in a house that serves as a reservoir where dust can accumulate.

EBL: See **Elevated Blood Lead level**.

Efflorescence: The salt rising to the surface of a material, which is caused by the movement of water through materials, typically masonry, plaster, or cement. Paint or encapsulants may not adhere to a surface contaminated with efflorescence.

Elastomeric: A group of pliable, elastic liquid encapsulant coatings. An elastomer is a macromolecular material which, at room temperature, is capable of substantially recovering its size and shape after the force that causes the deformation is removed (ASTM D 907, D-14).

Elevated Blood Lead level (EBL): In children, any blood lead level greater than 10 $\mu\text{g}/\text{dL}$; in adults, any blood lead level greater than 25 $\mu\text{g}/\text{dL}$, as determined by the U.S. Centers for Disease Control and Prevention.

Encapsulation: Any covering or coating that acts as a barrier between the lead-based paint and the environment and that relies on adhesion and the integrity of the existing bonds between paint layers and between the paint and the substrate for its durability. See also **Enclosure**.

Enclosure: The use of rigid, durable construction materials that are mechanically fastened to the substrate in order to act as a barrier between the lead-based paint and the environment.

Engineering controls: Measures other than respiratory protection or administrative control that are implemented at the work site to contain, control, and/or otherwise reduce exposure to lead-contaminated dust and debris. The measures include process and product substitution, isolation, and ventilation.

Epoxy paint: Paint based on an epoxy resin. An epoxy resin is a cross-linking resin whose reactivity depends on the epoxide group.

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Evaluation: Risk assessment, paint inspection, or both.

Examination: See **Clearance examination**.

Examiner: A person certified to conduct clearance examinations or reevaluations.

Exposure monitoring: Sampling and analyzing the air that can be breathed by an employee and the air within the work area to determine the degree of exposure to lead or some other contaminant exposure that can be inhaled.

Exterior work area: Any area such as a porch, stairway, or siding outside a building during lead-based paint hazard control work. This area includes a safety perimeter and access barriers.

Facility: All buildings, contiguous land, structures, and other appurtenances, as well as any improvements, where lead-based paint or hazardous waste is treated, stored, or disposed. A facility may consist of several treatment, storage, or disposal operational units, such as landfills, surface impoundments, or a combination of both.

Federal Register (FR): A daily Federal publication that contains proposed and final regulations, rules, and notices.

Fibermat: A semirigid woven material attached with a liquid adhesive to a surface or substrate.

Field blank: A clean sample of matrix, such as paint, soil, dust, and wipe, carried to the sampling site; exposed to the sampling conditions (for example, by having the bottle caps removed); returned to the laboratory; treated as an environmental sample; and carried through all steps of the analysis. Clean quartz sand, nonlead-containing paint, or a clean wipe could be used as a field blank. The field blank, which should be treated just like the sample, evaluates possible sources of contamination.

FR: See **Federal Register**.

Friction surface: Any interior or exterior surface, such as windows or stair treads, that is subject to abrasion or friction.

Generator: Any person, by site, whose act or operation produces hazardous waste identified or listed in 40 CFR Part 261 or whose act causes a hazardous waste to come under regulation (40 CFR 260.10).

Generator identification number: The unique number assigned by EPA to each generator or transporter of hazardous waste and each treatment, storage, or disposal facility.

Hazardous waste: As defined in EPA Regulations (40 CFR 261.3), the term *hazardous waste* means solid waste or a combination of solid wastes that because of its quantity, concentration, physical, chemical, or infectious characteristics may cause or significantly contribute to increases in mortality or serious and irreversible or incapacitating but reversible illnesses or pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed. As defined in the regulations, solid waste is hazardous if it meets one of four conditions: (1) exhibits a characteristic of hazardous waste (40 CFR Sections 261.20 through 262.24); (2) has been listed as

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hazardous (40 CFR Section 261.31 through 261.33); (3) is a mixture containing a listed hazardous waste and a nonhazardous solid waste, unless the mixture is specifically excluded or no longer exhibits any of the characteristics of hazardous waste; and (4) is not excluded from regulation as hazardous waste. For the waste produced in lead-based paint abatement, hazardous waste is waste that contains more than 5 ppm of leachable lead as determined by the TCLP Test, or waste that is corrosive, ignitable, or reactive and is not otherwise excluded.

Hazardous Waste Manifest: See Manifest.

Heat gun: A device capable of heating lead-based paint to separate it from the substrate. For lead hazard control work, the heat stream leaving the gun above 1100°F (some authorities may use a different temperature).

HEPA filter: See **High-Efficiency Particulate Air filter**.

HEPA/wet wash/HEPA cycle: The cleaning cycle that begins with HEPA vacuuming, followed by a wet wash with trisodium phosphate detergent, some other lead-specific cleaning agent, or any other equally effective liquid cleaning agent, followed by a final pass with a HEPA vacuum over the surface.

High-Efficiency Particulate Air (HEPA) filter: A filter capable of removing particles of 0.3 microns or larger from air at 99.97 percent or greater efficiency.

High phosphate detergent: See **Trisodium phosphate detergent**.

Impact surface: An interior or exterior surface such as those on doors and door jambs subject to damage by repeated impacts.

Incinerator: An enclosed device that uses controlled flame combustion and neither meets the criteria for classification as a boiler nor is listed as an industrial furnace.

Industrial hygienist: A person having a college or university degree in engineering, chemistry, physics, medicine, or related physical or biological science who, by virtue of special training, is qualified to anticipate, recognize, evaluate, and control environmental and occupational health hazards and the impact of those hazards on the community.

In-place management: See **Interim controls**.

Inspection: A surface-by-surface investigation to determine the presence of lead-based paint (and in some cases sampling for lead in dust and soil) and a report of the results.

Inspector technician: An individual who has completed training from an accredited program and been licensed to (1) perform inspections to determine and report the presence of lead-based paint on a surface-by-surface basis through the use of onsite testing, such as by an x-ray fluorescence analyzer or through analysis by an accredited laboratory; (2) report the findings of such an inspection; (3) collect environmental samples for laboratory analysis; (4) perform clearance testing and reevaluations; and (5) document successful compliance with lead-based paint hazard control requirements, or standards.

Interim controls: A set of measures designed to temporarily reduce human exposure or possible

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exposure to lead-based paint hazards. Such measures include specialized cleaning, repairs, maintenance, painting, temporary containment, and management and resident education programs. Monitoring levels of lead exposures by owners and reevaluation by professionals is an integral element of interim controls. Interim controls include dust removal, paint film stabilization, treatment of friction and impact surface, and installation of soil coverings, such as grass or sod, or land-use controls.

Interior window sill: The portion of the horizontal window ledge that protrudes into the interior of the room, adjacent to the window sash when the window is closed; often called the window stool.

Intermediate controls: Coatings or rigid materials such as encapsulants and floor tiles that prevent lead-based paint from causing excessive lead exposures and that rely on adhesion to the existing paint film for their durability.

Investigation: Determining the source of lead exposure for a child with an elevated blood lead level. Investigation consists of administration of a questionnaire, comprehensive environmental sampling, case management, and other measures.

Investigator: A person who conducts an investigation of a dwelling where a resident has an elevated blood lead level. The investigator must be proficient in interviewing techniques, environmental sampling, and interpretation of risk assessment and environmental sampling data.

Laboratory analysis: A determination of the lead content by atomic absorption spectroscopy, inductively coupled plasma emission spectroscopy, or laboratory-based "K" or "L" x-ray fluorescence.

Landfill: A State-licensed or State-permitted disposal facility that meets municipal solid waste standards (see Federal regulations at 40 CFR 258).

Landfill liner: A continuous layer of natural or synthetic materials, beneath a surface impoundment, landfill, or landfill cell or on its sides. The layer restricts the downward or lateral escape of hazardous waste, hazardous waste constituents, or leachate (40 CFR Part 258).

Latex: A waterborne emulsion paint made with synthetic binders, such as 100-percent acrylic, vinyl acrylic, terpolymer, or styrene acrylic. A stable emulsion of polymers and pigment in water.

Lead: Lead includes metallic lead and inorganic and organic compounds of lead.

Lead-based paint: Any paint, varnish, shellac, or other coating that contains lead equal to or greater than 1.0 mg/cm² as measured by x-ray fluorescence detector or laboratory analysis, or 0.5 percent by weight (5,000 µg/g, 5,000 ppm, or 5,000 mg/kg) by laboratory analysis. (Local definitions may differ.)

Lead-based paint hazard: A condition in which exposure to lead from lead-contaminated dust, lead-contaminated soil, or from lead-based paint that has deteriorated or coats accessible, friction, or impact surfaces would result in adverse human health effects, as established by the EPA Administrator under Title IV of the Toxic Substances Control Act.

Lead-based paint hazard control: Activities to control and eliminate lead-based paint hazards, including interim controls, intermediate controls, abatement, and complete removal.

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Lead-based paint abatement planner/designer: An individual who has completed an accredited training program for planning and designing lead-based paint abatement projects in target housing.

Lead-based paint worker: See **Worker**.

Lead carbonate: A pigment used in some lead-based paint as a hiding agent; also known as white lead.

Lead-contaminated dust: Surface dust in residences that contains an area or mass concentration of lead in excess of the standard established by the EPA Administrator, pursuant to Title IV of the Toxic Substances Control Act. Until the EPA standards are set, the HUD recommendations for leaded dust standards are 100 $\mu\text{g}/\text{ft}^2$ on floors, 500 $\mu\text{g}/\text{ft}^2$ on interior window sills and 800 $\mu\text{g}/\text{ft}^2$ on window troughs for clearance. For risk assessment, the HUD recommendation for window troughs is 3,000 $\mu\text{g}/\text{ft}^2$. A lead hazard screen recommended standard for floors is 50 $\mu\text{g}/\text{ft}^2$.

Lead-contaminated soil: Bare soil on residential property that contains lead in excess of the standard established by the EPA Administrator, pursuant to Title IV of the Toxic Substances Control Act. The interim HUD recommendation is 400 $\mu\text{g}/\text{g}$ in high-contact play areas, and 2,000 ppm in other bare areas of the yard. Soil above 5,000 $\mu\text{g}/\text{g}$ should be abated by removal or paving.

Lead-free dwelling: A lead-free dwelling contains no lead-based paint, and its interior dust and exterior soil have levels of lead below applicable HUD and EPA standards.

Lead hazard screen: A means of determining whether residences in good condition built between 1960 and 1978 should have a full risk assessment using dust sampling and visual survey.

Lead-poisoned child: A child with a single blood lead level measurement of 20 $\mu\text{g}/\text{dL}$ or 15 $\mu\text{g}/\text{dL}$ or greater for two measurements taken at least one month apart.

Lead-safe dwelling: A lead-safe dwelling meets the following characteristics: (1) leaded-dust window sills, levels on floors, interior and window troughs are below HUD clearance standards (or EPA health-based standards); (2) the lead levels of the bare soil in outdoor play areas are below EPA health-based standards; (3) no deteriorated known or suspected lead-based paint and no deteriorated paint suspected of containing lead is present on any indoor or outdoor surface; (4) a plan has been implemented to ensure that intact lead-based paint or suspected lead-based paint does not become a lead hazard in the course of routine maintenance and renovation; and (5) periodic surveillance is conducted to ensure that these criteria are met for a specific time period.

Lead-specific detergent: A cleaning agent manufactured specifically for cleaning and removing leaded dust or other lead contamination.

Leaded dust: See **Lead-contaminated dust**.

Leaded zinc: A paint primer made from zinc oxide and lead sulfates.

Licensed: Holding a valid license issued by EPA or by an EPA-approved State program pursuant to Title IV of the Toxic Substances Control Act. The license is based on certification for lead-based paint hazard control work. See **Certified**.

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Listed waste: A hazardous waste that has been placed on one of three lists developed by EPA: lists of nonspecific source wastes, specific source wastes, or commercial chemical products. The lists were developed by examining different types of waste and chemical products to see if they exhibit one of the four characteristics, meet the statutory definition of hazardous waste, are acutely toxic or acutely hazardous, or are otherwise toxic.

Maintenance: Work to maintain adequate living conditions in a dwelling that may disturb lead-based paint or paint that is suspected to be lead-based paint.

Manifest: The shipping document, EPA Form 8700–22, or a comparable form required by the State or locality used for identifying the quantity, composition, origin, routing, and destination of hazardous waste during its transport from the point of generation to the point of treatment, storage, or disposal. A shipping document used to keep track of items being transported. Hazardous wastes covered by regulations must be accompanied by a manifest. See hazardous waste.

Mat: See walk-off mat

Matrix blank: A sample of the matrix (paint chips, soil, or dust) but without the analyte lead. This sample goes through the complete analysis, including digestion.

MDL: See **Method detection limit**.

Mean: The arithmetic average of data values; for example, the algebraic sum of the data values divided by the number of data values. When using x-ray fluorescence (XRF), the mean is the average of a series of numerical XRF readings.

Medical removal: The temporary removal of workers due to elevated blood lead levels as defined in the OSHA Lead Standard (29 CFR 1926.62).

Method blank: See **Digestion blank**.

Method detection limit (MDL): The minimum concentration of an analyte that, in a given matrix and by using a specific method, has a 99-percent probability of being identified, qualitatively or quantitatively measured, and reported to be greater than zero.

mg: Milligram; one-thousandth of a gram; a unit of weight.

Micrograms: See μg .

Milligram: See **mg**.

Monitoring: Surveillance on a continuing basis by a property owner of lead-based paint hazard control measures implemented on a property. In contrast, reevaluation is the visual examination and environmental sampling conducted by a certified risk assessor or certified inspector of target housing units that have undergone abatement or interim control interventions (and clearance tests) to determine if lead-based paint hazards have reappeared. Monitoring *and* reevaluations are needed for interim controls, intermediate controls or encapsulation, and enclosure.

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Monofil: A State-approved landfill that accepts only construction debris.

Mouthable surface: See **Chewed surface**.

Multifamily housing: Housing that has more than one dwelling unit in one location.

NLLAP requirements: Requirements specified by the EPA National Lead Laboratory Accreditation Program (NLLAP) in order to be accredited for lead analysis in paint, soil, and dust matrixes by an EPA-recognized laboratory accreditation organization.

Offsite paint removal: The process of removing a component of a building and stripping the paint from the component at a paint-stripping facility.

Ongoing monitoring: See **Monitoring**.

Owner - The entity that possesses a dwelling unit: A person, firm, corporation, guardian, conservator, receiver, trustee, executor, government agency or entity, or other judicial officer who, alone or with others, owns, holds, or controls the freehold or leasehold title or part of the title to property, with or without actually possessing it. This definition includes a vendee who possesses the title, but does not include a mortgagee or an owner of a reversionary interest under a ground rent lease.

Oxidation: A chemical reaction that occurs upon exposure to oxygen. Some coatings cure by oxidation; oxygen enters the liquid coating and crosslinks (attaches) the resin molecules. This film-forming method is also called Air Cure or Air Dry. Oxidation also causes rust to form on metals and paint to chalk.

Paint film stabilization: The process of wet scraping, priming, and repainting deteriorated lead-based paint in a dwelling; the process includes cleanup and clearance.

Paint removal: A strategy of abatement that entails removing lead-based paint from surfaces. For lead-hazard control work this can mean using chemicals, heat guns that produce temperatures below 1100°F, and certain contained abrasive methods but not by open flame burning, open abrasive blasting, sandblasting, water blasting, or extensive dry scraping. (Methylene chloride paint removers are also not recommended.)

Patch test: A test method or procedure to assess the adhesion of an encapsulant coating to a substrate covered with a layer or layers of lead paint.

Periodic surveillance: A series of reevaluations. See **Reevaluation** and **Monitoring**.

Personal breathing zone samples: Air samples collected from the breathing zone of a worker (a 1-foot radius in front of the face) but outside the respirator. The samples are collected with a personal sampling pump operating at 2 liters per minute drawing air through a 37 mm mixed cellulose ester filter (closed face) with a pore size of 0.8 microns. See **Exposure monitoring**.

Personal Protective Equipment (PPE): Equipment for protecting the eyes, face, head, and/or extremities, including protective clothing, respiratory devices and protective shields when hazards capable of causing bodily injury or impairment are encountered.

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PHA: See **Public Housing Agency**.

Pigment: Insoluble, finely ground materials that give paint its properties of color and hide.

Pigment Volume Concentration (PVC): Pigment volume as a percentage of total nonvolatile ingredients.

Pilot project: In multifamily housing, testing of a lead-based paint hazard control strategy in a limited number of dwellings, usually those that are vacant, to determine the feasibility of carrying out such a strategy in the entire multifamily housing development; usually involves paint testing, air sampling, wipe sampling, worksite preparation, and a variety of lead-based paint hazard control treatments.

Plastic: See **Polyethylene plastic**.

Polyethylene plastic: All references to polyethylene plastic refer to plastic sheeting or polyethylene bags at least 6 mil thick—or doubled bags if 4 mil polyethylene bags are used—or any other plastic material with a thickness whose performance is equivalent or better. Plastic used to contain waste should be capable of completely containing the waste and after being properly sealed, should remain leak-tight with no visible signs of discharge during movement or relocation of the waste.

Polyurethane: An exceptionally hard and wear-resistant coating made by the reaction of polyols with a multifunctional isocyanate, often used to seal wood floors following cleaning after lead-based paint hazard control work.

Precision: The degree to which a set of observations or measurements of the same property, usually obtained under similar conditions, conform to themselves; a data quality indicator. Precision is usually expressed in either absolute or relative terms as standard deviation, variance, or range.

Primary prevention: The process of controlling lead hazards to prevent exposure. See **Secondary prevention** and **Tertiary prevention**.

Primary standard: A substance or device with a property or value that is unquestionably accepted, within specified limits, in establishing the value of the same or related property of another substance or device.

Public Housing Agency (PHA): Any State, county, municipality, or other governmental entity or public body, or agency or instrumentality thereof, authorized to engage or assist in the development or operation of housing for low-income families.

PVC: See **Pigment Volume Concentration**.

Quality Assurance (QA): An integrated system of activities involving planning, quality control, quality assessment, reporting, and quality improvement to ensure that a product or service meets defined standards of quality within a stated level of confidence.

Quality Control (QC): The overall system of technical activities whose purpose is to measure and control the quality of a product or service so that it meets the needs of users. The aim is to provide a level of quality that is satisfactory, adequate, dependable, and economical.

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Random sample: A sample drawn from a population in a way that allows each member of the population to have an equal chance of being selected. Random sampling is used to conduct lead-based paint inspections in multifamily dwellings.

RCRA: Resource Conservation and Recovery Act.

Reevaluation: In lead hazard control work, a visual assessment and collection of environmental samples by a certified risk assessor or certified inspector technician to determine if a lead-based paint hazard control measure that has been implemented is still effective and if the dwelling is still lead-safe.

Reference material: A material or substance that has at least one sufficiently well established property that can be used to calibrate an apparatus, assess a measurement method, or assign values to materials.

Reinspection: See **Reevaluation**.

Removal: See **Paint removal**.

Renovation: Work that involves construction and home or building improvement measures such as window replacement, weatherization, remodeling, and repainting.

Replacement: A strategy of abatement that entails the removal of building components that have surfaces coated with lead-based paint, such as windows, doors, and trim, and the installation of new components free of lead-based paint.

Representative sample: A sample of a universe or whole (for example, waste sample pile, lagoon, groundwater, or waste stream) that can be expected to exhibit the average properties of the universe or whole.

Resident: The person who lives in a dwelling.

Risk assessment: An onsite investigation of a residential dwelling for lead-based paint hazards. Risk assessment includes investigating the age, history, management, and maintenance of the dwelling, and the number of children under age 6 and women of child-bearing age who are residents; conducting a visual assessment; performing limited environmental sampling, such as dust wipe samples, soil samples, and deteriorated paint samples; and reporting the results that identify acceptable abatement and interim control strategies based on specific conditions and the owner's capabilities for controlling identified lead-based paint hazards.

Risk assessor: A certified individual who has completed training from an accredited training program and who has been certified to (1) perform risk assessments; (2) identify acceptable abatement and interim control strategies for reducing identified lead-based paint hazards (3) perform clearance testing and reevaluations; and (4) document the successful completion of lead-based paint hazard control activities.

Sample site: A specific spot on a surface being tested for lead concentration.

Saponification: Chemical reaction between alkalis and oil that produces a type of soap. Because of saponification, oil and alkyd coatings will not adhere to masonry substrates, galvanized metals, or zinc-rich primers. Also a form of incompatibility between types of coatings.

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Screening: The process of testing children's blood to determine if they have elevated lead levels.

Secondary prevention: The process of identifying children who have elevated blood lead levels and controlling or eliminating sources of further exposure. See **Primary prevention**.

SEL: See **Substrate Equivalent Lead**.

Site: The land or body of water where a facility is located or an activity is conducted. The site includes adjacent land used in connection with the facility or activity.

Small quantity generator: An owner, contractor (generator), or both who produces less than 100 kg of hazardous waste per month, or accumulates less than 100 kg of hazardous waste at any one time, or one who produces less than 1 kg of acutely hazardous waste per month, or accumulates less than 1 kg of acutely hazardous waste at any one time.

Soil: See **Bare soil**.

Solid waste: As defined in the Resource Conservation and Recovery Act, the term *solid waste* means garbage, refuse, sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility, and other discarded materials, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations and from community activities. The term does not include solid or dissolved material in domestic sewage or solid or dissolved materials in irrigation return flows or industrial discharges that are point sources subject to permits under the Clean Water Act, nor does the term include special nuclear or byproduct material as defined by the Atomic Energy Act of 1954.

Spectrum analyzer: A type of x-ray fluorescence analyzer that provides the operator with a plot of the energy and intensity, or counts of both "K" and "L" x-ray spectra, as well as a calculated lead concentration.

Spiked matrix: See **Spiked sample**.

Spiked sample: A sample prepared by adding a known mass of the target analyte (for example, leaded dust) to a specified amount of matrix sample (for example, wipe media) for which an independent estimate of target analyte concentration is available. Spiked samples are used to determine, for example, the effect of the matrix on a method's recovery efficiency.

Spot-prime: To apply a paint primer to localized areas of exposed substrate.

Standard deviation: A measure of the precision of the readings; the spread of the deviations from the mean. The smaller the standard deviation, the more precise the analysis, and the less variation there is when an analysis is repeated. The standard deviation is calculated by first obtaining the mean, or the arithmetic average, of all the readings. A formula is then used to calculate how much the values vary from the mean—standard deviation is the square root of the arithmetic average of the squares of the deviation from the mean. Many hand calculators have an automatic standard deviation function.

Standard reevaluation schedule: A schedule that determines the frequency of reevaluations that should be performed on a property. The schedule is based on the lead-based paint hazard control method that is

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implemented and the existing conditions.

Standard reference material (SRM): A certified reference material produced by the U.S. National Institute of Standards and Technology and characterized for absolute content independent of analytical method.

Subsample: A representative portion of a sample. A subsample may be taken from either in the field or in a laboratory.

Substrate: A surface on which paint, varnish, or other coating has been applied or may be applied. Examples of substrates include wood, plaster, metal, and drywall.

Substrate effect: The radiation returned to an x-ray fluorescence analyzer by the paint substrate or underlying material, apart from any radiation returned by any lead present. This radiation, when counted as lead x-rays by an XRF, contributes to substrate equivalent lead (bias). The inspector may have to compensate for this effect when using XRF analyzers.

Substrate Equivalent Lead (SEL): The average of at least three x-ray fluorescence single cycle readings on an unpainted surface; used to calculate the corrected lead concentration on a surface by the following formula: $\text{Apparent Lead Concentration} - \text{Substrate Equivalent Lead} = \text{Corrected Lead Concentration}$.

Target housing: Any residential unit constructed before 1978, except those developed specifically for the elderly or persons with disabilities—unless any child who is less than 6 years of age resides or is expected to reside in the dwelling—or any dwelling with no bedrooms. In the case of jurisdictions that have banned the sale or use of lead-based paint before 1978, the Secretary of Housing and Urban Development may designate an earlier date defining target housing.

Targeted sample: A sample of dwelling units selected from an apartment building or housing development using information supplied by the owner. The units selected are likely to have the greatest probability of having lead-based paint hazards. A targeted sample is usually selected for performing risk assessments in multifamily housing when it is not possible to select a worst-case sample. See also **Worst-case sample**.

TCLP: See **Toxicity Characteristic Leaching Procedure**.

Tertiary prevention: Medically treating children with elevated blood lead levels.

Toxicity Characteristic Leaching Procedure (TCLP): A laboratory test method to determine if excessive levels of lead or other hazardous materials could leach into groundwater; usually used to determine by its toxicity characteristic if the waste is hazardous.

Trained: Successful completion of a training course on a particular discipline. As applied to lead hazard control work, the course must be accredited by EPA or by an EPA-approved State program, pursuant to Title IV of the Toxic Substances Control Act.

Transporter: A person who transports hazardous waste offsite within the United States by air, rail, highway, or water, if the transport requires a manifest under 40 CFR Part 260.10.

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Treatment: In lead-based paint hazard control, a method designed to control lead-based paint hazards. Treatment includes interim controls, intermediate methods, abatement, and full removal. Hazardous waste treatment is a method, technique, or process, including neutralization, that is designed to change the physical, chemical, or biological character or composition of hazardous waste so as to neutralize it, render it nonhazardous or less hazardous, recover it, make it safer to transport, store, or dispose, or allow for easier recovery, storage, or volume reduction.

Treatment, Storage, and Disposal (TSD) facility: A facility licensed to handle hazardous waste.

Trisodium Phosphate (TSP) detergent: Detergent that contains at least 5 percent trisodium phosphate.

Truck-mounted vacuum unit: A vacuum system whose components, except for hoses and attachments, are located outside the building undergoing dust removal. Multiple hoses are used simultaneously and the exhaust is vented to the outside so that the dust inside the building is not disturbed.

TSD: See **Treatment, Storage, and Disposal facility**.

TSP: See **Trisodium phosphate detergent**.

µg (or ug): Micrograms. The prefix micro- means 1/1,000,000 (or one-millionth). A microgram is 1/1,000,000 of a gram and 1/1,000 of a milligram. A microgram is equal to about 35/1,000,000,000 (thirty-five billionths) of an ounce. An ounce is equal to 28,400,000 µg.

Urethane-modified alkyd: An alkyd molecule that has been chemically modified by the incorporation of a urethane. A coating, often a varnish, that uses a urethane-modified alkyd resin in the binder.

Useful life: Life expectancy of a coating before it requires refinishing or some other form of maintenance.

VOC: See **Volatile Organic Compound**.

Volatile Organic Compound (VOC): Substances that vaporize or evaporate from a coating during the coating-curing process.

Walk-off mat: A washable fibrous material preferably with a rubber or vinyl backing positioned at main entryways to reduce transport of lead dust and lead soil into the dwelling interior.

White lead: A white pigment; usually lead carbonate.

Window sill: See **Interior window sill**.

Window stool: See **Interior window sill**.

Window trough: The portion of the horizontal window sill that receives the window sash when the window is closed; often located between the storm window and the interior window sash (sometimes called the window well). If there is no storm window, the window trough is the portion of horizontal window trim that receives both the upper and lower window sash when the sashes are closed.

Window well: See **Window trough**.

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Worker: An individual who has completed training in an accredited program to perform lead-based abatement in target housing.

Worksite: A hallway, room or group of rooms, or exterior where a lead-based paint hazard control measure takes place.

Worksite preparation level: A set of measures designed to protect residents and the environment from leaded dust, paint chips, or other forms of lead contamination through the erection of barriers and the establishment of access control, resident relocation or movement restrictions, warning signs, ventilation, and other measures.

Worst-case sample: A sample of dwelling units selected on the basis of a walk-through visual examination by a risk assessor of all dwelling units in a housing development or apartment building to determine which ones are likely to have the greatest probability of containing lead-based paint hazards. See also **Targeted sample**.

XRF analyzer: An instrument that determines lead concentration in milligrams per square centimeter (mg/cm²) using the principle of x-ray fluorescence (XRF). Two types of XRF analyzers are used, direct readers and spectrum analyzers. In these *Guidelines*, the term XRF analyzer refers to portable instruments manufactured to analyze paint only, and does not refer to laboratory-grade units or portable instruments designed to analyze soil.

APPENDIX B:

STATE AND FEDERAL CONTACTS

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List of State and Federal Contacts for Lead Issues

Because lead is a complex issue, involving soil, water and lead-based paint in housing, several state government agencies are typically involved in any lead question or mitigation. The state agency listed, in most cases, is the state's leading agency for lead issues and can put callers in touch with the relevant agency for their specific lead question. Each state is supposed to have a chief contact or leading agency on lead issues, those agencies are listed in this directory.

This compilation of lead contacts is based on a directory published by the National Conference of State Legislatures. Their 198-page paperback book can be purchased for \$12. Write to: Publications Dept, National Conference of State Legislatures, Suite 700, 1560 Broadway, Denver, CO 80202, or call: (303) 830-2054. Entries are current as of 3/15/95.

ALABAMA

Melvin Maraman, Director
Environmental Services
Dept of Public Health
434 Monroe St
Montgomery, AL 36130
(205) 613-5200.

ALASKA

Linda Himmelbauer, Environmental Toxicologist
Environmental Quality
Dept. of Environmental Quality
410 Willoughby Ave.
Juneau, AK 99801-1795
(907) 465-5152.

ARIZONA

Norman Petersen, Assistant Director
Disease Prevention Services
Dept. of Health Services
3815 North Black Canyon Highway
Phoenix, AZ 85015
(602) 230-5800.

ARKANSAS

Kenny Free
Bureau of Environmental Health Protection
Dept. of Health
Slot 46
4815 West Markham Street
Little Rock, AR 72205
(501) 661-2574.

CALIFORNIA

Dr. Rex Ehling, Chief
Childhood Lead Poisoning Prevention
Dept. of Health Services
Suite 600
5800 Christie Ave.
Emeryville, CA 94608
(510) 450-2453.

COLORADO

Terry Taylor, Manager
Lead Programs
Office of Environment
Dept. of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80222
(303) 692-3012.

CONNECTICUT

Paul Schur, Director
Environmental Health Services Div.
Dept. of Public Health and
Addiction Services
21 Grand Street
Hartford, Ct 06106
Mail to:
150 Washington St
Hartford, CT 06106
(203) 240-9200.

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DELAWARE

Kevin Charles, Delead Program Manager
Div. of Public Health
Dept. of Health & Social Services
P.O. Box 637
Federal and Water St
Dover, DE 19903
(302) 739-4731

FLORIDA

Dr. Roger Inman, Chief of Toxicology
Environmental Health and Statewide Services
1317 Winewood Blvd.
Tallahassee, FL 32399
(904) 488-6811

GEORGIA

Marion Brown, Director
Environmental Health Programs
5th Floor Annex
2 Peachtree St.
Atlanta, GA 30303
(404) 657-6511.

HAWAII

Bruce Anderson, Deputy Director
Environmental Health
Dept. of Health
1250 Punchbowl St.
P.O. Box 3378
Honolulu, HI 96801
(808) 586-4424.

IDAHO

Jeff Muntz, Lead Program Manager
Office of Environmental Health
Div. of Health
4th Floor
450 West State street
Boise, ID 83720-0036
(208) 334-6584.

ILLINOIS

Michael Brant
Asbestos and Lead Section
Div. of Environmental Health
Dept Of Public Health
525 West Jefferson
Springfield, IL 62761
(217) 782-5830.

INDIANA

David Ellsworth, Director
Childhood Lead Poisoning Prevention Program
Maternal and Child Health Service
Dept. of Health
1330 West Michigan Street
P.O. Box 1964
Indianapolis, IN 46206-1964
(317) 383-6662.

IOWA

Rita Gergeley, Program Manager
Childhood Lead Poisoning Prevention
Bureau of Environmental Health
Dept. of Public Health
Lucas State Office Building
321 East 12th St.
Des Moines, IA 50319-0075
(515) 242-6340.

KANSAS

John Irwin, Director
Bureau of Air and Radiation
Dept. of Health & Environment
Building 283
Forbes Field
Topeka, KS 66620
(913) 296-1593.

KENTUCKY

Parker Moore, Environmental Control Manager
Div. for Air Quality
Dept for Environmental Protection
803 Schenkel Lane
275 East Main St
Frankfort, KY 40601
(502) 573-3382.

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LOUISIANA

Jerry Freedman, Lead Coordinator
Air Toxics Section
Dept. of Environmental Quality
P.O. Box 82135
7290 Bluebonnet Blvd.
Baton Rouge, LA 70884
(504) 765-0902.

MAINE

Edna Jones, Director
Bureau of Health
Dept. of Human Services
Statehouse Station 11
151 Capitol Street
Augusta, ME 04333
(207) 287-3201.

MARYLAND

Barbara Conrad, Lead Coordinator
Environmental Health Coordination Office
Dept. of the Environment
2500 Broening Highway
Lead Programs Room 2133
Baltimore, MD 21224
(410) 631-3847.

MASSACHUSETTS

Paul Hunter, Director
Childhood Lead Poisoning Prevention
Dept. of Public Health
305 South St
Jamaica Plain, MA 02130
(617) 522-3700.

MICHIGAN

Jim Bedford-Anthony, Director
Dept. of Public Health
Div. of Risk Assessment
Bureau of Environmental
and Occupational Health
3423 Martin Luther King Jr. Boulevard
P.O. Box 30195
Lansing, MI 48909
(517) 335-9125.

MINNESOTA

Greg Benson, Supervisor
Lead Unit
Environmental Health
Dept. of Health
925 SE Delaware St
P.O. Box 59040
Minneapolis, MN 55459-0040
(612) 627-5035.

MISSISSIPPI

Danny Jackson, Chief
Air Toxics Branch
Air Quality Div.
Office of Pollution Control
Dept. of Environmental Quality
P.O. Box 10385
Jackson, MS 39289
(601) 961-5171.

MISSOURI

William Schmidt, Director
Div. of Environmental Health & Epidemiology
Dept. of Health
1730 East Elm St
P.O. Box 570
Jefferson City, MO 65102
(314) 751-6080.

MONTANA

Todd Damrow, State Epidemiologist
Dept. of Health and Environmental Sciences
Room C314
Cogswell Building
1400 Broadway
Helena, MT 59620
(406) 444-3986.

NEBRASKA

Dr. Adi Pour, Head of Toxicology
State Dept. of Health
Bureau of Environment Health
P.O. Box 95007
301 Centennial Mall South
Lincoln, NE 68509
(402) 471-2541.

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NEVADA

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NEW HAMPSHIRE

Martha Wells, Program Chief
Lead Poisoning Prevention Program
Bureau of Health Risk Assessment
Div. of Public Health Services
6 Hazen Drive
Concord, NH 03301-6527
(603) 271-4664.

NEW JERSEY

Richard Riota, Program Manager
Environmental Health Services
Dept. of Health
210 S. Broad Street, 5th floor
John Fitch Plaza, CN 360
Trenton, NJ 08625
(609) 984-2193.

NEW MEXICO

Mark Weidler, Secretary
Environment Dept.
P.O. Box 26110
Santa Fe, NM 87502
(505) 827-2850

NEW YORK

William Stasiuk, Director
Center for Environmental Health
Dept of Health
Room 350
2 University Place
Albany, NY 12203-3399
(518) 458-6400.

NORTH CAROLINA

Margaret Babb, Environmental Chemist
Div. of Solid Waste Management
Dept of Environment, Health,
and Natural Resources
P.O. Box 27687
401 Oberlin Rd.
Raleigh, NC 27611-7867
(919) 733-2178.

NORTH DAKOTA

Francis Schwindt, Chief of Environmental Health
Environmental Health
Dept. of Health and Consolidated Laboratories
1200 Missouri Ave.
P.O. Box 5520
Bismarck, ND 58506-5520
(701) 328-5150.

OHIO

Daniel Chatfield, Program Administrator
Environmental Health
Dept. of Health
246 North High St
Columbus, OH 43266-0588
(614) 644-8649.

OKLAHOMA

Lawrence Gales, Director
Support Services
Dept. of Environmental Quality
1000 Northeast Tenth St
Oklahoma City, OK 73117-1212
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OREGON

Mike Skeels, Acting Administrator
Oregon Health Div.
Suite 950
800 NE Oregon Street
Portland, OR 97232
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PENNSYLVANIA

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Childhood Lead Poisoning Prevention Program
Dept. of Health
Health and Welfare Building
Room 725, P.O. Box 90
Harrisburg, PA 17108
(717) 783-8451.

RHODE ISLAND

Roger Greene, Assistant to the Director
Dept. of Environmental Management
291 Promenade Drive.
Providence, RI 02908
(401) 277-2797.

SOUTH CAROLINA

Sam McNutt, Director
Div. of Training and Consumer Purchases
Bureau of Environmental Health
2600 Bull St.
Columbia, SC 29201
(803) 935-7894.

SOUTH DAKOTA

Bob McDonald, Asbestos Coordinator
Dept. of Environment and Natural Resources
523 East Capitol Ave.
Pierre, SD 57501
(605) 773-4217.

TENNESSEE

Tom Tiesler, Director of Solid Hazardous Waste
Dept. of Environment and Conservation
L and C Tower, 5th Floor
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(615) 532-0109.

TEXAS

Kay Randall, Coordinator
Childhood Lead Poisoning Prevention Program
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1100 West 49th St.
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UTAH

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VERMONT

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VIRGINIA

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Childhood Lead Poisoning Prevention Program
Child and Adolescent Health
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Richmond, VA 23218
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WASHINGTON

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Environmental Health Assessment Section
Office of Toxic Substances
Dept. of Health
Mail Stop 7825
Airdustrial Center, Building 4
Olympia, WA 98504
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WEST VIRGINIA

William Pinnell, Director
Lead Abatement Programs
Bureau of Public Health
Dept. of Health and Human Resources
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WISCONSIN

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(608) 266-1253.

WYOMING

Dennis Hemmer, Director
Dept. of Environmental Quality
Herschler Building
122 West 25th St. 4W
Cheyenne, WY 82002
(307) 777-7938.

FEDERAL AGENCIES:

The U.S. Environmental Protection Agency, the departments of Defense, Housing and Urban Development, and Centers for Disease Control and Prevention, jointly fund the National Lead Information Center. The center operates a toll-free number that takes callers' names and addresses and sends them a basic packet of information on lead poisoning. The number is 800-LEADFYI, which translates to: 1-800-532-3394.

The Department of Housing and Urban Development, Office of Lead-Based Paint Abatement and Poisoning Prevention, Room B-133, 451 7th St. SW, Washington, DC 20410, (202) 755-1805.

Environmental Protection Agency, Office of Pollution Prevention and Toxics, 401 M St. SW, Mail Code 7401, Washington, DC 20460; (202) 260-3810.

Occupational Safety and Health Administration (U.S. Department of Labor), 200 Constitution Ave., NW, Washington, DC 20210; (202) 219-6091.

APPENDIX C:

BIBLIOGRAPHY

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Construction Specifications Institute. 1995. *Manual of Practice*. Alexandria, VA.: CSI.

National Institute of Building Sciences. 1995. *Lead Laws*. Washington, D.C.: NIBS.

National Institute of Building Sciences. 1995. *Lead-Based Paint Operations And Maintenance Work Practices Manual*. Washington, D.C.: NIBS.

National Society of Professional Engineers (NSPE). 1420 King Street, Alexandria, VA 22314-2794. (703) 884-2800. The NSPE publishes a number of documents that are useful in the preparation of contract and bidding documents in their publication *Standard Forms of Agreement*.

U.S. Department of Housing and Urban Development. 1995. *Guidelines For The Evaluation And Control Of Lead-Based Paint Hazards In Housing*. Washington, D.C.: GPO.

U.S. Department of Housing and Urban Development. *Lead Based Paint Hazard Elimination*. Title 24, Parts 35, 905, 941, 965 and 968 of the Code of Federal Regulations.

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APPENDIX D:
MAJOR FEDERAL REGULATIONS AND GUIDANCE
AFFECTING LEAD IN CONSTRUCTION

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OSHA LEAD IN CONSTRUCTION STANDARD

OSHA's Lead Exposure in Construction Standard, Title 29 of the Code of Federal Regulations, Part 1926, Section 62 [29 CFR 1926.62] went into effect June 3, 1993. The Standard contains employee protection requirements for construction workers exposed to lead. The standard applies to renovation, alteration and repair work, including painting and decorating, and maintenance operations associated with the standard's construction activities. It does not include routine cleaning and repainting (e.g., minor surface preparation and repainting of rental apartments between tenants or at scheduled intervals) where there is insignificant damage, wear or corrosion of existing lead-containing paint and coatings or substrates, which are covered by OSHA's general industry standard for lead (29 CFR 1910.1025).

Some states have their own occupational safety and health plans. State regulations may be more stringent and may apply to more activities than the federal standard. It is advisable to check with the state where the work is to be performed before starting.

OSHA's lead standard sets limits for the amount of lead in the air and in the blood of exposed workers. Certain actions must be taken in work areas where these limits have been exceeded. The permissible exposure limit (PEL) is the highest amount of lead in air to which employees may be exposed. The action level (AL) is an amount of lead in air at or above which employers must perform certain actions in addition to those they perform for any work involving occupational exposure of employees to lead. The following limits are set by the standard:

- AL = 30 micrograms (μg) of lead per cubic meter (M^3) ($30 \mu\text{g}/\text{M}^3$) of air
- PEL = 50 micrograms of lead per cubic meter ($50 \mu\text{g}/\text{M}^3$) of air*

* For shifts greater than 8 hours in any work day use:
 $\text{PEL} = 400 \div \text{number of hours worked in a day.}$

Exposure Assessment

Employers must determine if any of their employees are exposed to lead at or above the action level. One method is to collect air samples from the worker's breathing zone and have them analyzed by a laboratory. The samples should represent the worker's regular, daily exposure to lead. The samples should be taken for the full work shift. At least one sample for each job classification in each work area must be obtained. The results should be compared to the PEL and AL. The worker's exposure is the exposure that would occur if they were not wearing a respirator.

When lead is present, some work tasks generate high levels of lead. OSHA has identified a group of "lead related tasks" which require interim protection until air monitoring determines the actual lead exposures. Until then, employers must provide workers with respirators, protective clothing, equipment, change areas, hand washing facilities, biological monitoring and training required for an assumed level for these tasks. When the actual level of exposure for the job has been measured, the requirements for that level of exposure can be used. In addition, if an employer has reason to believe a worker's exposure in a job not listed by OSHA may be above the PEL, that employee must be protected as required for

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exposures above the PEL until monitoring is performed. The "lead related tasks" are listed in three groups with their assumed lead levels (See Figure 1, Lead-Related Tasks):

Employers must assume an exposure over 50 and up to 500 $\mu\text{g}/\text{M}^3$ for the following tasks:

- manual demolition of structures (e.g., dry wall)
- manual scraping
- manual sanding
- using a heat gun
- power tool cleaning with dust collection systems
- spray painting with lead-based paint

Employers must assume exposure over 500 and up to 2500 $\mu\text{g}/\text{M}^3$ for the following tasks:

- using lead containing mortar
- burning lead
- rivet busting on lead paint
- power tool cleaning without dust collection systems
- clean up activities where dry expendable abrasives are used
- abrasive blasting enclosure movement and removal

Employers must assume exposure over 2,500 $\mu\text{g}/\text{M}^3$ for the following tasks:

- abrasive blasting
- cutting
- welding
- torch burning

In certain cases, the employer may use existing air monitoring results, instead of taking new air samples, to make the initial determination of whether the worker's exposure exceeds the PEL or AL. The existing results must be personal air samples that are less than 12 months old. The work that was monitored must closely resemble the processes, material types, control methods, work practices, and environmental conditions of the current operation. The sampling and analytical methods used must meet the standards' technical accuracy requirements. Monitoring results meeting these requirements are known as "historical data".

If the initial monitoring shows that employee exposure is below the action level, further monitoring is not required unless there is a change in equipment, processes, controls or personnel, or a new task is added that may result in new or additional exposures to lead.

If the initial monitoring shows that employee exposure is at or above the action level, but at or below the PEL, the employer must perform additional monitoring every 6 months. The monitoring must continue until two consecutive measurements, taken at least 7 days apart, are below the action level. The monitoring can then be stopped.

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If the initial monitoring shows that employee exposure is above the PEL, the employer must repeat the monitoring quarterly. The monitoring must continue until two consecutive measurements, taken at least 7 days apart, are at or below the PEL. If the results are at or above the action level then sampling must continue every 6 months. If the results are below the action level, then no further sampling is required unless changes occur that may result in new or additional exposures to lead.

Employees must be notified in writing of the results of their air monitoring. This report must be given within 5 working days after completion of the exposure assessment. Employees must also be told in writing when their exposure is at or above the PEL. This notice must include what actions are being taken to reduce lead exposures below the PEL.

The following table summarizes the requirements of 29 CFR 1926.62 for specific exposure levels.

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TABLE 1

For Specific Air Lead Levels					During Assessment of Lead Related Tasks
Regardless of Level	At or above AL (30 µg/M ³)		Above PEL (50 µg/M ³)	Above 4 X PEL (200 µg/M ³)	
	1 - 30 Days	> 30 Days			
1926.62(d) - Exposure Assessment and Interim Protection 1926.62(h) - Housekeeping 1926.62(i)(5) - Handwashing Facilities 1926.62(l)(1)(i) - Hazcom Program	1926.62(d)(4) - Monitoring Representative of Exposure for Each Exposed Employee 1926.62(i)(1)(i) - Initial Medical Surveillance 1926.62(i)(2)(ii) - Follow-up Blood Sampling 1926.62(k) - Temporary Removal due to Elevated Blood Lead 1926.62(l)(1)(ii)-(iv) - Information and Training	1926.62(j)(1)(ii) - Medical Surveillance Program 1926.62(i)(3) - Medical Exams and Consultation (if required)	1926.62(e) - Engineering and Work Practice Controls 1926.62(f) - Respiratory Protection 1926.62(g) - Protective Clothing and Equipment 1926.62(i) - Hygiene Facilities and Practices 1926.62(m) - Signs	1926.62(g)(2) - Clean Protective Clothing Daily	1926.62(f) - Appropriate Respiratory Protection 1926.62(g) - Protective Clothing and Equipment 1926.62(i)(2) - Change Areas 1926.62(i)(5) - Handwashing Facilities 1926.62(j)(1)(i) - Biological Monitoring 1926.62(i)(2)(iii) - Respirator Training 1926.21 - Safety Training and Education

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Compliance Program

The employer must implement a written "compliance program" before starting a job where employees may be exposed to lead above the PEL. Employers must first identify engineering and work practice controls to reduce and maintain employee exposures to lead at or below the PEL. The written program must include:

1. Descriptions of activities that produce lead exposures.
2. Descriptions of the specific means that will be used to reduce exposure. Where engineering controls are used, the plans and studies used to determine the methods selected.
3. A detailed schedule for implementing the compliance program.
4. A report of the technology considered in meeting the PEL.
5. Air monitoring data that documents the source of the lead exposure.
6. Specific work practice procedures which will be used on the project.
7. A schedule of administrative controls, if these are to be used.
8. A description of all arrangements on multi-employer work sites to inform affected employers about the lead project.

The compliance program should also include information on inspections of the job site by a competent person, updating of the program at least every six months, and the availability of the plan to affected employees, their representatives and appropriate enforcement agencies. A competent person is one who is capable of identifying existing and predictable lead hazards and who has authority to take prompt corrective measures to eliminate them.

Respiratory Protection

Respirators are required for employees in the following situations:

1. When an employee's exposure exceeds the PEL.
2. Whenever an employee requests a respirator.
3. As an interim protection for employees performing one of the "lead-related tasks".

Employers must have a written respiratory protection program in accordance with 29 CFR 1910.134. The lead standard includes a table specifying which respirators should be used when exposures are above the PEL or when performing one of the "lead-related tasks". Any air-purifying respirator used for lead work must be equipped with high efficiency particulate air (HEPA) filter cartridges. Employers should refer to this table before writing a lead-related respiratory protection program. See the discussion of respiratory protection program requirements, including types of respirators used, in Section 4.D, OSHA Respiratory Protection Standards, below. See also Figure 1, Lead-Related Tasks.

Protective Work Clothing and Equipment

Employers must provide protective clothing to employees:

1. When an employee's exposure exceeds the PEL.
2. When employees are exposed to lead compounds which may irritate the skin and eyes.

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3. When an employee is performing any of the "lead-related tasks".

Protective clothing must be appropriate for the work, for example:

1. Coveralls or full body work clothes.
2. Gloves, hats, and shoes or disposable shoe coverlets.
3. Face shields, vented goggles or other eye and face protection.

Clean, dry protective clothing must be given weekly to employees exposed above the PEL and up to 200 $\mu\text{g}/\text{M}^3$. Protective clothing must be provided daily if employees are exposed to lead above 200 $\mu\text{g}/\text{M}^3$.

The employer is responsible for the following items related to protective clothing and equipment:

1. Provide for cleaning, laundering and disposal.
2. Repair or replace as needed to maintain effectiveness.
3. Ensure that all clothing is removed at the end of the work shift in the designated change area.
4. Ensure that any contaminated protective clothing to be cleaned, laundered or disposed of is placed in a closed container in the change area. The container should prevent the spread of lead outside the container.
5. Inform in writing anyone who cleans or launders the protective clothing or equipment of the potentially harmful effects of exposure to lead.
6. Ensure that containers of contaminated protective clothing or equipment are labelled as follows:

"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."

7. Prohibit the removal of lead from protective clothing or equipment by blowing, shaking or any other means which disperses lead to the air.

Housekeeping

The following housekeeping procedures must be followed on all jobs where employees are covered under this standard:

1. Maintain surfaces as free of lead and lead dust as is practical.
2. Clean surfaces with a vacuum equipped with HEPA filters or other methods that minimize the likelihood of lead becoming airborne.
3. Shoveling, dry or wet sweeping, and brushing can be used only where vacuuming or other equally effective methods have been tried and found not to be effective.
4. Compressed air should only be used in conjunction with a ventilation system that captures the airborne dust created by the compressed air.

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Hygiene Facilities

Food, beverages and tobacco products may not be present, used or consumed, and cosmetics may not be applied in areas where employees are exposed to lead above the PEL.

The employer must provide the following when workers are exposed to lead above the PEL or are doing any of the "lead-related tasks":

1. Change areas. (above PEL or lead-related tasks)
2. Showers, if feasible. (above PEL)
3. Clean eating areas. (above PEL)

In addition, hand washing facilities, which are required at any exposure level, must be provided in accordance with 29 CFR 1926.51(f).

Medical Surveillance and Medical Removal Protection

Employers shall make initial medical surveillance available to any employee exposed at or above the action level on any day. The surveillance must include sampling for blood lead and zinc protoporphyrin levels. Employers must also provide biological monitoring for all employees performing lead-related tasks. A medical surveillance program must be provided for employees exposed at or above the action level for more than 30 days in any consecutive 12 months. This program will include biological monitoring and medical examinations and consultations. Blood sampling and analysis for lead and zinc protoporphyrin should be made available:

- at least every 2 months for the first 6 months and every 6 months thereafter, for employees exposed at or above the action level for more than 30 days in any consecutive 12 months
- at least every 2 months when blood lead level is at or above 40 $\mu\text{g}/\text{dl}$. Testing should continue at this rate until 2 consecutive blood sample results are below 40 $\mu\text{g}/\text{M}^3$
- at least monthly during a period when an employee has been removed from work because of high blood lead levels
- if an employee's blood sample results exceed the criterion level for removal, another blood sampling test should be provided within 2 weeks

Medical exams and consultations must be made available on the following schedule:

- at least annually for an employee whose blood lead level was 40 $\mu\text{g}/\text{dl}$ or greater in the last 12 months
- as soon as possible for any employee who has developed signs and symptoms commonly associated with lead poisoning or who desires medical advice concerning the effects of current or past exposure to lead on their ability to have a healthy child
- as soon as possible upon learning an employee is pregnant
- as soon as possible after an employee has shown difficulty in breathing during a respirator fit

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- test or use
- as medically appropriate for each employee removed from lead exposure due to a risk of sustaining material impairment to health

Employers must remove employees with lead exposure at or above the Action Level each time:

- a periodic and follow up blood sampling test indicates a blood lead level at or above 50 µg/dl; or
- a final medical determination indicates a detected medical condition that increases health risks from lead exposure

A doctor may make a final medical determination to remove an employee from working with lead. The doctor is not to reveal any findings, lab results, or diagnosis unrelated to occupational exposure to lead to the employer. An employee exposed to lead at or above the action level must be removed from lead work, if the employee has a blood lead level at or above 50 µg/dl on two separate testings, two weeks apart. An employee can return to lead work when his or her blood lead level result is at or below 40 µg/dl on two consecutive testings or a doctor has made a medical determination that the employee can return to lead work. The employer must provide wages and benefits for any employee removed from lead work for up to 18 months, as long as the job exists.

The employer may not provide "prophylactic chelation". Prophylactic chelation is the routine use of chelating (binding) or similar acting drugs to prevent elevated blood levels in workers who are occupationally exposed to lead, or the use of these drugs to routinely lower blood lead to levels believed to be safe. Chelating drugs should not be used as a substitute for engineering controls, appropriate work practices, and proper personal protective equipment.

Employee Information and Training

Employers must provide hazard communication training for all employees exposed to lead at any level before they start their job assignment.

For employees exposed below the action level, basic training is required, including instruction in:

- the hazards of lead
- warning signs, labels, and material safety data sheets (MSDSs)
- the requirements of the OSHA lead in construction standard

For employees exposed to lead at or above the action level on any day, a broader training program must be provided initially and at least annually afterward. The same training must also be provided initially to any employees subject to exposure to lead compounds which could irritate the skin or eyes. The training program for these employees must include:

- the basic training topics listed above
- the contents of the lead in construction standard and its appendices
- the nature of tasks that could lead to exposures at or above the action level
- the purpose, proper selection, fitting, use, and limitations of respirators

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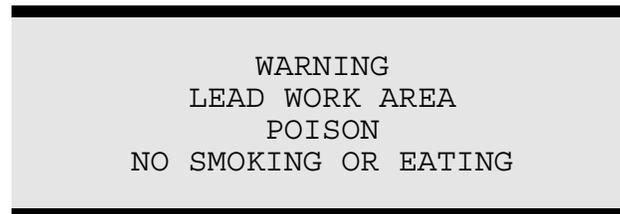
- the purpose and description of the medical surveillance program and medical removal program
- the engineering and work practice controls associated with an employee's job assignment(s)
- the contents of the employer's written compliance program
- instructions to employees prohibiting use of chelating agents except under medical supervision and removal from lead exposure
- the right of employees to access their exposure and medical records

For employees performing work in any of the "lead related tasks", or where an employer has reason to believe that the exposure is above the PEL, and until the employer performs an exposure assessment which documents that employee exposure is below the PEL, the employer shall train the employees in:

- the basic training topics listed above
- the purpose, proper selection, fitting, use, and limitations of respirators
- safety issues related to the work

Signs

Employers must post the following readily visible warning signs in areas where employees' exposure is above the PEL:



Recordkeeping

Employers shall establish and maintain records with the following information:

Exposure assessment data, including the employee(s) name, social security number and job classification of the employee who was monitored and of all other employees whose exposure the sampling is intended to represent. The date, number, duration of sampling, location, result(s), description of the sampling procedure, analytical methods used and evidence of their accuracy, type of respirator worn (if any), and the environmental factors that could affect the sampling results.

- training done for employees
- records of each employee subject to medical surveillance
- cases of medical removals
- objective data for exemption from requirement of initial monitoring

29 CFR 1910.20(d)(1)(i) requires that medical and exposure records must be maintained for 30 years past the end of employment. All records are to be available upon request to the OSHA Administrator, the Director of the National Institute for Occupational Safety and Health (NIOSH), affected employees, former employees

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or their designated representatives for examination and copying. If the employer goes out of business and there is no successor, records are to be transferred to the NIOSH Director. Contact NIOSH prior to transferring any records for instructions and specific requirements. Do not send any employee records to OSHA or NIOSH without first contacting the Agency.

OSHA HAZARD COMMUNICATION STANDARD

The Hazard Communication Standard for Construction (29 CFR 1926.59) applies to all employers in the construction industry. Its purpose is to inform workers of health risks associated with exposure to hazardous chemicals in the workplace. The standard requires labelling of toxic chemicals, providing information about chemicals (Material Safety Data Sheets), and training of employees.

An owner must establish a hazard communication program for hazardous chemicals to include:

1. Hazard determination.
2. Written hazard communication program
3. Warning labels.
4. Material Safety Data Sheets (MSDS).
5. Employee information and training.

OSHA RESPIRATORY PROTECTION STANDARD

The OSHA Lead in Construction standard (29 CFR 1926.62) and Construction Industry Respiratory Protection standard (29 CFR 1926.103) require employers to provide employees with proper respiratory protection. Respiratory protection must be used unless it can be determined that employees will not be exposed to lead dust above the PEL.

Of the two types of respirators, air-supplying, and air-purifying (filtering), the latter will most usually be used on lead-based paint O & M projects. The air-purifying respirator filters the contaminants in the air as it is breathed. Any air-purifying respirator used for lead work must be equipped with high efficiency particulate air (HEPA) filter cartridges.

A half-face (half-mask) respirator with HEPA filters is the minimum respirator required for lead dust exposures above the PEL. A full-face (full-facepiece) respirator with HEPA filters is required if the airborne lead particles cause eye or skin irritation at the concentrations occurring during the work, and may be used whenever a half-face respirator is allowed for lead work, such as if it may increase work efficiency. An employer shall provide a powered, air-purifying respirator with HEPA filters in place of a half-face respirator whenever it will provide adequate protection to the employee, and the employee chooses to use it.

A respiratory protection program is also required that includes, at a minimum:

1. Written standard operating procedures regarding the selection and use of respirators.

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2. Respirator selection based on the hazards to which workers are exposed. Respirators must provide adequate respiratory protection against the particular hazard for which they are designed.
3. A training program in the proper use and limitations of respirators.
4. Cleaning and disinfection of respirators on a regular basis.
5. Convenient, clean, and sanitary storage of respirators.
6. Routine inspection during respirator cleaning.
7. Appropriate surveillance of work area conditions and degree of worker exposure or stress.
8. Regular evaluation of the continued effectiveness of the program.
9. Assurance that workers assigned to tasks requiring respirators are physically able to perform the work and to use the equipment. OSHA recommends an annual review of a respirator worker's medical status.

EPA REGULATIONS AND GUIDELINES GOVERNING LEAD-BASED PAINT ACTIVITIES DISPOSAL OF LEAD-BASED PAINT WASTE

At this writing, lead abatement wastes will be either hazardous (Subtitle C) or non-hazardous (Subtitle D) under the Resource Conservation and Recovery Act (RCRA). Nearly all states are authorized to implement and administer the basic RCRA hazardous waste program. Generators should always contact the States; authorities for specific guidance on what constitutes a hazardous waste and specific requirements for abatement waste.

In making the determination of what constitutes hazardous waste, generators must use their knowledge or waste analysis data to determine whether others exhibit the "Toxicity Characteristic." The toxicity is measured using the Toxicity Characteristic Leaching Procedure (TCLP). For lead abatement wastes, the regulatory threshold of most concern is for lead; TCLP levels at or above 5 ppm lead define the waste as hazardous.

Exemptions:

Household Wastes--Wastes that are generated as part of "interim controls" or as operation and maintenance for lead paint may be exempt from hazardous waste regulations under the exclusion for household waste. The household waste exemption is relatively narrow (and applies to wastes from "routine maintenance"), and is not generally applicable to the renovation and demolition activities common in lead abatement. Generators should contact State RCRA authorities to determine the limitations of this exclusion.

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Small Quantity Wastes--If less than 100 kg/month (about 220 lbs.) of hazardous waste is produced, generators qualify as "conditionally exempt small quantity generators." The waste may then be handled as nonhazardous. Certain limitations apply and some States do not have this exemption.

Abatement Waste Categories

EPA encourages generators to segregate abatement wastes in order to minimize the volume of hazardous waste and reduce the testing needed. While the kinds of wastes generated will depend on abatement methods used, most wastes can be separated into several categories:

Low-Lead Waste--These wastes include filtered wash water, disposable clothing after vacuuming, and cleaned plastic sheeting. These wastes typically pass the TCLP test and are not hazardous.

Architectural Components--This category includes painted building components, such as doors, trim, windows, baseboards, soffits, railings, molding, radiators, and stone or brick. Current regulations require the generator to use testing results or "knowledge" of their waste to identify hazardous waste.

Various site-specific factors may affect whether the waste would be hazardous (age of building, thickness of paint, sampling protocol). Therefore, generators should contact State authorities for information on lead abatement wastes in their area, and whether architectural components are usually considered nonhazardous waste.

Concentrated Lead Waste--These wastes include lead paint chips and dust; sludge from paint stripping; uncleaned rags, mops, and scrapers; and HEPA vacuum filters. These waste typically fail the TCLP test and should be handled as hazardous (unless conditionally exempt as small quantity generator).

Other Wastes

Other wastes usually should be tested to determine if they are hazardous, and managed appropriately. The most important waste in this category is contaminated soil. While TCLP results for soils are difficult to predict, anecdotal experience suggests that soil lead that exceeds 5,000 ppm will likely fail the TCLP. Excavated soil that fails the TCLP test should be handled as hazardous. EPA is currently working on a comprehensive approach to deal with contaminated media.

Current Regulatory Activities

Title X, the Residential Lead-Based Paint Hazard Reduction Act of 1992, amends the Toxic Substance Control Act (TSCA) with Title IV, Lead Exposure Reduction, and contains all the EPA mandates for the regulation of LBP activities as defined by the Title. Under Section 402(a) (1) of TSCA, EPA is developing new disposal standards for LBP waste. The current intent of EPA is to temporarily defer the regulation of architectural components from RCRA to the TSCA regulation, where no RCRA requirements would apply (e.g., TCLP testing, transport requirements, etc). The TSCA regulations would mandate no co-disposal of LBP architectural components with municipal or other acidic/putrescible industrial wastes. This would likely lead to the disposal of components in construction and demolition landfills (C & D landfills), which do not

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accept municipal waste. Generators are urged to contact state or local authorities in their area for the current status of the disposal of architectural components from LPB activities.

Guidelines For The Evaluation And Control Of Lead-Based Paint Hazards In Housing

This document, referred to as the 1995 HUD Guidelines, provides detailed, comprehensive, and technical information on how to identify lead-based paint hazards in housing and how to control such hazards safely and efficiently. The guidelines are being issued pursuant to Section 1017 of Title X for the conduct of federally supported work involving risk assessments, inspections, interim, controls, and abatement of lead-based paint hazards. For purposes of this manual, the Guidelines are useful for anyone who is interested in a greater breadth of knowledge of lead hazards posed by paint, dust, and soil even though the housing or building has no connection with the Federal Government.

Lead in paint, dust, and soil in homes

Title X, the Residential Lead Based Paint Hazard Reduction Act of 1992, in amending TSCA at Section 403, requires that EPA develop health-based standards for paint, dust, and soil. Although final standards have not been issued, EPA has issued Interim Guidelines. The guidelines outline sampling procedures and ALs for lead in paint dust, and soil.

Coatings of residential paint are defined by EPA to be lead-based if the lead content exceeds either 1.0 mg/cm² or 0.5% by weight. In certain circumstances the LBP must be either abated or addressed through interim controls. Until either the 1995 HUD Guidelines are published in final form or the final Section 402 standards are issued, abatement activities should be performed according to the current Interim HUD Guidelines (1990) and interim control activities should be conducted according to state and local requirements since they are not addressed in the 1990 Interim HUD Guidelines.

Where abatement or interim control activities have been performed, EPA recommends that the following clearance levels be met:

<u>Location</u>	<u>Lead Loading</u>
Uncarpeted Floors	100 µg/ft ²
Interior Window Sills	500 µg/ft ²
Window Wells	800 µg/ft ²

This interim guidance document, while addressing lead in soil at Comprehensive Environmental Response (CERCLA) sites and Resources, Conservation, and Recovery Act (RCRA) facilities, recommends a threshold level of 400 ppm in bare soil for residential land use. This threshold applies in areas expected to be used by children including residential backyards, day care and school yards, playgrounds, public parks, and any other areas where children gather.

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Lead Training and Certification Rule (Model State Program)

In 1994, the EPA proposed a regulation under Sections 402 and 404 of Title IV of TSCA, designed to establish a comprehensive, national program for training, certifying and accrediting individuals and firms who perform lead-based paint activities. The proposed regulation would also establish standards for conducting those activities. The final version of the regulation will serve as the basis for EPA approval of State programs.

The proposed regulation cover four categories of buildings/ structures, each with its own requirements:

Target Housing, which is defined by Title IV as "any housing constructed prior to 1978," with certain limited exceptions.

Public Buildings, which the proposed regulation defines as "any building constructed prior to 1978...which is generally open to the public or occupied or visited by children." The proposed examples include schools, day care centers, museums, airport terminals, hospitals, stores, restaurants, office buildings, and government buildings.

Commercial Buildings, which the proposed regulation defines as "any building used primarily for commercial or industrial activity, which is generally not open to the public, or occupied or visited by children." Proposed examples include warehouses, factories, and garages.

Superstructures, which the proposed regulation defines as any "large steel or other industrial structure." Proposed examples include bridges and water towers.

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Training, Accreditation, and Certification.

EPA proposed that persons performing certain activities in one of the categories of buildings and structures, above, be trained and certified by an accredited training provider in courses specific to that type of building or structure. The proposed regulation requires that firms engaged in these activities be able to certify that they use only certified employees for such jobs.

Target Housing and Public Building	Training hours
Lead abatement worker	32
Supervisor	40
Inspector/Risk Assessor	40
Inspector/Technician	24
Planner/Project Designer	56

Commercial Buildings and Superstructures	Training hours
Lead worker	32
Supervisor	32

Conducting Lead-Based Paint Activities

The proposed regulation also specifies in detail how the following activities are to be conducted in the four building/ structure categories:

Target Housing

- Inspection
- Risk Assessment
- Abatement

Public Buildings

- Identification of Lead-Based Paint
- Risk Assessment
- Abatement
- Demolition

Commercial Buildings and Superstructures

- Identification of Lead-Based Paint
- Deleading
- Demolition

Users should note that existing State and local rules and regulations may be more stringent than the proposed EPA regulation, and should contact State and local agencies for guidance.

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix D - Major Federal Regulations

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APPENDIX E:

MANUFACTURERS

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GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix E - Manufacturers

Manufacturers by Product Type

1. Cementitious Enclosures: 09253

- a. Encap Systems Corporation
230 North Central Avenue
Columbus, Ohio 43222
(800) 732-9156

2. Encapsulants: 09940

- a. Abatement Technologies
1705 Belmeade Court
Lawrenceville, GA 30243
(404) 339-2600
- b. AGP Surface Control Systems
P.O. Box 388
Windham, NY 12496
(518) 734-5880
- c. American Coatings Corporation
2530 N. Powerline Road
Pompano Beach, FL 33069
(305) 960-0500
- d. C.I.M. Industries, Inc.
94 Grove Street
Peterborough, NH 03458
(603) 924-9481
- e. Carboline Company
350 Hanley Industrial Court
St. Louis, MO 63144
(314) 924-1000 x 2331
- f. Central Plastics
P.O. Box 3129
Shawnee, OK 74802-3129
(405) 273-6302
- g. Certech
1624 Harmon Place, #209
Minneapolis, MN 55403-1999
(800) 433-1892;
(612) 338-1250
- h. Conteplast of America, Inc
14200 Butternut Road
Burton, OH 44021
(216) 543-7700
- i. Design Materials, Inc.
241 S. 55th Street
Kansas City, KS 66106
(913) 342-9796
- j. Devoe Reynolds Coatings
4000 Dupont Circle,
P.O. Box 7600
Louisville, KY 40207
(502) 897-9861
- k. Dynacraft Industries
4 Kinney Raod
Englishtown, NJ 07726
(908) 303-8920
- l. Elasti-Cote, Inc.
34 S. Market Street
Frederick, MD 21701
(301) 663-0415

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix E - Manufacturers

Encapsulants (cont.)

- | | |
|--|--|
| m. Encap Systems Corporation
230 North Central Avenue
Columbus, OH 43205
(614) 274-3666 | u. FRP Products & Sons
P.O. Box 2504
Darien, IL 60561
(708) 654-1313 |
| n. Encasement Technologies
1700 McMullen Booth Road
Clearwater, FL 34619
(813) 724-8401 | v. Global Encasement
5036 Carpinteria Avenue
Carpinteria, CA 93013
(805) 684-4600 |
| o. Eppert Environmental Products
9100 Freeland Avenue
Detroit, MI 48228
(800) 783-0002 | w. Grayling Industries, Inc.
1008 Branch Drive
Alpharetta, GA 30201
(800) 635-1551 |
| p. Fiber Tec Coatings
P.O. Box 23209
Charlotte, NC 28227
(704) 841-8527 | x. Insi-X
50 Holt Drive
Stoney Point, NY 10908
(914) 786-5000 |
| q. Fiber Tec Coatings Corp
25 Annandale drive
Chippaqua, NY 10514
(914) 242-5188 | y. International Protective Coatings
725 Carol Avenue
Ocean Township, NJ 07112
(215) 362-9020 |
| r. Fiberlock Technologies, Inc.
630 Putnam Avenue
P.O. Box 432
Cambridge, MA
(800) 342-3755
(617)876-8020 | z. JV Manufacturing Company, Inc.
963 Ashwaubeon Street
Green Bay, WI 54301
(414) 337-4944 |
| s. Flame Stop Inc.
P.O. Box 888
Roanoke, TX 76262
(817) 431-3747 | aa. Kapsulkote, Inc.
5301 Nations Crossing
Charlotte, NC 28217
(800) 328-5885 |
| t. Flexi-wall Systems
208 Carolina Drive
P.O. Box 89
Liberty, SC 29657 | bb. Polibrid Coatings, Inc.
6700 FM 802
Brownsville, TX 78521
(210) 831-7818 |
| | cc. Preferred Solutions, Inc.
1601 Brookpark Road
Cleveland, OH 44109
(216) 741-5255 |

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix E - Manufacturers

Encapsulants (cont.)

- | | |
|---|---|
| dd. Premier Coatings, Inc.
2250 Arthur Avenue
Elk Grove, IL 60007
(708) 439-4200 | ii. Superior Products
720 W. Eules Boulevard
Eules, TX 76040
(817) 545-1498 |
| ee. PROKO Industries
18601 LBJ Freeway, #400
Mesquite, TX 75150
(214) 681-9261 | jj. Superior Products International
P.O. Box 193465
Little Road, AR 67401
(501) 455-2460 |
| ff. ProSoCo, Inc.
775 Minnesota Avenue, Box 171677
Kansas City, KS 66117
(913) 281-2700 | kk. Valspar Corporation
1401 Severn Street
Baltimore, MD 21230
(410) 625-7331 |
| gg. Relco Environmental Solutions
Highway 82 East, P.O. Box 102
Texarkana, AR 75504
(501) 772-3867 | ll. Visual Pollution Technologies, Inc.
P.O. Box 28517
Atlanta, GA 20258
(404) 971-0893 |
| hh. Senergy, Inc.
1367 Elmwood Avenue
Cranston, RI 02910
(401) 467-2600 | mm. Witco Corporation
520 Madison Avenue
New York, NY 10022-4236 |

3. **Gypsum Wallboard Enclosures:** 09252

- a. Domtar Gypsum
- b. Georgia-Pacific Corp.
- c. Gold Bond Building Products Div., National Gypsum Co.
- d. United States Gypsum Co.

4. **HEPA Filtered Fan Units:** 01514

- | | |
|--|-------------------|
| a. Aerospace America, Inc.
900 Truman Parkway
P.O. Box 189
Bay City, Michigan 48707 | "Aero-Clean 2000" |
| b. Asbestos Control Technology, Inc.
P.O. Box 183
Maple Shade, NJ 08052 | "Micro-Trap" |

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix E - Manufacturers

HEPA Filtered Fan Units (Cont.)

- c. Control Resource Systems, Inc. "Hog" 2000
670 Mariner Drive
Michigan City, Indiana 46360
- d. Global Consumer Services, Inc. "Red Baron"
1721 N. Highland Avenue
Los Angeles, CA 90028
- e. Tri-Dim Filter Corporation "ACCU-2M"
1431 West Lake Street
Chicago, Illinois 60607

5. HEPA Filtered Vacuums: 01505, 01506

- a. Nilfisk of America Inc. HEPA filtered Vacuums
225 Great Valley Parkway
Malvern, PA 19355
- b. Clayton Associates, Inc. ACE Model HEPA Vacuum
P.O. Box 589
30 Southard Avenue
Farmingdale, NJ 07727
- c. Hako Minuteman Hako Minuteman
111 South Route 53 HEPA Vacuums
Addison, IL 60101
- d. Vactagon Pneumatic Systems, Inc. Vaculoader HEPA Vacuum
18 Homestead Place
Bergenfield, NJ 07621
- e. Pullman-Holt (White) Corporation HEPA Filtered Vacuums
PO Box 277
Fultonville, New York 12072
- f. Pentek, Inc. Self Drumming HEPA Vacuums
1026 Fourth Avenue
Coraopolis, PA 15108

APPENDIX F:

PERFORMANCE SPECIFICATION

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Performance Specification

The *Guide Specifications* are prescriptive in nature, each section explicitly set forth the way in which the work is to be accomplished. The contractor is given virtually step-by-step instructions for each work activity. Responsibility for the success of the work practices used in the project lies with the designer.

Projects can also be based on a performance specification which sets forth the requirements that must be met when the work is complete, but allows the contractor to meet these requirements by any method. Performance based specifications allow the maximum flexibility for the contractor, but relies for success on the skill and knowledge of the contractor.

For designers desiring a sample of a performance based specification, the specification used by the US Navy follows. The approach represented by the Navy performance specification works well for an owner that has a well developed and experienced infrastructure of contracting and contract enforcement officers. The work practices proposed by the contractor need to be evaluated by a contracting officer that is knowledgeable in lead-based paint abatement practices. The contractor's work also needs to be evaluated by a contract enforcement officer that is familiar with lead-based paint abatement practices.

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DEPARTMENT OF THE NAVY NFGS-02090C (DRAFT)
NAVAL FACILITIES 31 August 1994
ENGINEERING COMMAND -----
GUIDE SPECIFICATION Superseding NFGS-02090B (03/92)

SECTION 02090

REMOVAL AND DISPOSAL OF LEAD-CONTAINING PAINT 08/94

NOTE: This guide specification covers the requirements and procedures for limiting occupational and environmental exposure to lead when removing lead-containing paint (LCP). This guide specification is intended for use in projects where lead-containing paints must be removed from painted surfaces. The classification of the lead-containing paint as hazardous waste must be performed in accordance with 40 CFR 261, and in the design phase of the project. This classification is prerequisite to the requirement of special handling, storage, and disposal according to federal and local hazardous waste management regulations.

NOTE: This revision "C" to NFGS-02090 amends the issue dated 31 March 1992 by updating "References," and revising text throughout.

NOTE: Obtain from the activities information on lead-containing paint to be removed by the project. If adequate information is unavailable, test the paint in accordance with 40 CFR 261.

NOTE: Projects that involve cutting, sawing, sanding, scraping, needlegunning, abrasive blasting, etc., of lead-containing painted materials may result in lead exposures in excess of OSHA limits. Therefore, personal protective equipment should be used and controls implemented. Institute worker protection controls as indicated in 29 CFR 1926.62 and herein.

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

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NOTE: Drawings should indicate total quantity of LCP to be removed or they should provide sufficient information so that bidders may determine the total quantity of LCP to be removed.

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

\-ANSI Z9.2-\ 1979 Fundamentals Governing the Design and Operation of Local Exhaust Systems

\-ANSI Z88.2-\ 1992 Respiratory Protection

CODE OF FEDERAL REGULATIONS (CFR)

\-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 Exposure in Construction

\-29 CFR 1926.103-\ Respiratory Protection

\-40 CFR 260-\ Hazardous Waste Management Systems: General

\-40 CFR 261-\ Identification and Listing of Hazardous Waste

\-40 CFR 262-\ Generators of Hazardous Waste

\-40 CFR 263-\ Transporters of Hazardous Waste

\-40 CFR 264-\ Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

\-40 CFR 265-\ Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

\-40 CFR 268-\ Land Disposal Restrictions

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\-49 CFR 172-\ Hazardous Materials Tables and Hazardous
Materials Communications Regulations

\-49 CFR 178-\ Shipping Container Specification

MILITARY SPECIFICATIONS (MIL)

\-MIL-A-22262-\ (Rev. A) (Am. 2) Abrasive Blasting Media
Ship Hull Blast Cleaning

UNDERWRITERS LABORATORIES INC. (UL)

\-UL 586-\ 1990 High-Efficiency, Particulate, Air Filter
Units

1.2 DEFINITIONS

1.2.1 Action Level

Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period in an occupational/industrial environment. In a domicile or other environment where 24 hour exposure is possible, the action level is: exposure to an airborne time weighted average (24 hour) of concentration of lead of 8 micrograms per cubic meter of air.

1.2.2 Area Monitoring

Sampling of lead concentrations within the lead control area and inside the physical boundaries which is representative of the airborne lead concentrations which may reach the breathing zone of personnel potentially exposed to lead.

1.2.3 Competent Person (CP)

As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current Federal, State, and Local regulation. An industrial hygienist certified for comprehensive practice by the American Board of Industrial Hygiene is the best choice.

1.2.4 Change Rooms and Shower Facilities

Rooms equipped with separate storage facilities for clean protective work clothing and equipment and for street

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clothes which prevent cross-contamination with a shower facility in between.

1.2.5 Decontamination Room

Room for removal of contaminated personal protective equipment (PPE).

1.2.6 Eight-Hour Time Weighted Average (TWA)

Airborne concentration of lead to which an employee is exposed, averaged over an 8-hour workday as indicated in 29 CFR 1926.62.

1.2.7 High Efficiency Particulate Air (HEPA) Filter Equipment

HEPA filtered vacuuming equipment with a \-UL 586-\ filter system capable of collecting and retaining lead-contaminated paint dust. A high efficiency particulate filter means 99.97 percent efficient against 0.3 micron size particles.

1.2.8 Lead

Metallic lead, inorganic lead compounds, and organic lead soaps. Excluded from this definition are other organic lead compounds.

1.2.9 Lead Containing Paint (LCP)

Protective or decorative coating which contains lead.

1.2.10 Lead Control Area

An enclosed area or structure with temporary containment equipped with HEPA filtered local exhaust to prevent the spread of lead dust, paint chips, or debris of lead-containing paint removal operations. The lead control area is isolated by physical boundaries to prevent unauthorized entry of personnel.

1.2.11 Lead Permissible Exposure Limit (PEL)

Fifty micrograms per cubic meter of air as an 8-hour time weighted average as determined by \-29 CFR 1926.62-\ . If an employee is exposed for more than 8 hours in a work day, the PEL shall be determined by the following formula:

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PEL (micrograms/cubic meter of air) = 400/No. hrs worked per day

1.2.12 Personal Sampling

Sampling of airborne lead concentrations within the breathing zone of an employee to determine the 8-hour time weighted average concentration in accordance with 29 CFR 1926.62-. Samples shall be representative of the employee's work tasks. Breathing zone shall be considered an area within a hemisphere, forward of the shoulders, with a radius of 6 to 9 inches and centered at the nose or mouth of an employee.

1.2.13 Physical Boundary

Area physically roped or partitioned off around an enclosed lead control area to limit unauthorized entry of personnel. As used in this section, "inside boundary" shall mean the same as "outside lead control area."

1.3 QUALITY ASSURANCE

1.3.1 *Medical Examinations*

Before exposure to lead-contaminated dust, provide workers with a comprehensive medical examination as required by 29 CFR 1926.62- and 29 CFR 1926.59-. The examination will not be required if adequate records show that employees have been examined as required by 29 CFR 1926.62- within the last year.

1.3.1.1 Medical Records

Maintain complete and accurate medical records of employees for a period of at least 40 years or for the duration of employment plus 20 years, whichever is longer.

1.3.1.2 Medical Surveillance

Provide medical surveillance to all personnel exposed to lead as indicated in 29 CFR 1926.62-.

1.3.2 Competent Person (CP) Responsibilities

- a. Certify training.
- b. Review and approve lead-containing paint removal plan for conformance to the applicable referenced standards.

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- c. Inspect lead-containing paint removal work for conformance with the approved plan.
- d. Perform monitoring.
- e. Ensure work is performed in strict accordance with specifications at all times.
- f. Control work to prevent hazardous exposure to personnel and to the environment at all times.

1.3.3 Training

Train each employee performing paint removal, disposal, and air sampling operations prior to the time of initial job assignment, in accordance with 29 CFR 1926.62 and state and local regulation.

1.3.3.1 *Training Certification*

Submit certificates signed and dated by each employee stating that the employee has received training.

1.3.4 Respiratory Protection Program

- a. Furnish each employee required to wear a negative pressure respirator or other appropriate type with a respirator fit test at the time of initial fitting and at least every 6 months thereafter as required by 29 CFR 1926.62.
- b. Establish and implement a *respiratory protection program* as required by ANSI Z88.2, 29 CFR 1926.103, 29 CFR 1926.62, and 29 CFR 1926.55.

1.3.5 *Hazard Communication Program*

Establish and implement a Hazard Communication Program as required by 29 CFR 1926.59.

1.3.6 Hazardous Waste Management

The *Hazardous Waste Management plan* shall comply with applicable requirements of federal, state, and local hazardous waste regulations and address:

- a. Identification and classification of hazardous wastes associated with the work.

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- b. Estimated quantities of wastes to be generated and disposed of.
- c. Names and qualifications of each contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location and a 24-hour point of contact. Furnish two copies of [EPA] [state] [and] [local] hazardous waste [permit applications] [permits] [and] [EPA Identification numbers].
- d. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes.
- e. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment.
- f. Spill prevention, containment, and cleanup contingency measures including a health and safety plan to be implemented.
- g. Work plan and schedule for waste containment, removal and disposal. Wastes shall be cleaned up and containerized daily.
- h. Cost for hazardous waste disposal according to this plan.

1.3.7 Safety and Health Compliance

NOTE: Include applicable state, regional, and local laws, regulations, and statutes. Do careful research, not all state and local law applies to federal installations.

In addition to the detailed requirements of this specification, comply with laws, ordinances, rules, and regulations of federal, state, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials. Comply with the applicable requirements of the current issue of \-29 CFR 1926.62-\ . Submit matters regarding interpretation of standards to the Contracting Officer for resolution before starting work. Where specification requirements and the referenced documents vary, the most stringent requirement

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

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shall apply.

[The following local laws, ordinances, criteria, rules and regulations regarding removing, handling, storing, transporting, and disposing of lead-contaminated materials apply:

- a. [_____]
- b. [_____]
- c. [_____]

1.3.8 Pre-Construction Conference

Along with the CP, meet with the Contracting Officer to discuss in detail the hazardous waste management plan and the lead-containing paint removal plan, including work procedures and precautions for the removal plan.

1.4 SUBMITTALS

NOTE: Where a "G" in asterisk tokens follows a submittal item, it indicates Government approval for that item. Add "G" in asterisk tokens following any added or existing submittal items deemed sufficiently critical, complex, or aesthetically significant to merit approval by the Government. Submittal items not designated with a "G" will be approved by the CQC organization.

Submit the following in accordance with Section \=01300=\, "Submittals."

1.4.1 *SD-02, Manufacturer's Catalog Data*\

- a. *Vacuum filters*\
- b. *Respirators*\

1.4.2 *SD-06, Instructions*\

- a. *Paint removal*\ materials

Include applicable material safety data sheets.

1.4.3 *SD-08, Statements*\

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- a. *Qualifications of CP*\
- b. *Testing laboratory*\ qualifications
- c. *Lead-containing paint removal plan*\ including CP approval (signature, date, and certification number)
- d. *Rental equipment notification*\
- e. *Respiratory protection program*\
- f. *Hazard communication program*\
- g. EPA approved hazardous waste treatment or *disposal facility*\ for lead disposal
- h. *Hazardous waste management plan*\ *G*\

1.4.3.1 *Qualifications of CP*\

Submit name, address, and telephone number of the CP selected to perform responsibilities specified in paragraph titled "Competent Person (CP) Responsibilities". Provide previous experience of the CP. Submit proper documentation that the CP is trained [and licensed] in accordance with federal, state and local law.

1.4.3.2 *Testing Laboratory*\

Submit the name, address, and telephone number of the testing laboratory selected to perform the monitoring, testing, and reporting of airborne concentrations of lead. Provide proper documentation that persons performing the analysis have been judged proficient by successful participation within the last year in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) Program. The laboratory shall be accredited by the American Industrial Hygiene Association (AIHA). Provide AIHA documentation along with date of accreditation/reaccreditation.

1.4.3.3 *Lead-Containing Paint Removal Plan*\ (LCPRP)

Submit a detailed job-specific plan of the work procedures to be used in the removal of LCP. The plan shall include a sketch showing the location, size, and details of lead control areas, location and details of decontamination rooms, change rooms, shower facilities, viewing ports, and mechanical ventilation system. Include in the plan, eating,

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

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drinking, smoking and restroom procedures, interface of trades, sequencing of lead related work, collected wastewater and paint debris disposal plan, air sampling plan, respirators, protective equipment, and a detailed description of the method of containment of the operation to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not exceeded outside of the lead control area. Include air sampling, training and strategy, sampling methodology, frequency, duration of sampling, and qualifications of air monitoring personnel in the air sampling portion of the plan.

1.4.4 *SD-12, Field Test Reports*\

a. *Monitoring Results*\ *G*\

1.4.4.1 Air Monitoring

Submit *monitoring results*\ to the Contracting Officer within 3 working days, signed by the testing laboratory employee performing the analysis, the employee that performed the monitoring, and the CP.

1.4.5 *SD-13, Certificates*\

a. *Vacuum filters*\

1.4.6 *SD-18, Records*\

a. Completed and signed hazardous waste *manifest*\ from treatment or disposal facility

b. Certification of *medical examinations*\

c. Employee *training certification*\

1.5 REMOVAL

1.5.1 Title to Materials

Materials resulting from demolition work, except as specified otherwise, shall become the property of the Contractor and shall be disposed of in accordance with Section \=02050=\, "Demolition and Removal," except as specified herein.

1.6 EQUIPMENT

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1.6.1 *Respirators*\

Furnish appropriate respirators approved by the Mine Safety and Health Administration (MSHA) and the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services, for use in atmospheres containing lead dust. Respirators shall comply with the requirements of \-29 CFR 1926.62-\.

1.6.2 Special Protective Clothing

Furnish personnel who will be exposed to lead-contaminated dust with appropriate disposable protective whole body clothing, head covering, gloves, and foot coverings as required by \-29 CFR 1926.62-\ . Furnish appropriate disposable plastic or rubber gloves to protect hands. Reduce the level of protection only after obtaining approval from the CP.

1.6.3 *Rental Equipment Notification*\

If rental equipment is to be used during lead-containing paint handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Furnish a copy of the written notification to the Contracting Officer.

1.6.4 *Vacuum Filters*\

\-UL 586-\ labeled HEPA filters.

1.6.5 Equipment for Government Personnel

NOTE: Verify the number of sets required with OICC/ROICC.

Furnish the Contracting Officer with [two] [_____] complete sets of personal protective equipment (PPE) daily, as required herein, for entry into and inspection of the paint removal work within the lead controlled area. Personal protective equipment shall include disposable whole body covering, including appropriate foot, head, and hand protection. PPE shall remain the property of the Contractor. Respiratory protection for the Contracting officer will be provided by the Government.

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PART 2 PRODUCTS

2.1 *PAINT REMOVAL*\ PRODUCTS

Submit applicable *Material Safety Data Sheets*\ for paint removal products used in paint removal work. Use the least toxic product [suitable for the job] [acceptable to the CP].

2.2 Abrasive Materials

Abrasive blasting materials shall meet the requirements of \-MIL-A-22262-\ for limits on chemical composition and hazardous material ingredients.

2.2.1 Limits on the Composition of Abrasive Materials

The soluble metal content and the total metal content shall not exceed values which would cause a material to be classified as a hazardous waste as specified in \-MIL-A-22262-\.

PART 3 EXECUTION

3.1 PROTECTION

3.1.1 Notification

\+Notify the Contracting Officer [20] [_____] days prior to the start of any paint removal work.+\<

3.1.2 Lead Control Area Requirements

NOTE: Choose the first paragraph if LCP will be removed by means which will not create airborne, lead containing, dust (such as scraping or chemical stripping). Choose the second paragraph if removal practice will create airborne, lead containing dust (such as sanding, abrasive blasting, or needlegun use).

[
Establish a lead control area by completely enclosing with [containment screens] [_____] the area or structure where lead-containing paint removal operations will be performed.]

NOTE: The Designer should consider the use of viewing ports for lead control areas under 1,000 square feet to save inspection

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time.

[
Contain removal operations by the use of a negative pressure full containment system with decontamination facilities and with HEPA filtered exhaust. For containment areas larger than 1,000 square feet install a minimum of two 18 inch square viewing ports. Locate ports to provide a view of the required work from the exterior of the enclosed contaminated area. Glaze ports with laminated safety glass.]

3.1.3 Protection of Existing Work to Remain

Perform paint removal work without damage or contamination of adjacent areas. Where existing work is damaged or contaminated, restore work to its original condition or better.

3.1.4 Boundary Requirements

Provide physical boundaries around the lead control area by roping off the area [designated in the work plan] or providing curtains, portable partitions or other enclosures to ensure that airborne concentrations of lead will not reach 30 micrograms per cubic meter of air outside of the lead control area.

3.1.5 Furnishings

NOTE: Verify with the activity furniture/equipment requirements.

[The Government will remove furniture and equipment from the building before lead-containing paint removal work begins.]

[Furniture [_____] and equipment will remain in the building. Protect and cover furnishings or remove furnishings from the work area and store in a location approved by the Contracting Officer.]

[Existing furniture and equipment is lead contaminated, decontaminate.]

3.1.6 Heating, Ventilating and Air Conditioning (HVAC) Systems

Shut down, lock out, and isolate HVAC systems that supply,

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exhaust, or pass through the lead control areas. Seal intake and exhaust vents in the lead control area with 6-mil plastic sheet and tape. Seal seams in HVAC components that pass through the lead control area. [Provide temporary HVAC system for areas in which HVAC has been shut down outside the lead control area.]

3.1.7 Change Room and Shower Facilities

Provide clean change rooms and shower facilities in accordance with requirements of \-29 CFR 1926.62-\.

3.1.8 Mechanical Ventilation System

- a. Use adequate ventilation to control personnel exposure to lead in accordance with \-29 CFR 1926.62-\.
- b. To the extent feasible, use fixed local exhaust ventilation connected to HEPA filters or other collection systems, approved by the CP. Local exhaust ventilation systems shall be designed, constructed, installed, and maintained in accordance with \-ANSI Z9.2-\.
- c. Vent local exhaust outside the building only.

3.1.9 Personnel Protection

Personnel shall wear and use protective clothing and equipment as specified herein. Eating, smoking, or drinking is not permitted in the lead control area. No one will be permitted in the lead control area unless they have been appropriately trained and provided with protective equipment.

3.1.10 Warning Signs

Provide warning signs at approaches to lead control areas. Locate signs at such a distance that personnel may read the sign and take the necessary precautions before entering the area. Signs shall comply with the requirements of \-29 CFR 1926.62-\.

3.2 WORK PROCEDURES

Perform removal of lead-containing paint in accordance with approved lead-containing paint removal plan. Use procedures

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and equipment required to limit occupational and environmental exposure to lead when lead-containing paint is removed in accordance with 29 CFR 1926.62, except as specified herein. Dispose of removed paint chips and associated waste in compliance with Environmental Protection Agency (EPA), federal, state, and local requirements.

3.2.1 Personnel Exiting Procedures

Whenever personnel exit the lead-controlled area, they shall perform the following procedures and shall not leave the work place wearing any clothing or equipment worn during the work day:

- a. Vacuum themselves off.
- b. Remove protective clothing in the decontamination room, and place them in an approved impermeable disposal bag.
- c. Shower.
- d. Change to clean clothes prior to leaving the physical boundary designated around the lead-contaminated job site.

3.2.2 Monitoring

Monitoring of airborne concentrations of lead shall be in accordance with 29 CFR 1926.62 and as specified herein. Air monitoring, testing, and reporting shall be performed by the CP.

- a. The CP shall be on the jobsite directing the monitoring, and inspecting the lead-containing paint removal work to ensure that the requirements of the contract have been satisfied during the entire lead-containing paint removal operation.
- b. Collect personal air samples on employees who are anticipated to have the greatest risk of exposure as determined by the CP. In addition, collect air samples on at least 25 percent of the work crew or a minimum of two employees, whichever is greater, during each work shift.

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NOTE: Choose 30 micrograms per cubic meter of air for industrial/occupational environments. Choose 8 micrograms per cubic meter of air for domiciles or other places where a 24 hour exposure could occur.

- c. Submit results of air monitoring samples, signed by the CP, within [16] [24] [_____] hours after the air samples are taken. Notify the Contracting Officer immediately of exposure to lead at or in excess of the action level of [30] [8] micrograms per cubic meter of air outside of the lead control area.

3.2.2.1 Monitoring During Paint Removal Work

NOTE: Choose 30 micrograms per cubic meter of air for industrial/occupational environments. Choose 8 micrograms per cubic meter of air for domiciles or other places where a 24 hour exposure could occur.

Perform personal and area monitoring during the entire paint removal operation. Sufficient area monitoring shall be conducted at the physical boundary to ensure unprotected personnel are not exposed above [30] [8] micrograms per cubic meter of air at all times. If the outside boundary lead levels are at or exceed [30] [8] micrograms per cubic meter of air, work shall be stopped and the CP shall immediately correct the condition(s) causing the increased levels and notify the Contracting Officer immediately. The CP shall review the sampling data collected on that day to determine if condition(s) requires any further change in work methods. Removal work shall resume when approval is given by the CP. The Contractor shall control the lead level outside of the work boundary to less than [30] [8] micrograms per cubic meter of air at all times. As a minimum, conduct area monitoring daily on each shift in which lead paint removal operations are performed in areas immediately adjacent to the lead control area. For outdoor operations, at least one sample on each shift shall be taken on the downwind side of the lead control area. If adjacent areas are contaminated, clean and visually inspect contaminated areas. The CP shall certify that the area has been cleaned of lead contamination.

3.2.3 Lead-Containing Paint Removal

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NOTE: See Note A located at rear of text.

[Manual or power sanding of interior and exterior surfaces is not permitted.] Provide methodology for removing LCP in work plan. Remove paint within the areas designated on the drawings in order to completely expose the substrate. Take whatever precautions where necessary to minimize damage to the underlying substrate.

NOTE: Use if paint removal is from metal or concrete surfaces.

[Avoid flash rusting or other deterioration of the substrate. Provide surface preparations for painting in accordance with Section 09900, "Painting."]

NOTE: See Note B located at rear of text.

Select paint removal processes to minimize contamination of work areas with lead-contaminated dust or other lead-contaminated debris/waste. This paint removal process should be described in the lead-containing paint removal plan. Perform manual sanding and scraping to the maximum extent feasible.

3.2.3.1 Indoor Lead Paint Removal

Perform [manual] [mechanical] paint removal and abrasive blasting in lead control areas using negative pressure full containments with HEPA filtered exhaust. Collect paint residue and spent grit (used abrasive) from blasting operations for disposal in accordance with EPA, state and local requirements.

3.2.3.2 Outdoor Lead Paint Removal

Perform outdoor LCP removal as indicated in federal, state and local regulations and in the work plan.

3.2.3.3 Monitoring After Paint Removal

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NOTE: Choose 30 micrograms per cubic meter of air for industrial/occupational environments. Choose 8 micrograms per cubic meter of air for domiciles or other places where a 24 hour exposure could occur.

After the visual inspection, collect sufficient area air samples inside and outside the lead control area to ensure that airborne levels of lead inside and outside the lead control are below the action level of [30] [8] micrograms per cubic meter. Collect wipe samples according to the HUD protocol to insure that surface dust contains less than 200 micrograms per square foot of surface area.

3.2.4 Cleanup and Disposal

3.2.4.1 Cleanup

NOTE: Verify with the local Industrial Hygienist if wet mopping of the work area and surfaces is necessary.

Maintain surfaces of the lead control area free of accumulations of paint chips and dust. Restrict the spread of dust and debris; keep waste from being distributed over the work area. Do not dry sweep or use compressed air to clean up the area. At the end of each shift and when the paint removal operation has been completed, clean the area of visible lead paint contamination by vacuuming with a HEPA filtered vacuum cleaner [and wet mopping the area].

3.2.4.2 Certification

NOTE: Choose 30 micrograms per cubic meter of air for industrial/occupational environments. Choose 8 micrograms per cubic meter of air for domiciles or other places where a 24 hour exposure could occur.

The CP shall certify in writing that the final air monitoring samples collected inside and outside the lead control area are less than [30] [8] micrograms per cubic meter of air, that the surface wipe sample results collected inside and outside the lead control area are less than 200 micrograms of lead per square foot of surface area, the

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respiratory protection for the employees was adequate, the work procedures were performed in accordance with 29 CFR 1926.62-, and that there were no visible accumulations of lead-contaminated paint and dust on the worksite. Do not remove the lead control area or roped-off boundary and warning signs prior to the Contracting Officer's receipt of the CP's certification. Reclean areas showing dust or residual paint chips.

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3.2.4.3 [Testing of Lead-Containing Paint Residue [and Used Abrasive]

NOTE: Add testing if required to be performed by the Contractor.

[Where indicated or when directed by the Contracting Officer,] test lead containing paint residue [and used abrasive] in accordance with \-40 CFR 261-\ for hazardous waste.]

3.2.4.4 Disposal

NOTE: Notify the activity that Federal regulations (40 CFR 260-265) require a U.S. EPA generator identification number for use on the Uniform Hazardous Waste Manifest prior to commencement of removal work.

NOTE: Research state, regional, and local laws, regulations, and statutes and revise the specifications accordingly.

- a. Collect lead-contaminated waste, scrap, debris, bags, containers, equipment, and lead-contaminated clothing which may produce airborne concentrations of lead particles. Label the containers in accordance with \-29 CFR 1926.62-\ and \-40 CFR 261-\. Dispose of lead-contaminated waste material at a [EPA] [or] [state] approved hazardous waste treatment, storage, or disposal facility off Government property.
- b. Store waste materials in U.S. Department of Transportation (\-49 CFR 178-\) approved 55-gallon drums. Properly label each drum to identify the type of waste (\-49 CFR 172-\) and the date the drum was filled. The Contracting Officer or an authorized representative will assign an area for interim storage of waste-containing drums. Do not store hazardous waste drums in interim storage longer than 90 calendar days from the date affixed to each drum.
- c. Handle, store, transport, and dispose lead or lead-contaminated waste in accordance with \-40 CFR 260-\
\-40 CFR 261-\
\-40 CFR 262-\
\-40 CFR 263-\
\-40

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CFR 264-\, and \-40 CFR 265-\. Comply with land disposal restriction notification requirements as required by \-40 CFR 268-\.

3.2.5 Disposal Documentation

NOTE: Include the following paragraph if the Contractor is to dispose of hazardous waste.

Submit written evidence that the hazardous waste treatment, storage, or *disposal facility*\ (TSD) is approved for lead disposal by the EPA and state or local regulatory agencies. Submit one copy of the completed *manifest*\, signed and dated by the initial transporter in accordance with \-40 CFR 262-\.

3.2.6 Payment for Hazardous Waste

Payment for disposal of hazardous waste will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-containing materials delivered is returned and a copy is furnished to the Government.

-- End of Section --

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CRITERIA NOTES

NOTE A: Use bracketed prohibition on manual and power sand when appropriate. Large scale manual or power sanding of painted surfaces should never be allowed in family housing, administrative buildings, galleys, barracks, etc., due to problems associated with the resulting dust fallout/contamination of crevices and cracks which may retain unseen quantities of lead-contaminated dust. Use of this type of removal technique for exteriors of the aforementioned facility types should be extremely limited, because the resulting airborne dust could result in significant contamination of the ground in the immediate vicinity of the facility. Manual or power sanding of interior and exterior surfaces may be an acceptable work method only if appropriate controls for personnel/environmental protection are in place.

NOTE B: Listed below are various types of paint removal techniques. Designer may be required to specify a particular technique in order to limit potential conflicts or problems.

1. Wood, Drywall, Interior Partitions
 - a. Scraping
 - b. Heat Stripping
 - c. Chemical Stripping
 - d. Power Tool Cleaning (least acceptable)
 - e. Wet Abrasive Blasting

2. Steel and Metal Surfaces (Industrial)
 - a. Power/Hand Tool Cleaning (least acceptable)
 - b. Dry Abrasive Blast with Water Ring (Wet "Halo")
 - c. Wet Abrasive Blast
 - d. Low Volume High Pressure Water Blast
 - e. Chemical Stripping

NOTE C: Suggestions for improvement of this specification will be welcomed using the "Agency Response Form" located in SPECSINTACT under "System Directory" or DD Form 1426. Suggestions should be forwarded to:

Commanding Officer
Naval Construction Battalion Center
NAVFAC 15G/CESO 158
1000 23rd Avenue
Port Hueneme, CA 93043-4301
-- End --

APPENDIX G:
MASSACHUSETTS PROTOCOLS -
ENCAPSULATION PERFORMANCE and
TOXICOLOGICAL ASSESSMENT for ENCAPSULANTS

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GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix G - MASSACHUSETTS PROTOCOLS



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Childhood Lead Poisoning
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800-532-9571

Liquid Encapsulant Product Performance Protocol for Interior Use. Pursuant to Regulations for Lead Poisoning Prevention and Control 105 CMR 460.115: Process for Approval of Encapsulants for the Abatement of Lead Paint. Commonwealth of Massachusetts, Department of Public Health. 3/15/94. Rev. 4/3/95.

This protocol is applicable to those encapsulants defined in 105 CMR 460.020 for use in containing lead based paint that are liquid (non-cementitious) and without structural reinforcement.

Liquid encapsulants for interior use must pass the minimum standards for performance properties established by this protocol to be approved for use in containing lead based paint in the Commonwealth of Massachusetts. Products which do not meet the minimum criteria for any physical property performance characteristic will not be approved.

Encapsulant Product Performance Standard Properties:

The following encapsulant product performance property tests are required to be performed on all liquid encapsulant systems. For detailed information on conducting performance tests, refer to the American Society for Testing and Materials test method for each performance property or other indicated test method.

All test samples of a given product will be prepared in a fashion determined by the certification organization and have identical dry film thickness per manufacturer's recommendation. Where the manufacturer recommends a range of film thickness, tests will be performed on panels with film thickness at the low point of the range. The samples should be cured according to the manufacturer's recommended cure conditions under standard laboratory conditions, including the recommended dry-film thickness, and dry/cure time and conditions should be identical for all specimens.

1. **Impact Resistance:** ASTM test method D 2794. Test specimens prepared on standard zinc-phosphate treated steel test panels, 0.032 inch (.81 mm), two test panels minimum, using 0.625 inch (15.9 mm) punch diameter, direct impact (i.e. coating side up). The minimum performance criteria for passing is that there is no cracking to the substrate of the applied encapsulant at 80 inch-pounds (92 cm-kg) when examined visually at 5X magnification.
2. **Adhesion:** ASTM test method D3359. The test samples will be prepared on tin-plated steel test panels, 0.01 inch (.25 mm). A minimum of three tests will be performed. Minimum performance criteria for passing is a rating score of 5A.

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Appendix G - MASSACHUSETTS PROTOCOLS

3. **Dry Abrasion Resistance:** ASTM test method D 4060. Use CS 17 wheel and 1000 gram weight on two 4 inch x 4 inch (101.6 mm x 101.6 mm) cold-rolled steel panels of 0.032 inch (0.81 mm) thickness. Minimum performance criteria for passing is no more than 20% loss of film thickness after 1,000 cycles.

Where applicable, specialty primers may be used only for flash rust resistance and not as a component of the product system. If used, subtract the thickness of the primer coat from the total film thickness used in the performance calculation. To more accurately measure film loss, draw diagonal lines with a marking pen from corner to corner across the test panel. Measure initial and final film thickness in an area approximately 1.25 inch (31.4 mm) from all four corners.

4. **Flexibility:** ASTM test method D 522. The test specimens are tin-plated steel panels of 0.01 inch (0.25 mm) thick. A minimum of three panels are to be tested. Minimum performance is the absence of cracking and other visual defects measured at 0.25 inch (6.4 mm) from the 0.125 inch (3.2 mm) end of the conical material after a 1 second band.

5. **Water and Chemical Resistance:** Determine the resistance to water and chemicals in accordance with test method D 1308 using 0.010 inch (0.256 mm) tin plated steel panels as the substrate for the immersion test, and glass panels as the substrate for the spot tests.

Conduct the water immersion test by placing the panel in a beaker of distilled water, to a depth of 50% of the length of the panel, for a period of 24 hours at standard laboratory conditions. The backs, sides and edges of the panel should be protected to prevent rust.

After removal, allow the panel to dry for 2 hours at standard laboratory conditions before testing for adhesion in accordance with test method D 3359. Minimum performance is an adhesion rating of 5A.

Conduct the chemical resistance test by placing 3ml of each of the reagents listed below into a cotton ball placed on the coated panel.

Ethyl Alcohol (50% volume)	Coca Cola
White Vinegar	3 in One Lubricating Oil
Sodium Hydroxide (5%)	Household Cleaner (Formula 409)
Hydrochloric Acid (5%)	Nail Polish Remover (non-acetone type)
Citric Acid (5%)	Distilled Water
Corn Oil	

Cover the cotton ball with a watch glass or other suitable device. After 24 hours, remove the cotton ball and gently pat dry with a paper towel. Allow a one hour recovery period at standard laboratory conditions and then evaluate each spot for the presence of blisters, wrinkling, cracking or delamination. After a 24 hour recovery period at standard laboratory conditions, evaluate for softening by lightly rubbing the exposed area, and an adjacent unexposed area, with a wood tongue depressor.

Minimum performance is no evidence of blistering, wrinkling, cracking or delamination on each of the exposed areas after the one hour recovery when examined with the unaided eye and no distinguishable difference in hardness between the exposed and unexposed areas when rubbed lightly with a tongue depressor after the 24 hour recovery.

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6. **Surface Burning Characteristics:** ASTM test method E 84. A single test using Sterling board panels or the equivalent will be performed. Minimum performance criteria for passing is a flame spread index of less than 25 and a smoke development rating of less than 50.
7. **Volatile Organics Content:** ASTM Practice D 3960, methods D1475; D2369; D3792 or D4017. Findings are to be reported.
8. **Scrub resistance:** ASTM test method D 2486. Test will be run on duplicate black plastic panels. Minimum performance criteria for passing is no failure to substrate after 1200 cycles (i.e., erosion of encapsulant to expose substrate).
9. **Mildew resistance:** ASTM test method D 3273. Test to be run on minimum of three clear 0.50 x 3.0 x 4.0 inch pine panels. Minimum performance criteria for passing is rating of 8, determined in accordance with ASTM D 3274.
10. **Paintability:** Test run on tin-plated steel panels, 0.01 inch (0.25 mm) thick. The encapsulant is applied on the panel and allowed to cure. The encapsulated panel is then painted with TT- P29K latex paint or a standard commercially available latex paint as recommended by the encapsulant manufacturer in accordance with the latex paint manufacturer's specifications for dry-film thickness and dry/cure time. Determine the degree of adhesion between the encapsulant and the latex paint. Adhesion Test ASTM D 3359 is to be run on one panel in a minimum of three locations. Repeat the test substituting a second coat of encapsulant for the paint and evaluate for intercoat adhesion. Minimum adhesion performance for all tests is 5A.
11. **Water Vapor Permeability:** Determine the resistance to water vapor permeability in accordance with test method D 1653, Method A (Dry Cup Method, Condition A). A minimum of three samples shall be tested. Test as free film with a minimum thickness of 0.003 inch (0.075 mm). Results are to be reported.
12. **Tensile Properties:** Determine tensile properties in accordance with test method D 2370. Test shall be performed on free film, not less than 0.003 inch (0.075 mm) thick. Specimens shall be 4 inch (100 mm) in length and 0.25 inch (6.35 mm) in width. Use a gauge length of 2 inch (50 mm) and a cross head speed of 0.5±0.05 inch/min. (10+/-1 mm/min). Determine percent elongation at 700 KPa (100 psi). A minimum of ten specimens shall be tested. Results are to be reported.

End.

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix G - MASSACHUSETTS PROTOCOLS



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Childhood Lead Poisoning
Prevention Program
800-532-9571

Toxicological Assessment Protocol for Encapsulants Pursuant to Massachusetts Department of Public Health, Regulations for Lead Poisoning Prevention and Control 105 CMR 460.115: Process for Approval of Encapsulants for the Abatement of Lead Paint.

1.0 BACKGROUND:

This assessment will determine human health risk for repeated or one-time exposures associated with the encapsulant product during preparation, application, curing, and fully cured states.

2.0 PURPOSE:

This evaluation procedure will assess the health risks to humans who may be exposed to encapsulant products associated with paint abatement activities. Single and repeated exposures will be considered for all ingredients and components of proposed encapsulant products for adult workers involved with preparation, application, curing and post-application activities associated with the use of these products. Whenever appropriate, in addition to workers who may be directly involved with these abatement procedures, potential receptors who may come into contact with any residues resulting from these activities (e.g. infants, small children, older inhabitants of dwellings where procedures are performed) will also be considered.

3.0 REQUIRED DOCUMENTATION:

For each encapsulant product, a Material Safety Data Sheet and complete written directions for use and disposal recommendations for that product will be required. In addition, emergency indicators and procedures to be followed in case of accidental discharges of components of the product or fire will be provided in accordance with OSHA requirements for Material Safety Data Sheets (29 CFR 1910.1200).

Each ingredient or component of the proposed encapsulant will be identified with a Chemical Abstract Registry Number (CASRN), if applicable, and listed by percent weight in accordance with OSHA requirements (29 CFR 1910.1200). Consideration of trade secrets or proprietary formulations will be made as provided under the OSHA Hazard Communication Standard.

4.0 EVALUATION PROCEDURES:

Human health risks to a given chemical are a function of the extent (concentration, frequency, route and duration) of exposures to that chemical and the toxicity of that chemical to humans. The toxicity of a chemical is usually expressed in terms of potential carcinogenic and non-carcinogenic adverse human health effects. Evaluation procedures to be used in estimating exposures of specific chemicals and assessing their corresponding carcinogenic and non-carcinogenic human health risks are summarized as follows:

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- 4.1 EXPOSURE ASSESSMENTS** - Potential exposure scenarios will be generated for adult male, non-pregnant and pregnant female workers who may use the proposed encapsulant products associated with all phases of lead paint remediation activities. As indicated in 2.0 (above), whenever appropriate, additional receptors who may inhabit the dwellings abated will also be subjected to exposure scenarios. Potential exposures by the inhalation, dermal and oral routes of administration will be considered whenever appropriate (for example, the inhalation of vapors of non-volatile chemicals will not be considered; however, the inhalation of particulates of non-volatile chemicals, will be considered). Concentrations of chemicals during exposures will be derived and durations of exposure will be estimated from information provided on the encapsulant product. Both one-time and repeat exposure scenarios will be considered whenever appropriate. The default assumption values to be used in these potential exposure scenarios are described in RAGS (1).
- 4.2 TOXICITY EVALUATIONS** - The potential carcinogenic and non-carcinogenic toxic effects of each ingredient will be evaluated. Information from the toxicological literature will be obtained for each ingredient by searching the National Library of Medicine's TOXNET databases (Appendix A) and/or other selected sources, as appropriate.
- 4.2a CARCINOGENIC EFFECTS** - Initially, each ingredient will be assessed for its carcinogenic potential (as defined by OSHA in 29 CFR 1910.1200) by comparing it to the most recently published lists of known, probable or possible human carcinogens prepared by the International Agency for Research on Cancer (IARC), the National Toxicology Program's Annual Lists of Carcinogens or the OSHA. All identified known, probable and possible human carcinogens will be compared to the calculated exposure values obtained from the exposure scenarios for each type of worker. Results of these comparisons will be related to OSHA TWA PEL and ACGIH TWA TLV/STEL levels.
- 4.2b NON-CARCINOGENIC TOXIC EFFECTS** - All non-carcinogenic adverse health effects (as defined in 29 CFR 1910.1200) identified for each ingredient will be quantified and compared to calculated exposure values obtained from the exposure scenarios for each type of worker. Results of these comparisons will be related to OSHA TWA PEL and ACGIH TWA TLV/STEL levels.

In addition to relating the assessed risks to human health for each ingredient to OSHA and ACGIH permissible workplace exposure levels, whenever such levels are exceeded, all appropriate types of personal protective equipment will be described for workers engaged in each activity of the abatement procedures. Based on this assessment, the manufacturer's MSDS and product literature will be reviewed to ensure that appropriate work practices and personal protective equipment are described to minimize exposures during application and curing.

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5.0 WRITTEN RECOMMENDATION BY TOXICOLOGIST:

A toxicologist certified by the American Board of Toxicology will review the toxicological information provided and utilize available databases. The toxicologist will provide a written recommendation to the CLPPP regarding the potential human health hazards associated with the encapsulant product during preparation, application, curing, and fully cured states. This will include recommendations regarding occupancy during and after application of a particular encapsulant.

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APPENDIX H:

MINORITY OPINION

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GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix H - Minority Opinion

MINORITY OPINION

NAME: Laura M. Plunkett, Ph.D.

ORGANIZATION: ENVIRON International Corporation

SUBJECT: Discussion of the sources and effects of lead exposure on page 9 and related issues on pages 11 and 21.

OBJECTION: The risks and hazards of exposure to lead in paint are over stated.

RATIONAL: The Center for Disease Control (CDC) has determined that a blood lead level of 10 µg/dl is the level of concern but there is no general agreement concerning the health effects occurring at blood lead levels at or near 10 µg/dl. The statement that "blood lead levels at least as low as 10 µg/dl are associated with adverse effects" implies that adverse effects are associated with blood lead levels below 10 µg/dl.

The risks and hazards are further overstated by the statement " any lead in paint should be considered a health risk". All levels of lead exposure are not considered a hazard. Federal regulations have been developed based on the assumption that there is a level of lead in paint that is safe for human exposure. The EPA Three Cities Study (EPA/600/AP-93/001) concluded that exposure to lead in dust or paint, at certain levels described in the study, have not been associated with significant elevation of blood lead levels as defined by CDC.

RECOMMENDED ALTERNATIVES: Delete (page 9, second paragraph, 9th line) "Blood lead levels at least as low as 10 µg/dl are associated with adverse health effects" and replace with "The CDC has determined a blood lead level of 10 µg/dl as the level of concern".

Delete (page 11, second paragraph, last sentence) "For this reason, if paint is or may be converted to dust or fume, any lead in paint should be considered as a potential health risk." and replace with "Not all levels of lead in paint are a potential health risk. When lead is present below the regulated action levels, the specific project conditions, exposure history of individuals, and other related circumstances should be considered when determining the appropriate action."

Laura M. Plunkett, Ph.D.

GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix H - Minority Opinion

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APPENDIX I:

ACKNOWLEDGEMENTS

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GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix I - Acknowledgements

PROJECT COMMITTEE

The following people participated in the technical review of this Guide as members of the project committee. Their efforts were essential to the NIBS consensus process and have added significant value to this document.

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GUIDE SPECIFICATIONS FOR REDUCING LEAD-BASED PAINT HAZARDS

Appendix I - Acknowledgements

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