

IH Activity/Hazard Table – Does not include all construction activities. Review the rules of use on Page 1 before determining the applicable controls required for your work.

Rules for the use of this table

1. DO NOT just copy from the table without modifying the hazards and control sets to the specific scope of work, means and methods of how work will be performed, applying the requirements of approved CSSPs, and duration, frequency, location, and extent of work to be performed.
2. Controls shall be implemented in the order of the Hierarchy of Controls. (Substitution ► Engineering ► Administrative ► Personal Protective Equipment). If a control is not feasible progress down the list, PPE shall be the last resort if other controls are not feasible and been accepted by SNL FMOC CST IH.
3. Most activities require the use of a combination of engineering controls, administrative controls, and personal protective equipment. Some activities have been pre-identified for this application and required combinations of controls have been highlighted in **bold** text. Others must be an informed decision based on each contractor assessing their means and methods of performing work and which combination of engineering controls, administrative controls and PPE will provide an acceptable level of exposure control for each situation.
4. Contact SNL FMOC CST IH to discuss the application of controls as they may apply to small scale, short duration projects.
5. Contact SNL FMOC CST IH for questions or clarification.

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Activity	Task & Hazard	Controls
Abrasive Blasting with sand based media	a) Loading blast media: <ul style="list-style-type: none"> • Inhalation hazard Respirable Silica b) Blasting: <ul style="list-style-type: none"> • Noise exposure hazard • Inhalation hazard Respirable Silica c) Clean up <ul style="list-style-type: none"> • Noise exposure hazard • Inhalation hazard Respirable Silica 	Substitution: <ul style="list-style-type: none"> • Use a less toxic abrasive blasting material. • Use abrasives that can be delivered with water (slurry) to reduce dust. Isolation and Containment: <ul style="list-style-type: none"> • Use barriers and curtain walls to isolate the blasting operation from other workers. • Use blast rooms or blast cabinets for smaller operations. • Use restricted areas for non-enclosed blasting operations. • Keep coworkers away from the blaster. Ventilation: <ul style="list-style-type: none"> • Use exhaust ventilation systems in containment structures to capture dust. Administrative Controls: <ul style="list-style-type: none"> • Perform routine cleanup using wet methods or HEPA filtered vacuuming to minimize the accumulation of toxic dusts. • Do not use compressed air to clean as this will create dust in the air. • Clean and decontaminate tarps and other equipment on the worksite. • Schedule blasting when the least number of workers are at the site • Avoid blasting in windy conditions to prevent the spread of any hazardous materials. • Prohibit eating, drinking, or using tobacco products in blasting areas. • Provide wash stations so workers can wash their hands and face routinely and before eating, drinking, or smoking. • Vacuum or remove contaminated work clothes before eating, drinking or smoking. Personal Protective Equipment (PPE): <ul style="list-style-type: none"> • Earplugs or earmuffs (minimum NRR of 32). • Leather gloves that protect to full forearm and aprons (or coveralls) • Safety shoes or boots • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Type CE NIOSH-certified blasting airline respirator with positive pressure blasting helmet.
Abrasive Blasting with non-sand based media (e.g., garnet, metal slags, glass, walnut shell,	a) Loading blast media: <ul style="list-style-type: none"> • Inhalation hazard – Heavy Metals, Particles Not 	Substitution: <ul style="list-style-type: none"> • Use a less toxic abrasive blasting material. • Use abrasives that can be delivered with water (slurry) to reduce dust.

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steel shot)	<p>Otherwise Specified</p> <p>b) Blasting:</p> <ul style="list-style-type: none"> • Noise exposure hazard • Inhalation – Heavy Metals, Particles Not Otherwise Specified <p>c) Clean up blast media and residue:</p> <ul style="list-style-type: none"> • Inhalation – Heavy Metals, Particles Not Otherwise Specified 	<p>Isolation and Containment:</p> <ul style="list-style-type: none"> • Use barriers and curtain walls to isolate the blasting operation from other workers. • Use blast rooms or blast cabinets for smaller operations. • Use restricted areas for non-enclosed blasting operations. • Keep coworkers away from the blaster. <p>Ventilation:</p> <ul style="list-style-type: none"> • Use exhaust ventilation systems in containment structures to capture dust. <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Perform routine cleanup using wet methods or HEPA filtered vacuuming to minimize the accumulation of toxic dusts. • Do not use compressed air to clean as this will create dust in the air. • Clean and decontaminate tarps and other equipment on the worksite. • Schedule blasting when the least number of workers are at the site • Avoid blasting in windy conditions to prevent the spread of any hazardous materials. • Prohibit eating, drinking, or using tobacco products in blasting areas. • Provide wash stations so workers can wash their hands and face routinely and before eating, drinking, or smoking. • Vacuum or remove contaminated work clothes before eating, drinking or smoking. <p>Personal Protective Equipment (PPE):</p> <ul style="list-style-type: none"> • Earplugs or earmuffs (minimum NRR of 32). • Leather gloves that protect to full forearm and aprons (or coveralls) • Safety shoes or boots • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Type CE NIOSH-certified blasting airline respirator with positive pressure blasting helmet or full-face air purifying respirator (FF APR) with P100 filters (if allowed by airborne concentration and Maximum Use Concentration).

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Asphalt Paving and Coating	<p>a) Application of “Asphalt cement” at 112 to 162°C (235 to 325°C):</p> <ul style="list-style-type: none"> • Inhalation hazards • Contact burn hazards • Heat stress <p>b) Application of “Cutback asphalt” “Emulsified asphalt” [liquid asphalts – sprayed] at ambient to 150°C (300°F):</p> <ul style="list-style-type: none"> • Inhalation hazards • Splash or spray burn hazards from sprayer or cleaning of clogged nozzles on sprayers • Heat stress <p>c) Tamping with gasoline powered equipment</p> <ul style="list-style-type: none"> • Inhalation hazard – CO • Noise exposure <p>d) Application of cold coal tar coating to asphalt</p> <ul style="list-style-type: none"> • Dermal contact with coal tar 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use fume-suppressing asphalts. • Use long handled sprayers with flexible hoses when emulsified asphalts are applied by hand. • Keep application temperature of heated asphalt as low as possible <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Maintain proper asphalt equiviscous temperature (EVT) plus or minus 25° F, to reduce exposure to asphalt fumes [Hot mix asphalt begins to cool after leaving the plant. Small batches of emulsified asphalt may require supplemental heat.] • Reduce the number of times the lid is opened. • Provide training for heat stress. Monitor for early signs of the onset of heat stress while working. Any one sign of heat stress is: blurred vision, fainting, pale skin, profuse sweating, nausea, vomiting and headaches. • Ensure adequate breaks in shaded areas and fluids are provided. • Obtain and review MSDS for all chemicals, including asphalt. <p>Personal Protective Equipment (PPE):</p> <ul style="list-style-type: none"> • Prevent dermal exposure • Safety glasses with side shields. • Wear face shield over splash goggles with side shields when working with liquid asphalts or coal tar coatings which may be splashed. • Loose long cotton sleeve and pant (no cuff) clothing. • Thermally insulated gloves with gauntlets when handling hot equipment and asphalt.
Cold Milling Asphalt	<p>Milling asphalt</p> <ul style="list-style-type: none"> • Dust and Respirable silica inhalation exposure • Noise exposure <p>Brooming/Sweeping</p> <ul style="list-style-type: none"> • Dust and Respirable silica inhalation exposure 	<p>Engineering controls:</p> <ul style="list-style-type: none"> • Milling machines - Increasing the water flow to the cutter drum spray bars to at least 11 gpm and to at least 5 gpm at the conveyor sprays including discharge housing • Future (2017) requirements will include milling machines with optimized water and ventilation control systems – based on agreement that the National Asphalt Pavement Association (NAPA) has that all Milling machines sold in North America will have the improved dust control and capture systems. • Enclosed conveyor delivery • Motorized brooms (riding or walking) must have water spray bars for dust suppression and contained debris collection bins <p>Administrative Controls:</p>

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		<ul style="list-style-type: none"> • To the extent possible position workers upwind • Provide training for heat stress. Monitor for early signs of the onset of heat stress while working. Any one sign of heat stress is: blurred vision, fainting, pale skin, profuse sweating, nausea, vomiting and headaches. • Ensure adequate breaks in shaded areas and fluids are provided. <p>Personal Protective Equipment:</p> <ul style="list-style-type: none"> • Wear earplugs or earmuffs (NRR of 32) • Contractors will be required to have a written Respiratory Protection Program when respirators are worn. • Half face piece air purifying respirator (APR) with P100 filters is required if dust controls methods are absent or ineffective.
Asphalt crack repair (routing, sweeping, compressed air cleaning, mechanical sweeping)	<ul style="list-style-type: none"> • Excessive noise. • Flying particles. • Exposure to re-occurring vibration. • Inhalation of dust containing silica • Cold/Heat stress 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • To the extent possible use wet methods to control dust levels. • Compressed air should be no higher than 30 psi • Use anti-vibration gloves or anti-vibration materials on equipment/tool handles to reduce vibration. • Use anti-vibration tools when available. • Motorized brooms (riding or walking) must have water spray bars for dust suppression and contained debris collection bins <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Increase frequency of breaks, as appropriate, to avoid vibration fatigue. • Use proper work practices that keep the worker’s hands and remaining body warm and also minimize the vibration coupling between the worker and the vibration tool as necessary to minimize vibration exposure. • Provide training for heat stress. Monitor for early signs of the onset of heat stress while working. Any one sign of heat stress is: blurred vision, fainting, pale skin, profuse sweating, nausea, vomiting and headaches. • Ensure adequate breaks in shaded areas and fluids are provided. <p>Personal Protective Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear earplugs with earmuffs (NRR of 32) • Half face piece air purifying respirator (APR) with P100 filters is required if dust controls methods are absent or ineffective. • Anti-vibration work gloves to absorb vibration.
Cutting or Jackhammering Asphalt	All work requiring cutting or jackhammering asphalt	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use tools with integrated vacuum dust collection systems

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	<ul style="list-style-type: none"> • Excessive noise. • Flying particles. • Exposure to re-occurring vibration. • Inhalation of dust and Respirable silica 	<ul style="list-style-type: none"> • Use wet methods to suppress dust levels • Use HEPA filtered wet/dry vacuums to remove sludge before drying and becoming airborne • Use anti-vibration materials on equipment/tool handles to reduce vibration. • Use anti-vibration tools when available. <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Increase frequency of breaks, as appropriate, to avoid vibration fatigue. • Use proper work practices that keep the worker’s hands and remaining body warm and also minimize the vibration coupling between the worker and the vibration tool as necessary to minimize vibration exposure. • Provide training for heat stress. Monitor for early signs of the onset of heat stress while working. Any one sign of heat stress is: blurred vision, fainting, pale skin, profuse sweating, nausea, vomiting and headaches. • Ensure adequate breaks in shaded areas and fluids are provided. <p>Personal Protective Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear earplugs or earmuffs (NRR of 32). • Safety glasses with side shields and an impact rated face shield shall be worn. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Half face piece air purifying respirator (APR) with P100 filters is required if dust controls methods are absent or ineffective. • Anti-vibration work gloves to absorb vibration.
Cutting or Jackhammer concrete sidewalks, manholes, or any outdoor ground level or below grade fixture.	<p>All work requiring cutting or jackhammering concrete.</p> <ul style="list-style-type: none"> • Exposure to re-occurring vibration • Noise hazard • Inhalation of silica-containing dust • Flying particles. 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use tools with integrated vacuum dust collection systems • Use wet methods to suppress dust levels • Use HEPA filtered wet/dry vacuums to remove sludge before drying and becoming airborne • Use anti-vibration materials on equipment/tool handles to reduce vibration. • Use anti-vibration tools when available. <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Increase frequency of breaks, as appropriate, to avoid vibration fatigue. • Use proper work practices that keep the worker’s hands and remaining body warm and also minimize the vibration coupling between the worker and the vibration tool as necessary to minimize vibration exposure

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		<ul style="list-style-type: none"> • Provide training for heat stress. Monitor for early signs of the onset of heat stress while working. Any one sign of heat stress is: blurred vision, fainting, pale skin, profuse sweating, nausea, vomiting and headaches. • Ensure adequate breaks in shaded areas and fluids are provided. <p>Personal Protection Equipment (PPE):</p> <ul style="list-style-type: none"> • Wear earplugs with ear muffs (NRR of 32). If concrete cutting or jackhammering is performed for greater than 60 minutes dual hearing protection may be required. • Safety glasses with side shields and a face shield shall be worn. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Half face piece air purifying respirator (APR) with P100 filters is required if dust controls methods are absent or ineffective.
<p>Concrete cutting, core drilling, or jackhammer demolition of concrete walls or interior floors.</p>	<p>All work requiring cutting or jackhammering concrete.</p> <ul style="list-style-type: none"> • Exposure to re-occurring vibration • Noise hazard • Inhalation of silica-containing dust • Flying particles. 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use tools with integrated vacuum dust collection systems • Use wet methods to suppress dust levels • Use HEPA filtered wet/dry vacuums to remove sludge before drying and becoming airborne • Use anti-vibration gloves or anti-vibration materials on equipment/tool handles to reduce vibration. • Use anti-vibration tools when available. <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Increase frequency of breaks, as appropriate, to avoid vibration fatigue. • Use proper work practices that keep the worker’s hands and remaining body warm and also minimize the vibration coupling between the worker and the vibration tool as necessary to minimize vibration exposure • Plan the work to minimize cutting, coring, or jackhammering time to reduce exposure time <p>Personal Protection Equipment (PPE):</p> <ul style="list-style-type: none"> • Wear earplugs with ear muffs (NRR of 32). If concrete cutting or jackhammering is performed for greater than 60 minutes dual hearing protection is required. • Safety glasses with side shields and a face shield shall be worn. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.

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		<ul style="list-style-type: none"> • Full or half face piece air purifying respirator (APR) with P100 filters are required in addition to wet methods when cutting, core drilling (> 2 inch cores), or jack hammer activities exceed 1 hour based on the limitations of the wet methods to reduce airborne silica concentrations to an acceptable level in indoor locations.
Demolishing Gypsum Board (Drywall)	<ul style="list-style-type: none"> • Inhalation Respirable silica 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use tools with integrated vacuum dust collection systems • Use wet methods or HEPA vacuum to control dust generation. • Use hand tools when practical to cut and break board instead of mechanical cutting <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Perform housekeeping with HEPA vacuum and/or wet methods <p>Personal Protection Equipment (PPE):</p> <ul style="list-style-type: none"> • Dust goggles shall be worn. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Full or half face piece air purifying respirator (APR) with P100 filters is required if dust controls methods are absent or ineffective.
Fume Hood Removal	<ul style="list-style-type: none"> • Dermal exposure (skin contact) to residue chemical contamination. 	<p>Engineering Controls</p> <ul style="list-style-type: none"> • Maintain airflow through the exhaust system to prevent residues from settling back in the hood. <p>Administrative controls</p> <ul style="list-style-type: none"> • All chemicals shall be removed or secured in tightly-closed containers in LEV system (hood) by the owner. • When breaching an LEV system, run for 8 hours without introduction of chemicals before opening (Coordinate with lab/shop LEV owners). • After performing work and doffing PPE, wash hands before eating or smoking. <p>Personal Protection Equipment</p> <ul style="list-style-type: none"> • Wear nitrile gloves under leather gloves. • Wear safety glasses with side shields. • Wear splash goggles and face shield if a potential exists for liquid to be splashed from duct during breach.
Descaling (cleaning using chemicals) pipe	<p>(a) Mixing chemicals (acid)</p> <ul style="list-style-type: none"> • Inhalation 	<p>Engineering Controls for Mixing</p> <ul style="list-style-type: none"> • Provide additional ventilation (opening doors, fans).

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	<ul style="list-style-type: none"> • Skin exposure (b) Pumping acid mixture • Inhalation • Skin exposure 	<p>Administrative controls</p> <ul style="list-style-type: none"> • Obtain and review MSDS for all chemicals <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Full face Respiratory protection with acid gas cartridges required when mixing/pumping the acid (HCl) mixture. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Saranex™ or rubber coveralls (acid resistant) with hood and booties when mixing the acid mixture • Acid resistant gloves (butyl, neoprene) over nitrile with taped openings when handling acid mixture.
<p>Descaling (Wire brush or other mechanical means) pipe</p>	<p>Mechanical removal of scale</p> <ul style="list-style-type: none"> • Inhalation of dust 	<p>Engineering Controls</p> <ul style="list-style-type: none"> • Use wet methods or local ventilation exhaust to reduce dust levels. <p>Administrative controls</p> <ul style="list-style-type: none"> • After performing work and doffing PPE, wash hands before eating or smoking. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Nitrile gloves under leather gloves • Respirators with P100 filters are required if large scale brush descaling. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
<p>Chemical Drain Line Repair or Modifications</p>	<p>Residual chemicals contamination in drain and pipe</p> <ul style="list-style-type: none"> • Inhalation • Dermal contact <p>Torch cutting/brazing</p> <ul style="list-style-type: none"> • Inhalation metal fume 	<p>Engineering Controls</p> <ul style="list-style-type: none"> • Run cold water through drain and pipe system for 15 minutes before breaching. • Use a wet/dry HEPA vacuum to remove residual liquids or scale from drain. • When possible use hand tools to reduce aerosol generation. <p>Administrative controls</p> <ul style="list-style-type: none"> • After performing work and doffing PPE, wash hands before eating or smoking. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear nitrile gloves under leather gloves. • Wear safety glasses with side shields and a face shield. • Wear splash goggles and a face shield if liquid may splash from the drain during breach. • Wear labcoat or Tyvek™ top with long sleeves.

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Drains – PVC Work	<ul style="list-style-type: none"> • Inhalation of vapors • Dermal contact or absorption exposure to solvents 	<p>Engineering Controls</p> <ul style="list-style-type: none"> • Ensure adequate ventilation – Use Local Exhaust Ventilation, pedestal, or axial fans when working in an area with limited ventilation or in a small space. <p>Administrative Controls</p> <ul style="list-style-type: none"> • Obtain and review MSDS for all products/materials. • After performing work and doffing PPE, wash hands before eating or smoking. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear butyl, neoprene, or nitrile gloves. Avoid other than incidental gloved contact with chemicals. Remove and replace glove when glove contacts chemicals • Wear safety glasses with side shields
Exhaust Ventilation Systems – Maintenance of Bldg LEV*systems (Lab chemical exhaust)	Dermal contact with residual chemical on surfaces Confined Space Entry	<p>Engineering Controls</p> <ul style="list-style-type: none"> • When feasible work with fans operating to sustain negative pressure into the LEV duct work <p>Administrative Controls</p> <ul style="list-style-type: none"> • When breaching an LEV system, run for 8 hours without introduction of chemicals before opening (Coordinate with lab/shop LEV owners). • After performing work and doffing PPE, wash hands before eating or smoking. <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> • Wear nitrile gloves under leather gloves. • Wear lab coat or Tyvek™ top with long sleeves
Floor Work – Laying tile, linoleum, or carpet	Dermal contact with adhesives Inhalation of adhesive vapor	<p>Engineering Controls</p> <p>Ensure adequate ventilation by:</p> <ul style="list-style-type: none"> • Prevent HVAC recirculation of vapors during curing process by increasing fresh air percentage or shutting down recirculation and increasing fresh air percentage to 100% • Use additional air movement (pedestal or axial fans) when working in a small room (<1000 sq feet) or when natural cross ventilation cannot be created • Ensure vapors are not being blown to occupied areas when using fans <p>Administrative Controls</p> <ul style="list-style-type: none"> • Obtain and review MSDSs for all chemicals • Perform work off-hours when feasible <p>Personal Protective Equipment</p>

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		<ul style="list-style-type: none"> • Wear nitrile gloves under leather gloves • Wear safety glasses with side shields • Wash hands after doffing gloves
<p>Floor work – coating floor with urethane (isocyanate) sealer or epoxy sealer</p>	<p>Mixing, Applying, and tool clean-up</p> <ul style="list-style-type: none"> • Dermal contact and absorption of solvent components of coatings • Inhalation of solvent or isocyanate vapors • Skin or respiratory sensitization 	<p>Substitution</p> <ul style="list-style-type: none"> • Substitute an isocyanate-free sealant <p>Engineering Controls Ensure adequate ventilation by:</p> <ul style="list-style-type: none"> • Prevent HVAC recirculation of vapors during curing process by increasing fresh air percentage or shutting down recirculation and increasing fresh air percentage to 100% • Use additional air movement (pedestal or axial fans) when working in a small room (<1000 sq feet) or when natural cross ventilation cannot be created • Ensure vapors are not being blown to occupied areas when using fans <p>Administrative Controls</p> <ul style="list-style-type: none"> • Obtain and review MSDS for all chemicals • Perform work off-hours when feasible <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> • Wear nitrile, neoprene, or butyl gloves when working directly with sealer. Avoid other than incidental gloved contact with chemicals. Remove and replace gloves when gloves contact chemical products. • Safety glasses with side shields. • After performing work and doffing PPE, wash hands before eating or smoking. • Personal monitoring is required if engineering controls are not implemented to prevent exposure • Respiratory Protection is required if adequate ventilation cannot be achieved, until air monitoring demonstrates exposures are acceptable. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
<p>Prepping concrete floors by hand grinding and bead blasting</p>	<p>Bead Blasting, Hand Grinding and vacuum maintenance</p> <ul style="list-style-type: none"> • Exposure to re-occurring vibration • Noise hazard • Inhalation of silica-containing dust 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use a bead blaster with vacuum extraction and HEPA filter collection to minimize airborne dust. • Use vacuum booted grinding attachments for hand grinders and vacuums equipped with HEPA filter collection. • Use a vacuum with HEPA filters or HEPA vacuum or wet methods to immediately remove debris from the area to avoid re-suspension of dust.

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	<ul style="list-style-type: none"> Flying particles 	<ul style="list-style-type: none"> Use anti-vibration gloves or anti-vibration materials on equipment/tool handles to reduce vibration. Use anti-vibration tools when available. <p>Administrative Controls:</p> <ul style="list-style-type: none"> Change filters at routine intervals to not overload filters. Do not shake out filters and reuse. Immediately and carefully bag filters. Replace with new filters. Place heavy duty plastic bag over vacuum and dump large debris into bag in a closed system to minimize generation of airborne dust when emptying vacuum. Seal openings to other work spaces to minimize the spread of dust to unintended areas. <ul style="list-style-type: none"> Increase frequency of breaks, as appropriate, to avoid vibration fatigue. Use proper work practices that keep the worker’s hands and remaining body warm and also minimize the vibration coupling between the worker and the vibration tool as necessary to minimize vibration exposure Plan the work to minimize hand grinding to reduce exposure time <p>Personal Protection Equipment (PPE):</p> <ul style="list-style-type: none"> Wear earplugs or ear muffs (NRR of 32). Safety glasses with side shields and a face shield shall be worn. At a minimum and in addition to ventilation controls on the equipment, half face piece air purifying respirators with P100 cartridges are required to control inhalation of Respirable silica dust to acceptable airborne concentrations (< the ACGIH TLV) when grinding and bead blasting concrete floors. This is required due to the limitations of the ventilation on the tools to reduce airborne exposures levels to an acceptable level. Levels are reduced to allow for half face air purifying respiratory protection when using ventilated equipment. Unventilated equipment requires the use of Powered Air Purifying Respirators with P100 cartridges rated by the manufacturer for an Applied Protection Factor (APR) of 1000. Contractors are required to have a written Respiratory Protection Program when respirators are worn.
Renovation – Visual mold growth (small and midsized areas)	Inhalation of mold spores and/or mold bodies during: <ul style="list-style-type: none"> Removal of old or damaged 	<p>Small isolated areas 10 ft² or less:</p> <ul style="list-style-type: none"> Dust suppression methods – misting, not soaking surfaces prior to removal Use dilute chlorine solution (1 part bleach, 10 parts water) or other

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	building material with visible indication of mold growth	<p>antimicrobial solution on mold to clean contaminated surfaces that will not be removed.</p> <ul style="list-style-type: none"> • Work area must be unoccupied. • Contaminated materials that cannot be cleaned – remove from building in a sealed plastic bag. • Work area and egress areas cleaned with HEPA vacuum and damp cloth and/or mop and detergent solution. • Allow areas to thoroughly dry. • Minimum half face piece air purifying respirator with P100 cartridge filters. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Work gloves and safety glasses with side shields. <p>Mid-sized isolated areas >10 to 30 ft²:</p> <ul style="list-style-type: none"> • Dust suppression methods – misting, not soaking surfaces prior to removal • Use dilute chlorine solution (1 part bleach, 10 parts water) or other antimicrobial solution on mold to clean contaminated surfaces that will not be removed. • Work area contained with poly and sealed with tape before work begins. • Work area must be unoccupied. • Contaminated materials that cannot be cleaned – remove from building in a sealed plastic bag. • Work area and egress areas cleaned with HEPA vacuum and damp cloth and/or mop and detergent solution. • Allow areas to thoroughly dry. • Minimum half face piece air purifying respirator with P100 cartridge filters. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Work gloves and safety glasses with side shields.
Renovation – Positive mold identity (Large areas)	Inhalation of mold spores and mold bodies during: Removal of old or damaged building material with visible indication of mold growth	<p>Large isolated areas >30 ft²:</p> <ul style="list-style-type: none"> • Requires a written Mold Remediation Plan reviewed by IH staff • Dust suppression methods – misting, not soaking surfaces prior to removal • Use dilute chlorine solution (1 part bleach, 10 parts water) or other antimicrobial solution on mold to clean contaminated surfaces that will not be removed. • Work area contained with poly and sealed with tape before work begins.

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Activity	Task & Hazard	Controls
		<ul style="list-style-type: none"> • Cover all air vent openings with plastic to eliminate the spread of the mold spores to other areas of the building. • Work area must be unoccupied. • Contaminated materials that cannot be cleaned – remove from building in a sealed plastic bag. • Work area and egress areas cleaned with HEPA vacuum and damp cloth and/or mop and detergent solution. • Allow areas to thoroughly dry. • Minimum half face piece air purifying respirator with P100 cartridge filters. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • Work gloves and safety glasses with side shields.
<p>Gypsum board - hanging/installing dry wall</p>	<p>Cut drywall</p> <ul style="list-style-type: none"> • Inhalation hazard Respirable silica containing • Noise <p>Install drywall, tape, skim and texture drywall.</p> <ul style="list-style-type: none"> • Inhalation hazard: Respirable silica containing dust found in mud and texture • Noise <p>Sand joints to smooth mud and tape area.</p> <ul style="list-style-type: none"> • Inhalation hazard: Respirable silica containing dust found in found in mud and texture coats • Noise 	<p>Engineering Controls</p> <ul style="list-style-type: none"> • Do not sand, use wet sponge tapering methods • Use vacuum booted sanders connected to HEPA filter vacuums or HEPA vacuums • Use HEPA filter vacuums or HEPA vacuums and/or wet methods to perform housekeeping • Use an oil-based or wax based sweeping compound to control dust if sweeping floors for housekeeping <p>Administrative Controls</p> <ul style="list-style-type: none"> • Use hand cutting tools when practical. • Use gypsum board/mud with the lowest available percent silica. • Do not use mechanical means such as a RotoZip™ unless wet methods (water mist or shaving cream) can be used to reduce airborne dust. • Rigorous housekeeping protocols must be implemented, including tool washing • Personal hygiene and not wearing soiled (covered in dry wall joint compound) clothing <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Use hearing protection (ear plugs with NRR ≥28) when cutting dry wall using mechanical means. • Respiratory protection is required during taping, mudding, and finishing activities, if appropriate engineering controls are not implemented. Minimum half face piece air purifying respirator with P100 cartridge.

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Activity	Task & Hazard	Controls
		<p>Disposable dust masks (filtering face pieces) are not allowed.</p> <ul style="list-style-type: none"> Contractors are required to have a written Respiratory Protection Program when respirators are worn. If engineering controls are not implemented and respiratory protection is worn, personal monitoring is required to verify airborne exposure levels to Respirable silica is within the Maximum Use Concentration (MUC) of the respirator.
<p>Insulation – Epoxy (2 part isocyanate) foam insulation material</p>	<p>Opening containers of epoxy foam insulating material</p> <ul style="list-style-type: none"> Skin exposure Inhalation <p>Spraying Epoxy foam insulation</p> <ul style="list-style-type: none"> Flammable Skin exposure Inhalation 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> Ensure adequate cross ventilation – Use additional LEV (pedestal or axial fans) to create cross ventilation when working indoors. <p>Administrative Controls</p> <ul style="list-style-type: none"> Obtain and review MSDS for all products/materials. After performing work and doffing PPE, wash hands before eating or smoking. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> Wear butyl, neoprene, or nitrile gloves under leather/heavy gloves Wear Tyvek™ coveralls with head covering when spraying isocyanate based foams. Wear splash goggles when manually mixing products. Respiratory Protection is required when spraying isocyanate based foam insulation. Minimum required respiratory protection when spraying isocyanate based foam insulation is full face piece supplied air respirator (airline) with pressure demand or other positive pressure mode. Contractors are required to have a written Respiratory Protection Program when respirators are worn.
<p>Insulation - FOAMGLAS© Insulation.</p>	<p>Cutting, abrading, grinding, crushing or drilling FOAMGLAS© insulation:</p> <ul style="list-style-type: none"> Inhalation dust Skin abrasion <p>Adhering insulation using an adhesive</p> <ul style="list-style-type: none"> Inhalation hazard of vapors Skin exposure to chemical 	<p>Substitution:</p> <ul style="list-style-type: none"> Substitute type of insulation to one that doesn't create a particle/fiber hazard. <p>Engineering Controls:</p> <ul style="list-style-type: none"> Use vacuum exhaust collection system to control dust. Use general ventilation pedestal or axial fans. Use wet methods (e.g., applying mist and water to the air in areas of dust release). Provide adequate cross ventilation when applying adhesive – Work space should be $\geq 1,000 \text{ ft}^3$. <p>Administrative Controls</p>

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Activity	Task & Hazard	Controls
		<ul style="list-style-type: none"> • Ensure dust/fibers are not being blown to occupied areas if using axial or pedestal fans for general dilution ventilation. • After performing work and doffing PPE, wash hands before eating or smoking. • Obtain and review MSDS for all products/materials. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear leather/heavy gloves or rubber impregnated canvas gloves for abrasion protection when handling insulation. • Wear nitrile gloves under leather gloves when handling adhesive. Avoid other than incidental gloved contact with chemicals. • Wear long sleeve shirt. • Wear dust goggles which comply with ANSI Z87.1. • Respiratory Protection is required if adequate ventilation cannot be achieved. Minimum half face piece air purifying respirator with P100 cartridge. Disposable dust masks (filtering face pieces) are not allowed. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
Insulation - Encapsulated fiberglass insulation	<p>(a) Cutting and Installing Encapsulated fiberglass insulation</p> <ul style="list-style-type: none"> • Skin exposure • Inhalation - Uncontrolled release of airborne fibers 	<p>Substitution:</p> <ul style="list-style-type: none"> • Substitute type of insulation to one that doesn't create a particle/fiber hazard. <p>Engineering Controls:</p> <ul style="list-style-type: none"> • During cutting or abrading use vacuum exhausted tools or local exhaust capture ventilation • Use wet methods, additional ventilation or enclosures (e.g., applying mist and water to the air in areas where suspended fibers are released). <p>Administrative Controls</p> <ul style="list-style-type: none"> • Ensure dust/fibers are not being blown to occupied areas if using axial or pedestal fans for general dilution ventilation. • Ensure encapsulated wrap is not punctured or torn during installation process. • After performing work and doffing PPE, wash hands before eating or smoking. • Minimize time of exposure and skin contact when working with fiberglass. • Obtain and review MSDS for all products/chemicals. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear leather/heavy gloves or rubber impregnated canvas gloves for abrasion protection.

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Activity	Task & Hazard	Controls
		<ul style="list-style-type: none"> • Wear long sleeve shirt. • Wear safety glasses with side shields when cutting, grinding, crushing or drilling or goggles when performing these tasks in windy/dusty conditions. • Respiratory Protection is required if adequate ventilation can not be achieved. Minimum half face piece air purifying respirator with P100 cartridge. Disposable dust masks (filtering face pieces) are not allowed. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
Insulation - Man-made fiber, fiberglass (MMF).	(a) Cutting and installing Man-made fiber, fiberglass (MMF) <ul style="list-style-type: none"> • Inhalation (Uncontrolled release of airborne fibers) • Skin exposure 	<p>Substitution:</p> <ul style="list-style-type: none"> • Substitute type of insulation to one that doesn't create a particle/fiber hazard. <p>Engineering Controls:</p> <ul style="list-style-type: none"> • During cutting or abrading use vacuum exhausted tools or local exhaust capture ventilation • Use wet methods, additional ventilation or enclosures (e.g., applying mist and water to the air in areas where suspended fibers are released). <p>Administrative Controls</p> <ul style="list-style-type: none"> • Ensure dust/fibers are not being blown to occupied areas if using axial or pedestal fans for general dilution ventilation. • After performing work and doffing PPE, wash hands before eating or smoking. • Minimize time of exposure and skin contact when working with fiberglass. • Obtain and review MSDS for all products/chemicals. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear leather/heavy gloves or rubber impregnated canvas gloves for abrasion protection. • Wear long sleeve shirt. • Wear safety glasses with side shields when cutting, grinding, crushing or drilling or goggles when performing these tasks in windy/dusty conditions. • Respiratory Protection is required if adequate ventilation cannot be achieved. Minimum half face piece air purifying respirator with P100 cartridge. Disposable dust masks (filtering face pieces) are not allowed. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
Insulation - Mineral fiber batts.	(a) Installing Mineral fiber batts: <ul style="list-style-type: none"> • Skin exposure 	<p>Substitution:</p> <ul style="list-style-type: none"> • Substitute type of insulation to one that doesn't create a particle/fiber hazard.

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Activity	Task & Hazard	Controls
	<ul style="list-style-type: none"> • Inhalation 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • During cutting or abrading use vacuum exhausted tools or local exhaust capture ventilation • Use wet methods, additional ventilation or enclosures (e.g., applying mist and water to the air in areas where suspended fibers are released). <p>Administrative Controls</p> <ul style="list-style-type: none"> • Ensure dust/fibers are not being blown to occupied areas if using axial or pedestal fans for general dilution ventilation. • After performing work and doffing PPE, wash hands before eating or smoking. • Minimize time of exposure and skin contact when working with fiberglass. • Obtain and review MSDS for all products/chemicals. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear leather/heavy gloves or rubber impregnated canvas gloves for abrasion protection. • Wear long sleeve shirt. • Wear safety glasses with side shields when cutting, grinding, crushing or drilling or goggles when performing these tasks in windy/dusty conditions. • Respiratory Protection is required if adequate ventilation cannot be achieved. Minimum half face piece air purifying respirator with P100 cartridge. Disposable dust masks (filtering face pieces) are not allowed. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
Insulation – Placing MDI insulation on pipe	<p>(a) Mixing 2-part solution</p> <ul style="list-style-type: none"> • Skin exposure to MDI – may cause sensitization • Inhalation of vapors <p>(b) Spraying</p> <ul style="list-style-type: none"> • Skin exposure to MDI – may cause sensitization • Inhalation of vapors 	<p>Engineering Controls for mixing and spraying:</p> <ul style="list-style-type: none"> • Use engineering controls (distance or mixing in hose) to isolate worker from the separate components prior to mixing. • When hand mixing solution, do so in a well ventilated area – preferable outside in an open area (not in a trench). <p>Administrative Controls.</p> <ul style="list-style-type: none"> • After performing work and doffing PPE, wash hands before eating or smoking. • Obtain and review MSDS for all products/materials. <p>Personal Protection Equipment (PPE) for mixing and spraying:</p> <ul style="list-style-type: none"> • Wear butyl, neoprene, or nitrile gloves. Avoid other than incidental gloved contact with chemicals. Remove and replace gloves when gloves

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Activity	Task & Hazard	Controls
		<p>contact chemicals.</p> <ul style="list-style-type: none"> • Wear long sleeve shirt and long pants. Protect skin from contact. • Wear chemical splash goggles; in addition to splash goggles use a face shield when there is a splash hazard (e.g., pouring). • Wear Tyvek™ coveralls with head covering when spraying isocyanate based foams. • Respiratory Protection is required when spraying isocyanate based foam insulation. Minimum required respiratory protection when spraying isocyanate based foam insulation is full face piece supplied air respirators (airline) with pressure demand or other positive pressure mode. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
<p>Insulation - Excessive demo of distressed non-asbestos containing insulation</p>	<p>(a) Demo of insulation</p> <ul style="list-style-type: none"> • Inhalation (Uncontrolled release of airborne fibers) • Skin exposure 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • During cutting or abrading use vacuum exhausted tools or local exhaust capture ventilation • Use wet methods, additional ventilation or enclosures (e.g., applying mist and water to the air in areas where suspended fibers are released). <p>Administrative Controls</p> <ul style="list-style-type: none"> • Ensure dust/fibers are not being blown to occupied areas if using axial or pedestal fans for general dilution ventilation. • After performing work and doffing PPE, wash hands before eating or smoking. • Minimize time of exposure and skin contact when working with fiberglass. • Obtain and review MSDS for all products/chemicals. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Wear leather/heavy gloves or rubber impregnated canvas gloves for abrasion protection. • Wear long sleeve shirt. • Wear safety glasses with side shields when cutting, grinding, crushing or drilling or goggles when performing these tasks in windy/dusty conditions. • Respiratory Protection is required if adequate ventilation cannot be achieved. Minimum half face piece air purifying respirator with P100 cartridge. Disposable dust masks (filtering face pieces) are not allowed. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.

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Activity	Task & Hazard	Controls
Laser Leveling activities (Class 1, 2, 3A Lasers)	Interference with aircraft operations.	<ul style="list-style-type: none"> Lasers must be correctly labeled. Do not direct into navigable airspace or towards airport ground activities (e.g., runways, taxiways).
Operating Heavy equipment – backhoes, forklifts, truck - outdoors	Operating heavy equipment outdoors – excessive noise, and dust when operating in dusty environments	<p>Engineering Controls</p> <ul style="list-style-type: none"> Use equipment with enclosed conditioned air cabs with HEPA filtered cab air intakes Use adequate dust suppression methods (application of water) during travel or excavation. <p>Administrative Controls</p> <ul style="list-style-type: none"> Curtail work when too dry and windy to control the dust. <p>Personal Protective Equipment (PPE)</p> <ul style="list-style-type: none"> Wear earplugs or muffs with NRR \geq 25dBA
Operating Heavy equipment – backhoes, forklifts, truck - indoors	Operating heavy equipment indoors - excessive noise and build up of high concentrations of carbon monoxide gas [CO] and/or other by-products of combustion.	<p>Engineering Controls</p> <ul style="list-style-type: none"> Use electric forklifts or trucks Use equipment with exhaust controls (catalytic converters meeting requirements for indoor use) Ensure adequate ventilation (e.g., open doors, general ventilation). <p>Administrative Controls</p> <ul style="list-style-type: none"> Use direct-reading instrument monitoring for CO to determine whether ventilation is adequate. <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> Wear earplugs or muffs with NRR of \geq 25 dBA
Paint Prep using scraping or sanding – Paint does not contain lead, cadmium, chromate or other toxic metals.	<p>Sanding of existing coatings that may contain quartz</p> <ul style="list-style-type: none"> Respirable silica inhalation hazard <p>Sanding of existing coatings that do not contain quartz: Nuisance dust – Minimal IH hazard</p>	<p>For coatings containing quartz:</p> <p>Engineering Controls:</p> <ul style="list-style-type: none"> Use vacuum exhausted sanders with HEPA filtration Use wet scuffing methods Use HEPA filter vacuums or HEPA vacuums and/or wet methods to perform housekeeping Use an oil-based or wax based sweeping compound to control dust if sweeping floors for housekeeping <p>Administrative Controls:</p> <ul style="list-style-type: none"> Rigorous housekeeping protocols Personal hygiene: Vacuum (HEPA vacuum) contaminated work clothes and wash hands and face before eating, drinking or smoking. <p>Personal Protection Equipment (PPE)</p>

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Activity	Task & Hazard	Controls
		<ul style="list-style-type: none"> • Use hearing protection (ear plugs with NRR ≥28) when cutting dry wall using mechanical means. • Respiratory protection is required during sanding of quartz containing coating, if appropriate engineering controls are not implemented. Minimum half face piece air purifying respirator with P100 cartridge. Disposable dust masks (filtering face pieces) are not allowed. • Contractors are required to have a written Respiratory Protection Program when respirators are worn. • If engineering controls are not implemented and respiratory protection is worn, personal monitoring is required to verify airborne exposure levels to Respirable silica is within the Maximum Use Concentration (MUC) of the respirator.
<p>Painting – Paint preparation (scraping, sanding, etc...) lead, cadmium, chromate or other toxic metal containing paint.</p>	<p>Inhalation of lead, chromate, etc. dust from:</p> <ul style="list-style-type: none"> • Manual sanding or scraping • Mechanical sanding or scraping 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use a paint stripper that does not contain methylene chloride, such as Peel Away® • Use vacuum exhausted sanders with HEPA filtration • Use wet scuffing methods • Use HEPA filter vacuums or HEPA vacuums and/or wet methods to perform housekeeping • Use an oil-based or wax based sweeping compound to control dust if sweeping floors for housekeeping <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Training must be completed for all workers in accordance with 29 CFR 1926.62 Lead, 29 CFR 1910.1026 Chromium (VI), or 29 CFR 1910.1027 Cadmium depending on the metal in the coating • Initial biological monitoring must be completed for all workers in accordance with 29 CFR 1926.62 Lead, 29 CFR 1910.1026 Chromium (VI), or 29 CFR 1910.1027 Cadmium depending on the metal in the coating • Rigorous housekeeping protocols • Personal hygiene: Vacuum (HEPA vacuum) contaminated work clothes and wash hands and face before eating, drinking or smoking. <p>Personal Protection Equipment (PPE)</p> <ul style="list-style-type: none"> • Respiratory protection is required during sanding of lead, chromate or cadmium containing coating, if appropriate engineering controls are not

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Activity	Task & Hazard	Controls
		<p>implemented. Minimum half face piece air purifying respirator with P100 cartridge. Disposable dust masks (filtering face pieces) are not allowed.</p> <ul style="list-style-type: none"> Contractors are required to have a written Respiratory Protection Program when respirators are worn. If engineering controls are not implemented and respiratory protection is worn, personal monitoring is required to verify airborne exposure levels to lead, hexavalent chromium, and/or cadmium is within the Maximum Use Concentration (MUC) of the respirator.
<p>Painting – lead, cadmium, chromate or other toxic metal containing paint.</p> <p>This requires approval of SNL Industrial Hygiene, FMOOC Architect</p>	<p>Inhalation of lead, chromate, cadmium ,etc. containing aerosol aerosol:</p> <ul style="list-style-type: none"> Brush or roller application – Minimal IH hazard Spray application 	<p>Brush or roller:</p> <ul style="list-style-type: none"> Minimum PPE – nitrile gloves, safety glasses with side shields, coveralls (cloth or Tyvek™). <p>Spray Application:</p> <p>Substitution:</p> <ul style="list-style-type: none"> Use a paint that does not contain lead, any chromate compound, or cadmium. <p>Engineering Controls:</p> <ul style="list-style-type: none"> Use HEPA filter vacuums or HEPA vacuums and/or wet methods to perform housekeeping Utilize spray booth <p>Administrative Controls:</p> <ul style="list-style-type: none"> Initial personal air monitoring is required to comply with initial determination requirements of 29 CFR 1926.62. Training must be completed for all workers in accordance with 29 CFR 1926.62 Lead, 29 CFR 1910.1026 Chromium (VI), or 29 CFR 1910.1027 Cadmium depending on the metal in the coating Initial biological monitoring must be completed for all workers in accordance with 29 CFR 1926.62 Lead, 29 CFR 1910.1026 Chromium (VI), or 29 CFR 1910.1027 Cadmium depending on the metal in the coating Rigorous housekeeping protocols Personal hygiene: Vacuum (HEPA vacuum) contaminated work clothes and wash hands and face before eating, drinking or smoking. <p>Personal Protective Equipment (PPE):</p> <ul style="list-style-type: none"> Minimum required PPE – half face respirator with Organic vapor/P100 cartridge, nitrile gloves, splash goggles, coveralls (cloth or Tyvek™), and cap/hood.

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Activity	Task & Hazard	Controls
<p>Painting – Brush and/or roller with latex, alkyd, oil or gloss paint</p>	<p>Skin/eye contact and inhalation due to brushing or rolling paint containing: Latex (propylene glycol, ethylene glycol, texanols, butoxyethoxyethanol, butyl propionate, alcohols, and aldehydes) Alkyd, Oil, Gloss (toluene, xylenes, ethyl benzene, naphthalene, heavy alkanes)</p>	<ul style="list-style-type: none"> • Contractors are required to have a written Respiratory Protection Program when respirators are worn. <p>Substitution:</p> <ul style="list-style-type: none"> • Substitute low VOC paints when possible <p>Engineering Controls</p> <ul style="list-style-type: none"> • Ensure adequate cross ventilation – Open doors/windows and/or use additional ventilation (pedestal or axial fans) to create cross ventilation when working indoors. • Ensure vapors are not being blown to occupied areas when using fans. • Prevent HVAC recirculation of vapors during curing process by increasing fresh air percentage or shutting down recirculation and increasing fresh air percentage to 100% <p>Administrative Controls</p> <ul style="list-style-type: none"> • Work during off-hours when feasible. • Obtain and review MSDS for all paint products <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> • Safety glasses with side shields and nitrile gloves,; splash goggles when there is a potential for splashing (e.g., pouring paints). • Half face piece air purifying respirator with organic vapor cartridges and mist pre-filter is required for alkyd, oil or gloss paint applications if ventilation is not adequate. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
<p>Spray painting Epoxy or polyurethanes - outside</p>	<p>Opening containers of and mixing paint containing isocyanate components</p> <ul style="list-style-type: none"> • Skin exposure • Inhalation <p>Spraying paint containing isocyanate components</p> <ul style="list-style-type: none"> • Skin exposure • Inhalation 	<p>Substitution:</p> <ul style="list-style-type: none"> • Substitute low VOC non-isocyanate containing paints when possible <p>Engineering Controls</p> <ul style="list-style-type: none"> • Ensure adequate natural ventilation. If performing in a trench, electrical vault, manhole, etc., supplement ventilation with mechanical supply and/or exhaust is required in accordance with Excavation and Confined Space Entry Requirements. Other outside work may require fans, etc. in addition to natural ventilation depending on local wind. <p>Administrative Controls</p> <ul style="list-style-type: none"> • Ensure that vapors or aerosols do not enter building supply air intake locations. Coordinate with FMOC Mechanical Maintenance Teams if painting is near a building supply air intake location to shut down intake or shut down and cover intake location.

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Activity	Task & Hazard	Controls
		<ul style="list-style-type: none"> • Obtain and review MSDS for all paint products <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> • Safety glasses with side shields, nitrile gloves, and coveralls (cloth or Tyvek™). • Wear splash goggles when there is a potential for splashing (e.g., pouring paints). • At a minimum, a half face piece air purifying respirator with organic vapor cartridges with a paint mist pre-filter is required if ventilation is not adequate. For epoxy or polyurethane coatings that contain an isocyanate compound, minimum required respiratory protection is full face piece supplied air respirator (airline) with pressure demand or other positive pressure mode. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.
<p>Spray painting Epoxy or polyurethanes - indoors</p>	<p>Opening containers of and mixing paint containing isocyanate components</p> <ul style="list-style-type: none"> • Skin exposure • Inhalation <p>Spraying paint containing isocyanate components</p> <ul style="list-style-type: none"> • Skin exposure • Inhalation 	<p>Substitution:</p> <ul style="list-style-type: none"> • Substitute low VOC non-isocyanate containing paints when possible <p>Engineering Controls</p> <ul style="list-style-type: none"> • Use a spray paint booth. • Ensure adequate cross ventilation – Open doors/windows and/or use additional ventilation (pedestal or axial fans) to create cross ventilation when working indoors. • Ensure vapors are not being blown to occupied areas when using fans. • Prevent HVAC recirculation of vapors during curing process by increasing fresh air percentage or shutting down recirculation and increasing fresh air percentage to 100% <p>Administrative Controls</p> <ul style="list-style-type: none"> • Work during off-hours when feasible. • Obtain and review MSDS for all paint products <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> • Safety glasses with side shields, nitrile gloves, and coveralls (cloth or Tyvek™). • Wear splash goggles when there is a potential for splashing (e.g., pouring paints). • At a minimum, a half face piece air purifying respirator with organic vapor cartridges with a paint mist pre-filter is required if ventilation is

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Activity	Task & Hazard	Controls
		<p>not adequate. For epoxy or polyurethane coatings that contain an isocyanate compound, minimum required respiratory protection is full face piece supplied air respirator (airline) with pressure demand or other positive pressure mode.</p> <ul style="list-style-type: none"> Contractors are required to have a written Respiratory Protection Program when respirators are worn.
Spray painting latex	Skin/eye contact due to liquid splash Inhalation due to paint aerosols and/or vapors	<p>Engineering Controls</p> <ul style="list-style-type: none"> Ensure adequate cross ventilation – Open doors/windows and/or use additional LEV (pedestal or axial fans) to create cross ventilation when working indoors. Ensure vapors are not being blown to occupied areas when using fans. Prevent HVAC recirculation of vapors during curing process by increasing fresh air percentage or shutting down recirculation and increasing fresh air percentage to 100% <p>Administrative Controls</p> <ul style="list-style-type: none"> Work during off-hours when feasible. Obtain and review MSDS for all paint products. <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> Safety glasses with side shields Wear splash goggles when there is a potential for splashing (e.g., pouring paints).
Pesticide/fertilizer Application	Splash or spray to eyes/skin, or inhalation of chemicals from pesticides or fertilizers during: <ul style="list-style-type: none"> Mixing and loading Application 	<p>Administrative Control</p> <ul style="list-style-type: none"> EPA Certified Applicators license, or be under direct supervision of one, is required. Obtain and review MSDSs for all products/materials. All containers must be properly labeled. <p>Personal Protective Equipment</p> <ul style="list-style-type: none"> Closed mixing systems or enclosed cabs on application vehicles do not require coveralls. Mixing and loading: full-length pants, long-sleeved shirt, rubber apron or Tyvek™ coveralls (cloth or disposable), rubber boots (no leather shoes), goggles & face shield, nitrile or neoprene gauntlet gloves. Applying pesticide or fertilizer by spraying: Tyvek™ coveralls, rubber boots (no leather shoes), splash goggles & face shield, nitrile or neoprene gloves.

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Activity	Task & Hazard	Controls
Potholing	(a) Mechanical Potholing with Vacuum truck <ul style="list-style-type: none"> • Excessive noise (b) Hand Potholing <ul style="list-style-type: none"> • Minimal IH related hazards 	Personal Protection Equipment: <ul style="list-style-type: none"> • Wear earplugs or muffs with NRR \geq 32 dBA when performing mechanical potholing with a vacuum truck.
Powder actuated tools	Operating Power Actuated Tools <ul style="list-style-type: none"> • Excessive noise 	Administrative Controls: <ul style="list-style-type: none"> • Do not leave power actuated tools unattended (> 25 feet) Personal Protection Equipment: <ul style="list-style-type: none"> • Wear earplugs or muffs with NRR \geq 32 dBA
Refrigerant work - Replacing refrigerant with chloro, fluoro hydrocarbons or Preventative Maintenance (PM)	Skin/eye contact and inhalation of refrigerant gases during: <ul style="list-style-type: none"> • Draining and recharging of refrigerant systems. • Preventative Maintenance check for proper operation, absence of leaks and pressure readings of refrigerant systems. 	Administrative Controls: <ul style="list-style-type: none"> • Work on refrigerant systems must be performed by Refrigerant Technicians with EPA Certifications and trained in the use of leak and portable gas detection equipment. • Obtain and review MSDS for all refrigerant gases • Monitor for leakage in area with permanent monitoring or portable instruments for oxygen displacement or for the specific refrigerant. Personal Protection Equipment: <ul style="list-style-type: none"> • Minimum PPE: Safety glasses with side shields and a face shield; and thermal insulating gloves to prevent frostbite. Use splash goggles and face shield when a splash or spray hazard exists.
Roofing – Hot Petroleum asphalt <ul style="list-style-type: none"> • BUR (built up roofing) systems • Modified Bitumen Roofing Systems 	a) Application (mopped or mechanically spread) asphalt at 112 to 162°C (235 to 325°C): <ul style="list-style-type: none"> • Inhalation hazards • Contact burn hazards • Heat stress b) Operating the asphalt kettle <ul style="list-style-type: none"> • Inhalation hazards • Contact burn hazards • Heat stress 	Engineering Controls: <ul style="list-style-type: none"> • Use fume-suppressing asphalts when feasible. • Use mechanical felt-laying machines which have insulated lid covers. • Use pedestal or axial fans to reduce exposures. • Make sure the fan blows air away from workers. • Ensure fumes are not being blown to occupied areas when using fans. • Keep all cords and fans out of the workers’ walking paths. • Make sure that electrical connections for fans are grounded. Administrative Controls: <ul style="list-style-type: none"> • Maintain proper asphalt equiviscous temperature (EVT) plus or minus 25° F, to reduce exposure to asphalt fumes [Hot mix asphalt begins to cool after leaving the plant. Small batches of emulsified asphalt may require supplemental heat.] • Reduce the number of times the lid is opened. • Monitor for early signs of the onset of heat stress while working. Any one sign of heat stress is: blurred vision, fainting, pale skin, profuse sweating, nausea,

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Activity	Task & Hazard	Controls
		<p>vomiting and headaches.</p> <ul style="list-style-type: none"> • Ensure adequate breaks and fluids are taken, and shade provided as needed. • Place kettle away from air intakes, doors and windows. • Place kettle where the operator and workers will be least exposed to the fumes. • If buckets are used, take the following precautions: <ul style="list-style-type: none"> • Use buckets with half lids. • Fill buckets only ¾ full. • Obtain hot work permit if open flame is used. • Obtain and review MSDS for products/materials. <p>Personal Protective Equipment (PPE):</p> <ul style="list-style-type: none"> • Wear splash goggles and faceshield when working near kettle or at risk of a splash hazard. • Wear safety glasses or splash goggles when risk of splash is minimal (e.g., away from kettle, mechanically spreading asphalt). • Loose long cotton sleeve and pant (no cuff) clothing. • Thermally insulated gloves with gauntlets.
Roofing – Spray epoxy (MDI/TDI)	<p>Spraying epoxy roofing material:</p> <ul style="list-style-type: none"> • Inhalation • Skin/eye exposure 	<p>Engineering Controls for mixing and spraying:</p> <ul style="list-style-type: none"> • Use engineering controls (distance or mix in hose) to isolate worker from the separate components prior to mixing. • Hand mixing solution is not recommended and if it is used then it must be done in a well ventilated area – preferable outside in an open area (not in a trench) or using local exhaust. <p>Administrative Controls.</p> <ul style="list-style-type: none"> • Wash hands and face after doffing PPE. • Obtain and review MSDS for products/materials. <p>Personal Protection Equipment (PPE) for mixing and spraying:</p> <ul style="list-style-type: none"> • Wear butyl, nitrile, or neoprene gloves. • Respiratory Protection is required when spraying isocyanate based foam insulation. Minimum required respiratory protection when spraying isocyanate based foam insulation is full face piece supplied air respirator (airline) with pressure demand or other positive pressure mode. • Personal monitoring may be required to ensure engineering controls are adequate to prevent exposure over the occupational exposure limit. • Contractors are required to have a written Respiratory Protection Program when respirators are worn.

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Activity	Task & Hazard	Controls
		<ul style="list-style-type: none"> • Avoid other than incidental gloved contact with chemicals. Remove and replace gloves when gloves contacts chemicals. • Wear Tyvek™ coveralls. Protect skin from contact. • Wear splash goggles with a face shield.
Sewer Work – Includes sump	<ul style="list-style-type: none"> • Entry into confined spaces • Physical contact with space and/or equipment that is or was in contact with sewage 	<p>Administrative Controls:</p> <ul style="list-style-type: none"> • Follow all permit-required confined space entry procedures (e.g. atmospheric monitoring; ventilation) as required. • Wash exposed after doffing PPE. <p>Personal Protective Equipment:</p> <ul style="list-style-type: none"> • Minimum PPE: Splash goggles; and a face shield in addition to the goggles when splash hazard exists; double nitrile gloves (work gloves can be used over nitrile and then disposed of as waste); booties or rubber boots; and a Saranex suit; hood on coveralls when entering sewer. • Rinse reusable PPE with potable water, then wash with warm water and detergent, allowed to air dry.
Brazing – copper pipe	<p>Dermal contact solder fluxes (may be corrosive) Inhalation of metal fume (copper)</p>	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • Use welding fume extractor or a pedestal or axial fans when brazing for full shift duration or when brazing for >1 hour in a small space (utility chase) <p>Administrative Controls:</p> <ul style="list-style-type: none"> • Wash hands after removing gloves. • Obtain and review MSDS for all chemicals. <p>Personal Protection Equipment (PPE):</p> <ul style="list-style-type: none"> • Wear leather gloves. • Wear safety glasses with side shields.
Vacuum systems	<p>(a) Breaching Lines Residual chemicals found in pipes</p> <ul style="list-style-type: none"> • Inhalation • Skin Exposure <p>(b) Maintain or replace pumps Residual chemicals found in pump and working with lubricants/solvents</p> <ul style="list-style-type: none"> • Inhalation • Skin Exposure 	<p>Engineering Controls:</p> <ul style="list-style-type: none"> • When breaching a vacuum system, it should run for 8 hours (disconnected from labs) without introduction of chemicals before opening. • If using mechanical tools and dust will be generated, use wet methods or HEPA vacuum to contain dust. • When possible use hand tools instead of mechanical tools to reduce dust generation. <p>Administrative controls:</p> <ul style="list-style-type: none"> • Wash hands after doffing gloves. <p>Personal Protection Equipment (PPE):</p>

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		<ul style="list-style-type: none"> • Wear nitrile gloves under leather gloves. • Wear safety glasses with side shields; • Wear splash goggles, if liquid may be splashed from drain during breach. • Wear labcoat or Tyvek top with long sleeves.
Water treatment systems – Test water	Taking sample of water and adding test reagents: <ul style="list-style-type: none"> • Dermal exposure 	Administrative controls: <ul style="list-style-type: none"> • Wash hands after doffing gloves. • Obtain and review MSDS for all chemicals/reagents. Personal Protection Equipment (PPE): <ul style="list-style-type: none"> • Wear nitrile gloves. • Wear safety glasses with side shields; or goggles if there is a splash hazard.
Water treatment systems – Adding chemical to water treatment systems	Manually adding chemical to water system: <ul style="list-style-type: none"> • Skin/Eye Exposure • Inhalation 	Engineering Controls: <ul style="list-style-type: none"> • Only add chemicals by hand in a well ventilation area. Administrative controls: <ul style="list-style-type: none"> • Wash hands after doffing gloves. • Identify closest eye wash station; if not available maintain portable eye wash and buddy system to get nearest eye station and medical facility • Obtain and review MSDS for all chemicals/reagents. Personal Protection Equipment (PPE): <ul style="list-style-type: none"> • Wear nitrile gloves. • Wear chemical splash goggles and a face shield if there is a splash hazard.
Welding, Thermal Cutting or Brazing	Welding, thermal cutting, or brazing outside, inside, or confined space: <ul style="list-style-type: none"> • Electrical shock • Thermal burns • UV/visible light exposure to eyes/skin • Inhalation of metal fumes and gases 	Engineering Controls: <ul style="list-style-type: none"> • Use portable welding fume extractor for all indoor welding and thermal cutting activities or for all welding or thermal cutting activities that involve: <ul style="list-style-type: none"> ➤ Lead coatings/plating. ➤ Cadmium coatings/plating. ➤ Stainless steel or chromium steel coatings or alloys, electrodes in 300 series. • Remove lead coatings using requirements addressed in Paint Prep section of this document • Arc flash protection is required to prevent eye injury to incidental workers and by-standers Administrative Controls: <ul style="list-style-type: none"> • IH reviewed and accepted Contractor Welding, Cutting, Brazing Exposure Assessment and Hot Work Permit issued by Fire Protection Personal Protective Equipment - Welding:

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		<ul style="list-style-type: none"> • Welding helmet with Auto-Darkening filter or appropriate shade filter depending on type of welding and amperage. • Welding cape or jacket • Leather welding gloves • Safety glasses under welding helmet • Hearing protection when grinding weld area or welds <p>Personal Protective Equipment – Thermal cutting</p> <ul style="list-style-type: none"> • Face shield, goggles, or welding helmet minimum Shade 5 lens • Leather welding gloves • Safety glasses under face shield or welding helmet • Fire Resistant clothing (long sleeved shirts, no cuff pants) <p>Personal Protective Equipment – Brazing</p> <ul style="list-style-type: none"> • Safety glasses with side shields or Shade 3-5 safety glasses for eye comfort • Leather gloves